

**Date : 2008-08-24**  
**Session : SIROT - Biomechanics**  
**Time : 0800-0900**  
**Room: Theater 1**

**Abstract number : 18395**

**RADIOSTEREOMETRIC ANALYSIS (RSA) OF THREE-DIMENSIONAL MICROMOTION IN A FRACTURE MODEL OF FEMUR**

Saravana Vail KARUPPIAH<sup>1</sup>, Martin DOWNING<sup>1</sup>, George P ASHCROFT<sup>1</sup>, Alan J JOHNSTONE<sup>2</sup>, Blair ASHCROFT<sup>2</sup>

<sup>1</sup>University of Aberdeen, Aberdeen (UNITED KINGDOM), <sup>2</sup>NHS Grampian University Hospitals Trust, Aberdeen (UNITED KINGDOM)

**INTRODUCTION:** Intramedullary nail (IM) has been used in the treatment of both simple and comminuted femoral fractures. However there may be a high variability in the stability provided by IM nail, to the fracture fragments, depending on the type of fracture configuration, thereby influencing the union rate. We aimed to observe the degree of movement at the fracture site and the relative displacements between the fracture fragments in different fracture configurations using stereoradiographs (RSA). **METHOD:** This study was done in an experimental set-up which consisted of a physically simulated femoral shaft fractures models fixed with a Russell Taylor nail in a standard fashion. Three common fracture configurations were used: 1. Transverse fracture, 2. Wedge fracture with butterfly fragment and 3. Complex comminuted fracture. Each fracture was studied by simulated weight bearing conditions (x1 times body weight) and the axis of fragment movements recorded in x, y and z directions. **RESULTS:** There is significant difference in the movement of fracture fragments between different fracture configurations, with highest being for comminuted midshaft fractures. The degree of translation movement in the comminuted fracture was 6 times more compared to a simple transverse fracture, in x, y and z directions; and similarly the observed degree of rotation was 3 times more at the fracture site when comparing both the fractures. **CONCLUSION:** Comminuted fractures, treated with IM nailing, have an observed higher fracture movement compared to a simple fracture configuration. This may explain some of the clinically observed delayed or nonunion of femoral fractures.

**Date : 2008-08-24**  
**Session : SIROT - Biomechanics**  
**Time : 0800-0900**  
**Room: Theater 1**

**Abstract number : 18359**

**SUTURE ANCHORS FOR BANKART REPAIR REVISITED**

Ilias BISBINAS, Petros MIKALEF, Evangelos MAGNISSALIS, Theodoros BESLIKAS, Ioannis CHRISTOFORIDIS  
*Orthopaedic Dept, Aristotle University of Thessaloniki, Thessaloniki (GREECE)*

AIM: The aim of our work was to characterize and compare the performance of sutures anchors used for Bankart repair in shoulder surgery. MATERIAL AND METHODS: Three metallic: Arthrex Fastak, Mitek GII, Smith+Nephew Ti 3.5 and three absorbable anchors: Arthrex BioFastak, Mitek Panalok, Smith+Nephew Bioraptor were tested. Their pull-out strength and failure mode was determined in ex-vivo ovine glenoids. For every type of specimen five samples were used. Materials Testing Machine and attached load cell run with Emperor Software (MECMESIN, UK) were used for the tests. Tensile load was applied at a rate of 60mm/minute, while load and displacement were recorded at a sampling rate of 100Hz. Pull-out strength and failure mode was recorded for each specimen. RESULTS: The metallic anchors Arthrex Fastak and Smith+Nephew Ti 3.5 had a median strength of 678.3N and 499.7N respectively which was higher than all the others. ( $p=0.007$ ). Mitek GII had a low median strength of 86.5N. In Smith+Nephew Ti 3.5 anchor tests 4 out of 5 anchors had eyelet failure. All bioresorbable anchors exhibited much lower pull-out strengths which were not statistically different between each other ( $p=0.056$ ): Arthrex BioFastak: 175.6N, Mitek Panalok: 99.6N, Smith+Nephew Bioraptor: 249.2N. CONCLUSION: As it is obvious, metallic anchors have a better performance than bioabsorbable ones and S+N metallic anchors in high pull-out forces fail often in their eyelet, which is their weak point and need design improvement.

Date : 2008-08-24  
Session : SIROT - Biomechanics  
Time : 0800-0900  
Room: Theater 1

Abstract number : 18270

**INFLUENCE OF A SINGLE SHAFT ANGLE-STABLE SCREW IN OSTEOPOROTIC DISTAL RADIUS FRACTURES TREATED WITH VOLAR FIXED-ANGLE PLATES - A BIOMECHANICAL STUDY**

Patrick WENINGER<sup>1</sup>, Herwig DROBETZ<sup>2</sup>, Martin LEIXNERING<sup>3</sup>, Elmar TSCHEGG<sup>4</sup>, Heinz REDL<sup>5</sup>, Harald HERTZ<sup>3</sup>

<sup>1</sup>Lorenz Boehler Trauma Centre; Ludwig Boltzmann Institute for Experimental and Clinical Traumatology, Vienna (AUSTRIA), <sup>2</sup>Mackay Base Hospital, Mackay (AUSTRALIA), <sup>3</sup>Lorenz Boehler Trauma Centre, Vienna (AUSTRIA), <sup>4</sup>Institute for Material Sciences, Technical University, Vienna (AUSTRIA), <sup>5</sup>Ludwig Boltzmann Institute for experimental and clinical traumatology, Vienna (AUSTRIA)

**INTRODUCTION:** Volar fixed-angle plating is a popular treatment for distal radius fractures. It is generally accepted that fixed-angle locking screws should be used to stabilise the distal metaphyseal fragment. To date, no information is available whether locking screws or bicortical non-locking screws should be used for plate fixation in the shaft. **MATERIAL AND METHODS:** An osteoporotic distal radius fracture model was created by using Sawbones. Fracture stabilisation was performed with volar fixed-angle locking plates (Aptus, Medartis) in all samples. Mechanical testing was performed with 800N for 2,000 cycles to simulate 5 weeks of early motion. Implant stiffness, cycles to failure and permanent and elastic deformation were recorded in each specimen. **RESULTS:** Plates with a single fixed-angle locking screw significantly increased implant stiffness and fatigue strength of the implants. Elastic and permanent displacement rates were reduced significantly if such locking screws were inserted into the most proximal screw hole. Loosening of the most proximal screw followed by secondary loss of reduction was recorded if shaft screws were inserted bicortically and if no fixed-angle locking screw was used. **DISCUSSION:** A single fixed-angle locking screw in the shaft increases stability of volar plating and reduces secondary loss of reduction in distal radius fractures. It is superior to plate fixation with bicortical non-locking screw fixation. If a single fixed-angle locking screw is used in the shaft, early motion without cast can be recommended even in patients with osteoporotic bone.

Date : 2008-08-24  
Session : SIROT - Biomechanics  
Time : 0800-0900  
Room: Theater 1

Abstract number : 18227

**WHAT HAPPENS AFTER IMMEDIATE FULL WEIGHT BEARING AFTER INTRAMEDULLARY NAILING OF DISTAL TIBIAL FRACTURES - A BIOMECHANICAL ANALYSIS**

Patrick WENINGER<sup>1</sup>, Arthur SCHULTZ<sup>1</sup>, Elmar TSCHEGG<sup>2</sup>, Heinz REDL<sup>3</sup>, Harald HERTZ<sup>1</sup>

<sup>1</sup>Lorenz Boehler Trauma Centre, Vienna (AUSTRIA), <sup>2</sup>Institute for Material Sciences, Technical University, Vienna (AUSTRIA), <sup>3</sup>Ludwig Boltzmann Institute for experimental and clinical traumatology, Vienna (AUSTRIA)

INTRODUCTION: Intramedullary nailing of tibial fractures is a generally accepted standard procedure. Little is known about displacement rates at the fracture site if patients immediately bear full weight after tibial nailing. MATERIAL AND METHODS: A distal tibia Sawbones-fracture model was created. Four different nail types were used for fracture stabilisation (n=4). Stiffness and cycles to failure were recorded after axial loading with 700 (+-600) N for 40,000 cycles. Using displacement transducers and acoustic emission sensors, elastic and permanent displacement rates at the fracture site were recorded during the loading series. RESULTS: Tibial nails with 4 distal interlocking options were significantly stiffer and showed higher fatigue strength when compared to nails with 3 distal interlocking screws. 3 displacement rates were recorded at the fracture site in each nail type: offset, elastic and permanent displacement. Those displacement rates differed depending on the nail type used. We did not record any implant failures or damage to the synthetic bone. DISCUSSION: Early weight bearing is possible after intramedullary nailing of distal tibial fractures. 4 distal screws should be used for distal interlocking. Displacement at the fracture site has to be considered despite stable proximal and distal interlocking.

Date : 2008-08-24  
Session : SIROT - Biomechanics  
Time : 0800-0900  
Room: Theater 1

Abstract number : 17901

**A BIOMECHANICAL COMPARISON OF SURGICAL STRATEGIES OF POSTERIOR FIXATION AFTER TWO-LEVEL ALIF**

Chang-Yuan FAN<sup>1</sup>, Ching-Kong CHAO<sup>1</sup>, Kuo-Hua CHAO<sup>2</sup>, Son-Jyh LIN<sup>3</sup>

<sup>1</sup>Department of Mechanical Engineering National Taiwan University of Science and Technology, Taipei (TAIWAN), <sup>2</sup>Department of Orthopedic Surgery, Tri-Service General Hospital, Taipei (TAIWAN), <sup>3</sup>National Central University, Institute of Biomechanical Engineering, Taoyuan (TAIWAN)

After ALIF, the discrepancy of biomechanical properties resulted from different posterior fixations. We used finite element analysis to analyse the biomechanical properties for different posterior instrumentation constructs after two-level ALIF. A three-dimensional finite element model of the L3-L5 lumbar spine was used to simulate the two-level ALIF cylindrical cages placement between L3/L4 and L4/L5 with different posterior instrumentation systems including 3 level posterior pedicular screws and rods (3TPS-R) fixation, 2 level translaminar facet screws (TLFS) fixation, 2 level transfacet screws (TFPS) fixation, 2 level posterior pedicular screws and rods (2TPS-R) fixation, and 2 level posterior pedicular screws and rods plus cross-link (2TPS-R-CL) fixation. In the present finite element model, we also investigated the biomechanical properties for different loading conditions including axial displacement, the angular rotation, the total energy of the vertebra and posterior instrumentation structures in variable bending moments, and the displacement of the anterior direction in L4 vertebra in posterior pushing force. This study demonstrated the compression caused by different fixation structures that brought out the tiny effect of cage subsidence into the endplates. The results showed that 3TPS-R for L3-L4 motion segments of ALIF came into the best stable effect among different fixation structures. Postoperative may avoid doing intense lateral bending movement that can prevent the loosening and the failure of posterior instrumentation structure in the short-term and long-term respectively. Both 2TRS-R fixation and 2TPS-R-C fixations were found to fail to prevent the occurrence of relative micro motion between L4 and bone cage interfaces effectively.

Date : 2008-08-24  
Session : SIROT - Biomechanics  
Time : 0800-0900  
Room: Theater 1

Abstract number : 17444

**ARCHITECTURAL AND MECHANICAL PROPERTIES OF CANCELLOUS BONE WITH STRONTIUM TREATMENT IN OSTEOPOROTIC GOATS**

Zhaoyang LI<sup>1</sup>, William W LU<sup>1</sup>, Peter KY CHIU<sup>1</sup>, Wing Moon LAM<sup>1</sup>, Bin TANG<sup>1</sup>, Hing Wan NGAN<sup>1</sup>, David FANG<sup>1</sup>, Kenneth MC CHEUNG<sup>1</sup>, John CY LEONG<sup>2</sup>, Keith DK LUK<sup>1</sup>

<sup>1</sup>The University of Hong Kong, Hong Kong (HONG KONG), <sup>2</sup>The Open University of Hong Kong, Hong Kong (HONG KONG)

**INTRODUCTION:** Recently, strontium (Sr) compounds have become more popular in the treatment of osteoporosis by concomitantly inhibiting bone resorption and enhancing bone formation. Previously, we developed a novel strontium fortified calcium compound. This study was designed to evaluate the effects of this compound on the micro-architectural and nano-mechanical properties of cancellous bone in osteoporotic goats. **MATERIALS AND METHODS:** Large animal model of osteoporosis was established in aged goats underwent ovariectomy. Strontium fortified calcium compound were orally administered for 4 months. Histomorphometric indices were determined and trabecular micro-architectural parameters from  $\mu$ CT were quantified. The biomechanical properties of single trabecula were determined by nano-indentation. **RESULTS AND DISCUSSION:** Sr combined with Ca treatment increased osteoid area and the anabolic effects of Sr were confirmed from the increased bone mineral apposition rate. No adverse effects on bone mineralization were detected. Consistent with histomorphometric indices,  $\mu$ CT results demonstrated that combination treatment increased bone mineral density. Sr combined with Ca treatment significantly increased trabecular bone volume by 12.22%, primarily by increasing trabecular thickness (Tb.Th\*). Elastic modulus (E) of single trabecula was not changed in Sr combined with Ca treatment despite a slight decrease in hardness (H). This results in considerable increase in fracture toughness of bone and contributes as one of the reasons for fracture risks reduction in postmenopausal women after Sr treatment. **CONCLUSION:** The present results indicate that Sr combined with Ca increased bone volume by stimulating new bone formation, thus increased the toughness of bone and decreased the fracture risk.

Date : 2008-08-24  
Session : SIROT - Biomechanics  
Time : 0800-0900  
Room: Theater 1

Abstract number : 16342

**THE BIOMECHANICAL FINITE ELEMENT SIMULATION STUDY FOR EVALUATION OF THE EFFECT OF INITIAL GRAFT TENSION AND THE KNEE FLEXION ANGLE WHEN GRAFT FIXED IN TUNNEL IN ACL RECONSTRUCTION WITH BONE-PATELLAR-TENDON-BONE GRAFT AND HAMSTRING GRAFT**

Dariush GOURAN SAVADKOOHI<sup>1</sup>, M. MIRGHASEMI<sup>1</sup>, M. ESHRAGHI<sup>2</sup>

<sup>1</sup>*Sina Hospital, Tehran University of Medical Sciences, Tehran (IRAN),* <sup>2</sup>*Sharif University of Technology, Faculty of Biomechanics, Tehran (IRAN)*

INTRODUCTION: Number of in vitro studies have shown that tension over an ACL reconstruction graft at the time of fixation will affect the stability of joint. Pretension force to the soft tissue graft during ACL reconstruction and the angle which the graft is fixed in tunnel are debated issues. In this study we have evaluated the effects of initial graft tension and angle of fixation on anterior knee laxity after ACL reconstruction. TYPE OF STUDY: Biomechanical finite element simulation study. METHODS: The angle of the knee that graft fixed in the tunnel and pretension of graft were our variables in a knee simulator. The effects of changes in these two variables on the anterior knee laxity in response to an anterior tibial loading force were evaluated by finite element analysis. In this finite element study we compared anterior tibial displacement in response to anterior tibial load after the fixation in different angles (0 to 90 degrees); then anterior tibial load was applied in three different angles of the knee (0 degree, 30 degrees and 90 degrees) of knee flexion and the results were compared with normal knee. RESULTS: Our results regarding the knee flexion were heterogeneous. The assessment of the pretension of the graft has shown that a pretension of 50-65 N with angle of 20 degrees to 40 degrees of knee flexion will result in the least anterior tibial displacement which is similar to normal knee joint.

Date : 2008-08-24  
Session : SIROT - Infections  
Time : 0900-1030  
Room: Theater 1

Abstract number : 17852

**SELECTIVE TARGETING OF CATIONIC LIPOSOMES TO THE SYNOVIAL ENDOTHELIUM IN RHEUMATOID ARTHRITIS - A NEW FORM OF VASCULAR TARGETING**

Oliver GOTTSCHALK<sup>1</sup>, Philip METZ<sup>2</sup>, Britta SCHULZE<sup>3</sup>, Uwe MICHAELIS<sup>3</sup>, Eric GUENZI<sup>3</sup>, Volkmar JANSSON<sup>1</sup>, Marcus SCHMITT-SODY<sup>4</sup>

<sup>1</sup>Orthopaedic Surgery, LMU Munich, München (GERMANY), <sup>2</sup>Institute for Surgical Research, LMU Munich, München (GERMANY), <sup>3</sup>MediGene, Martinsried (GERMANY), <sup>4</sup>Medical Park Klinik Chiemsee, Bernau am Chiemsee (GERMANY)

**INTRODUCTION:** Activated endothelial cells play a major role in the inflammatory process in rheumatoid arthritis (RA). Enhanced angiogenesis contributes to the formation and maintenance of the pannus. Cationic liposomes have been shown to target angiogenic endothelial cells in tumours and inflammation. To test whether cationic liposomes can serve as vehicles for drug delivery in RA we investigated the targeting of fluorescently labelled cationic liposomes (LipoRed) to activated synovial vasculature. **MATERIALS AND METHODS:** Targeting of LipoRed to the synovial vasculature was analysed by intravital microscopy (IVM) in mice with antigen induced arthritis (AIA). C57/Bl6 mice were divided in three main groups; cationic, anionic or neutral liposomes, each containing 7 arthritic and 7 control animals. Synovial tissue was investigated at day 8 after AIA induction. The mice each received 5µl of the substance to investigate. Time resolved binding of liposomes was quantified at functional vessels of the microvasculature. **RESULTS:** Intravenously applied LipoRed enriched more than threefold in the synovial vasculature of AIA mice compared with healthy mice. In AIA animals maximum binding measured as relative fluorescence (Fmax=142 RFU) was already achieved 5 min after LipoRed application (tmax) and dropped to the half maximum after 100 min (tmax/2) compared with healthy mice with a Fmax=48 RFU, tmax=15 min, tmax/2= 60 min. Anionic and neutral liposomes showed no specific binding. **DISCUSSION:** Based on our in vivo data, cationic liposomes seem to be very well suited to deliver compounds to rheumatoid joints for diagnosis and/or therapy.



Date : 2008-08-24  
Session : SIROT - Infections  
Time : 0900-1030  
Room: Theater 1

Abstract number : 17847

**ENDOTAG-1®, A CATIONIC LIPOSOME-CONTAINING PACLITAXEL, DEMONSTRATES ANTI-ANGIOGENIC AND ANTI-INFLAMMATORY ACTIVITY IN RHEUMATOID ARTHRITIS IN VIVO**

Oliver GOTTSCHALK<sup>1</sup>, Philip METZ<sup>2</sup>, Britta SCHULZE<sup>3</sup>, Uwe MICHAELIS<sup>3</sup>, Eric GUENZI<sup>3</sup>, Volkmar JANSSON<sup>1</sup>, Marcus SCHMITT-SODY<sup>4</sup>

<sup>1</sup>*Orthopaedic surgery, LMU Munich, München (GERMANY)*, <sup>2</sup>*Institute for Surgical Research, München (GERMANY)*, <sup>3</sup>*MediGene, Martinsried (GERMANY)*, <sup>4</sup>*MedicalPark Chiemsee, Bernau am Chiemsee (GERMANY)*

**INTRODUCTION:** Inflammation and angiogenesis in rheumatoid arthritis (RA) contribute largely to the formation of pannus. Cationic liposomes target efficiently angiogenic endothelial cells in the synovial vasculature of rheumatoid joints and may also serve as potent vehicles for systemic drug delivery and therapy. The aim was to demonstrate that EndoTAG-1® (paclitaxel in cationic liposomes) is effectively delivered to the synovial vasculature of knee joints and to compare the therapeutical efficacy of EndoTAG-1® to Taxol®. **MATERIALS AND METHODS:** Targeting of fluorescently labelled cationic liposomes (LipoRed) and of fluorescently labelled paclitaxel included in cationic liposomes (EndoOGT) to the synovial vasculature in mice with antigen-induced arthritis (AIA) was analysed by intravital microscopy. Density of functional vessels and adhesion of fluorescently labelled platelets or leukocytes were determined after treatment with EndoTAG-1® and analysed afterwards. **RESULTS:** Treatment of AIA mice with EndoTAG-1® concomitant to disease induction showed a complete remission of the course of the disease as shown by a significant decrease of clinical scores compared to control and Taxol® treated groups. A complete inhibition (98%) of neo-vascularisation was observed in the synovial vasculature of mice with AIA that were treated with EndoTAG-1® whereas Taxol® alone showed only 50% inhibitory effect. Rolling and adhesion of platelets were reduced to 53% (paclitaxel 5%) and 98% (paclitaxel 57%), respectively. **DISCUSSION:** Therapeutic efficacy with EndoTAG-1® was superior to Taxol® which strongly suggests that systemic delivery of cationic liposomes is very well suited to enrich compounds to rheumatoid joints for therapy and could be a promising treatment option for RA.

Date : 2008-08-24  
Session : SIROT - Infections  
Time : 0900-1030  
Room: Theater 1

Abstract number : 16407

**PERIOPERATIVE ANTIBIOTICS DO NOT AFFECT INTRAOPERATIVE TISSUE BIOPSIES FOR MICROBIOLOGY ANALYSIS. A BLINDED PROSPECTIVE RANDOMIZED STUDY**

Rihard TREBŠE, Nataša FAGANELI, Martina KAVIČIČ, Simon KOVAČIČ,  
*Orthopedic Hospital Valdoltra, Ankaran (SLOVENIA)*

Applying prophylactic cephazolin half an hour before surgery in potentially infected joint arthroplasty may adversely affect growth of bacteria from intraoperative tissue samples resulting in false negative microbiology exams. Delaying antibiotics may, on the other hand, predispose not-infected patients for an infection or already infected cases for an additional infection. In 19 patients with suspected prosthetic infection revision surgery was performed. Before application of antimicrobials just after opening the joint 3 tissue samples were collected and then cephazolin was administered. At the end of the surgery, as long as possible after the application of antibiotic we collected additional 3 samples from the same spots. We also checked tissue penetration and blood concentration of cefazolin at the end of the surgery. The microbiologist and the pathologist performed the analysis of all samples in a blinded fashion. RESULTS: In 3 patients with positive cultures acquired before application of cefazolin cultures obtained after application resulted negative. In 2 patients with negative cultures before application of cefazolin cultures obtained after application resulted positive. For all the others there were no changes in cultures before and after the application of antibiotic. Statistically we could not confirm the hypothesis that perioperative antibiotics influence tissue cultures. Mean cefazolin concentration in tissue specimen varied depending on intraoperative blood loss and BMI; tissue concentrations were within therapeutic levels in 17 patients (out of 19). CONCLUSION: With the numbers available it seems advisable to apply perioperative prophylactic antibiotics preoperatively even in cases where intraoperative sampling for microbiology analysis is planned.

**Date : 2008-08-24**  
**Session : SIROT - Infections**  
**Time : 0900-1030**  
**Room: Theater 1**

**Abstract number : 17694**

**TUBERCULOSIS OF STERNUM - WHAT WE KNOW AND WHAT WE DON'T**

Shah Alam KHAN, Manish VARSHNEY, Ashok KUMAR, Shishir RASTOGI  
*All India Institute of Medical Sciences, New Delhi (INDIA)*

**INTRODUCTION:** Musculoskeletal affections of tuberculosis are extremely rare. The increase in atypical presentations with the advent of HIV has tested the physicians' ability in correctly diagnosing and treating the disease. We present a series of 14 cases of tuberculosis of sternum with evaluation of the disease outcome and management protocol. **METHODS:** Ours was a prospective evaluation of 14 cases of tuberculosis of the sternum with an average follow-up of 2.8 years. Twelve cases were treated with antitubercular treatment only (out of which two required treatment for MDR (multi drug resistant) tuberculosis) and the rest two cases required surgical debridement in addition to first line antitubercular therapy. We evaluated the clinical presentation, disease duration and treatment options in these cases. **RESULTS:** All patients had complete healing of disease and showed no recurrence at the last follow-up. MRI (magnetic resonance imaging) helps to diagnose the condition in early stage. Early and adequate treatment with multidrug antitubercular therapy (ATT) may averse the need of surgical treatment. We also present an anatomical classification for tuberculosis of sternum. We divided the lesions into three type I, II and III. Type I disease affects Manubrium, type II affects the body and type III disease affects the whole sternum.

Date : 2008-08-24  
Session : SIROT - Infections  
Time : 0900-1030  
Room: Theater 1

Abstract number : 16319

**RELATIVE RATES AND FUTURES OF ACUTE LEG INFECTIONS IN AFRICAN EMERGENCY SETTING; A REPORT OF 71 CASES OBSERVED IN THE CENTRAL HOSPITAL OF YAOUNDÉ**

Jean BAHEBECK, Maurice SOSSO

*Central Hospital of Yaounde, Yaounde (CAMEROON)*

The aim of this paper was to report the clinical patterns, the bacteriological flora, the antibiotic sensitivity, the management as well as the outcome of a consecutive series of acute leg infections observed in the University Hospitals of Yaoundé, a Sub-Saharan African community. Patients were recruited in the emergency department unit during 24 months. The clinical diagnosis was based on the opinion of the same consultant surgeon, confirmed by the same consultant physician. All patients underwent standard radiography, Doppler ultrasound of the leg, blood sugar test, and routine preoperative check-up. The bacteriological analysis as well as the antibiotic sensitivity was done on the surgical specimen in all cases. All cases of discordant clinical diagnosis were excluded from the study. A total of 73 cases of acute leg infections were concordant and admitted; patients were aged 15 to 70 years old and their sex ratio was 2.38. 45 patients were diabetic but 10 of them were not known before the leg infection. Nine types of acute leg infections were observed: 25 cellulites (35%), 10 wet gangrenes (14%), 9 myositis (12%), 8 osteomyelitis (11%), 7 dry gangrenes (10%), 5 gas gangrenes (7%), 4 feet phlegm (5.5%) and 3 erysipelas. The 65 microorganisms isolated in the specimens of 36 diabetic feet were divided in 24 species; their antibiotic sensitivity was evaluated. The types, the frequencies, the aetiologies, the management of these infections are discussed in comparison to whether patients were diabetic or not and to some African specificities.

**Date : 2008-08-24**  
**Session : SIROT - Infections**  
**Time : 0900-1030**  
**Room: Theater 1**

**Abstract number : 16226**

**THE TREATMENT OF ACUTE INFECTION FOLLOWING PLATING OF TIBIA RESULTING WITH AN EXPOSE BONE AND METAL IMPLANT**

Nazri MOHD YUSOF<sup>1</sup>, Mohammad Azril MOHAMMAD AMIN<sup>1</sup>, Ahmad Hafiz ZULKIFLY<sup>1</sup>, Mohd Kamil MOHAMMAD AMIN<sup>2</sup>

<sup>1</sup>*International Islamic University of Malaysia, Kuantan, Pahang (MALAYSIA)*, <sup>2</sup>*Hospital Tengku Ampuan Afzan, Kuantan, Pahang (MALAYSIA)*

The subcutaneous anteromedial aspect of tibia is vulnerable to open injuries. The thin layer of subcutaneous tissue is precarious to developed wound complication because of its poor blood supply. Plating of tibia requires large surgical exposure which causes additional injury to the soft tissue. Precaution like avoiding incision through the injured skin, elevating a fasciocutaneous flap, avoiding the subcutaneous dissection, doing the anterolateral approach or delaying the surgery until the skin contusion and swelling reduced has been advocated to avoid wound complication. We report 4 cases of infection following plating of tibia resulting with an expose bone and metal implant. Two had fracture at the proximal third of tibia, one fracture of medial tibia plateau and one at the midshaft. All the infections developed within 2 weeks of surgery. Initial treatment is by surgical drainage and local antibiotic beads. However, aggressive wound debridement, removal of implant and coverage with gastrocnemius muscle or myocutaneous flap are done when the infection cannot be controlled. The bone defect is managed by autologous bone graft or bone transport at a later stage.

**Date : 2008-08-24**  
**Session : SIROT - Infections**  
**Time : 0900-1030**  
**Room: Theater 1**

**Abstract number : 18385**

**DOES A KNEE JOINT ASPIRATION GUIDE THE TREATMENT OF POTENTIAL SEPTIC KNEE ARTHRITIS?**

Ibrar MAJID, Talal IBRAHIM, Ravi THIMMAIAH, Nandan ADLA, Mahmoud SLIBI  
*University Hospitals of Leicester, Leicester (UNITED KINGDOM)*

AIM: To investigate whether a knee joint aspiration of a potential septic arthritis yields clinical information to guide treatment in the form of an arthroscopic knee wash-out. PATIENTS AND METHODS: The case notes of 45 patients admitted to hospital with potential septic knee arthritis who underwent arthroscopic wash-out were reviewed over a six-month period. All patients had a knee joint aspiration performed and microbiological results were reviewed. Arthroscopic findings were correlated with microbiology results. RESULTS: Twenty-eight females and 17 males with a mean age of 62 years underwent arthroscopic knee wash-outs. Three of the joint aspirates contained micro-organisms on initial gram stain and only two aspirates grew *Staphylococcus Aureus* on primary culture. Two aspirates grew micro-organisms (*Staphylococcus Aureus* and Group G *Streptococcus*) from fluid sent at arthroscopy. Four blood cultures grew micro-organisms that were completely different to micro-organisms from knee aspirates. CONCLUSION: Most patients that underwent arthroscopic wash-out had no micro-organisms grown on culture of preoperative and intraoperative knee aspirates. Protocols need to be developed to determine who requires an arthroscopic knee wash-out for potential septic knee arthritis.

**Date : 2008-08-24**  
**Session : SIROT - Infections**  
**Time : 0900-1030**  
**Room: Theater 1**

**Abstract number : 18296**

**LIMITED VALUE OF FROZEN SECTION HISTOLOGY AS AN INTRAOPERATIVE TEST FOR INFECTION DURING TOTAL HIP ARTHROPLASTY REVISION**

Micha HOLLA, Charlotte LOOTS, Willem SCHREURS  
*Radboud University Nijmegen Medical Center, Nijmegen (NETHERLANDS)*

Performing a revision total hip arthroplasty in an unrecognised septic loosening often results in a disappointing outcome. Hence, assessment of a possible infection preceding a total hip revision procedure is crucial. We studied the predictive value of intraoperative fresh frozen sections. We studied 198 revision procedures in 178 patients. Intraoperative antibiotics were given after obtaining intraoperative cultures. In all at least two cultures and in all intraoperative frozen sections were obtained. In 151 hips revisions the intraoperative cultures were negative and in 47 hip revisions the intraoperative cultures were positive. In 33 of the 198 hips frozen sections were positive for septic loosening according to the used definition. Using the intraoperative cultures as a gold standard, the fresh frozen section histology had 19% sensitivity and 84% specificity. The positive and negative predictive values were 32% and 77% respectively. In contrast to previous reports, our study shows a limited value of intraoperative frozen sections as an intraoperative test to exclude septic loosening during revision total hip arthroplasty. Users of intraoperative frozen section histology as a test to exclude infection must be aware of higher chances of false negative results than reported previously.

Date : 2008-08-24  
Session : SIROT - Infections  
Time : 0900-1030  
Room: Theater 1

Abstract number : 17309

**COMPLICATION MANAGEMENT IN FATAL NECROTISING FASCIITIS ASSOCIATED WITH INTRAMUSCULAR INJECTION OF INFLUENZA VACCINE**

Marlon COULIBALY<sup>1</sup>, Sven JUNG<sup>1</sup>, Malte PLATO<sup>1</sup>, Micheal ADOLF<sup>2</sup>, Thomas WEISS<sup>2</sup>, Levent OEZOKYAY<sup>1</sup>, Gert MUHR<sup>1</sup>, Christian SCHINKEL<sup>1</sup>

<sup>1</sup>Department of Traumatology, University Hospital Bergmannsheil GmbH, Bochum (GERMANY), <sup>2</sup>Department of Anaesthesiology, University Hospital Bergmannsheil GmbH, Bochum (GERMANY)

INTRODUCTION: Necrotising fasciitis (NF) often caused by streptococcus pyogenes is a life-threatening infection of the superficial muscle fascia and the adjacent deep layer of subcutaneous tissue that can be fatal. There is actually no data in the literature about complication management of NF developing after influenza vaccination. CASE REPORT: We report a 40-year-old man who was vaccinated against influenza virus 3 days prior to primary hospital admission. He presented with progressive swelling and tenderness of the left upper extremity. After 12 hours he was transferred to our institution due to clinical progress. The diagnosis of NF was made by clinical findings. Laboratory findings showed a coagulopathy state with acute renal failure, rhabdomyolysis and hepatic failure. As surgical procedure immediate fasciectomy of the left arm and hemithorax were performed. The operation was complicated by a severe bleeding disorder. Shoulder exarticulation as rescue procedure was undertaken. The patient died 48 hours after admission due to fatal sepsis and multi organ failure (MOF). CONCLUSION: Infection by group A streptococci after vaccination is uncommon. Streptococcal toxic shock like syndrome can be accompanied by NF and MOF and the course is often fulminant and fatal. Therapeutical strategy should aim for early surgical intervention, high-dose antibiotic therapy and intensive care medical treatment. Determinant factors are extensive preoperative planning including supply of stored blood and interdisciplinary work between intensive care medicine, anesthesiologist and orthopaedic surgeon.



**Date : 2008-08-24**  
**Session : SIROT - Infections**  
**Time : 0900-1030**  
**Room: Theater 1**

**Abstract number : 18620**

**NECROTISING FASCIITIS: ANALYSIS OF 48 CASES IN HONG KONG**

Kin Wai Kelvin SUN, Pak Ho Andrew CHAN, Yuk Yin CHOW

*Department of Orthopaedics and Traumatology, Tuen Mun Hospital, Hong Kong (HONG KONG)*

Necrotising fasciitis is a rare but life threatening condition. We retrospectively review the patients with necrotising fasciitis treated in a tertiary care hospital, Hong Kong SAR, China between January 2001 and June 2007. There were 50 patients identified. There were 29 males and 21 females aged from 1 to 90 (mean age 53.68) at presentation. There were 38% of the patients suffering from polymicrobial infection and the most common single organism causing necrotising fasciitis was Group A Streptococcus. The overall mortality rate was 32%. In multivariate analysis, delay in diagnosis was found to be associated with increased mortality. Sex, age, diabetes mellitus, type and number of pathogens did not affect the mortality. We therefore need to improve public awareness of this disease entity so earlier detection of this potentially deadly disease can be achieved.

**Date : 2008-08-24**  
**Session : SIROT - Fracture healing**  
**Time : 1100-1200**  
**Room: Theater 1**

**Abstract number : 18288**

**MINIMIZING SURGICAL INVASION IN THE TREATMENT OF PSEUDOARTHROSIS**

Viktor VOLOSHIN, Vladimir ZUBIKOV, Konstantin SHEVYREV, Pavel ZHADAN, Saravanan ARUMUGAM  
*Moscow Regional Clinical Research Institute, Moscow (RUSSIAN FEDERATION)*

AIM: To optimise the surgical methods for treating pseudoarthrosis and old fractures of long bones. MATERIALS AND METHODS: Data of 103 patients (52 - upper extremities, 51 - lower extremities) with complex old fractures of long bones treated with modern blocking plates were analysed. The duration of trauma varied from 1 month to 10 years. Before the referral to our clinic, several patients underwent different type of osteosynthesis in different hospitals which restricts us to perform mini-invasive osteosynthesis. Optimal intrafragmental contact, possibility of closed reduction of angle deformity and the absence of early implanted fixators allowed us to perform mini-invasive osteosynthesis with LCP in 7 patients with pseudoarthrosis. In the absence of above told conditions, we performed biological osteosynthesis which concludes fixation of pseudoarthrosis without separation of fragments and periosteum. RESULTS: In most cases, we observed radiological consolidation and the others are having good prognosis. CONCLUSIONS: Treating pseudoarthrosis and old fractures of long bones with modern plates with angular stability allows preserving vascularisation of the pathologically changed bone which gives the possibility of getting good results.

**Date : 2008-08-24**  
**Session : SIROT - Fracture healing**  
**Time : 1100-1200**  
**Room: Theater 1**

**Abstract number : 16823**

**A MINIMAL INVASIVE BIOLOGICAL APPROACH FOR HARVESTING OF FREE FIBULAR GRAFT**

Amitava Narayan MUKHERJEE<sup>1</sup>, Ananda PAUL<sup>2</sup>

<sup>1</sup>*J.N.Roy Hospital, Anandalok Hospital, Kolkata (INDIA),* <sup>2</sup>*Burdwan Medical College, Kolkata (INDIA)*

Free non-vascularised fibular grafting is a common procedure in our day to day orthopaedic practice. The conventional technique involves a significant amount of blood loss, soft tissue damage, delayed soft tissue healing, and increased morbidity, long and ugly looking scar in addition to the primary procedure. Our objective was to reduce donor site morbidity through minimal invasive technique with little interference to the surrounding soft tissues especially when a relatively longer (more than one third of whole length) fibula is required. 24 patients of age varying from eight to 51 years (avg. 23.5) having various pathologies like bone cysts, fibrous dysplasia, giant cell tumour and fracture non union were taken up for the study. We have used two separate incisions, one cm each at proximal and distal extent of proposed donor site for taking out of graft after elevating the periosteum circumferentially using a special periosteum stripper. Compression bandage and below knee plaster immobilization were applied to reduce the dead space collection. On the basis of a criterion, cases were followed-up for six to 34 months. 23 patients showed good with highly satisfactory cosmetic value. One patient had fair result due to delayed wound healing from haematoma treated surgically.

Date : 2008-08-24  
Session : SIROT - Fracture healing  
Time : 1100-1200  
Room: Theater 1

Abstract number : 17759

**INFLAMMATION CAUSED BY FRACTURE MAY ALTER LONGITUDINAL GROWTH PROCESSES AT THE PHYSIS**

Eva Elisa FISCHERAUER<sup>1</sup>, Gregor JANEZIC<sup>1</sup>, Christian GÜLLY<sup>2</sup>, Florian AMERSTORFER<sup>3</sup>, Michael HÖLLWARTH<sup>3</sup>, Annelie-Martina WEINBERG<sup>3</sup>

<sup>1</sup>Department for Paediatric and Adolescent Surgery, Medical University of Graz, Graz (AUSTRIA), <sup>2</sup>Medical University of Graz, Center for Medical Research, Graz (AUSTRIA), <sup>3</sup>Department for Paediatric and Adolescent Surgery, Medical University of Graz, Graz (AUSTRIA)

BACKGROUND AND AIM: Fracture healing is associated with differential molecular growth-plate mechanisms which may lead to severe limb-length-discrepancy due to overgrowth or growth arrest during childhood. To elucidate this altered growth process after fracture, we investigated physal chondrocyte-proliferation and gene-expression of growth factors and cytokines. METHODS: Male Sprague-Dawley-rats (1 month old, ~110g) were used as a living fracture-animal-model. Experimental animals sustained a unilateral fracture of the tibia with a Bonnarens and Einhorn device. After euthanasia at scheduled time-points (day 3, 10, 14, 29), physal chondrocyte-proliferation was analysed by 5-Bromo-2'-deoxy-uridin-Labeling, whereas gene-expression was investigated by microarray and determined by quantitative Real Time-PCR (qRT-PCR). RESULTS: Microarray analysis revealed a strong positive inflammatory response of the growth-plate 3 days post-fracture in the fractured bone compared to contra-laterals and controls which was confirmed by Interleukin (IL)-6 detection by qRT-PCR. This up-regulation correlates with the high physal chondrocyte-turnover detected 3 days post-fracture. Chondrocyte proliferation was significantly higher than in contra-lateral and control samples (p-value<0.05) on day 3, 10, and 14, and resembled contra-lateral and control levels on day 29 post-fracture. Physal expression of growth factors known to influence chondrocyte-proliferation, -differentiation, and angiogenesis were initially down-regulated in the fractured bone and displayed similar levels to the contra-lateral physis on day 29 post-fracture, which were higher than in controls. CONCLUSION: The high physal expression of IL-6 initially after fracture suggests IL-6 to contribute to the high physal turnover seen on day 3 in the fractured bone and thus, stimulating differential growth after fracture.

Date : 2008-08-24  
Session : SIROT - Fracture healing  
Time : 1100-1200  
Room: Theater 1

Abstract number : 17653

**BISPHOSPHONATES HAVE SIGNIFICANT EFFECTS ON ENHANCING HEALING OF HUMAN FRACTURES**

Hwa-Chang LIU<sup>1</sup>, Wen-Chi TSAI<sup>2</sup>

<sup>1</sup>Department of Orthopaedic Surgery, National Taiwan University Hospital, Taipei (TAIWAN), <sup>2</sup>Department of Orthopaedic Surgery, Jen-Chi Hospital, Taipei (TAIWAN)

INTRODUCTION: Healing disturbance of fracture, 5 to 10% of occurring rate, represents a clinical problem that can be challenging for even the most experienced surgeon to treat. Bisphosphonates are well-known with remarkable effect on treatment of osteoporosis. However, the effect of enhancing fracture healing of adult patients has not been studied thoroughly. MATERIALS AND METHODS: From July 2003 to April 2005, 88 patients were enrolled in our studies. 55 female and 33 male, average ages 59.2± 20.6 (range 20 to 98). The including criteria of the above patients were fracture but still delayed healing in six weeks after the operation, remained bony gap after fixation, and non-union more than one year. All patients had been followed up more than one year. Same operator and same oral drug by FDA-approved bisphosphonates, in same dosage were regarded as control factors. Observation set point defined in two months after treatment. RESULTS: In study group, most patients had significant grade I change at first two weeks of treating course. Even though in chronic stage, gap sclerosis restarted after bisphosphonates therapy. 84.2% has significant effects on pain relief. CONCLUSIONS: In human fracture healing, bisphosphonates are not only enhancing bone healing in early healing stage in most cases, but it is also effective in chronic stage. But poor response to enhance healing in poor reduction of fracture and heavy smoker. It had remarkable effects in pain relief in all patients. In addition, BP also has significant effects on relieving pain.

Date : 2008-08-24  
Session : SIROT - Fracture healing  
Time : 1100-1200  
Room: Theater 1

Abstract number : 17531

**COMPARATIVE STUDY OF THE USE OF ELECTROMAGNETIC FIELDS IN PATIENTS WITH PSEUDOARTHROSIS OF TIBIA TREATED WITH INTRAMEDULLARY NAILING**

Juan Luis CEBRIAN PARRA, Elena MANRIQUE, Maria Del Pilar GALLEGO JUNCAL, Luis LOPEZ-DURAN STERN  
*Hospital Clinico San Carlos, Madrid (SPAIN)*

We made a comparative cohort study in patients suffering from tibial pseudoarthrosis, all of whom were treated with intramedullary nailing. We divided patients into 2 groups: one treated with intramedullary nailing only (control group) and the other treated with intramedullary nailing combined with pulsed electromagnetic fields (PEMFs). The study included 57 cases of tibial pseudoarthrosis in 57 patients from February 1987 to February 2002. Pseudoarthrosis was treated by surgery in all cases (Grosse-Kempf dynamic intramedullary nailing). This was combined with PEMFs in 22 cases. The average age was 38.3 years (range: 14 to 89 years) and the average duration of follow-up was 27.2 months (range: 12 to 48 months). Forty-nine fractures (86%) healed and 8 (14%) did not. Of the group treated with PEMFs, 20 (91%) healed and 2 (9%) did not; of the group that did not receive PEMF (35), 29 (83%) healed compared with 6 (17%) that did not. The relationship between union and use of PEMFs, and between time to union and use of PEMFs was statistically significant ( $P < .05$ ). PEMFs are useful when treating tibial pseudoarthrosis. Its noninvasive nature meant that there were more complication-free unions.

Date : 2008-08-24  
Session : SIROT - Fracture healing  
Time : 1100-1200  
Room: Theater 1

Abstract number : 17435

**ROLE OF THE PKA PATHWAY IN OSTEOCHONDROGENESIS OF MESENCHYMAL STEM CELLS VIA SYNERGIZING WITH THE ESSENTIAL TRANSCRIPTION FACTOR SOX9 AT MULTILEVEL**

Li ZHAO<sup>1</sup>, Gang LI<sup>1</sup>, Guang-Qian ZHOU<sup>2</sup>

<sup>1</sup>Queen's University of Belfast, Belfast (UNITED KINGDOM), <sup>2</sup>The University of Hong Kong, Hong Kong (HONG KONG)

Bone formation, remodeling and fracture healing are exquisitely coordinated processes involving both osteo- and chondrogenic differentiation. Our previous study shows that in addition to the well characterized Smad and MAPK pathways, the cAMP/PKA pathway is activated during the osteogenetic differentiation due to the down-regulation of the cognate PKA inhibitor, PKI<sup>1</sup>. Herein we provide molecular evidences showing that the cAMP/protein kinase A (PKA) signaling pathway contributes to osteochondrogenesis through multilevel synergy with the essential osteochondrogenic transcription factor SOX9. Specific PKA activators were firstly found to enhance BMP-2-stimulated osteochondrogenesis of primary mesenchymal stem cells (MSCs) and MSC-like cell lines, which was accompanied by the SOX9 up-regulation. Experimentally overexpression of SOX9 efficiently promoted the BMP-2-induced osteogenic and chondrogenic differentiation of these cells, as indicated by the increased ALP activity, type I collagen, osteocalcin, and aggrecan expression, and type II collagen promoter activity. Such promotion was further enhanced by PKA activation. SiRNA-mediated ablation of SOX9 expression, on the other hand, diminished *in vitro* osteogenic differentiation and *in vivo* bone formation. The removal of PKA-phosphorylation sites of SOX9 deprived its stimulatory effects. Campomelic Dysplasia-causing mutations of SOX9 also severely impaired the facilitation effect of SOX9 on osteochondrogenic markers. More interesting, through its carboxyl terminal domain, SOX9 physically and functionally interacts with CREB, the prototypical PKA-downstream transcription factor. Taken together, these data provide novel insights into the functional mode of PKA and SOX9 in osteo- and chondrogenic cells and could open a new path to ultimately modulate clinical osteogenesis and fracture healing processes.

**Date : 2008-08-24**  
**Session : SIROT - Fracture healing**  
**Time : 1100-1200**  
**Room: Theater 1**

**Abstract number : 17161**

**OPERATIVE TREATMENT OF TOTAL DISTAL HUMERAL PHYSEAL FRACTURE**

JiXin WU, RuiXue MA, Wei MA

*Children's Hospital of Fudan University, Shanghai (CHINA)*

To evaluate the use of operation and pin fixation for displaced, distal, humerus, epiphyseal fractures, the children with epiphyseal separating fracture of the distal part of humerus were retrospectively investigated. After open reduction, fracture stabilization was accomplished with the use of pin fixation, and at an average follow-up of 12 months (range 6-18 months), all children were evaluated radiographically and functionally. All patients had full painless range of elbow motion, without complications such as deformity, malunion, joint incongruity, nonunion, necrosis, and limb-length discrepancy. The results did not change over time. Treatment of displaced, distal, humeral, epiphyseal fractures with operation and pin fixation gives satisfactory results while allowing function exercising earlier, and it may be the treatment of choice for such injuries in children. **KEYWORDS:** epiphyseal fracture, distal part of humerus, open reduction, pin fixation.



**Date : 2008-08-24**  
**Session : SIROT - Infections/Tissue engineering**  
**Time : 1100-1200**  
**Room: Theater 2**

**Abstract number : 18752**

**GUNSHOT OSTEOMYELITIS: PATHOGENESIS, CLINICAL PICTURE, DIAGNOSIS AND TREATMENT**

V.M. SHAPOVALOV, Andrei OVDENKO

*St. Petersburg Military Medical Academy, St. Petersburg (RUSSIAN FEDERATION)*

The wounded with gunshot osteomyelitis in amount of 262 men treated at the clinic of military traumatology and orthopedics are fully examined. It is established that general factors promoting wound suppuration development included blood loss and shock, and local factors included the extent of gunshot injury and defects made by the doctors at evacuation stages (most of all, excessively radical initial surgical wound treatment). High-speed bullets had the most destructive effect on soft tissue and bone (impulse pressure amounted to 16atm in a medullary cavity of bone and 15atm in soft tissue in a distance up to 10cm from bullet channel). Low-speed bullets damaged soft tissue to a considerably lesser degree (3.4atm), but had greater crushing effect on bone (14.8atm). Proinflammatory cytokine level in peripheral blood and especially in wound discharge was the most informative in early diagnostics. Development of angioneurodystrophic syndrome played the crucial part in pathogenesis. Drainage operations and stabilisation of bone fragments are indicated in the acute stage of disease, and necrosectomy is indicated in the chronic stage. Ilizarov's unfree osteoplasty is the operation of choice at the appearance of bone defects. Proposed standards of treatment enabled us to secure stable remission in 92% of the wounded with gunshot osteomyelitis.

**Date : 2008-08-24**  
**Session : SIROT - Infections/Tissue engineering**  
**Time : 1100-1200**  
**Room: Theater 2**

**Abstract number : 18487**

**REVISION FOR INFECTED TOTAL KNEE ARTHROPLASTY - 10-YEAR EXPERIENCE AT TERTIARY REFERRAL CENTRE IN IRELAND**

Kayode ODUWOLE, Murali SAYANA KRISHNA, Diamurd MOLONEY, Kevin J. MULHALL  
*Cappagh National Orthopaedic Hospital, Dublin (IRELAND)*

**BACKGROUND:** Infected total knee arthroplasty causes significant morbidity to patients and also challenges to surgeons to provide a functional mobile knee joint. **AIM:** To present a 10-year review of all the revision total knee replacements performed for infection in our centre. **MATERIALS AND METHODS:** Perioperative and financial data for TKA revised for infection were reviewed. **RESULTS:** Twenty-eight revision TKRs were performed in last 10 years for suspected infections. All the patients underwent 2 staged revision knee Arthroplasty. There were 16 women and the average age was 68.9 years with range of 46 years to 83 years. The mode for ASA grade was 2. The average blood loss was 2 litres and the mean blood transfusion units per case were 3.8 units. The average length of stay was 42 days. Only 13 out of 28 patients had positive cultures from the deep tissues (5 staphylococcus epidermidis, 3 staphylococcus aureus, 2 enterococci, 1 pseudomonas, 1 streptococcus pneumonia, 1 MRSA). The mean total cost per case was €21,436.63. **DISCUSSION:** Patients undergoing two-stage revision TKR on average stayed 35 days longer than patients undergoing revision for aseptic loosening or other non-infective causes. The two-stage revision cost was €6,500 more than the single stage revision for non-infective causes. Approximately half of the patients with infected total knee replacement have positive cultures with staphylococcus epidermidis being the most frequent organism. Two stage revision knee arthroplasty for infected total knee replacement is associated with significant morbidity, length of inpatient stay and more cost.

**Date : 2008-08-24**  
**Session : SIROT - Infections/Tissue engineering**  
**Time : 1100-1200**  
**Room: Theater 2**

**Abstract number : 18226**

**INFECTED ARTICULAR PROSTHESIS**

Gaetano GIUDICE, Roberto ROSSI, Paolo PALUMBI, Piergiorgio VASINA  
*Mazzolani Vandini, Argenta Ferrara (ITALY)*

We have adopted a two-stage treatment procedure for infected articular prostheses for both the hip and the knee. During the first stage there is the removal of the prosthesis, followed by a surgical clean-up and the implant of a spacer and of antibiotic cement balls to be slowly removed to keep the area draining out. Antibiotic treatment by general administration. During the second stage there is a new prosthetic implant once all blood tests turn out to be negative and the clinical picture satisfactory. The role of the antibiotic spacer has been remarkably sized down, since antibiotic concentrations are high only at an initial stage, but are subsequently reduced over time. The mechanical role of the spacer is of paramount importance inasmuch as it is essential to preserve articular functions and preserve the length of the soft tissues to prevent any possible retraction. For this reason, above all in the knee, oversized spacers have been employed to keep tissues stretched out. This allows for good skin coverage and immediate flexing articulation. Antibiotic therapy by general administration must begin immediately after the removal of the prosthesis in order not to jeopardize the in-between-operation buffer time, and it must be monitored by means of culture tests with an antibiogramme. Ideally one should send the removed prosthesis to a microbiological lab to isolate the germ which affected the prosthesis and begin an empirical therapy and then go on with an aimed antibiotic therapy as soon one gets the antibiogramme.

**Date : 2008-08-24**  
**Session : SIROT - Infections/Tissue engineering**  
**Time : 1100-1200**  
**Room: Theater 2**

**Abstract number : 15350**

**ILIZAROV HIP RECONSTRUCTION AFTER EXCISION ARTHROPLASTY IN MANAGEMENT OF HIP INFECTION IN ADULTS**

Khaled EMARA

*Ain Shams University, Cairo (EGYPT)*

**INTRODUCTION:** Resistant hip infection in adults can be a complicated problem that does not respond to surgical and medical treatment. In such cases the only remaining option would be excision arthroplasty. This line of treatment can eradicate the infection but is also associated with poor function. In some cases, conversion of excision arthroplasty to artificial joint replacement is associated with a too great risk, either due to local hip surgical risks or low immunity with risk of infection recurrence. Pelvic support osteotomy with Ilizarov modification can present an alternative solution for such patients. **MATERIAL AND METHODS:** The study included 11 patients with resistant hip infection that was treated using excision arthroplasty. Pelvic support osteotomy was then used to improve hip stability and abductor muscle function and Ilizarov modification was applied to correct the mechanical alignment of the limb and the limb length discrepancy. **RESULTS:** The Harris hip score improved in all patients (average score preoperative was: 43.5 (range 31-50), while at final follow-up the average score was 70.9 (range 65-80). **DISCUSSION AND CONCLUSION:** Pelvic support osteotomy, along with Ilizarov modification can provide an alternative treatment to improve function in patients previously managed with excision hip arthroplasty and Girdlestone operation.

**Date : 2008-08-24**  
**Session : SIROT - Infections/Tissue engineering**  
**Time : 1100-1200**  
**Room: Theater 2**

**Abstract number : 18509**

**EFFECT OF PULSE ELECTROMAGNETIC FIELD ON OSTEOSARCOMA CELL LINE MG63**

Umesh NAGARE, Akbar MUGHAL, Mohammad MAQSOOD

*Lincoln County Hospital, Department of Orthopaedics, Lincoln (UNITED KINGDOM)*

The effects of pulsed electromagnetic field (PEMF) on the osteoblastic activity of osteoblast like cells human MG63 osteosarcoma cell line was studied in vitro. Assessment of the osteoblastic activity was measured at a cellular level using osteoblastic markers protein collagen and alkaline phosphatase. The cells were divided into control and PEMF and were exposed to pulsed electromagnetic field for different time periods. We studied effect on cells in three and five days. Our results showed no significant difference between PEMF treated cells and control. It does not mean that the study was a failure because the study was done on bone cancer cells, although MG63 cells display some similarity with human bone cells, they are not normal osteoblasts, previous studies have shown that pulse electromagnetic field do effect the osteoblastic activity of bone. This study can produce different observation when done on normal osteoblasts or different human osteosarcoma cell line for example SaOS-2, which shows higher alkaline phosphatase activity.

Date : 2008-08-24  
Session : SIROT - Infections/Tissue engineering  
Time : 1100-1200  
Room: Theater 2

Abstract number : 18340

**CONSERVATIVE THERAPY OF LIGAMENTOUS LESION OF THE ANKLE USING PLASMA RICH IN GROWTH FACTORS (PRGF)**

HAVLAS VOJTECH<sup>1</sup>, Robert FREI<sup>1</sup>, Tomas TRC<sup>1</sup>, Milan HANDL<sup>1</sup>, Francesco Estrella BIOSCA<sup>2</sup>

<sup>1</sup>Charles University in Prague - 2nd Medical School, Prague 5 (CZECH REPUBLIC), <sup>2</sup>Institut Nacional d'Educatio Fisica de Catalunya, University of Lleida, Lleida (SPAIN)

Therapeutic utilisation of separated autologous growth factors in treatment of type III injury to the ankle ligamentous complex. Between X/2004 and III/2005 a group of 21 patients, aged 18 to 41 years with acute injury to the lateral ligamentous complex of the ankle were treated by PRGF infiltration. On functional radiographic examination, the post-traumatic lateral opening of the tibiotalar intra-articular space was 17.45 degrees (12.0-30.0; s=5.68). The injured patients were clinically examined and standard forced inversion radiographs were made using topical anesthesia. Autologous PRGF activated with calcium chloride was used to infiltrate the injured tissues. The treatment was followed by immobilisation of the joint and subsequent rehabilitation. Clinical examination of injured tissues was carried out at 4 and 6 weeks of follow-up, using stability assessment tests and functional radiography of the ankle. Physical therapy included standard procedures, but faster regeneration of the soft tissues allowed for more exercises. The average time of healing was 5.18 weeks. Ten patients showed no signs of instability at 4 weeks after therapy and could return to their previous sports activities. One patient had lateral ankle instability at 5 weeks and therefore the therapy continued with prolonged immobilisation and then rehabilitation at a slower pace. The average lateral opening of the tibiotalar intra-articular space at 4 or 6 follow-up weeks was 4.73 degrees (3.0-7.0; s=1.19). At 6 weeks after therapy, 90.9% of the patients resumed their full sports activities.

Date : 2008-08-24  
Session : SIROT - Infections/Tissue engineering  
Time : 1100-1200  
Room: Theater 2

Abstract number : 17323

**AN IN VITRO MODEL OF OSTEOGENIC DIFFERENTIATION OF MICE BONE MARROW DERIVED MESENCHYMAL CELLS CULTURED ON A SCAFFOLD OBTAINED FROM RED DEER DECIDUOUS HORN**

Ondine LUCACIU<sup>1</sup>, Olga SORITAU<sup>2</sup>, Mihaela BACIUT<sup>1</sup>, Dan LUCACIU<sup>1</sup>, Radu CAMPAN<sup>1</sup>, Eموke PALL<sup>3</sup>, Bogdan CRISAN<sup>1</sup>, Mihai ASCHILEAN<sup>1</sup>, Rares BULIGA<sup>2</sup>, Grigore BACIUT<sup>1</sup>

<sup>1</sup>University of Medicine and Pharmacy, Cluj Napoca (ROMANIA), <sup>2</sup>Oncological Institute, Cluj Napoca (ROMANIA), <sup>3</sup>Faculty of Veterinary Medicine, Cluj Napoca (ROMANIA)

**INTRODUCTION:** The seeding of bone marrow derived mesenchymal cells on a scaffold obtained from red deer deciduous horn could be an appealing alternative for the engineering of cell-based osteoinductive grafts. **PURPOSE:** This study evaluated the feasibility of creating a tissue engineered bone using mesenchymal cells seeded on a scaffold obtained from the red deer deciduous horn. **MATERIALS AND METHODS:** The bone marrow derived mesenchymal cells were obtained from the femur of mice type CD1. The cells were cultured for three weeks in DMEM complete medium and immunohistochemical analysis was performed. After three weeks we started culturing the cells on scaffolds obtained from red deer deciduous horn using passive seeding in flasks containing basal or complex osteogenic medium. Cell differentiation in vitro was assessed biochemically by alkaline phosphatase activity. The tissue engineered constructs were implanted in bone defects surgically induced in the left parietal bone of the mice and ectopically. Bone formation in vivo was quantified by histologic examination at 2 and 4 months after in vivo grafting. **RESULTS:** The immunohistochemical analysis revealed the presence of non-differentiated cells in the initial culture. Culturing the cells in osteogenic medium on the scaffold induced bone formation, showed by high alkaline phosphatase activity. The tissue engineered constructs produced ectopic bone tissue at low frequency and amounts. The microscopic evaluation of the tissue, generated in the defect, demonstrated bone formation. **CONCLUSIONS:** Our data indicate that bone marrow derived mesenchymal cells can be cultured on red deer deciduous horn for cell based tissue engineering of bone.

**Date : 2008-08-24**

**Session : SICOT/SIROT Research Commission - Stem Cells and Orthopaedics**

**Time : 1400-1645**

**Room: Theatre 1**

**Abstract number : 19191**

**MESENCHYMAL STEM CELLS FOR SKELETAL TISSUE ENGINEERING**

Kuang-Sheng Oscar LEE

*National Yang-Ming University, Taipei (TAIWAN)*

It was not until the late 80s that tissue engineering was regarded as an independent branch of science. The term tissue engineering was initially defined by the attendees of the first National Science Foundation of the United States sponsored meeting in 1988 as "application of the principles and methods of engineering and life sciences toward fundamental understanding of structure-function relationship in normal and pathologic mammalian tissues and the development of biological substitutes for the repair and regeneration of tissue or organ function". In 1993, Langer and Vacanti summarized the early development in this field and defined tissue engineering as "an interdisciplinary field that applies the principles of engineering and life sciences towards the development of biological substitutes that restore, maintain, or improve tissues or organ function. The exercise of interdigitating these different functional talents into a coherent device has produced the working definition of tissue engineering: Tissue engineering is an art and science by which synthetic compounds are manipulated into anatomically and/or functionally specific architectures and, when required, may be integrated with biologically active agents and/or living cells such that resultant properties of the whole are precisely suited to support the specific cell life prescribed for recipient tissues". Consequently, tissue engineering has now emerged as a potential alternative to tissue or organ transplantation. Based on the above mentioned principles of tissue regeneration, reconstructing segmental bone defects after resection of malignant bone tumors, a long-standing challenge for orthopaedic surgeons, was an excellent demonstration of the application of mesenchymal stem cells (MSCs) in orthopaedic tissue engineering. With the increased knowledge of MSCs, we have demonstrated that it is possible to reconstruct segmental bone defects using a tissue engineering approach. Also, the combination of nano-technology with MSCs for skeletal regeneration is another good example. We have cultured MSCs on biomimetic electrospun Type 1 collagen nanofiber scaffold, making the composite an excellent advanced therapy product for reconstruction of flat bones. Future efforts will be made to further validate the safety and efficacy of applying MSC technology for skeletal regeneration in both pre-clinical and clinical settings.



**Date : 2008-08-24**

**Session : SICOT/SIROT Research Commission - Stem Cells and Orthopaedics**

**Time : 1400-1645**

**Room: Theatre 1**

**Abstract number : 19193**

**ENHANCEMENT OF BONE REGENERATION WITH STEM CELL BASED BMP2 GENE MEDICINE**

Ting-Ting TANG, Meng-ning YAN, Bin LU, Jue-Ren LOU, Ke-Rong DAI  
*Shanghai Ninth People's Hospital, Shanghai (CHINA)*

Brief Bibliography: Professor of Orthopaedic Research, Associate Chairman of the Department of Orthopaedic Surgery, Shanghai Ninth Peoples Hospital. Deputy Director of Bone and Joint Research Centre, Shanghai Jiaotong University School of Medicine. Research interest is mainly focus on the bone and cartilage regeneration with cell and gene therapy. INTRODUCTION: Recently, the use of bone marrow derived mesenchymal stem cells (MSCs) for bone repair has gained much focus while the osteoinductive capacity of bone morphogenetic proteins (BMPs) had been well demonstrated by many researchers. It is believed that the BMP gene modified stem cells lead to an enhanced osteogenic effect in vivo. METHODS: In the present study, the bone marrow derived mesenchymal stem cells (MSCs) were transfected with BMP2 gene in vitro, loaded on the scaffolds and implanted into the local areas in vivo to enhance the bone repair. Different animal models including the critical-size segmental bone defects in weight bearing animals or aged animals, periprosthetic bone defects, and experimental necrosis of femoral head were used to investigate the effects of BMP2 gene therapy technique on the treatment of various clinical problems. The study also evaluate the safety of stem cell based BMP-2 gene medicine. RESULTS: The results showed that the the stem cell based BMP2 gene medicine had successfully repaired the segmental bone defects in large weight bearing animals (goat model), osteoporotic bone defects (aged rat model), periprosthetic bone defects (dog model), and experimental necrosis of femoral head (goat model). The study also showed that the cellular and humoral immune reaction were activated against adenovirus in vivo. CONCLUSION: The stem cell based BMP2 gene therapy combined the seed cells (MSCs), growth factors (BMP2) and osteoconductive materials and effectively meet the requirements to deal with variety of orthopaedic problems associated with bone loss and bone formation deficit.

Date : 2008-08-24  
Session : SICOT/SIROT Research Commission - Stem Cells and Orthopaedics  
Time : 1400-1645  
Room: Theatre 1

Abstract number : 19192

**CLINICAL USE OF CONCENTRATED AUTOLOGOUS BONE MARROW ASPIRATE TRANSPLANTATION (CABMAT) FOR BONE NON-UNION AND OSTEONECROSIS OF THE FEMORAL HEAD**

Tomokazu YOSHIOKA, Hajime MISHIMA, Shinsuke SAKAI, Hiroshi AKAOGI, Toshiki MURAMATSU, Naoyuki OCHIAI  
*University of Tsukuba, Ibaraki (JAPAN)*

**PURPOSE**Bone marrow is a source of osteoprogenitor cells that are key elements in the process of bone formation and fracture healing. It has been reported that failed or delayed fracture healing can be repaired with the aid of autologous bone marrow transplantation. Recently, some researchers reported that cell concentration of the transplanted bone marrow relates to osteogenic stimulation and centrifuged bone marrow enhances osteogenesis<sup>1, 2</sup>. However, the centrifugation technique using -Cell Separator- is too expensive to be available everywhere. The aim of this study is to introduce our manual blood-bag centrifugation technique to concentrate bone marrow aspirate (BMA) and to present a clinical experience with the use of Concentrated Autologous Bone Marrow Aspirate Transplantation (CABMAT) in the treatment of non-union.**METHODS:**Under general anesthesia, BMA was collected from both anterior iliac crests. The BMA was concentrated by a two-step centrifugation technique. (KUBOTA9800 centrifuge: KUBOTA, JAPAN). This technique reduces a typical 300-400 ml BMA to a concentrated bone marrow aspirate (CBMA) of 30-40 ml for extracting buffy coat containing abundant nucleated cells. The CBMA was percutaneously transplanted into the non-union site after multiple drilling under fluoroscopic control. The number of nucleated cells were estimated with a cell counter, and the number of transplanted progenitor cells, by counting the fibroblast colony-forming units<sup>3</sup>.**RESULTS:**A 29-year-old women sustained a comminuted fracture of a left distal tibia. The fracture was internally stabilized with a plate and screws. Three months after the operation, the fracture was judged to be a delayed union, so Low-Intensity Pulsed Ultrasound (LIPUS) was applied. However, the healing process was not accelerated (Figure 1A). Therefore, 15 months after the initial operation, CABMAT was performed. After 3 months the non-union was united (Figure 1B). There were no complications associated with the procedure.**CONCLUSIONS:**We have demonstrated that effective bone healing of non-union can be achieved with CABMAT that contains a cocktail of osteoprogenitor cells, other nucleated cells, and osteogenic cytokines. This technique could be an easy-to-use approach for the treatment of non-unions.

**Date : 2008-08-24**

**Session : SICOT/SIROT Research Commission - Stem Cells and Orthopaedics**

**Time : 1400-1645**

**Room: Theatre 1**

**Abstract number : 19194**

**MESENCHYMAL STEM CELLS IN SPINAL SURGERY**

Seong-Hwan MOON

*University College of Medicine, Seoul (KOREA)*

The author presents the role of MSC in disc regeneration, tissue engineering, spinal fusion. Intervertebral disc (IVD) degeneration is caused by loss of water content in nucleus pulposus (NP) which is resulted, in part, from proteoglycan and type II collagen reduction. To regenerate IVD or prevent degeneration of IVD, various approaches have been attempted such as gene therapy, cell therapy, protein therapy, tissue engineering. Among the anabolic factors, transforming growth factor- $\beta$ 1 (TGF- $\beta$ 1) and bone morphogenetic protein-2 (BMP-2) demonstrated promising results. As a technique of tissue engineering, composite IVD implants are fabricated as novel materials for disc replacement. Mesenchymal stem cells (MSCs) are known to be multipotent in tissue regeneration. In this current experiment, cocultures of disc cells and MSCs in alginate beads and in atelocollagen type I scaffold under the influence of TGF- $\beta$ 1 and BMP-2, adenovirus mediated TGF- $\beta$ 1 and BMP-2 gene transfer were performed. Spinal fusion is gold standard of treatment in various spinal diseases. Numerous approaches to gain 100% fusion were attempted. Among them, BMP-2, LMP-2 therapy seems to be also promising. In the current study, to induce osteogenesis of the spine, MSC and ligamentum flavum cells were utilized as a carrier and osteoconductive and inductive agent by using ALK-2 and BMP-2 gene therapy. Finally experiment on novel adenoviral vector for better transduction efficiency using VSVS adenovirus to disc cells, ligamentum flavum cell, MSC was presented. This study was supported in part by Brain Korea 21 project Medical Sciences Yonsei University and Grand No. R01-2006-000-10933-0 from the Basic Research Program of the Korea Science & Engineering Foundation.

**Date : 2008-08-24**

**Session : SICOT/SIROT Research Commission - Stem Cells and Orthopaedics**

**Time : 1400-1645**

**Room: Theatre 1**

**Abstract number : 19185**

**INTERVERTEBRAL DISC REGENERATION**

Kenneth M.C. CHEUNG, VYL LEUNG

*University of Hong Kong, Queen Mary Hospital, Hong Kong (HONG KONG)*

Motion preservation in the spine has become a major area of research over the past few years. While prosthetic intervertebral disc replacement has been approved for clinical use, they are not without problems. Biologic motion preservation, on the other hand, may have the potential to overcome some of these, since the disc architecture and cell populations are preserved. This talk will discuss the current state of the art on biologic motion preservation, with particular emphasis on the use of mesenchymal stem cells for this purpose. Our laboratory has developed novel methods to histologically and radiographically assess disc degeneration and regeneration, and using these, we have examined the role of allogenic stem cells, cell number and stage of degeneration in their ability to regenerate the disc. Overall, we feel that this area of research is promising and may herald new treatments for intervertebral disc degeneration in the future.

**Date : 2008-08-24**  
**Session : SIROT - Osteoporosis**  
**Time : 0800-0930**  
**Room: Theater 2**

**Abstract number : 18581**

**IMPACT OF THE TYPE OF SURGICAL PROCEDURE ON SURVIVAL, FUNCTIONAL OUTCOME, AND COSTS OF CARE AMONG POSTMENOPAUSAL WOMEN WITH AN INTERTROCHANTERIC HIP FRACTURE: A ONE-YEAR PROSPECTIVE COHORT STUDY**

Patrick HAENTJENS<sup>1</sup>, Martine BARETTE<sup>2</sup>, Philippe AUTIER<sup>2</sup>, Steven BOONEN<sup>3</sup>

<sup>1</sup>*Vrije Universiteit Brussel, Brussels (BELGIUM)*, <sup>2</sup>*Jules Bordet Institute, Brussels (BELGIUM)*, <sup>3</sup>*Katholieke Universiteit Leuven, Leuven (BELGIUM)*

**OBJECTIVES:** To examine the impact of the type of surgical procedure on survival, functional outcome, and costs of care during the one-year period after hospital discharge among postmenopausal women who sustained an intertrochanteric hip fracture. **METHODS:** The design was a one-year prospective cohort study reflecting day-to-day clinical practice. Eighty-two women were enrolled on a consecutive basis. Three groups were defined by the time of surgery: sliding hip screw fixation, intramedullary nail fixation, and prosthetic replacement. **RESULTS:** There were no significant differences between the three groups for prefracture residence, type and number of comorbidities, and mean age at the time of the injury (80.8 years, 80.6 years, and 81.3 years, respectively). Survival differed significantly ( $P=0.003$ ), with one-year mortality rates of 20%, 27%, and 66%, respectively. No differences were found between the treatment groups for functional outcome at one year. The mean direct costs of medical care amounted 12,046 EURO, 18,859 EURO, and 42,767 EURO, respectively ( $P=0.001$ ). **CONCLUSIONS:** Among postmenopausal women with an intertrochanteric hip fracture, mortality and direct costs of medical care for patients treated with primary prosthetic replacement are higher than that for patients treated with sliding hip screw or intramedullary nail fixation. Functional outcome is not significantly different. Our findings underscore the need to perform a randomised trial to address the critically important question whether differences in outcome for the three groups are the result of the different treatment regimens given, or related to baseline characteristics of the patients.

**Date : 2008-08-24**  
**Session : SIROT - Osteoporosis**  
**Time : 0800-0930**  
**Room: Theater 2**

**Abstract number : 17036**

**IMPORTANCE OF INPATIENT MANAGEMENT OF UNDERLYING OSTEOPOROSIS IN HIP FRACTURE PATIENTS**

Matt NIXON, Rohit MAHESHWARI, Emma HOSKINSON, Sarah ZAREIAN, Sean TREADWELL

*University Hospitals Leicester NHS Trust, Leicester (UNITED KINGDOM)*

**INTRODUCTION:** Orthopaedic surgeons play a central role in acute management and secondary prevention of osteoporosis in hip fracture patients. **AIMS:** This study assessed whether management of osteoporosis is subsequently picked up in primary care and is improved by a dedicated prescribing pharmacist. **METHODS:** 250 case notes were reviewed of patients admitted with hip fractures in 2005 (no prescribing pharmacist) and 2006 (in which patients with fragility fractures were identified by a prescribing pharmacist and treatment initiated). General Practitioners (GPs) were contacted 6 months after discharge to assess compliance, initiation of new treatments and patient mortality. **RESULTS:** In both years, 16% of the patients admitted with hip fracture were already on osteoporosis medications. There was an increase in the proportion of patients discharged on treatment from 27% in 2005 to 56 % in 2006 ( $p < 0.001$ ). Older female and patients seen by the pharmacist were more likely to be discharged on treatment ( $p < 0.01$ ). This was mainly through calcium and vitamin D prescription. GPs did not initiate new treatments, but did alter medication (bisphosphonate use increased from 9% at discharge to 20% at follow-up). Prescription costs for a unit seeing 700 hip fractures per year was around £2500 per year. **CONCLUSION:** Osteoporosis treatment is initiated as an inpatient. A dedicated hospital pharmacist has doubled the number started on treatment, although significant proportions are still discharged without treatment. Further work needs to be done to ensure all patients are seen by such a liaison service and that appropriate drugs are started.

**Date : 2008-08-24**  
**Session : SIROT - Osteoporosis**  
**Time : 0800-0930**  
**Room: Theater 2**

**Abstract number : 18256**

**TEMPERATURE OF POLYMERISATION OF BONE CEMENT IN VERTEBROPLASTY**

Bernd WEGENER, Nicole KRATZER, Christof BIRKENMAIER, Volkmar JANSSON, Andreas BÜTTNER  
*Ludwig-Maximilians University, München (GERMANY)*

INTRODUCTION: Vertebroplasty and kyphoplasty have become essential techniques for treating osteoporotic vertebral fractures. The most frequent perioperative complications result from leakage of bone cement into the spinal canal or into the paravertebral vessel system where it may lead to pulmonary embolism. The time and again the temperature generated during the polymerisation of bone cement have been accused of affecting the myelon. METHODS: In the present study we performed vertebroplasty in a human spine preparation and investigated the temperature transmitted through the posterior edge of the vertebral body into the spinal canal. Using the Biomet bone cement V, we injected 10ml of the bone cement into the vertebral body. The blood circulation through the paravertebral vessel system was simulated using a temperate water bath. RESULTS: During the hardening of bone cement we recorded a distinct increase of temperature inside the spinal canal. The temperature showed its peak at the posterior edge of the vertebral body and decreased over the distance to the inside of the spinal canal. Potentially harmful temperatures for the myelon or the cauda could not be displayed. DISCUSSION: There are only few studies measuring the temperature generated during polymerisation of bone cement in vertebro- or kyphoplasty. In most cases, the experimental setting seems to be incapable of simulating an in vivo situation. We were able to show that the temperature emitted by the utilised bone cement during hardening is not harmful to the cauda. When applied correctly, bone cement can be excluded as a source of damage to the myelon.

Date : 2008-08-24  
Session : SIROT - Osteoporosis  
Time : 0800-0930  
Room: Theater 2

Abstract number : 17975

**OXYS RAT STRAIN AS A MODEL OF GENETICALLY DETERMINED OSTEOPOROSIS**

Michael SADOVOY<sup>1</sup>, Olga FALAMEYEVA<sup>1</sup>, Julia KHRAPOVA<sup>1</sup>, Natalia KOLOSOVA<sup>2</sup>

<sup>1</sup>*Novosibirsk Research Institute of Traumatology and Orthopaedics, Novosibirsk (RUSSIAN FEDERATION),* <sup>2</sup>*Institute of Cytology and Genetics, Novosibirsk (RUSSIAN FEDERATION)*

OBJECTIVE: To study etiological and pathogenetic features of bone tissue in OXYS rats of different age used as a model of genetically determined osteoporosis. METHODS: Bone tissue samples from male OXYS and Wistar rats at the age of 2, 6, 12, 18, and 24 months were investigated by means of X-ray absorptiometry, histomorphometry, and biochemistry. Molecular-genetic methods were used to study Bsm1 in vitamin D receptor gene (VDR3) and Sp1 in type 1 collagen gene (COL1A1). RESULTS: The alteration in Bsm1 expression in receptor gene VDR3 and in Sp1 expression in COL1A1 gene was revealed in OXYS rats. OXYS rats at 6 months of age presented decrease of mineral bone tissue in the spine ( $p < 0.001$ ) and in peripheral skeletal sites ( $p < 0.05$ ) as compared to age-matched Wistar rats. Histomorphometric analysis of tissue samples from OXYS rat spine and limb showed a decrease in trabecular bone volume both in spine and in limbs ( $p < 0.05$ ). Bone loss was accompanied by a gradual trabeculae thinning ( $p < 0.05$ ) and concurrent decrease in osteoid thickness ( $p < 0.01$ ). It was found that decrease in bone mineral density in OXYS rats was related with alteration of structural-functional condition of bone tissue determined by inhibition of osteoblast activity, by predominantly periosteocytic osteolysis, and by general decrease in osteoplastic processes. OXYS rats showed age-related rise in activity of matrix metalloproteases and cathepsin K. CONCLUSION: Rats of OXYS train can be considered as a model of genetically determined systemic osteoporosis.



**Date : 2008-08-24**  
**Session : SIROT - Osteoporosis**  
**Time : 0800-0930**  
**Room: Theater 2**

**Abstract number : 16665**

**OSTEOPOROSIS - PUBLIC AWARENESS, COMMITMENT AND PERSPECTIVE**

Woon Man Margaret FOK<sup>1</sup>, Hon Bong LEUNG<sup>1</sup>, Wai Man LEE<sup>2</sup>

<sup>1</sup>*Queen Mary Hospital, Hong Kong (HONG KONG)*, <sup>2</sup>*Holistic Medical Centre, Hong Kong (HONG KONG)*

**INTRODUCTION:** Osteoporosis is a prevalent disease particularly affecting post-menopausal women. In Hong Kong, only the tertiary prevention is being subsidized by the health care system. This study aimed at exploring the public awareness of this disease and their willingness in undertaking its management, with reference to various socio-economic factors. **METHODOLOGY:** 250 post-menopausal women, recruited from five different groups, were administered a questionnaire. They were patients with fragile fracture, their next-of-kin, patients from government primary health care clinic, patients from government orthopaedic specialist clinic, and patients from private primary health care clinic. **RESULTS:** Only 81% of those interviewed had heard of the disease. Among these, 92% believed that the government was responsible for managing osteoporosis. Most (83%) were willing to self-finance treatment; a higher percentage was willing to do so among those with relatives suffering osteoporotic fractures. Most (87%) of the subjects underestimated the cost. Less than 40% expected to pay more than HK\$1200 annually. Given the current market price, only 66% would still consider undertaking the treatment. Notably, 98.5% of interviewees would commence treatment provided the cost was lower. **CONCLUSION:** Direct costs of managing osteoporosis deter the public from commencing treatment. If the cost of treatment could be lowered and publicised, a dramatic increase in self-financing treatment can be anticipated.

**Date : 2008-08-24**  
**Session : SIROT - Osteoporosis**  
**Time : 0800-0930**  
**Room: Theater 2**

**Abstract number : 18513**

**SCREENING AND TREATMENT OF OSTEOPOROSIS IN INDIA: A 5-YEAR PROSPECTIVE COHORT STUDY**

Shailendra LAKHOTIA  
*Mohan, Kolkata (INDIA)*

**OBJECTIVE:** To examine the relevance of clinical diagnosis in the early detection of osteoporosis and its subsequent treatment. **METHODS:** From 2002 to 2007, adult patients without history of recent fractures were screened in this observational, prospective cohort study. The incidence of clinical symptoms was noted. The bone mineral density (BMD), T-score and Z-score (by DEXA Scan) of the lumbar spine and both femora were assessed. **RESULTS:** A total of 696 patients (mean age: 59.8±11.0 years; male:female = 18:82) were enrolled. Major clinical symptoms >6 months were cramps (47.6%), generalised bone pain (GBP, 59.3%), chronic low back pain (LBP; 54.3%), Leg pain (LP; 51.7%) and burning sensation in the limbs (15.8%). Osteopenia was detected in 37.1%, osteoporosis in 47.5%, and 15.4% were normal. Among symptomatic patients, a higher percentage had osteoporosis/osteopenia compared to those who were normal (cramps: 91.6% vs. 9.4%; GBP: 88.9% vs. 11.1%; LBP: 90.5% vs. 9.5%; LP: 88.6% vs. 11.4%; and burning sensation: 95.5% vs. 4.5%). There was high prevalence (35.5%) of coexisting LBP and GBP, and of combined cramps, LBP and GBP (20.7%). **CONCLUSION:** Osteoporosis, when detected at early stage, can be arrested and improved. Patients with symptoms suggestive of osteoporosis should be screened for low bone mass and be offered requisite treatment at the earliest. **KEYWORDS:** Osteoporosis, clinical diagnosis, bone mass.

Date : 2008-08-24  
Session : SIROT - Osteoporosis  
Time : 0800-0930  
Room: Theater 2

Abstract number : 16475

**STRONTIUM PROMOTES OSTEOGENIC DIFFERENTIATION OF MESENCHYMAL STEM CELLS THROUGH THE RAS/ERK1/2 MAPK SIGNALING PATHWAY**

Songlin PENG<sup>1</sup>, Guang-Qian ZHOU<sup>1</sup>, Keith DK LUK<sup>1</sup>, Zhaoyang LI<sup>1</sup>, Kenneth MC CHEUNG<sup>1</sup>, Zhongjun ZHOU<sup>2</sup>, William W LU<sup>1</sup>

<sup>1</sup>Department of Orthopaedics and Traumatology, The University of Hong Kong, Hong Kong (CHINA), <sup>2</sup>Department of Biochemistry, The University of Hong Kong, Hong Kong (CHINA)

The cellular and molecular mechanism underlying the anabolic effect of strontium on bone remains to be elucidated. The present study thus aimed to investigate the effect of strontium on the osteoblast lineage differentiation of mesenchymal stem cells (MSCs) and the possible involvement of the mitogen activation protein kinase (MAPK) signaling pathway. Primary murine bone marrow MSCs and MSC-like C3H10T1/2 cells were induced to differentiate into osteoblasts in the presence of strontium chloride. Strontium significantly increased the cellular ALP activity at day 14, 21 of induction and dose-dependently promoted calcium deposition in MSCs cultures. Three osteogenic marker genes, RUNX2, osteopontin (OPN) and osteocalcin (OCN) were also significantly up-regulated in response to strontium treatment. Accompanying the enhanced osteogenic differentiation, the increased phosphorylation of ERK1/2, but not p38 and JNK MAPKs, was detected in strontium-treated MSCs. PD98059, a selective inhibitor of ERK1/2 kinase, on the other hand, exhibited significant inhibitory effects on strontium-induced enhancement of ERK1/2 phosphorylation, Runx2 gene expression and ALP activity. Furthermore, Rous sarcoma kinase (RAS), an upstream regulator of ERK1/2, was also found to be essential in the process as Ras was activated by strontium treatment and siRNA mediated Ras knockdown inhibited strontium-stimulated expression of osteogenic markers. Taken together, these results indicated that strontium can potentate osteogenesis of progenitor cells through a mechanism mediated by the Ras/ERK1/2 MAPK signalling pathway.

Date : 2008-08-24  
Session : SIROT - Joint replacement  
Time : 0900-1030  
Room: Theater 2

Abstract number : 18668

#### FEASIBILITY OF MODEL-BASED RSA IN TMC JOINT REPLACEMENT

Edwin OOMS<sup>1</sup>, Peter PILOT<sup>1</sup>, Jacco VAN DOORN<sup>2</sup>, Rob NELISSEN<sup>3</sup>, Ruud DEIJKERS<sup>1</sup>

<sup>1</sup>Department of Orthopaedics, Reinier de Graaf Groep, Delft (NETHERLANDS), <sup>2</sup>Department of Orthopaedics, Erasmus University Medical Center Rotterdam, Delft (NETHERLANDS), <sup>3</sup>Department of Orthopaedics, Leiden University Medical Center, Leiden (NETHERLANDS)

INTRODUCTION: A problem in the clinical studies of trapeziometacarpal (TMC) joint prostheses is identifying and predicting prosthetic loosening at an early stage. We studied if Roentgen Stereophotogrammetric Analysis (RSA) assessment is feasible after total TMC-joint arthroplasty. MATERIALS AND METHODS: In five cadaveric hands the TMC-joint was replaced by the SR-TMC prosthesis. Tantalum beads were implanted in the trapezium, first metacarpal bone and metacarpal prosthesis component. A 3D-surface model of the trapezium prosthesis component was used for model-based RSA. RSA radiographs were made of all hands in two commonly used positions for imaging of the TMC-joint. Visually detected markers for each bone/implant were recorded. Of one hand, RSA radiographs were made in ten different positions to calculate the measurement error (differences from zero). RESULTS: For the metacarpal bone, all beads were visible in all positions and both RSA radiographs. For the polyethylene metacarpal prosthesis component 1 of the 5 specimen had an overprojection of the proximal bead by the metal trapezium prosthesis component. In the trapezium always 3 out of 5 beads could be detected. The accuracy analysis showed that for the translations the measurement error (mm $\pm$ std) varied between 0.003 $\pm$ 0.057mm and 0.055 $\pm$ 0.133mm. For the rotations values ranged from 0.034 $\pm$ 1.759mm to 0.502 $\pm$ 1.617mm. CONCLUSION: RSA analysis of total TMC-joint replacement is feasible. The measurement error is average/good for the translations but high for the rotations. The latter is to be expected from the close relationship between the markers.

Date : 2008-08-24  
Session : SIROT - Joint replacement  
Time : 0900-1030  
Room: Theater 2

Abstract number : 18378

**REDUCING EXPOSURE TO METAL IONS FOLLOWING HIP RESURFACING: THE IMPORTANCE OF ACETABULAR ORIENTATION**

David LANGTON<sup>1</sup>, Simon JAMESON<sup>1</sup>, Tom JOYCE<sup>2</sup>, Antoni NARGOL<sup>1</sup>

<sup>1</sup>University Hospital of North Tees, Stockton (UNITED KINGDOM), <sup>2</sup>Newcastle University, Newcastle (UNITED KINGDOM)

Metal ion concentrations following metal-on-metal hip resurfacing arthroplasty remain a concern. Variables associated with increased metal ion concentrations need to be established. This study provides data from a consecutive cohort of the first 76 patients implanted with a fourth generation hip resurfacing prosthesis. All patients agreed to blood metal ion sampling at a minimum of one year. Postoperative radiographic measurements were obtained using the EBRA software. Mean whole blood chromium (Cr) and cobalt (Co) concentrations in patients receiving the smallest femoral implants ( $\leq 51$ mm) were greater than in the patients implanted with the largest prostheses ( $\geq 53$ mm) by a factor of 3 and 9 respectively. Ion concentrations in the small femoral group were significantly related to acetabular inclination ( $P < 0.001$  for Cr,  $P = 0.004$  for Co) and anteversion ( $P = 0.010$  for Cr,  $P = 0.008$  for Co). This relationship was not significant in the large implant group. Mean Cr and Co concentrations in patients with accurately orientated cups (inclination  $< 45^\circ$ , anteversion  $< 20^\circ$ ) were  $3.7 \mu\text{g/l}$  and  $1.8 \mu\text{g/l}$  respectively, compared to  $9.1 \mu\text{g/l}$  and  $17.5 \mu\text{g/l}$  in malaligned cups. A reduced surface contact area caused by cup malalignment may increase contact stresses, resulting in a high wear rate if fluid film lubrication is inadequate. Improved fluid film lubrication has been found in larger heads in vitro. Accurate acetabular component positioning is essential in order to reduce metal ion concentrations following hip resurfacing.

Date : 2008-08-24  
Session : SIROT - Joint replacement  
Time : 0900-1030  
Room: Theater 2

Abstract number : 17938

**SURFACE COMPARISON OF ALUMINA CERAMIC TKP AND COBALT-CHROME ALLOY TKP RETRIEVED AFTER LONG-TERM CLINICAL USE**

Mikio IWAMOTO<sup>1</sup>, Hiroyuki OONISHI<sup>2</sup>, Sok Chol KIM<sup>2</sup>, Masayuki KYOMOTO<sup>3</sup>, Masaru UENO<sup>3</sup>, Hironobu OONISHI<sup>2</sup>

<sup>1</sup>Japan Medical Materials Corporation, Osaka (JAPAN), <sup>2</sup>H. Oonishi Memorial Joint Replacement Institute, Tominaga Hospital, Osaka (JAPAN), <sup>3</sup>Japan Medical Material Corporation, Osaka (JAPAN)

We started to use total knee prosthesis (TKP) consisting of an alumina ceramic femoral component (F-comp) and a UHMWPE insert in late 1970s. In the present study, the wear pattern of alumina ceramic and Co-Cr alloy F-comps retrieved after long-term use was investigated in order to evaluate the efficacy of alumina ceramic bearing surface in TKP. Seven TKPs retrieved after clinical use for 6-23 years were studied by the scanning electron microscope (SEM), the surface roughness analyser, and the shape tracer: three of F-comps were alumina ceramics and the other four were made of Co-Cr alloy. The SEM observation revealed a lot of scratches in anterior-posterior direction in Co-Cr alloy F-comps. The roughness of the articulating surface of Co-Cr alloy F-comps was significantly higher compared to that of alumina ceramic F-comps. The linear wear rate of the UHMWPE insert in alumina ceramic TKPs was 0.026 mm/year, in contrast, the wear of Co-Cr alloy TKPs was 0.104 mm/year. Protrusive scratches were frequently observed on the Co-Cr alloy F-comp retrieved after clinical use, whereas the ceramic F-comp substantially maintained the immaculate surface aspect. This is because alumina ceramics is harder and less plastic than Co-Cr alloy, and far less susceptible to scratches especially in a way to cause protrusion. In addition its surface morphology, only with re-entrants by nature, works to prevent wear even under a third body condition. Therefore, alumina ceramic F-comp has a large advantage on the wear of UHMWPE insert.

**Date : 2008-08-24**  
**Session : SIROT - Joint replacement**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 16931**

**A FOLLOW-UP STUDY FOR THE CORRELATION BETWEEN ACETABULAR CUP ORIENTATION, HEAD DIAMETER AND WEAR OF TOTAL HIP ARTHROPLASTIES**

Nicolae MIHAILIDE<sup>1</sup>, Tiberiu LAURIAN<sup>2</sup>

<sup>1</sup>*The Clinical Hospital of Ortopaedics-Traumatology and Osteoarticular TBC, Bucharest (ROMANIA),* <sup>2</sup>*Polytechnic University of Bucharest, Bucharest (ROMANIA)*

The long-term behaviour of Total Hip Arthroplasties (THA) is more or less influenced by a large number of functioning parameters such as femoral head diameter, patient weight and age, position and orientation of the acetabular cup and so on. It seems that the polyethylene cup inclination in the frontal plane may play a major role in the wear of total hip prostheses. In order to assess the influence of acetabular cup orientation and head diameter on the wear of total hip prostheses, a number of 70 patients with THA were studied. The wear was evaluated using a 2D computerized radiographic method, and in several cases the wear of retrieved acetabular cups was also measured with a coordinate measuring machine directly after revision surgery. Besides the cup inclination and head diameter, several other parameters were also studied. In order to validate the findings, a custom made hip simulator, based on the biaxial rocking motion principle, was employed. The average prosthesis life was more than 8 years.

**Date : 2008-08-24**  
**Session : SIROT - Joint replacement**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 16758**

**ASSESSMENT OF THE FEMORAL COMPONENT ROTATION IN TOTAL KNEE ARTHROPLASTY**

Jaroslav DESZCZYNSKI

*Department of Orthopaedic Surgery and Rehabilitation, 2nd Medical Faculty of Warsaw Medical University, Warsaw (POLAND)*

**INTRODUCTION:** Accurate placement of the femoral component in total knee arthroplasty, particularly in rotation is very important to ensure in a biomechanically stable construct. There are known reproducible femoral landmarks such as the anteroposterior axis (APA or Whiteside's line), the posterior condylar axis (PCA) or epicondylar axis (EA) to locate the optimal position for femoral component rotation. We have assessed the epicondylar axis (EA) as a reproducible rotational landmark in the femur. **METHODS:** We analysed the rotational position of EA with the aspect to the PCA using CT scans. 35 knees were assessed - 22 women and 13 men, mean age was 65.9 years (SD=9.7 years). Each line was drawn using defined criteria and reproducible landmarks and the angle between them measured on the medial side of the CT slice to determine a mean value. Every 1.25mm CT slice were done. **RESULTS:** The mean value for the EA with respect to the PCA was 4.05° (range 0.8° to 10.3°, SD=2.55°). There was no statistically significant difference between right and left knees or men and women. **CONCLUSIONS:** The epicondylar line is a reproducible landmark in the knee with relatively consistent relationship with other axes of femoral rotation. Establishing of the EA is vital for proper positioning and external rotation of the femoral component.



**Date : 2008-08-24**  
**Session : SIROT - Joint replacement**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 16160**

**CLINICAL OUTCOME OF ALUMINA CERAMIC TOTAL HIP REPLACEMENT. THREE TO SEVEN-YEAR FOLLOW-UP STUDY**

Shankar KASHYAP<sup>1</sup>, Mustafa ALNAIB<sup>1</sup>, Deepu BHASKAR<sup>2</sup>

<sup>1</sup>Queen Elizabeth Hospital, Gateshead Health NHS Foundation Trust, Gateshead (UNITED KINGDOM), <sup>2</sup>Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM)

**INTRODUCTION:** The use of ceramic in hip replacement has been increasing since its introduction. Improvement in quality and reduction in grain size reduced the incidence of ceramic fractures. We are presenting mid-term results of ceramic THR from data collected between 2000 and 2007. **METHODS:** The data of 148 consecutive patients who underwent primary total hip replacement using Alumina ceramic-on-ceramic implant were collected. Patients were followed-up prospectively for 3 to 7 years and were assessed using two validated outcome measures, the Harris and Oxford Hip Scores. Secondary outcome measures included dislocations, infections, alumina fracture, periprosthetic fractures and medical events. **RESULTS:** There were 72 females and 76 males. Average age was 54 years. The follow-up period was between 36 to 84 months, with an average of 61.8 months. The average Oxford and Harris Hip scores were, respectively, 43 and 45, preoperatively, and 16 and 90 in the last follow-up clinic. There were three hip dislocations (2%), two alumina fractures (1%), one periprosthetic fracture (0.6%) and two cases of wound infections (1%)(one superficial and one deep). Medical Complications included one CVA and one DVT. Three patients required revision surgery due to alumina fractures and deep infection (2%). **DISCUSSION:** Ceramic implants have been used in the younger age group requiring THR in view of its better wear properties. Mid-term results demonstrate that results are equivalent to or better compared to other implants available. It also demonstrated lower incidence of ceramic fractures in the new generation of implants.

Date : 2008-08-24  
Session : SIROT - Joint replacement  
Time : 0900-1030  
Room: Theater 2

Abstract number : 16044

**UNCEMENTED CERAMIC ON CERAMIC ARTICULATION TOTAL HIP REPLACEMENT FOR DYSPLASTIC OSTEOARTHRITIS - FIVE TO NINE-YEAR FOLLOW-UP**

Atsushi KUSABA, Saiji KONDO, Yoshikatsu KUROKI

*Institute for Joint Replacement, Ebina General Hospital, Ebina, Kanagawa (JAPAN)*

We replaced 166 hips in 151 patients (male 4, female 147) to Spongiosa Metall II Total Hip System combining with ceramic on ceramic articulation (Bilox Forte). The preoperative diagnosis was dysplastic osteoarthritis for all patients (including failed osteotomy, avascular necrosis after DDH, dislocation, and subdislocation). The average age at surgery was 57. The average of follow-up period was 6 years (5 to 9 years). The average of Sharp angle was 48 (35-58) degrees before surgery. The average of cup inclination angle was 39 (29-49) degrees. The average of cup anteversion angle was 18 (10-30) degrees. The hip score was improved in all patients at the final follow-up. The average amount of the hip score was 62 (30 to 83) before surgery and 91 (69 to 100) at the final follow-up. No patient required the revision surgery. At the final follow-up, all implants were stable. In the acetabulum, the radiolucent line was observed in 4 hips (2%). In the femur, the line was observed in 20 hips (12%). There was no cystic osteolytic lesion. The prevalence of these periprosthetic reactions was less than those in the same type of implant with the polyethylene on ceramic articulation ( $p < 0.05$ ). There was neither breakage of the ceramic components nor dislocation. Even for the dysplastic osteoarthritis, Spongiosa Metal Hip provided a rigid initial fixation in a safe zone and was suitable for the use of the ceramic on ceramic articulation.

**Date : 2008-08-24**  
**Session : SIROT - Joint replacement**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 16770**

**BIPOLAR HEMIARTHROPLASTY IN INTERTROCHANTERIC FRACTURES**

Shubhranshu Shekhar MOHANTY<sup>1</sup>, Hitesh GARG<sup>2</sup>, Prashant PATARE<sup>2</sup>, Manish KAWADE<sup>2</sup>

<sup>1</sup>King Edward Memorial Hospital, Dept. of Orthopaedics, Mumbai (INDIA), <sup>2</sup>Kem Hospital, Mumbai (INDIA)

Literature shows the rate of complications in unstable intertrochanteric fractures in osteoporotic bones is high. The post fixation re-operation rate is 23% after 2-3 years. High rate implant cut-out leads to increased morbidity and mortality. The aim of this study is to find out the results of primary prosthetic replacement in comminuted, osteoporotic intertrochanteric fractures in elderly patients. Eighty patients of the age group from 68-94 years (average 78.4) with four part fractures were operated primarily with bipolar hemiarthroplasty. They were operated by posterolateral approach and a modular locally manufactured cemented bipolar hemiarthroplasty was performed. Due care was taken to restore offset, limb length and soft tissue balancing. The patients were mobile early after 2 days with walker and they became independent within 4 weeks after operation. They were followed-up from 6 months to 3.5 yrs (average 2.1 yrs). The functional and radiological evaluation was done. There were 50 females and 30 males. The modified Charnley score improved from average 2.3 preoperatively to an average of 5.2 with respect to pain, mobility and function. One patient developed abductor lurch. One patient had a dislocation. Radiologically, there were no signs of loosening, progressive radiolucent lines, subsidence or osteolysis at the latest follow-up. Primary prosthetic hemi replacement in cases of osteoporotic four part fractures in elderly patients helps early restoration of function and thereby prevents complications.

Date : 2008-08-24  
Session : SIROT - Joint replacement  
Time : 0900-1030  
Room: Theater 2

Abstract number : 15512

**ARTHRITIS IN YOUNG PATIENTS: DOES MOBILE BEARING KNEE HAVE A ROLE?**

Ravi INDLURU<sup>1</sup>, Arun KHANNA<sup>2</sup>, Arvind KUMAR<sup>1</sup>, Anil KHANNA<sup>3</sup>

<sup>1</sup>Peterborough and Stamford Hospitals NHS Foundation Trust, Peterborough (UNITED KINGDOM), <sup>2</sup>Yeovil District Hospital, Yeovil (UNITED KINGDOM), <sup>3</sup>Peterborough District Hospital, Peterborough (UNITED KINGDOM)

INTRODUCTION: A painful arthritic knee in a young patient presents a therapeutic dilemma. AIM: The aim of the present study was to evaluate the role of fully congruent mobile bearing total knee arthroplasty in patients <60 years. MATERIAL AND METHOD: This is a prospective consecutive study of 73 patients who received eighty knees between 2001 and 2006. Patients were evaluated using Oxford and International knee society scores. Radiological evaluation and scanograms were performed in all patients. RESULTS: The mean age at the primary operation was 52.7 years. The mean follow-up was 4.2 years. Fixed flexion deformity was seen in 35 knees. Previous operation had been performed in 15 knees. Seven patients had Valgus knees. The mean Oxford Knee Society ratings improved from 49.47 preoperatively to 20.48 at final follow-up. The mean preoperative range motion was from 11.15° to 91.6°. At final follow-up the range of motion was from an average of 0.178° to 103.9°. Preoperative Knee Society and function scores averaged 31 points and 40.76 points respectively. The patients demonstrated an excellent knee and function International Knee Society Score of 95.3 and 93.25 respectively at final follow-up. RADIOLOGICAL EVALUATION: None of these knees had radiographic evidence of loosening or osteolysis. Mechanical axis was restored in all patients. CONCLUSION: Our results with mobile bearing knee arthroplasty do seem to indicate that this prosthesis has a role in young patients with knee arthritis.

**Date : 2008-08-24**  
**Session : SIROT - Joint replacement**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 16921**

**INDIGENOUS CEMENTED BIPOLAR ARTHROPLASTY - SHORT-TERM RESULTS AND MOTION STUDIES**

Shubhranshu Shekhar MOHANTY, Prashant PATARE, Niraj KALORE  
*King Edward Memorial Hospital, Dept. of Orthopaedics, Mumbai (INDIA)*

To study clinicoradiological outcome of indigenous cemented bipolar hemiarthroplasty in fracture neck femur in the elderly and the outer and inner cup bearing motion, retrospective reviews of 56 patients were done. 46 patients (24 females, 22 males) participated in this study. Average follow-up was 54 months. Patients were assessed clinically by Harris hip score. Details of prosthesis used and perioperative complications and postoperative mobilisation were found out from the records. Average patient age was 68.5 year. 18 had no pain or ignorable pain. 12 had occasional pain, but there was no compromise in activities. 10 patients had mild pain, which had no effects on average activities. Patients showed excellent mobility at follow-up. Out of these, 26 patients enjoyed unlimited ambulation without support. 18 other patients could walk 6 blocks. We found that most patients had hip flexion averaging 100 degrees. In the radiographic component motion analysis at average follow-up of 54 months, we found that 42.65% of the motion was occurring at the inner bearing and 57.35% motion was occurring at the outer bearing. There was one dislocation, one loosening, one deep venous thrombosis and no infection in the entire series. Indigenous cemented modular bipolar hemiarthroplasty relieves pain, permits early full-weight bearing unlimited ambulation in transcervical fracture femur in elderly. In addition, the bipolar design permits near normal range of motion due to the small inner head. The large outer cup offers resistance against dislocation. Our series of indigenous cemented bipolar arthroplasty compares favourably with series in western literature.

Date : 2008-08-24  
Session : SIROT - Tissue engineering  
Time : 1100-1200  
Room: Theater 2

Abstract number : 18616

**ENHANCEMENT OF TISSUE ENGINEERED STEM CELL-TRICALCIUM PHOSPHATE COMPOSITE ON POSTERIOR SPINAL FUSION WITH NON-DECORTICATION APPROACH**

Chun Wai, Francis CHAN<sup>1</sup>, Kin Wah, Bobby NG<sup>1</sup>, Fan Fong, Celine HUI<sup>1</sup>, Wei Min PAN<sup>2</sup>, Kwong Man LEE<sup>3</sup>, Ling QIN<sup>1</sup>, Yun Yu HU<sup>2</sup>, Chun Yiu, Jack CHENG<sup>1</sup>

<sup>1</sup>Department of Orthopaedics and Traumatology, The Chinese University of Hong Kong, Hong Kong (HONG KONG), <sup>2</sup>The Institute of Orthopaedics and Traumatology, The Fourth Military Medical University, Xian (HONG KONG), <sup>3</sup>Lee Hysan Clinical Research Laboratories, The Chinese University of Hong Kong, Hong Kong (HONG KONG)

In spinal fusion surgery, extensive decortication of spinal segments leads to significant bleeding. This study was to investigate whether tissue engineered composite could promote fusion in rabbit posterior spinal fusion model with non-decortication approach. Rabbit bone marrow derived mesenchymal stem cells (MSCs) were isolated by adherence of plastic culture ware. The MSCs expanded in number and were treated with osteogenic supplement. Two modalities of cell number 5X10<sup>6</sup> (Low-cell group) and 10X10<sup>6</sup> (High-cell group) were seeded on beta-tricalcium phosphate block (TCP). The composites were implanted onto transverse processes of 5th and 6th lumbar vertebral segments without decortication. For the control group, the TCP block alone was implanted with decortication approach. The spinal segments were harvested at week 12 and subject to the assessment of manual palpation, microCT and pQCT analysis and undecalcified histology stained with toluidine blue. In High-cell group, 67% of samples showed solid fusion by manual palpation and microCT 3D images while 0% fusion in the Low-cell and control group. The BMD of transverse processes in High-cell group was 34.0% and 39.9% significantly greater than Low-cell and control group respectively. The volume in High-cell group was greater than Low-cell group by 20.8% significantly. More cancellous bone was found in transverse processes near mineralization front of High-cell group while the other two were less. Implantation of bioengineered composite might serve as an alternative method in enhancing posterior spinal fusion without decortication with the distinct advantage of reducing the morbidity associated with decortication and donor site graft harvesting.

**Date : 2008-08-24**  
**Session : SIROT - Tissue engineering**  
**Time : 1100-1200**  
**Room: Theater 2**

**Abstract number : 18434**

**ANTERIOR CRUCIATE LIGAMENT REPLACEMENT WITH TENDON GRAFT - AN ANALYSIS OF MORPHOLOGICAL CHANGES**

Viktor VOLOSHIN, Vadim ZAR, Valentina SUXONOSSENKO, Dmitry MURIN, Saravanan ARUMUGAM

*Moscow Regional Clinical Research Institute, Moscow (RUSSIAN FEDERATION)*

AIM: To study the morphological dynamics of tendon graft in anterior cruciate ligament replacement. MATERIALS AND METHODS: In 35 dogs, replacement of anterior cruciate ligament with tendon graft was performed. For studying vascularisation of graft, complex methods including micro angiography and morphological analyses were performed. RESULTS: In all the cases, we did not observe tear of the tendon graft. Neo-angiogenesis from the metaphyseal vessels grew in between the bone and the tendon graft 7 days after surgery. The tendon graft gets fully vascularised in all the extent of bone canal after 1.5-2.5 months from the time of surgery. At the end of 4-6 months, the tendon graft gets fully replaced by dense fibrous tissue. Vessels grow into superficial layers from synovial membranes only after 1 month from the time of surgery. At the end of 3 months from the surgery, the graft is fully covered by the synovial membrane. Only at the end of 6 months, the intra-articular part of the tendon graft gets fully vascularised. But the process of reformation of the tendon graft come to an end only in 3 years from the time of surgery. DISCUSSION: The remote clinical study shows that anterior cruciate replacement can depend on the material chosen as a graft. Data of our experimental study allows considering the property of the implant such as capacity of maintaining stability for minimum 6 months from the moment of implantation in the aerobic conditions and in the aggressive synovial environment.

Date : 2008-08-24  
Session : SIROT - Tissue engineering  
Time : 1100-1200  
Room: Theater 2

Abstract number : 18086

**AN OPEN LABEL SAFETY AND EFFICACY STUDY OF PORCINE BONE MATRIX DERIVED OSTEOGENIC BIOMATERIAL IN TRAUMATIC LONG BONE INJURIES**

Nicolaas DUNEAS<sup>1</sup>, S.C. GOVENDER<sup>2</sup>, Marshall MURDOCH<sup>3</sup>

<sup>1</sup>Centre for Tissue Engineering, R&I Unit, Tswane University of Technology, Pretoria (SOUTH AFRICA), <sup>2</sup>Dept Orthopaedics, University of Kwazulu Natal, Durban (SOUTH AFRICA), <sup>3</sup>University of the Witwatersrand, Johannesburg (SOUTH AFRICA)

Bone morphogenetic proteins (BMPs) are used clinically to stimulate bone regeneration. AIMS: To provide safety and efficacy data of Altis (TM) Osteogenic Bone Matrix (OBM) when implanted into human long bone defects in a 3-month open label study. METHODS: OBM is a reconstituted biomaterial that contains numerous porcine derived matrix proteins including BMP-2 and BMP-4 as shown by Western blotting and ELISA. The delivery system component of OBM is porcine atelopeptide collagen, shown to have reduced immunogenicity and improved biocompatibility. OBM was implanted into bone voids of 12 cases of traumatic long bone defects. Clinical, biochemical, immunological and radiological follow-up was done at intervals of 2, 6 and 12 weeks. Serum IgG anti-body titres to human and porcine type I and type II collagens were studied using ELISA. RESULTS: At all time intervals normal soft tissue healing was evident. Radiographic evidence of cortical bridging varied from complete remodelling to minimal soft callus. No adverse clinical reactions to the implanted material were reported. Biochemical and immunological results outside normal reference ranges were reported in line with GCP guidelines, and deemed to be non-significant by the Safety Board. A small number of patients developed high anti-body titres to type I collagen, but without any related clinical consequences within the study period. This clinical study in a small sample suggests that porcine derived OBM may represent a safe and effective osteogenic biomaterial for traumatic long bone defects. A further study with a larger participant group will be conducted to expand on the data.



**Date : 2008-08-24**  
**Session : SIROT - Tissue engineering**  
**Time : 1100-1200**  
**Room: Theater 2**

**Abstract number : 17453**

**EXTRACELLULAR MATRIX STABILITY OF PRIMARY MAMMALIAN CHONDROCYTES AND INTERVERTEBRAL DISC CELLS CULTURED IN ALGINATE-BASED MICROBEAD HYDROGELS**

Sunday ABBAH<sup>1</sup>, Weijia William LU<sup>2</sup>, Songlin PENG<sup>2</sup>, Wai Kit TAM<sup>2</sup>, Darwesh ALADIN<sup>2</sup>, Kenneth MC CHEUNG<sup>2</sup>, Keith KD LUK<sup>2</sup>, Guang-Qian ZHOU<sup>2</sup>

<sup>1</sup>National University of Singapore, Singapore (SINGAPORE), <sup>2</sup>The University of Hong Kong, Hong Kong (HONG KONG)

Three-dimensional alginate constructs are widely used as carrier systems for transplantable cells. In the present study, we evaluated the chondrogenic matrix stability of primary rat chondrocytes and intervertebral disc (IVD) cells cultured in three different alginate-based microbead matrices to determine the influence of microenvironment on the cellular and metabolic behaviours of chondrogenic cells confined in alginate microbeads. Cells entrapped in calcium-, strontium- or barium- ion gelled microbeads were monitored with the live/dead dual fluorescent cell viability assay kit and the 1, 9-dimethylmethylene blue (DMB) assay designed to evaluate sulfated glycosaminoglycan (s-GAG) production. Expression of chondrogenic extracellular matrix (ECM) synthesis was further evaluated by semi-quantitative RT-PCR of sox9, type II collagen and aggrecan mRNAs. Results indicate that Ca- and Sr-alginate maintained significantly higher population of living cells compared to Ba-alginate ( $p < 0.05$ ). Production of s-GAG was similarly higher in Ca- and Sr-alginate microbead cultures compared to Ba-alginate microbeads. Although there was no significant difference between strontium and calcium on day 14 of culture, Sr-alginate showed remarkably improved cellular and metabolic activities on long-term cultures, with chondrocytes expressing as much as 31% and 44% greater s-GAG compared to calcium and barium constructs respectively while IVD cells expresses 63% and 74% greater s-GAG compared to calcium and barium constructs respectively on day 28. These findings indicate that Sr-alginate represent a significant improvement over Ca- and Ba-alginate microbeads for the maintenance of chondrogenic phenotype of primary chondrocytes and IVD cells.

Date : 2008-08-24

Session : SIROT - Tissue engineering

Time : 1100-1200

Room: Theater 2

Abstract number : 17047

**3D MIGRATION AND DIFFERENTIATION ANALYSIS OF INTRAORAL HARVESTED MSC AT DIFFERENT BONE SUBSTITUTES**

Birgit LOHBERGER<sup>1</sup>, Elke STADELMEYER<sup>1</sup>, Michael PAYER<sup>2</sup>, Christina BARTMANN<sup>3</sup>, Dirk STRUNK<sup>3</sup>, Reinhard WINDHAGER<sup>1</sup>

<sup>1</sup>Department of Orthopaedic Surgery, Medical University, Graz (AUSTRIA), <sup>2</sup>Department of Oral Surgery and Radiology, School of Dental Medicine, Medical University, Graz (AUSTRIA), <sup>3</sup>Departement of Internal Medicine, Division of Hematology and Stem Cell Transplantation, Medical University, Graz (AUSTRIA)

Concerning their plasticity and high proliferation capacity in vitro, mesenchymal stem cells (MSC) isolated from human intraoral bones are promising candidates for use in tissue engineering approaches for the repair or replacement of mesenchymal tissues such a bone, cartilage or dental prosthesis. Accordingly with the tissue engineering term, the isolated MSC are cultivated both on two-dimensional (2D) cultures and three-dimensional (3D) scaffolds to replace 3D tissue defects. In this study MSC from five patients in the age between 14 and 20 years were isolated from the posterior maxilla. After in vitro expansion, cells were cultivated until passage 4 and differentiated towards the osteogenic and adipogenic lineage on 2D cultures and towards the osteogenic lineage on a natural bone mineral of bovine origin and  $\beta$ -tricalcium phosphate. To investigate how applicable these scaffolds would be for clinical application in odontology, we established a method to constitute seeding efficiency, osteogenic differentiation, cell distribution and proliferation behaviour on each individual scaffold. Alizarin Red S, Alkaline phosphatase and Osteocalcin were used as preliminary biomarkers of the osteogenic differentiation. Oil Red O was used to verify the adipogenic differentiation. Using this in vitro characterisation and CellTracker<sup>TM</sup> Green CMFDA labeling in combination with Laser Scanning Microscopie we are able to demonstrate actual 3D growth of MSC on both scaffold types. In conclusion, our data show that MSC isolated from human intraoral bones are able to be cultivated and differentiated as well as to osteogenic and adipogenic lineage and are applicable candidate for the clinical practice of MSC.

**Date : 2008-08-24**  
**Session : SIROT - Tissue engineering**  
**Time : 1100-1200**  
**Room: Theater 2**

**Abstract number : 18131**

**INCREASING THE STEM CELL ATTACHMENT AND PROLIFERATION CAPACITY OF HUMAN BONE ALLOGRAFTS**

Zsombor LACZA<sup>1</sup>, Miklos WESZL<sup>1</sup>, Attila CSELENYAK<sup>1</sup>, Gábor SKALICZKI<sup>2</sup>, Miklos SZENDROI<sup>2</sup>, Mark KOLLAI<sup>1</sup>, Csaba FORSTER-HORVATH<sup>2</sup>

<sup>1</sup>*Dept. Human Physiology and Clinical Experimental Research, Budapest (HUNGARY)*, <sup>2</sup>*Dept. Orthopaedics, Budapest (HUNGARY)*

Despite the widespread use of lyophilized bone allografts, their incorporation is slow resulting in inadequate mechanical properties. The donor allografts are treated to remove organic material in order to minimize immunogenicity; however, this also makes the allograft much less receptive for stem cell attachment. We designed a novel coating technique which is able to increase the attachment and proliferation capacity of stem cells seeded onto bone allografts. Human lyophilized bone fragments were pre-incubated with fibronectin, albumin, fetal calf serum or collagen I solutions which were used immediately or lyophilized before use. Human bone marrow derived mesenchymal stem cells were seeded onto the constructs and cultured in standard media. Cell attachment and proliferation was evaluated by confocal microscopy 3, 10 and 18 days after seeding. The untreated allograft barely attracted any cells and the constructs were devoid of cells after 18 days. Coating the bone with fibronectin increased the attachment, however, proliferation and long-term survival was still not achievable. Pre-incubating the bone with human albumin, especially when it was lyophilized onto the bone resulted in very good stem cell attachment and proliferation. Collagen I and fetal calf serum were also effective; however, their clinical use is limited because of their animal origin. Our novel procedure, which uses only ingredients of human origin, allows significantly better stem cell attachment and proliferation which may allow faster incorporation of the grafted bone into the host environment. Supported by OTKA T049621, AÖU 66öu5, Bolyai and Oveges Fellowships.

Date : 2008-08-24  
Session : SIROT - Tumours  
Time : 1200-1300  
Room: Theater 2

Abstract number : 18676

**RADIOFREQUENCY ABLATION IN THE TREATMENT OF OSTEOID OSTEOMAS**

Mehmet Ali DEVECI, Ayk&#305;n &#351;IM&#351;EK, Erdal CILA, erdiç ESEN, Alparslan &#351;ENKöYLü  
*Gazi University, Faculty of Medicine, Department of Orthopaedics and Traumatology, Ankara (TURKEY)*

Osteoid osteoma is a benign tumour of bone characterized with small nidus causing nocturnal pain relived with the use of Asetylsalysilate. Excision of the nidus is necessary for the absolute treatment. In cases with bizarre locations (close to neurovascular structures or intra-articular nidus) a minimal invasive treatment option as radiofrequency ablation became a popular treatment. Between November 2005 and December 2007, 10 patients with osteoid osteoma underwent to radiofrequency ablation under computerized tomographic guidance. 7 patients were male and 3 were women. Average age was 21 (between 16 and 30 years) years. In seven patients nidus is located in proximal femur around intertrochanteric area. 2 cases located in iliac crest and one is located in proximal humerus. In all patients the nocturnal pain disappear in a few days after the operation and neither of them has pain symptom. The control MRI investigation at third month showed the bone edema regress. The average visual pain scale was 7 preoperatively became 1 at postoperative first month and zero at the last follow-up. Radiofrequency ablation of the nidus is a minimally invasive treatment option without any wound and destruction of normal or reactive sclerotic bone to find out nidus. The only disadvantage of this treatment option - it is expensive. But in localisations of reached with difficulty this treatment option should be very harmless and useful.

Date : 2008-08-24  
Session : SIROT - Tumours  
Time : 1200-1300  
Room: Theater 2

Abstract number : 18437

**DOES NEO-ADJUVANT CHEMOTHERAPY INCREASE THE RISK OF INFECTION AFTER LIMB SALVAGE SURGERY FOR BONE TUMOURS?**

Saravanan ARUMUGAM<sup>1</sup>, Viktor VOLOSHIN<sup>1</sup>, Vladimir SOKOLOVSKIY<sup>2</sup>, Vladimir ZUBIKOV<sup>1</sup>

<sup>1</sup>Moscow Regional Clinical Research Institute, Moscow (RUSSIAN FEDERATION), <sup>2</sup>N.N. Blokhin Russian Cancer Research Center, Moscow (RUSSIAN FEDERATION)

**BACKGROUND:** Neo-adjuvant chemotherapy is commonly used to eradicate the micro metastases and to prepare the patient for limb-salvage surgery. It helps the surgeon to get the good oncological margin intraoperatively. **METHODS:** Data from 321 patients who underwent limb salvage surgery for bone tumours were analysed. 230/321 patients (Group A) received neo-adjuvant chemotherapy. The course of chemotherapy ranges from 2 to 11 cycles. 95/321 patients (Group B) did not receive neo-adjuvant chemotherapy. The histological diagnoses were: 155 - Conventional high grade osteosarcoma, 38 - Giant cell tumor, 36 - Malignant fibrous histiocytoma, 29 - Chondrosarcoma, 25 - Periosteal osteosarcoma, 21 - Metastasis from other organs and 17 - Ewing's tumour. **RESULTS:** In Group A, 27 patients (11.7%) and in Group B, 7 (7.3%) had infection of endoprosthetic bed. Suppression of the immune system by chemotherapeutic agents is the main reason for the higher incidence of infection in Group A. All the 27 patients in Group A and 2 patients in Group B had revisional endoprosthetic replacement. In group A 7/27 and in Group B 0/7 died of post operative infection. The follow-up ranged from 1 - 13 years (mean follow-up 6 years). **DISCUSSION:** In our opinion, it has a major disadvantage, i.e. it increases the risk of postoperative infection. How best combine to these drugs is still unknown. In the future, therapy for bone tumours should be enhanced by advances in pharmacology, immunology, and molecular genetics that will lead to more efficacious, specific and less toxic treatments.

**Date : 2008-08-24**  
**Session : SIROT - Tumours**  
**Time : 1200-1300**  
**Room: Theater 2**

**Abstract number : 18381**

**SYNCHRONOUS MULTICENTRIC OSTEOSARCOMA. A CASE REPORT**

Kiran Kumar SINIGSETTI<sup>1</sup>, Maqsood KHAN<sup>2</sup>, L. LOKNADH<sup>3</sup>

<sup>1</sup>*Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM)*, <sup>2</sup>*South Tyneside District Hospital, South Shields (UNITED KINGDOM)*,

<sup>3</sup>*King George Hospital, Visakhapatnam (INDIA)*

Synchronous multicentric or multifocal presentation of osteosarcoma is rare and has poor prognosis. We report a case of a 14-year-old boy who presented initially with a vague left knee pain without any obvious clinical or radiological signs. Within a span of 2 weeks, he developed diffuse body pains and constitutional symptoms including weight loss and loss of appetite. Plain radiographs confirmed an aggressive destructive lesion involving both distal femur and left proximal tibia suggestive of an osteosarcoma. Total body bone scan revealed diffuse spread of hot spots including lumbar and dorsal spine, chest wall and skull bone. Histopathological examination confirmed the diagnosis. Local radiotherapy and high dose chemotherapy was commenced but the patient continued to be distressed by the painful swellings throughout the body particularly around the scalp and eyes. He soon died even after attempts to keep him comfortable continued. An early diagnosis is possible only with a high index of suspicion. Newer and novel chemotherapy regimens have been described to improve survival and quality of life in such patients.

**Date : 2008-08-24**  
**Session : SIROT - Tumours**  
**Time : 1200-1300**  
**Room: Theater 2**

**Abstract number : 17684**

**DIAPHYSEAL OSTEOSARCOMAS - BIOLOGICAL BEHAVIOUR AND LIMB SALVAGE**

Shishir RASTOGI, Shah Alam KHAN

*All India Institute of Medical Sciences, New Delhi (INDIA)*

**INTRODUCTION:** Diaphyseal osteosarcomas are rare tumours with limited information on biological behaviour and treatment modalities. **AIM:** To study the epidemiological pattern of occurrence, tumour aggressiveness and survivorship in 37 patients with diaphyseal osteosarcoma. **METHODS:** We evaluated 37 cases of biopsy proven diaphyseal osteosarcomas. Neoadjuvant chemotherapy was given to all patients as per the St. Jude's protocol. Different surgical treatment modalities, aiming at radical excision and reconstruction were done. Limb reconstruction was done using diaphyseal prosthesis, non-vascularised fibular grafting, autoclaved tumour bone and bone allografts. Average follow-up was 6.7 years. **RESULTS:** Results were evaluated using the Musculoskeletal Tumor Society scoring system. The average age of patients in the series was 27.5 years which was higher as compared to metaphyseal osteosarcomas. There were 21 femoral, 9 tibial, 4 fibular, 2 radial and 1 ulnar lesions. 25 patients were alive at the end of 5 years. Best survivorship was seen for femoral osteosarcomas. Fracture of the allograft with failure of union was seen in 2 patients. Functional results were better for biological allografts (non-vascularised fibula and allografts) as compared to diaphyseal prosthesis. **CONCLUSIONS:** Diaphyseal osteosarcomas are unusual tumours in terms of biological behaviour, age incidence and bone involved. These lesions were better in terms of biological behaviour when compared to their metaphyseal counterparts. The average age of occurrence was about 10 years younger to metaphyseal tumours. Autoclaved host bone (3 cases in our series) has shown encouraging results.

**Date : 2008-08-24**  
**Session : SIROT - Tumours**  
**Time : 1200-1300**  
**Room: Theater 2**

**Abstract number : 18176**

**THE ROLE OF LIMB SALVAGE SURGERY AND CUSTOM MEGA PROSTHESIS IN MULTIPLE MYELOMA**

Paraskumar MOHANLAL<sup>1</sup>, Mayil Vahanan NATARAJAN<sup>2</sup>, J.C. BOSE<sup>3</sup>

<sup>1</sup>Medway Maritime Hospital, Kent, Rochester (UNITED KINGDOM), <sup>2</sup>Madras Medical College and Research Institute, Chennai (INDIA),

<sup>3</sup>Govt. Royapettah Hospital, Chennai (INDIA)

**PURPOSE:** To find the functional and oncological outcome of patients who underwent limb salvage surgery and custom mega prosthesis for multiple myeloma. **MATERIALS AND METHODS:** Nine patients with multiple myeloma underwent limb salvage surgery and custom mega prosthetic replacement for tumour involving long bones. Females were predominantly affected and the average age of presentation was 47.7 years. Lower limb was commonly involved: 7 patients had tumour involving the femur. All patients had pathological fractures. Resection and reconstruction was done using custom mega prosthesis. Proximal femoral prosthesis was used for proximal femoral tumour and intercalary prosthesis for femoral shaft lesion. Each patient had total femoral prosthesis and total knee prosthesis. **RESULTS:** With an average follow-up of 88.2 months, three patients died of disease. One patient with total knee prosthesis had delayed deep infection requiring removal of prosthesis and another patient with intercalary prosthesis had fracture of femoral stem that declined revision surgery. Radiological evidence of loosening was seen in one patient. The functional outcome was excellent in 3 and good in 3 patients. The 5-year Kaplan-Meier survival rate of the patients was 66.7%. **CONCLUSION:** Multiple myeloma is a systemic malignancy. Chemotherapy and/or radiotherapy with biphosphonates are the main stay of treatment. Surgery is indicated for painful pathological fractures and limb salvage surgery with custom prosthesis can provide pain relief, early mobilisation and provide good functional result with improved quality of life.



**Date : 2008-08-24**  
**Session : SIROT - Tumours**  
**Time : 1200-1300**  
**Room: Theater 2**

**Abstract number : 16808**

**RESULT OF THE SURGICAL TREATMENT OF THE PATHOLOGICAL FEMUR FRACTURES WITH GAMMA NAIL**

Juan Luis CEBRIAN PARRA, Raquel VALLEZ ROMERO, María del Pilar GALLEGO JUNCAL, Luis LÓPEZ-DÚRAN STERN  
*Hospital Clinico San Carlos, Madrid (SPAIN)*

**BACKGROUND AND AIMS:** To evaluate the results of the gamma nail in the pathological fractures of femur. **METHODS:** Retrospective study of 43 taken part pathological fractures of femur between 1990 and 2005, 65% with long gamma nail and the rest with short gamma nail. The average age was of 70 years (19-94), the common tumour in women being the breast tumour (69%), and in men the prostate and lung (23% respectively). The 86% of the lesions were lytic and mixed being in 56% of subtrochanteric location. The 82% of the patients had other bone and visceral metastasis at the moment of the fracture. The radiotherapy was the main adjuvant treatment in 76%. **RESULTS:** 85% of the trochanteric fractures consolidated and 19% of the diafisaric fractures with a 3-month average time. The reductions were anatomical in 72% being opened in three cases and in 4 cases the osteosynthesis was applied with cement. Like complications: 4 breakages of the osteosynthesis material, 4 superficial infections and one iartrogenic femoral fracture. The average of beginning of walking is of 10 days and the hospital average stay of 20 days. To the 6 months of the surgery of the patients who survive (63%) 72% walk. The average survival after the surgery is of 1 year. **CONCLUSIONS:** The gamma nail obtains a reduction of the fractures with minimum approach, few complications allowing walking very fast.

Date : 2008-08-24  
Session : SIROT - Tumours  
Time : 1200-1300  
Room: Theater 2

Abstract number : 16259

**SURGICAL CONSIDERATIONS FOR BENIGN BONE TUMOURS**

Samuel Uwale EYESAN<sup>1</sup>, O.K. IDOWU<sup>1</sup>, Obiageli NNODU<sup>1</sup>, F.B. ABDULKAREEM<sup>2</sup>

<sup>1</sup>National Orthopaedic Hospital, Yaba, Lagos (NIGERIA), <sup>2</sup>Lagos University Teaching Hospital, Idi-Araba Lagos (NIGERIA)

The data on the management of benign bone tumours are scanty, particularly in the West African subregion. This is a prospective study in 63 patients presenting with benign bone tumours over a 3-year period at the National Orthopaedic Hospital, Lagos. The common histologic types include osteochondroma [47.6%], giant cell tumour [28.6%], and simple bone cyst [11.1%]. These tumours have varying anatomic locations but were more commonly located around the knee joint. In this series, most of the patients presented with active or aggressive diseases; hence various surgical options were considered. These surgical options varied from simple excision to 2-stage resection and reconstruction. Patients with significant bone defects had bone graft or methylmetacrylate cement application, in conjunction with compression plate and screws fixation. Ablation was only necessary in a patient with a huge aneurysmal bone cyst. At an average follow-up period of 28.6 months, 5 patients had recurrence, all with histologic diagnosis of giant cell tumour. This study further confirms the heterogenous mode of presentation for benign bone tumours, which necessitates various surgical options. Limb sparing is largely a feasible option, but recurrence rate is particularly higher for giant cell tumours.

**Date : 2008-08-25**  
**Session : Hand and wrist 1**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 15500**

**EATON LITTLER LIGAMENT RECONSTRUCTION OF THE PAINFUL UNSTABLE THUMB CMC JOINT**

Christian-Thomas RADDA<sup>1</sup>, Roland MEIZER<sup>1</sup>, Christian KRASNY<sup>1</sup>, Franz LANDSIEDL<sup>1</sup>, Martin CHOCHOLE<sup>2</sup>

<sup>1</sup>*Orthopädisches Spital Speising, Vienna (AUSTRIA)*, <sup>2</sup>*Herz Jesu Krankenhaus, Vienna (AUSTRIA)*

Pain free function of the thumb carpometacarpal joint is essential for manual work. This study should evaluate the results of the Eaton littler ligament reconstruction in which a slip of the flexor carpi radialis tendon (FCR) weaved through the first metacarpal and around the abductor pollicis longus and back to the FCR. In our 8 patients (10 surgeries) we had two times a post-traumatic instability and 8 times a rhizarthrosis I°. All patients would undergo the operation again. The mean DASH score was 17.43, the VAS under stress 1.29 and in rest 0. The pinch and key grip strength were excellent (3.98kg, 7.18kg). The loss of ROM was low. Radiologically there was no progression of the Eaton Littler rhizarthrosis stadium. Our experiences with the Eaton Littler procedure for stabilisation of the hypermobile painful thumb saddle joint were positive. The subjective satisfaction of the patients and the objective clinical and radiological results could confirm this impression.

**Date : 2008-08-25**  
**Session : Hand and wrist 1**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 16089**

**THUMB SADDLE JOINT PROSTHESIS FOR THE TREATMENT OF RHIZARTHROSIS**

Christian-Thomas RADDI, Roland MEIZER, Franz LANDSIEDL, Christian KRASNY  
*Orthopädisches Spital Speising, Vienna (AUSTRIA)*

Rhizarthrosis is very common. Among the different treatment options, the implantation of a prosthesis is an alternative. This study reports short time results of the Ivory prosthesis. The clinical results show good pain relief, good ROM and excellent strength. Radiologically, there were no signs of implant loosening. As complications we saw one post-traumatic fracture and one tendovaginitis De Quervain. The advantage of a total replacement of the CMC I joint, compared to the standard resection arthroplasty, is a faster rehabilitation and preservation of the length of the thumb and better strength.

**Date : 2008-08-25**  
**Session : Hand and wrist 1**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 17073**

**ARTHROGRYPOSIS WRIST DEFORMITIES: CLINICAL VARIANTS AND SURGICAL TREATMENT**

Olga AGRANOVICH<sup>1</sup>, Ekaterina PETROVA<sup>1</sup>, Igor SHVEDOVCHENKO<sup>2</sup>

<sup>1</sup>Turner scientific and research institute for children's orthopedics, St-Petersburg (RUSSIAN FEDERATION), <sup>2</sup>Albrecht research center for occupational expertise, prosthetics and rehabilitation, St-Petersburg (RUSSIAN FEDERATION)

From 2004 to 2007 in the Turner scientific and research institute for children's orthopedics there were on inspection and treatment 31 patients (60 upper extremities) with arthrogryposis multiplex congenita aged from 1 to 16 years. In 59 cases (98.3%) were observed wrist flexion contractures in a combination with ulnar deviation and only in 1 (1.7%) - isolated ulnar deviation. The carried out clinical inspection of patients has allowed to create classification wrist flexion contractures at patients with arthrogryposis multiplex congenita in which basis have been put angular size of initial deformation, an opportunity of its passive correction, and also amplitude of active movements in wrist. All patients were divided in three groups. Operative treatment has been executed at 30 patients (43 upper extremities) with arthrogryposis multiplex congenita with the purpose of eliminating flexion contractures of wrist. At deformations of a slight degree it was made transposition of wrist flexor on to the wrist extensors. In a case of middle degree the specified interventions were supplemented a resection of bones of a wrist with liquidation of an intercarpal joint and preservation of wrist, transposition of wrist flexor on to the wrist extensors. At deformations of a heavy degree were made cutting off of wrist flexor from distal points of an attachment, a resection of bones of a wrist with liquidation of an intercarpal joint and it is the extremely rare - transposition of wrist flexor on to the wrist extensors.

Date : 2008-08-25  
Session : Hand and wrist 1  
Time : 0900-1030  
Room: 403

Abstract number : 17326

**NEGLECTED/UNREDUCED PERILUNATE DISLOCATIONS: EXPERIENCE FROM A DEVELOPING COUNTRY**

M.S. DHILLON<sup>1</sup>, Emal WARDAK<sup>2</sup>, Devinder CHAUHAN<sup>1</sup>

<sup>1</sup>Postgraduate Institute of Medical Education and Research, Chandigarh (INDIA), <sup>2</sup>Wardak Hospital, Dept of Orthopaedics and traumatology, Kabul (INDIA)

Neglected perilunate dislocations which are lying unreduced are a problem exclusive to underdeveloped countries. The problems at this stage are methods of reduction, whether reduction will be successful and the projected complication rate. Sporadic case reports in the literature advocate methods ranging from delayed reduction, to excision, and interposition arthroplasty. We present our experience with 16 such injuries, where 14 were managed by delayed ORIF. MATERIALS: Over a period of 10 years, 16 dislocations in 14 patients were treated (11 male, 3 female, age range 21-48 years, delay in treatment 4 weeks to 1.5 years, 2 bilateral injuries). All except 2 were reduced surgically, 6 by dorsal approach, 8 by combined dorsal and volar. One case had volar PLD, and 4 had trans-scaphoid fracture dislocations. RESULTS: At mean follow-up of 2.4 years, functional outcome was fair to good. 1 lunate AVN was encountered. Wrist ROM never became normal, but function was significantly improved. DISCUSSION: The problem of unreduced PLD is compounded by the anticipated complications at surgery. We recommend reduction in all patients regardless of delay, as wrist stability, at the cost of motion is invariably achieved. Even AVN does not lead to excessive problems, and can then be managed on a reduced wrist. Although we found fair results in the 2 cases who refused surgery, we advocate reduction in all. This is ideally achieved by a double incision method, which is to be recommended in all neglected cases.

**Date : 2008-08-25**  
**Session : Hand and wrist 1**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 17470**

**TRANSOSSEOUS OSTEOSYNTHESIS POSSIBILITIES IN COMBINATION WITH MICROSURGERY IN TREATMENT OF SEVERE WRIST AND FOREARM TRAUMA**

Vladimir SHEVTSOV, Natalia SHIKHALEVA

*Russian Ilizarov Scientific Center "Restorative Traumatology and Orthopaedics", Kurgan (RUSSIAN FEDERATION)*

INTRODUCTION: Forearm and wrist damages are actual. They are attended by multiple injuries of functionally important structures that need difficult surgeries. MATERIAL AND METHOD: We have an experience of 20 patients' treatment (only two women among them) with extensive forearm wound. Patients' age is from 22 to 51 years. We had 3 patients with first-degree of severity, II-degree - 7, III-degree - 9. We had the following injured structures: median nerve - in 11 cases, ulnar nerve - 10 cases, radial nerve - 8, ulnar artery - 8, all flexor tendons - 11 cases. Clinico-laboratory, functional examinations, ECG, EMG and angiography were applied. RESULTS: We did primary wounds' debridement, identified injured vessels' ends and neurovascular tracts with their underrunning. We did osteosynthesis by Ilizarov, fixed hand in maximum palmar flexion to simplify stitching on neurovascular tracts without tissue tension. We worked out stitching technology to apposite nerves' ends. It is necessary to make transneural interfascicular stitches, tighten to contact ground bundle margins. Closure finishes by making of epineurial or epi-perineurial stitches for hermetization. In postoperative period - intensive medical and hypobaric therapy, massage, electrostimulation. In 3-4 weeks - extension of wrist joint 4-5 times on 90° till extension 20°. DISCUSSION: Microsurgery application with external fixation in extensive injures of IV and V zones of forearm and hand make optimal conditions for tissues regeneration. Flexor apparatus of hand with possibility of dosing extension of wrist joint, stable hand and bone fragments fixation make necessary suppositions for stable union of soft tissues and bone structures and provide early functional restoration.

**Date : 2008-08-25**  
**Session : Hand and wrist 1**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 17627**

**DOES SCAPHOID BONE BRUISING LEAD TO FRACTURE AND SHALL IT BE TREATED SAME AS FRACTURE?**

Turab SYED, Yousaf SHAH, Martin Harry WETHERILL, Syed TURAB  
*Milton Keynes Foundation Hospital NHS Trust, Milton Keynes (UNITED KINGDOM)*

**INTRODUCTION:** Bone bruising of scaphoid is commonly reported when MRI Imaging is carried out for continued pain in Anatomical Snuff Box following trauma. Is it significant? **PURPOSE:** To ascertain what percentage of bone bruising leads to continued symptoms or results in secondary fracture detection. **MATERIAL AND METHODS:** Prospective study looking at MRIs of scaphoid for 100 consecutive patients with a suspected scaphoid fracture and negative initial X-rays. These are followed up for at least 8 weeks to ascertain whether they have developed into fracture line or not during this period. These are also assessed for continuity of symptoms by way of clinical examination and time to resolution of symptoms for both with continued bruising and those with secondary fractures. Bruising was divided into different grades and assessed if any particular grade was more prone to later on develop into a secondary fracture. **RESULTS:** The group of 100 MRI SCANS showed propensity of bone bruising. Bone bruising was divided into various groups and correlated with later on fracture development. We also provide the % age of patients developing fracture. The time it takes for bone bruising to develop into fracture was studied along with what treatment and how long it was received. **CONCLUSION:** Bone bruising can develop into secondary fracture and needs aggressive treatment similar to undisplaced scaphoid fracture.



**Date : 2008-08-25**  
**Session : Hand and wrist 1**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 18030**

**LENGTHENING OF HAND SEGMENTS BY MINI-FIXATOR**

Vladimir SHEVTSOV, Natalia SHIKHALEVA, Mikhail DANILKIN

*Russian Ilizarov Scientific Center "Restorative Traumatology and Orthopaedics", Kurgan (RUSSIAN FEDERATION)*

INTRODUCTION: Congenital and acquired segments' shortening or their absence is actual problem, because of hand dysfunction. MATERIAL AND METHOD: Last 6 years we had 399 patients with 571 congenital and acquired shortening of hand segments. Clinical, X-ray, electro-physiological, biometric and other examination methods were used before surgical treatment. RESULTS: Short segments' lengthening was done by Ilizarov mini-fixator. Distraction was performed in 7-8 days after osteotomy of short segment or its stump. Lengthening temp was 0.75mm 3 times per day. Distraction was finished after lengthening for 100-300% from original segment's size. After achievement of optical density of regenerate for 0.8 from maternal bone density we removed the frame. Frame removal without anesthesia and following fixation by plaster cast. In examination of late result we found out that achieved lengthening was kept, fingergrip restored, grip strength increased, cosmetic look improved. CONCLUSION: Mini-fixator construction work out in our Center help to restore short segments length, perform maximum possible restoration of hand anatomic shape and function; as a result, social adaptation and psychological status of patients improve.

Date : 2008-08-25  
Session : Hand and wrist 1  
Time : 0900-1030  
Room: 403

Abstract number : 18046

**EXPERIENCE OF A DISTRICT GENERAL HOSPITAL IN MANAGING DISPLACED INTRA-ARTICULAR FRACTURES OF DISTAL RADIUS USING DISTAL VOLAR LOCKING PLATE**

Jagan Mohana Reddy VELPULA<sup>1</sup>, A. MALHOTRA<sup>1</sup>, M. MADHU<sup>1</sup>, M. WASEEM<sup>1</sup>, Jagwant SINGH<sup>2</sup>

<sup>1</sup>Macclesfield hospitals, Macclesfield (UNITED KINGDOM), <sup>2</sup>Macclesfield District General Hospital, Dewsbury (UNITED KINGDOM)

**INTRODUCTION:** Distal radius fractures are one of the commonest fractures encountered on an orthopedic trauma take. Displaced intra articular distal radius fractures are managed using various surgical modalities for example plating, k wire fixation, external fixation etc. We present a study of 60 displaced intra-articular distal radius fractures with open reduction and internal fixation with distal volar locking plate. **SURGICAL TECHNIQUE:** Standard anterior approach through flexor carpi radialis bed, distal radius was exposed, fracture reduction was achieved under the guidance of an image intensifier, and fracture was stabilised with volar locked plate. Patient was mobilised from day one and was followed up at 2 weeks, 6 weeks, 12 weeks, 6 months and one year. **METHODS:** Clinical and radiological assessments were done. The average follow-up was 9 months. **RESULTS:** All fractures united both clinically and radiologically. Radiologically no radial shortening or volar angulations were present. There was no evidence of any neurological complications. There was high patient satisfaction and all of them have returned to their original occupation. Mean Visual analogue score was 9 /10, dash score was used; average dash score was 18. **CONCLUSIONS:** Our results suggest that distal volar locking plate give excellent results, sound fracture stability, good range of movements, maintain radial length, early mobilisation, high patient satisfaction and early recuperation and return to work lessening the sickness burden.

**Date : 2008-08-25**  
**Session : Hand and wrist 1**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 18148**

**PERIPHERAL NERVE INJURIES AND NERVE GRAFTING**

Harilaos SAKELLARIDES

*Boston University School of Medicine, Boston, MA (UNITED STATES)*

**PURPOSE:** To demonstrate that severe injuries can be treated by nerve grafting with very satisfactory end results. **METHODS:** Previously applied methods of nerve grafting had disappointing results. Over a span of 15 years, new techniques have been used, namely, microscope, microsurgical techniques, and fine suture material. Evaluation of nerve repairs was according to the British methods. Experimental work proved: 1) The detrimental role of tension at the suture line. 2) The deleterious effect of postoperative stretching on successful functional recovery. 3) Regeneration axons advanced more easily through nerve grafts of 2cm with two tension free anastomoses compared with a single suture under tension. The epineurium was the primary source of connective tissue proliferation. **SUMMARY:** Motor recovery for Median Nerve: Excellent 40%; Good 40%; Fair 20%. Ulnar Nerve: Excellent 38%; Good 40%; Fair 22%. Radial Nerve: Excellent 42%; Good 38%; Fair 20%. **CONCLUSION:** Encouraging results obtained providing certain details of method are strictly followed.

**Date : 2008-08-25**  
**Session : Hand and wrist 1**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 18162**

**TREATMENT OF THE CEREBRAL PALSY HAND**

Harilaos SAKELLARIDES

*Boston University School of Medicine, Boston, MA (UNITED STATES)*

**PURPOSE:** To demonstrate the correction of severe deformities by early treatment of the flexor slide operation. **METHODS:** One hundred sixteen patients were treated with severe flexion contracture of wrist, fingers and thumb due to cerebral palsy or post-traumatic hemiplegia. Ages ranged from 12 to 65 years. The right upper extremity was involved 70 times and the left 46. The operation consisted of a long zig-zag type of incision over the medial border of the lower end of arm, elbow and medial aspect of forearm down to wrist. The origin of all flexors of wrist, fingers, and flexor pollicis longus are released from the medial epicondyle, both bones of forearm and interosseous membrane. The ulnar nerve is now found in the ulnar groove, freed from surrounding soft tissues and investing fascia. The nerve is mobilised well proximally in the arm, the medial intermuscular septum is excised, and the nerve is mobilised from its branches and brought anteriorly to elbow. **SUMMARY:** Postoperative care is of paramount importance and consists of cast immobilisation for ten days, then dynamic splinting follows. The postoperative evaluation was performed by occupational therapy and the author with the following results: Excellent 35%; Good 45%; Fair 20%. **CONCLUSION:** Early surgery can improve this serious condition.

**Date : 2008-08-25**  
**Session : Hand and wrist 1**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 18277**

**DISTRACTION APPARATUS FOR TREATMENT OF CLAW HAND**

Valeriy TSAREV, Viktor VOLOSHIN, Vladimir ZUBIKOV, Igor DOROZHKO, Saravanan ARUMUGAM  
*Moscow Regional Clinical Research Institute, Moscow (RUSSIAN FEDERATION)*

AIM: To improve the possibilities of treating claw hand in fingers with three phalanges. MATERIALS AND METHODS: Distraction apparatus was used in 8 patients (5 men, 3 women). Extension of the fingers followed by mobilisation with adequate distraction was performed at one setting for 2 separate joints or one by one. Extension was given for 2 weeks. After this, mobilisation of joints was attained during the period of 2-3 weeks. The duration of treatment varied from 1 to 2.5 months, mainly depends on the time of preoperative contractures. RESULTS: All the patients attained full regression of contractures. Two patients had infection around the metal wires, which were treated by antibiotic ointment. In 2 patients, intensive pain syndrome was observed, which was relieved by decreasing distraction. During follow-up, in 2 patients we observed 2nd degree of contracture 6 months after surgery, which had limited restriction on grasp functions after rehabilitation. DISCUSSION: To compare with open surgical treatment for contractures, the apparatus method appears less traumatic to the joints.

Date : 2008-08-25  
Session : Hand and wrist 1  
Time : 0900-1030  
Room: 403

Abstract number : 18373

**OUTCOME OF CARPAL TUNNEL DECOMPRESSION: THE INFLUENCE OF AGE, GENDER AND OCCUPATION**

Ibrar MAJID, Talal IBRAHIM, Malcolm CLARKE, Christopher KERSHAW  
*University Hospitals of Leicester, Leicester (UNITED KINGDOM)*

AIM: To investigate the effect of age, gender and occupation on the outcome of carpal tunnel decompression. PATIENTS AND METHODS: We prospectively reviewed all patients undergoing primary surgical decompression by a single operator over a 17-month period. Outcome was assessed using the Brigham carpal tunnel questionnaire two weeks preoperatively and six months postoperatively. Cases were divided into four age (less than 40 years, 40 to 59, 60 to 79, over 80 years) and two occupational (repetitive and non-repetitive) groups. Statistical analysis was performed using Kruskal-Wallis and Mann Whitney-U tests. RESULTS: A total of 479 patients (females = 342 and males = 137) undergoing 608 primary carpal tunnel decompression were studied. The mean differences for both the symptom-severity ( $p=0.21$ ) and functional-status ( $p=0.29$ ) scores amongst the four age categories were similar and no significant difference was found. We found no difference between symptom-severity ( $p=0.66$ ) and functional-status ( $p=0.40$ ) scores between the genders. Of the 497 patients, the occupation of 297 patients (females = 222 and males = 75) were recorded. The majority of patients (223) were categorised to the non-repetitive group. The mean differences for both the symptom-severity ( $p=0.77$ ) and functional-status ( $p=0.32$ ) scores between the two occupation groups were similar and no significant difference was found. Overall, 93% of patients improved following carpal tunnel decompression. CONCLUSION: We found no influence of age, gender and occupation on the outcome of carpal tunnel decompression in our series of patients.

**Date : 2008-08-25**  
**Session : Hand and wrist 1**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 18619**

**MODIFIED PULL-OUT WIRE SUTURE TECHNIQUE FOR THE TREATMENT OF BONY MALLET FINGER**

Sang-Jin CHEON, Jong-Min LIM

*Pusan National University Hospital, Pusan (KOREA)*

**PURPOSE:** To report the new surgical treatment of bony mallet finger deformity using modified pull-out suture technique and evaluation of functional outcome, subjective patient satisfaction and radiographic findings. **MATERIALS AND METHODS:** Fourteen bony mallet fingers treated by modified pull-out wire suture technique were included in this study. Mallet fractures were classified by the Wehbe and Schneider method; 5 Type IB, 7 Type IIB, 1 Type IIC and 1 Type IIIB. The assessment consists of clinical symptoms, active range of motion of the distal interphalangeal joint, patient satisfaction, bony healing using radiographs of distal interphalangeal joint and complications. Objective results and subjective patient's satisfaction were evaluated by the Crawford system and the visual analog scale (VAS), respectively. **RESULTS:** As to objective results, six were graded as excellent and seven had good results. One patient was re-operated because of wire cut-out and the result was good. Subjectively five were excellent and nine were good. Radiographs obtained at follow-up showed bone union in all cases. Slight degenerative changes occurred in three cases, an intra-articular step off of less than 1mm was present in two cases. A minimal ridging of nail occurred in two cases but other complications were not observed. **CONCLUSION:** Modified pull-out wire suture technique was considered useful procedure in bony mallet finger because it can achieve not only anatomical reduction and solid fixation but also rapid fracture union and excellent range of motion with relatively low complication rates.

**Date : 2008-08-25**  
**Session : Hand and wrist 1**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 18715**

**BONE GRAFT AND EXTERNAL SPLINT FOR NONUNION OF CARPAL SCAPHOID**

Mohammed Ali F. AL-BAYATTI, Tarik KERALLA

*Al- Wasyiy Hospital, Baghdad (IRAQ)*

Prospective study for treatment of nonunion of carpal scaphoid bone by clearance of fracture site and impaction by cancellous bone graft from the iliac crest and stabilisation by plaster of Paris (P.O.P) thumb spica for 12 weeks. Thirty-two patients, age range from 25-42 years, volar approach used, 95% rate of union occurred, normal range of motion returned after 2-4 months of physiotherapy, power progressively increased to normal level. Follow-up period was 6-18 months, no residual complication encountered, internal fixation with bone graft is widely practiced by different devices with good results, with our limited resources we found P.O.P external splint with bone graft ended in comparable good results.



**Date : 2008-08-25**  
**Session : Hand and wrist 2**  
**Time : 1100-1200**  
**Room: 403**

**Abstract number : 15752**

**ARTHRODESIS OF THE WRIST IN THE GROWING CHILD. A NEW SURGICAL TECHNIQUE**

Federico FERNANDEZ-PALAZZI, Salvador RIVAS, Freddy CHAKAL  
*Paediatric Orthopaedics and Neuro-Orthopaedic Unit, Caracas (VENEZUELA)*

INTRODUCTION: Arthrodesis of the wrist must still be considered as a useful procedure in the treatment of certain deformities of the wrist joint that by performing this operation can improve the function or the aesthetics of the limb. Except those techniques of partial carpal arthrodesis, the surgical procedures of wrist arthrodesis require a bridging from the radius to the metacarpal in order to stabilise the joint. When this procedure is performed in a growing child, this can be a draw back. MATERIAL: We have developed a new procedure that producing the arthrodesis distally to the growing cartilage of the radius does not interfere with the growing at wrist level. Furthermore, the use of a wire shroud gives an active fixation reducing postoperative immobilisation and shortening healing time. Since 1986 we have performed this technique in 9 cases of children with mean age of 14 years. The pathology was in 5 cases Cerebral Palsy, in 2 cases Juvenile Rheumatoid Arthritis and in 2 cases Obstetrical Braquial Plexus Palsy. Eight cases were males and 3 cases females. The indication for surgery was flexion deformity of the wrist in 8 cases and extension in 1 case. Four cases had carpal instability (including the 2 Juvenile Rheumatoid Arthritis). RESULTS: The time of fusion was in all cases 2 months with primary arthrodesis and useful extremity ever since. Functional improvement seemed to be most related with preoperative conditions. Follow-up ranged from 20 years to 22 years.

Date : 2008-08-25  
Session : Hand and wrist 2  
Time : 1100-1200  
Room: 403

Abstract number : 15504

**RESECTION - SUSPENSION - ARTHROPLASTY FOR THE TREATMENT OF RHIZARTHRISIS: COMPARISON OF TWO TECHNIQUES**

Christian-Thomas RADD<sup>1</sup>, Christian KRASNY<sup>1</sup>, Martin CHOCHOLE<sup>2</sup>, Roland MEIZER<sup>1</sup>, Franz LANDSIEDL<sup>1</sup>

<sup>1</sup>Orthopädisches Spital Speising, Vienna (AUSTRIA), <sup>2</sup>Herz Jesu Krankenhaus, Vienna (AUSTRIA)

We compare clinically and radiologically two groups of total trapezectomy performed as treatment of rhizarthrosis combined in 31 cases (26 patients) with the Weilby procedure (flexor carpi radialis tendon suspension) and in 12 cases (10 patients) with the Lundborg procedure (abuctor pollicis longus tendon suspension) in a retrospective study. In patient satisfaction, relief of pain, DASH Score, ROM and pinch grip no group had significantly better results. Patients of the Weilby group had significantly better results in grip strength and key grip, patients of the Lundborg group in the trapezial height ratio (trapezial height space/height prox. phalanx). As complications we saw in the Weilby group one sensitive scar and one time paraesthesia of the thumb region, in the Lundborg group on case of dehiscence and one wound infection. Both techniques led to satisfactory results with good function, pain relief and strength. From our point of view, both techniques can be recommended for the treatment of arthrosis of the thumb carpometacarpal joint.

**Date : 2008-08-25**  
**Session : Hand and wrist 2**  
**Time : 1100-1200**  
**Room: 403**

**Abstract number : 16171**

**SURGICAL MANAGEMENT OF WINDBLOWN HAND - CASE SERIES OF 18 PATIENTS**

Ashok GAVASKAR<sup>1</sup>, Ravi CHANDRAN<sup>1</sup>, Chandra PRAKASAM<sup>2</sup>

<sup>1</sup>*Mahatma Gandhi Medical College and Research Institute, Chennai (INDIA),* <sup>2</sup>*Madurai Medical College, Madurai (INDIA)*

Windblown hand is a congenital anomaly characterized by multiple hand deformities. The condition is extremely rare as shown by the paucity in literature. The deformities are progressive in nature and needs to be treated early. The hand deformities cause significant functional impairment and give rise to maladaptive behaviours if left untreated. In this article we report our experience in the surgical treatment of this condition in 23 hands in 18 patients operated at a tertiary care centre over a period of seven years. Patients from the age of 6 months to 16 years were operated. They were followed for an average period of 4 years and 8 months. The type of surgery was decided as per the severity according to Zancolli's classification. According to the criteria of Wood and Biondi, 19 hands had good cosmetic result and 15 hands had good functional result out of the 23 hands operated. The results were better in patients undergoing surgery before the age of two years. Relapse of the deformity to a lesser extent was seen in two hands at the last follow-up. Experience in surgical management of this rare condition is limited to draw definitive conclusions. Early surgical management is probably the best option available for the patient and they be warned and counselled about the relapsing nature of this condition before embarking on surgical treatment. Early surgery and good postoperative compliance from parents can help in successful management of this rare condition with predictable results.

**Date : 2008-08-25**  
**Session : Hand and wrist 2**  
**Time : 1100-1200**  
**Room: 403**

**Abstract number : 16202**

**TREATMENT OF UPPER LIMB DEFORMITIES WITH EXTERNAL FIXATION**

Ghassan SALAMEH

*Head of Limb Lengthening and Reconstruction Center, Damascus (SYRIA)*

For treatment of upper limb deformity and lengthening a modified special external hinge distraction system has been developed, which allows the combined Treatment of congenital and acquired complex deformities of the upper limbs. Since 1995 until 2006 this new system was used in 85 patients with different indications in the upper limbs; they presented with upper limb length discrepancies and axial deviations and deformities. The hinges used are modified system of /EFDLAS1, Salamehfix/ which had the PCT. RESULTS: The used hinge system allows multiplanar corrections; different size of used arcs makes it more suitable in shape and allows joint movements freely; the insertion of wires and pins in a nearly right angle makes the fixation more stable in addition to insertion in a minor painful region makes it more tolerable. Good correction and X-ray control is easy. CONCLUSION: The new developed hinges are easy to use and allow the treatment of complex deformities of the upper limbs.

**Date : 2008-08-25**  
**Session : Hand and wrist 2**  
**Time : 1100-1200**  
**Room: 403**

**Abstract number : 17083**  
**TRIPHALANGEAL THUMB**

Olga AGRANOVICH<sup>1</sup>, Igor SHVEDOVCHENKO<sup>2</sup>

*<sup>1</sup>Turner scientific and research institute for children's orthopedics, St-Petersburg (RUSSIAN FEDERATION), <sup>2</sup>Albrecht research center for occupational expertise, prosthetics and rehabilitation, St-Petersburg (RUSSIAN FEDERATION)*

Triphalangeal thumb is a rare congenital anomaly and characterised by that the thumb consists of three phalanxes. From 1978 till 2007, 63 children (102 hands) with triphalangeal thumb were treated in Turner scientific and research institute for children's orthopedics. Several forms of triphalangeal thumb were distinguished. I. The simple form: brachymesophalangeal, dolychophalangeal thumb, pseudotriphalangism. II. The complex form: triphalangeal thumb in a combination with hypoplastic first ray; triphalangeal thumb in a combination with radial polydactyly. On the basis of the analysis of roentgenograms and clinical examination on patients the basic attributes have been revealed, allowing to differentiate one form triphalangeal thumb from another: 1. longitudinal and cross-section sizes of first metacarpal bone; 2. arrangement epiphysis of first metacarpal bone; 3. the sizes and the form of an additional phalanx; 4. the longitudinal sizes of the first ray; 5. size of the first intermetacarpal interval; 6. condition of muscles thenar (normal or hypoplastic); 7. hand function. The choice of the method of operative treatment consists of form triphalangeal thumb, age of the child, the sizes of an additional phalanx and the first ray as a whole and condition of muscles thenar.

**Date : 2008-08-25**  
**Session : Hand and wrist 2**  
**Time : 1100-1200**  
**Room: 403**

**Abstract number : 17620**

**DOES GRIP STRENGTH IMPROVE AFTER TRAPEZIUMECTOMY?**

Turab SYED, Yousaf SHAH, Martin Harry WETHERILL

*Milton Keynes Foundation Hospital NHS Trust, Milton Keynes (UNITED KINGDOM)*

INTRODUCTION: Generally, patients undergoing trapeziectomy are advised that grip would improve post-op as there would be less pain. PURPOSE: This prospective study was designed to look at the differences in grip strength in patients suffering from OA CMCJ both prior and 6/52 post-trapeziectomy. MATERIAL AND METHODS: 20 patients suffering from CMCJ OA listed for surgery had their grip strength measured objectively with a grip strength dynamometer and pain on Visual Analogue Scale (VAS) while using this preoperatively and following their trapeziectomy procedure at 6/52. Patients underwent trapeziectomy through dorsal approach and had surgicell interposition as spacer. RESULTS: Show that almost all patients had improved grip strength and less pain score on VAS. CONCLUSION: Trapeziectomy with Surgicell Interposition provides good functional outcome results with decreased VAS pain scores and improved objective grip strength.

**Date : 2008-08-25**  
**Session : Hand and wrist 2**  
**Time : 1100-1215**  
**Room: 403**

**Abstract number : 18644**

**WRIST REPLACEMENT WITH THE MPH DESIGN**

Heiner THABE

*Orthop.Department Diakonie Hospital, Bad Kreuznach (GERMANY)*

Beside post-traumatic destruction rheumatoid arthritis is the main indication for intervention on the dorsal wrist. In 20% severe destructions according to LDE stage 4-5 reconstructive surgery or arthrodesis are necessary. As a mobile solution we prefer the resection interposition arthroplasties and wrist replacement with the MPH. As a key-factor, reconstruction of a stable and pain-free wrist is mandatory for a functional range of motion and usability. For the success of arthroplasties the restoring of joint mechanics and the soft tissue balancing is of essential value. The centre of rotation for extension-flexion, ulna and radial abduction is located in the proximal part of os capitatum. A malposition of this centre of rotation will therefore lead to further dysbalance and upraise of the forces on the implant bed. Swanson's arthroplasty was dominating the '70 and '80s in wrist replacement with the principal of a dynamic spacer and the main disadvantage of the loss of carpal height. New designs disappeared because of severe problems with the carpal anchorage. In 1992 we developed the APH design as tricompartimental prosthesis, anatomical, uncemented with HA coating. The metal to metal pairing led to revisions after 4 years in 15% due to metallosis. We are using now our present design with a metal-PE pairing. The main advantage of the wrist reconstruction is an 80% restoring of the carpal height with increase of power in the wrist and finger function. 26 MPH prosthesis with the Metal/PE pairings are implanted and continuously followed up.

Date : 2008-08-25  
Session : Hand and wrist 2  
Time : 1400-1530  
Room: 403

Abstract number : 15473

**MODIFIED JONES TRANSFER THROUGH A SINGLE INCISION; SURGICAL TECHNIQUE, CASE SERIES AND LITERATURE REVIEW**

Ashok Sunil GAVASKAR<sup>1</sup>, Ravi CHANDRAN<sup>2</sup>

<sup>1</sup>*Mahatma Gandhi Medical College and Research Institute, Chennai (INDIA)*, <sup>2</sup>*Madurai Medical College, Madurai (INDIA)*

**PURPOSE OF THE STUDY:** Various modifications in the classic Jones transfer have been described. All use multiple incisions producing multiple scars over the forearm. Three modifications of the Jones transfer are widely accepted today. Of these the FCR transfer is carried out using four incisions and the FCU and superficialis transfer are carried out through three incisions. To avoid this problem of extensive scarring, we in our institution devised a single incision through which the tendon transfer procedure can be carried out. **MATERIALS AND METHODS:** 16 patients with radial nerve palsy were operated from 2001 to 2005. We used a single incision running along the radial aspect of the distal forearm curving obliquely at the lower end of radius to end at the Lister's tubercle. We used the Flexor carpi radialis transfer in all patients. **RESULTS AND CONCLUSION:** The cosmetic result was highly satisfactory and the functional result was excellent in all patients. The advantages of this method are better cosmesis, easy rerouting of the Extensor pollicis longus tendon, a technically easier procedure with less operating time. **KEYWORDS:** Single incision, Jones transfer, modified, cosmesis.



**Date : 2008-08-25**  
**Session : Hand and wrist 3**  
**Time : 1400-1530**  
**Room: 403**

**Abstract number : 16099**

**JESS (JOSHI'S EXTERNAL STABILISATION SYSTEM) A UNIQUE INNOVATIVE EXTERNAL FIXATOR: RESULTS IN METACARPAL AND PHALANX FRACTURES**

Ranjit Kumar BARUAH

*Assam Medical College, Dibrugarh (INDIA)*

INTRODUCTION: JESS, an innovative external fixator, consisting of K-wires, Link joints, rods and hinges, has become popular because of its simplicity and low cost. We report our results in metacarpal and phalanx fractures which were treated with JESS. MATERIALS: 19 males and 11 females in the age group of 6 to 60 years were included from 2003 to 2005. It was applied in 17 metacarpal and 13 phalanx. Unstable (Drenth & Klasen'98) closed fractures and open fractures. There were 21 open fractures. Fractures followed RTA in 4 cases, fall in 20 cases and assault in 6 cases. Associated Extensor tendon injuries seen in 4 cases. METHOD: Frames were used as per pattern of fractures. Wound debridement was done in all open fractures. Primary tendon repair was done in cases of tendon ruptures. Meticulous postop protocol was followed in all cases. RESULTS: All fractures united and the device was removed at a mean of 4.8 weeks (3 to 7) and 6.3 weeks (4 to 8) in phalanx and metacarpal fracture respectively. Final evaluation was done at six months, based on total active digital range of motion suggested by the American Society for surgery of hand. Overall results were excellent to good in 92%. Metacarpal fractures (51%) and closed fractures (62%) showed better total results. No pin tract infection and pin loosening seen. DISCUSSION AND CONCLUSION: JESS is an excellent Ex.Fix for treating closed unstable and open fractures of hand. Functional outcome is satisfactory with minimum of complications.

Date : 2008-08-25  
Session : Hand and wrist 3  
Time : 1400-1530  
Room: 403

Abstract number : 16374

**THE FUNCTIONAL OUTCOME OF VOLAR BARTON FRACTURES TREATED BY OPEN REDUCTION AND INTERNAL FIXATION WITH BUTTRESS PLATE**

Krishnakumar RAMACHANDRAN NAIR

*Medical College, University of Kerala, Trivandrum, Kerala (INDIA)*

AIM OF THE STUDY: To study the functional outcome of volar barton fractures treated by open reduction and internal fixation with buttress plate and early mobilisation in medical college hospital, Thiruvananthapuram, between 2004 and 2006. MATERIALS AND METHODS: Reference population - Southern districts of Kerala and Tamilnadu. A prospective study: sample size - 22 cases. Inclusion criteria: Volar barton fractures proved radiologically in the age group of 20-60 yrs. Exclusion criteria: a) Undisplaced fractures of distal end of radius with intra-articular extension treated by plaster cast immobilisation; b) Patients younger than 20, older than 60; c) Patients with very severe soft tissue injuries and multiple fractures involving the same limb. OBSERVATION AND RESULTS: The subjective and objective criteria were incorporated into an overall assessment of the outcome with use of the modified wrist-scoring system of Gartland and Werley. There were thirteen excellent, five good, and four fair results according to the system described by Gartland and Werley in our study. We also had 82% good to excellent results and 18% fair results. After having analysed the functional results of volar barton fractures treated by internal fixation and early mobilisation with buttress plate, we found that the method is easy to perform, early mobilisation can be done and is a good method of treatment of such fractures.

**Date : 2008-08-25**  
**Session : Hand and wrist 3**  
**Time : 1400-1530**  
**Room: 403**

**Abstract number : 16612**

**CLINICAL RESULTS OF VOLAR LOCKING PLATE FIXATION WITH MIPO TECHNIQUE FOR DISTAL RADIUS FRACTURES**

Yukichi ZENKE<sup>1</sup>, Toshihisa OSHIGE<sup>2</sup>, Akinori SAKAI<sup>2</sup>, Shirou MORITANI<sup>1</sup>

<sup>1</sup>Kagawa Rosai Hospital, Marugme, Kagawa pref. (JAPAN), <sup>2</sup>University of Occupational and Environmental Health, Kitakyusyu, Fukuoka pref. (JAPAN)

**PURPOSE:** To clarify whether using minimal invasive plate osteosynthesis (MIPO) method affects postoperative clinical results. **OBJECT AND METHOD:** More than 36 cases of 50-year-old (22 conventional cases (C group) and 14 MIPO cases (M group)) underwent open reduction and internal fixation of an inadequately reduced distal radius fracture with use of the volar locking plating system. The average age was 69.7 (51-88) years and mean follow-up period was 5.4 (3-12) months. Outcome measures included operation time, DASH score, grip power, wrist range of motion and the Mayo wrist score. **RESULTS:** The average of operation time - C group was 58 minutes and M group was 50 minutes. M group was significantly shorter than C group. M group showed earlier recovery of postoperative GP and DASH score until 4W compared to C group (GP: C group; 42.4, M group: 52.6, and DASH score: C group; 42.4, M group 34.8 at the postoperative 4W). But the final clinical result did not have a significant difference between both groups. **SUMMARY:** The MIPO technique appears to provide effective procedure at the postoperative early stage (until 4W), superior to cosmetically for the operation wound scar, and shorter than conventional operation time.

Date : 2008-08-25  
Session : Hand and wrist 3  
Time : 1400-1530  
Room: 403

Abstract number : 16616

**COMPLEMENTARY K-WIRE OSTEOSYNTHESIS IN COMPARISON TO THE STAND ALONE FIXATEUR EXTERNE PROCEDURE IN THE TREATMENT OF DISTAL RADIUS FRACTURES**

Matthias BLANKE<sup>1</sup>, Telse GRÖTECKE<sup>2</sup>, Alexander OLK<sup>1</sup>, Friedrich HENNIG<sup>1</sup>, Carl KOLVENBACH<sup>1</sup>

<sup>1</sup>University Hospital Erlangen, Dept. of Trauma and Orthopedic Surgery, Erlangen (GERMANY), <sup>2</sup>Clinic Neustadt a.d. Aisch, Dept. of Trauma and Orthopedic Surgery, Neustadt a.d. Aisch (GERMANY)

**PURPOSE:** To evaluate the clinical and radiological outcome of a complementary k-wire osteosynthesis in comparison to the stand alone fixateur externe procedure in the treatment of the distal radius fracture. **MATERIAL AND METHOD:** A total of 59 patients with 60 distal radius fractures were reviewed using clinical and radiological scores. Group I comprises 25 women and 5 men at an age of  $63.6 \pm 8.3$  years who were treated with a fixateur externe as stand alone procedure. Group II comprises 22 women and 7 men at an age of  $65.7 \pm 9.6$  years who were treated with k-wires inserted over the processus styloideus radii in addition to the external fixation. All fractures were classified by using the AO classification and showed an equal distribution in the both groups. All cases were reviewed radiologically and clinically, as defined in the Score according to Gartland and Werley. The wristjoint angle in a.p. and lateral radiation as well as the alternation of length was measured on standard x-rays digitally. **RESULTS:** Using the U-test according to Mann-Whitney there was no significant disparity between these two groups in reference to the clinical outcome. Analysis of the joint angle showed a significant difference between additional k-wire osteosynthesis and stand alone external fixation. **CONCLUSION:** Using a complementary k-wire in the treatment of distal radius fractures with fixateur externe could significantly improve the joint angle, with no higher rate of complications.

**Date : 2008-08-25**  
**Session : Hand and wrist 3**  
**Time : 1400-1530**  
**Room: 403**

**Abstract number : 17040**

**CAN RADIOGRAPHIC FINDINGS PREDICT OUTCOME OF INTRA-ARTICULAR DISTAL RADIUS FRACTURES? A PROSPECTIVE MULTI-CENTER STUDY**

Tak Wing LAU, Frankie LEUNG  
*Queen Mary Hospital, Hong Kong (HONG KONG)*

Our study is to investigate the correlation between the residual deformity and articular incongruity with the functional outcome as well as the grading of osteoarthritis. **METHODS:** Patients under sixty years with AO type C fractures fixed by plate fixation or external fixation and pinning were recruited. Acceptable reduction was defined as dorsal tilt  $<10^\circ$ ; radial tilt  $<20^\circ$ ; articular step or gap  $<2\text{mm}$ ; radial inclination  $\geq 10^\circ$  and radial shortening  $<5\text{mm}$ . Radiological parameters including deformity and articular incongruity were evaluated by two surgeons. Anatomical parameters included radial height, radial shortening, radial tilt, radial shift, palmar tilt and dorsal/palmar shift. Articular deformity parameters included articular gap, articular step and central depression. Functional outcome was assessed by Green & O'Brien score and Gartland & Werley System. Arthritis was graded with a modification of Knirk and Jupiter criteria. Spearman rank correlations were calculated between the radiological measurements with the functional scores and grading of arthritis. **RESULTS:** A total of 139 distal radius fractures with a follow-up of 1-2 years were assessed. Radial height, radial shortening, radial tilt and palmar tilt were related to poor function. However, no significant correlation with arthritis could be found with the numbers studied. Articular step or gap and central depression were both related to poor function and arthritis. **CONCLUSION:** Anatomical results can predict function and articular deformity can predict both function and arthritis in intra-articular distal radius fractures.

Date : 2008-08-25

Session : Symposium - Hand & Wrist

Time : 1400-1530

Room: 403

Abstract number : 17200

**MANAGEMENT OF DISTAL RADIUS FRACTURES IN A DISTRICT GENERAL HOSPITAL IN SOUTH WALES - AN ANALYSIS**

Ashok MARUDANAYAGAM, Prakash KANSE, Chandra DHANANA, Venugopal GUDURI  
*Withybush General Hospital, Haverfordwest (UNITED KINGDOM)*

AIM: To find out the outcome of the management of distal radius fracture. MATERIALS AND METHODS: This was a prospective study analysing 103 patients with distal radius fracture over a period of 10 months. Patients were assessed with regard to mode of injury, side of fracture and associated injury. Radiographs were taken to document the type of fracture, radial shortening, radial articular inclination and volar tilt. RESULTS: We found that 35.9% were in 71-80 years age. 64.1% sustained fracture on the left side and 62% on non-dominant hand. 95.1% sustained the injury by fall on an outstretched hand. 53.4% were Frykman type II fracture and 24.3% type IV. 59.2% had MUA and K-wiring and 7 had ORIF. 61.2% had axial radial shortening of 4-6mm preoperatively while 70.9% had no shortening postoperatively. 57.3% had radial articular inclination between 15 and 30, while 92.2% had it postoperatively. 100% had dorsal tilt preoperatively and 93.2% had full correction to volar tilt between 0-20 postoperatively. Majority regained the normal dorsiflexion (93.2%), palmar flexion (86.4%), radial deviation (97.1%) and ulnar deviation (94.2%) at 3 months. 67% returned to routine work by 6-8 weeks. CONCLUSION: We had excellent outcome with distal radius fracture management in our hospital and hope to maintain the good results, at the same time moving with the recent trend of fixing most of these fractures by open reduction and internal fixation and early mobilisation.

**Date : 2008-08-25**  
**Session : Symposium - Hand & Wrist**  
**Time : 1400-1530**  
**Room: 403**

**Abstract number : 17648**

**PROSPECTIVE STUDY OF OPEN REDUCTION AND INTERNAL FIXATION OF EXTRAARTICULAR FRACTURE OF DISTAL RADIUS USING AO 3.5MM LOCKING PLATE**

Michael TO, Tak Wing LAU, Frankie LEUNG  
*Queen Mary Hospital, Hong Kong (CHINA)*

**OBJECTIVE:** To determine the anatomic and functional results of extraarticular distal radius fractures treated by open reduction and internal fixation using AO 3.5mm locking plate. **METHODS:** All patients admitted between August 2004 and December 2006 with AO type A distal radius fractures that failed closed reduction were treated by open reduction and internal fixation using AO 3.5mm locking plate. Standard anteroposterior and lateral radiographs were used for evaluation of the reduction and healing. The anatomical outcome was assessed by the dorsal angulation, radial inclination and radial shortening. The functional outcome was assessed by the severity of pain, deformity, range of active motion and grip strength. **RESULTS:** 56 patients (13 males and 43 females) were recruited. The average age was 60 (20-90 years old). The average follow-up was 16.3 months (3-24 months). All fractures healed at the latest follow-up. 70% of the patients achieved excellent or good results. Two patients were unable to resume their normal activities because of either significant wrist pain or limited range of motion. Over 86% patients had good anatomical reduction after surgery. There was no significant loss of reduction radiologically comparing between immediate postoperative and latest follow-up x-rays. One patient had ruptured extensor pollicis longus, one had mild median nerve palsy and another one had distal radioulnar joint subluxation. **CONCLUSION:** Open reduction and internal fixation using AO 3.5mm locking plate is effective in maintaining the reduction of the extraarticular distal radius fracture. 70% of the patients achieved excellent and good functional results.

**Date : 2008-08-25**  
**Session : Hand and wrist 3**  
**Time : 1400-1530**  
**Room: 403**

**Abstract number : 17926**

**BRUNELLI PROCEDURE FOR SCAPHOLUNATE INSTABILITY - A CASE SERIES**

Kiran Kumar SINGISETTI<sup>1</sup>, Shyam Sundar SWARNA<sup>2</sup>

<sup>1</sup>*Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM)*, <sup>2</sup>*South Tyneside District Hospital, South Shields (UNITED KINGDOM)*

Scapholunate instability is a common form of carpal instability and is quite disabling to patients. Twenty-five patients with scapholunate dissociation were clinically and radiologically reviewed. All patients were treated by a single surgeon with modified Brunelli procedure, which involves the flexor carpi radialis tendon being passed through a drill hole in scaphoid and sutured back to lunate or radiotriquetral ligament. The average postoperative follow-up for the patients was 41 months. Patient-rated wrist evaluation score improved from an average of preoperative score of 108 to a postoperative score of 33.8. 21 (84%) patients were quite satisfied with the procedure and would undergo the operation again if required. The hand grip strength was reduced postoperatively but patients seemed to be less concerned with this. This case series reaffirms the current literature regarding efficacy of modified Brunelli procedure in scapholunate instability. It should be considered after careful patient selection and counselling.



**Date : 2008-08-25**  
**Session : Hand and wrist 3**  
**Time : 1400-1530**  
**Room: 403**

**Abstract number : 18324**

**DOES THE FUNCTIONAL OUTCOME OF SCAPHOID FRACTURES DEPEND ON THE TYPE OF SCREW YOU USE?**

Wolfram TESKE<sup>1</sup>, Claudia RADEMACHER<sup>2</sup>, Gunter HUEBNER<sup>2</sup>, Helmut TASSLER<sup>2</sup>

<sup>1</sup>*Ruhr Universitaet Bochum, Bochum (GERMANY)*, <sup>2</sup>*Klinikum Dortmund, Dortmund (GERMANY)*

The influence of different screw fixations on healing, function and post-traumatic arthrosis was analysed in a retrospective study. METHODS: 78 fractures treated in one centre in five years were examined. ROM, DASH Score and analysis of radiographs were surveyed. The fixation was performed with 3/0 cannulated Synthes screws in 29 cases, Stryker Twinfix (two screw threads) in 45 cases and AO 3.5mm screws in 4 cases. Time elapsed after operation was at least one year. RESULTS: 88% of our patients were male. Time between trauma and fixation (1-6 weeks) has no influence on functional outcome. 14% fractures are proximal third, 60% middle third, 26% distal third fractures. Scaphoid shortening was seen in 5%. 16% of the cannulated 3/0 screws showed loosening of the implant. No loosening was seen in the AO and the Twinfix group. The radiographs showed arthrosis in 10 cases, predominantly of the STT joint. ROM showed no difference between the groups. Extension, flexion, ulnar abduction of the injured hand were reduced about 10%, radial abduction about 15%. The median DASH Score was 6.2 (s.d. 4.2). Excellent DASH scores were correlated with regular fluoroscopic images. CONCLUSION: ROM and DASH score are correlated with the stability of the osteosynthesis and do not correlate with the used implant. The Twinfix demonstrated the lowest rate of loosening. Primarily the functional long-term results and the rate of post-traumatic arthrosis depend on correct anatomical reposition, less from the type of fracture and not from the used implant.

**Date : 2008-08-25**  
**Session : Hand and wrist 3**  
**Time : 1400-1530**  
**Room: 403**

**Abstract number : 18380**

**DISTAL RADIUS INTRA-ARTICULAR MELONE 2A AND 2B INJURIES, METHODS OF TREATMENT AND RESULTS BY LINDSTROM GRADING**

Vikas SHARMA

*Lincoln County Hospital, Lincoln (UNITED KINGDOM)*

62 consecutive distal radius intra-articular Melone 2A and 2B injuries between March 2006 and February 2007 were selected for this retrospective study at a District General Hospital in UK. These patients underwent manipulation and casting; or manipulation, percutaneous pinning and casting; or open reduction and internal fixation under general anaesthesia. All these fractures had a radiological assessment at 6 weeks following the procedure. At 6 weeks, the results were graded according to radiological Lindstrom Grade 1 to 4. Lindstrom grade 1 and 2 were considered acceptable. Lindstrom grade 3 and 4 were considered unacceptable because of excessive distal radius dorsal/volar tilt and/or shortening. Manipulation and casting alone resulted in 55% and 100% unacceptable results in Melone 2A and 2B injuries respectively. Manipulation, percutaneous pinning and casting resulted in 50% and 70% unacceptable results in Melone 2A and 2B injuries respectively. Open reduction and internal fixation resulted in 15% and 20% unacceptable results in Melone 2A and 2B injuries respectively. Melone classification of intra-articular fractures of distal radius is a good predictor of fracture stability and can be very useful in devising the appropriate treatment method for these injuries.

**Date : 2008-08-25**  
**Session : Hand and wrist 3**  
**Time : 1400-1530**  
**Room: 403**

**Abstract number : 18587**

**FACTORS ASSOCIATED WITH DRUJ INSTABILITY AMONG PATIENTS WITH ACUTE DISTAL RADIUS FRACTURES**

Czar Louie GASTON, Tammy DELA ROSA  
*Philippine General Hospital, Manila (PHILIPPINES)*

Distal radio-ulnar joint (DRUJ) instability is a common associated injury after distal radius fractures and is an established cause of residual disability and poor outcome when left untreated. A high index of suspicion, careful clinical examination and radiographs are the keys to diagnosing DRUJ instability. One hundred (n=100) acute distal radius fractures treated at the Philippine General Hospital from January to November 2006 were assessed for concomitant DRUJ instability after reduction and fixation of the distal radius fracture. Associations between demographic data, clinical findings, and radiographic parameters with the occurrence of DRUJ instability were determined. DRUJ instability was found in 21% of distal radius fractures. On univariate analysis, male sex (OR 17.62, 95% CI 2.3 - 369), patients of non-osteoporotic age (OR 0.16, 95% CI 0.01 - 1.25), high energy trauma (OR 6.3, 95% CI 2 - 21), ulnar styloid base fractures (OR 4.4, 95% CI 0.8 - 25), displacement of ulnar styloid base fractures (OR 32, 95% CI 2 - 1051), sigmoid notch involvement (OR 3.6, 95% CI 1.2 - 11), and displacement of sigmoid notch (OR 11, 95% CI 2 - 70), were significantly associated with occurrence of DRUJ instability in distal radius fractures. On multivariate analysis, male sex (OR 3.22 e-08), patients of non-osteoporotic age (OR 1.99 e-07), displaced ulnar styloid base fractures (OR 6.77e+08), and displaced sigmoid notch (OR 7.2) were significantly associated with DRUJ instability.

**Date : 2008-08-25**

**Session : Trauma: polytrauma and new techniques**

**Time : 1600-1730**

**Room: 403**

**Abstract number : 16004**

**RESULTS OF SURGICAL MANAGEMENT OF UNSTABLE PELVIC RING INJURIES**

Mohamed ALAMELDIN

*Sohag university hospital, Sohag (EGYPT)*

**BACKGROUND:** Internal fixation has become the preferred treatment for type-C pelvic ring injuries, but controversies persist regarding surgical approach and surgical technique. **OBJECTIVE:** Study the value of open reduction and stabilisation of the completely disrupted sacroiliac (SI) joint with two three-hole DC plates in fracture pelvic type C injuries. **MATERIAL AND METHODS:** Over the last four years, 15 patients with completely disrupted sacroiliac (SI) joint were treated with two three-hole DC plates. Detailed clinical data were recorded for each patient with particular reference to age, sex, mechanism of injury. The age ranged from 14 to 50 years with mean age of 28 years. There were 11 males (73%) and 4 females (27%). The male to female ratio was 2.8:1. **RESULTS:** Results are evaluated according to Majeed's system for functional assessment after pelvic fractures. Out of 15 cases included in this study, 5 cases (33.3%) were graded as excellent, 4 cases (26.7%) good, 5 cases (33.3%) fair and 1 case (6%) poor results. There were 94% satisfactory results (33.3% of cases were excellent, 26.7% were good and 33.3% were fair). There was one patient (6.6%) showing unsatisfactory results. **COMPLICATIONS:** One case of residual displacement and one case with limb length discrepancy (>2cm). **CONCLUSIONS:** For type C vertically unstable pelvic ring disruptions, stabilisation of the posterior lesion is the corner-stone of the treatment and restores the stability of the pelvic ring even if the anterior lesion left untreated.

**Date : 2008-08-25**  
**Session : Trauma: polytrauma and new techniques**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 16223**

**TREATMENT OF PELVIC RING INJURIES AND ACETABULAR FRACTURES USING MODIFIED STOPPA APPROACH**

Kap Jung KIM, Hayong KIM, Won-Sik CHOY, Sang Ki LEE

*Department of Orthopedic Surgery Eulji University Hospital, Daejeon (KOREA)*

The purpose of the study was to analyse the surgical results of pelvic ring injuries and acetabular fractures using modified Stoppa approach. We reviewed 36 patients. Pelvic ring injuries were 26 cases, acetabular fractures were 9 cases. There was 1 case of both pelvic ring injuries and acetabular fractures. Injury mechanisms, combined injuries, duration from injury to operation, postoperative complication, radiological and clinical results were analysed. The mean age was 41.9 years (19-76) and the mean follow-up period was 31.7 months (12-94). The most common injury mechanism was a fall from a height. Other orthopedic combined injuries were 20 cases, other site combined organ injuries were 14 cases. In pelvic ring injuries, 26 cases had displacement of less than 10mm. In acetabular fractures, 4 cases had displacement of less than 1mm, 5 cases had displacement of between 2 and 3mm. One case had displacement of more than 3mm. At the final follow-up, clinical results were excellent in 9, good in 18, fair in 7 and poor in 2 cases. Postoperative complications were 2 cases of infection and 3 cases of implant loosening. Modified Stoppa approach obtained good clinical and radiologic results on pelvic ring injuries and acetabular fractures. Cases of other combined organ injuries and longer duration from injury to operation had no statistical significance with clinical results.

Date : 2008-08-25

Session : Trauma: polytrauma and new techniques

Time : 1600-1730

Room: 403

Abstract number : 17689

**TREATMENT IN REPERFUSION SYNDROME FOLLOWING ACUTE LOWER LIMB ISCHAEMIA**

Olivera LUPESCU<sup>1</sup>, Mihail NAGEA<sup>2</sup>, Gheorghe Ion POPESCU<sup>2</sup>, Cristina PATRU<sup>2</sup>, Doriană LUPESCU<sup>3</sup>

<sup>1</sup>University of Medicine and Pharmacy, Emergency Hospital, Bucharest (ROMANIA), <sup>2</sup>Emergency Hospital, Bucharest (ROMANIA),

<sup>3</sup>University of Medicine and Pharmacy, Bucharest (ROMANIA)

INTRODUCTION: Complex limb trauma, with both bone and soft tissue injuries, are more and more frequent since high energy trauma agents are responsible for them. Vascular injuries are usually associated with these traumas, the most severe being represented by Acute Peripheral Ischaemia (API) which needs surgery in order to preserve the vitality of the injured limb. Reperfusion Syndrome following surgery can affect both local and general prognosis of the patient (in the most severe cases, by MSOF) and demands sustained treatment in order to preserve the life of the patient. MATERIAL AND METHOD: The authors present 8 cases of Reperfusion Syndrome (following ischaemia of the inferior limb), treated in the Emergency Hospital, Bucharest, between 01.06.2003-01.06.2007. The patients are analysed concerning: - the moment of surgical repair of the artery; - postoperative treatment; - the clinical aspect and the treatment of the reperfusion syndrome. RESULTS: Unfortunately, 3 of the patients died, 2 developed acute renal failure and 1 chronic renal failure after reperfusion. The reperfusion syndrome was associated, in these cases, with late surgical arterial repair and with incomplete fasciotomy. Complex treatment was necessary in all these cases for the systemic consequences of reperfusion. CONCLUSION: Early surgical restoration of the artery, correct fasciotomy and complete systemic sustaining treatment are absolutely necessary in order to avoid Reperfusion Syndrome. Once developed, this is a threatening-life disorder and needs a huge amount of therapeutical means in order to maintain the patient alive.

**Date : 2008-08-25**

**Session : Trauma: polytrauma and new techniques**

**Time : 1600-1730**

**Room: 403**

**Abstract number : 17696**

**COMPLEX INJURIES OF THE LIMBS - PROBLEMS CONCERNING DIAGNOSIS AND TREATMENT**

Olivera LUPESCU<sup>1</sup>, Mihail NAGEA<sup>2</sup>, Cristina PATRU<sup>2</sup>, Cornelia VASILACHE<sup>2</sup>, Doriana LUPESCU<sup>3</sup>

<sup>1</sup>University of Medicine and Pharmacy, Emergency Hospital, Bucharest (ROMANIA), <sup>2</sup>Emergency Hospital, Bucharest (ROMANIA),

<sup>3</sup>University of Medicine and Pharmacy, Bucharest (ROMANIA)

**PURPOSE:** Complete diagnosis of trauma includes not only the injuries, but also the mechanism, suggesting the trauma energy. The purpose of this study is to establish a therapeutic protocol depending on clinical aspects. **MATERIAL AND METHOD:** This prospective study analyses 125 patients admitted in our hospital between 01.06.2004-01.06.2006 with the diagnosis of "complex injury of the inferior limb". The main clinical aspects of these cases were: crushing without fracture, fracture, open injury, compartment syndrome (with or without fracture), acute peripheral ischaemia. The authors describe the algorithm for diagnosis (including laboratory findings and complementary examinations) and treatment for these cases. **RESULTS:** In 45% of patients compartment syndrome appeared (76% of cases with fracture and 35% of cases with crushing without fracture). Open fracture appeared in 72% of cases, and close fractures associated with peripheral ischaemia in 32% of cases. 24% of cases were associated with acute peripheral ischaemia. **CONCLUSIONS:** Complex injuries of the lower limb are associated with high energy trauma, which can produce severe injuries, with different clinical aspects. Initial correct diagnosis, followed by specific monitoring and treatment, provides the favourable outcome of the patient. The authors recommend thorough and complete surgical treatment. The efficacy of the treatment is reflected in decrease of fatal complications (renal failure, MSOF) and favourable local outcome.

Date : 2008-08-25

Session : Trauma: polytrauma and new techniques

Time : 1600-1730

Room: 403

Abstract number : 17701

**DAMAGE CONTROL ORTHOPAEDIC SURGERY FOR POLYTRAUMA WITH FEMORAL FRACTURES**

Olivera LUPESCU<sup>1</sup>, Mihail NAGEA<sup>2</sup>, Cristina PATRU<sup>2</sup>, Stefan NICULESCU<sup>2</sup>, Dorian LUPESCU<sup>3</sup>

<sup>1</sup>University of Medicine and Pharmacy, Emergency Hospital, Bucharest (ROMANIA), <sup>2</sup>Emergency Hospital, Bucharest (ROMANIA),

<sup>3</sup>University of Medicine and Pharmacy, Bucharest (ROMANIA)

INTRODUCTION: Treatment of femoral fractures in polytrauma patients represents a very actual debate, since both fracture and its treatment have a significant influence upon these patients. The time and the type of surgery for femoral fractures in polytrauma have not been concluded yet, but everybody agrees that polytrauma patients have significant benefit after immediate stabilization of the femoral fracture. The type of stabilization has changed during the last years, from reamed to undreamed nails, than to the concept (Krettek, Pape) of Damage Control Orthopaedic Surgery (DCOS) - initially stabilization of the femoral fracture by external fixation, followed by intramedullary nailing in polytrauma patients at risk of organ failure. MATERIAL AND METHOD: This retrospective study evaluates 90 polytrauma patients with femoral fractures, treated between 1.01.2001-1.01.2005, 40 by intramedullary nailing (IMN), 50 by DCOS, concerning: hospital stay, rate of MSOF, of ARDS and local complications (wound infections, pin track infections, implant failure, non-unions). RESULTS: Hospital stay was not significantly influenced by the type of osteosynthesis; the rate of MSOF and that of ARDS were less for the DCOS group than the IMN group. Intramedullary nailing following external fixation was not associated with higher rate of local complications than primary IMN. CONCLUSION: DCOS represents a valuable choice for femoral fractures in polytrauma patients in order to improve the patients' outcome.



**Date : 2008-08-25**  
**Session : Trauma: polytrauma and new techniques**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 18011**

**EXTERNAL FIXATOR CONTROLLED BY ELECTROMOTORS**

Klaus SEIDE, Nourddine BAHRI, Robert WENDLANDT, Frank WACKENHUT, Uwe SCHUEMANN, Christian JUERGENS  
*Berufsgenossenschaftliches Unfallkrankenhaus (Trauma Center), Hamburg (GERMANY)*

**OBJECTIVE:** Development of automatic external fixators by application of modern micromechanics and microelectronics. **METHODS:** By implementation of 6 motors, gears and position sensors as well as a control unit, a motorized fixator was realized. As basic principle, a 6 degree-of-freedom controllable hexapod robot kinematics was applied. **RESULTS:** Fixator systems with a stand alone automatic control unit as well as with a connection to a notebook computer was developed, the software enabling motor controlled bone movements input by a 3-dimensional input device ("3D-mouse"). The motorized fixator was applied in 6 patients with femoral or tibial fractures. It was demonstrated, that fracture reduction could be performed secondarily on the ward or in the intensive care unit without anaesthesia, as the slow movements were painless to the patients. **CONCLUSIONS:** It was shown, that automatic motor controlled fracture reduction is possible. Applications will be a joystick controlled system for intraoperative fracture reduction, e.g., mounting it on Schanz' screws temporarily. After the closed motorized exact reduction an internal implant can be inserted over a minimal invasive approach. Another type of application will be long time successive automatic reductions or deformity corrections. Additionally, the motorized fixator is the basis for load measuring and self adapting "intelligent" external fixator systems, optimizing bone healing and increasing patient safety, which we are currently developing.

Date : 2008-08-25

Session : Trauma: polytrauma and new techniques

Time : 1600-1730

Room: 403

Abstract number : 18122

**AN INTERNAL FIXATOR WITH A LOAD MEASURING TELEMETRY SYSTEM**

Klaus SEIDE, Maximilian FASCHINGBAUER, Nils WEINRICH, Frank WACKENHUT, Christian JUERGENS  
*Berufgenossenschaftliches Unfallkrankenhaus (Trauma Center), Hamburg (GERMANY)*

INTRODUCTION: Monitoring of the fracture healing process is typically done by X-ray examinations. In some cases it is difficult to distinguish healing problems radiologically and there is a significant radiation exposure to the patient. So, an implant incorporating a miniature electronic transponder with load measurement capabilities was developed and evaluated in clinical application. METHODS: A transponder unit of 12mm x 12mm x 3mm in size was mounted on the back of an internal femoral fixator, a wave plate with locked screws. Strain gauges were used as sensors sensitive to plate bending. Preclinically, biocompatibility and function were proven in 6 sheep. RESULTS: The system enabled the successful treatment of femoral nonunions in 5 patients, in which two or more prior surgical procedures had failed to achieve consolidation. Measurements in 2-week intervals under axial, varus and valgus external loads on the leg showed that elasticity of the osteosynthesis decreased over healing time, parallel to radiographically determined healing. The telemetric measurements typically showed increasing stability already before consolidation could be determined on the radiographs. Additionally, measurements under muscle activation, lifting of leg, walking and physical therapy showed that high harmful loads in the callus can emerge during these activities. CONCLUSIONS: It was shown that, with an electronically instrumented internal fixator system optimising postoperative treatment will be possible, by obtaining information about the progress of callus formation, emerging bone healing problems, allowable extremity loading as well as by adapting exercises to the individual healing situation.

**Date : 2008-08-25**  
**Session : Trauma: polytrauma and new techniques**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 18308**

**OUTCOME OF FEMORAL NECK FRACTURE IN THE YOUNG ADULT**

Deepu BHASKAR<sup>1</sup>, Debashish CHAKRAVARTI<sup>2</sup>, Kieran SINGISETTI<sup>1</sup>, Roshan RAGHAVAN<sup>2</sup>, Martyn PARKER<sup>2</sup>

<sup>1</sup>Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM), <sup>2</sup>Peterborough District Hospital, Peterborough (UNITED KINGDOM)

Femoral neck fracture in the higher demand young adult have been shown to be associated with an increased complication rate. Data was collected prospectively at admission and at one year in patients aged less than 60 years admitted with femoral neck fractures to Peterborough District Hospital. 82 patients in the database met criterion for inclusion. Average age was 48 years with 47 females and 35 males (ratio of 1.3). 66 Patients (80%) underwent fixation using AO screws, 7 patients had fixation using DHS and 2 were fixed using DCP, 3 patients had cephalo-medullary fixation and three patients had arthroplasty. There were 17 complications including six non-unions (7.3%) and eight avascular necroses (9.8%). Seven (8.5%) patients (1 female and 6 male) underwent revision surgery (5 nonunion and 2 AVN). 71 patients returned questionnaire on pain, mobility and place of residence at one year follow-up - 59 (83%) had no or occasional pain, 9 (12.7%) had moderate pain and 3 (4.2%) had severe pain 50 (70%) patients were mobilising independently while 14 (20%) required walking aids. 66 (93%) patients returned to own or rented accommodation, 2 (3%) to warden controlled, 2 (3%) to residential and 1 to nursing home. As expected there was excellent return to own accommodation, independent mobilisation and pain relief as compared to the geriatric population with these fractures. Also our series shows a decreased rate of complications as compared to other studies that have been undertaken in this age group.

**Date : 2008-08-25**

**Session : Trauma: polytrauma and new techniques**

**Time : 1600-1730**

**Room: 403**

**Abstract number : 18403**

**INJURIES ON THE LONDON UNDERGROUND- AN OBSERVATIONAL STUDY OF THE HELICOPTER EMERGENCY MEDICAL SERVICE (HEMS)**

Zaki CHOUDHURY<sup>1</sup>, Gareth DAVIES<sup>2</sup>

<sup>1</sup>*King's College Hospital, London (UNITED KINGDOM)*, <sup>2</sup>*Royal London Hospital, London (UNITED KINGDOM)*

We present an observational study of the work of the Royal London Hospital Helicopter Emergency Medical Service (HEMS). Attempted suicide on the London underground requires rapid medical assistance and results in a call out from ambulance control. We explore the phenomenon of the "one under" and evaluate the numbers of injuries observed, comment on geographical distribution and look at the severity of injuries suffered. We also review preventative strategies for the safety of underground trains.

**Date : 2008-08-25**  
**Session : Trauma: polytrauma and new techniques**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 18419**

**HIGH VELOCITY SUBTROCHANTERIC FRACTURES TREATED WITH BIOLOGICAL PLATING**

Thilak JEPEGNANAM, Manasseh NITHYANANTH, Boopalan P.R.J.V.C., Vinoo Mathew CHERIAN, Titus V.T.K.  
*Christian Medical College, Vellore, Vellore (INDIA)*

**INTRODUCTION:** Subtrochanteric fractures occurring in young patients are due to high velocity injury. Complications are high in these. **MATERIALS AND METHODS:** We retrospectively reviewed patients treated for subtrochanteric fractures between 2004 and 2006. Inclusion criteria were high energy fractures in young patients, treated biologically with 95 degree angled blade plate. Exclusion criteria were pathological fractures, age more than 60 years and those who needed primary bone grafting. There were 19 patients with 20 fractures. There were 16 males and 3 females. Their age ranged from 18 to 56 years (mean 37). Motor vehicle accident was the predominant mode of injury in 11 patients. The common injury patterns were 32-B injuries in 10 and 31-A3 in 7, according to AO classification. All had 95 degree angled blade plate fixation inserted biologically. At follow-up, any malalignment, limb length discrepancy, hip and knee range of motion were assessed. **RESULTS:** 18 fractures (90%) united without bone grafting. Of these 2 patients needed revision of bent angled blade plates. The time to union ranged from 3 to 20 months (mean 5.5). The follow-up ranged from 4 to 36 months (mean 18). Except one, all had good functional outcomes. 2 patients needed bone grafting to achieve union. Of these one was an alcohol addict and non-compliant. The other had varus malreduction at index surgery. **CONCLUSION:** 95 degree angled plate devices can be used to achieve early union and good functional results in high energy subtrochanteric fractures when inserted biologically.

**Date : 2008-08-25**

**Session : Trauma: polytrauma and new techniques**

**Time : 1600-1730**

**Room: 403**

**Abstract number : 18500**

**OSTEOSYNTHESIS OF MULTIPLE FRACTURES OF LOWER EXTREMITIES' LONG BONES IN VICTIMS WITH POLYTRAUMA**

Sabyrbek DJUMABEKOV, Arstanbek IMANALIEV

*Scientific Research Centre of Traumatology and Orthopedics., Bishkek (KYRGYZSTAN)*

Polytrauma is one of the severest types of trauma, when compound multifragmental fractures of long bones are complicated by craniocerebral trauma, damages of thorax and abdominal organs, musculoskeletal and pelvic organs injury. Those damages are badly beard by victims, disable them to move independently for a long time and are the main sources of failure outcomes of musculoskeletal system treatment. The goal of the survey is to study treatment outcomes of fractures of lower extremities' long bones in victims with polytrauma for the period 2002-2007. Within that period, 54 victims with polytrauma, who underwent 78 operations for osteosynthesis, were operated. The following techniques were used: transosseous osteosynthesis by Ilizarov's apparatus - in 16 cases mostly in open multiple fractures of the shin bones; intra-modular joint pin - in 14 cases, metal plates over osseous - in 24 cases. Traumatic shock was noted in 37 (68.5%) patients. Among those who had polytrauma, 7 individuals died of craniocerebral trauma. In case of closed fractures of long extremities accompanied by co-damages, the skeletal traction or a plaster cast are used. Operation should be performed later only after having the general state of a patient improved as well biochemical and hemodynamics of homeostasis normalised. We preferred osteosynthesis of long bone fractures with plates over osseous, where an accurate reposition and stable fixation of fractures are achieved, and it enables to provide full treatment at postoperative period and early training of adjacent joints and recovery of functions of extremities.

**Date : 2008-08-25**  
**Session : Trauma: polytrauma and new techniques**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 18770**

**ENHANCEMENT OF OSTEOGENESIS IN LONG BONES BY PLATELETS - A CLINICAL STUDY OF 39 PATIENTS**

Anil ARORA<sup>1</sup>, S. KUMAR<sup>1</sup>, Anil AGARWAL<sup>2</sup>, Apurv MEHRA<sup>1</sup>

<sup>1</sup>University College of Medical Sciences, University of Delhi, New Delhi (INDIA), <sup>2</sup>CNBC Hospital, New Delhi (INDIA)

**INTRODUCTION:** Platelet Concentrate has shown enhancement of osteogenesis in various experimental situations, but there is no study on ununited fractures of long bones, in humans, using platelet concentrate. **MATERIAL AND METHODS:** Prospective study (1995-2005). 39 adults with ununited long bone fracture/osteotomy, age range 21-69 years. Bones involved - Tibia (21), ulna (11), radius (3), femur (2) and humerus (2). Duration of delayed/nonunion: >1 year (7 cases), 1 year (2 cases), and <1 year in 32 cases (range 6 months-8 years). Platelet Concentrate (APC) prepared from Autologous blood by refrigeration centrifugation technique (platelet cell count >60, 00,000/ml). 10-40ml APC injected percutaneously, at and around ununited fracture/osteotomy site, and adjoining periosteum made angry by needle. Injection followed by splintage (cast/functional bracing) till union. In 13 cases, the injection repeated after 1-3 months. **RESULTS:** Follow-up: 6 months to 8 years. Thirty two long bones (32/39), including one osteotomy, united by this method. First radiological evidence of union (bridging callus) seen at an average of 9.4 weeks (range 6 to 12 weeks) (p value <0.001). Frank synovial pseudoarthroses (2), gap (3) and atrophic hypermobile (2) nonunions did not unite. **CONCLUSIONS:** In ununited long bones Autologous Platelet Concentrate, enhances union. Platelets, rich in Platelet Derived Growth Factor and Transforming Growth Factor-beta, release these growth factors at ununited site. These factors restart the "growth factors cascade" of fracture union, in stable environment, effecting fracture union. Autologous Platelet Concentrate being an osteoinductive agent only (and not an osteoconductive medium), does not bridge gap in "Gap nonunions".

Date : 2008-08-25

Session : Symposium & Free Papers - Basic Science: Biomaterials

Time : 0900-1030

Room: 404-405

Abstract number : 16667

**PROGNOSTIC SIGNIFICANCE OF BSALP IN HEALING OF LONG BONE FRACTURES**

Ante MULJACIC<sup>1</sup>, Renata POLJAK-GUBERINA<sup>2</sup>

<sup>1</sup>University Hospital of Traumatology, Zagreb (CROATIA), <sup>2</sup>Dental School, University of Zagreb, Zagreb (CROATIA)

The aim of this work was to assess the relationship of both total alkaline phosphatase (ALP) and bone-specific alkaline phosphatase (BsALP) with the course and outcome of operatively treated long-bone fractures. The activity of total ALP and BsALP was measured in 41 patients with a long bone fracture, comprising 26 men and 15 women. All patients were treated operatively. Total ALP and BsALP levels were measured in sera on day 1, 7, 14 and 21 after sustaining injury. Patient monitoring included X-rays. According to the outcome, patients were divided into two groups: the fast healing group and the slow healing group. The levels of total ALP and BsALP showed parallel trends in the course of this study. Depending on the healing outcome, on day 7, an increase in the case of slow healing, or a decrease in the case of fast healing, for both BsALP and total ALP was observed. No difference was found between various sites of bone fracture. This is an important result indicating the prognostic significance of total ALP and BsALP measurement in the monitoring of long bone fracture healing. In addition, an early change in the level of these enzymes was associated with the efficiency of the performed surgery.



Date : 2008-08-25

Session : Symposium & Free Papers - Basic Science: Biomaterials

Time : 0900-1030

Room: 404-405

Abstract number : 17299

**MODIFICATIONS OF SERUM CYTOKINE PROFILE IN RHEUMATOID ARTHRITIS PATIENTS DURING INFlixIMAB THERAPY**

Masao SATO<sup>1</sup>, Masao TAKEMURA<sup>2</sup>, Ryo TANAKA<sup>1</sup>, Ryuki SHINOHE<sup>1</sup>, Kuniaki SAITO<sup>3</sup>, Shoji TAKEUCHI<sup>4</sup>, Katsuji SHIMIZU<sup>1</sup>

<sup>1</sup>Orthopedic Surgery, Gifu University, Gifu (JAPAN), <sup>2</sup>Laboratory Medicine, Gifu University, Gifu (JAPAN), <sup>3</sup>Human Health Science, Kyoto University, Kyoto (JAPAN), <sup>4</sup>Chikaishi Hospital, Gifu (JAPAN)

The aim of this study is to measure tumour necrosis factor alpha (TNF-alpha) concentrations in patients with rheumatoid arthritis (RA) undergoing TNF-alpha blockade (infliximab) treatment and to evaluate the concomitant changes in serum concentration of interleukin (IL) 6, tumour necrosis factor receptor (TNFR) 1 and TNFR2. Fifteen patients with RA received intravenous infliximab therapy at a dose of 3mg/kg on day 0 and at weeks 2, 6 and 14. The mean age of the patients was 57.1 years and twelve of fifteen were female. Serum samples were gathered from patients just before each infusion of infliximab and stored at -80 centigrade until assay. Samples were assayed for TNF-alpha, IL6, TNFR1 and TNFR2 by ELISA. At the third infusion of infliximab, the patients were categorised as responders or non-responders, based on EULAR Improvement Criteria. Serum concentrations of TNF-alpha of all-RA patients at baseline were above 0.2pg/ml. TNF-alpha concentrations of two cases were above 10.0pg/ml, and there was a tendency of decreases in TNF-alpha concentrations especially in responders. There was a rapid and persistent decrease in serum IL6 concentrations ( $p < 0.05$ ) in responders, but no significant changes were found in non-responders. No significant modifications were found in serum concentrations of TNFR1 and TNFR2 at any time point. There was a rapid and persistent decrease in serum concentrations of TNF-alpha and IL6 in patients who well responded to infliximab treatment. The result suggested that anti-TNF-alpha therapy is likely to interrupt the synergic effect between these cytokines.

Date : 2008-08-25

Session : Symposium & Free Papers - Basic Science: Biomaterials

Time : 0900-1030

Room: 404-405

Abstract number : 17476

**SOLUBILITY ISOTHERMS OF GRADIENT STRONTIUM-REINFORCED HAP BY SOLID TITRATION**

H.B. PAN, Zhaoyang LI, W.M. LAM, C.T. WONG, K.D.K. LUK, W.W. LU

*The University of Hong Kong, Hong Kong (HONG KONG)*

INTRODUCTION: Strontium plays special interest in the treatment of osteoporosis and enhancement of bone mineralization. Therefore, strontium-reinforced apatite was widely used as bone filling material. However, the dissolution behaviour, in particular the mechanism of the formation of interface between bone and material is still controversial. Therefore, the solubility study of strontium-reinforced HAp may provide basic knowledge to understand the dissolution behaviour in human body. MATERIALS AND METHODS: Solid titration, using laser-scattering end-point detection, was used to determine the solubility isotherms of gradient strontium-reinforced HAp (1%, 5%, 10% and 100%) in 100 mM KCl at 37°C. The precipitates were respectively characterized by XRD, EDX and SEM. RESULTS AND DISCUSSIONS: 1%Sr-HAp was found significantly higher soluble than pure HAp. Meanwhile, the solubility further increased with the increase of strontium content. It is possibly due to the crystal stability of apatite decreased with the incorporation of strontium. In addition, the precipitates at equilibrium were only identified as HAp without other phases, EDX indicated that the Ca/P ratio decreased with the decrease of pH, meanwhile strontium released completely. Thus, it is clear that the formation of interface between bone and material was due to the (re)precipitation of partial dissolved strontium-reinforced HAp. The released strontium was not a crystal composition of the precipitate. CONCLUSIONS: The solubility isotherms of gradient strontium HAp were well established. The solid titration method shows excellent reliability and reproducibility in the determination of solubility; such method can be further employed to investigate other complicated system.

**Date : 2008-08-25**

**Session : Symposium & Free Papers - Basic Science: Biomaterials**

**Time : 0900-1030**

**Room: 404-405**

**Abstract number : 18267**

**AUTOHEMOTRANSFUSION - AN ALTERNATIVE METHOD FOR DONOR'S BLOOD TRANSFUSION IN ORTHOPAEDIC SURGERY?**

Igor DOROZHKO, Viktor VOLOSHIN, Vladimir LITVINOV, Saravanan ARUMUGAM

*Moscow Regional Clinical Research Institute, Moscow (RUSSIAN FEDERATION)*

The risk of infections, significant number of immunogenic complications forces to look on donor's blood transfusion as an unsafe and expensive method of treatment. AIM: The objective of the study is to develop and introduce an optimal strategy in clinical practice by compensating the blood loss during surgeries with the patient's own blood. MATERIALS AND METHODS: 1180 autodonors' (Group A) analyses of clinical observation, laboratory examination and results of functional control were analysed in the study. 360 patients (Group B) refused to become an autodonor also analysed. Collection of blood before surgery, acute normovolumic hemodilution, Intraoperational collection of blood with cell saver, collection of blood from the drainage system using with HaendyVac ATS were performed in the autodonor's group. In this group, only 10% of donor's blood was needed. The comparative results of multifactor analysis for hemostasis from the 2 groups were almost identical and within the physiological limits after surgery. CONCLUSIONS: Autohemotransfusion allowed us to decrease the general necessity of donor's blood up to 90%. It decreases immunological reactions, infectious and pyrogenic complications. Selection of complex, individual methods is needed to optimize the autohemotransfusion.

**Date : 2008-08-25**

**Session : Symposium & Free Papers - Basic Science: Biomaterials**

**Time : 0900-1030**

**Room: 404-405**

**Abstract number : 19146**

**RECENT DEVELOPMENT OF PLASMA SURFACE TECHNOLOGY IN ORTHOPAEDIC BIOMATERIALS**

Kelvin YEUNG

*City University of Hong Kong, Hong Kong (HONG KONG)*

Plasma immersion ion implantation is an advance surface technology by making use of the bombardment of energetic ions to the material surface to improve the mechanical and biological properties of materials. This nano-surface technology has been applied in orthopaedics for a long time. In addition to the enhancement of surface mechanics, the surface properties such as surface chemistry, energy and topography can be altered so as to meliorate the interaction of cells and orthopaedic material surface. However, regardless of the change of surface properties, the bulk mechanical properties of material itself can be retained after the treatment. In our research group, the applications of plasma surface modification include (1) the enhancement of bone on-growth on the surface of hip prosthesis, (2) the attachment and proliferation of fibrocartilage tissues to the metallic interference screw used in anterior cruciate ligament reconstruction surgery, (3) the reduction of bacterial adhesion and growth on polymeric and metallic material surface, (4) the control of degradation rate of degradable metallic implant for bone fracture fixation, and (5) the suppression of nickel ion leaching of nickel titanium shape memory alloy while implanting in human body permanently. The pros and cons of all these research work will be discussed within the lecture.

**Date : 2008-08-25**  
**Session : Joint: osteotomies around the hip**  
**Time : 1600-1730**  
**Room: 404-405**

**Abstract number : 16238**

**TOTAL HIP ARTHROPLASTY IN HIGH RIDING CONGENITAL DISLOCATION OF THE HIP, RESULTS OF TWO METHODS OF FEMORAL SHORTENING OSTEOTOMY**

Mohammad Taghi GHAZAVI, Zahra FARAHANI  
*Shafa Hospital, Mehrad Hospital, Tehran (IRAN)*

BACKGROUND: THR in high riding CDH is a challenging procedure. For true acetabulum positioning of the cup, femoral shortening osteotomy is often needed. The purpose of our study was to evaluate the results of two different methods of femoral shortening osteotomy. MATERIALS AND METHODS: 31 THRs were performed in 29 cases with high congenital hip dislocation. The cups were placed at true acetabulum and femoral shortening osteotomies of the femur were performed at proximal (14 hips, group 1) or distal femur (17 hips, group 2). After a mean follow-up of 4.2 years, all 31 hips were evaluated with Harris Hip Scores and X-rays. Technical difficulties and complications were also reported. RESULTS: The mean increase in Harris Hip Score was 51 in group one and 52 in group two. There were one peroneal nerve palsy and one early dislocation in group 1, while there were no such perioperative complications in group 2. One acetabular cup and femoral stem were revised in group 1. Nonunion happened in two cases of group 2. Special shape (cylindrical, non-tapered and longer than standard) femoral stems were needed for most proximal osteotomy patients. CONCLUSIONS: Hip arthroplasty, with cup at true acetabulum and femoral shortening osteotomy in patients with high congenital dislocation can produce good results. Either proximal or distal femoral shortening, osteotomy could have advantages and disadvantages. Proximal shortening osteotomy is a more challenging procedure, may need special stem design and could compromise stem fixation.

**Date : 2008-08-25**

**Session : Joint: osteotomies around the hip**

**Time : 1600-1730**

**Room: 404-405**

**Abstract number : 16414**

**COMPARATIVE RESULTS OF ANGLED CONDYLAR PLATE AND T-PLATE AS A FIXATION TOOL IN HIGH TIBIAL OSTEOTOMY**

Ayman GOUDA, Khalid BATTERJEE, Osama FARAG

*Saudi German Hospital, AlMadinah AlMonourah (SAUDI ARABIA)*

AIM OF THE WORK: To evaluate the advantages, disadvantages and relevance of using angled condylar plate in fixation of high tibial osteotomy in cases of genu varus deformity and improvement in patient functional outcome in comparison with T-plate. METHOD: 40 patients with medial compartment knee osteoarthritis underwent high tibial osteotomy. 22 patients operated upon using angled condylar plate and 18 patients T-plate was used for fixation of osteotomy site. Operations were done at Saudi German Hospitals between June 2003 and November 2006. Male to female 17:23, age ranged 25-49 years. Varus deformity with obesity in all cases. HSS scoring used to evaluate all patients pre- and postoperatively. RESULTS: Preoperative scoring for all cases ranged between 60-80, postoperatively scoring for cases with angled plate excellent in 19 cases and good in one case; poor in 2 cases. Postoperative results in cases where T-plate were used excellent in 13 cases, good in 2 cases, fair in one case and poor in 2 cases. Two cases with angled plate developed peroneal nerve palsy. Implant failure occurred in 3 cases of T-plate. No cases of DVT or infection were recorded. CONCLUSION: Results of angled condylar plate and T-plate as a fixation tool in high tibial osteotomy were almost the same but in obese and muscular patients the implant failure was high in T-plate with delayed union of osteotomy site in comparison with angled plate no recorded cases of implant failure with early weight bearing and return to functional activities.

**Date : 2008-08-25**  
**Session : Joint: osteotomies around the hip**  
**Time : 1600-1730**  
**Room: 404-405**

**Abstract number : 16523**

**CLINICAL AND RADIOLOGICAL OUTCOME OF GANZ OSTEOTOMY**

Sattar ALSHRYDA, Gavin DE KIEWIET

*City Hospital of Sunderland, Middlesbrough (UNITED KINGDOM)*

**INTRODUCTION:** Acetabular dysplasia is a significant cause of osteoarthritis in young people. The treatment of such young patients with arthritis of the hip is difficult. Options for treatment include hip arthrodesis, pelvic or femoral osteotomy and total hip replacement or resurfacing. Young patients do not usually accept the limitation of the arthrodesis. Hip replacement is associated with poor results in young people. Pelvic osteotomy may be the procedure of choice. Different types of pelvic osteotomy have been recommended such as Salter, Dial, Steel, or Ganz periacetabular osteotomy. We would like to present our experience with 25 patients who underwent Ganz periacetabular osteotomy in our centre. **MATERIAL AND METHODS:** A retrospective study of 25 patients who underwent Ganz periacetabular osteotomy. The following data has been collected: A - Clinical data: 1-Demographic data. 2-Clinical evaluations. 3-Operative data. 4-Early and late complications. 5-Extra and salvage operation to deal with complications. B - Radiological data: 1-Preoperative and postoperative Centre Edge Angle (CE angle). 2-Preoperative and postoperative Tonnis angle. 3-Any complications such as nonunions, screw avulsions, Heterotopic ossifications. **RESULTS:** Although, there has been significant improvement in radiological outcome, however, the clinical outcome is not always predictable. The best predictor for good outcome was early presentation with minimal osteoarthritic changes on X-rays. There has been significant drop in HB level and blood transfusion rate; however, none has led to serious complications. There have been three cases with nonunion of the pubic ramus and two ischium nonunions.

**Date : 2008-08-25**

**Session : Joint: osteotomies around the hip**

**Time : 1600-1730**

**Room: 404-405**

**Abstract number : 16726**

**FUNCTIONAL ANTHROPOMETRIC MEASUREMENT OF INDIAN PELVIS ON PLAIN RADIOGRAPH**

Lalit MAINI, Nishant JAIN, VK GAUTAM

*Maulana Azad Medical College, Delhi (INDIA)*

AIM: To determine the normal values of several radiographic measurements of hip and pelvis in individuals of Indian population. MATERIAL AND METHODS: We conducted a cross-sectional study of Indian population and calculated mean and variation seen in different parameter. We took the plain X-ray of randomly selected hundred individuals with magnification factor of 20%. Different parameters including acetabular inclination angle, cup size, tear drop position, neck shaft angle, neck offset, abductor lever arm, canal size, level of lesser trochanter were drawn on the X-rays and values measured. 100 subjects were taken (63 male and 37 female). The mean of acetabular inclination angle was  $37.70 \pm 3.82$  degree (30-47 degree). The mean neck shaft angle was  $131.53 \pm 7.70$  degree (114-158) the most commonly occurring value was 131 degree. The mean abductor lever arm was  $38.48 \text{mm} \pm 5.77$  (23-54) with the mode of 40. The mean cup size was  $48.9 \pm 3.67 \text{mm}$  (34-58) with the most commonly occurring value as 50. The mean angle from tip of trochanter to center of head was  $80.2 \pm 9.1$  (62-110). Among all the seven parameters correlations were drawn. There were in all 22 correlations out of which 14 were statistically significant. Since there is significant difference between the measurements of Indian population as compared to the European population, an evaluation in the design of the implant by the Indian manufacturers is recommended. Also this study proposes that the normal values of our own population be used as reference values in interpreting standard radiographs.



**Date : 2008-08-25**  
**Session : Joint: osteotomies around the hip**  
**Time : 1600-1730**  
**Room: 404-405**

**Abstract number : 16920**

**TOTAL JOINT REPLACEMENT CLINICAL OUTCOMES: THE DIFFERENCE BETWEEN GENDERS**

Dale WILLIAMS, Justin DEBEER, Danielle PETRUCELLI  
*McMaster University, South Melbourne (AUSTRALIA)*

Arthroplasty design focus has shifted to gender-specific implant design but there is little evidence about gender specific outcomes. We hypothesized that outcomes in arthroplasty patients are affected by gender. Patients were identified from a prospectively collected TJR database performed at one center. Six surgeons performed 1123 primary TKAs, 989 primary cementless THAs over seven years. Demographic data, preoperative and 1-year clinical outcomes including the Harris Hip/Knee Society Score and Oxford Hip/Knee scores were collected. The TKA sample included 540 females and 449 males, THA sample included 744 females and 379 males. In the TKA group, females were younger, had higher BMI and had differing rates of comorbidities and complications. Female KSS, Oxford and ROM outcomes were inferior to male scores preoperatively and at 1 year follow-up. Females reported higher pain scores than males from pre-op to 1 year. Females showed significantly more improvement from pre-op to 1 year. In the THR group there were varying rates of complications and comorbidities by gender. Females did significantly worse in the HHS and Oxford hip score from pre-op until one year. Pain scores were higher for females pre-op and at 6 weeks but became equivalent thereafter. Females showed significantly greater improvements from pre-op to 1 year in. As reported in the literature, results of this study indicate that women choose TJR at a later stage of disease, with inferior functional status. This effect is highest in knee arthroplasty populations with inferior outcomes and pain relief persisting out to 1 year.

Date : 2008-08-25

Session : Joint: osteotomies around the hip

Time : 1600-1730

Room: 404-405

Abstract number : 16935

**FEMORAL SHORTENING OSTEOTOMY IN CEMENTLESS TOTAL HIP ARTHROPLASTY WITH THE USE OF A MODULAR FEMORAL COMPONENT FOR HIGH HIP DISLOCATION**

Hiroyasu OGAWA<sup>1</sup>, Yoshiki ITO<sup>1</sup>, Mansho ITOKAZU<sup>2</sup>, Nobuyuki MORI<sup>1</sup>, Takashi SHIMIZU<sup>1</sup>, Nobuo TERABAYASHI<sup>1</sup>, Daichi ISHIMARU<sup>1</sup>, Katsuji SHIMIZU<sup>1</sup>

<sup>1</sup>Gifu University School of Medicine, Gifu (JAPAN), <sup>2</sup>Hirano General Hospital, Gifu (JAPAN)

**INTRODUCTION:** High hip dislocation is a challenging reconstructive condition. The main obstacles are increased femoral anteversion, severe femoral head migration, and shortened hip musculature. We performed femoral transverse shortening osteotomy in cementless total hip arthroplasty using a modular-type femoral component for this condition. This procedure is characterized by femoral transverse shortening osteotomy, positioning of the cup in the true acetabular region, and rotational stability of the osteotomy site achieved with a feature of this implant. We evaluated the outcome of this procedure. **PATIENTS AND METHODS:** Between 2001 and 2006, this procedure was performed in 9 hips of 8 patients (7 women and 1 man; mean age: 59.7 years) with high hip dislocation. Two hips were in the Crowe III class, and 7 were in the Crowe IV class. The mean follow-up period was  $4.0 \pm 0.6$  years. Clinical evaluations including the Japanese Orthopaedic Association (JOA) score, Trendelenberg sign, and complications and radiographic evaluations were performed. **RESULTS:** The mean JOA score improved from 39.6 points before surgery to 78.3 points at the latest follow-up. Positive Trendelenburg sign in all patients turned to all negative postoperatively. There was no major complication except 3 dislocations. All the hip centers were within the true acetabular region. There was no migration or loosening of the implant. There was no delayed union or nonunion of the osteotomy. **CONCLUSION:** This procedure is technically simple and useful with recovery of hip function including abductor muscle strength in high hip dislocation.

**Date : 2008-08-25**

**Session : Joint: osteotomies around the hip**

**Time : 1600-1730**

**Room: 404-405**

**Abstract number : 17328**

**SLOTTED ACETABULAR AUGMENTATION WITH CONCURRENT OPEN REDUCTION FOR DEVELOPMENTAL DYSPLASIA OF THE HIP IN OLDER CHILDREN**

Ruijiang XU

*Department of Paediatric Surgery, General Hospital of PLA, Beijing (CHINA)*

**OBJECTIVE:** To evaluate the results of the patient with developmental dysplasia of the hip treated by slotted acetabular augmentation with concurrent open reduction in older children. **METHODS:** Slotted acetabular augmentation with concurrent open reduction was performed in 21 patients with 25 developmental dysplasia of the hip. Among them, ten dislocated hips needed simultaneously dealing with femoral shortening and derotation osteotomy. Preoperative average acetabular index was  $41^{\circ}$  ( $35^{\circ}$ - $45^{\circ}$ ) and the average height of dislocated femoral head was 0.85cm with a range of 0.5cm to 2.0cm. The average age at the time of surgery was 10 years, with a range of 6 to 14 years. **RESULTS:** Patients were followed up for an average of 5.3 years. Using McKay's clinical criteria, 16 hips were classified as excellent, six hips as good and 3 hips as fair. Using Severin's radiographic classification, 15 hips were classified as excellent, 6 hips as good and 4 hips as fair. **CONCLUSION:** Slotted acetabular augmentation with concurrent open reduction can be an effective procedure for developmental dysplasia of the hip.

**Date : 2008-08-25**

**Session : Joint: osteotomies around the hip**

**Time : 1600-1730**

**Room: 404-405**

**Abstract number : 17466**

**TRANSOSSEOUS OSTEOSYNTHESIS IN TREATMENT OF CONGENITAL DISLOCATION OF FEMUR AT CHILDREN**

Vladimir SHEVTSOV<sup>1</sup>, Mikhail TEPLENKY<sup>2</sup>

<sup>1</sup>*Russian Ilizarov Scientific Center "Restorative Traumatology and Orthopaedics", Kurgan (RUSSIAN FEDERATION)*, <sup>2</sup>*Russian Ilizarov Scientific Center, Kurgan (RUSSIAN FEDERATION)*

INTRODUCTION: Congenital dislocation of femur at children is a frequent pathology of childhood and down to recent times there are no safe methods of this pathology treatment. MATERIAL AND METHODS: We have an experience of 85 patients' treatment in age from 2 to 16 years. Clinical, X-ray, biomechanical and other methods were used for examination. RESULTS: In examination process different degrees of femoral head dislocation were found out. Because of it, different treatment methods were used. At children of infancy (2-5 years) osteoperforation and wire tunneling were performed. At children of old age radical surgical treatment was used to avoid space variation of acetabulum position. Transverse iliac bone osteotomy, L-shaped superacetabulum osteotomy use in this case; and at children of old age - triple osteotomy of iliac, pubic and ischium bones. On operating table we perform coxofemoral complex turn, the end aim of that is supply of full cover of femoral head with normalization of acetabulum roof slope. DISCUSSION: The use of developed technologies of coxofemoral component reconstruction in treatment of congenital femoral dislocation at children helps to receive positive results in 93-95% cases and shows high effectivity.

**Date : 2008-08-25**  
**Session : Joint: osteotomies around the hip**  
**Time : 1600-1730**  
**Room: 404-405**

**Abstract number : 18703**

**TRANSPOSITIONAL ACETABULAR OSTEOTOMY (TAO) COMBINED WITH BONE GRAFT AS A TREATMENT FOR SEVERE ACETABULAR DYSPLASIA**

Elsayed SAID, Masaaki MAWATARI, Motoki SONOHATA, Takao HOTOKEBUCHI  
*Saga medical school, Saga (JAPAN)*

**INTRODUCTION:** One of the most common etiologies of secondary osteoarthritis in young patients is uncorrected acetabular dysplasia. Periacetabular osteotomy is an effective treatment to delay and possibly prevent osteoarthritis. From January 1999 to April 2006 we performed Transpositional Acetabular Osteotomy (TAO) in a total of 274 hips in 243 patients, 24 hips in 22 patients were of the severe type (CE angle <0 degree, AHI<50%, and acetabular roof obliquity >30 degrees); there were one male and 21 females. The average age was 24.5 (ranging from 12 to 44 years). The average follow-up was 21 months (ranging from 6 months to 66 months). All patients underwent periacetabular osteotomy with allogeneic bone graft. Postoperatively, the patients were assessed clinically and radiographically at an average of 2.4 years. **RESULTS:** Radiographic evaluation revealed an average improvement of 56.1 (from -16.5° to 38.5°) in CE angle and of 23.8 (from -15° to 40°) in acetabular roof obliquity. The hip centre was translated medially at an average of 4.7mm (range: -6 to 16mm) and inferiorly at an average of 4.0mm (range: -10 to 18mm). Osteotomy sites union rate was 100% and grafts were incorporated without collapse. Average Harris hip score improved from 76.2 points preoperatively to 90.4 points at the time of the latest follow-up. No major complications were encountered in this series. **CONCLUSION:** TAO with allogeneic bone graft is an effective technique for correction of severe hip dysplasia.

**Date : 2008-08-25**

**Session : Symposium - General Orthopaedics: DM Foot**

**Time : 1100-1215**

**Room: 405**

**Abstract number : 19165**

**MANAGEMENT OF DIABETIC FOOT INFECTION**

Wing Cheung WONG

*Kwong Wah Hospital, Hong Kong (HONG KONG)*

Diabetic foot infections are common, complex, potentially limb and sometimes life threatening. They are usually preceded by pre-existing ulcers or trauma. Diabetic foot infection is clinically diagnosed by the presence of purulent discharges with clinical signs of inflammation such as warmth, redness, swelling and occasionally pain. However, these findings can be obscured by the presence of peripheral neuropathy, lower extremity ischaemia, immunological dysfunction or metabolic perturbations. Charcot neuroarthropathy should be excluded in the absence of foot ulcer or penetrating wound. Tissue cultures rather than wound swabs are more appropriate for adequate antibiotic regimen. Gram-positive cocci, *Staphylococcus aureus*, coagulase-negative staphylococci and streptococci, are the most common pathogens in acute diabetic foot infection. For chronic or necrotic infection, polymicrobials such as Gram-negative and anaerobic bacteria are commonly isolated. Consider to hospitalize patients with severe soft tissue and bone sepsis; critical ischaemia; needing intravenous therapy; or poor compliance. Narrow spectrum antimicrobial therapy should be started initially and subsequent re-adjustment based on the culture results and clinical response to the initial regimen. When medical treatments and off-loading measures fail to control sepsis, surgical intervention should be considered. Depending on the infected anatomical sites, surgical debridement, drainage of abscess, bone resection and amputation are indicated in controlling the infection. The goals of each procedure are in achieving a plantigrade foot with a stable and completely healed soft tissue envelope. Reference:1. Lipsky BA. International consensus group on diagnosing and treating the infected diabetic foot. A report from the international consensus on diagnosing and treating the infected diabetic foot. *Diabetes Metab Res Rev* 2004;20:S68-S77.

**Date : 2008-08-25**  
**Session : Sports: articular cartilage repair**  
**Time : 0900-1030**  
**Room: 406-407**

**Abstract number : 16210**

**INTRA-ARTICULAR INJURIES OF KNEE JOINT IN DIFFERENT AGE GROUPS**

A.V. BELETSKY<sup>1</sup>, M.A. GERASIMENKO<sup>2</sup>, E.V. ZHUK<sup>2</sup>

<sup>1</sup>*Belarussian Research Institute of Traumatology and Orthopaedics, Minsk (BELARUS)*, <sup>2</sup>*Belarussian State Medical University, Minsk (BELARUS)*

Chondral and osteochondral fractures in a knee joint are a widespread pathology mainly among young people. The main trauma reasons are sprain of knee (especially at sportsmen, dancers), hit, weight bearing. 174 patients with intra-articular damages of the knee joint were examined by arthroscopy. Average age was 24.5 years. All patients were divided into 4 age groups: younger than 14 years (30 patients), 15-18 years (58), 19-30 years (39), elder than 30 years (47). In the first group prevailed chondral and osteochondral fractures (26.7%); chondromalacia of the knee joint cartilage was defined at 7 patients (23.3%). In the second group chondral and osteochondral fractures were revealed in 22.4% (1 due to Konig disease); chondromalacia was observed at 39.7%. In the third group osteochondral fractures met in 5.1%; chondral fractures were not detected. The chondromalacia of knee cartilage was found at 46.2%. In the eldest group the further reduction of quantity of cases of osteochondral fractures (4.3%) and increase in number of patients with chondromalacia (63.8%) were observed. 23% of chondral and osteochondral fractures in the youngest group (14.9% in the eldest) which were revealed arthroscopically had been previously determined during MRI as meniscuses damages. Thus, at young patients, chondral and osteochondral fractures of the knee joint prevail over chondromalacia, and among patients of the senior age groups the opposite situation is observed. The best method of verification of intra-articulate damages of a knee joint is arthroscopy.

Date : 2008-08-25

Session : Sports: articular cartilage repair

Time : 0900-1030

Room: 406-407

Abstract number : 16676

**BIOLOGIC FIXATION IN OSTEOCHONDRITIS DISSECANS WITH MOZAICPLASTY**

Tuluhan Yunus EMRE<sup>1</sup>, Macit UZUN<sup>1</sup>, Özgür ÖZER<sup>2</sup>

<sup>1</sup>*Etimesgut Military Hospital, Ankara (TURKEY),* <sup>2</sup>*Bayindir Hospital, Ankara (TURKEY)*

Osteochondritis dissecans (OCD) is a problem that affects the subchondral bone. Drilling can be used to enhance the healing potential of osteochondral fragment. Fixations with Herbert screw, bioabsorbable screw or bone-peg are the other surgical procedures that are frequently used. In this study we aimed to give the results of our OCD cases in which lesion had been fixed with mozaicplasty. The study group consisted of 14 patients (2 women, 12 men). The mean age time of operation was 22.14 years (range 17-29 years) and mean follow-up period was 24.3 months (range 11-40 months). The localisations of lesions were medial femoral condyl in 11 patients (78.6%) and lateral femoral condyl in 3 patients (21.4%). Lesion type was classified according to "International Cartilage Repair Society". In 5 patients (35.7%) the lesion was ICRS type II and in 9 patients (64.3%) ICRS type III. After debridement and drilling of the lesion site, fixation was made with mozaic autograft. During the post-operative 3 weeks, patients were not allowed to weight-bearing. According to Hughston Scale, perfect and good results were obtained from 10 patients (71.4%) and 4 patients (28.6%), respectively. Fixation of OCD with mozaicplasty gave good and perfect results in our cases. So, this resulted with enhancement of the strength of the biologic fixation and shorter healing period. As a result, we believe that our surgical procedure is a successful technique with the advantage of no need to a second surgical procedure to remove a metallic implant.



**Date : 2008-08-25**  
**Session : Sports: articular cartilage repair**  
**Time : 0900-1030**  
**Room: 406-407**

**Abstract number : 17103**  
**OATS GRAFTS IN OSTEOCHONDRAL DEFECTS OF THE KNEE**  
Hatem SAID  
*Assiut University Hospital, Assiut (EGYPT)*

Osteochondral defects of the knee arise commonly due to OCDs (osteochondritis dissecans) or traumatic cartilage injuries. We describe fixing or replacement of these defects using 1-4 osteochondral autografts (average 2.6), using the OATS technique. We had nine cases with an average age of 24 years (ranging 18-46). The defect diameter ranged from 1-3.5cm (average 2.5cm). The problem arises when there is a bony defect in addition to the cartilage defect, and there is a need to restore the surface of the femoral condyle to its normal shape. Our technique of protruding the graft from the defect corrects this dilemma and allows for bone and cartilage growth. Follow-up ranged up to 17 months with complete restoration of the articular surfaces, seen on MRI. OATS grafting remains a valuable single surgery solution to solve osteochondral defects with low morbidity, cost and a fast learning curve.

Date : 2008-08-25

Session : Sports: articular cartilage repair

Time : 0900-1030

Room: 406-407

Abstract number : 17108

**EFFICACY OF HYLAN G-F 20 AND SODIUM HYALURONATE IN TREATMENT OF OSTEOARTHRITIS OF KNEE - A PROSPECTIVE RANDOMIZED BLINDED CLINICAL TRIAL**

Raghu RAMAN, A DUTTA, Nicky DAY, HK SHARMA, Chris SHAW, GV JOHNSON

*Hull Royal Infirmary, Normanton (UNITED KINGDOM)*

AIM: To compare clinical effectiveness, functional outcome, patient satisfaction following Synvisc® and Hyalgan® in OA of knee. METHODS: 356 consecutive patients were randomized into two groups to receive Hylan G-F-20(n=184) or Sodium Hyaluronate (n=172). Knee pain and patient satisfaction were measured on VAS, WOMAC, Oxford knee, EuroQol-5D scores. Mean follow-up was 12 months. RESULTS: Patients in both groups predominantly had grade III OA. Knee pain (VAS) improved from 6.7 to 3.2 by 6 weeks (p=0.02) and was sustained until 12 months p=0.04 with Synvisc. In Hyalgan group, pain improved from 6.6 to 5.7 at 6 weeks and 4.1 at 3 months (p=0.04) and sustained until 6 months (5.9, p>0.05). Improvements in the WOMAC pain, physical activity subscales were significantly superior in the Synvisc group at 3, 6 and 12 months (p=0.02). Patient compliance was 99.2% in the Synvisc group as compared to 92.2% in the Hyalgan group. There was no difference in the cost of drugs, but total treatment cost was 23% more in the Hyalgan group due to two additional visits to complete the course of treatment. CONCLUSION: Although both treatments offered significant pain reduction, it was achieved earlier and sustained for a longer period in patients with Synvisc. Local reaction of pseudo sepsis was observed with Synvisc in one patient. The total treatment cost, both for the patient and the hospital are higher with Hyalgan.

**Date : 2008-08-25**  
**Session : Sports: articular cartilage repair**  
**Time : 0900-1030**  
**Room: 406-407**

**Abstract number : 17464**

**LARGE OSTEOCHONDRAL DEFECTS OF THE FEMORAL CONDYLE WITH THE MEGA OATS TECHNIQUE - A 5-YEAR FOLLOW-UP**

Erik HOHMANN<sup>1</sup>, Andreas IMHOFF<sup>2</sup>

<sup>1</sup>*Musculoskeletal Research Unit, Central Queensland University, Rockhampton (AUSTRALIA)*, <sup>2</sup>*Department of Orthopaedic Sports Medicine, Munich (GERMANY)*

**INTRODUCTION:** Large osteochondral defects of the femoral condyle still pose a difficult problem to treat. A variety of options are available but most result in replacement with inferior cartilage in the load-bearing zone of the knee joint. We present the five-year results of Mega-OATS. This technique utilizes the posterior femoral condyle for coverage of osteochondral defects. **METHOD:** From July 1999, 33 patients of mean age 34.3 years (15-59) were treated with MEGA-OATS. Fifteen patients additionally underwent high tibial osteotomy and two bone grafting using bone harvested from the proximal tibia. The average defect size was  $6.2 \pm 1.8 \text{ cm}^2$ . The mean follow-up was  $66.4 \pm 13.2$  months. The technique calls for excision of the posterior femoral condyle which is placed in a specially designed work station. **RESULTS:** The Lysholm score increased postoperatively from  $49.0 \pm 19.4$  to  $88.5 \pm 14.9$  12 months post surgery to  $85.5 \pm 16.0$  five years post surgery. Three months postoperatively, patients attained a full range of motion and became fully weight-bearing. There was no difference in patients undergoing combined surgery with high tibial osteotomy and patients undergoing Mega OATS as a single procedure after five years. No post-operative meniscal lesions of the posterior horn have been observed. **CONCLUSIONS:** Mega-OATS achieves a congruent reconstruction of the articular surface in the load bearing zone of the femoral condyle. We consider it a good alternative and salvage procedure in the treatment of large osteochondral defects of the femoral condyle.

**Date : 2008-08-25**

**Session : Sports: articular cartilage repair**

**Time : 0900-1030**

**Room: 406-407**

**Abstract number : 17617**

**LONG-TERM FOLLOW-UP OF TWO CONTINUED SERIES OF YOUNG ATHLETES AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION WITH HAMSTRINGS TREATED WITH ELECTROMAGNETIC WAVES, TECAR-THERAPY DEVICE**

Piefilippo BOTTIGLIA AMICI-GROSSI, Eleonora Paola FUSI, Elisabetta DIOTTI, Paolo FERRUA, Mara AVELLA, Cesare VERDOIA  
*Istituto Ortopedico Gaetano Pini, Milan (ITALY)*

For this purpose two different groups of athletes have been evaluated: 20 patients were treated with Tecartherapy and standard physiotherapy from the first day after surgery to the twentieth week; 10 patients, representing the control group, were treated with standard physiotherapy only. We have evaluated the subjective pain through the Visual Analogic Scale (VAS), aedema and inflammation through leg circumference and the proprioceptivity through stabilometric platform (KAT 2000). Our findings pointed out a reduction of inflammation, pain and aedema, and an improvement of proprioceptivity. These elements allow a quicker mobilization, a recovery time reduction and a faster return at the previous sport level.

**Date : 2008-08-25**  
**Session : Sports: articular cartilage repair**  
**Time : 0900-1030**  
**Room: 406-407**

**Abstract number : 17634**

**OSTEOCHONDRAL DEFECTS OF THE KNEE: AUTOLOGOUS CHONDROCYTE IMPLANTATION ALLOWS RETURN TO PHYSICAL ACTIVITY AND SPORTS**

Parag JAISWAL, Simon MACMULL, Richard CARRINGTON, John SKINNER, Tim BRIGGS, George BENTLEY  
*Royal National Orthopaedic Hospital, Stanmore (UNITED KINGDOM)*

**PURPOSE:** We determined whether autologous chondrocyte implantation (ACI) in patients with osteochondral defects (OCD) of the knee resulted in patients returning to high levels of work and physical activities. **METHODS:** 133 patients from January 2001 to December 2002 underwent ACI. A telephone and postal questionnaire was conducted to ascertain a detailed occupational and leisure activity profile in this cohort. For each job held we asked whether an average working day had involved any of ten specified physical activities. For each sport that had been played 5 times a year, we asked the age the sporting activities had began and whether they were able to return to these sports after surgery. **RESULTS:** 109 patients responded to the questionnaire. There were 59 females and 50 males. Sports injuries accounted for 63% of the traumatic OCDs of the knee. The mean age at the time of operation was 34.5 (range 14 to 49). 42% of patients had to make some form of modification to their work. 47% of patients were able to return to at least one of the sports they played pre-injury. The mean number of sports played pre-injury was 2.5 and following surgery was 1.6. The mean time at which they could commence walking, swimming and cycling as a form of exercise was 3.3, 3.9, and 4.2 weeks respectively. **CONCLUSION:** Patients rehabilitate quickly following Autologous Chondrocyte Implantation and return to work and sport in almost all cases but with fewer sporting activities.

**Date : 2008-08-25**

**Session : Sports: articular cartilage repair**

**Time : 0900-1030**

**Room: 406-407**

**Abstract number : 17814**

**NOVEL IDENTITY AND POTENCY QUALITY CONTROL ASSAYS FOR AUTOLOGOUS CHONDROCYTE IMPLANTATION**

Steve RAPKO, Amy PARKER, Christina MORTELLITI, Stephen DUGUAY, Leslie WOLFE

*Genzyme, Cambridge (UNITED STATES)*

Autologous chondrocyte implantation (ACI) has been used successfully in the clinic to repair cartilage defects. Manufacturing and characterization of autologous chondrocytes present unique challenges, and robust and reliable release assays are required to ensure product quality. We have developed identity and potency assays for our Matrix-induced Autologous Chondrocyte Implant product, known as the MACI® implant. MACI® implant is a chondrocyte/membrane composite that is placed directly into the cartilage defect and held in place with fibrin glue. Developing identity and potency assays for chondrocytes has been difficult because chondrocytes expanded in monolayer culture dedifferentiate, as marked by the down-regulation of cartilage specific markers, the loss of extracellular matrix, and the display of fibroblastic morphology. In this work, we report the discovery of two markers, cart1 and synov1, that have been characterized as the two most differentially expressed mRNA markers present in chondrocyte cultures relative to synovial fibroblast cultures. An identity assay based on the ratio of the cartilage marker to the synovial fibroblast marker has been developed. The assay is highly selective for chondrocytes and is also sensitive to the presence of synovial or dermal fibroblasts, providing the performance characteristics necessary for a MACI® implant product release identity assay. We also describe a potency assay based on the marker hyaline 1, which has been shown to predict chondrogenic potential of cells on collagen membranes for production of MACI® implants.

**Date : 2008-08-25**  
**Session : Sports: articular cartilage repair**  
**Time : 0900-1030**  
**Room: 406-407**

**Abstract number : 18300**

**RESURFACING FOR SPORTIVE PATIENTS: HEMICAP RESULTS AND BIOMECHANIC IN VITRO TESTS**

Gobert V. SKRBENSKY<sup>1</sup>, Christoph BECHER<sup>2</sup>, Maximilian SCHMIDT<sup>3</sup>

<sup>1</sup>University of Vienna, Vienna (AUSTRIA), <sup>2</sup>Hannover Medical School, Department of Orthopaedics, Hannover (GERMANY), <sup>3</sup>Medical University Vienna, Department of Orthopaedics, Vienna (AUSTRIA)

To fill the gap between cartilage transplantation and indication for joint replacement of middle aged sportive patients, the Hemicap® was tested in a knee simulator to define the optimised surgical procedure. MATERIAL AND METHOD: 10 fresh frozen knee human knee specimen have been mounted in the MTS® based Vienna knee simulator 2.2, performing knee bending under calculated body load. Tecscan® sensors were applied to measure the pressure distribution of condyles with defect, overlapping implantation and correct fitting. After this in vitro test series, the implant was used for 6 patients with cartilage III defects at the femur condyle, in a second phase hip, shoulder and patella and ankle joints were treated with the new device. RESULTS: The correct implanted implant without overlapping edges showed pressure distribution pattern as the normal condyle during loaded knee bending. In a histological investigation there was no tibial plateau abrade obvious. The other 5 knee patients, 3 male and 2 female, average ages of 46.4 years, improved their knee society score up to 98 on an average. They were all able to return to their favorite sport activities. CONCLUSION: Small implant resurfacing can improve the knee functions for active patients and make them return to sport activities. Literature: Christoph Becher, Roland Huber, Hajo Thermann, Hans H. Paessler and Gobert V. Skrbensky, Knee Surgery, Sports Traumatology, Arthroscopy, Volume 16, Number 1/January 2008.

**Date : 2008-08-25**

**Session : Sports: articular cartilage repair**

**Time : 0900-1030**

**Room: 406-407**

**Abstract number : 18347**

**ANALYSIS OF MENISCAL AND CHONDRAL LESIONS ACCOMPANYING ANTERIOR CRUCIATE LIGAMENT TEARS**

Eyup Selahattin KARAKAS, Mehmet Nurullah ERMIS, Ozgun ERCELTIK, Umit TUHANIOGLU, Hasan DOGRULOGLU, Sukru Levent UCAR

*Baltalimani Bone Disease Hospital, Istanbul (TURKEY)*

The purpose of this study was to evaluate arthroscopically the type, localisation and prevalence of the meniscal and chondral lesions accompanying complete rupture of the anterior cruciate ligament (ACL). The localisation and type of the accompanying lesions of 161 knees with complete rupture of the ACL were recorded. Average age was 30.3. 97 (60.24%) knees had meniscal tears. 82.47% (80) of these tears were on the medial meniscus. Types of these medial meniscal tears were 30.92% (30) bucked handle, 51.54% (50) posterior horn radial and horizontal tears. 6.83% (11) of the tears were on the lateral meniscus. 5 (5.15%) patients had both medial and lateral meniscal tears. 86 (53.41%) patients had chondral lesions. In this group, 50 (58.13%) patients had medial chondropathy (both femur and tibia), 16 (18.60%) had lateral compartment chondropathy and 20 (23.25%) had both medial and lateral compartment chondropathy. In medial compartment chondropathy group 82.0% of the patient had medial meniscal tears. In lateral compartment chondropathy group only 18.75% of patients had medial meniscal tears and 43.75 % had lateral meniscal tears. There was not any chondral lesion in 75 (46.58%) patients. In this group, 39 (52.0%) patients had not any meniscal pathology. Medial compartment chondropathy and medial meniscal lesions are more frequent than other site lesion with complete rupture of ACL.



**Date : 2008-08-25**

**Session : Symposium- Sports Medicine: Surgical Realignment for Patellofemoral Disorders (Knee)**

**Time : 1100-1215**

**Room: 406-407**

**Abstract number : 19147**

**MEDIAL PATELLOFEMORAL LIGAMENT RECONSTRUCTION'S STATE OF THE ART**

Wilson LI

*Queen Elizabeth Hospital, Hong Kong, Hong Kong (HONG KONG)*

The Medial Patellofemoral Ligament is an important medial stabilizer of the patella. A 45-64mm long band of retinacular tissue in layer 2 of the medial structures of the knee, it lies deep to the deep fascia and superficial to the joint capsule with the superficial layer of the Medial Collateral Ligament, and deep to the Vastus Medialis Obliquus muscle. Kaplan described the transverse retinacular ligament in 1951, while Feller demonstrated in 1993 that the MPFL was identified consistently in 20 cadavers. The femoral and patellar attachment of this ligament were described by various authors, as well as its biomechanical significance. Surgical exploration and MRI studies have showed that the MPFL was torn in almost all patella dislocations (Burks 1997, Sallay 1996), with MPFL deficiency shown in all recurrent patella dislocations. While non-operative treatment reported a 14-44% recurrence rate, lateral release with or without medial plication were still followed by 20-30% recurrence. MPFL reconstruction may therefore be indicated in these failure cases. While acute repair of the MPFL is difficult, and 30-40% failure have been reported, delayed realignment for recurrent cases has not been proven to be less successful than acute surgery. A host of different techniques and graft choices for MPFL reconstruction are discussed here, together with their clinical results. The author's preferred method of reconstruction is also presented with the clinical results.

**Date : 2008-08-25**  
**Session : ISMISS Part 1**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 16764**

**MINIMAL INVASIVE SURGICAL TREATMENT OF THE LUMBAR FACET SYNDROME**

Vladimir RADCHENKO

*Sytenko Institute of Spine and Joint Pathology, KHARKIV (UKRAINE)*

INTRODUCTION: The lumbar facet syndrome is encountered most frequently; it follows that possible ways of its treatment are particularly important. PURPOSE: To study the results of treatment of the lumbar facet syndrome using new methods of denervation of the facet joints and their percutaneous fusion. MATERIALS AND METHODS: In our work we used data about 428 patients having lumbar facet syndrome which underwent mini-invasive surgical treatment including denervation and percutaneous arthrodesis. 201 patients were treated by way of denervation through electrocoagulation (1st group) and 211 by way of cryodestruction (2nd group). Percutaneous arthrodesis was performed in 16 patients. The results were evaluated by Oswestry scale. RESULTS: In the course of comparative analysis of the results in first and second groups we could find significant difference in favour of cryodestruction. Among the patients with the percutaneous arthrodesis performed, 15 patients had good results and in 1 patient the condition was not changed. CONCLUSION: Application of active tactics in the treatment of the lumbar facet syndrome makes possible to achieve good results.

**Date : 2008-08-25**  
**Session : ISMISS Part 1**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 16860**

**ENDOSCOPIC LUMBAR DISCECTOMY**

Kisan PATOND, Roshan BHAIASARE

*Dept of Orthopaedics, Mahatma Gandhi Institute of Medical Sciences, Wardha (INDIA)*

**INTRODUCTION:** Traditionally prolapsed lumbar disc with radicular symptoms is treated with laminectomy, fenestration and discectomy is associated with significant postoperative morbidity. Microdiscectomy gives broadly comparable results to standard discectomy. Over a decade, endoscopic discectomy techniques have been developed to accomplish less morbidity and early return to activity. Foley and Smith and Destandau are among the most common of these techniques. **PATIENTS AND METHOD:** 20 Endoscopic discectomies were performed using paraposterior technique described by J. Destandau in 13 males and 7 females. Age ranges from 20-55 years. L5-S1, L4-L5 disc were the most common sites of disc herniation as assessed on neurological examination and MRI scans. Patients were selected on predetermined inclusion and exclusion criteria. Only single level disc was operated. **RESULTS:** We used Prolo's criteria for outcome assessment. Excellent and good results were found in 19 (95%), and fair in 1 (5%) patients, with no poor results. Discitis and traction neuritis developed in one patient each, managed with intravenous antibiotics, and neurotonics with no deterioration in neurological outcome. **CONCLUSION:** Endoscopic discectomy by Destandau technique for lumbar prolapsed intervertebral disc in properly selected patients is a safe and minimally invasive technique. Patients are mobilised early and very comfortable after surgery because of less pain. Hospital stay is significantly reduced and patients can go to work early.

**Date : 2008-08-25**  
**Session : ISMISS Part 1**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 17334**

**FORAMINOSCOPIC LUMBAR DISC SURGERY: CONCEPT/EXPERIENCE SINCE 1991**

Hansjoerg LEU

*Bethnia Spine Center, Zurich (SWITZERLAND)*

The idea to combine simultaneous endoscopic control with direct extradiscal tissue elaboration across a uniportal approach raised in the later eighties. Anatomical studies demonstrated, in 1990, that endoscopic applications are possible also in non-preformed anatomical spaces. Endoscopic coaxial foraminoscopy we introduced clinically for the first time in February 1991 in a case of a foraminal sequestered herniation. A first publication was published in 1996. Since then the technology with improved endoscopic tools and irrigation systems as well as high-frequency coagulation under irrigation became almost standardized for this specific range of indication. The posterolateral approach from 9-12cm from the midline follows the same criteria as for intradiscal applications, but the working cannula is directed to the foraminal sequester, which is extracted under endoscopic control then with a special working scope. Our first clinical series of 180 standardized cases brought successful primary results in 149 cases, including an initial definite learning curve. 24 patients needed later on conventional open surgery w/wo fusion. Here the initial results trend to "black or white": or the sequester is removed or not. Relatively freshly sequestered fragments without local scar-adhesions are easier to remove. Anatomical limits can occur in L5/S1 when high iliac crests can impair flat approach to medioforaminally located sequestra. For preop. evaluation a 3d-CT offering clear bony analysis of accessible trajectories can trace the access precisely. Detailed knowledge of foraminal anatomy is mandatory. Hospital stay could be reduced to 2 to 3 days; outpatient care is possible nowadays as well.

**Date : 2008-08-25**  
**Session : ISMISS Part 1**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 17850**

**ENDOSCOPIC MICRODECOMPRESSIVE CERVICAL DISCECTOMY AND FORAMINIAL DECOMPRESSION**

John CHIU

*California Spine Institute Medical Center, Thousand Oaks (UNITED STATES)*

To demonstrate outpatient endoscopic microdecompressive cervical discectomy and foraminal decompression, with low energy non-ablative Holmium laser for disc shrinking and tightening effect laser thermodiskoplasty, performed for treatment of symptomatic herniated cervical disc to be efficacious and safe, and preserves spinal motion. **MATERIALS AND METHODS:** Since 1995, 2218 patients 3691 Discs, who failed at least 12 weeks of conservative care, were treated. Levels were C2 to C7, inclusive. All patients demonstrated unilateral radicular pain of a specific dermatome, single level or multiple levels, confirmed with EMG/NCV. MRI or CT scans demonstrated the herniated cervical disc. Anterior endoscopic microdecompressive cervical discectomy and foraminal decompression technique is described. **RESULTS:** Average time to return to work was ten days, at an average follow-up of 4.2 years. For single level, 94% had good to excellent symptomatic relief and spinal motion preservation. There were no intraoperative complications. Postoperatively, one patient with transient Horner's syndrome and one transient hoarseness voice were noted. Seventy-five patients (6%) had persistent neck and upper extremity pain associated with paresthesia, after surgery. **CONCLUSION:** This endoscopic microdecompressive cervical discectomy and foraminal decompression with added application of non-ablative lower Holmium laser energy for disc shrinkage has proven to be safe, less traumatic, easier, and efficacious with significant economic savings. It preserves spinal motion and provides a channel for spinal arthroplasty. It is an effective alternative or replacement for conventional open cervical spinal surgery for discectomy, and can decompress stenosis, in degenerative spine disease.

**Date : 2008-08-25**  
**Session : ISMISS Part 1**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 17990**

**PERCUTANEOUS ANTERIOR SPINE SURGERY FOR CERVICAL DISC HERNIATION**

Jin Kuk KIM, Byungjoo JUNG, Sang-Ho LEE  
*Seoul Wooidul Hospital, Seoul (KOREA)*

Percutaneous endoscopic cervical discectomy and percutaneous endoscopic cervical annuloplasty could be considered as a good alternative to the standard anterior cervical discectomy and fusion in dealing with soft cervical disc herniation. Wooidul spine hospital uses WSH working channel scope to operation of cervical disc herniation. WSH scope (WSH endoscopy set, Storz, Germany) provides working cannula (4mm in diameter) allowing manual discectomy with microforceps and much clear endoscopic visualization. Wooidul spine hospital also introduced the Laser Assisted Spinal Endoscope (LASE Clarus, USA) in percutaneous endoscopic cervical annuloplasty (PECA). Like WSH system, it has a working cannula that can integrate high-resolution endoscope, illumination, and irrigation, enabling the surgeons to selectively remove the herniated disc via Ho: YAG laser under clear endoscopic visualization. LASE integrates straight-firing Ho: YAG laser, endoscopy, illumination, and irrigation. Since LASE is a steerable flexible fine cable, it is easy to control the direction of laser beam. The aforementioned surgical procedure is safely completed and the surgical outcomes are satisfactory for cervical disc herniation. The clinical outcome shows significant improvement after surgery. This procedure yielded good results and should be considered an alternative option for standard anterior cervical discectomy and fusion.

**Date : 2008-08-25**  
**Session : ISMISS Part 1**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 17998**

**AUTOMATED OPEN LASER DISCECTOMY (AOLD) ON THE LUMBAR DISC HERNIATION - EARLY EXPERIENCE**

Sang-Ho LEE<sup>1</sup>, Jin-Sung KIM<sup>2</sup>, June Ho LEE<sup>2</sup>

<sup>1</sup>*Seoul Wooidul Hospital, Seoul (KOREA)*, <sup>2</sup>*Chungdam Wooidul Hospital, Seoul (KOREA)*

**OBJECTIVE:** To evaluate the clinical efficacy of CO2 laser dissection followed by automated discectomy in lumbar disc surgery. **MATERIALS AND METHODS:** Between 2004 and 2005, 45 consecutive patients underwent Automated Open Lumbar Discectomy (AOLD) by single surgeon. Clinical outcomes were graded using the VAS, and functional outcomes were measured using the ODI scores, and return-to-work status. They were followed-up more than one year with plain radiographs, and their mean follow-up period was 31.2 months. **RESULTS:** Patients' mean hospital stay was 5.32 days. Pain scores on a visual analog scale (VAS) for back and leg pain were improved from a preoperative mean of 6.43, 7.97 to postoperative 0.93, 1.46, respectively (P<0.001). Clinical outcomes based on Oswestry disability index (ODI) were improved from a preoperative mean of 64.93% to 11.97%, postoperatively (P<0.001). The mean disc height index decreased from preoperative 0.301 to postoperative 0.268 during the follow-up period (P<0.001). The mean disc height loss rate was 10.96%. Even though there was statistically significant decrease of disc height index, it had no significant effect on clinical outcomes. **CONCLUSION:** AOLD is an effective treatment for the back and leg pain in lumbar disc herniation. In terms of radiological outcomes including DH, CO2 laser dissection followed by automated lumbar discectomy induced minimal disc height collapse and provided benefit of early discharge, early return to work, and cosmetic effectiveness to the one level herniated lumbar disc patient.

**Date : 2008-08-25**  
**Session : ISMISS Part 1**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 18002**  
**PERCUTANEOUS CERVICAL DISC DECOMPRESSION**

Tolgay SATANA  
*Medart Medical Center, Ankara (TURKEY)*

The study was designed to determine the indication of Percutaneous cervical disc decompression (PCD) and choose appropriate procedure and inform surgeons about patient selection. Controversy in the treatment of cervical radicular as well as low back pain. Most of surgical treatment options have had different morbidity and results. Open surgical techniques have high morbidity rates compared to minimal and less invasive options. Unless patient selection was not done properly in PEC, complication rates could be more than the open surgical techniques. Percutaneous Cervical interventions may have more reasonable results compared to lumbar interventional treatments. Advantages of the PEC are awakening anesthesia, easy approach and short operation time with high patient satisfaction. Any of percutaneous applications are useful to reduce intradiscal pressure, relieve pain. We simply divided PCD Needle interventions and safe tube applications. Needle applications; consist of chemonucleolysis and IDET. Laser, RF and automated disc decompressor could be performed by safe tube as well as endoscopy. Perioperative discography is the most important diagnostic method to select the type of procedure. Selective endoscopic discectomy allows us to remove fragments and decompression. Appropriate indications were determined by MRI evaluation and correlation with clinical signs. Basically the surgical technique is not so complicated and learning curve is low. Our suggestion to surgeons is to focus on aiming to herniation and to use more eustatic navigation systems.



**Date : 2008-08-25**  
**Session : ISMISS Part 1**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 18332**

**RESULTS OF AUTOLOGOUS DISC CELL REPLANTATION FOR DEGENERATIVE DISC DISEASE**

Petra KREPLER, Josef GROHS

*Dept. of Orthop.Surg., Med. Univ. Vienna, Vienna (AUSTRIA)*

Reduction of volume by mechanical reduction, ultrasound, hyperthermic coagulation or coablation techniques to achieve release of compromised nervous structures was the key option for the treatment of symptomatic mild to moderate disc degeneration. This may lead to increased mobility of the motion segment, to an increased stress on the facet joints, accelerating degeneration processes of these structures. The concept of restoring the volume and thereby optimising the motion segment is promising. Methods either focus on replacement or stimulation of disc cells or on replacement or stimulation of extracellular matrix. Autologous disc cell transplantation (ADCT) is the most further developed and already applied method in humans. We overlook six patients (3 male, 3 female, mean age 42.2 years) with a follow-up of 37.6 months after ADCT. All patients required surgery for symptomatic disc herniation causing motor weakness in the lumbar spine. The removed disc material was harvested and disc cells were cultivated. Three months after discectomy the autologous disc cells were transplanted by injection into the previously operated disc space under radiographic control. Three, six, twelve, 24 and 36 months after the procedure MRI control investigation and clinical follow up with Oswestry disability index (ODI) and Visual Analogue Scale (VAS) were performed. No complications but one reherniation were observed. VAS score, ODI and MRI signal improved in all patients. Preliminary results impose promising, long time evaluation will demonstrate the potential of the method to delay segment degeneration.

**Date : 2008-08-25**  
**Session : ISMISS Part 1**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 18590**

**DISCECTOMY WITH FACET JOINT FUSION**

Saurabh SINGH<sup>1</sup>, Sudeep JAIN<sup>2</sup>

<sup>1</sup>*Institute of Medical Sciences, Varanasi (INDIA),* <sup>2</sup>*AIIMS, New Delhi (INDIA)*

We have been able to achieve a high rate of successful arthrodesis across facet joints using a simple technique that does not require removal of faceto-laminar structures; which is important for segmental stability. Our technique does not require excessive retraction of cord and neural structures. It does not require any bulky instrumentation that adds cost to the treatment. It is a simple and less time consuming procedure that provides good results without added complications. Problems relating to mechanical instability like increased slippage of vertebra, dislodgement of graft or facet laminar flap commonly seen in Posterior Lumbar Interbody Fusion (PLIF) and other fusion techniques were not noted in our study.

**Date : 2008-08-25**  
**Session : ISMISS Part 2**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 16592**

**A NEW PERCUTANEOUS LOCAL ANAESTHETIC DEVICE FOR LUMBAR SPINAL STENOSIS - RESULTS OF OUR FIRST 50 CASES USING SUPERION**

Reuven GEPSTEIN, Shay SHABAT  
*Sapir Medical Center, Kfar-Saba (ISRAEL)*

INTRODUCTION: Surgery for lumbar spinal stenosis has several negative consequences. It is done under general anesthesia and there is a risk for dural tear and also fibrosis and adhesions in the long run. PURPOSE: Our short-term experience of first 50 cases with a new device (Superion Interspinous Spacer), which is inserted percutaneously under local anesthesia, is reported. MATERIALS AND METHODS: Our first 50 cases with stenosis who underwent implantation of the Superion Interspinous Spacer under local anesthesia are reported. The VAS was recorded before and after the procedure. The procedure is performed under local anesthesia in the angiography room under image intensifier. A 1cm cut is performed in the midline and an 8mm cannula is inserted splitting the supraspinous ligament between the spinous processes of the treated level. Fluoroscopy is taken to verify the exact depth of the cannula. The device is inserted through the cannula in a closed position and opened between the spinous processes. RESULTS: 43 patients (20 males and 23 females) with 50 implants. Mean age 70.4 years (48-85 years). Average surgical time: 21 minutes per level. Local anesthesia and mild sedation was used. No complications were reported and all patients reported improvement. VAS was improved from 6.2 to 2.8 points on average. CONCLUSIONS: The Superion Interspinous Spacer is an ideal solution for patients with moderate symptoms of stenosis as an alternative to non-surgical management or invasive surgical treatment. The surgical technique is simple, done under local anesthesia and easy to learn.

Date : 2008-08-25  
Session : ISMISS Part 2  
Time : 1600-1730  
Room: 406-407

Abstract number : 16830

**BALLOON KYPHOPLASTY USING KYPHOSTM FS(R) CALCIUM PHOSPHATE BONE SUBSTITUTE IN TRAUMATIC VERTEBRAL BODY FRACTURES (VCF)**

Jan VAN MEIRHAEGHE<sup>1</sup>, J. HILLMEIER<sup>2</sup>, J.P. MEEDER<sup>3</sup>, Rainer GUMPERT<sup>4</sup>, Paul VANDERSCHOT<sup>5</sup>, Franz ORTNER<sup>6</sup>  
<sup>1</sup>Dienst Orthopedie, Algemeen Ziekenhuis St Jan, Brugge (BELGIUM), <sup>2</sup>St. Vincenz Krankenhaus, Limburg (GERMANY), <sup>3</sup>Universität Heidelberg, Unfall-und Wiederherstellungs chirurgie, Heidelberg (GERMANY), <sup>4</sup>Universitätsklinik für Unfallchirurgie, Graz (AUSTRIA), <sup>5</sup>UZ KUL Gasthuisberg, Traumatologie, Leuven (BELGIUM), <sup>6</sup>A.Ö. Krankenhaus der Statuarstadt, Wiener Neustadt (AUSTRIA)

In this study, we evaluated the safety and effectiveness of KyphOsTMFS(R), a calcium magnesium hydroxyapatite cement, in younger patients. Patients, male and female, aged 50 years or less, with up to 3 traumatic VB fractures of type A1.1, A1.2 or A3.1, according to the Magerl/AO classification were included. Quality of life, back pain and back function of 45 patients were assessed at baseline and at 3 months in this ongoing 1-year follow-up study. The mean age was 36.4 years, 64% were male. The change from baseline in RMDQ at 7d was 9.42 pts (95%CI 7.50-11.34, p<0.0001) and 16.76 pts (95%CI 15.21-18.30, p<0.0001) at 3 months. The change from baseline in total EQ-5D at 7d was 0.52 pts (95%CI 0.42-0.62, p<0.0001) and 0.71 pts (95%CI: 0.60-0.82, p<0.0001) at 3 months. The change from baseline in VAS at 7d was 4.44 pts (95%CI 3.80-5.08, p<0.0001) and 5.43 pts (95%CI 4.81-6.05, p<0.0001) at 3 months. There were no device-related serious adverse events during the perioperative period up to 3 months. KyphOs FS(R) during Balloon Kyphoplasty appears as a safe and effective method to treat traumatic VCFs in younger patients. Follow-up is needed to confirm these results at 1 year.

**Date : 2008-08-25**  
**Session : ISMISS Part 2**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 17194**

**THE EMOTIONAL STATE OF THE PATIENT AFTER BALLOON KYPHOPLASTY**

Jiong Jiong GUO, Huilin YANG

*Dept Orthopaedics, The First Affiliated Hospital of Soochow University, Suzhou (CHINA)*

Balloon kyphoplasty is a minimally invasive procedure to reduce and stabilize osteoporotic and osteolytic vertebral compression fractures (VCFs). It helps patients achieve all three goals of operation: pain relief, improvement in function, and satisfaction. To learn the emotional state of the patient preoperatively, and during recovery is very important. We prospectively followed and evaluated 75 elderly patients with symptomatic VCFs. The mean age was 67 years. 50 patients were osteoporotic fractures (Group 1), 25 were osteolytic fractures caused by multiple myeloma or metastatic tumours (Group 2). Outcomes included mental components score of SF-36 (MCS), VAS, Oswestry Disability Index (ODI), pre and postoperatively at 1, 6, 12, 24, and 36 months. Statistically significant improvement occurred in all outcome measurements postoperatively ( $P < 0.01$ ). Two groups had similar increases in postoperative scores at first year but with negligible improvements in most parameters afterwards. MCS and ODI began to decrease 2 years postoperatively and a statistically significant difference was found between two groups ( $P < 0.05$ ). Less improvement occurred in all outcomes scores in Group 2 at 24 and 36 months. The dissatisfaction of these patients was mostly because of the recurrence of back or body pain and endless adjuvant treatments. In patients with symptomatic VCFs, kyphoplasty yielded quick pain relief and improvement in mental health scores. However, these improvements were not sustained. Efficacy in terms of mental health scores was less in osteolytic patients than those in osteoporotic patients. Surgeons should understand these phenomena and educate patients to realistic goals preoperatively.

Date : 2008-08-25  
Session : ISMISS Part 2  
Time : 1600-1730  
Room: 406-407

Abstract number : 17213

**INCORRECT FRACTURE ANALYSIS IN KYPHOPLASTY - POTENTIAL FOR SEVERE COMPLICATIONS**

Christof BIRKENMAIER<sup>1</sup>, Hans TROUILLIER<sup>2</sup>, Tamara SEIDL<sup>2</sup>, Bernd WEGENER<sup>1</sup>, Christoph VON SCHULZE PELLENGAHR<sup>3</sup>, Volkmar JANSSON<sup>1</sup>

<sup>1</sup>Dept. of Orthopedics, University of Munich, Grosshadern Medical Center, Munich (GERMANY), <sup>2</sup>Department of Surgery II, Franziskus Hospital, Bielefeld (GERMANY), <sup>3</sup>Department of Orthopedic Surgery, St. Josef-Hospital, Ruhruniversität, Bochum (GERMANY)

**INTRODUCTION:** Kyphoplasty is a popular therapy for osteoporotic vertebral fractures (OVF), based on an easy-to-learn technique and few perioperative complications. Good reimbursement and intense advertisement by the industry also play a role. PMMA-cement does not integrate into bone and there is no secondary stabilization around the tamp. **METHODS:** Analysis of 5 cases referred to our departments in 2006 and 2007. All patients had received kyphoplasty of the thoracolumbar junction or the thoracic spine. After initial improvement, all patients experienced renewed pain and immobilization within weeks, one patient suffered neurological deficits. Presented is an analysis of the radiographic features of these fractures, how these relate to the AO fracture classification and what the implications for the primary stability of these fractures are. **RESULTS:** In all 5 cases, gross instability was found around the cement tamp, in several cases with advanced destruction of neighbouring vertebrae and in 1 case with subtotal spinal canal occlusion. Analysis of the preoperative imaging studies gave evidence to unstable burst fractures, pedicle root discontinuity or disc-with-endplate avulsion. The low contrast of severely osteoporotic vertebrae in CT combined with thick slices may have been contributing. 4 patients required multisegment posterior instrumentation, 1 patient died from complications of immobilization prior to the scheduled stabilization. **DISCUSSION AND CONCLUSION:** Performing kyphoplasty in unstable OVF may cause complications that far exceed the original problem. Correct fracture analysis is of paramount importance and a high-resolution, thin-slice CT scan is required. Despite the availability of kyphoplasty, conservative therapies for OVF should not be forgotten.

Date : 2008-08-25  
Session : ISMISS Part 2  
Time : 1600-1730  
Room: 406-407

**Abstract number : 17298**

**COMPARATIVE STUDY OF BALLOON KYPHOPLASTY WITH UNILATERAL VERSUS BILATERAL APPROACH IN OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURES**

Kook Jin CHUNG<sup>1</sup>, Hoi Soo YOON<sup>2</sup>, In Hyup KWON<sup>1</sup>

<sup>1</sup>Department of Orthopaedics, Kangnam Sacred Heart Hospital, College of Medicine, Hallym University, Seoul (KOREA), <sup>2</sup>Department of Radiology, Hallym University Hospital, College of Medicine, Hallym University, Seoul (KOREA)

This study analyses the radiologic and clinical results according to the two techniques of unilateral and bilateral balloon kyphoplasty in osteoporotic vertebral compression fractures. Fifty-two patients with osteoporotic vertebral compression fractures occurring at thoracolumbar junction were enrolled in this study. All patients were classified into two groups, group I treated with unilateral approach, group II with bilateral approach. The Cobb angle was measured each time to evaluate kyphotic angle pre- and postoperative period and last follow-up and a 10 point visual analog scale for pain was recorded at same time. We found that bilateral approach had a greater advantage on the reduction of kyphosis and loss of reduction than unilateral approach for the treatment of osteoporotic vertebral compression fractures.

**Date : 2008-08-25**  
**Session : ISMISS Part 2**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 18261**

**MINIMALLY INVASIVE SURGICAL TREATMENT WITH INTERSPINOUS PROCESS IMPLANT (X-STOP) FOR LUMBAR SPINAL STENOSIS**

John CHIU

*California Spine Institute Medical Center, Thousand Oaks (UNITED STATES)*

With increase in life expectancy and the aging of baby boomers, more people are living to an age where degenerative lumbar spinal stenosis (LSS) becomes symptomatic presenting as neurogenic intermittent claudication (NIC). Minimally invasive surgical treatment of neurogenic intermittent claudication secondary to lumbar spinal stenosis with an interspinous process distraction device (IPD), i.e. X-STOP appears to be a significant improvement in the surgical treatment of this condition over traditional decompressive lumbar spinal surgery with or without lumbar fusion. METHODS: Lumbar stenosis patients with intermittent neurogenic claudication are to be clarified with x-rays and imaging studies with radiographic evidence of stenosis. Interspinous Process Decompression System (X-STOP), outpatient procedure was developed as an alternative to more traumatic decompressive lumbar spinal procedures, with or without fusion. The surgical indication and technique are described in detail. This is truly a minimally invasive surgical procedure especially for the elderly patients. RESULTS: This procedure can be carried out safely under local anesthetic as an outpatient in the elderly. Patients significantly improved with this outpatient minimally invasive X-STOP lumbar surgery. If the device fails to provide relief, the patient still has the option of traditional more traumatic spinal surgery. They can return home and resume normal daily activity with immediate improvement in spinal symptoms. CONCLUSION: Interspinous process decompression system (IPD), X-STOP provides a conservative yet effective outpatient minimally invasive surgical treatment for patients suffering from lumbar spinal stenosis with neurogenic intermittent claudication (NIC) and offers an attractive alternative to more traumatic traditional decompressive spinal surgery.



**Date : 2008-08-25**  
**Session : ISMISS Part 2**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 17857**

**PERCUTANEOUS VERTEBRAL AUGMENTATION AND RECONSTRUCTION WITH AN INTRAVERTEBRAL MESH AND MORCELIZED BONE GRAFT**

John CHIU

*California Spine Institute Medical Center, Thousand Oaks (UNITED STATES)*

This presentation is to discuss the percutaneous outpatient vertebral augmentation (VA) and reconstruction with a polyethylene intravertebral mesh (OptiMesh® Spineology, Inc., Stillwater, MN, USA) and biologic morcelized bone graft, the surgical indications, operating technique, case illustrations and clinical outcome. In the past vertebroplasty and kyphoplasty have provided excellent pain relief for vertebral compression fracture (VCF), but with a high incidence of complication; i.e., leakage of Polymethylmethacrylate (PMMA) into spinal canal or vasculature, cardiopulmonary complication, and adjacent vertebral fracture. This percutaneous VA system is designed, developed, and used for VCF treatment without above complications, and is a true biologic vertebral reconstruction. An OptiMesh® consists of multi-strand polyester mesh or sac to be packed with specially ground bone chips or morcelized bone chips inside the mesh device to create a hyperdense graft pack for restoring height resulting in pain relief. This minimally invasive outpatient percutaneous OptiMesh® VA provides an efficacious and controlled delivery mechanism to stabilize and treat painful osteoporotic, traumatic and neoplastic VCF. In addition it can easily be used as an excellent intravertebral spacer and for intravertebral spinal fusion/fixation.

Date : 2008-08-25  
Session : ISMISS Part 2  
Time : 1600-1730  
Room: 406-407

Abstract number : 18260

**ADJACENT OR JUNCTIONAL DISC HERNIATIONS IN POST SPINAL FUSION TREATED WITH ENDOSCOPIC SPINAL SURGERY FOR SEGMENTAL MOTION PRESERVATION**

John CHIU

*California Spine Institute Medical Center, Thousand Oaks (UNITED STATES)*

INTRODUCTION: Fusions of the cervical and lumbar spine are often followed within months or several years by protrusion of discs at the adjacent level or levels. Mobility lost at the fused levels is thought to be transferred to the adjacent segment/s increasing stress on the disc, resulting in early recurrent protrusion at that level. In a number of anterior cervical fusions (ACF) and lumbar fusions this occurs in both superior and inferior adjacent levels simultaneously. MATERIALS AND METHODS: Case reports 180 of post spinal fusion junctional disc herniation syndrome (260) (also called transitional discs, or adjacent segment disease) are reported, as well as a review of the literature to determine their frequency of occurrence following fusions of the lumbar and cervical spine. They are treated with endoscopic minimally invasive spine surgery (MISS). RESULTS: Average time to return to work was 14 days. For single level, 92% had good to excellent symptomatic relief and spinal motion preservation. Cervical and lumbar endoscopic minimally invasive spinal surgery (MISS), combined with laser thermodyskoplasty, is an ideal way to treat junctional discs to avoid a sequential recurrence. CONCLUSION: MISS provides the optimal method to treat post spinal fusion junctional disc syndrome of the cervical and lumbar spine with minimal morbidity, and no threat of further junctional recurrence and at less cost. Its use as the initial treatment of choice would greatly lessen the incidence of this syndrome and preserve spinal segmental motion.

**Date : 2008-08-25**

**Session : CTL - General Orthopaedics: Current Concepts in Osteoporosis Management**

**Time : 0800-0900**

**Room: 408**

**Abstract number : 19078**

**SURGICAL MANAGEMENT OF OSTEOPOROTIC FRACTURES**

Frankie LEUNG

*The Univeristy of Hong Kong, Pokfulam (HONG KONG)*

The impact of osteoporosis starts from fractures of the hip, spine and forearm. Up to 30 percent of hip fracture patients die within a year of the event, and among those who survive, almost two-thirds remain disabled. Operative treatment of elderly hip fractures is the preferred treatment. The operation should be performed within 24-48 hours of admission after essential pre-operative workup. The sliding hip screw is still the implant of choice for most intertrochanteric fractures. Intramedullary devices are indicated for more unstable patterns. It is also well known that much of the morbidity and mortality is related to complications as a result of either the surgery itself or co-existing medical diseases. A special entity of subtrochanteric insufficiency fractures can also occur after prolonged bisphosphonate intake. The typical radiological appearance is a transverse fracture, with unusually thick cortices and a beaking appearance of the lateral cortex. There have been reports to show the severely suppressed bone turnover. Hence, it is advisable that all patients should not take prolonged bisphosphonate for over 4-5 years. Although distal radial fractures in the elderly can be effectively treated by casting, there are other surgical options including locking plate fixation. The choice is usually based on the fracture configuration and stability. As more elderly people are enjoying a more active lifestyle, the physical demand of the patient must also be taken into consideration. Early mobilization and return of function after locking plate fixation is a great advantage to most patients. Finally a multi-disciplinary team approach is crucial. Realistic and practical goals of rehabilitation should be set in the early phase of management. Physiotherapists, occupational therapists, social workers are key members of the management team.

Date : 2008-08-25

Session : General orthopaedics: Learning and Teaching

Time : 0900-1030

Room: 408

Abstract number : 15727

**LEARNING CURVE OF A NAVIGATION SYSTEM FOR TOTAL KNEE REPLACEMENT. A MULTICENTRIC STUDY**

Jean-Yves JENNY<sup>1</sup>, Rolf MIEHLKE<sup>2</sup>, Alexander GIUREA<sup>3</sup>, Yann DIESINGER<sup>4</sup>

<sup>1</sup>University Hospital Strasbourg, Illkirch (FRANCE), <sup>2</sup>Sankt-Josef Stift Sendenhorst, Sendenhorst (GERMANY), <sup>3</sup>University Hospital Vienna, Wien (AUSTRIA), <sup>4</sup>Centre de Chirurgie Orthopédique et de la Main, Illkirch-Graffenstaden (FRANCE)

INTRODUCTION: We performed a prospective, multicentre study to compare the accuracy of implantation of a TKR measured on postoperative X-rays in experienced and less experienced centres. MATERIAL AND METHODS: All centres used the same navigation system: 4 had already a significant experience with it (group A - 182 cases), 9 centres were considered as beginners with less than 10 cases performed prior to the study (group B - 221 cases). Accuracy of implantation was measured on postoperative long leg X-rays. The mean accuracy note was compared in the two groups by a Student t-test at a 0.05 level of significance. Power of the study was 0.80. RESULTS: Mean accuracy note was  $3.9 \pm 0.8$  in both groups. The expected femoro-tibial angle was achieved by 90% of the cases in group A and 88% in group B ( $p > 0.05$ ). There was no significant difference between both groups for all X-ray criteria. The mean operative time was significantly longer in group B than in group A (110 minutes vs. 90 minutes,  $p = 0.01$ ). However this difference occurred mainly during the first twenty cases in the beginner centres where we observed a clear tendency to achieve the same operative time as the experienced centres at the end of the study. DISCUSSION: The used navigation system allowed accurate implantation of a TKR in both experienced and less experienced centres. The learning curve of the used navigation system can be regarded as very short in high volume TKR centres (about 20 cases).

**Date : 2008-08-25**  
**Session : General orthopaedics: Learning and Teaching**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 15900**

**QUALITY ASSESSMENT OF THE POSTOPERATIVE RADIOGRAPHS IN JOINT REPLACEMENT SURGERY: A RETROSPECTIVE STUDY**

Zaid JIBRI, Suresh FERNANDO, Saqeb MIRZA, Benjamin OLLIVERE, Malcolm GLASGOW  
*Norfolk and Norwich University Hospital, Birmingham (UNITED KINGDOM)*

**PURPOSE:** It is a routine practice in most orthopaedic units to obtain early postoperative radiographs before discharging the patients who underwent total hip replacement (THR) or total knee replacement (TKR). Our aim was to assess the quality of early and late postoperative radiographs. **METHODS:** We assessed the postoperative radiographs of 87 patients who had THR (46 patients) or TKR (41 patients). The AP and the lateral views for both the early and late postoperative films were evaluated by 2 independent practitioners. Each view was scored using 4 criteria: adequacy, exposure, position and rotation. A total score, out of 8, was given to each imaging. **RESULTS:** The early postoperative films were obtained in average of 1.5 days after THR and 2.2 days after TKR. Late postoperative radiographs were performed in average of 15 and 17 weeks following the THR and TKR respectively. The mean early and late postoperative X-ray scores for THR were 4.54 and 6.87 respectively while those for TKR were 5.84 and 6.83. The differences in the early and late postoperative X-ray scores were statistically significant for both THR and TKR ( $p < 0.001$ , Wilcoxon-Rank test). **CONCLUSIONS:** There is a significant difference in the quality of early and late postoperative radiographs in favour of the late films. We question the necessity for obtaining routine early postoperative X-rays and recommend performing them at the first follow-up visit. This would result in obtaining better quality radiographs in more comfortable easily positioned patients.

Date : 2008-08-25  
Session : General orthopaedics: Learning and Teaching  
Time : 0900-1030  
Room: 408

Abstract number : 16376

**COMPUTER NAVIGATION DID NOT IMPROVE ALIGNMENT IN A LOWER-VOLUME TOTAL KNEE PRACTICE**

Wai Pan YAU<sup>1</sup>, KY CHIU<sup>2</sup>

<sup>1</sup>The University of Hong Kong, Hong Kong (HONG KONG), <sup>2</sup>The Univeristy of Hong Kong, Hong Kong (HONG KONG)

The postoperative alignment of the implanted prosthesis in computer navigation TKA has been reported to be superior to that using the conventional technique. There is an assumption that the adoption of computer navigation technique can make the inexperienced or occasional TKA surgeon perform more like the expert TKA surgeon. To assess the improved accuracy in recreation of the mechanical alignment in TKA performed using computer navigation, a retrospective review of the author's experience before and after adopting computer navigation was performed. Radiographic results of 104 TKAs (52 - computer navigation, 52 - conventional technique) were reviewed. It was found that the accuracy in the postoperative radiographic alignment of the implanted prosthesis was not improved by adopting computer navigation technology as judged by (a) overall limb alignment (Case: varus 1.3°, Control: varus 0.3°,  $p=0.1$ ); (b) femoral component alignment (Case: 90.3°, Control: 90.3°,  $p=0.999$ ) and (c) tibial component alignment (Case: 89°, Control: 90°,  $p=0.01$ ). The significant factors which affected the postoperative overall mechanical alignment in the current navigation series included the severity of the preoperative deformity ( $p=0.028$ ), the amount of error in the execution of bone cuts ( $p=0.012$ ) and the experience of the surgeon in using the computer navigation system ( $p=0.023$ ).

Date : 2008-08-25  
Session : General orthopaedics: Learning and Teaching  
Time : 0900-1030  
Room: 408

Abstract number : 16378

**ERRORS IN THE IDENTIFICATION OF THE DISTAL FEMUR TRANSEPICONDYLAR AND ANTERIOR POSTERIOR AXES IN MINIMAL INCISION TKR AND CONVENTIONAL INCISION TKR - A CADAVERIC STUDY**

Wai Pan YAU, KY CHIU

*The University of Hong Kong, Hong Kong (HONG KONG)*

INTRODUCTION: Minimal incision surgery (MIS) total knee replacement (TKR) has become widespread in the past few years. However, because the exposure is limited in MIS TKR, there is a concern about the precision in the identification of the anatomical landmarks during the course of the TKR procedure, including those used for aligning the rotation of the femoral prosthesis. This study investigated the errors in the identification of the Transepicondylar-Axis (TEA) and Anterior-Posterior-Axis (Whiteside line) between a MIS and a conventional-incision-approach in four pieces of fresh frozen cadaveric knees. METHODS: The specimens were approached first with minimal-incision-approach and then conventional-incision-approach. Repeated identification of the TEA and Anterior-Posterior-Axis was sequentially performed twenty five times by each of the two orthopaedic surgeons in the same setting. The spatial orientations of these axes were recorded using an optical computer navigation system. The errors in aligning the prosthesis were compared with the reference TEA established by CT. RESULTS: It was found that the errors in identifying the Anterior-Posterior-Axis in MIS and conventional-incision-approach were  $0.4^{\circ}/-5^{\circ}$  and  $1.8^{\circ}$  internal-rotation $\pm/5^{\circ}$  ( $p<0.001$ ). The error in the identification of the TEA was significantly higher in the MIS-approach ( $4.5^{\circ}$  internal-rotation $\pm/4^{\circ}$ ) when compared with the conventional-incision-approach ( $3^{\circ}$  internal-rotation $\pm/4^{\circ}$ ) ( $p<0.001$ ). CONCLUSION: The precision in the identification of the Anterior-Posterior-Axis was not ostensibly jeopardized by the use of MIS-approach. On the other hand, the adoption of the minimal incision approach led to an increase in error in the identification of the TEA.

**Date : 2008-08-25**  
**Session : General orthopaedics: Learning and Teaching**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 16382**  
**CUTTING ERRORS IN TOTAL KNEE REPLACEMENT**

WP YAU, KY CHIU, CH YAN  
*The University of Hong Kong, Hong Kong (HONG KONG)*

**INTRODUCTION:** The observed errors in the implanted prosthesis in TKR can be due to a number of causes. One of these is the potential error during execution of the bone cuts. However, information concerning this item is minimal in the literature. **MATERIALS AND METHODS:** The amount of cutting errors in forty consecutive TKRs was reported. The execution of the bone cuts were done either through the cutting slot (slotted-cutting) or on the surface of the cutting guide (open-cutting). The amount of cutting error after the first-cut was measured by the use of computer navigation system. It was hypothesized that there was no difference in the error between slotted-cutting and open-cutting. This was examined using Mann-Whitney U Test. **RESULTS:** It was found that the average cutting error was 1 degree in the coronal plane and 1.4 degrees in the sagittal plane. Significantly more outlier (>3 degrees) was observed in the errors in the sagittal plane ( $p=0.014$ ). 58 cuts were done through the cutting slot and 22 cuts were done on the surface of the cutting guide. Open-cutting resulted in less error in the sagittal plane of the tibial cut when compared with slotted-cutting ( $p=0.031$ ). **DISCUSSION AND CONCLUSION:** The magnitude of the error in the execution of bone cut in TKR was around 1 degree. Open-cutting resulted in less error. This was attributed by the use of a thicker saw blade with higher stiffness in the open-cutting method.



**Date : 2008-08-25**  
**Session : General orthopaedics: Learning and Teaching**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 16477**

**EXPERIMENT PREOPERATIVE PLANNING FOR HIP SURGERY USING 3D PLASTIC REPLICA WITH STEREO LITHOGRAPHY**

Kensuke FUKUSHIMA, Naonobu TAKAHIRA, Katsufumi UCHIYAMA, Moritoshi ITOMAN

*Department of Orthopaedic Surgery, Kitasato University School of Medicine, Sagamihara, Kanagawa (JAPAN)*

We have performed various osteotomy produces, which are the first choice for joint reconstruction surgery for hip joint disorders in young and middle-age patients. In addition, we established Kitasato University Bone Bank (KUBB) in 1971 and have been able to perform biological reconstruction using allograft for primary and revision total hip replacement. However, the complicated anatomical shape has made it difficult to plan preoperatively and considerable surgical experience is required. Therefore, we investigated techniques of producing 3D plastic replicas using the stereo lithography method applied widely for industrial production, and made a 3D plastic replica for each patient based on preoperative 3D-CT data. Six cases underwent osteotomy, seven cases underwent revision total hip replacement with severe bone defect. For each case, we made a 3D plastic replica with stereo lithography, then preoperatively planed and simulated surgery. Except in one case of osteonecrosis of the femoral head, our models accurately reflected the bone form in all cases, and reliable surgery simulation was possible. The authors present our methods, which make facilitate reliable preoperative surgery simulation, clear explanation to the patients, and provide good educational opportunities for inexperienced hip surgeons.

Date : 2008-08-25

Session : General orthopaedics: Learning and Teaching

Time : 0900-1030

Room: 408

Abstract number : 17709

**DO'S AND DON'TS FOR ORTHOPAEDIC SURGEON TO AVOID WELL-LEG ACUTE COMPARTMENT SYNDROME**

Kiran Kumar SINGISETTI<sup>1</sup>, Shyam Sundar SWARNA<sup>2</sup>, Hans FUCHS<sup>2</sup>

<sup>1</sup>Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM), <sup>2</sup>South Tyneside District Hospital, South Shields (UNITED KINGDOM)

Compartment syndrome in an uninjured leg after prolonged operations such as colorectal, gynaecologic and urological procedures has been previously reported. Its incidence after orthopaedic procedures is relatively uncommon. Compartment syndrome of any nature is quite devastating to patient, physician and hospital. We reviewed the literature to summarise the risk factors for well leg compartment syndrome and enumerate the measures to reduce the risk of such a complication during orthopaedic procedure. Surgeons should realise that compartment syndrome can happen in either the operated or the nonoperated limb in such situations. Following simple measures such as appropriate leg positioning during orthopaedic procedures could significantly reduce the incidence of well leg compartment syndrome. The effects can further be minimised by an early detection with a high index of suspicion.

**Date : 2008-08-25**  
**Session : General orthopaedics: Learning and Teaching**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 17976**

**THE DESIGN HISTORY AND CLINICAL RESULTS OF CERAMIC TOTAL KNEE**

Sok Chol KIM<sup>1</sup>, Hiroyuki OONISHI<sup>1</sup>, Hironobu OONISHI<sup>1</sup>, Masayuki KYOMOTO<sup>2</sup>, Mikio IWAMOTO<sup>2</sup>, Masaru UENO<sup>2</sup>

<sup>1</sup>*H. Oonishi Memorial Joint Replacement Institute, Tominaga Hospital, Osaka (JAPAN)*, <sup>2</sup>*Japan Medical Materials Corporation, Osaka (JAPAN)*

We started clinical use of a total knee prosthesis (TKP) made of alumina ceramics in late 1970s. The first generation of the ceramic TKP (1981-1985) consisted of an alumina ceramic femoral component (F-comp) and a tibial component (T-comp) with a UHMWPE insert. Both cemented fixation and cementless fixation were attempted for F- and T-comps. In the second generation (1990-1996), fixation of the T-comps was changed to cemented. In the third generation (1993-1998), the F-comp had a porous coating of ceramic beads to improve fixation between the bone cement and the F-comp. In the second and third generation, F- and T-comps were implanted using bone cement. In this study, we examined findings of clinical radiographic observation, and also compared the wear of metal and ceramic TKPs which were retrieved after long-term use. In 137 joints of the first generation with 20-23-year follow-up, the rates of loosening, sinking and revision were higher with cementless fixation than cemented fixation. In 249 joints of the second and third generation with 6-14-year follow-up, neither loosening nor sinking was observed. Radiolucent line was observed in the medial and lateral areas of the tibia at rates of 4.3% and 2.1% respectively. No osteolysis was observed in any case. The retrieved metal TKPs exhibited a higher wear rate than retrieved ceramic TKPs, with scratched surface damages. The lower wear rate with much less surface damage suggests the possibility of a long-term durability and performance of the ceramic TKP.

Date : 2008-08-25  
Session : General orthopaedics: Learning and Teaching  
Time : 0900-1030  
Room: 408

Abstract number : 18059

**CO-VARIATES OF REFERRAL FOR REHABILITATION AFTER POSTERIOR LUMBAR FUSION**

Emin AGHAYEV<sup>1</sup>, Markus MELLOH<sup>2</sup>, Thomas ZWEIG<sup>1</sup>, Lukas STAUB<sup>1</sup>, Thomas BARZ<sup>3</sup>, Peter RIEGER<sup>3</sup>, Jean-Claude THEIS<sup>4</sup>, Roeder CHRISTOPH<sup>1</sup>

<sup>1</sup>Institute for Evaluative Research in Orthopaedic Surgery, Bern (SWITZERLAND), <sup>2</sup>University of Otago, Dunedin (NEW ZEALAND),  
<sup>3</sup>Asklepios Klinikum Uckermark, Schwedt (GERMANY), <sup>4</sup>Dunedin Hospital, Dunedin (NEW ZEALAND)

**INTRODUCTION:** Posterior lumbar fusion is one of the most frequent procedures in spinal surgery accounting for a high percentage of referral for rehabilitation. Though, little is known about factors influencing the referral for rehabilitation after posterior lumbar fusion. **METHODS:** A prospective consecutive study of 720 patients out of the international spine registry SPINE TANGO, who had been treated with posterior lumbar fusion for degenerative disease or spondylolisthesis between 05/2005 and 10/2007, was performed. We dichotomized the postoperative rehabilitation combining in- with outpatient rehabilitation to professional rehabilitation, and none with self-managed rehabilitation to non-professional rehabilitation. Multivariate logistic regression was performed on potential co-variables. **RESULTS:** Median age was 63 years (range 13-90 years) with a male to female ratio of 3.7:6.3. 40% of all patients were referred to professional rehabilitation. Gender ( $p<0.05$ ) and surgeon credentials ( $p<0.01$ ) were found to be co-variables of the dichotomized postoperative rehabilitation. Women received professional rehabilitation one and a half times as frequently as men. Spine surgeons referred their patients two and a half times as frequently to professional rehabilitation as non-spine surgeons. All other examined co-variables showed no influence on referral for rehabilitation. **DISCUSSION:** Co-variables of referral for rehabilitation after posterior lumbar fusion are gender and surgeon credentials. Gender inequalities should be taken into account by surgeons when considering referral for rehabilitation. Spine surgeons should also be aware of a potential number of inadequate referrals for rehabilitation compared to non-spine surgeons.

**Date : 2008-08-25**  
**Session : General orthopaedics: Learning and Teaching**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 18065**

**ABC OF SHOULDER RADIOGRAPHS**

Little NICK, Prasthofer ANNA, David RICKETTS  
*Department of Orthopaedics, Hamilton (NEW ZEALAND)*

Staff in Accident and Emergency departments often has difficulty in requesting and interpreting the radiographs of patients presenting with shoulder problems. We describe improvements in the ordering and interpretation of these images following the introduction of an ABC algorithm. **METHOD:** We studied the practice of 10 newly appointed SHO's in orthopaedics. None had previous clinical experience of A&E or orthopaedics. The doctors were asked to list the radiographs they would request for patients presenting with a given set of acute shoulder problems. They were also asked to give a diagnosis and management plan for each of a set of 16 radiographs showing shoulder problems that commonly present to casualty departments. We repeated both arms of the study after education of the SHOs using the ABC algorithm. **RESULTS:** Prior to the use of the algorithm we found that that 2/10 doctors surveyed ordered appropriate radiographs and had an overall accuracy of 91/160 (57%) in interpretation of radiographs. Following education, 10/10 doctors ordered appropriate radiographs and diagnostic accuracy improved from 142/160 (89%). Identification of acromio-clavicular joint dislocation (6/20 to 20/20) and posterior dislocation (11/40 to 34/40) improved considerably post-education. **CONCLUSION:** The ABC algorithm reduces inappropriate ordering of radiographs and increases the accuracy of radiological diagnosis for patients presenting with acute shoulder conditions. We recommend its use in accident and emergency departments.

**Date : 2008-08-25**  
**Session : General orthopaedics: Learning and Teaching**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 18420**  
**HIP APPROACHES USED WORLDWIDE BY SICOT SURGEONS**

Venkata Sunil DACHEPALLI  
*Rochdale Infirmary, Wrexham (UNITED KINGDOM)*

AIM: To look at the commonly practised approach worldwide. To see if there has been any change recently. METHODS: This study was done at the SICOT 2007 conference in Morocco. Most surgeons were requested to fill in a pre-designed questionnaire. RESULTS: All results were analysed using Microsoft office. 168 surgeons were requested to fill in the form and 162 of them filled in completely. The conference was well attended by worldwide surgeons and we could find the practice in 15 countries. Most of the surgeons preferred to use posterior or anterolateral approach for primary and revision hip replacements. The reason for choosing particular approach mainly depended on how they were trained. Some surgeons preferred to change their approach following evidence-based medicine. Most surgeons are not practising minimally invasive surgery or navigation. Majority of them recommended their technique.

**Date : 2008-08-25**  
**Session : General orthopaedics: Learning and Teaching**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 18633**  
**NEED-BASED INNOVATIONS IN ORTHOPAEDICS**  
S S SANGWAN, Zile Singh KUNDU  
*PGIMS, Rohtak, Rohtak (INDIA)*

**INTRODUCTION:** As our needs, expectations and circumstances are different from Western countries so we should not be Xerox copies of the West. We have innovated implants which suit our needs and also modified few existing implants accordingly e.g. Kuntscher's nail, Bohler-Braun splint, DHS etc. Here we will discuss the utilities of these modified implants and their results over a long-term follow-up. **MATERIALS AND METHODS:** We performed a retrospective study of the last 15 years to assess the results of our modified implants. In all the patients need based modifications were done. In patients with subtrochanteric fractures we modified Kuntscher's nail in the upper part to maintain valgus angle. We modified Bohler-Braun splint to decrease the oedema in the patients with fractures of lower limbs. The other modifications include abduction bed, modified DHS, periosteum elevator, tourniquet technique, wooden frames for prone position for spinal surgeries and T-shaped fixator-cum-distractor. **RESULTS:** In the last 15 years these modifications have almost become a protocol in our institution. The results have been quite encouraging. **DISCUSSION AND CONCLUSION:** As our needs and circumstances are different from the West, these modifications are really cost effective and very useful to Indian patients. These are very simple modifications which can be easily utilised by the peripheral centers and the surgeons of the average aptitude.

**Date : 2008-08-25**  
**Session : Symposium - Kashin Beck Disease**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 17542**

**KBD STUDIES: CRITICAL OVERVIEW OF THE EXPERIMENTAL DESIGNS AND STATISTICAL ANALYSES**

Viviane DE MAERTELAER

*Free University of Brussels, Brussels (BELGIUM)*

It is well-known and worldwide accepted that prospective studies are more reliable and performing than retrospective studies. The results presented in this KBD devoted session are mainly based on prospective studies. Nevertheless, some variables included in our studies have actually been acquired through retrospective and/or subjective information (for example: age of the children, details of food consumption). The purpose of this end session presentation is to focus on the possible weaknesses of our studies, to explain the reasons why they could not have been avoided and to justify the methods actually used for the analysis of our data.



**Date : 2008-08-25**  
**Session : Symposium - Kashin Beck Disease**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 17588**

**KBD IS AN AGRO-ENVIRONMENTAL DISEASE: THE SOUTH CENTRAL TIBET INPUT**

Eric HAUBRUGE<sup>1</sup>, Camille CHASSEUR<sup>2</sup>, Georges LOGNAY<sup>1</sup>, Françoise MATHIEU<sup>3</sup>, François MALAISSE<sup>1</sup>

<sup>1</sup>*Gembloux Agricultural University, Gembloux (BELGIUM)*, <sup>2</sup>*Institut de la Santé publique - Pasteur, Brussels (BELGIUM)*, <sup>3</sup>*Kashin Beck Disease, Forrières (BELGIUM)*

Kashin-Beck Disease (K.B.D.) results from the synergy of several agro-environmental causes that build favourable conditions for its development. Output of enquiries carried out in rural ecosystems by more than hundred families from 10 counties in 3 prefectures of South Central Tibet (T.A.R., P.R. China) indicates low diversity of the diet. Our survey has stated the diversity of the diet, including barley flour, potherbs, roots, fruits, flowers, spices, aromatic herbs, condiments, mushrooms, as well has offered an estimation of annual food uptake by Ü-Tsang inhabitants in rural ecosystems and data concerning the chemical composition of these various foods. This has lead to establish diet's suggestions for prevention of KBD; these suggestions include beneficial role of wild edible products.

Date : 2008-08-25  
Session : Symposium - Kashin Beck Disease  
Time : 1100-1215  
Room: 408

Abstract number : 17610

**ANALYSIS OF ERGOSTEROL AND THE MAIN ALTERNARIA MYCOTOXINS IN CEREALS FROM ENDEMIC AND NON ENDEMIC KBD AREAS IN TAR**

Georges LOGNAY<sup>1</sup>, Quentin DENIS<sup>1</sup>, Camille CHASSEUR<sup>2</sup>, Françoise MATHIEU<sup>3</sup>

<sup>1</sup>Gembloux Agricultural University, Gembloux (BELGIUM), <sup>2</sup>Scientific Institute of Public Health, Section of Mycology, Brussels (BELGIUM), <sup>3</sup>KBD Foundation asbl, Gent (BELGIUM)

Food contamination by moulds and their noxious mycotoxins is frequently reported in KBD aetiology. The present study was designed to validate Ergosterol and Alternaria mycotoxins methods of analysis and to apply them within KBD Foundation's programme. Extent of fungal contamination in cereal grains was evaluated by ergosterol (mould bioindicator) HPLC assay: linearity: 0-25µg/ml ( $r^2 > 0.999$ ); LOQ=0.3µg/g; recoveries = 98.4±4.0%; repeatability (RSD=4.1%). Low ergosterol concentrations in Barleys from non endemic (1.2±1.1µg/g) and endemic (2.8±2.2µg/g) KBD areas indicated limited mould contamination; no difference could be made between KBD affected and non affected families. Since previous mycological surveys revealed the prevalence of Alternaria in endemic KBD area, the main A. mycotoxins (Altenuene, Altertoxin I, Alternariol and Alternariol mono-methyl ether) were searched by HPLC. The developed HPLC method showed satisfactory performances (LOQ=0.1µg/g, recoveries >85% at 0.25µg/g level, and linearity ( $r^2 > 0.999$ ) over the range of 0.1 to 10µg/g). Among the 28 tested Barley samples, none of them revealed detectable amounts of the four mycotoxins. Additional T-2 toxin analyses were also all <LOD (25ng/g), nevertheless it cannot be denied that other non investigated mycotoxins could be present at low concentration. As a result of the study, the proposed analytical protocols showed good performances but did not allow to clearly distinguish Barley samples from KBD endemic and non endemic areas.

Date : 2008-08-25  
Session : Symposium - Kashin Beck Disease  
Time : 1100-1215  
Room: 408

Abstract number : 17633

**THREE YEARS OF FUNGAL CONTAMINATION FOLLOW-UP OF THE STORED BARLEY SAMPLED IN ENDEMIC AND NON ENDEMIC KBD AREAS, IN THE TIBETAN AUTONOMOUS REGION (TAR, CHINA)**

Camille CHASSEUR<sup>1</sup>, Pascal KANYANDEKWE<sup>1</sup>, Georges LOGNAY<sup>2</sup>, Carl SUETENS<sup>3</sup>, Rinchen LOBSANG<sup>4</sup>, Françoise MATHIEU<sup>4</sup>  
<sup>1</sup>Scientific Institute of Public Health, Section of Mycology, Brussels (BELGIUM), <sup>2</sup>Gembloux Agricultural University, Dept. of Analytical Chemistry, Gembloux (BELGIUM), <sup>3</sup>Scientific Institute of Public Health, Dept of Epidemiology, Brussels (BELGIUM), <sup>4</sup>KBD Foundation asbl, Lhasa (TAR) (CHINA)

In the Tibetan Autonomous Region (TAR), previous works showed high Kashin-Beck Disease (KBD) prevalence in villages north of Brahmaputra, whereas south of the river, KBD was absent. In 2001, we conducted a mycological survey in 38 families from 6 counties, Nakartse, Gyantse and Rimpung in Non Endemic Area (NEA), and Nyemo, Neudong and Sangri in Endemic Area (EA). Mycological analyses of barley grain, by direct plating method, showed significant differences between EA and NEA. We extended this study during 3 years (2004-2005-2006) and we added 20 families selected in Lundrup and Meldrogonkar (situated in EA). The mean percentage of grains contaminated with *Alternaria* in 2001 was significantly higher in EA (29.6%) as compared to the NEA (1.9%) ( $p < 0.01$ ). A significant difference ( $p < 0.01$ ) was confirmed during the 3 years, with respectively in EA 11.9, 9.9 and 4.5%. Among the EA counties, we noted 2 distinct geographical areas for *Alternaria*. At Nyemo and Neudong, a significantly higher contamination (20.6-16.0-7.0%) was present during the 3 years ( $p < 0.01$ ). On the opposite, at Lhundrup and Meldrogongar, contamination was weak (1.7-1.6-1.7%) and not significantly different from the NEA. The only significant difference ( $p < 0.05$ ) between affected (92%) and healthy families (79%) was only observed for total mould contamination in 2006. Higher barley grain contamination with *Alternaria* in endemic KBD areas was confirmed by our study although not in the same degree in all counties and throughout the years.

Date : 2008-08-25

Session : Symposium - Kashin Beck Disease

Time : 1100-1215

Room: 408

Abstract number : 17661

**PREVENTION TRIAL ON KASHIN-BECK DISEASE (KBD) IN TIBET AUTONOMOUS REGION (TAR)**

Carl SUETENS<sup>1</sup>, Françoise MATHIEU<sup>2</sup>, Camille CHASSEUR<sup>3</sup>, Philippe GOYENS<sup>4</sup>, William CLAUS<sup>2</sup>, Rinchen LOBSANG<sup>2</sup>, Lhakpa WANGDU<sup>5</sup>, Maurice HINSENKAMP<sup>6</sup>

<sup>1</sup>Scientific Institute of Public Health, Unit of Epidemiology, Brussels (BELGIUM), <sup>2</sup>Kashin-Beck Disease asbl - vzw, Gent (BELGIUM),

<sup>3</sup>Scientific Institute of Public Health, Section of Mycology, Brussels (BELGIUM), <sup>4</sup>Hôpital des Enfants - Reine Fabiola. Free University of Brussels, Brussels (BELGIUM), <sup>5</sup>Kashin-Beck Disease Foundation, Lhasa (CHINA), <sup>6</sup>Hôpital Erasme. Service d'Orthopédie et Traumatologie, Brussels (BELGIUM)

To assess the effect of a combined iodine and anti-oxidant supplementation on KBD, 997 children aged 5 to 15 years were enrolled in a clinical trial in 3 prefectures of the TAR from 1998 till 2001. KBD symptoms were evaluated at baseline and outcome by the same physical therapist, without awareness of the intervention to which the children were submitted. Serum bone alkaline phosphatase (BALP) was assessed as biological marker. Outcome data were obtained for 810 children (81.2%). Age- and sex adjusted BALP (a-BALP) levels were higher in stage 2-3. In the randomised clinical trial (RCT), the percentage cases whose KBD stage improved between 1998 and 2001 was 21.6% in the supplemented group (n=168) as compared to 10.3% in the placebo group (n=157) (RR 2.1, p=0.006). This finding was paralleled by an improvement of clinical signs and lower BALP levels in supplemented children. Overall, clinical evolution was best in children with access to more diversified food. Reduction of a-BALP between 1998 and 2001 was more important in children with high food diversity and clinical signs improved by 15.6 points more in these children as compared to children with low food diversity (p<0.001). We previously identified food diversity as a protective factor of KBD, acting through increased intake of protective factors (incl. antioxidants) and/or decreased exposure to causal factors, e.g. mycotoxins from barley. Currently, a RCT to study the effects of broader micro-nutrient supplementation on KBD is ongoing.

**Date : 2008-08-25**  
**Session : Symposium - Kashin Beck Disease**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 17816**

**RICKETS IN YOUNG CHILDREN LIVING IN A KBD ENDEMIC AREA IN CENTRAL TIBET**

Philippe GOYENS<sup>1</sup>, Pascale BALLY<sup>2</sup>, Zhu WANG<sup>3</sup>, Sheero RAPTEN<sup>4</sup>, Viviane DE MAERTELAER<sup>5</sup>, William CLAUS<sup>2</sup>, Françoise MATHIEU<sup>2</sup>

<sup>1</sup>Laboratory of Pediatrics, Brussels (BELGIUM), <sup>2</sup>Kashin Beck Disease a.s.b.l. - v.z.w., Gent (BELGIUM), <sup>3</sup>Chinese Center for Disease Control and Prevention, Beijing (CHINA), <sup>4</sup>Tibet Center for Disease Control and Prevention, Lhasa - TAR (CHINA), <sup>5</sup>I.R.I.B.H.N., Brussels (BELGIUM)

Kashin-Beck disease (KBD) is an osteo-articular disease of unknown etiology. Many children in KBD endemic areas in Tibet present with sequelae of rickets. The objective of the study was to evaluate calcium and vitamin D status of young children, living in a KBD endemic area in Tibet. The study was conducted in January 2005, in 7 villages in Nyemo County (Lhasa prefecture). All children aged 12 to 24 months were enrolled. Mothers were interviewed regarding breastfeeding practice and weaning foods. Overt signs of rickets (Harrison groove, enlarged costo-chondral junctions) were looked for. Blood was obtained in all but one child. Eight children (26%) were fully weaned and 23 (74%) partially breastfed; 5 did not receive milk at all. Age at weaning was between 11 and 22 months. Overt signs of rickets were observed in 8 children (26%). All children presented with very low calcium (mean + SD: 6.6+0.7mg/dl) and low 25-OH vitamin D levels (12.3+4.2ng/ml), correlated to high PTH levels (412+220ng/dl). Alkaline phosphatase was high (111.6+44.7). No correlation could be found between calcium, vitamin D or PTH levels, and bone alkaline phosphatase. Unexpectedly, serum phosphorus was very high (10.9+1.9mg/dl). **CONCLUSION:** Rickets in young children is highly prevalent in Nyemo valley, a rural area endemic for KBD. Vitamin D deficiency plays a role in the patho-physiology of rickets; the calcium intake is probably insufficient also.

Date : 2008-08-25  
Session : Symposium - Kashin Beck Disease  
Time : 1100-1215  
Room: 408

Abstract number : 17842

**GROWTH OF YOUNG CHILDREN LIVING IN A KBD ENDEMIC AREA IN CENTRAL TIBET**

Philippe GOYENS<sup>1</sup>, Pascale BALLY<sup>2</sup>, Sheero RAPTEN<sup>3</sup>, Rinzin WANGLA<sup>4</sup>, Viviane DE MAERTELAER<sup>5</sup>, William CLAUS<sup>2</sup>, Françoise MATHIEU<sup>2</sup>

<sup>1</sup>Laboratory of Paediatrics, Université Libre de Bruxelles, Brussels (BELGIUM), <sup>2</sup>Kashin Beck Disease a.s.b.l. - v.z.w., Gent (BELGIUM),

<sup>3</sup>Tibet Center for Disease Control and Prevention, Lhasa - TAR (CHINA), <sup>4</sup>Kashin Beck Disease Foundation, Lhasa - TAR (CHINA),

<sup>5</sup>I.R.I.B.H.N., Bruxelles (BELGIUM)

The etiology of Kashin-Beck disease (KBD) is unknown. Growth of young children living in a KBD endemic area in Tibet was evaluated. The study was conducted in January 2005 and in February 2006, in 16 natural villages in Nyemo County (Lhasa prefecture). All children aged 12 to 24 months (n=53) were enrolled. Anthropometric measurements included measurements of length and weight. Clinical signs of KBD and of nutritional deficiencies were looked for. Children aged 12 to 24 months were severely stunted (height/age Z-score: -2.44) but not wasted (weight/age Z-score: -0.21). Severity of linear growth retardation increased with age. At physical examination, 10 patients (19%) presented with overt signs of rickets. A large proportion of children presented with clinical signs of nutritional deficiencies: goiter, abnormalities of hair, skin, mucosae, and teeth. As expected, due to the young age of the subjects, no child was found to present with symptoms suggestive of KBD. Besides, growth was assessed in a second group of children (n=345), 30 to 60 months of age, investigated in July 2004 in the counties of Nyemo, Lundrup and Medrogongkar (Lhasa prefecture). Linear growth seems to resume after 2 years of age (height/age Z-score: -1.6). On the contrary, wasting increases with age (weight/height Z-score: -0.77). CONCLUSION: Young children in a rural area endemic for KBD present with severe stunting and moderate wasting between 12 and 60 months age. Causes of growth retardation need to be analysed.

Date : 2008-08-25  
Session : Symposium - Kashin Beck Disease  
Time : 1100-1215  
Room: 408

Abstract number : 18008

**EFFECT OF DRYING TIMES ON FUNGAL CONTAMINATION OF GRAIN IN KASHIN-BECK DISEASE ENDEMIC AREAS IN THE TIBETAN AUTONOMOUS REGION**

Lixing HE<sup>1</sup>, Camille CHASSEUR<sup>2</sup>, Carl SUETENS<sup>3</sup>, Pema DROLKAR<sup>4</sup>, Francoise MATHIEU<sup>5</sup>

<sup>1</sup>Tibet Center for Disease Control and Prevention, Lhasa (T.A.R.) (CHINA), <sup>2</sup>Scientific Institute of Public Health, Section of Mycology, Brussels (BELGIUM), <sup>3</sup>Scientific Institute of Public Health, Unit of Epidemiology, Brussels (BELGIUM), <sup>4</sup>Kashin-Beck Disease Foundation, Lhasa (T.A.R.) (CHINA), <sup>5</sup>Kashin-Beck Disease asbl - vzw, Gent (BELGIUM)

In the KBD endemic areas of Tibet Autonomous Region (TAR), not everyone is affected by the disease. It is thus interesting to compare the familial environment and more specifically the food practices between families with or without KBD. Among possible parameters responsible of fungal contamination of food, the drying of grain and the storage conditions are essential, and can differ between families. In this experiment, we examined a traditional practice which consists, after harvest, in keeping barley in bundles on the field for drying, before to be stored. The contamination of grain according to the drying duration on field and the disease status were examined in 530 families in 3 prefectures (Lhasa, Lhoca, Shigatse) during a period of 5 years (1997-2001). For mycological analyses, direct plating method was used with a Malt Extract agar medium. On the whole, 10 days minimum on field was the optimum duration to record a significant reduction of total fungal contamination, but results differed according to the 3 prefectures. The difference was especially marked in Lhoca ( $p<0.001$ ) and in Lhasa ( $p<0.001$ ) but not in Shigatse where overall contamination rates were lower. CONCLUSION: Longer drying times of grain in the field may reduce fungal contamination rates and therefore may have a role in the prevention of KBD.

**Date : 2008-08-25**  
**Session : Symposium - Kashin Beck Disease**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 18197**

**PREVALENCE SURVEY OF KASHIN-BECK DISEASE (KBD) IN TIBET AUTONOMOUS REGION (TAR)**

Sheero RAPTEN, Tashi SAMDUP, Lobsang TSHUNZIN

*Tibet Center for Disease Control and Prevention, Lhasa (T.A.R.) (CHINA)*

Kashin-Beck Disease is an endemic, chronic, osteoarticular disease. Its aetiology remains unclear. KBD is still highly prevalent in large areas of Tibet. Nowadays, the disease is present in 417 villages of 133 townships. They are included in 39 of the 74 counties in the 7 prefectures in the TAR. The prevalence survey is based on clinical and radiological criteria (national standards). Clinical criteria are classified in 3 stages, based mainly on joint pain, joint deformity and restriction of motion. The survey will consider the people aged from 3 till 40 years old. X-ray diagnosis is based on the right hand image (long and carpal bones). There is also a classification in 3 stages. Only children from 4 till 12 years old are examined. The total endemic area is covering 45.2% of the whole TAR. In this endemic area, 78.1% is classified as severe or moderate endemic places. More than 50% of the clinical patients are under the age of 25. Depending on the village, the X-ray detection rate varied from 12.8 till 84.4%. Several children showed shortened limbs and deformed fingers. According to the first KBD survey done in 1999, TAR has carried out some interventions, such as displacement of KBD villages, provision of grain from non-endemic areas, selenium supplementation and improvement of general life standards of the people living in the endemic areas. An update of the prevalence survey in each prefecture is currently ongoing with the natural village as the smallest checked unit.



**Date : 2008-08-25**  
**Session : General orthopaedics: Functional outcome 1**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 16580**

**UNILATERAL TOTAL HIP ARTHROPLASTY: INDICATORS FOR POOR OUTCOME AT 3 YEARS**

Simon JOHNSON, Andy BALLANTYNE, Sam MOLYNEUX  
*Queen Margaret Hospital, Dunfermline (UNITED KINGDOM)*

**INTRODUCTION:** Total Hip Arthroplasty (THA) has shown to provide significant improvements in quality of life to patients with hip arthritis. However, some patients report poor outcomes and the reasons for this are not clearly defined. This study aims to determine demographic and perioperative factors associated with poor outcome. **METHODS:** Between 1998 and 2004, demographic and perioperative data were collected prospectively on 1318 consecutive unilateral THA. Outcome was assessed using the Harris Hip Score (HHS) and Short Form 36 (SF-36) collected pre-operatively and at a three-year follow-up. A HHS of <75 at follow-up was defined as a poor outcome. **RESULTS:** 144 patients (10.9%) had a HHS of <75 at three years. When independent factors were considered: age, sex, body mass index, smoking history, hypertension, diabetes, post-operative infection and thrombo-embolic disorders were not significantly associated with poor outcome. ASA grade, a history of coronary disease, length of stay, pre-operative HHS ( $p$  values <0.001), NSAID, aspirin and postoperative dislocation ( $p$ <0.05) were all significant independent predictors. All but 2 of the 8 SF-36 variables (RP and MH) were also highly significant ( $p$ <0.001). Multiple logistic regression analysis identified SF-36 General Health ( $p$ =0.001), SF-36 Bodily Pain ( $p$ =0.007) and the patient's deprivation score ( $p$ =0.009) as the three most significant associations with poor outcome. **CONCLUSION:** Low socio-economic status and a poor perception of personal health and bodily pain are closely related to poor outcomes at three years following unilateral THA.

Date : 2008-08-25

Session : General orthopaedics: Functional outcome 1

Time : 1400-1530

Room: 408

Abstract number : 16618

**PAIN IN THE ASSESSMENT OF OXFORD PHASE 3 UNICOMPARTMENTAL KNEE ARTHROPLASTY (UKA)**

Lukas LISOWSKI<sup>1</sup>, Inez CURFS<sup>2</sup>, Andrzej LISOWSKI<sup>3</sup>

<sup>1</sup>Academic Medical Center Amsterdam, Utrecht (NETHERLANDS), <sup>2</sup>University of Maastricht Medical School, Heerlen (NETHERLANDS), <sup>3</sup>Atrium Medical Center Kerkrade, Heerlen (NETHERLANDS)

OBJECTIVES: The results of knee arthroplasty are commonly assessed by survival-analysis using revision as the endpoint. We have used the assessment of moderate and severe pain by a patient-based-questionnaire as an alternative for survival-analysis after the Oxford prosthesis using a minimally invasive technique. MATERIALS AND METHODS: A prospective study is being conducted in which 191 Oxford arthroplasties, implanted between January 1999 and May 2006 by a single surgeon in a community hospital, are included. Mean follow-up period is 35 months. Patients are assessed prospectively preoperatively and after UKA by the WOMAC-questionnaire, Oxford, Knee-Society Knee and Function scores and VAS-pain and satisfaction. Survival-analysis is being undertaken. RESULTS: Preoperatively 85.8% had moderate or severe pain. Postoperatively five patients (2.6%\*) with retrospectively wrong indication criteria had persisting pain complaints. Of these, three were revised to TKA and the other two are being followed. Three patients (1.6%\*\*\*) with identified moderate pain after proper indication criteria accepted their pain. Ten other patients (5.2%) experiencing moderate pain at some stage during the 8-year period were successfully treated by arthroscopy. Totally 9.4% of patients experienced moderate or severe pain at some stage in this period and (4.2%\*/\*\*) was considered a failure. CONCLUSION: The failure rate could be even lower if strict indication criteria were followed in all patients. Pain must be identified and if possible solved. As relief of pain is the primary reason for joint replacement, this is likely to be the most important factor in determining the long-term outcome for the patient.

**Date : 2008-08-25**  
**Session : General orthopaedics: Functional outcome 1**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 16711**

**LONG-TERM RESULTS OF 586 CEMENTLESS PRIMARY THR USING HAC COATED ENDOPROSTHESIS**

Raghu RAMAN<sup>1</sup>, David DICKSON<sup>2</sup>, Vasanth ESWARAMOORTHY<sup>2</sup>, Peter ANGUS<sup>2</sup>

<sup>1</sup>Hull Royal Infirmary, Normanton (UNITED KINGDOM), <sup>2</sup>Dewsbury Hospital, Normanton (UNITED KINGDOM)

**INTRODUCTION:** We report the clinical and radiological outcome of consecutive primary hip arthroplasties using JRI-Furlong HAC coated components. **METHODS:** We reviewed 586 consecutive cementless primary THA in 542 patients with minimum 12-18 year follow-up. Clinical outcome was measured using Harris, Charnley, Oxford scores. Quality of life using EuroQol EQ-5D. **RESULTS:** The mean age was 75.2 yrs. Dislocation occurred in 12 patients. Re-operations performed in 11 patients (1.9%). Four acetabular and one stem revisions were performed for aseptic loosening. Others were for infection (2), periprosthetic fractures (2), cup malposition (1), revision of worn liner (2). The mean Harris and Oxford scores were 89 and 18.4 (12-32) respectively. The Charnley score was 5.7 for pain, 5.3 for movement and 5.4 for mobility. Acetabular radiolucencies were present in 54 hips (9.7%). The mean linear polythene wear was 0.06mm/year. Stable stem by bony ingrowth was identified in all hips excluding one femoral revision case. Mean stem subsidence was 2.2mm (0.30-3.4mm). Radiolucencies were present around 37 (6.6%) stems. With an end point of definite or probable loosening, survival at 12 years was 96.1% for acetabular and 98.3% for femoral components. Overall survival at 12 years was 97.2%. **CONCLUSION:** The results of this study support the continued use of a fully coated prosthesis and document the durability of the HAC coated components. In our clinical experience, the Furlong prosthesis revealed encouraging radiographic stability over a long-term period.

Date : 2008-08-25

Session : General orthopaedics: Functional outcome 1

Time : 1400-1530

Room: 408

Abstract number : 16989

**THE INTERNATIONAL SPINE REGISTRY SPINE TANGO - STATUS QUO AND FIRST RESULTS**

Markus MELLOH<sup>1</sup>, Thomas ZWEIG<sup>2</sup>, Lukas STAUB<sup>2</sup>, Emin AGHAYEV<sup>2</sup>, Thomas BARZ<sup>3</sup>, Peter RIEGER<sup>3</sup>, Jean-Claude THEIS<sup>1</sup>, Christoph ROEDER<sup>2</sup>

<sup>1</sup>University of Otago, Dunedin (NEW ZEALAND), <sup>2</sup>MEM Research Center/ University of Berne, Berne (SWITZERLAND), <sup>3</sup>Asklepios Klinikum Uckermark, Schwedt/ Oder (GERMANY)

INTRODUCTION: SPINE TANGO is the first International Spine Registry. While it has now been fully operational for five years, no results of its collected data have been presented yet. The Swedish Spine Registry has already shown that a National Spine Registry can generate valid and meaningful data. Here we present first data of the first three versions of SPINE TANGO. METHOD: From 2002 until 2006, about 6000 datasets were submitted by 25 hospitals worldwide. Descriptive analysis was performed for demographic, surgery, and follow-up data comparing all three versions of SPINE TANGO. RESULTS: Over the course of its existence, the SPINE TANGO database showed a rise in median patient age from 52.3 up to 58.6 years and an increasing percentage of degenerative disease as main pathology from 60.1 up to 71.4%. Posterior decompression was the most frequent surgical measure. About one third of all patients had follow-ups. Rehabilitation was arranged more frequently, especially home-based and outpatient rehabilitation. The complication rate was decreasing below 10%. CONCLUSION: The feasibility of data analysis from the International Spine Registry SPINE TANGO could be demonstrated performing descriptive analysis with an evidence level 2++. In the near future, the meanwhile established SPINE TANGO version 3 with patient-based data will make outcome evaluations possible. This will enable us to present more comprehensive analyses of SPINE TANGO and to make the database even more beneficial for the whole spine community.

Date : 2008-08-25  
Session : General orthopaedics: Functional outcome 1  
Time : 1400-1530  
Room: 408

Abstract number : 17000

**PREDICTIVE FACTORS OF PHYSICIAN-BASED OUTCOMES AFTER POSTERIOR LUMBAR FUSION IN THE SPINE TANGO REGISTRY**

Markus MELLOH<sup>1</sup>, Thomas ZWEIG<sup>2</sup>, Emin AGHAYEV<sup>2</sup>, Lukas STAUB<sup>2</sup>, Thomas BARZ<sup>3</sup>, Peter RIEGER<sup>3</sup>, Jean-Claude THEIS<sup>1</sup>, Christoph ROEDER<sup>2</sup>

<sup>1</sup>University of Otago, Dunedin (NEW ZEALAND), <sup>2</sup>MEM Research Center/ University of Berne, Berne (SWITZERLAND), <sup>3</sup>Asklepios Klinikum Uckermark, Schwedt/ Oder (GERMANY)

INTRODUCTION: Little is known about factors predicting physician-based outcomes in posterior lumbar fusion. METHODS: Prospective consecutive study of 720 patients in the international spine registry SPINE TANGO, who had been treated with posterior lumbar fusion for degenerative disease or spondylolisthesis between 05/2005 and 10/2007. McNab criteria as commonly used physician-based outcomes were chosen as dependent outcome variable. We dichotomized the original McNab criteria combining "excellent" with "good" to "good", and "fair" with "poor" to "poor". Multivariate logistic regression was performed on potential predictor-variables. RESULTS: Median age was 63 yrs (range 13-90 yrs) with a female to male ratio of 6.3:3.7. Number of previous spinal surgeries ( $p < 0.001$ ) and follow-up interval ( $p < 0.001$ ) were found to be predictors of the dichotomized McNab criteria. Patients without previous spinal surgery showed the highest ratio of "good" to "poor" outcome (81.4%:18.2%). This ratio was almost consistently decreasing with the number of previous spinal surgeries to 40%:60% in patients with five previous surgeries. At six-week follow-up outcomes were significantly better than after one year. DISCUSSION: Predictors of physician-based outcomes in posterior lumbar fusion are "number of previous spinal surgeries" and "follow-up interval". Concerning treatment options in patients with more than four previous spinal surgeries, a higher likelihood of "poor" than of "good" outcomes should be taken into consideration. At six-week follow-up physicians should be aware that their outcome assessment may be too positive and should carefully monitor the outcome in later follow-up intervals.

**Date : 2008-08-25**

**Session : General orthopaedics: Functional outcome 1**

**Time : 1400-1530**

**Room: 408**

**Abstract number : 17114**

**OUTCOME OF REVISION TOTAL HIP ARTHROPLASTIES; A 5-YEAR RETROSPECTIVE STUDY IN A DISTRICT GENERAL HOSPITAL**

Yousaf SHAH, Turab SYED, Ravi GANGONE, Fauzia ZAFAR, Andrew FLOYD, Martin WETHERILL  
*Milton Keynes General Hospital, Milton Keynes (UNITED KINGDOM)*

**AIM OF STUDY:** To assess the clinical outcome of revision total hip arthroplasties at a district general hospital over the last 5 years.  
**MATERIALS AND METHODS:** Clinical notes and radiographs of 25 revision total hip arthroplasties were assessed between 2001 and 2006. Patients who underwent acetabular cup and/or femoral stem replacement were included and were contacted at 14 months post-operatively to assess mobility, pain and satisfaction. The indications for revision were stem and/or cup loosening and dislocations in the majority of cases. **RESULTS:** Out of 25, 16 were females and 9 males. The average age was 75 years. 9 Charnley, 6 Charnley-Elite, 2 Bateman and 2 Omnifit stems with their cups were replaced in the majority of cases. Teicoplanin was given at induction and majority were approached posteriorly. 7 cases required femoral and/or acetabular impaction bone grafting. Cemented Exeter stem and cup were used in 16 cases. 18 patients were allowed to full weight bearing immediately post-operatively. Five patients had further dislocations post-operatively and one had chest infection, treated with antibiotics. There were no cases of wound infection and/ or thrombo-embolism. Out of 5 dislocators, 2 ended up having excision arthroplasty, 1 had a long locking stem placed in and 2 were managed with physiotherapy. 21 out of 25 patients were satisfied at follow-up and 15 were mobilizing independently, where as 6 used one walking stick. **CONCLUSION:** We have a fairly satisfactory outcome (84%) following revision total hip arthroplasty in terms of mobility, pain and patients' satisfaction.

**Date : 2008-08-25**  
**Session : General orthopaedics: Functional outcome 1**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 17734**

**PREOPERATIVE FACTORS THAT PREDICT SEQUENTIAL IMPROVEMENT IN CLINICAL AND FUNCTIONAL OUTCOME FOLLOWING TOTAL KNEE ARTHROPLASTY**

Benedict ROGERS<sup>1</sup>, Lynda UNITT<sup>2</sup>, Steve CANNON<sup>3</sup>, Tim BRIGGS<sup>3</sup>

<sup>1</sup>*St Peter's Hospital, Woking (UNITED KINGDOM)*, <sup>2</sup>*Balancer Study Group, Birmingham (UNITED KINGDOM)*, <sup>3</sup>*Royal National Orthopaedic Hospital, Stanmore (UNITED KINGDOM)*

**INTRODUCTION:** The heterogeneity of the population undergoing Total Knee Arthroplasty (TKA) makes predicting outcome difficult. This prospective multi-centre study quantifies the relationship between preoperative variables and the sequential clinical and functional outcome following TKA. **METHODS:** The Oxford Knee Score (OKS), Knee Society Score (KSS) and a functional score relating to 526 primary cemented TKA, implanted into 506 patients were assessed annually for 3 years. Outcomes were quantified relative to the following patient-specific factors: patient demographics, medical comorbidities, including unilateral or bilateral knee degeneration, and preoperative knee function and alignment. One-way ANOVA or an independent T-test was used for statistical analysis (SPSS v12.0). **RESULTS:** Age predicted 3-year sequential significant differences ( $p < 0.005$ ) in KSS and function. Preoperative OKS predicted 3-year sequential significant differences ( $p < 0.01$ ) in KSS, function and OKS. Preoperative KSS predicts a 3-year sequential significant difference ( $p < 0.0001$ ) in the functional score only. No similar differences were found for the other patient-specific factors assessed. **DISCUSSION:** Patient age, preoperative comorbidity, Oxford Knee Score and KSS patient category are good discriminative factors for predicting the sequential improvement in outcome following TKA. However, preoperative knee alignment, range of movement and gender are poor discriminative factors.

**Date : 2008-08-25**  
**Session : General orthopaedics: Functional outcome 1**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 17721**

**THIRTY-DAY MORTALITY RATE AND RISK FACTORS AFTER 3232 PRIMARY THAs IN A SINGLE INSTITUTION**

Fernando COMBA, Martin BUTTARO, Ignacio ALONSO HIDALGO, Francisco PICCALUGA  
*Hospital Italiano de Buenos Aires, Buenos Aires (ARGENTINA)*

The purpose of this study was to determine the prevalence of, and associated risk factors for 30-day perioperative death following primary THA in our single institution. Between May 1993 and May 2006, 3232 primary THA (2453 elective and 779 non-elective) were performed. All patients have at least one month of follow-up with eleven deaths (0.34%) at this period. Mortality rate after elective THA was 0.08% (2 of 2453 IC 95% (0-0.4)). Mortality rate after non-elective THA was 1.15% (9 of 779 IC 95% (0.7-2.4)). To analyse the factors we conducted a 4 to 1 case-control study. Control cases were strictly matched by sex, age, surgeon, type of prosthesis and date of surgery. Conditional logistic regression was used to evaluate the association of risk factors with mortality. Elective surgery was associated with a lower risk of mortality with an Odds Ratio of 0.07 (95% CI: 0.008-0.6);  $p=0.015$ . ASA score III-IV increased the mortality risk 13 times (OR: 13.7; 95% CI: 1.6-114.8). Cardiovascular disease increased the risk for mortality 8 times (OR: 8.83 (95% CI: 1.78-43.6)). Time delay before surgery showed a trend towards significance ( $p=0.06$ ). Aggressive vs non-aggressive thromboprophylaxis and the amount of blood transfusions required were not associated with the high risk of dying. Fractures, high ASA score, cardiac disease and delay before surgery were high risk factors for 30-day mortality after primary THA.



**Date : 2008-08-25**  
**Session : General orthopaedics: Functional outcome 2**  
**Time : 1600-1730**  
**Room: 408**

**Abstract number : 17747**

**TYPE OF ANAESTHESIA FOR TOTAL KNEE ARTHROPLASTY - A STUDY ON PATIENT SATISFACTION**

Ashok MARUDANAYAGAM, Mohammad YAQOOB, Karadi Hari SUNIL KUMAR  
*Withybush General Hospital, Haverfordwest (UNITED KINGDOM)*

AIM: To find out if the patients were satisfied with the details given by the anaesthetist and the type of anaesthesia they received. MATERIALS AND METHODS: A questionnaire was prepared and all 98 patients who underwent TKA over the last 8 months were contacted over the phone and questionnaire filled up. RESULTS: 64.3% were seen by anaesthetic nurse and 35.7% by anaesthetist in pre-assessment clinic (PAC). All of them felt that they were informed about the types of anaesthesia in PAC. 94.9% mentioned that they were told about the advantages and disadvantages of each type of anaesthesia. 77.5% were admitted in hospital the day before surgery, but 22.5% were admitted on the day of surgery. 99% felt that they should be admitted the day before surgery. 96.9% rated the explanation given by the anaesthetist as excellent. 66.3% had spinal anaesthesia with sedation, 28.6% had GA, 3 had spinal without sedation and 2 had epidural. Majority (71.4%) said that they had only mild post-operative pain. 84.7% said that they would prefer same type of anaesthesia again. Out of the 15 who were not satisfied, 5 had spinal anaesthesia and 10 had GA. CONCLUSION: To conclude, most patients were satisfied with the details given by the anaesthetist and with the type of anaesthesia they received. Since every patient except one felt that they should be admitted the day before surgery, the hospital protocol for admission was changed after our study.

Date : 2008-08-25

Session : General orthopaedics: Functional outcome 2

Time : 1600-1730

Room: 408

Abstract number : 17971

**GAIT ANALYSIS OF FUNCTION AFTER TOTAL HIP ARTHROPLASTY IN COMPARISON TO RESURFACING HIP ARTHROPLASTY**

Reinhard WINDHAGER<sup>1</sup>, Werner MAURER-ERTL<sup>1</sup>, Gregor KIENBACHER<sup>1</sup>, Michael PECHMANN<sup>1</sup>, Andreas LEITHNER<sup>1</sup>, Ernst Bernhard ZWICK<sup>2</sup>

<sup>1</sup>University Clinic of Orthopaedic Surgery, Medical University of Graz, Graz (AUSTRIA), <sup>2</sup>Department of Paediatric Surgery, Paediatric Orthopaedic Unit, Medical University of Graz, Graz (AUSTRIA)

**INTRODUCTION:** For hip resurfacing arthroplasty several advantages like bone preservation, anatomical reconstruction of the hip and reduced dislocation rate have been advocated. This study aimed to evaluate the gait function before and after standard total hip arthroplasty performed by a modified Watson-Jones-Approach in comparison to resurfacing hip arthroplasty performed by a dorsal approach. **PATIENT AND METHODS:** 20 patients between 18 and 65 years of age with unilateral osteoarthritis of the hip, normal daily or sporty activity in the past and a body mass index lower than 30 were included prospectively into this pilot study. Using VICON MX10 camera system, Helen Hayes markers set and 4 centrally located force plates, gait analysis was performed preoperatively, 6 weeks, 3 and 6 months postoperatively. 8 patients received resurfacing arthroplasty, 12 patients received total hip arthroplasty. All surgeries were performed by the first author. All patients were subjected to a similar standard rehabilitation protocol. **RESULTS:** There were no statistic significant differences in gait function values between the two groups preoperative and 6 weeks postoperative. 3 months postoperative in the total hip arthroplasty group the stride length was significant longer. 6 months postoperative velocity, cadence and stride length were significant increased in the total hip arthroplasty group. **DISCUSSION:** Our very preliminary data display that patients with total hip arthroplasty walk faster 6 months postoperative. **CONCLUSION:** There is no advantage in terms of gait function values for hip resurfacing arthroplasty in comparison with total hip arthroplasty in the early postoperative period.

**Date : 2008-08-25**  
**Session : General orthopaedics: Functional outcome 2**  
**Time : 1600-1730**  
**Room: 408**

**Abstract number : 18021**

**LIFE QUALITY AND OSTEOPOROSIS**

Vladyslav POVOROZNYUK, Tetyana ORLYK  
*Institute of Gerontology AMS Ukraine, Kiev (UKRAINE)*

Research was aimed at studying the peculiarities of vertebral pain syndrome and its influence on life quality in women with postmenopausal osteoporosis in relation to localisation. OBJECT: 353 women in postmenopausal period aged from 50 to 89 years were examined and divided into groups depending on localisation and type of vertebral deformations. Research does not include the women with duration of postmenopausal period less than six months. METHODS: The questionnaire, X-ray of thoracic and lumbar spine in two projections, morphometry of vertebral analysis were used. RESULTS: According to questionnaire EuroQol-5D, Life Quality of women with fractures of only thoracic vertebrae was significantly lower ( $4.7 \pm 0.6$  points,  $p < 0.05$ ) in contrast to women with fractures of lumbar spine vertebrae ( $5.9 \pm 0.4$  points) or combined localisation fractures ( $6.4 \pm 0.5$  points). Life Quality and general condition, related to back pain caused by the osteoporosis, according to the questionnaire ECOS-16, in women with vertebral fractures of ( $52.3 \pm 6.2$  and  $53.8 \pm 2.4$  points respectively,  $p > 0.05$ ) only thoracic or only lumbar spine did not differ significantly, while women with fractures of combined localisation had a considerably lower life quality index ( $60.6 \pm 2.2$  points,  $p < 0.05$ ). CONCLUSION: Vertebral pain syndrome and its influence on life quality in women with postmenopausal osteoporosis relate to localisation.

Date : 2008-08-25

Session : General orthopaedics: Functional outcome 2

Time : 1600-1730

Room: 408

Abstract number : 18042

**CLINICAL, FUNCTIONAL AND RADIOLOGICAL EVALUATION OF TOTAL HIP REPLACEMENT IN VARIOUS PAINFUL HIP DISORDERS**

S K MUKHERJEE, A S DAU, V K JAIN

*Pt JNM Medical College & Dr B R Ambedkar Hospital, Raipur (INDIA)*

INTRODUCTION: Total Hip Arthroplasty is a very satisfying Orthopaedic Procedure to alleviate painful limitations of the hip joint in various joint diseases. Whatever type (Cemented or Non-cemented) of arthroplasty, the relief of pain and improved functional ability gives gratifying results. METHODS: From January 2001 to November 2007, 23 THA in 19 patients have been performed, in the age group of 26-73 years the average age being 40 years in 13 male and 6 female patients with various painful hip disorders, 5 AVN, 3 Seronegative Arthritis, 3 RA, 3 old # Neck Femur, 3 AS, 1 old operated excisional arthroplasty and 1 Traumatic Arthritis. 13 cemented, 4 Hybrid and 6 Non-cemented THA have been done. Posterolateral approach in 14 hips and Lateral in 4 hips were used. Follow-up assessment was done using Harris Hip Score, along with radiographic evaluation noting radiolucent lines, migration, osteolysis and heterotopic ossification. RESULT: With minimal Intra- & Postop complications we report excellent clinical and radiological outcomes after an average of one-year follow-up, with average improvement of HHS from 29 points pre-op to 91 points till last follow-up. CONCLUSION: THA provides excellent functional outcome in various painful hip pathologies depending on various factors like preoperative functional status of the hip joint, condition of the surrounding musculature, condition of the adjacent joints (knee and spine). Supervised physical therapy in the postoperative period plays an important role in restoring the functional ability of the hip joint.

**Date : 2008-08-25**  
**Session : General orthopaedics: Functional outcome 2**  
**Time : 1600-1730**  
**Room: 408**

**Abstract number : 18254**

**METAL ON METAL HIP RESURFACING: PROSPECTIVE STUDY RESULTS**

Michael GRECULA, Justin KLIMISCH  
*University of Texas Medical Branch, Galveston (UNITED STATES)*

**INTRODUCTION:** The availability of low wear metal on metal bearings has renewed interest in hip resurfacing because of the potential benefits of conserving femoral bone stock, reducing dislocation, and more normal physiological loading of bone. **METHODS:** A prospective, non-randomised study of a cobalt-chrome metal on metal hip resurfacing device was conducted. Cementless acetabular and cemented femoral components were implanted using posterior approach. Outcome measures included Harris Hip Score, Short Form 12 Outcome Questionnaire (SF-12), adverse events, and radiographic measurements. Forty-one patients (52 hips) were enrolled (31 males and 10 females). Average age was 53.5 years (34-71 yrs). Average weight 202 lbs (112-269 lbs). Diagnoses included: osteoarthritis (39), osteonecrosis (6), post-traumatic osteoarthritis (3), DDH (4). **RESULTS:** One patient (2 hips) died and one patient is lost, leaving 39 patients (49 hips) with average 2 year follow-up (1-5 years). Harris Hip Scores improved; 54.8 to 87.0 ( $p < .001$ ). SF-12 mental scores remained similar; 53.6 preop and 53.9 postop, but physical score showed significant improvement; 29.3 and 46.8. There were no dislocations, no femoral neck fractures, no infections, and no revisions. One sciatic palsy improved. Radiographically, no migration, loosening, progressive radiolucencies, or osteolysis was observed. **CONCLUSION:** These early results of metal on metal hip resurfacing are encouraging. There has been no increase in short-term complications when compared to published results of total hip arthroplasty. The high patient satisfaction and low complication rates warrant continued use of this implant design with close monitoring of the results.

**Date : 2008-08-25**

**Session : General orthopaedics: Functional outcome 2**

**Time : 1600-1730**

**Room: 408**

**Abstract number : 18365**

**OUTCOMES OF VANCOUVER B PERIPROSTHETIC HIP FRACTURE TREATED WITH LONG, CEMENTLESS DISTALLY FIXED STEMS**

Paulo Gilberto Cimbalista ALENCAR, Marcelo ABAGE, Julio KOURY

*Hospital de Clínicas-PR, Curitiba (BRAZIL)*

The management of periprosthetic femoral fractures is a challenging task. Between 1990 and 2004, we treated type B fractures in 10 patients (58 years mean age) using cementless distally fixed stems, at the Hospital de Clínicas-PR Brazil. In 3 (33%) patients the follow-up was insufficient (less than 2 years). The remainder fractures were classified as B1 (n=3) and B3 (n=4). At the end of the follow-up, 4 patients were classified as excellent and 3 as regular, according to the clinical evaluation of Merle d'Aubigné and Postel. On Beals and Towers' radiological evaluation, 6 were classified as excellent and 1 as good. All prostheses were stable and displayed good function. No patient needed second surgery. We conclude that this is a successful technique for the treatment of Vancouver B Periprosthetic Hip Fracture.

**Date : 2008-08-25**  
**Session : General orthopaedics: Functional outcome 2**  
**Time : 1600-1730**  
**Room: 408**

**Abstract number : 18408**  
**FEMOROACETABULAR IMPINGEMENT - WHERE ARE WE NOW?**

Vikas KHANDUJA<sup>1</sup>, Richard VILLAR<sup>2</sup>

<sup>1</sup>Cambridge University Hospitals NHS Trust, Cambridge (UNITED KINGDOM), <sup>2</sup>The Wellington Hospital - South Building, London (UNITED KINGDOM)

Femoroacetabular Impingement (FAI) has been implicated in causing a spectrum of injury ranging from anterior hip pain, labral tears, chondral damage, and eventually perhaps to idiopathic arthritis of the hip. Three distinct types have been described: cam, pincer and mixed, with the mixed one being the commonest. Surgical treatment of FAI is focused towards providing an adequate clearance to alleviate femoral abutment against the acetabular rim. This is achieved by restoring a normal femoral head-neck offset and recessing the acetabular rim if necessary. The treatment of FAI has been achieved with reasonable success by the open surgical dislocation as described by the Swiss group. However, the protracted postoperative recovery coupled with the trauma sustained during the open procedure, have led to the development of an arthroscopic approach to this problem. The purpose of this presentation is to provide an up-to-date knowledge of the clinical and diagnostic aspects of FAI, to describe the arthroscopic technique in detail with its pitfalls and possible complications and to discuss the current results and future of FAI.

**Date : 2008-08-25**  
**Session : General orthopaedics: Functional outcome 2**  
**Time : 1600-1730**  
**Room: 408**

**Abstract number : 18567**

**WHY SOME COUNTRIES DO NOT HAVE A NATIONAL JOINT REGISTRY**

Kayode ODUWOLE<sup>1</sup>, Mary CODD<sup>2</sup>, John O'BYRNE<sup>1</sup>, Paddy KENNY<sup>1</sup>

<sup>1</sup>Cappagh National Orthopaedic Hospital, Dublin (IRELAND), <sup>2</sup>University College Dublin, Dublin (IRELAND)

Despite the documented benefits, some countries have yet to agree on the establishment of a national joint registry. We aim to find the possible reasons why national joint registers are not established in some countries e.g. Ireland. METHOD: Questionnaire study to sample the opinions of the Consultant orthopaedic surgeons and Specialist registrars. RESULTS: 79 responses were received of 114 questionnaires (69% first response rate). 97% believe registry should be set up, 94% will contribute and 81% say it should be made compulsory for unwilling Surgeons and Hospitals to participate. 82% of respondents felt the set up cost should be borne by the government. Only 10% felt orthopaedic association should share costs. Despite the overwhelming support for a national register, privacy and liability issues were major concern. 58% of the total respondents agree that access to registry report by the general public can expose surgeons and Hospitals to a medico-legal loophole; hence access to database should be restricted. 78% agree that the registry data may be used as benchmarking tools by the administrators of health-care systems to discriminate methods, implants, surgeons and hospitals, which are found to be underperforming. CONCLUSION: There are considerable logistical challenges involved in the establishment of any registry. In a litigious society, legislation may be required to further protect the integrity of a national joint replacement registry to ensure that the data are used as intended - to serve as an early warning system for premature device failure and to improve outcomes for our patients.



**Date : 2008-08-25**

**Session : International Hip Society - Session 2: Total Hip in Young**

**Time : 0800-1215**

**Room: 603-604**

**Abstract number : 19036**

**THE INITIAL EXPERIENCE OF THE BIRMINGHAM RESURFACING REPLACEMENT IN USA. A SAFETY SURVEY FOR INTRODUCTION OF BHR WITH FOLLOW-UP OF THE FIRST 540 CASES.**

Henrik MALCHAU

*HOBBL, Massachusetts General Hospital, Boston (UNITED STATES)*

Henrik Malchau, Craig J Della Valle, Ryan M Nunley, Stephen J Raterman, Robert L Barrack. Introduction: In May of 2006 the FDA approved the first metal-on-metal total hip resurfacing. Surgeons wishing to implant this device were required to undergo formal industry sponsored training prior to performance of their first case and a technical specialist attended their initial ten cases. Material and methods: The safety surveys were completed on the first 540 consecutive cases performed and included patient age, gender, diagnosis, and occurrence of any unexpected events perioperatively or postoperatively with 1 year follow-up. Results: Adverse events were documented in forty cases and included nine nerve injuries and eight dislocations. There were fourteen early component revisions including ten for femoral neck fracture, two for dislocations and two for acetabular component loosening. Complications were frequently seen among patients older than fifty-five years of age and in women emphasizing the importance of appropriate patient selection for the procedure. Conclusions: The complication rate during the early American experience with metal-on metal hip resurfacing, while acceptable, may be higher than expected compared to conventional total hip replacement. These findings emphasize the importance of appropriate training and careful initial surveillance when introducing a new procedure.

**Date : 2008-08-25**  
**Session : International Hip Society - Complications and Conservative Options**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19037**  
**COMPUTER AIDED CUSTOM-MADE HEMIPELVIC PROSTHESIS USED IN PELVIC TUMOR INVOLVED ACETABULUM.**

Kerong DAI

*Department of Orthopaedics, Ninth People's Hospital, Shanghai Jiaotong University, Shanghai (CHINA)*

Kerong Dai, Mengning Yan -

Introduction: Approximately 10-15% of all primary malignant bone tumors involve the pelvis. Since the size of pelvic tumors are usually so large that the full resection and limb function reconstruction may be a severe challenge, especially for those with acetabulum involved. The experiences in the development and application of custom-made hemipelvic prosthesis with CAD/CAM technique in 20 cases of internal hemipelvectomy for pelvic tumor were summarized. Materials and Methods: From 1999.1-2006.1, 20 cases of internal hemipelvectomy for pelvic tumor were done and reconstructed with custom-made hemipelvic prosthesis with CAD/CAM technique. Full image information was collected from the X-ray, CT and MRI, to evaluate the possibility of adequate resection of tumor and reliable reconstruction of pelvic ring and hip joint. CT data and Rapid Prototyping Technique (RPT) were used to make a precise model of patient's pelvic for the simulated hemipelvectomy and then the remained model was used to design and manufacture the prosthesis which could be easily and accurately installed during operation, and the location and orientation of acetabulum was easy to be adjusted. Results: Six cases died 6-12 months post-operation due to metastasis and the other 14 cases had 21-72 months follow-ups with good functions and life quality. The early hip dislocations occurred in 3 cases and cured by manual reduction without recurrence. Conclusion/Discussion: Prosthetic replacement after pelvic resection may have better functional recovery, but more challenges will be induced by the complexity of prosthetic design and installation. The introduction of CAD/CAM technique and RPT can make these processes more feasible and reliable.

**Date : 2008-08-25**  
**Session : International Hip Society - Session 1: Basics**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19040**

**CERAMIC-CERAMIC VERSUS CERAMIC-POLYETHYLENE BEARING ON THE CONTRALATERAL HIP: A 20 YEARS STUDY OF 21 PATIENTS WITH OSTEONECROSIS**

Philippe HERNIGOU

*Hopital Henri Mondor, Creteil (FRANCE)*

Introduction: 21 patients with bilateral arthroplasty (one ceramic-ceramic and the contralateral ceramic-polyethylene) who had already survived 20 years without revision and without loosening of both hips were identified. Materials and Methods: All the femoral heads were alumina 32 mm and made by the same manufacturer (Ceraver Osteal France). All the cups (ceramic or polyethylene) and femoral implants were cemented and made by the same manufacturer. Both hips were performed between 1981 and 1985. The mean age at surgery was 57 years (38-64). The cohort was reviewed more than 20 years after surgery to determine osteolysis and wear in both hips. Osteolysis was measured on anteroposterior pelvic X-rays and with three dimensional volume based on CT scans at the most recent follow-up. Results: On ceramic-ceramic hips no osteolysis was detected on X-ray, and with CT scan three acetabular lesions and one calcar lesion were detected. On ceramic-polyethylene hips, using CT scan, 21 acetabular lesions and 21 calcar lesions were detected, versus 5 acetabular lesions and 17 calcar lesions on X-ray. The ceramic-ceramic hips had significantly less osteolysis in square millimeters on X-ray (average 25 for ceramic-ceramic versus 98 for ceramic-polyethylene) and in cubic millimeters on CT scan (170 for ceramic-ceramic versus 1290 for ceramic-polyethylene). Wear was undetectable on ceramic-ceramic hips (using the Livermore technique and digital calipers) as compared to ceramic-polyethylene (mean of 1,6 mm). Conclusion/Discussion: Ceramic-on-ceramic bearing displayed lower wear rates and less osteolysis.

**Date : 2008-08-25**  
**Session : International Hip Society : Session 2: Total Hip in Young**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19041**  
**ALL ALUMINA BEARINGS THR IN PATIENTS UNDER 50.**

Laurent SEDEL  
*Hopital Lariboisiere - Université of Paris (Denis Diderot), Paris, Cedex 10 (FRANCE)*

Laurent Sedel, Remy Nizard, Didier Hannouche, Pascal Bizot -All alumina couple is dedicated to young and active. Long term studies had demonstrated lack of osteolysis. Materials and methods: From patients under fifty years of age operated consecutively between 1990 and 1994, we selected an active group Devanne 3 to 5. The prosthesis was hybrid type with a cemented stem. The socket was a press fit with an alumina insert. Eighty- two hips in 74 patients, 43 males/31 females, mean age 43 (21 to50). 8 bilateral. Sixty-five were primaries, 17 had some previous operations. Postoperative complications: 2 dislocated before 3 months and never dislocated again. One had a DVT without PE. Results: 10 hips in 6 patients (12%) could not be traced), 4 hips in 3 patients deceased. Leaving 65 patients (68 hips) fully examined. Follow up is from 6 to 14 (median 8,6 years). Clinical evaluation (PMA rating): 90% 17 or 18. Radiological results: femur: 2 osteolytic lesion, no subsidence, 4 radiolucent lines incomplete, socket side: no osteolysis, no migration, 23 radiolucent lines (2 in three zones). 3 hips were revised: one for ceramic head fracture at 8.8 years, one bipolar loosening, one deep infection. Survivorship curves depicted 93% survivors at 14 years (revision for any reason), and 98% at 14 years (revision for aseptic loosening). Conclusion: This material provides excellent results at 14 years.

**Date : 2008-08-25**

**Session : International Hip Society - Complications and Conservative Options**

**Time : 0800-1215**

**Room: 603-604**

**Abstract number : 19042**

**MEAN 20-YEAR FOLLOWUP OF BERNESE PERIACETABULAR OSTEOTOMY**

Reinhold GANZ

*Inselspital, University of Berne, Berne (SWITZERLAND)*

SD Steppacher, M Tannast, Reinhold Ganz, KA Siebenrock - The goal of the Bernese periacetabular osteotomy (PAO) is to correct the deficient acetabular coverage in hips with developmental dysplasia (DDH) to prevent secondary osteoarthritis. We questioned what the 20-year survivorship of the first hips treated with the procedure was. Additionally, we asked what the clinical and radiographical outcome of the surviving hips was and if there were any factors predicting poor outcome. We retrospectively evaluated the first 63 patients (75 hips) that underwent PAO at the institution where the technique was developed. The mean age at operation was 29 years (range, 13-56 years) and preoperatively, 24% presented with advanced grades of osteoarthritis. Four patients (five hips) were lost to follow up and one patient (two hips) died. The remaining 58 patients (68 hips) were followed for a minimum of 19 years (mean, 20,4 years; range, 19-23 years) and 41 hips (60%) were preserved at last follow up. We identified 6 factors predicting poor outcome: age at operation, preoperative Merle d'Aubigné and Postel score, positive anterior impingement test, limp, osteoarthritis grade, and the postoperative extrusion index. PAO is an effective and successful technique for treating symptomatic DDH and can maintain the natural hip for at least 19 years in most patients.

**Date : 2008-08-25**  
**Session : International Hip Society - Complications and Conservative Options**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19046**  
**TOTAL HIP DISLOCATION**

Daniel J BERRY  
*Mayo Clinic, Rochester (UNITED STATES)*

Dislocation has represented the most common early complication leading to reoperation after THA for the past decade. Improved operative approaches, soft tissue closures and routine use of larger head sizes hopefully will reduce dislocation rates. Most patients with chronic dislocation are eventually treated with operative management. Traditional management has focused on remedying specific identified problems: implant malposition is treated with implant revision and repositioning; inadequate soft tissue tension is treated with trochanteric advancement or component revision to increase length or offset; and intra- or extra-articular impingement are treated with procedures to remove the source of impingement. These methodologies have yielded success in 60-80% of cases. Recently, new technologies to treat recurrent instability have become available: large diameter fixed femoral heads, non-constrained tripolar implants, and improved constrained implants. Each has strengths and weaknesses. Large diameter heads improve head-neck ratio and increase the displacement distance required for dislocation. They have only one bearing surface and no constraint. In most cases, the size is limited to 36 to 40 mm by availability. Tripolar implants provide a large head size relative to the cup, have the self-centering effect of the bipolar articulation, are not constrained at the bipolar-fixed socket interface, and are compatible with many stem designs that may not be compatible with new large fixed heads. However, they have two bearing surfaces, and the bipolar implant usually is made of conventional polyethylene, hence wear debris generation potential is greater than for large fixed heads. Constrained implants lock the ball in the socket and therefore resist dislocation most forcefully. However, constrained implants have reduced range of motion to impingement, and may transmit high loads to multiple interfaces, including the constraining polyethylene interfaces and the implant-bone interfaces. The latest data pertaining to the efficacy of each of these interventions will be summarized and discussed in this presentation.

**Date : 2008-08-25**  
**Session : International Hip Society : Session 2: Total Hip in Young**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19047**  
**THA IN DEVELOPMENTAL DYSPLASIA**  
Miguel E CABANELA  
*Mayo Clinic, Rochester (UNITED STATES)*

We like Hartofilakidis classification of developmental dysplasia in three stages: dysplasia, low dislocation and high dislocation. The anatomy is more difficult to handle in low dislocation than in dysplasia or high dislocation. Uncemented fixation is preferred today, and if possible 28 mm (or larger) prosthetic head diameter is the choice. The socket should be placed as near as possible to the anatomic center of rotation, preferably without perforating the medial wall (cotyloplasty). If there are superior and lateral deficiencies we augment them with autologous femoral head grafts. We have data which confirm both the incorporation and the longevity of these grafts (Lee BP et al: J Arthroplasty 12:503, 1997, Spangehl MJ et al: JBJS 83A:1484, 2001, Farrell, CM et al: J.Arthroplasty 20:698, 2005). This technique is simple, allows easy augmentation of acetabular bone stock if needed and facilitates future revision. On the femoral side the potential problem in dysplasia and low dislocation is the increased femoral anteversion. If minor, it can be handled with standard uncemented metaphyseal filling prosthesis; if the anteversion is significant, a small cemented stem heating the anatomy can be used. We however prefer the use of a modular femoral stem that allows to fit independently the metaphysis and the diaphysis of the femur. High dislocation is the most challenging form of DDH on the femoral side. We prefer the technique of subtrochanteric realignment + shortening + derotation and an uncemented stem performed through a transfemoral approach. This offers the advantages of best deformity correction, best restoration of anatomy and offset and no trochanteric osteotomy. However it is a complex operation with a risk of nonunion. Our results will be presented. In summary, the objectives of replacement in DDH are to restore the joint mechanics to as close to normal as possible. Meticulous technique produces a low rate of complications and results in high patient satisfaction.

Date : 2008-08-25

Session : International Hip Society - Complications and Conservative Options

Time : 0800-1215

Room: 603-604

Abstract number : 19048

**TWO-STAGE REVISION HIP REPLACEMENT WITH AN INTERVAL ANTIBIOTIC-LOADED SPACER FOR THE MANAGEMENT OF INFECTION: A 10-15 YEAR FOLLOW-UP IN 103 PATIENTS**

Clive P DUNCAN

*Vancouver General Hospital, Vancouver (CANADA)*

G Biring, T Kostamo, B A Masri, D Garbuz, C P Duncan - We report the outcomes 10-15 years after two stage revision for hip infection with use of an interval antibiotic-loaded facsimile of the hip to achieve high levels of periprosthetic antibiotic, expedite rehabilitation of the patient, and facilitate the second stage. Re-infection was the primary outcome measurement. Patient reported quality of life outcomes were the secondary measures, including the Oxford-12, SF-12, and WOMAC questionnaires. Of the 103 patients, 4 were excluded because they did not undergo a second stage. Of the remaining 99 patients, only 7 were lost to follow-up, although 2 of these had recurrent infection included in our results; a 93% follow-up rate. Forty-four were deceased with their outcome confirmed using the last follow-up data point and interview with family members. Seven patients had an early re-infection which responded to repeat surgery with no further sequelae. They were infection free. Four patients had re-infection and were characterized as treatment failures; 2 requiring a resection arthroplasty, 1 requiring hip disarticulation and 1 immuno-compromised patient living with chronic infection. We concluded that the long term success for infection control was 89% with two stages alone and 96% following additional surgical intervention. In addition, the patient reported QOL outcomes revealed no difference when compared with a matched cohort of patients who had undergone revision hip replacement for aseptic failure. Two-stage revision for the management of infected hip replacement, including the use of an interim antibiotic-loaded facsimile of the hip, offers a high level of success and a lasting solution with a functional outcome equal to the management of non-infected cases.



**Date : 2008-08-25**

**Session : International Hip Society: Session 2: Total Hip in Young**

**Time : 0800-1215**

**Room: 603-604**

**Abstract number : 19049**

**IS POLYETHYLENE STILL A SOLUTION IN YOUNG PATIENTS?**

Moussa HAMADOUCHE

*Centre Hospitalo-Universitaire Cochin-Port Royal, Paris (FRANCE)*

The weak link of articular prosthesis using polyethylene remains periprosthetic osteolysis induced by the cellular response to particulate debris. Among the solutions explored to reduce this complication, a number of studies have considered the production of polyethylene of which macromolecular chains are more linked (so-called material cross-linking). These highly cross-linked polyethylenes available since 1999 are manufactured through a high dose of radiation (> 5 Mrads) always followed by a thermal treatment (either re-melting or annealing). However, the manufacturing process is highly variable among the materials with important consequences on the tribological and mechanical properties. Practically, the augmentation of the radiation dose increases the wear resistance but reduces the mechanical properties (crack propagation resistance and ultimate tensile strength). Re-melting eliminates the risk of secondary oxidative degradation of the material but decreases the yield point. All published controlled studies at mid-term follow-up confirm that these highly cross-linked polyethylenes have a higher resistance to wear and would therefore be highly suitable in young and active patients. However another body of the literature indicates that the reduction of the mechanical properties can lead to severe failures, underlying that basic tribological rules do apply to these materials. Longer-term results are mandatory to warrant that the lower wear will result in a decreased incidence of peri-prosthetic osteolysis.

**Date : 2008-08-25**

**Session : International Hip Society - Complications and Conservative Options**

**Time : 0800-1215**

**Room: 603-604**

**Abstract number : 19051**

**MANAGEMENT OF PERIACETABULAR BONE LOSS IN REVISION ARTHROPLASTY**

Allan E GROSS

*Mt Sinai Hospital, Toronto (CANADA)*

Allan E Gross, Catherine F Kellet, Oleg Safir, David Backstein - The goals of acetabular revision surgery are to restore the anatomy and achieve stable fixation for the new acetabular component. The existing bone stock and the type of defect are the determining factors in surgical decision making. When necessary, and especially in younger patients, attempts should be made to restore the bone stock by grafting. The advent of modern reconstruction options, like the trabecular metal revision system and the cup-cage construct, provide more options in addressing the management of severe defects. Trabecular metal has a porosity similar to bone and provides an environment more favorable to bone graft remodeling than conventional metals. Contained (cavitary) acetabular defects can usually be managed by conventional uncemented cups (jumbo if necessary) and morsellized bone graft. If however contact with bleeding host bone is less than 50% we use trabecular metal cups. For massive contained defects requiring a large amount of morsellized bone graft we use a combination of a trabecular metal cup with a cage (cup cage construct). Uncontained defects involving less than 50% of the acetabulum are managed by structural allografts in high demand patients and trabecular metal augments in low demand patients. Uncontained defects involving greater than 50% of the acetabulum are managed by structural allografts protected by a cage in high demand patients and by trabecular metal column augments in low demand patients. We will present an overview of our experience and current approach to acetabular revision.

**Date : 2008-08-25**  
**Session : International Hip Society - Session 1: Basics**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19052**  
**IN VIVO MEASUREMENT OF POLYETHYLENE WEAR IN THJR**

Peter A DEVANE  
*Wellington Hospital, Wellington (NEW ZEALAND)*

Peter A Devane, J Geoffrey Horne - Introduction: Measurement of polyethylene (PE) wear in THJR is performed by measuring change in the position of the femoral head on post-operative radiographs. The aim of this paper is to describe two new methods for measuring PE wear. Materials and Methods: 1. The Automated Measurement Technique (AMT), where software has been developed which locates the centre of the acetabular cup and femoral head on both the anteroposterior and lateral radiographs. No user input is required. Accuracy is  $\pm 0.16$  mm. 2. The Model Matching Technique (MMT), where two pieces of software are combined, Ray-Tracing technology (used in the generation of animated movies), and the Genetic Algorithm (a branch of Artificial Intelligence). CAD models of an acetabular cup and femoral head are matched to post-operative films to position them in 3D space. Change in position of these models over time represents PE wear. Results: The AMT was used to measure the PE wear of 116 patients enrolled in a prospective RCT comparing conventional and cross-linked PE. At a follow-up of 2 to 4 years, cross-linked PE showed statistically significant lower PE wear than the conventional material. A cadaver pelvis and femur has been used to analyse accuracy of the MMT for measurement of component migration. Preliminary results show an accuracy of  $\pm 0.22$ mm for component migration. The accuracy of PE wear measurement appears to be significantly less than this. Conclusions: Two new methods of in-vivo wear measurement of THJR have been developed to analyse the performance of new bearings.

**Date : 2008-08-25**  
**Session : International Hip Society - Session 1: Basics**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19056**

**OPENLY REPORTED QUALITY INDICATORS IN THE SWEDISH HIP ARTHROPLASTY REGISTER**

Peter HERBERTS

*Sahlgrenska University Hospital, University of Gothenburg, Göteborg (SWEDEN)*

Peter Herberts, Johan Kärrholm, Göran Garellick - The Swedish Hip Arthroplasty Register was initiated in 1979. All public and private orthopaedic units in Sweden participate voluntarily in the register. The mission is to improve the outcome of THR-surgery. We think that feed-back of data stimulates the participating clinics to reflect and to improve. The register is the basis for a continuous learning process. 270.031 primary THR 1979-2006, 31.951 reoperations and 25.984 revisions are included in the analysis. Patient-related outcome is measured 2002-2006 on 37.143 cases. Since 1999 almost all data to and back from register are reported via a specific web application. In 2002 an extended model was introduced for follow-up based on patient-related outcome. Factors such as co morbidity, health-related quality of life (EQ-5D), pain relief and patient satisfaction based on VAS-scales were introduced. Important factors that describe the quality of the outcome is reoperation within 2 years of the primary THR, implant survival at 5 and 10 years and health related quality of life gained at 1 year follow-up according to EQ-5D. Pain relief and overall satisfaction at 1 year according to VAS-scales are included and openly reported variables have increased to 8. We found that some clinics have an unexplained high frequency of reoperations because of early dislocations, some have more infected cases and other units have low patient satisfaction not corresponding to the expected outcome. The information is described in a clinical value compass besides tables giving an immediate picture of the quality at the unit to initiate a deep analysis if problems are obvious. Every unit compares their own compass to the mean of the nation. This open comparison is important to start a continuous learning process and improve the outcome on a local as well as a nation-wide base.

**Date : 2008-08-25**  
**Session : International Hip Society (open session)**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19054**  
**STEM REVISION: SOME SPECIAL TOOLS**

Laurent SEDEL

*Hopital Lariboisiere, Université of Paris (Denis Diderot), Paris, Cedex 10 (FRANCE)*

Some special tools are currently used in the department. Cement retrieval is at the moment performed since 9 years using Ultra sound (Oscar\*) material. This very successful tool allows us to perform retrieval of cemented stems without the help of fenestration. Then medullary canal is reamed in order to receive either a cemented or sometimes a cementless stem. For Paprowsky type 2, 3 A or B lesions at the femur level we modified Exeter technique. We used since 1999 hydroxyapatite granules (45 cases) to fill the medullary canal, and then impact a long stem into a fluid cement. Results in 37 cases presented interesting results with a regular complete restoration of cortical bone and limited subsidence. This can be done either with a cemented or a cementless stem. In case of very severe bone loss and osteolysis, we performed massive allogenic bone transplant associated with long cemented stem and distal HA granules with cement.(18 cases).As we usually performed one stage revision for septic cases, strategy is not different. It is only in selected cases with many sepsis recurrence and specially aggressive bacteria that we performed a two stage procedure. Our goal is always to get a step down to keep the maximum living bone; and also to get the best functional outcome permitted.

**Date : 2008-08-25**  
**Session : International Hip Society - Session 1: Basics**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19055**

**CERAMIC-CERAMIC VERSUS CERAMIC-POLYETHYLENE BEARING ON THE CONTRALATERAL HIP : A 20 YEARS STUDY OF 21 PATIENTS WITH OSTEONECROSIS**

Philippe HERNIGOU  
*Hôpital Mondor, Creteil (FRANCE)*

Introduction: 21 patients with bilateral arthroplasty (one ceramic-ceramic and the contralateral ceramic-polyethylene) who had already survived 20 years without revision and without loosening of both hips were identified. Materials and Methods: All the femoral heads were alumina 32 mm and made by the same manufacturer (Ceraver Osteal France). All the cups (ceramic or polyethylene) and femoral implants were cemented and made by the same manufacturer. Both hips were performed between 1981 and 1985. The mean age at surgery was 57 years (38-64). The cohort was reviewed more than 20 years after surgery to determine osteolysis and wear in both hips. Osteolysis was measured on anteroposterior pelvic X-rays and with three dimensional volume based on CT scans at the most recent follow-up. Results: On ceramic-ceramic hips no osteolysis was detected on X-ray, and with CT scan three acetabular lesions and one calcar lesion were detected. On ceramic-polyethylene hips, using CT scan, 21 acetabular lesions and 21 calcar lesions were detected, versus 5 acetabular lesions and 17 calcar lesions on X-ray. The ceramic-ceramic hips had significantly less osteolysis in square millimeters on X-ray (average 25 for ceramic-ceramic versus 98 for ceramic-polyethylene) and in cubic millimeters on CT scan (170 for ceramic-ceramic versus 1290 for ceramic-polyethylene). Wear was undetectable on ceramic-ceramic hips (using the Livermore technique and digital calipers) as compared to ceramic-polyethylene (mean of 1,6 mm). Conclusion/Discussion: Ceramic-on-ceramic bearing displayed lower wear rates and less osteolysis.

**Date : 2008-08-25**  
**Session : International Hip Society - Session 1: Basics**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19057**  
**FOREIGN BODY REACTION AFTER TOTAL HIP ARTHROPLASTY**  
William J MALONEY  
*Stanford University School of Medicine, Stanford (UNITED STATES)*

Total hip arthroplasty is a reliable procedure for pain relief for patients with end stage arthritis of the hip. Short term outcomes are excellent and short term failure is primarily related to infection or instability. Over the long term, generation of particulate wear debris results in a foreign body reaction that can lead to implant loosening and periprosthetic osteolysis. Foreign body wear debris can be generated at several locations. The primary source of particulate wear particles is the bearing surface. However, other sources include modular junctions, the implant-bone interface as well as the bone-cement interface with cemented implants. The impact of foreign body wear debris on the periprosthetic bone is related to three factors: 1) The particle load, 2) Access of the particles to the implant-bone interface and periprosthetic bone, 3) The biologic response to wear debris. The particle load is a critical factor in determining whether the foreign material will have an impact on implant survivorship. Several clinical studies have documented the relationship between the volumetric wear of polyethylene and the development of the periprosthetic osteolysis as well as loosening of cemented acetabular components. There appears to be a threshold below which the body is capable of sequestering foreign material without significant biologic impact. This likely varies from individual to individual. Access of particles to the implant bone interface or periprosthetic bone is obviously critical in determining whether a bony reaction occurs. Several studies have demonstrated the impact of circumferential porous coating on femoral components eliminating access to the diaphyseal bone and preventing diaphyseal osteolysis. Similarly, screw holes in the acetabulum as well as central holes for acetabular component insertion have been shown to be access channels for wear debris to the surrounding bone. The biologic reaction to foreign body wear debris has been well documented. Wear particulates are phagocytosed by macrophages. High particle load leads to secretion of enzymes which are capable of digesting bone organic matrix as well as cytokines that result in orthoclastic activation and bone absorption. Again, there is likely to be some individual variation in the degree of response from a biologic standpoint. The long-term survivorship of hip replacement implants depends on limiting the particle load as well as limiting access to periprosthetic bone. Modern implant designs as well as new bearing surfaces should have a marked impact on both the problem of osteolysis as well as long term implant failure.

Date : 2008-08-25  
Session : Session 2: Total Hip in Young  
Time : 0800-1215  
Room: 603-604

Abstract number : 19058

**MINIMUM 5 YEAR FOLLOW-UP RESULTS OF TOTAL RESURFACING ARTHROPLASTY IN PATIENTS WITH OSTEONECROSIS OF THE FEMORAL HEAD**

Myung Chul YOO

*Center for Joint Disease, Kyung Hee University, Seoul (KOREA)*

Myung Chul Yoo, Yoon Je Cho, Kang Il Kim, Young Soo Chun, Kee Hyung Rhyu - Introduction: This study was performed to assess the overall clinical and radiological results of the total resurfacing arthroplasty for the patients with osteonecrosis of the femoral head (ONFH) after at least 5 years-follow-up. Materials and Methods: 444 hips of ONFH received resurfacing arthroplasty from Sep 1998 to Mar 2008. 88 hips which were followed up minimally 5 years were included in this study. Among 88 hips (79 patients) of ONFH that have underwent hip resurfacing arthroplasties from Dec 1998 to Apr 2003, 85 hips (76 patients) were available for the complete study. The mean age at the time of operation was 37 (16-67) years old. The average follow-up period was 80 (60-112) months. The patients were analyzed clinically and radiographically. Results: The Harris hip score increased from 77.8 preoperatively to 98.4 at the final visit. Hip abduction/adduction and rotations significantly improved after the operation. Flexion contracture disappeared and further flexion also returned to almost normal. No patient complained of limb length discrepancy and pain on the hip or thigh at the last visit. Although they are not related to the clinical results, some cases showed various types of radiographic changes in the neck of the proximal femur. Neck narrowing was observed in 3 hips. There was no detectable wear or change of position of the acetabular cup and femoral stem. There was no femoral neck fracture or reoperation case. Conclusion/Discussion: Our experience with resurfacing arthroplasty in osteonecrosis of the femoral head indicates that the overall results are superior to conventional THA in the aspect of pain relief, the range of hip motion, earlier rehabilitation and earlier return to preoperative activity. This procedure of hip resurfacing arthroplasty could be an alternative between joint preserving procedures and THA in the case of early-to-mid staged osteonecrosis of the femoral head especially in younger patients who need arthroplasty. Extent and location of necrosis, and bone quality are the most important factors in resurfacing arthroplasty in osteonecrosis.



**Date : 2008-08-25**  
**Session : International Hip Society - Session 1: Basics**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19059**  
**FIVE TO 7 YEARS EXPERIENCES WITH HIGHLY CROSS-LINKED PE**

Johan KÄRRHOLM  
*Sahlgrenska University Hospital, University of Gothenburg, Mölndal (SWEDEN)*

Johan Kärrholm, Georgios Digas, Jonas Thanner, Peter Herberts - This is an extended the follow up of uncemented and cemented sockets with use of highly cross-link polyethylene (PE) (1). Patients and Methods. Hybrid Study: Thirty-two patients with a median age of 48 years with bilateral osteoarthritis of the hip received bilateral simultaneous hybrid total hip arthroplasties. They randomly received Trilogy cups with either a highly crosslinked or conventional PE liner (Zimmer, USA). Repeated radiostereometric examinations (RSA Biomedical, Sweden) were done up to 5 years. Cemented Study: Sixty patients (61 hips) with a median age of 55 years participated. The patients were randomized to either highly cross-linked or conventional all-PE cups. Repeated RSA examinations were done up to 7 years. 28 mm CoCr heads were used in both studies. Results. Hybrid Study: The mean proximal penetration at 1 year was 0,08 and 0,12 mm in the highly cross-linked and control groups, respectively ( $p = 0,07$ ). During the remaining follow up period the proximal mean penetration remained unchanged in the highly cross-linked group but increased to 0,29 mm in the control group  $p < 0,0005$ . Cemented study: Up to 6 months the proximal penetration was close to 0.1 mm in the two groups ( $p=0,6$ ). Between 6 months and 2 years the penetration rate increased more in the control group and continued to increase up to 7 years. In the study group increased penetration was observed between 5 and 7 years ( $p=0.03$ ). At 7 years the mean proximal penetration was still higher in the control group ( $0.46 \text{ mm} \pm 0.06$  vs.  $0.23 \pm 0.07$ ,  $p < 0.0005$ ). Discussion: After the bedding in period the wear for the two types of highly cross-linked polyethylene is undetectable up to 5 years. The increase noted after 5 years in the Durasul group (cemented cups) was unexpected. Reference: (1) Digas et al. Acta Orthop. 2007 Dec;78(6):746-54.

**Date : 2008-08-25**  
**Session : International Hip Society - Complications and Conservative Options**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19060**  
**50 YEARS OF CHIARI'S PELVIC OSTEOTOMIES**  
Rainer Ingo KOTZ  
*Medical University of Vienna, Vienna (AUSTRIA)*

Rainer Kotz, Catharina Chiari - Introduction: In 1944 Karl Chiari had the idea of a pelvic osteotomy. After thorough investigation of the anatomy he did his first operation in 1955 on a 4 year old girl with a dislocation of the hip joint. The good success of the procedure encouraged him to do the operation frequently. When Salter published his osteotomy, Chiari had already 7 years of experience. Chiari himself performed more than 2000 osteotomies during his lifetime. Even after Chiari's death in 1982 the Chiari osteotomy was frequently performed at the Orthopaedic Department in Vienna. Materials and Methods: The technique is a minimal invasive surgery between tensor fascia latae and sartorius muscle, which exposes the iliac notch by radiolucent spatulas to protect the sciatic nerve. The osteotomy is performed by straight chisels in a curved manner around the capsule of the hip joint and below the reflected head of the rectus muscle ascending to the iliac notch by 10o. By abduction of the leg the lower pelvis is medialised. The technique changed after Chiari's death from plaster cast to fixation of the osteotomy with two parallel wires to avoid immobilisation. 22 papers were published in the literature by Chiari and his pupils from 1953 to 1991. 102 secondary publications of Chiari's osteotomy are available. A comprehensive study by Windhager et al in 1991 gave in long term survivors (20-35 yrs) 50% excellent, 30% fair and 20% poor results. In memory of Chiari's osteotomy a long term surveillance of nearly 1000 cases is being performed. Results: According to the good results of durable bearings in total hip arthroplasty and the use of endoprostheses in younger patients the indication for Chiari's osteotomies was dramatically reduced. At present the operation is only used in a few cases a year in young patients with severe dysplasia of the hip joint.

**Date : 2008-08-25**

**Session : International Hip Society - Complications and Conservative Options**

**Time : 0800-1215**

**Room: 603-604**

**Abstract number : 19064**

**RESULTS OF BERNESE PERIACETABULAR OSTEOTOMY IN PATIENTS OVER AGE FORTY**

Michael B MILLIS

*Children's Hospital Boston, Boston (UNITED STATES)*

Michael B Millis, Young-Jo Kim, Robert Trousdale, Rafael Sierra, Perry Schoenecker, John C Clohisy - Introduction: No study to date has evaluated patients over forty treated with PAO. We report collective results in 3 American centers with large PAO experience. Materials and Methods: 73 patients(89 hips) with DDH older than age 40 treated with PAO were reviewed at minimum 2years after surgery. Clinical outcomes were measured with HHS and WOMAC. Mean age at surgery 44 years. Mean pre-op lateral C-E angle was 8 degrees, anterior C-E angle was 5 degrees, Tönnis grade was 0.8. Mean Tönnis roof angle was 22 degrees. Results: At last follow-up, 66 of the original 89 hips were still functioning. Two patients died. 21 hips underwent THR, at mean 5.2 years after PAO. Mean post-op lateral C-E angle was 30 degrees, anterior C-E angle 30 degrees, Tönnis roof angle 7.5 degrees, and Tönnis grade was 1.2. No significant differences were noted in pre-op radiographic angles between hips surviving and those requiring THR. There was a difference in pre-op Tönnis grade between surviving hips and those requiring THR: pre-op Tönnis in the survival group being 0.7. Mean pre-op Tönnis grade in hips requiring THR was 1.2 ( $p=0.016$ ). Significant improvement was noted in WOMAC scores (pre-op 8.6; post-op 3.0) and Harris hip score (pre-op 61; post-op 90). Preoperative Tönnis grade was the single parameter statistically associated with THR: Pre-operative Tönnis grade for surviving hips mean being 0.7. Mean pre-op Tönnis grade for hips requiring THR was 1.2, ( $p=0.016$ ). Conclusion: PAO gave generally very satisfactory outcomes in patients over age 40. Pre-operative radiographic arthrosis was a significant predictor of failure to THR. dGEMRIC MRI may improve decision-making.

**Date : 2008-08-25**

**Session : World Federation of Hemophilia (WFH)**

**Time : 1400-1730**

**Room: 603-604**

**Abstract number : 18003**

**RADIOISOTOPE SYNOVECTOMY IN CHILDREN WITH HEMOPHILIA BELOW 10 YEARS OF AGE**

Semih AYDOGDU, Kaan KAVAKLI, Memduh TANER, Can BALKAN, Dilek KARAPINAR

*Ege University Hospital, Izmir (TURKEY)*

During a 7-year period, we treated 41 joints of young (below 10 years of age) children by radioisotope synovectomy (RS) for refractory chronic haemophilic synovitis. These patients consisted of 23% of all our RS cases (n=221). The youngest age at the time of treatment was 3. Of 41 joints treated 19 were knees, 11 elbows and 11 ankles. We used Yttrium 90 as radioisotope agent in all knees and also in 8 ankles and 5 elbows dosed according to the patient's age and amount of synovial tissue (3 to 4 mCi for knees; 2 to 3 mCi for others). Additionally, we used Rhenium 186 in 6 elbows and 3 ankles. RS was performed in joints with grade II and III synovitis according to the Fernandez-Palazzi's 4-grade scale. Evaluation was based on the decreasing rate of bleeding episodes. We did not observe any serious complication. We only encountered transitory inflammatory changes around the ankle joint treated by Y-90 in a 5-year-old boy. The grading of synovitis seemed to be more important for the success than the age of patient. Even in patients below 10 years old, outcomes were less satisfactory if grade-III synovitis established. RS seems to be a safe and effective modality for treatment of chronic synovitis related to recurrent joint bleedings. Young age did not seem as a success guaranteeing factor. Once synovitis progressed and articular cartilage damage has occurred, response to treatment was less satisfactory even in young patients.

**Date : 2008-08-25**  
**Session : World Federation of Hemophilia (WFH)**  
**Time : 1400-1730**  
**Room: 603-604**

**Abstract number : 18993**  
**OSTEO ARTICULAR INVOLVMENT IN HAEMOPHILIACS OF CENTRAL INDIA**  
Vinod BHARADWAJ  
*tbc, Bhopal (INDIA)*

Introduction: Haemophilic Osteo arthropathy is clearly a Complication of recurrent bleeding in Haemophilic joint but the mechanism involved in humans is not well understood as very few histopathological specimens are available so presently understanding is basically from animal models. To fill up this gap, this Clinicohaematological study was carried out in haemophilia care centre Hamidia Hospital by Orthopaedic and Pathology Department Gandhi Medical College Bhopal Central India. Material and Method: Total 30 Patients who visit Haemophilia care centre Bhopal regularly was included in this study. The Detailed clinical history as regard to age of onset, site, frequency of bleeding, nature of pain and treatment taken was regarded. Comprehensive clinical examination and Haematological profile was undertaken. Observations: Haemophilia A in 93.3% and Haemophilia B in 6.7% of patients were observed. Average age of onset of bleeding episode was 2.9Yrs. Majority of patients (73.5%) had 1-5 bleeds per year. In 30 patients frequency of haemarthrosis was 47.2% in knee, elbow 25% ankle shoulder and wrist was 19.4%. Commonest knee deformity was flexion ( 44%) followed by valgus ( 26.4%) and varus ( 11.7%). Tenderness unlike pain was not a major feature, Movement restriction was observed in 55% of joints affected. In the Radiological examination epiphyseal Widening, Cyst, reduction in joint space, irregular Cartilage surface, Osteophytes. Treatment received was categorized in three modalities. First no treatment, second only AHF, and third AHF with physiotherapy received. Summary and conclusions: 30 patients were examined clinically, radiologically and haematologically. Total 72 joints were found affected in above patients ranging from 6 yrs. to 58 years. Most common joint observed was knee joint and flexion. Attempts were made to assess the musculoskeletal disorder in early stage to provide adequate medical help.

Date : 2008-08-25  
Session : World Federation of Hemophilia (WFH)  
Time : 1400-1730  
Room: 603-604

Abstract number : 18994

**BLOOD INDUCED JOINT DAMAGE AS A RESULT OF RECURRENT INTRA-ARTICULAR BLEEDS**

Goris ROSENDAAL, N.W.D. JANSEN, F.P. LAFEBER  
*University Medical Center Utrecht, Utrecht (NETHERLANDS)*

Recurrent intra-articular bleeds ultimately lead to severe joint destruction. Joint bleeds can occur after joint trauma, and are despite prophylactic treatment frequently seen in hemophilia patients. Such patients often develop severe arthropathy in time. Because of the delay between joint bleeding and the subsequent clinically apparent joint damage, it is difficult to establish the exact pathogenetic mechanism of blood-induced arthropathy. Both the synovial tissue and the cartilage are involved in this process. Cartilage is directly affected by joint bleeds. Exposure of cartilage to blood (independent of synovial tissue and inflammatory mediators) results in adverse changes in chondrocyte activity. In vitro studies have shown that this is caused by the induction of apoptosis of chondrocytes by hydroxyl radicals formed upon exposure to blood. These hydroxyl radicals are formed when hydrogen peroxide production by chondrocytes is increased upon stimulation by pro-inflammatory cytokines such as IL-1, originating from activated blood monocytes/macrophages as present in the blood within the joint. H<sub>2</sub>O<sub>2</sub> reacts with hemoglobin-derived iron from damaged and phagocytosed red blood cells in the vicinity of chondrocytes leading to the formation of radicals that induce apoptosis. Surprisingly, despite this knowledge, the current opinion amongst physicians is that a few joint bleeds are acceptable, and consequently, blood-induced joint damage is still frequently seen. Therefore, we searched for possible modalities that are able to diminish or even prevent joint damage caused by a joint hemorrhage. In this light, we evaluated the potential benefit of immunoregulatory cytokines.

**Date : 2008-08-25**  
**Session : World Federation of Hemophilia (WFH)**  
**Time : 1400-1730**  
**Room: 603-604**

**Abstract number : 19002**

**PERCUTANEOUS TREATMENT OF CHRONIC HAEMOPHILIC ARTHROPATHY**

Federico FERNÁNDEZ PALAZZI, Rafael VISO, Absara BOADAS, Arlette SAEZ, Norma DE BOSCH  
*Orthopaedic Unit, National Haemophilia Center, Caracas (VENEZUELA)*

CHRONIC HAEMOPHILIC ARTHROPATHY BEST TREATMENT CHRONIC ARTHROPATHY... IS PREVENTION WITH CORRECT TREATMENT OF ACUTE BLEEDING. PERCUTANEOUS TREATMENT: LONG STANDING CORTICOSTEROIDS 1 injection every 3 weeks for 3 to 5 (Grades III and IV - latin American classification - )SUBJECTIVE EVALUATION: GOOD (8 to 10 points ):No pain, Increase ROM . Total integration ADL. FAIR (5 to 7 points):Diminution pain. Same R.O.M. Limited A.D.L. BAD (1 to 4 points):Persistence pain. Diminution R.O.M. Big limitations to A.D.L. RESULTS: SUBJECTIVE: Good 56%, Fair 35%, bad 12%. OBJECTIVE: Good 65%, Fair 26% and bad 12%Due to anti inflammatory fibrosing action, acts diminishing painfull irritability, ameliorating the ROM. Possible further destruction of the cartilage is a price to pay further benefits mentioned. HYALURONIC ACID I inyection weekly 3 times with 1 reinforced dosage in one month. SUBJECTIVE. PAIN: PAIN 0 none, 10 requires medication. RANGE OF MOVEMENT 0 none, 10 full R.O.M. USE OT THE EXTREMITY 0 non weight bearing , 10 normal D.L.A. OBJECTIVE EVALUATION .Joint diameter, ROM.EXCELLENT NO PAIN (0) , Good diminuty pain 5 or more, FAIR diminution pain less than 5, and BAD required other procedure to calmate painMean of injections 3.1. MEAN reduction of PAIN 4.7, 17 knees : 5,7 / 6 shoulders : 5 / 4 ankles : 6 / 1 hip 0 / 1 elbow 7. RESULTS: 5 years INCREASE USE mean 2,1, knees 2,5 / ankles 2,5 / hip 0 / elbows 3, shoulders 2,6. DIAMETER mean > 1, 7 cmts. in knees, < 5 cmts. in elbows RANGE OF MOVEMENT: KNEES > 5,7 degrees extension with 0 flexion / ankles < 5 degrees dorsiflexion 5 degrees plantar flexion / elbow > 10 degrees flexion without change extension. EXCELLENT 4 : 3 shoulders, 1 knee, GOOD 18 : 12 knees, 4 ankles, 1 shoulder, 1 elbow. FAIR 4 : 2 shoulders, 1 knee, 1 ankle. BAD 3 : 2 knees, 1 hip.

Date : 2008-08-25  
Session : World Federation of Hemophilia (WFH)  
Time : 1400-1730  
Room: 603-604

Abstract number : 18996

**SYNOVITIS TREATMENT WITH INTRAARTICULAR P32-COLLOID IN HEMOPHILIACS**

Victoria Ester SOROA<sup>1</sup>, Carlos GIANNONE<sup>1</sup>, Horacio CAVIGLIA<sup>2</sup>, Gustavo GALATRO<sup>2</sup>, N. MORETTI<sup>3</sup>

<sup>1</sup>National Commission of Atomic Energy Argentina, Buenos Aires (ARGENTINA), <sup>2</sup>Hemophiliac Foundation & Traumatology - Hospital Fernandez, Buenos Aires (ARGENTINA), <sup>3</sup>Hemophiliac Foundation, Orthopedic Division - Hospital Fernandez, Buenos Aires (ARGENTINA)

Aim: To assess radiosynovectomy outcome with P-32 enlarged colloidal preparation predominantly in synovitic inflamed knees & elbows of hemophilic (H) patients, proved in a 3-Bone phase scan. Evaluate the therapeutic cost/benefit ratio. Material & Methods: Sixty five hemophilic male patients, ages: 4-51 years, sent by the Hemophilic Foundation, were enrolled for knee (62) and elbow (3) radiosynovectomy with an enlarged chromic phosphate P-32 colloid. Comparison was drawn from i.a synovitic treatment with the antibiotic Rifamicin (15). Informed consent was obtained. Routine blood tests performed, X-ray, US & a 3-phase bone scan, plus a 3 and 6month MDP controls. Exclusion criteria: bone destruction as by Larsens´ classification. Patients were blind to the type of treatment received. Records in follow-up charts on state of joint involvement, pain, motility, requirements of antihemophilic factors (AHF), corticoids or analgesics. Joint aspiration when required. Saline flushing followed intra-articular instillation. P-32 Bremsstrahlung emission was used in the gamma camera for imaging & in the gamma well counter. Percent of Leakage was investigated counting blood and urine samples in the well counter. Immobilization for 72-h followed the procedures. Results: Absence of local or systemic effects. Leakage with the 200 nm colloid was less than 5-7 per cent Traditional intraarticular Rifamicin and corticoids procedures required several injections. Comparison of Rols in treated knees during soft tissue scintigraphies in pre and post third MDP controls and obtaining a Severity Index (SI) showed knee improvement when SI was higher than 1. The follow-up evaluation demonstrated an increase in join motion, diminished volume and less requirement and frequency of the use of AHF in 86 per cent of the radiosynovectomies (60|65), thus lowering health costs. Conclusions: Knee radiosynoviorthesis in H patients in early staging of osteoarticular compromise (Larsen 2-3), has 4-6 month relief of symptoms. Radiosinovectomy turned out to be a safe, economic procedure in emerging nations, where availability of AHF is difficult and expensive.



**Date : 2008-08-25**  
**Session : World Federation of Hemophilia (WFH)**  
**Time : 1400-1730**  
**Room: 603-604**

**Abstract number : 18997**

**REVISION SURGERY AFTER TOTAL KNEE REPLACEMENT IN HAEMOPHILIC PATIENTS**

Luigi Piero SOLIMENO<sup>1</sup>, Olivia PERFETTO<sup>1</sup>, C. CASADEI<sup>1</sup>, Gianluigi PASTA<sup>2</sup>

<sup>1</sup>Hemophilic Arthropathy Treatment Center "M.G. Gatti Randi", CTO Hospital, Milan (ITALY), <sup>2</sup>Traumatology Department and Angelo Bianchi Bonomi Hemophilia Center, IRCCS Maggiore Hospital Foundation, Milan (ITALY)

Introduction: Knee arthroplasty is the treatment of choice in advanced hemophilic arthropathy, even if a high complication rate has to be considered. The revision of a total knee replacement (TKR) is a challenging surgery considering lack of bone stock, ligamentous instability, stiffness and tissues necrosis. Methods: We reviewed our experience since 1993 of 116 TKR performed on 98 PWH. Clinical data on 17 revision surgeries (10 deep infections and 7 aseptic loosening) performed at a single Centre in 16 patients with haemophilia A or B (3 with inhibitors) were reviewed. The Hospital for Special Surgery knee-rating score (HSS), data on knee flexion contracture and range of motion were collected before, after surgery and after a short-term follow-up. Results: The median duration of follow-up after revision surgery was 27 months (range: 6-132). One patient died 15 months after surgery for causes unrelated to revision. The two-stages exchange technique was used in 4 cases of deep infections. For the persistence of infection, of the remaining 6 cases: 3 needed resection arthroplasty and 3 arthrodesis. Three deep infections and 1 aseptic loosening of the revised implant occurred after a median of 18 months and after 84 months, respectively. In all these cases a re-revision was performed. Conclusions: Our results show that knee revision arthroplasty is often complicated with infections, nevertheless it remains the only surgical option to maintain joint mobility. Keywords: revision surgery, total knee replacement, haemophilia.

**Date : 2008-08-25**  
**Session : World Federation of Hemophilia (WFH)**  
**Time : 1400-1730**  
**Room: 603-604**

**Abstract number : 19073**

**EXTRADURAL HEMORRHAGE CERVICAL SPINE IN PATIENTS WITH HEMOPHILIA**

Muhammad TARIQ SOHAIL

*Services Institute of Medical Sciences., Lahore (PAKISTAN)*

Extradural Hemorrhage Cervical Spine in young Hemophiliac children & adolescent is rare and result can be very devastating because of variable neurological deficit. A case of young child of 9 years is presented with EDH in Cervical Spine resulting in Quadriperesis in presented Cervical Spine was decompressed & patient recovered slowly over the period of six months & regained ambulatory friction. The related literature is reviewed

**Date : 2008-08-25**  
**Session : World Federation of Hemophilia (WFH)**  
**Time : 1400-1730**  
**Room: 603-604**

**Abstract number : 19074**  
**HETROTOPIC OSSIFICATION IN PATIENTS WITH HEMOPHILIA**  
Muhammad TARIQ SOHAIL  
*Services Institute of Medical Sciences., Lahore (PAKISTAN)*

Hetrotopic Ossification in an unusual sequelae of soft tissue bleeding in patient with Hemophilia previous cases reported have other predisposing factors like auto immune disorder, history of CNS trauma case is presented with Extradural hemorrhage with Quadriperesis which resulted in Hetrotopic Ossification involving both Hips. Bone - Scan, CT scan including 3D reconstruction, were carried out Hetrotopic bone mass was resected out to mobilize the Hips & allow frictional range of motion.

**Date : 2008-08-25**  
**Session : World Federation of Hemophilia (WFH)**  
**Time : 1400-1730**  
**Room: 603-604**

**Abstract number : 19122**  
**ORTHOPEDIC SURGERY IN PATIENTS WITH HEMOPHILIA**  
Muhammad TARIQ SOHAIL  
*Services Institute of Medical Sciences, Lahore (PAKISTAN)*

Lahore Hemophilia Centre is a very active centre for the treatment of Hemophilia patients. Total registered patients are 350. Almost 40 % of the patients have Musculoskeletal issues ranging from Hemophilia Arthropathy to Fractures, Soft Tissue Contracture, Hemophilic Cyst and Pseudo Tumors. The previous by treatment has been administrating cryoprecipitate and non-operative treatment in most of the patients. But with the provision of factor VIII and Factor IX, its been possible to treat this patient in a more updated line of management. The centre has come a long way in providing treatment with purified factors for management of Musculoskeletal complications of Hemophilia. Though there are huge areas of development and we hope with the centre will progress to provide advance treatment as in developed countries

**Date : 2008-08-25**  
**Session : General orthopaedics: Cost effectiveness**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 16345**

**ANALYSIS OF EARLY RESULT DISCHARGE PATTERN OF RESURFACING METAL ON METAL TOTAL HIP ARTHROPLASTY**

Dariush GOURAN SAVADKOOHI<sup>1</sup>, Alireza AMIN JAVAHERI<sup>1</sup>, Mostaffa SHAHREZAE<sup>1</sup>, Mohammad GOURAN SAVADKOOHI<sup>2</sup>

<sup>1</sup>*Sina Hospital, Tehran University of Medical Sciences, Tehran (IRAN),* <sup>2</sup>*Shaheed Beheshti University of Medical Science, Tehran (IRAN)*

**INTRODUCTION:** The incidence of younger people requiring arthroplasty is increasing. Metal on metal hybrid hip resurfacing arthroplasty is an exciting alternative instead of conventional arthroplasty. Orthopedic surgeons will use this method in young active patients where preserving bone stock is important. **MATERIAL AND METHOD:** In this experimental study (before and after study), we evaluated the efficacy of resurfacing arthroplasty in 27 cases. Femoral neck in all patients intact and none of them had comorbidity. All of the patients operated by the senior surgeon were followed. They had annual AP and lateral X-Rays. Evaluation criteria according to Harris hip score, radiographic changes and revision necessity were assessed. **RESULTS:** There were 27 patients - 16 males and 11 females. The mean age of patients was 53.2 years. The mean follow-up was 15.3 months. Except for 4 patients with aseptic loosening, revision was not done in these cases. Harris hip score was increased from 57 (preop) to 78 (postop) (p value=0.05). In the final postoperative visit of patients, there were no needs to revision in all cases. 85% of patients returned to normal or near normal level of activity in their daily life. **CONCLUSION:** Clinical results of resurfacing metal on metal arthroplasty were safe and satisfactory such as bone preservation and less stress shielding, low dislocation rate, ability to activities and other advantages of this method and also returning to the ordinary activities of the patients make us satisfied with applying the method.

**Date : 2008-08-25**  
**Session : General orthopaedics: Cost effectiveness**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 16347**

**PREOPERATIVE PREDICTORS OF LENGTH OF HOSPITAL STAY IN TOTAL KNEE REPLACEMENT PATIENTS**

Innes SMITH, James BALLANTYNE, Robert ELTON, Ivan BRENKEL  
*Queen Margaret Hospital, Dunfermline (UNITED KINGDOM)*

**INTRODUCTION:** In Scotland, the number of primary total knee replacements (TKRs) performed annually has been steadily increasing. The price of the implant is fixed but the length of hospital stay (LOHS) is variable. An understanding of what currently influences LOHS may therefore be of paramount importance in order that we can influence some of these parameters, with resulting benefit to our patients as well as contributing significantly and favourably towards the health economics of this procedure. This study investigates the influence of preoperative variables on LOHS. **MATERIALS AND METHODS:** All patients who underwent primary unilateral TKR in the region of Fife, Scotland, United Kingdom, during the period December 1994 - February 2007 were prospectively investigated. The following preoperative details were recorded: age, sex, Body Mass Index (BMI), day of operation, year of admission, diagnosis, surgeon performing the operation, walking score, walking aid score, stair score, knee score and preoperative haemoglobin. The data were analysed using univariate and multiple linear regression statistical analysis. **RESULTS:** Data on LOHS was available from a total of 2105 primary unilateral TKRs. The median LOHS was 8.0 days. The highly significant preoperative risk factors for increased LOHS were year of admission, surgeon performing the operation, stair score, walking aid score and patient age. **CONCLUSION:** Prolonged hospital stay following TKR is associated with a number of preoperative factors. An awareness and understanding of these factors may enable us to influence them favourably with resulting reduction in the LOHS and, therefore, the associated costs.

**Date : 2008-08-25**  
**Session : General orthopaedics: Cost effectiveness**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 16469**

**RAPID RECOVERY PROGRAMME - A ONE-YEAR PROSPECTIVE STUDY FOR PRIMARY TOTAL HIP REPLACEMENTS**

Mustafa ALNAIB, Michaelis KOKKINAKIS, Aysha RAJEEV, Deiyar KADER, Sylvia BATEY, Shankar KASHYAP  
*Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM)*

A recovery programme which reduces the length of stay following total hip replacements and maintains a high standard of patient care would improve clinical practice and is cost effective. The aim of the study was to evaluate the efficiency of accelerated recovery programme following total hip replacement and to assess its impact on patient's recovery, complications, readmission rate and cost savings. A prospective study of 205 patients who underwent total hip replacement was included in the programme. There were 101 (49%) males and 104 (51%) females. The average age was 69 (range-50 to 87). The average BMI was 28 (range-18 to 39) and the median ASA grade was 2. A standardised postoperative protocol was followed and the patients were discharged when they were medically fit and had achieved physiotherapy requirements. They were then followed up by a community orthopaedic rehabilitation team in patient's own environment. The average length of stay was 6.1 days. The complications encountered during in-patient stay was wound discharge (54), surgical site infection (1), DVT (1). 10 patients needed postoperative blood transfusion. The readmissions rate was 5%. Deep infection was noted in 2 patients and 5 patients were admitted with dislocation. In conclusion, the rapid recovery programme for primary total hip replacement has proven to be an efficient method of reducing the length of stay in hospital and thereby reducing the financial costs at the same time delivering a safe and effective perioperative management of patients.

**Date : 2008-08-25**

**Session : General orthopaedics: Cost effectiveness**

**Time : 0900-1030**

**Room: 605**

**Abstract number : 16494**

**MAXIMUM SURGICAL BLOOD ORDERING SCHEDULE FOR REVISION KNEE AND HIP ARTHROPLASTY**

Devendra MAHADEVAN, Christopher CHALLAND, Andrew CLARKE, Jonathan KEENAN

*Plymouth Hospitals NHS Trust, Plymouth (UNITED KINGDOM)*

A retrospective analysis of blood ordering practices was undertaken to establish an evidence-based Maximum Surgical Blood Ordering Schedule (MSBOS) for revision TKR and THR. Cases of revision TKR and THR were cross-referenced with the transfusion database. The transfusion index (TI) and cross-match to transfusion ratios (CTR) were calculated. The TI is the number of units transfused divided by the number of patients having the procedure. If the TI is under 0.5, cross-matching blood is considered unnecessary. Procedures with CTR greater than 3:1 should substitute for a "group and save". For revisions of non-infected TKR (95 cases), the TI was 0.48 and CTR was 4.33. In infected cases (54 cases) the TI was 1.35 and CTR was 2.16. In revisions of non-infected THR (269 cases), the TI was 1.67 and CTR was 2.24. In infected cases (69 cases), the TI was 1.68 and CTR was 2.16. Following the introduction of intraoperative-cell-salvage devices for non-infected cases only, the TI had reduced to 0.16 for revision TKR, and 0.84 for revision THR. The transfusion index shows that cross-matching was still required for revisions of THR and infected TKR. The CTR analysis proposes that two cross-matches may be sufficient for these cases, and a "group and save" sufficient for revisions of non-infected TKR. The use of intraoperative cell-salvage devices reduces the likelihood of patients requiring transfusions. The introduction of this MSBOS in conjunction with intraoperative-cell-salvage could promote blood conservation and financial savings.



Date : 2008-08-25  
Session : General orthopaedics: Cost effectiveness  
Time : 0900-1030  
Room: 605

Abstract number : 17676

**EFFECT OF TRANEXAMIC ACID ON POSTOPERATIVE BLOOD LOSS AND DVT IN TOTAL KNEE ARTHROPLASTY**

Yoshinaga EGAWA<sup>1</sup>, Hiroshi HASHIGUCHI<sup>1</sup>, Ryoichi MURASHIGE<sup>1</sup>, Kazufumi MINAMI<sup>1</sup>, Hiromoto ITO<sup>2</sup>, Takao NAKAJIMA<sup>1</sup>  
<sup>1</sup>*Nippon Medical School, Chiba Hokosoh Hospital, Chiba (JAPAN)*, <sup>2</sup>*Nippon Medical School, Tokyo (JAPAN)*

OBJECTIVE: The objective of this study is to investigate the effect of perioperative intravenous administration of tranexamic acid on postoperative blood loss and DVT. SUBJECTS AND METHODS: We conducted informed consent (ICs) about postoperative venography with all patients who underwent TKA. This study consisted of 19 consecutive patients (2 males and 17 females) who underwent TKA with administration of tranexamic acid (T-group) and 25 consecutive patients (3 males and 22 females) without tranexamic acid (C-group). The mean age was 72 years in the T-group, 65 years in the C-group; the BMI was 27 in the T-group, 28 in the C-group. The surgery was performed under tourniquet, and implants were cemented. Those in the T-group received intravenous infusion of 1g tranexamic acid with 100ml physiological saline before the release of the tourniquet. The total blood loss including those of postoperative 2 days and detection rate of DVT were compared between the T and C group. In statistical analyses, t-test was used, and significance was defined as  $p < .01$ . RESULTS: The blood losses were  $585 \pm 280$ ml in the T-group, and  $876 \pm 341$ ml in the C-group with a significant difference ( $p = .003$ ). The detection rates of DVT were 68% in the T-group and 72% in the C-group. There was no significant difference in the detection rate of DVT ( $p = .79$ ), age ( $p = .17$ ), or BMI ( $p = .96$ ). CONCLUSION: Perioperative administration of tranexamic acid may decrease total blood loss in TKA and have no effect on the detection rate of DVT.

**Date : 2008-08-25**  
**Session : General orthopaedics: Cost effectiveness**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 18235**

**ROLE OF YOGA THERAPY IN MANAGEMENT OF OSTEOARTHRITIS KNEE IN INDIAN PATIENTS**

Ashish GOHIYA, Nirbhay SHRIVASTAVA  
*Gandhi Medical College, Bhopal, MP (INDIA)*

Osteoarthritis knee is the most common degenerative disorder of middle and old age group especially in Indian subcontinent maybe because of the life style and habit of sitting on the ground for various activities. At one end of the treatment spectrum is the cumbersome conservative measures with too many drugs and their undesirable side effects, while at the other end is the modern day aggressive knee replacements, it still remains elusive to an average Indian patient due to poverty, ignorance, apathy etc. With this background we conducted this study to evaluate role of yoga therapy in osteoarthritis knee patients. This study was conducted at "arthritis clinic" of Department of Orthopaedics, Gandhi Medical College, Bhopal, MP, India. Of the 76 patients who fulfilled the selection criteria 56 gave the consent and only 42 patients completed the follow-up. After the completion of the study the results were quite satisfactory in terms that only 17% patients continued having morning stiffness and decreased range of movement, 19% were feeling tenderness on pressure and only 7 patients continued to have pain on joint movement. 4 patients of radiological grade III showed poor response, out of 24 patient of grade II, 3 patients showed good or fair response, whereas 14 patients of grade I gave excellent response. After Yoga Therapy patients of osteoarthritis of knee show a significant pain relief, improved range of joint movement and reduced morning stiffness. The need for surgical intervention can be delayed.

**Date : 2008-08-25**  
**Session : General orthopaedics: Cost effectiveness**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 18281**

**NO EXTRA VALUE OF A CT-SCAN COMPARED TO PLAIN RADIOGRAPHS FOR THE CLASSIFICATION OF TIBIA PLATEAU FRACTURES AND TREATMENT PLAN**

Micha HOLLA, Albert VAN KAMPEN, Jorien KOOPS  
*Radboud University Nijmegen Medical Center, Nijmegen (NETHERLANDS)*

In this study the value of CT-scans in addition to plain radiographs in tibia plateau fractures was examined. Eight experienced doctors (6 traumatology surgeons and 2 trauma-radiologists) classified 15 different tibia plateau fractures according to Schatzker with plain radiographs and CT-scans. Furthermore a treatment plan was made with the plain radiograph and thereafter with CT-scan. Three weeks later, these fractures were classified in a different sequence by the same observers. A complete dataset was available for analysis. For the inter-observer and intra-observer agreement the mean Cohen's Kappa coefficient was determined. The intra-observer agreement for classification with plain radiographs was 0.61 and with CT-scans 0.58. The mean inter-observer agreement for classification with plain radiographs was 0.51 and with CT-scans 0.49. According to Landis and Koch these Kappa values indicate that both plain radiographs and CT-scans have a moderate inter- and intra-observer agreement. There was no significant difference of the inter- and intra-observer agreement of the treatment plan based on the plain radiographs and CT-scan. Conclusively there is no extra value of a CT-scan compared to plain radiographs for the classification and treatment plan of tibia plateau fractures.

**Date : 2008-08-25**  
**Session : General orthopaedics: Cost effectiveness**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 18566**

**THE FINANCIAL AND CLINICAL BURDEN OF REVISION TOTAL KNEE ARTHROPLASTY (TKA) - A 10-YEAR REVIEW IN A NATIONAL ORTHOPAEDIC HOSPITAL**

Kayode ODUWOLE, Diamurd MOLONEY, Simi PICHA, Kevin J. MULHALL  
*Cappagh National Orthopaedic Hospital, Dublin (IRELAND)*

Revision (TKA) consumes considerably more resources than primary TKA. We investigated the financial and clinical implication of Revision TKA. **PATIENTS AND METHODS:** Perioperative and financial data of patients that underwent revision TKA between 1997 and 2006 were reviewed. Patients comprised 116 females (65.17%) and 62 males (34.83%). The annual revision increased steadily. The mean age for both groups was 68.97 with a 6.7% increase in mean age over the ten-year period. 15.73% of TKA was revised for infection. The mean length of stay (LOS) for revision due to aseptic loosening in 1997 was 19.5 days. The LOS for revision for infected TKA was 35 days. In 2006, LOS increased to 65 days for infected TKA but decreased to 14.21 days for aseptic cases. The cost of revision for infection rose by 2.62% and that for aseptic loosening rose by 20.62%. There was a 20-42% increase in generic hospital costs in the same period. The industry cost of implants increased by 32-35% between 1999 and 2006 depending on implant selection. The revision burden increased from 3.29% in 1997 to 8.0% in 2006. Perioperative tissue culture was positive in 46.43% of the cases revised for septic reason. **CONCLUSION:** With increasing life expectancy and indications for primary arthroplasty more patients are coming to revision surgery. Patient's optimisation through pre-assessment clinics, control of the variable costs of implants and supplies, accurate and cost effective preoperative investigation and surgical planning are essential to optimise resources.

Date : 2008-08-25  
Session : General orthopaedics: Cost effectiveness  
Time : 0900-1030  
Room: 605

Abstract number : 18577

**COSTS OF CARE AFTER HOSPITAL DISCHARGE AMONG POSTMENOPAUSAL WOMEN WITH AN INTERTROCHANTERIC HIP FRACTURE**

Patrick HAENTJENS<sup>1</sup>, Philippe AUTIER<sup>2</sup>, Martine BARETTE<sup>2</sup>, Steven BOONEN<sup>3</sup>

<sup>1</sup>Vrije Universiteit Brussel, Brussels (BELGIUM), <sup>2</sup>Jules Bordet Institute, Brussels (BELGIUM), <sup>3</sup>Katholieke Universiteit Leuven, Leuven (BELGIUM)

**OBJECTIVES:** To identify potential predictors of medical care costs during the 1-year period after hospital discharge, and to examine the impact of the type of surgical procedure among women with an intertrochanteric hip fracture. **PARTICIPANTS AND METHODS:** The design was a 1-year prospective cohort study reflecting day-to-day clinical practice. Sixty-two women of 50 years or older with an intertrochanteric hip fracture were enrolled on a consecutive basis. Three groups were defined by the time of surgical repair: sliding hip screw fixation, intramedullary nail fixation, and prosthetic replacement. Direct costs of medical care were documented during the 1-year period after hospital discharge. Multivariable analyses were done to explore potential predictors of costs. **RESULTS:** There were no significant differences between the three groups for prefracture residence, type and number of comorbidities, and mean age at the time of the injury. The mean direct costs of medical care during the 1-year period after hospital discharge amounted €12,046 after sliding hip screw fixation, €18,859 after intramedullary nail fixation, and €42,767 after prosthetic replacement surgery (ANOVA among groups,  $P=0.001$ ). A multivariable model identified living in an institution at the time of the injury ( $P=0.026$ ) and prosthetic replacement surgery ( $P<0.001$ ) as the two significant determinants of increased medical costs. **CONCLUSIONS:** Among postmenopausal women with an intertrochanteric hip fracture living in an institution at the time of the injury and treatment with prosthetic replacement surgery are strong predictors of increased direct costs of medical care after hospital discharge.

Date : 2008-08-25  
Session : Joint: Total knee replacement 3  
Time : 1100-1200  
Room: 605

Abstract number : 15955

**SOFT TISSUE BALANCING IN PRIMARY TOTAL KNEE REPLACEMENT FOR OSTEOARTHRITIS WITH VALGUS DEFORMITY**

Adrian Radu RADULESCU, Adrian Emilian BADILA, Octavian NUTIU, Cristian NITA, Robert MANOLESCU  
*Bucharest University Hospital, Bucharest (ROMANIA)*

GOAL: Outcome of primary total knee replacement for osteoarthritis with valgus deformity. MATERIALS AND METHODS: Between 2004 and 2006, 28 primary total knee replacements were performed for osteoarthritis with valgus deformity. 21 cases were women and 7 men with a mean age of 66.6 years (extremes 54-81). Knee balancing in frontal plane was done by: detachment of iliotibial tract from Gerdy tubercle, lateral capsular release from the tibial posteromedial corner, detachment of lateral collateral ligament and popliteus tendon from the femoral lateral epicondyle. Clinical and radiological evaluation were done considering knee range of motion, Knee Society Score (KSS) and femurotibial angle measured on the frontal standing long leg x-rays. Preoperative, knee valgus deformity angle was 6 to 15 degrees in 14 cases, 15 to 25 degrees in 10 cases and over 25 degrees in 4 cases. RESULTS: After a mean follow-up time of 14 months (extremes 4-29), knee range of motion improved from a mean of 71 degrees (extremes 52-87) preoperative to a mean of 95 degrees (extremes 78-110) postoperative. KSS value grew from 21.3 points (extremes 1-33) preoperative to 80.7 points (extremes 70-92) postoperative and frontal femurotibial angle from a mean of 21 degrees (extremes 11-39) of valgus before surgery, to a mean of 9 degrees (extremes 0-12) of valgus after surgery. CONCLUSIONS: Standard medial parapatelar approach allows a proper primary total knee replacement with a stable and aligned knee if a rationale soft tissue balancing is performed in the lateral compartment.

**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 1**  
**Time : 1100-1200**  
**Room: 605**

**Abstract number : 16208**

**REPLACEMENT PROSTHETIC KNEE ARTHROPLASTY AT PATIENTS WITH KNEE ANGLE DEFORMITIES: BICONDYLAR PROSTHESIS APPLICATION**

P.G. SKAKUN<sup>1</sup>, M.A. GERASIMENKO<sup>2</sup>, A.V. BELETSKY<sup>1</sup>, E.V. ZHUK<sup>2</sup>

<sup>1</sup>*Belarussian Research Institute of Traumatology and Orthopaedics, Minsk (BELARUS)*, <sup>2</sup>*Belarussian State Medical University, Minsk (BELGIUM)*

The aim of investigation was the assessment of the possibility and results of bicondylar prosthesis application at patients with ligamental insufficiency of knee joint. We analysed 183 cases of bicondylar prosthesis application at 144 patients operated between 1996 and 2002. There were 109 (59.6%) persons with osteoarthritis deformans (OAD) among patients, 71 (38.8%) with rheumatoid arthritis (RA) and 3 (1.6%) with other pathology of the knee joint. Most patients (71.6%) had various axial deformations of knee joint (varus angle <25° and valgus <20°). Patients were observed in terms from 3 months to 5 years after operation. The results of treatment were good in 90 (86.5%) cases, satisfactory in 13 (12.5%), unsatisfactory in 1 (aseptic loosening of implant had arisen at patient with OAD in 20 months after operation). Best results had appeared at patients with RA 1 year after operation (Knee Society Scores - KSS - had changed from 24.7 before operation to 83.3 a year later), but they had a little worsened in terms of 3-5 years after operation (to 73.1). At patients with OAD the following results were observed: KSS was 28.4 before operation, 81.3 in 1 year and 79.8 in 3-5 years after operation. Thus, bicondylar prosthesis application at patients with not great axial deformation of the knee joint (varus <25° or valgus <20°) under the condition of operative equation of the ligamental insufficiency allows us to reach up to 99.0% of good and satisfactory results.

**Date : 2008-08-25**

**Session : Joint: Total knee replacement 1**

**Time : 1100-1200**

**Room: 605**

**Abstract number : 17370**

**A NEW METHOD FOR PATELLAR LIGAMENT REPLACEMENT: VASTUS MEDIALIS FASCIA Y-FLAP**

Norbert WIEGAND, Istvan NAUMOV, Laszlo VAMHIDY

*University of Pecs, Pécs (HUNGARY)*

Our team processed a new method for the treatment of the neglected patellar ligament rupture or the replacement of the ligament after complication or during TKR revision. During the surgery first we have to excise the scull between the tuberositas tibiae and the quadriceps muscle. Second we prepare a 2cm wide and approximately 12cm long reverse fascia flap from the vastus lateralis fascia. Then we turn down distally the flap in a "Y" form to the tuberositas. The medial branch of the Y-flap has to suture to the medial border of the patella, the shaft of the Y-flap has to fix to the tuberositas tibiae and the lateral branch to the lateral border of the patella. Then the flap holds the patella like a sling. After this procedure the patella has to be hooked to the tuberosity with an 8-form twisted steel cable which can be removed after six weeks. We used this method in 14 cases. Four of them were neglected patellar ligament ruptures, two operations were performed after a re-rupture of patellar ligament, five replacements made during a revision total knee arthroplasty and two cases managed after septic complication of the ligament suture. All patient were healed satisfactory (Lysholm Score), the minimum follow-up time was 12 months. There were no complications after surgery. The advantages of this method are that no need of artificial materials, the traction direction of the quadriceps muscle will be physiological. With this method we can easily replace a big defect, too.



**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 1**  
**Time : 1100-1200**  
**Room: 605**

**Abstract number : 16670**

**INTEROBSERVER AND INTRAOBSERVER ERROR IN OBTAINING TRANSEPICONDYLAR AXIS AND WHITESIDE LINE IN TOTAL KNEE ARTHROPLASTY**

Chun Hoi YAN, Wai Pang Peter YAU, KY Peter CHIU, Tsz Pui NG, Wai Hung LIE, Wai Man TANG  
*The University of Hong Kong, Hong Kong SAR (HONG KONG)*

Four cadaveric knee joints with an intact soft tissue envelope were approached using the medial parapatellar approach employed in standard conventional incision total knee replacement. The transepicondylar axis and Whiteside line of the distal femur were repeatedly identified by three orthopaedic surgeons for a total of twenty times each. The precision in the identification of these landmarks was compared with the reference transepicondylar axis and Whiteside line established at the end of the experiment by dissecting the soft tissue from the cadaveric knees. It was found that there was significant interobserver error in the identification of both the transepicondylar axis and Whiteside line ( $p < 0.001$ , ANOVA). The repeatability in the identification of these two axes was relatively low ( $13^\circ$  for transepicondylar axis and  $24^\circ$  for Whiteside line).

**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 1**  
**Time : 1100-1200**  
**Room: 605**

**Abstract number : 17514**

**THE DELUXE TOTAL KNEE PROSHESIS**

Xi-Sheng WENG

*Peking Union Medical College Hospital, Beijing (CHINA)*

**BACKGROUND:** The purpose of the present study was to determine the short-term results of a series of 13 consecutive primary cemented posterior stabilized modular knee arthroplasties that had been performed in 9 patients with use of a new five-in-one cutting instrument and the Deluxe prosthesis and who have been followed up for at least one year. A control group was obtained from a series of 13 consecutive primary cemented posterior stabilized knee arthroplasties that had been performed in 12 patients with use of Genesis II prosthesis during the same period of time. **METHODS:** The patients were evaluated using the HSS clinical and functional scoring systems before the surgery and three months and one year after surgery. **RESULTS:** All patients in both groups had excellent pain relief. The mean HSS score before surgery was 48.69 and 55.23 in Deluxe and Genesis II group respectively; 84.7 and 87.8 at three months after surgery respectively; 85.6 and 88.3 at one year after surgery. There were no statistical differences between the two groups before and after surgery ( $P>0.05$ ). The survivorship was 100% in both groups of patients. **CONCLUSIONS:** We concluded that The Deluxe knee prosthesis is a safe and effective total knee replacement depending on our short-term follow-up.

**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 1**  
**Time : 1100-1200**  
**Room: 605**

**Abstract number : 17827**

**TO ELEVATE OR EXANGUINATE? THAT IS THE QUESTION**

Hesham AL-KHATEEB, Ibrahim EDWARD, Marusezki SHEM  
*Basildon University Hospital, LONDON (UNITED KINGDOM)*

**INTRODUCTION:** Operations on the extremities are made easier by use of a tourniquet. Complications of tourniquet use include nerve injury, post-tourniquet syndrome, compartment syndrome, pressure sores, rhabdomyolysis. All of the above have been directly linked to tourniquet time, especially nerve injury (Horlocker et al., 2006). Recent data have revealed that the volume of emboli passing through the right atrium after tourniquet release is directly proportional to tourniquet time (Kazuyoshi et al., 2001). Tourniquet time is also directly related to wound hypoxia in vivo (Clarke et al., 2001). Routine in most orthopaedic departments, few studies have dealt with this topic. Limb elevation and Rhys-Davies exsanguinator are the most common methods applied. **MATERIALS AND METHODS:** We reviewed the average tourniquet time from the time of inflation to the time of skin incision in 50 knee arthroscopies and 50 total knee replacements. The data were collected over a period of 6 months at a busy district general hospital. The patients were then subdivided into two groups based on the method of exsanguination used and the tourniquet time documented from the time of inflation to the time of the skin incision. **RESULTS:** The mean tourniquet time in the elevation only group was 1.2 minutes in both knee arthroscopies and total knee replacements compared to a mean of 6.4 minutes in the second group using the Rhys Davis exsanguinator. **CONCLUSIONS:** Limb elevation significantly reduces delay between tourniquet inflation and skin incision compared with roll cylinder exsanguination. Limb elevation shortens total tourniquet time in knee surgery.

**Date : 2008-08-25**

**Session : Joint: Total knee replacement 1**

**Time : 1100-1200**

**Room: 605**

**Abstract number : 18029**

**POSTOPERATIVE PAIN MANAGEMENT OF UNICOMPARTMENTAL KNEE ARTHROPLASTY WITH INTRA-ARTICULAR COCKTAIL REGIMEN**

Jagan Mohana Reddy VELPULA, A. MALHOTRA, Peter DENN

*Macclesfield hospitals, Macclesfield (UNITED KINGDOM)*

Postoperative pain management is an essential component of joint replacement surgery. Routinely epidural infusions have been used for managing postoperative pain in total knee replacements. In unicompartmental knee replacements we used a cocktail regime consisting of 30ml of levobupivacaine (5mg/ml), 0.5ml of adrenalin (1:1000) and 40mg of parecoxib mixed in 50ml of normal saline. This was injected into the joint after the surgery was performed. No epidural analgesia was used postoperatively. We found that this regime provided effective pain relief in postoperative patients supported by decreased use of oral or paraneural analgesics. It enabled patients to mobilise early, shorter convalescence period and a shorter hospital stay. They all achieved good postoperative range of movements averaging 120 degrees by the second day. This led to high patient satisfaction. Twelve patients who have had a unicompartmental knee replacement done, had this cocktail regime. Their average length of hospital stay was three days. Pain relief was satisfactory and physiotherapy outcome was improved. In conclusion our study shows that the cocktail regime not only helps in effective pain relief, early mobilisation, reducing the incidence of deep vein thrombosis, pulmonary embolism and reducing the hospital stay.

**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 1**  
**Time : 1100-1200**  
**Room: 605**

**Abstract number : 18376**

**COMPARISON OF CEMENTED- VS. PRESS-FIT DIAPHYSEAL STEMS FOR REVISION TOTAL KNEE ARTHROPLASTY**

Paulo Gilberto Cimbalista ALENCAR, Marcelo ABAGE, Francisco Fontes CINTRA  
*Hospital de Clínicas-PR, Curitiba (BRAZIL)*

Methods of stem fixation in total knee arthroplasty (TKA) remain controversial. The objective of this retrospective study was comparing the results of cemented- vs press-fit diaphyseal stems. We reviewed 43 revision TKA in 40 patients (mean age 68 years), between 1999 and 2005 with a postoperative follow-up of at least 2 years (mean 5.2 years). Of these, 25 were cemented thin stems and 18 uncemented press-fit stems. Patients who died (n=5) and who had acute postoperative infection (n=2) were excluded from this study leaving 36 knees, with 67 stems for the final data. We used a modified Knee Society radiographic scoring system to evaluate the postoperative and the last radiographs, as well as the WOMAC and Insall Knee Score to evaluate the function. To the final data only one of the prosthesis needed to be revised due to femoral loosening. Three patients complained of quadriceps weakness; one had loss of flexion and two had pain at the femoral diaphysis (at the end of the stem). Cemented and cementless stems were considered good options for stabilisation in revision total knee arthroplasty.

**Date : 2008-08-25**

**Session : Joint: Total knee replacement 1**

**Time : 1100-1200**

**Room: 605**

**Abstract number : 18632**

**IS THERE A NEED OF PATELLA REPLACEMENT IN BICONDYLAR SURFACE REPLACEMENTS?**

Heiner THABE

*Orthopaedic Department, Bad Kreuznach (GERMANY)*

From July 1999 until December 2005, 2171 TKA have been performed in our department. With the Gemini Mk II 1338 surface replacements have been done, in former years, natural knee and LCS-meniscal bearings and Gemini MkI. Clinical and radiological results are presented with these different types of surface replacements. We compared the rates of patella disorders with these different types of knee designs and different surgical approaches. The Gemini MK II design has an asymmetrical rotation platform with deep dished PE plateau and an anatomically shaped tibial tray. The femoral component of Gemini MK II was consequently aligned to the sulcus. Together with the asymmetric anatomical rotational platform a better patella tracking could be achieved. This led to a decrease of pain in the patella femoral joint. The anterior knee pain could be dropped from 5.2% in the LCS design to 3.5% only with an additional resection of the ramus infrapatellaris of the saphenus nerve in all designs the natural knee as well as the Gemini Mk I. The new design with a release of pressure in the patella femoral contact area diminished the anterior knee pain to 0.8%. The HSS-Score increased from 68.8 to 94.4, 4 years postoperatively. The range of motion increased with the Gemini MKII to 0/0/128 due to the anatomically adapted hybrid version of this mobile bearing knee. It acts like a fixed plateau design with the additional.

**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 1**  
**Time : 1100-1200**  
**Room: 605**

**Abstract number : 18634**

**DOES THE TKA GEMINI MK2 FULFILL THE CRITERIA OF A GENDER KNEE?**

Heiner THABE

*Orthop.Department Diakonie Hospital, Bad Kreuznach (GERMANY)*

Resurfacing TKA has to correct severe deformities, defects in two or more surfaces and correct unphysiological function and axis deviation TKA has to restore the reproduction of an a.p. sliding and internal/external rotation during flexion and weight bearing without enlarged wear. To mimic natural kinematics is only possible with anatomical designs and surgical soft tissue balancing. Therefore a "hybrid type of mobile bearing TKA"-conformity like a conventional fixed bearing knee in combination with rotation capacity does simulate normal kinematics. The Gemini MK II design has an asymmetrical rotation platform with deep dished PE plateau and an anatomically shaped tibial tray. The centre of tibial rotation was placed medially and a little bit dorsally to the centre of the tibia. The femoral shell with its 6 sizes fits excellently in all our implanted 2500 cases. Based on the data of Hitt and Ho the femoral sizes are all positioned under the average line of men as well as women. 97% of all our replacements are covered by 4 sizes each in men and women. The additional enlargement of the patella groove against the anatomical axis to 3-4° more valgus supports the run of patella especially in women. Due to the rotational capacity of the tibia plateau there is only a need of a release at Gerdi's tubercle to solve the problems with the Q angle. This guarantees an excellent fit for all gender solution since 1999, our first date of implantation.

Date : 2008-08-25

Session : Joint: Total knee replacement 2

Time : 1400-1530

Room: 605

Abstract number : 15648

**EVALUATION OF THE ROLE OF MOBILE BEARING TOTAL KNEE ARTHROPLASTY FOR VALGUS ARTHRITIC KNEE USING LATERAL CAPSULAR APPROACH WITH VASTUS LATERALIS PROXIMAL REALIGNMENT**

Ravi INDLURU, Anil KHANNA, Arvind KUMAR

*Peterborough District Hospital, Peterborough (UNITED KINGDOM)*

AIM: To evaluate results of fully congruent Mobile bearing knee arthroplasty for valgus arthritic knees using lateral capsular approach and realignment of vastus lateralis. MATERIAL AND METHOD: We reviewed results of 50 mobile bearing total knee arthroplasties performed consecutively between 2001 and 2006 for Valgus arthritic knees, using lateral capsular approach and realignment of vastus lateralis. Patients were evaluated using oxford and International knee society Score. Radiographic evaluation and scanograms assessment were also done. RESULTS: The study group consisted of 47 patients who received fifty knees. The mean age at the primary operation was 71.57 years. The mean follow-up was 4.2 years. The mean Valgus deformity was 15.92°. Fixed flexion deformity was seen in 15 knees. The mean Oxford Knee Society ratings were 52 preoperatively, and 19 at final follow-up. The preop mean range motion was 84.28° (range 45°-120°). At final follow -up the average range of motion was 107.5° (range 95°-120°). According to the system of the Knee Society, the average knee score was 94 points and the average functional score was 89 points at final follow-up. There were no clinical failures or cases of postoperative instability and no cases of radiographic loosening or wear. RADIOLOGICAL EVALUATION: None of these knees had radiographic evidence of loosening. Mechanical axis was restored in all the patients. CONCLUSION: This study demonstrates satisfactory results of Mobile bearing knee arthroplasty using lateral parapatellar with proximal realignment of vastus lateralis for Valgus arthritic knees.



**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 2**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 15733**

**MEDIO-LATERAL LAXITY BEFORE AND AFTER TOTAL KNEE REPLACEMENT**

Jean-Yves JENNY, Yann DIESINGER, Cyril BOERI, Eugen CIOBANU  
*University Hospital Strasbourg, Illkirch (FRANCE)*

**INTRODUCTION:** To get a balanced knee is desirable after total knee replacement. Navigation system might help measuring the knee laxity during the implantation. **MATERIAL AND METHODS:** 30 patients operated on for primary TKR have been analysed. Preoperative examination involved varus and valgus stress X-rays at 0 and 90° of knee flexion. The intraoperative medial and lateral laxity was measured with the navigation system before and after prosthetic implantation. Varus and valgus stress X-rays were repeated after 6 weeks. X-ray and navigated measurements before and after TKR were compared with a paired Student t-test at a 0.05 level of significance. **RESULTS:** There was a significant difference between navigated and radiographic measurements. However, this difference was less than 2mm in most cases, and then considered as clinically irrelevant. There was a significant correlation between the two measurements. **DISCUSSION:** The navigation system used allowed measuring the medial and lateral laxity before and after TKR. This measurement was strongly correlated to the radiographic measurement by stress X-rays, and can therefore be considered as accurate. The navigated measurement is a valuable information for balancing the knee during TKR. The reproducibility of this balancing might be improved due to a more objective assessment. **CONCLUSION:** The navigation system used allows measuring accurately and objectively the knee laxity during TKR.

**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 2**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 16468**

**A ONE-YEAR PROSPECTIVE STUDY OF RAPID RECOVERY PROGRAMME FOR PRIMARY TOTAL KNEE REPLACEMENTS**

Mustafa ALNAIB, Michaelis KOKKINAKIS, Aysha RAJEEV, Deiry KADER, Sylvia BATEY, Shankar KASHYAP  
*Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM)*

The aim of the study was to assess the efficacy of rapid recovery programme following total knee replacements in terms of reducing length of stay, morbidity, complications and readmission rates. A prospective study of 252 patients who underwent primary total knee replacement for a period between October 2006 and 2007 were included in the programme. There were 123 (49%) males and 129 (51%) females. The average age was 71 (range-53 to 86). The average BMI was 30 (range-22 to 46). The median ASA grade was 2. The programme included preoperative education of patient and relatives, standardised operation protocols, infection control, pain management, continuous education and motivation by nursing staff and physiotherapists and intensive rehabilitation by a community based physiotherapy team in patient's own environment. The patients were only discharged when they were medically fit and had achieved the ward physiotherapy requirements. The average length of stay was 5.2 days. The complications encountered during inpatient stay was wound discharge (43), surgical site infection (1), DVT (1), pneumonia (1). 12 patients needed postoperative blood transfusion. The readmissions rate was 4%. Deep infection was noted in 4 patients, DVT (1), pulmonary embolism (1) and 3 patients had medical complications. In conclusion, the rapid recovery programme following total knee replacement is an efficient method of speeding the recovery and reducing the length of hospital stay after primary knee replacements. It is useful to achieve a balance between financial savings and a consistent, responsive and high-quality care for patients.

**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 2**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 16556**

**THE EVALUATION OF MIDVASTUS APPROACH TO THE TOTAL KNEE REPLACEMENT**

Marek SYNDER, Marcin SIBINSKI  
*Medical University, Lodz (POLAND)*

Surgeons usually use the straight skin approach to the knee joint; however, the deeper approaches differ. The aim of this study is to evaluate the results of midvastus approach to the knee joint in total knee replacement. **MATERIAL AND METHODS:** Since 2006 we started to implant the total knee joint using the midvastus approach. We performed 116 TKR (group I) using midvastus approach and compared clinical results with 100 TKR (group II) performed with the use of medial parapatellar capsular approach, extended proximally to the inferior margin of the rectus femoris. In both groups the average age of patients was 65 years (most females). In all cases the diagnosis was idiopathic gonarthrosis and in all of those cases the varus deformity from 10 to 280 was noted. The same rehabilitation program was employed in both groups. The mean follow-up was 11 months. All patients were evaluated clinically and radiologically. **RESULTS:** In group I patients obtained the 90° of flexion and full extension at the operated knee average on the 4th day after surgery, required less pain killers and started earlier walk without crutches. At the time of discharge all of them had full extension and minimum of 105° of flexion in the operated knee. In group II the postoperative recovery was slower; however, we did not observe any differences in both groups at the last follow-up. **CONCLUSION:** The midvastus approach to the TKR is a valuable technique, which improves early postoperative care and gives more patients' satisfaction.

Date : 2008-08-25

Session : Joint: Total knee replacement 2

Time : 1400-1530

Room: 605

Abstract number : 16611

**ONE STAGE BILATERAL UNICOMPARTMENTAL KNEE ARTHROPLASTY. RESULTS FOR A PROSPECTIVE STUDY OF 14 CASES**

Dominique SARAGAGLIA, Charbel NEMER

*University of Grenoble, South Teaching Hospital, Échirolles (FRANCE)*

The purpose of this study was to analyse the early results of bilateral unicompartmental knee arthroplasty (UKA) performed in the same operative setting, in terms of morbidity, post-operative blood loss, functional recovery, hospital stay and patient satisfaction. Between January 2001 and December 2006, the senior author performed 190 UKA of which 44 were bilateral (that is 22 patients). 28 out of the 44 were done on 14 patients as a single stage bilateral UKA (14.7% of the 190). We operated on 13 bilateral medial osteoarthritis and 1 bilateral lateral osteoarthritis. The average amount of blood loss measured from surgical drains was similar from one side to the other. None of the patients required blood transfusions, while 2 of them were given intravenous iron supplements. All patients got up on average, at D+1.1 +/- 0.26 (1-2), and left the hospital full weight bearing, with 2 crutches, at D+12.1 +/- 3.28 (9-21) knowing that, the in hospital recovery period following a single UKA procedure is 8 days at our institution. 3 months after the operation all patients were satisfied with the procedure and would recommend it without hesitation. Bilateral unicompartmental knee arthroplasty can be performed as a single stage procedure without any increase in morbidity. None of the patients in our series had enough blood loss to require blood transfusion. The benefits for health care are obvious regarding hospital stay (12 days instead of 16), lesser period of disability etc.

**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 2**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 17383**

**RADIOGRAPHIC ANALYSIS AND OUTCOME OF UNICOMPARTMENTAL OXFORD KNEE ARTHROPLASTY - THE ROLE OF THE TIBIAL CUT**

Marius NICULESCU, Dan LAPTOIU, Mihai NEGRUSOIU  
*Colentina Clinical Hospital, Bucharest (ROMANIA)*

**PURPOSE:** Rotation and posterior slope of the tibial component influence various aspects of the replaced knee including knee kinematics, implant fixation, wear of polyethylene insert. We assessed the effect of these variables on the outcome of unicompartmental arthroplasty in knees with intact anterior cruciate ligaments. **MATERIAL:** We retrospectively determined the influence of tibial rotation and posterior slope in 38 Oxford Phase 3 unicompartmental knees (34 patients, mean aged 61, reviewed at 2 to 8 years). Osteoarthritis was the reason for surgery in 34 knees, osteonecrosis in 4 knees. Mean HSS knee score was 58 (41-72) before surgery and 82 (40-100) at follow-up. The mean range of motion was 110° (90-135) before surgery and 120° at follow-up (95 -140). **METHODS:** Tibial slope was measured on lateral view with regard to anatomic tibial axis. A CAD three dimensional model of the implant was realized and, using image matching techniques, exact positioning and rotation of components were appreciated. **RESULTS:** There were only 6 cases of "ideal" implantation (slope 5°); a 10° increase of slope makes the anterior tibial translation rise by more than 5mm in weight bearing. Preservation of ACL or the degree of posterior tibial slope had no influence on HSS score, range of motion or radiolucent lines incidence. **DISCUSSION:** The increase of posterior tibial slope in order to improve range of appears unjustified with this mobile bearing prosthesis. Moreover it exposes to high anterior tibial translation and risk of meniscus luxation.

Date : 2008-08-25  
Session : Joint: Total knee replacement 2  
Time : 1400-1530  
Room: 605

Abstract number : 17420

**INTRAOPERATIVE AND POSTOPERATIVE PREDICTORS OF LENGTH OF HOSPITAL STAY IN TOTAL KNEE REPLACEMENT PATIENTS**

Innes SMITH, Robert ELTON, James BALLANTYNE, Ivan BRENKEL  
*Queen Margaret Hospital, Dunfermline (UNITED KINGDOM)*

**INTRODUCTION:** In Scotland, the number of primary total knee replacements (TKRs) performed annually has been steadily increasing. The price of the implant is fixed but the length of hospital stay (LOHS) is variable. An understanding of what currently influences LOHS may therefore be of paramount importance in order that we can influence some of these parameters, with resulting benefit to our patients as well as contributing significantly and favourably towards the health economics of this procedure. This study investigates the influence of intraoperative and postoperative variables on LOHS. **MATERIALS AND METHODS:** All patients who underwent primary unilateral TKR in the region of Fife, Scotland, United Kingdom, during the period December 1994-February 2007 were prospectively investigated. The following intraoperative and postoperative details were recorded: length of operation, need for urinary catheterisation, patella resurfacing, lateral release, blood transfusion, the presence of superficial or deep infection, day 1 postoperative haemoglobin and haemoglobin drop. The data was analysed using univariate and multiple linear regression statistical analysis. **RESULTS:** Data on LOHS was available from a total of 2105 primary unilateral TKRs. The median LOHS was 8.0 days. The highly significant intraoperative and postoperative factors associated with an increased LOHS were lateral release, postoperative haemoglobin, blood transfusion, urinary catheterisation, deep and superficial infection. **CONCLUSION:** Prolonged hospital stay following TKR is associated with intraoperative and postoperative factors. An awareness and understanding of these factors may enable us to influence them favourably with resulting reduction in the LOHS and, therefore, the associated costs.

**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 2**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 18222**

**MID TO LONG-TERM RESULTS OF TOTAL KNEE ARTHROPLASTY IN HEMOPHILIC KNEES: A REVIEW OF 34 CASES**

Philippe BOVIER-LAPIERRE, Olivier GUYEN  
*Pavillon T, Hôpital Edouard Herriot, Lyon (FRANCE)*

**INTRODUCTION:** Total knee arthroplasty (TKA) in hemophilic knees is getting renewed attention as both surgical techniques and implants and medical management of hemophilia have improved. The goal of the present study was to assess the mid-term results of TKA in hemophilic patients. **MATERIALS AND METHODS:** We retrospectively reviewed 34 TKA (24 patients) performed at our institution. All patients had severe form of hemophilia. Coagulation control during and after surgery was performed with continuous infusion of factors VIII or IX. Clinical and radiographic data on all patients were collected prospectively, with particular attention to postoperative complications. Clinical evaluation was performed using the International Knee Society Score (IKS). **RESULTS:** Two patients were lost to follow-up and two patients died of unrelated cause during the study period. The mean follow-up was 3.5 years (minimum 2 years). Complications reported were: skin necrosis followed by deep infection (one case), intraoperative fracture (one case), aseptic loosening (one case) and knee stiffness (one case) requiring reoperations. Results showed an improvement of the IKS score (mean increment of 90 points) and a dramatic relief of pain. Regarding the knee mobility, preoperative flexion contracture significantly improved while improvement of the flexion remained limited. **CONCLUSION:** The main advantage to be gained from TKA in hemophilic arthropathy appears to be relief of pain. The restoration of joint movement appears to be a secondary consequence. Because of the increased potential for intra and postoperative complications, knee replacement in hemophilic arthropathy should be performed only properly equipped and experienced centers.

**Date : 2008-08-25**

**Session : Joint: Total knee replacement 2**

**Time : 1400-1530**

**Room: 605**

**Abstract number : 18230**

**5-7-YEAR RESULTS OF MODULAR MOBILE BEARING TKA GEMINI MK II**

Lutz ECKART, Hans-Ekkehard STAY, Volker FUCHS

*St Salvator Hospital, Halberstadt (GERMANY)*

Between 3/00 and 12/05 1100 GEMINI MkII TKA using a rotating platform were implanted in our department, all cemented. Thereof we investigated the first 200 implants with a minimal follow-up of 5.5 years. There were no aseptic loosening, 1% septic revisions, 1% revisions because of instability and 0.5% revision because of malpositioning. Patella replacement was not performed during primary TKA, in 1 patient a secondary patella resurfacing was performed due to patella related anterior knee pain. There were more than 88% good and excellent clinical results using the Knee Society Score. Postoperative ROM showed correlation with preoperative ROM, there was no statistical significance regarding gender and age. There was also no significant difference in clinical outcome between patients with equal size of femoral and tibial implants and patients with different implant sizes, especially bigger tibial implants, which was done in 7% of the operations. In 75% of the cases the smallest PE plateau was used; there was no higher amount of instability in those cases with bigger plateau height, although the number was limited and of limited statistic value. The GEMINI TKA showed excellent overall clinical results with good ROM and good stability and there was no disadvantage in mixing the implant sizes. There was also no negative influence in using bigger PE insert. Leaving the patella "natural" worked well with the GEMINI due to optimized patella tracking.



Date : 2008-08-25  
Session : Joint: Total knee replacement 2  
Time : 1400-1530  
Room: 605

Abstract number : 18375

**PREOPERATIVE STRENGTHENING IN TOTAL KNEE ARTHROPLASTY - A RANDOMISED CONTROLLED STUDY OF NEUROMUSCULAR ELECTRICAL STIMULATION**

Raymond WALLS<sup>1</sup>, Gavin MCHUGH<sup>1</sup>, Niall MOYNA<sup>2</sup>, John O'BYRNE<sup>1</sup>

<sup>1</sup>Cappagh National Orthopaedic Hospital, Dublin (IRELAND), <sup>2</sup>School of Health and Human Performance, Dublin City University, Dublin (IRELAND)

Quadriceps femoris muscle (QFM) weakness has been implicated in predicting functional ability after TKA. Preoperative strengthening has been shown to improve recovery after surgery although it is unknown if this can be facilitated using a home-based neuromuscular electrical stimulation (NMES) program. This single blind, randomised control efficacy study applied NMES to the affected QFM for 20 min, 5 days a week, for 8 weeks pre-TKA. Isokinetic and isometric strength were determined at baseline, week 2, week 5, and immediately preop. Functional assessments included a 25 metre timed walk test (TWT), timed stair-climb test (SCT), and timed chair-rise test (CRT) at baseline and preop. Statistical analysis was performed using ANOVA's and independent t-tests. Thirteen patients (8 women and 5 men) scheduled for TKA were recruited and randomised into control (n=5) or intervention (n=8) groups. Groups had similar age (65.5±6.8 vs. 61.8±9.0; mean ± SD) and BMI (29.7±2.1 vs.33.2±5.6). There was improvement in SCT (p<0.01) and CRT (p<0.01) in the NMES group at week 8 compared to baseline. Isokinetic hamstring strength and isometric QFM strength increased significantly at weeks 2, 5 and 8 compared to baseline while isokinetic QFM strength increased only at week 5 (p<0.05) and week 8 (p<0.01). The use of a home-based NMES program for 8 weeks results in significant strength gains with associated improvements in function in patients scheduled for TKA for knee OA.

**Date : 2008-08-25**

**Session : Joint: Total knee replacement 3**

**Time : 1600-1730**

**Room: 605**

**Abstract number : 16267**

**UNICOMPARTMENTAL KNEE ARTHROPLASTY IN PATIENTS WITH OSTEOARTHRITIS OF THE MEDIAL COMPARTMENT**

Gershon VOLPIN, Alexander KAUSHANSKI, Moshe DANIEL, Haim SHTARKER

*Western Galilee Hospital, Nahariya (ISRAEL)*

**INTRODUCTION:** The optimal treatment of osteoarthritis of the medial compartment of the knee joint is still controversial. We present our experience with unicompartmental meniscal bearing knee arthroplasty in these patients. **PATIENTS:** Between 2001 and 2006, 38 Pts. (21F, 17M; 52-70 year-old, mean 63Y) underwent surgery using the Medial Oxford Unicompartmental Knee. 5/38 Pts. had since been operated on their other knee, 1-2 years after the first UKA. Patients were followed for 1.5-6 years (mean 3.5Y) and evaluated by the Knee Society Score and radiographs. **RESULTS:** 34/38 Pts. (89.5%) including the five patients who had staged bilateral procedures of both knees had excellent and good results. They were almost free of pain and had marked improvement in knee function. 4/38 Pts. (10.5%) had fair results. A second look arthroscopy of these patients revealed a progressive development of degenerative changes in their knees. Two of them had a second operation of total knee replacement after 4 and 5 years and in another patient the femoral component was replaced due to loosening after 5 years. **CONCLUSIONS:** Unicompartmental knee arthroplasty is a favourable procedure in patients with localised arthritis of the medial compartment. It allows replacement of only the affected joint compartment with less bone loss. Recovery and rehabilitation is quick and ambulation is early. The ideal patient for UKA is a relatively young with a stable knee, a flexion contracture less than 15 degrees and a change of mechanical axis of less than 5-10 degrees from neutral.

**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 3**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 16312**

**LONG-TERM RESULTS OF THE CEMENTED ALL-POLYETHYLENE TIBIAL COMPONENT IN MEDIN - WALTER CONDYLAR KNEE REPLACEMENT**

Vratislav RYBKA, T. KRUTA, A. SOSNA, P. VAVRIK, I. LANDOR, J. HACH  
*1st Orthopaedic Clinic, 1st Medical Faculty of Charles University, Prague (CZECH REPUBLIC)*

The review of 49 patients with 55 TKA Medin - Walter in follow-up time 8-17 years (average 14 years) was carried out. Seven patients with 10 operated knees were lost to follow-up. Therefore, we evaluated 35 patients with 38 (69%) TKA. There were 24 patients (26 knees) suffering from OA and 12 patients (12) knees in group of RA. In rating of the results according to Euler Knee Assessment Chart, 14 knees (37%) were pain-free when walking. The radiolucent line under the all-polyethylene tibial component appeared in 14 followed-up knees (37%). We evaluated 5 cases of aseptic loosening and 2 cases of late infection. The rotation of femoral component in 12 knees of 8 patients on average of 17 years since the implantation to the Transepicondylar Axis (TEA) has been measured on CT scans. The average of 3.5° external rotation of Condylar T wist Angle (CTA) was found. The all-polyethylene tibial components seem to us to be cost-effective implant for knees affected in elderly. **KEYWORDS:** All-polyethylene tibial component, total knee replacement (TKA), follow-up evaluation, rotation of femoral component, CT scans - TEA, CTA.

Date : 2008-08-25

Session : Joint: Total knee replacement 3

Time : 1600-1730

Room: 605

Abstract number : 16553

**PERIPROSTHETIC FRACTURES OF THE DISTAL FEMUR FOLLOWING TOTAL KNEE ARTHROPLASTY**

Patrick PLATZER, Gerhild THALHAMMER, Anna KRUMBOECK, Rupert SCHUSTER, Florian KUTSCHA-LISSBERG, Vilmos VECSEI  
*Medical University of Vienna, Department for Trauma Surgery, Vienna (AUSTRIA)*

INTRODUCTION: Periprosthetic femoral fractures following total knee arthroplasty are continuously rising due to an increasing number of knee joint replacements. The purpose of this study was to determine the clinical and radiographic long-term results of patients following surgical or non-operative treatment of periprosthetic fractures of the distal femur. MATERIAL AND METHODS: We reviewed the clinical and radiographic records of 19 patients (17 females and 2 males, average age: 76.5) with periprosthetic fractures of the distal femur after total knee arthroplasty between 1997 and 2006. 18 patients underwent operative stabilization by plate fixation (n=9), intramedullary nailing (n=7) or revision arthroplasty (n=2), one patient was treated non-operatively by cast immobilisation. RESULTS: 14 patients (74%) returned to their pre-injury activity level and were satisfied with their clinical outcome. In 4 patients we saw a relevant decrease of knee function and severe limitations in gait and activities of daily living. One patient died related to surgery. Successful fracture healing was achieved in 18 patients (95%). Failures of reduction or fixation occurred in three patients (16%). Re-operation due to technical failures was necessary in one patient (5%). CONCLUSION: Compared to current data in literature, we had a satisfactory outcome following individualized treatment of periprosthetic fractures of the distal femur. Referring to the wide field of treatment options and high rates of complications, periprosthetic femoral fractures after knee joint replacement constitute a challenging problem for the treating surgeons and require an adequate analysis of fracture aetiology and corresponding transfer into individual treatment concepts.

**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 3**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 16558**

**MEDIUM-TERM RESULTS OF PATELLOFEMORAL JOINT ARTHROPLASTY**

Riazuddin MOHAMMED, Ashwin UNNITHAN, Manish BANSAL, Kaustubh DURVE, Tushar JIMULIA  
*Royal Orthopaedic Hospital, Birmingham (UNITED KINGDOM)*

INTRODUCTION: The results of a multi-surgeon, multi-implant series of patellofemoral joint arthroplasty performed over a ten-year period are presented. MATERIAL AND METHODS: All patellofemoral joint arthroplasty performed from 1996 to 2006 were retrospectively reviewed using case notes, radiographs and clinic appointments until their latest follow-up period. RESULTS: 101 arthroplasties in 91 patients were followed-up for an average period of 48 months (range 6-96 months). The average age was 57 years with female patients thrice as common as male patients. There were 5 (5%) complications with 1 deep infection and 4 stiff knees. 35 subsequent procedures were performed in 28 patients including arthroscopic debridement in 18, arthroscopic lateral retinacular release in 8, tibial tuberosity transfer in 3, manipulation for stiffness in 2, and revision to total knee arthroplasty in 4 patients (3 for progression of tibiofemoral osteoarthritis and 1 for infection). CONCLUSIONS: The necessity of further surgeries in one third of the study group suggests that close follow-up of these patients is needed to address any concerns that can be easily resolved.

**Date : 2008-08-25**

**Session : Joint: Total knee replacement 3**

**Time : 1600-1730**

**Room: 605**

**Abstract number : 16567**

**MANIPULATION UNDER ANAESTHESIA FOR STIFFNESS FOLLOWING KNEE ARTHROPLASTY**

Riazuddin MOHAMMED, Shakir SYED, Naveed AHMED

*Royal Orthopaedic Hospital, Birmingham (UNITED KINGDOM)*

**INTRODUCTION:** Our experience of knee stiffness requiring manipulation under anaesthesia (MUA) following partial or total knee arthroplasty and early outcomes from manipulation are reported. **METHODS:** Data were collected from case notes for all stiff knees requiring MUA over a six-month period from March to August 2007. **RESULTS:** Twenty-one patients (11 females, 10 males) underwent MUA. The average age was 62 years (56-80 years). 15 primary and 3 revision total knee replacements underwent manipulation, as did two medial unicompartmental and one patellofemoral arthroplasty knees. The mean duration between arthroplasty and MUA was 13 weeks (6-32 weeks). The range of knee movement improved from a mean range of 10.40-71.20 in the pre-MUA period to 2.10-94.00 post-MUA and at follow-up was 2.30-91.90 (Figure 1). The mean arc of motion improved from 60.20 (range 400-800) pre-MUA to 91.90 (range 450-1200) post-MUA. The mean improvement in the arc of motion was 31.60 ( $p < 0.001$ ). At follow-up of a mean period of 3 months (6 weeks - 8 months) the mean arc of motion was 90.40 (range 400-1200). The mean improvement in knee movement from the pre-MUA at the follow-up was 30.20 ( $p < 0.001$ ). There were no complications noted except failure to gain improvement from MUA in one patient. **CONCLUSION:** We believe MUA has got a role in the treatment of early stiffness and should be the first line of management after failed physiotherapy.

**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 3**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 17189**

**THE L-M STABILITY IN NAVIGATED TKA**

Katsuya KANESAKI<sup>1</sup>, Kensuke YAMANAKA<sup>1</sup>, Kensei NAGATA<sup>2</sup>

<sup>1</sup>*Nagata Orthopedic Hospital, Omuta (JAPAN)*, <sup>2</sup>*Kurume University, Kurume (JAPAN)*

INTRODUCTION: OrthoPilot navigated TKA software manufactured by Aesculap has the technology of ligament balance check capability. In navigated TKA, there is a phase to check the position of the lower extremity. We check the angle at two different points. The first point is after arthrotomy, only with bony registration. The second point is post-implantation when closing the wound. We have evaluated the angles, varus or valgus, in several positions. The discrepancy of the former and the latter demonstrates the stability of TKA. MATERIALS AND METHODS: Nine cases were female. Seven were OA knee and two were RA. Average age was 74.5 years old. We will discuss the L-M instability angle in every point. RESULTS: The average angle of the maximum discrepancy was 7.4 degrees, which is that the average L-M instability is 7.4 degrees preoperatively. The average angle of the maximum discrepancy was 2.78 degrees. This angle indicates that the average L-M instability is 2.78 degrees postoperatively. The number of cases is too small to discuss any statistical suggestions; however, there is a tendency to reduce the L-M instability angle in every checking point. CONCLUSION: TKA was performed using the kinematic navigation system, OrthoPilot, and the L-M instability at several points were evaluated. The instability between pre-meniscectomy and post-implantation was compared. The results showed that there is a tendency to reduce the discrepancy of M-L instability. It may lead to the long durability of TKA.

**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 3**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 17584**

**TREATING STIFFNESS AFTER TOTAL KNEE ARTHROPLASTY**

Parag JAISWAL, Veerabahu MUTHUSAMY, Saket TIBREWAL, Sudhir RAO  
*Queen Mary's Hospital, Sidcup, Kent (UNITED KINGDOM)*

**INTRODUCTION:** The purpose of this study is to describe a surgical technique to improve stiffness after total knee arthroplasty (TKA). We defined stiffness as being inability to flex greater than 55 degrees which the patient found disabling. None of the patients had fixed flexion deformity. **METHODS:** Between 1996 and 2005, the senior author has performed 568 TKAs. As happens with TKA surgery, three patients developed stiff knees post surgery. This is a detailed report of the surgical technique used to improve the range of movement in all 3 patients and the associated improvement of lateral knee pain in all 3 patients after surgery. **RESULTS:** There were 2 females and 1 male with a mean age of 68.3 years (range 59 to 84). The average time from primary to secondary surgery was 17.7 months (range 14 to 20 months). The mean flexion pre-operatively was 46.7 degrees (range 40-55) and post-operatively was 106.7 (range 100-110). **CONCLUSIONS:** We conclude that if other obvious causes of stiffness such as component mismatch, patello-femoral joint overstuffing, infection, etc. have been excluded, we are faced with the diagnosis of arthrofibrosis. This procedure provides a relatively straightforward technique to improve outcomes without resorting to complex revision surgery.



**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 3**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 17606**

**UTILITY OF PREOPERATIVE DISTRACTIVE STRESS RADIOGRAPH TO EXTENT OF MEDIAL RELEASE IN TOTAL KNEE ARTHROPLASTY**

Jae Ang SIM<sup>1</sup>, Beom Koo LEE<sup>1</sup>, Sang Hoon YANG<sup>2</sup>

<sup>1</sup>Department of Orthopaedic Surgery, Gil Medical Center, Gachon University, Incheon (KOREA), <sup>2</sup>Department of Orthopaedic Surgery, Gil Medical Center, Incheon (KOREA)

The utility of preoperative distractive stress radiograph in determining the extent of medial release in primary total arthroplasty was examined by reviewing 120 varus, osteoarthritic knee joints (75 patients). The association of the angle on distractive stress radiograph was analysed from the extent of medial release. The extent of medial release was classified into the following 4 groups according to the stage: release of the deep medial collateral ligament (group 1), release of the posterior oblique ligament and/or semimembranous tendon (group 2), release of the posterior capsule (group 3), and release of the superficial medial collateral ligament (group 4). The mean femorotibial angle on the preoperative distractive stress radiograph was valgus 2.4° (group 1), valgus 0.8° (group 2), varus 2.1° (group 3), varus 2.7° (group 4). The extent of medial release increased with increasing degree of varus deformity in the preoperative distractive stress radiograph. The preoperative distractive stress radiograph was useful for predicting the extent of medial release in primary total knee arthroplasty.

Date : 2008-08-25  
Session : Joint: Total knee replacement 3  
Time : 1600-1730  
Room: 605

Abstract number : 18013

**COMPARISON BETWEEN CLOSED WOUND DRAINAGE AND NO DRAINAGE IN TOTAL KNEE ARTHROPLASTY**

Jagan Mohana Reddy VELPULA<sup>1</sup>, Akshay MALHOTRA<sup>1</sup>, Peter DENN<sup>1</sup>, Jagwanth SINGH<sup>2</sup>

<sup>1</sup>Macclesfield Hospitals, Macclesfield (UNITED KINGDOM), <sup>2</sup>Leighton hospital, Crewe (UNITED KINGDOM)

The use of drains in total knee arthroplasty remains controversial. The drains do not affect the patients' hospital stay, blood loss or the patients' satisfaction in any way. On the contrary the drains tend to cost the National Health Service dearly. This prospective, non-randomised study was designed to evaluate the role of drains in routine total knee arthroplasty. We analysed the following parameters - age, sex of the patient, length of stay and haemoglobin drop. We investigated 100 patients undergoing knee arthroplasties out of which 50 patients had drains inserted and 50 had no drains inserted. The group having no drains inserted had an average age of 70 years with a range of 54-88 years and a male to female ratio of 3:4. The average stay was 5 days and the average haemoglobin drop was 22gm/ml. The group having drains inserted had an average age of 69 years with range of 54-87 years and a male female ratio of 1:2. The average stay was 5 days and average haemoglobin drop was 30gm/ml. Thus on conclusion we found that patients without any drains placed had a comparable length of hospital stay and a lesser drop in haemoglobin as compared to the group of patients where drains were used. There were no wound complications in this group either. The cost-effectiveness of not using drains supported by better patient satisfaction and easier dressing post-operatively on the ward outweighs against argument in the favour of placing drains.

**Date : 2008-08-25**  
**Session : Joint: Total knee replacement 3**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 18102**

**CLINICAL RESULTS OF ROTATING VS. FIXED PLATE KNEE ARTHROPLASTY: A 2 TO 7-YEAR FOLLOW-UP**

Antonio CROCE, Andrea MONDINI, Marco OMETTI  
*Istituto Ortopedico G.Pini, Milan (ITALY)*

In this work we mean to compare the results of two different knee prostheses (fully mobile plate prosthesis - Rotaglide® vs. fixed bearing TKR - Nexgen®) implanted in our Institute since 2000 up to now. We have evaluated 140 (70 vs.70) patients treated for primary knee osteoarthritis with TKR in 1° Orthopaedic Division of Istituto Ortopedico "G. Pini" of Milan. Our evaluation protocol includes: 1. Local objective examination and BMI evaluation; 2. Evaluation of full R.O.M.; 3. Functional Index statement of patient's agreement with WOMAC score; 4. Standard X-Rays; 5. Gait analysis and superficial electromiography of the gluteus. Our results have pointed out no mobilisations of both prostheses models, showing a 5% superior amount of patients with flexion angle >90° and full extension with the use of mobile plate TKR. The functional results were also significantly superior comparing mobile vs. fixed prosthesis. As stated in our previous short-term analysis, the use of mobile plate prostheses of the knee guarantees a faster and complete recovery in postoperative ROM, rapid recovery of proprioceptive sensibility, and most of all, minimizes the physical and psychological stress for the patient. These factors, in association with surgeon's ability, an immediate and intense rehabilitation programme and the use of materials even more resistant to debris, carry to a greater satisfaction of patient, a faster regain of normal social life and a longer duration of the prosthesis.

Date : 2008-08-25  
Session : Joint: Total knee replacement 3  
Time : 1600-1730  
Room: 605

Abstract number : 18611

**THE BLOOD LOSS IN THE NAVIGATED LESS INVASIVE TOTAL KNEE ARTHROPLASTY**

Chyun-Yu YANG, Chih-Wei CHANG, Po-Ting WU  
*National Cheng Kung University Hospital, Tainan (TAIWAN)*

Computer-assisted operations were reported to have the benefits of blood saving and lessening the risk of blood transfusion in some studies. The authors were curious about the same impact in the patients having a less invasive primary total knee arthroplasty. A retrospective review was performed with 150 cases divided into two groups according to different methods: the computer-assisted kinematic navigation and the manual method. All the surgeries were carried out by a single surgeon using the same approach with a 8~12cm skin incision. In the manual group, the femoral cutting alignment jigs was placed with intramedullary guidance, as was performed extramedullary with navigation. Besides, all the proximal tibia cuts were performed extramedullary by visual judgment in the manual group and navigation assistance in the other. No drainage was left in each groups and the tourniquet was released till skin closure. The values of pre- and postoperative hemoglobin were recorded and compared to estimate the perioperative blood loss. Similar reduction in hemoglobin was noted for  $1.39\pm 0.84$  in the manual group versus  $1.55\pm 0.94$  in the navigation group; no significant difference was found ( $p=0.315$ ). In this study, the reported benefit of less blood loss with navigation system could not be found. The effect of "natural clamping" by no drainage placement was supposed to outweigh the impact of computer-assisted techniques in the less invasive TKAs. Further studies are needed to clarify their individual effects.

**Date : 2008-08-25**  
**Session : Trauma I**  
**Time : 0800-0900**  
**Room: 606-607**

**Abstract number : 18228**

**ATLANTO-AXIAL TRAUMA IN THE YOUNGER CHILD**

Guy GRIMARD<sup>1</sup>, Benoit MORIN<sup>1</sup>, Bernard LARUE<sup>2</sup>

<sup>1</sup>Hospital Ste-Justine, Montreal (CANADA), <sup>2</sup>Centre hospitalier universitaire de Sherbrooke - Hôpital Fleurimont, Sherbrooke (CANADA)

**OBJECTIVES:** Atlanto-axial trauma in the very young child is a rare occurrence, with less than 50 cases reported in the surgical literature. We describe three additional cases to illustrate the management of this clinical entity. **MATERIALS, METHODS AND RESULTS:** Three patients aged 16 to 34 months were treated for post-traumatic atlanto-axial instability. Two patients had an odontoid fracture and were treated with C1-C2 fusion or a halo-vest. The other patient had a purely ligamentous trauma and was treated with C1-C2 fusion. One patient had a neurological deficit, related to a cranial injury (patient 1). All patients had a satisfactory clinical and radiological outcome. **DISCUSSION:** Atlanto-axial trauma in children are most often related to fall or road traffic accidents. Head weight proportion, skeletal and muscular immaturity, as well as soft tissue laxity all contribute to the vulnerability of this patient population. Between 25 and 50% of patients presented with a neurological deficit. Halo-vest is now more frequently used than plaster Minerva to maintain a closed reduction. In cases when reduction is inadequate or if there is residual instability, surgical treatment with posterior reduction and fusion with C1-C2 cerclage is the preferred treatment. **CONCLUSION AND PERTINENCE:** Atlanto-axial trauma in the young child is rare and sometimes catastrophic. These injuries are different from those encountered in the adult or adolescent population. Health care providers should be knowledgeable of the pre-hospital and definitive care of these injuries to optimised patient outcome.

Date : 2008-08-25  
Session : IFPOS -Trauma II  
Time : 0800-1215  
Room: 606-607

Abstract number : 15720

**ELASTIC STABLE INTRAMEDULLARY NAILING (ESIN) OF UNSTABLE PAEDIATRIC TIBIAL DIAPHYSEAL FRACTURES**

Moez BALLAL

*Royal Liverpool Children's NHS Trust, Liverpool (UNITED KINGDOM)*

INTRODUCTION: The treatment of unstable Tibial diaphyseal fractures in children can include conservative treatment, Elastic Stable Intramedullary Nailing (ESIN), plating and external fixation. The aim of this study was to analyse the treatment of paediatric Tibial diaphyseal fractures using ESIN stabilisation in our institute. METHODS: Between 1998 and 2005, 18 tibial fractures were treated using ESIN. They included 13 mid shaft, four distal and one proximal shaft fractures. Fracture configuration included 11 transverse, four oblique and three with a butterfly fragment. The commonest indications for surgery were most commonly failed manipulations under anaesthetic or unable to maintain acceptable alignment with plaster casts. RESULTS: Fracture healed in all 18 patients at an average of 16.3 weeks. Mean duration to fully weight bearing was 10.5 weeks. There was one case of delayed union but no nonunion. One patient had 5 degrees of varus and another patient had 5 degrees of procurvatum. There was one case of compartment syndrome, requiring surgical fasciotomy. CONCLUSION: This method has the advantage of preservation of fracture haematoma, less soft tissue dissection, smaller and more cosmetic wounds, ease of management and most importantly reduced complication rate.

**Date : 2008-08-25**  
**Session : IFPOS -Trauma I**  
**Time : 0800-1215**  
**Room: 606-607**

**Abstract number : 15721**

**COMPARISON BETWEEN COLLAR AND CUFFS AND ABOVE ELBOW BACK SLABS IN THE INITIAL TREATMENT OF GARTLAND TYPE I SUPRACONDYLAR HUMERUS FRACTURES**

Moez BALLAL

*Royal Liverpool Children's NHS Trust, Liverpool (UNITED KINGDOM)*

We compared two commonly used methods of immobilization of Gartland Grade I Supracondylar humeral fractures, with respect to pain control, use of analgesia and sleep interruption. Forty patients were included in the study. Collar and cuff immobilization (group1, n=20) and above elbow back slab immobilization (group2, n=20). Diagnosis was made in the accident department and patients were immobilized (collar & cuff or back slab) according to the preference of the treating doctor. Patients were then reviewed in the next available fracture clinic where they were assessed. The Wong-Baker Faces scale was used to measure pain. Patients immobilized with a collar & cuff had an average pain score of 7.2 compared with 3.4 for those immobilized with a back slab ( $p < 0.0001$ ). Children in the collar & cuff group used analgesia at regular intervals, nearly 4 times more than those in the back slab group ( $p = 0.005$ ) and 85% of children immobilized with a collar & cuff had interrupted or no sleep at all the night following the injury ( $p = 0.008$ ) compared to 45% of children in the back slab group. We conclude that immobilization of Gartland type I fractures with an above elbow back slab provides better pain relief and is more comfortable for paediatric patients than collar and cuff immobilization.

**Date : 2008-08-25**  
**Session : IFPOS -Trauma I**  
**Time : 0800-1215**  
**Room: 606-607**

**Abstract number : 15828**

**TRAMPOLINE INJURIES IN CHILDREN**

Umesh NAGARE, Mohammad MAQSOOD, Aroop SEN  
*Lincoln County Hospital, Lincoln (UNITED KINGDOM)*

**OBJECTIVES:** To quantify and describe trampoline-related injuries in children attending a district general hospital emergency department. **METHODS:** Retrospective cohort study of consecutive patients attending an emergency department with trampoline-related injuries over a 1-year period (April 2006-May 2007). **RESULTS:** Twenty-nine children were treated for trampoline-related injuries during the period reviewed. Forty-one percent were girls. Upper limb injuries (62%) were more common overall. The most common injuries were to the forearm (41%), followed by supracondylar elbow (10%). The most common mechanism of injury was direct trauma after fall from a trampoline. **CONCLUSIONS:** The marked increase in emergency room visits related to trampoline injuries might reflect only the increased number of trampolines now available for recreational use or the creative manner in which they are being used. Trampoline-related injuries to children treated in the emergency department are almost exclusively associated with the use of backyard trampolines. The prevention strategies of warning labels, public education, and adult supervision are inadequate to prevent these injuries. Children should not use backyard trampolines, and the sale of trampolines for private recreational use should be halted.



**Date : 2008-08-25**  
**Session : IFPOS - Trauma I**  
**Time : 0800-1215**  
**Room: 606-607**

**Abstract number : 16260**

**RESULTS OF TREATMENT OF DISPLACED SUPRACONDYLAR FRACTURES OF THE HUMERUS IN CHILDREN**

Haim SHTARKER, Riad DAQWAR, Gershon VOLPIN  
*Western Galilee Hospital, Nahariya (ISRAEL)*

**INTRODUCTION:** The most frequently encountered elbow fracture in children is the extension supracondylar fracture of humerus, which accounts for more than 60% of elbow injuries in children. Many types of treatment approaches have been proposed in the literature of the last 20 years. We present our own protocol of treatment with the results. **PATIENTS:** This is a report of 154 children (1-14 years old; mean 6.2Y), followed for 1-3 years (mean 2Y) with displaced supracondylar elbow fractures. 143 (93%) were treated by closed reduction and percutaneous cross KW fixation performed under nerve stimulation control. In 4 pts (2.5%) initial exploration of brachial artery or nerves was performed due to neuro-vascular compromise. In the remaining 7 pts (4.5%) open reduction and percutaneous KW fixation were done. 72/154 (46.7%) underwent surgery following skeletal traction for 3-6 days. **RESULTS:** Results were assessed according to Flynn's grading score, evaluating both elbow motion and changes in elbow carrying angle. Functional overall results were excellent in 141 pts (91.5%) and good in 13 (8.5%). Mild cubitus varus or valgus was diagnosed in 4 pts (2.6%). Transitory ulnar nerve neuropraxy appeared in 1 child (0.64%) and neuropraxy of anterior interosseal nerve in one other child. No cases of re-displacement of fracture were observed. **CONCLUSIONS:** It seems that closed reduction and cross KW percutaneous fixation under nerve stimulation control is a secure method of treatment which provides the highest degree of fracture stability and the lowest rate of complications.

**Date : 2008-08-25**  
**Session : IFPOS -Trauma II**  
**Time : 0800-1215**  
**Room: 606-607**

**Abstract number : 16276**

**GREENSTICK FRACTURES OF THE PELVIS: A COMMONLY MISSED DIAGNOSIS?**

Hesham AL-KHATEEB, P PAUL, Danny BOXER  
*Watford General Hospital, LONDON (UNITED KINGDOM)*

Pelvic fractures in children are high-energy injuries. Road traffic accidents are the prime cause of pelvic fractures in children, usually a pedestrian child being hit by a car. The fracture types most commonly recognised in these age groups are related to the mechanism of injuries. We report a case of a 15-year-old girl in whom a greenstick fracture of the pelvis was diagnosed on a CT scan. To our knowledge, there has been no previously reported case of a greenstick fracture of the pelvis in the present literature. **DISCUSSION:** Conventionally pelvic fractures in children are considered to represent major skeletal trauma and because of the association with injuries to other systems, the morbidity and mortality are quite high unless stabilised very early, often before performing any X-ray examination. In most instances, an AP view of the pelvis is sufficient to determine the stability of the pelvic ring in the acute situation. In the United Kingdom, CT scanning is often not performed within the initial stage of emergency assessment and management. It is, however, indicated in planning the operative management of complex fractures, and when there is doubt regarding the extent of the fracture on plain radiographs, particularly if involving a joint. Such injuries are unlikely to be visualised on plain films; it is likely that they are under-reported. It is worth considering the possibility of such an occult injury in children who have persisting pain following significant pelvic trauma.

**Date : 2008-08-25**  
**Session : IFPOS - Basic Science, upper limb and spine**  
**Time : 0800-1215**  
**Room: 606-607**

**Abstract number : 16318**

**BICEPS TENDINITIS IN A THREE-YEAR- OLD CHILD**

Venkata Sunil DACHEPALLI<sup>1</sup>, Samer MORGAN<sup>2</sup>, Vincent JARAMILLO<sup>2</sup>

<sup>1</sup>*Rochdale Infirmary, Wrexham (UNITED KINGDOM)*, <sup>2</sup>*Whiston Hospital, Prescot (UNITED KINGDOM)*

A three-year-old girl presented with a spontaneous onset of severe pain in the left shoulder. There was no history of trauma, previous injury or recent infection. On examination, there was no apparent swelling or deformity. She had generalised tenderness and was very reluctant to move her shoulder. It was very difficult to elicit any specific physical findings apart from generalised tenderness and restricted range of movement. Inflammatory markers were within normal range. Plain radiograph of the shoulder showed no abnormality. The patient continued to have pain with no improvement and little response to analgesics. Accordingly ultrasound scan of the left shoulder was arranged. Ultrasound scan of the shoulder revealed biceps tendinitis associated with tendon sheath effusion (tenosynovitis of the long head of the biceps). Management included non-steroidal anti-inflammatory drugs and physical therapy. In the acute stage, physical therapy involved rest, ice and elevation. In the sub-acute stage, physical therapy involved soft tissue therapy and range of movement exercises. As symptoms started to subside, she progressed to resistive exercises. The patient continued to progress steadily and made full recovery at 12 weeks following the onset of the condition.

Date : 2008-08-25  
Session : IFPOS -Trauma II  
Time : 0800-1215  
Room: 606-607

Abstract number : 16419

**RESULTS OF CLOSED REDUCTION AND INTRAMEDULLARY K-WIRES FIXATION OF LONG BONES IN CHILDREN**

Osama FARAG

*Saudi German Hospital, AlMadinah AlMonourah (SAUDI ARABIA)*

OBJECTIVES: To evaluate the use of long intramedullary K-wires as a tool of fixation of long bone fresh fractures in children and to assess the rate of union and return to usual daily activity. METHOD: 56 cases with different fractures including humerus, forearm, tibia and femoral fractures were studied in the period between March 2004 and July 2007 at Saudi German Hospital. The ages ranged from 4-13 years, male:female 41:15. The ratio of humerus:forearm:tibia:femur fractures were 17:28:7:4. RESULTS: The cases were evaluated according to union rate and return to pre-fracture activity which showed excellent results in humeral and forearm fractures with union of fracture within 4-7 weeks. In femoral and tibial fractures the results were good for femoral fractures with union of all cases between 6-12 weeks but for tibial fractures the results were satisfactory with 2 cases of delayed union which ranged between 12-16 weeks and the rest of cases achieved full union within 8-12 weeks. CONCLUSION: The method of percutaneous fixation of long bones fracture in children with the use of K-wires showed excellent results with rapid return to functional activity and union rate specially in humeral and forearm fractures, whereas in femoral and tibial fractures it has not shown any difference in comparison to other methods of conservative treatment, the only advantage was ensuring good alignment of the bone.

**Date : 2008-08-25**  
**Session : IFPOS - Basic Science, upper limb and spine**  
**Time : 0800-1215**  
**Room: 606-607**

**Abstract number : 16455**

**NEUROCHEMICAL CHANGES IN THE SPINAL DORSAL HORN IN NEUROPATHY FOLLOWING LIMB-LENGTHENING IN RABBITS**

George SZOKE, Zita PUSKAR, Karoly PAP, Mate KOZSUREK, Gyula DOMOS  
*Orthopaedic Department of Semmelweis University, Budapest (HUNGARY)*

Limb-lengthening is a widely used surgical procedure to correct bone deformities of the extremities. Nerve injury is one of the most serious complications associated with this type of operation resulting in neuropathy with pain, sensory loss or motor weakness. Despite of the fact that limb-lengthening is a common practice, changes in the nervous system underlying the symptoms are still unknown. We showed earlier that following limb-lengthening, huge vacuoles appeared in large dorsal root ganglion (DRG) cells on the ipsilateral side of the operation. In addition, the number of substance P- (SP) immunoreactive cells in the DRGs decreased (by 10%), while the total number of DRG neurons was unchanged. In this study, we examined the neurochemical changes in the spinal dorsal horn associated with limb-lengthening in rabbits. Four groups of rabbits (5 rabbits/group) were used. In group A, B and C (sham operated) tibial osteotomy, external fixateur application and 7-day bone compression were carried out. After the callus formation in group A and B, 1 mm distraction was applied once a day for 20 days to achieve 120% of the original length. Untreated animals formed the group D. All animals were sacrificed after the lengthening had been terminated except those in group B that reached full recovery before. Using immunohistochemistry and confocal image analysis, SP-, calcitonin gene-related peptide- (CGRP) immunoreactivity and Bandeireae simplicifolia lectin (IB4) binding were measured in the dorsal horn of the L6 segments in the four groups.

Date : 2008-08-25

Session : IFPOS - Basic Science, upper limb and spine

Time : 0800-1215

Room: 606-607

Abstract number : 16519

**TRICEPS PRESERVING APPROACH TO THE ELBOW BASED ON THE VASCULAR ANATOMY OF TRICEPS BRACHII IN THE TREATMENT OF DISPLACED SUPRACONDYLAR FRACTURES OF HUMERUS IN CHILDREN**

Aysha RAJEEV, Gautam TAWARI, Joseph POOLEY

*Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM)*

We have found difficulties performing open reduction using the described surgical approaches. We report an approach based on studies of the vascular anatomy of triceps, which provides a wide exposure facilitating surgery. Between 2002 and 2006 we performed open reduction and internal fixation on 16 children (10 girls, 6 boys: mean age 6). Our vascular injection studies indicate that the blood supply to triceps brachii is proximally based. Moreover, the anastomosis between the branches of profunda brachii and radial and ulnar collateral arteries takes place at the fine vessel level and are functionally end arteries. We used a posterior approach identifying the ulnar nerve. We mobilised lateral triceps and anconeus in continuity preserving the vascularity and separated the components of distal triceps through an intermuscular septum. The fractures were reduced and fixed using K-wires. The fractures healed in the anatomical position in each child and all 16 demonstrated a full range of elbow movements within 6-8 weeks of K-wire removal. We observed no complications. In our approach no muscle tissue is divided, triceps dehiscence and postoperative stiffness due to scarring and avascular necrosis of muscle tissues can be avoided. Although closed reduction and percutaneous K-wire fixation remains the treatment of choice for displaced supracondylar humeral fractures, anatomical reduction must be achieved ideally and residual rotation of the fracture fragments avoided. This approach provides a wide, symmetrical and safe exposure facilitating open reduction and internal fixation of supracondylar fractures of the humerus in children.

**Date : 2008-08-25**  
**Session : IFPOS -Trauma I**  
**Time : 0800-1215**  
**Room: 606-607**

**Abstract number : 17022**

**DISPLACED SUPRACONDYLAR FRACTURES OF THE HUMERUS IN CHILDREN: BLIND PINNING IN A PRONE POSITION WITHIN SIX HOURS OF THE TRAUMA**

Angela BRIVIO<sup>1</sup>, Ezio PESCATORI<sup>2</sup>

<sup>1</sup>Università degli Studi di Milano – I Scuola di Specialità in Ortopedia e Traumatologia, Lissone (ITALY), <sup>2</sup>Azienda Ospedaliera di Melegnano – Presidio di Cernusco sul Naviglio, Milano 2 - Segrate (ITALY)

It is still controversial how many inherent aspects of displaced supracondylar humerus fractures are managed. After having analysed 11 years of second and third grade fractures cases according to Gartland, 46 cases treated have been selected and analysed with the same technique: 1. Immediate surgery (within 6 hours). 2. Positioning of the patient in a prone position with the arm bent at the elbow and hanging free, flexed at between 45 and 90 degrees. 3. Percutaneous synthesis with two or three K-wires. The results were evaluated according to the Flynn criteria. Out of 46 children studied (36 males and 10 females, average age 7 years, range 1-12 years), the average follow-up was 70 months (range 5-149 months), the average hospital stay was 3 days (range 1-10 days). Seeing the low number of complications (one patient with median nerve stupor, which was resolved spontaneously in 21 days and two patients who had a new operation for unsatisfactory reduction) and taking into account the satisfaction of the parents, it is to be concluded that the immediate reduction and synthesis of the fracture is preferable, with the child in a prone position, as this has turned out to be a reliable, safe and effective procedure with a short hospital stay.

Date : 2008-08-25  
Session : IFPOS -Trauma II  
Time : 0800-1215  
Room: 606-607

Abstract number : 17067

**THE TREATMENT OF DIAPHYSEAL FOREARM-SHAFT REFRACTURES WITH INTRAMEDULLARY NAILING (ESIN) IN PEDIATRIC PATIENTS**

Annelie-Martina WEINBERG<sup>1</sup>, Florian AMERSTORFER<sup>1</sup>, Simon PEARCE<sup>2</sup>, Eva Elisa FISCHERAUER<sup>1</sup>, Sonja GABER<sup>1</sup>, Barbara SCHMIDT<sup>1</sup>

<sup>1</sup>Department of Paediatric and Adolescent Surgery, Medical University, Graz (AUSTRIA), <sup>2</sup>Orthopaedic SpR, Maidstone & Tunbridge Wells NHS Trust, Kent (UNITED KINGDOM)

**BACKGROUND:** Forearm fracture is a common injury in childhood with an increasing incidence. The cause of fracture is mostly a fall on the outstretched arm at home or during sports activities. One of the complications of forearm fracture management is a refracture. This can occur in the metaphysis or diaphysis. **METHODS:** We analysed the operative treatment of diaphyseal forearm refractures with ESIN (elastic stable intramedullary nailing) in 21 children, aged between 2 and 14. **RESULTS:** Greenstick fractures were the primary fractures in 19 patients. Out of 21 children, 18 were treated with an above elbow cast for averaged five weeks. The other three primary fractures were managed with ESIN. All 21 refractures were treated with ESIN. In 18 cases, closed reduction with nailing was possible; three required an open reduction. In nine patients a closed medullary cavity was present; however, only two of them needed an open reduction. Average time of surgery was 60 minutes. None of the patients had complications with wound healing, osteomyelitis, or rupture of the extensor pollicis longus. Swelling appeared in four and paraesthesia of the thumb in one patient. Free functional movement was achieved in all children. Long-term results were examined with questionnaires: No re-refracture occurred. One patient suffered from meteorosensitivity. 92% were able to do the same sports activities as before injury. **CONCLUSION:** ESIN seems to be one choice for treatment in refracture of the forearm. If the surgery is correctly performed, good results can be expected and only few complications may occur.



**Date : 2008-08-25**  
**Session : IFPOS -Trauma I**  
**Time : 0800-1215**  
**Room: 606-607**

**Abstract number : 17119**

**PROXIMALLY PEDICLED CROSS-LEG FLAP IN SEVERE FOOT AND ANKLE TRAUMA IN CHILDREN**

Tianyou LI, Ruixue MA

*Children's Hospital of Fudan University, Shanghai (CHINA)*

**BACKGROUND:** Classical cross-leg flaps for severe lower-extremity soft-tissue defects have been replaced by free-flap transfers in most centres due to advances in microsurgery. But free-flap surgery is still a challenging field in young children because of technical difficulties. Proximally pedicled fasciocutaneous cross-leg flap was used in 8 cases with severe soft-tissue defect on foot and ankle in our hospital. **MATERIALS:** Eight children (3 male and 5 female), ages from 2 to 10 years old (mean age 6 years), were referred to our hospital between December 2004 and December 2007 with smashed injuries of foot and ankle combined with severe soft-tissue defects. Four of the cases had the defect on the dorsum of the foot and ankle; four had the defect on the heel. Immediately after thorough debridement of the wounds, five of 8 were given proximally pedicled cross-leg flaps from the opposite leg to cover the defects, three were given original suture to the degloving soft-tissue, which produced necrosis later, were replaced by cross-leg flaps 3 weeks after injury. The flap donor sites were abdominal skin grafted. The legs were immobilised with plaster to protect the flaps. The flaps were divided around 20 days after operation. **RESULTS:** All the flaps survived successfully without complications. After 11.5 (1 to 37) month follow-up, full ankle range of motion was achieved in all cases, but that of affected toes was restricted. **CONCLUSIONS:** Proximally pedicled fasciocutaneous cross-leg flap may be still a safe choice in children.

**Date : 2008-08-25**  
**Session : IFPOS -Trauma II**  
**Time : 0800-1215**  
**Room: 606-607**

**Abstract number : 17339**

**SINGLE ELASTIC STABLE INTRAMEDULLARY NAILING APPLIED TO TREAT THE FRACTURES OF LOWER LIMB IN YOUNG CHILDREN**

Xiang Xin ZHANG, Rui Xue MA  
*Children's Hospital of Fudan University, Shanghai (CHINA)*

**OBJECTIVE:** To use single elastic stable intramedullary nailing (ESIN) to treat the fractures of lower limb in young children between 2 to 4 years old and assess the clinical outcome. **METHODS:** Eleven patients aged from 2 to 4 years old with fractures of lower limb, including 10 femurs and 2 tibias, were treated with single ESIN and hip spica or long leg cast from April 2005 to July 2007. All patients were followed up regularly from 6 to 30 months. All imaging data and clinical examination were retrospectively analysed. **RESULTS:** Average of hospitalization was 5.6 days. Average healed time was 5.8 weeks. All cases had normal range of motion in the near joints and got excellent results, all scores of lower limb function are excellent. No refracture, delayed union or non-union, rotational deformity. 3 cases had overgrowth of the femur less than 1.0cm. **CONCLUSIONS:** Using single ESIN is an effective therapeutic approach for the fractures of lower limb in young children between 2 to 4 years old. The method is easily adopted by the parents because of the advantages of minimal invasion, convenience of nursing and short time of hospitalization et al.

Date : 2008-08-25  
Session : IFPOS - Basic Science, upper limb and spine  
Time : 0800-1215  
Room: 606-607

Abstract number : 17659

**STERNOCLEIDOMASTOID PSEUDOTUMOUR OF INFANTS (SCMPOI) AND CONGENITAL MUSCULAR TORTICOLLIS (CMT):  
IMMUNOHISTOCHEMICAL RESEARCH**

Shengping TANG<sup>1</sup>, Zhengquan LIU<sup>2</sup>

<sup>1</sup>Shenzhen Children's Hospital, Shenzhen (CHINA), <sup>2</sup>Chongqing Children's hospital, Chongqing (CHINA)

INTRODUCTION: The ultrastructure of SCMPOI found that there were myoblasts, fibroblasts, myofibroblasts, and mesenchyme-like cells in the proliferation fibrous tissue. The purpose of the current study is to further investigate cells differentiation in the SCMPOI and CMT. METHODS: The immunohistochemical expression of desmin,  $\alpha$ -smooth-actin, HHF-35,  $\alpha$ -sarcomeric actin, myosin and vimentin was examined in 56 cases, among them, 25 cases with mass (Group 1), 20 with tumour history (Group 2) and 11 without tumour and tumour history (Group 3). RESULTS: Vimentin positive stain in all cases. Desmin stain showed more positive cells in group 1 than in group 2 and group 3. Comparing group 1 with group 2 and 3, 2 test showed that desmin positive rate in group 1 was significantly higher than the latter two groups ( $X^2 = 8.700$  and  $6.414$ , respectively). Using HHF-35 and  $\alpha$ -sarcomeric actin stain, there were more positive cells in group 1 than in group 2 and 3.  $\alpha$ -smooth-actin stain demonstrated that there were numerous cells with characteristic of myofibroblasts and the myofibroblasts decreased with age. CONCLUSION: The spindles-like cells in mass demonstrate that, on the one hand, the masses are capable of differentiation and maturation with characteristics of fetal muscle, on the other hand, the masses are restricted on their way to differentiate and mature.

**Date : 2008-08-25**  
**Session : IFPOS -Trauma I**  
**Time : 0800-1215**  
**Room: 606-607**

**Abstract number : 18206**

**EPIDEMIOLOGY OF PAEDIATRIC FRACTURES IN SOUTH DUBLIN**

Colm TAYLOR, Paul CURTIN, Eoin SHEEHAN, Esmond FOGARTY  
*National Children's Hospital, Dublin (IRELAND)*

Fracture surveillance is effective at describing local trends in injury incidence. Data is difficult to obtain retrospectively. The aim of this study was to quantify and describe paediatric fractures and identify potentially preventable injuries in children. A form to parents of all children with fractures seen acutely in two South Dublin hospitals, an area with a large young urban population. Forms included a brief description of the injury in terms of location and mechanism. This was correlated with initial and follow-up radiographs. Results from 1200 fractures over a four-month period were analysed. The mean age of injury was 8.9 years, and 57% were male. The peak hour of injury was 7-8pm. 73% of fractures were due to falls. The most common location was in or about the home (35%). 61% of falls greater than 1 metre occurred at home, mostly from walls. 17% of fractures occurred while participating in sport, most commonly Gaelic football and hurling. Injuries occurring during unsupervised sport were more likely to need surgery. Domestic trampolines were an emerging cause of injury to the upper limb. Vehicular accident was an uncommon cause of injury. Predictably, 41% of all fractures involved the radius. Younger children were effectively treated with removable casting material. 39% of operative cases were performed outside of normal working time. The timing of fractures needing emergent surgery has implications on theatre staffing. We conclude that many injuries may be preventable, especially in the home where the environment is modifiable.

**Date : 2008-08-25**  
**Session : IFPOS -Trauma I**  
**Time : 0800-1215**  
**Room: 606-607**

**Abstract number : 18631**

**A NEW METHOD OF CLOSE REDUCTION FOR TREATMENT OF PAEDIATRIC TYPE III SUPRACONDYLAR HUMERAL FRACTURE - SURGICAL TECHNIQUE AND RESULTS**

Bobby Kin-Wah NG, P. K. CHAN, K. Y. LAW, K. L. LIU, Jack C.Y. CHENG

*Department of Orthopaedics & Traumatology, Prince of Wales Hospital, The Chinese University of Hong Kong, Shatin, N.T. (HONG KONG)*

**INTRODUCTION:** Close reduction of Type III supracondylar humeral fractures can be difficult. The understanding of the pathological anatomy and the obstruction to reduction holds the key to successful reduction of this fracture. We describe a new technique and the outcome of this method. **MATERIALS AND METHODS:** 32 consecutive type III fractures had been treated over last two years. The surgical technique consisted of: a) screening under X-rays intensification; b) the procedure consisted of bimanual maneuver and screening to confirm complete reduction of the fracture. Position of reduction was then held and routine percutaneous lateral pinning was then performed for fixation of the fracture. A long arm cast was applied for additional immobilisation. **RESULTS:** 20 male and 12 female patients were treated in this manner. Age ranged from 2-10 with peak age at 6-7. Left 59% right 41%. Displacement directions: posterolateral 14, direct posterior 10, posteromedial 8. Before the operation, there were 7 cases of nerve palsy: 3 median, 3 anterior interosseous and 1 posterior interosseous. Three cases of pulseless fractures all had nerve palsy. All pulse returned after CR and PKWF. All cases had successful reduction without need to proceed to open reduction. All patients had healed uneventfully. All nerve palsy recovered without complications. **DISCUSSION AND CONCLUSION:** Type III supracondylar fractures could be treated successfully with a new technique which is safe for the important soft tissue in front of the fracture. It can be successful even for the pulseless supracondylar fractures.

Date : 2008-08-25  
Session : IFPOS -Trauma II  
Time : 0800-1215  
Room: 606-607

Abstract number : 18647

**FLEXIBLE INTRAMEDULLARY NAILS IN OPERATIVE STABILISATION OF PAEDIATRIC DIAPHYSEAL FEMORAL SHAFT FRACTURES**

Devdatta NEOGI<sup>1</sup>, Ashish JAIMAN<sup>1</sup>, Vivek TRIKHA<sup>1</sup>, Saurabh SINGH<sup>2</sup>

<sup>1</sup>All India Institute of Medical Sciences, New Delhi (INDIA), <sup>2</sup>BHU - Institute of Medical Sciences, Varanasi (INDIA)

INTRODUCTION: Fracture treatment in children relies on rapid healing and spontaneous correction of angulated fractures; therefore most of the diaphyseal fractures can be treated by plaster alone. Time and experience of many clinicians have shown that with diaphyseal femoral fractures do not always recover with conservative treatment. Our aim was to evaluate internal fixation by titanium elastic nail as a surgical technique in the treatment of femoral shaft fractures in children by a prospective study. MATERIALS AND METHODS: 28 patients with paediatric femoral shaft fractures with age ranging from 6 to 10 years were treated by internal fixation with TENS at AIIMS hospital and JPNTC-AIIMS and followed for an average of 16 months (12 to 36) from June 2004 to December 2006. 20 cases involved the mid-diaphyseal region and pattern was closed transverse in 13 cases. The most common cause of injury was motor vehicle accident. Nails were present and inserted retrograde from supracondylar region above the distal growth plate under image guidance. Postoperatively thigh brace was used for 4 weeks. RESULTS: All fractures united between 6-12 weeks. Full weight bearing started 6-12 weeks. Average operative time was 55min. 7 cases (24%) had angular deformities. Detectable limb length discrepancy was seen in 60% of the cases. No major complications were seen. COMPLICATIONS: This method has a low rate of serious complications and the relatively easy and safe learning curve for most surgeons. It provides early mobility, return to home and less disruption of family life.

**Date : 2008-08-25**  
**Session : IFPOS - Basic Science, upper limb and spine**  
**Time : 0800-1215**  
**Room: 606-607**

**Abstract number : 18763**

**NEW BRACE SYSTEM FOR TREATMENT OF ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS)**

Naum SIMANOVSKY<sup>1</sup>, Leon KAPLAN<sup>1</sup>, Ron LAMDAN<sup>1</sup>, Meir LIEBERGALL<sup>1</sup>, Natalia SIMANOVSKY<sup>1</sup>, Shlomo PORAT<sup>2</sup>  
<sup>1</sup>*Hadassah-Hebrew University Medical Center, Jerusalem (ISRAEL)*, <sup>2</sup>*Hadassah University Hospital, Jerusalem (ISRAEL)*

**PURPOSE:** We evaluate the effectiveness of new type of brace in treatment of AIS. **MATERIAL AND METHOD:** We proposed originally designed brace for treatment of AIS based on a concept of continuous rotation of lumbar and thoracic parts of scoliosis in opposite directions. Three groups of adolescent with AIS different severity of scoliotic curves are involved. First group consisted of five patients with mild and borderline curves, the second group consisted of ten patients with moderate and significant curves and the third group consisted of five patients with severe and very severe curves. The treatment protocol was a standard one for Boston type of brace. The Helsinki committee approval was permitted and the patients and their parents signed inform consent form before participation in clinical trial. **RESULTS:** During 44 months of treatment four of five patients with mild and borderline curves were improved or stable. Seven of ten significant curves were stable or improved. One of five severe and very severe curves was stable. The brace manufacturing is relatively simple and more universal than classic braces. The brace has good tolerance and sufficient compliance. **CONCLUSION:** All classic types of braces for treatment of AIS are static constructs. However the scoliosis is dynamic pathology. The new brace is dynamic and working on rotational component of scoliotic curves. In our clinical trial we demonstrated that treatment of idiopathic scoliosis with device that provides constant mostly rotational forces is possible. Development of new dynamic derotational brace may open a wide space for investigation of more physiological methods of conservative treatment of AIS.

**Date : 2008-08-25**  
**Session : IFPOS - Basic Science, upper limb and spine**  
**Time : 0800-1215**  
**Room: 606-607**

**Abstract number : 18764**

**LONG-TERM FOLLOW-UP OF WOODWARD PROCEDURE**

Shlomo PORAT, Sharon EYLON, Naum SYMANOVSKY, Ron LAMDAN  
*Hadassah-Hebrew University Medical Center, Jerusalem (ISRAEL)*

**PURPOSE OF THE STUDY:** To document the long-term results of Woodward procedure in the treatment of Sprengel's and Klippel-Feil deformities. **PATIENTS AND METHODS:** Between 1984 and 2007 we performed seven Woodward procedures. Average age at operation was 7.5 years. Follow-up of four patients, including physical exam and radiographs averaged eighteen years (range 13-22). No morcelization of the clavicle was done in any of the patients. One patient was operated ten months ago. Two patients were lost to follow-up despite multiple attempts to contact them. **RESULTS:** Shoulder abduction was improved by an average of eighty degrees (range 50-90). In all patients the scapula was brought inferiorly by an average of 1.5cm, but more important was the rotation in which the lower pole of the scapula, was shifted away from the centre line. All families and patients were pleased with the cosmetic as well as the functional result. The only complication we had in this series was complete brachial plexus paralysis, occurred in the sixth case, in which almost complete recovery occurred. In our seventh child, we used evoked potentials, to verify the normal function of the brachial plexus intraoperatively. **CONCLUSIONS:** Woodward procedure is an effective surgical procedure for correction of undescendent scapula. The correction achieved during surgery was maintained during our long-term follow-up. All patients are satisfied functionally and aesthetically. Careful mobilisation of the scapula is essential, to prevent any damage to the brachial plexus.



**Date : 2008-08-25**  
**Session : IFPOS - Basic Science, upper limb and spine**  
**Time : 0800-1215**  
**Room: 606-607**

**Abstract number : 18765**

**MEASUREMENTS AND STANDARDISATION OF HUMEROCONDYLAR ANGLE IN CHILDREN**

Naum SIMANOVSKY<sup>1</sup>, Ron LAMDAN<sup>1</sup>, Nurit HILLER<sup>1</sup>, Natalia SIMANOVSKY<sup>1</sup>, Shlomo PORAT<sup>2</sup>

<sup>1</sup>Hadassah-Hebrew University Medical Center, Jerusalem (ISRAEL), <sup>2</sup>Hadassah University Hospital, Jerusalem (ISRAEL)

**BACKGROUND:** Supracondylar fractures of the humerus in children are very common. However, the literature regarding measurements of normal anatomical relationships of the distal humerus in sagittal plane is sparse. **METHOD:** We reviewed radiographs of normal elbow joints in 142 children treated in our hospital over two years. No history of previous trauma of distal humerus was found. The children were separated into three age groups (under five years, five to ten, and ten to fifteen years) and measurement of the humerocondylar angle (HCA) in sagittal plane was performed. **RESULTS:** The mean age of children in group 1 was three years one month, in group 2 seven years eight months, and 12 years in group 3. There were 99 boys and 43 girls. The mean HCA was 41.6° (range 30°-70°). No statistically significant influence on HCA by age, gender or side was found. We found a small number of extreme variants in HCA (down to 30° and up to 70°) in children without any history of previous trauma and having a normal range of elbow motion. **CONCLUSIONS:** We found that HCA is close to the well-accepted figure of 40°. Interestingly, this value remains the same in all age groups. That means that the geometry of the distal humerus in sagittal plane is established very early during the growth and remains constant. Due to significant individual variations of HCA it alone can not be sufficient for final decisions in evaluation and treatment of supracondylar fractures.

**Date : 2008-08-25**  
**Session : IFPOS - Knee, Foot**  
**Time : 1100-1200**  
**Room: 606-607**

**Abstract number : 16185**  
**CORRECTION OF FOOT DEFORMITIES USING THE BLOODLESS TECHNIQUES**

Gamal HOSNY  
*Benha Faculty of medicine, Cairo (EGYPT)*

Conventional surgical treatment of foot deformities is not always successful or easy to apply. About 25% of operated clubfeet will develop a recurrence or show marked residual deformities (Road and Krauspe, 1999). Ilizarov developed and refined an alternative technique, "the bloodless technique", to address these problems without any real surgical incision. From 1993 until 2001, 118 cases with complex foot deformities older than 2 years were referred to our centre. The average age of patients at operation was 16 years and 4 months. There were 57 cases relapsed clubfeet, two neglected clubfoot, five poliomyelitis, three Charcot-Marie-tooth disease, 34 post-traumatic, two tibial hemimelia and five cases cerebral palsy. All patients had previous operations (range 1-8) except for 6 cases. Corticotomy was performed concomitantly with original procedure in 15 cases followed by lengthening or bone transport. At an average follow-up 30.6 months (range 12-78 months) there 98 good, 15 fair and 5 bad results. COMPLICATIONS: Pin tract infection; there was some sort of pin tract infection in all cases, Temporary oedema developed in the dorsum of the foot or the ankle in 78 cases, Migration of the calcanean wire in one case. The reported complication did not affect the outcome. The stiff deformed feet preoperatively had been corrected to a stiff plantigrade corrected feet postoperatively. Ilizarov method also offers the advantage of treating other associated tibial deformities and leg length discrepancy. The bloodless technique using Ilizarov external fixator is a very effective method in treating foot deformities in different age groups.

**Date : 2008-08-25**  
**Session : IFPOS - Knee, Foot**  
**Time : 1100-1200**  
**Room: 606-607**

**Abstract number : 16875**

**OUR EXPERIENCE IN ARTHROSCOPIC TREATMENT OF OSTEOCHONDRITIS DISSECANS IN CHILDREN AND ADOLESCENTS**

Mikhail GERASIMENKO<sup>1</sup>, Alexandre BELETSKY<sup>2</sup>, Oleg SOKOLOUSKY<sup>2</sup>, Kirill CHERNYAVSKY<sup>1</sup>

<sup>1</sup>*Belarussian State Medical University, Minsk (BELARUS)*, <sup>2</sup>*Belarussian Research Centre for Traumatology and Orthopedics, Minsk (BELARUS)*

The results of the use of endoscopic techniques in diagnostics and treatment of 12 patients with osteochondritis dissecans of knee-joint over a period of time from October 2005 to March 2007 underlie this research in the Minsk Center of traumatology and orthopedy of 6 clinics of Minsk, Byelorussia. The age of the patients was from 10 to 17 years (7 girls and 5 boys). Arthroscopy served both as diagnostic and medical measure; depending on the stage of the disease, different techniques were used. 5 children underwent osteochondroperforation with K-wire, 6 - osteochondroperforation and microfracturing. We succeeded in extracting osteochondral fragments in all patients; then we performed abrasive mechanical chondroplasty and lavage of the joint. Once in case of incomplete separation of a piece of cartilage 3x3cm in size after the revisional arthroscopy we performed microarthrotomy, open reduction and compression wire fixation of the fragment. In 5 cases the arthroscopy allowed to detect the disease at early stages. Observation time took from 2.5 months to 2 years. We got satisfactory long-term effects in 100% cases. **CONCLUSION:** Invasive therapeutic approach including arthroscopy on the 1-2 stages of the disease allows curtailing the terms of rehabilitation to 1.5-2 months instead of 12-18; the use of arthroscopic techniques on terminal stages of osteochondritis dissecans allows reducing free osteochondral body with minimal invasiveness.

Date : 2008-08-25  
Session : IFPOS - Knee, Foot  
Time : 1100-1200  
Room: 606-607

Abstract number : 17155

**OUR EXPERIENCE OF THE ARTHROSCOPIC RELEASE OF THE LATERAL RETINACULUM AT HABITUAL LUXATION OF THE PATELLA IN ADOLESCENT SPORTSMEN/WOMEN**

Sandor ROTH

*KBC Rijeka, Rijeka (CROATIA)*

AIM: The aim was to prove the efficiency of the arthroscopic release of retinaculum as minimally invasive and primary surgical method in treatment of lateral habitual luxation of patella in adolescents. Majority of the patients were sportswomen and so it was required to have smaller scarring. MATERIALS: Between July 2003 and July 2007, we did the arthroscopic release of the lateral retinaculum in 24 children (21 female, 3 male), aged between 12 and 18, on 28 knees. All of them were active in different sports. The indication was set after the second to twentieth preoperative luxation depending on when the patient came for treatment to our clinic. Retinaculotomy was always done in fluid milieu, using spinal or endotracheal anesthesia depending on the age of the child. The average postoperative follow-up was 24 months. RESULTS: To compare our patients we made a table, which is filled in with queries preoperatively and postoperatively about the number of luxations and subluxations, pain, mobility, axial images of patella at 60°, patient's satisfaction and sports activity. In 26 cases we cured the luxations, lowered the painfulness and 17 children returned to their previous sports activities. In 2 cases, after continuation of sports, the luxation occurred again, so we had to use additional surgical methods. CONCLUSION: With this method we achieved good results with smaller scarring if we did the lateral release earlier comparing to the number of luxations and if there was no hypoplasia of lateral condyle of femur.

**Date : 2008-08-25**  
**Session : IFPOS - Knee, Foot**  
**Time : 1100-1200**  
**Room: 606-607**

**Abstract number : 17226**

**BONESTAR® IMPLANT IN MINIMALLY INVASIVE CALCANEO-STOP METHOD FOR CORRECTING FLAT FEET IN CHILDHOOD**

Sandor ROTH

*KBC Rijeka, Rijeka (CROATIA)*

AIM: To improve results in Calcaneo-Stop Method with spongious screw, we managed to construct a new canulated titanium implant for per cutem implantation. MATERIAL and METHOD: We have operated on 218 cases from 1997 to 2005 with the Calcaneo-Stop Method using the spongious screw. We have a minimum five-year follow-up period in 94 cases. In 92% of the cases we had excellent and good results. Complications showed: breakage of screws (8), wrong positioning of the screws (7).In 8% we did not achieve correction postoperatively, therefore we constructed a new type of screw. We reinforced the screw's dimensions and shape, and changed the material (titanium alloy) to make it more flexible and resistant to breakage. Further on, we canulated it to make the placement easier by means of Kirschner wire. We placed the apex-thread and the conical smooth body with spongious coil. We need to place the implant Kirschner - wire, fluorograph control, canulated Imbus key, the titanium screw ("bone star®"), scalpel, scissors and two stitches. RESULTS: From July 2005 to December 2007, we operated on 102 cases without anysurgical complications, breakages and incorrect positioning of the implant. We achieved 98% excellent and good results. CONCLUSION: We think that we have improved the method compared to other types of implants, which have been used in this method up to present, because our patients could walk the third day after the operation without any immobilization, although we operated on both feet.

Date : 2008-08-25  
Session : IFPOS - Knee, Foot  
Time : 1100-1200  
Room: 606-607

Abstract number : 17274

**ANTERIOR TIBIAL TRANSFER FIXATION BY MYTEK ANCHOR: QUICK AND SAFE PROCEDURE**

Francesco M. LOTITO, Antonio LAMBIASE, Luca MADDALUNO, Anna DECARO  
*Orthopaedic Clinic, "Federico II" University- Naples, Napoli (ITALY)*

**PURPOSE:** The tibialis anterior tendon transfer has been used in the treatment of recurrent congenital clubfoot or in paralytic equinovarus foot deformities in cerebral palsy in presence of dynamic supination during gait. Many authors describe results in biomechanical, clinical and surgical studies without paying attention how demanding is to fix the tendon onto the new site through a "pull out" technique or other way used to fix the tendon transfer. To overcome these difficulties, we describe the possibility to use a simple and quick method to fix it. **MATERIALS:** 15 relapsed clubfoot and 3 dynamic inverted foot in cerebral palsy patients were operated on for tibialis anterior tendon transfer on the 3rd cuneiform. The tendon was fixed by GII QuickAnchor (DePuy Mityec). The patients affected by clubfoot were operated on at a mean of 4 years while in patients affected by CP at a mean of 13 years. **RESULTS:** The time of operation is decreased from a mean of 1 hour an half that it took before using the anchor to 45 minutes making very easy this procedure especially in younger patients. At a mean of 2.5-year follow-up (minimum 6 months), no complications have been observed. All transplanted tendons are perfectly integrated in the new site, as in a younger as in older children with significantly improving of their functional gait. **CONCLUSION:** The anchor device, routinely used for rotator cuff repair, is worth to fix tendon transfer, even in muscles that have to support high strain.

**Date : 2008-08-25**  
**Session : IFPOS - Knee, Foot**  
**Time : 1100-1200**  
**Room: 606-607**

**Abstract number : 18078**

**CALCANEAL LENGTHENING OSTEOTOMY IN TREATMENT OF CHILDREN WITH PLANOVALGUS FOOT DEFORMITY**

Christian FANG<sup>1</sup>, Wang CHOW<sup>2</sup>, Yun Hoi LI<sup>2</sup>, Michael TO<sup>1</sup>

<sup>1</sup>Queen Mary Hospital, Hong Kong (HONG KONG), <sup>2</sup>Duchess of Kent Children's Hospital, Hong Kong (HONG KONG)

**INTRODUCTION:** Planovalgus foot deformity is common especially in children with cerebral palsy. Calcaneal lengthening osteotomy aims at restoring the medial foot arch, improving talar head coverage, preventing mid-foot break and correcting hind-foot valgus by lengthening the lateral column. It is believed to be superior to subtalar joint fusion because of preserved subtalar motion. **METHODS:** We reviewed 21 consecutive patients (34 feet) who received calcaneal lengthening osteotomy. There were 11 males and 10 females. The mean age was 12.9 (from 5.4 to 19.4) at surgery. Cerebral palsy and symptomatic flexible flat foot were the most common diagnoses. Gastrocnemius recession or lengthening of the Tendo-Achilles was commonly performed with or without concomitant knee or hip area corrective procedures. **RESULTS:** Clinical, radiological and gait analysis results were measured at an average follow-up of 3 years. Complications included bone graft collapse at the osteotomy site leading to early recurrence in 2 patients younger than 6. All patients had a mobile subtalar joint with no radiographic osteoarthritic changes. Gait improved in most patients. There was a statistically significant correction of the calcaneal pitch angle from 0.1 degrees to 13.3, lateral talo-1st metatarsal angle from 35.4 degrees to 15.3, and anteroposterior talo-1st metatarsal angle from 25 degrees of valgus to 9.1 degrees of valgus, talo-navicular coverage angle from 26 degrees of valgus to 8.2 degrees of varus. **CONCLUSION:** This method provides a lasting correction of plano-valgus foot deformity with preservation of pain free subtalar joint motion.

Date : 2008-08-25  
Session : IFPOS - Knee, Foot  
Time : 1100-1200  
Room: 606-607

Abstract number : 18221

**COMPLEX PEDIATRIC FOOT DEFORMITIES TREATED WITH JESS DIFFERENTIAL DISTRACTION: AN ADAPTED VIEW IN AN EXPANDING WORLD**

Robert FRIDMAN<sup>1</sup>, Azriel BENAROYA<sup>2</sup>, Ram PRABHOO<sup>3</sup>, B.G. KANAJI<sup>4</sup>, Henri BENSACHEL<sup>5</sup>

<sup>1</sup>Columbia University Medical Center, New York (UNITED STATES), <sup>2</sup>Mount Sinai School of Medicine, Bayside, New York (UNITED STATES), <sup>3</sup>V.N. Desai Hospital, Mumbai (INDIA), <sup>4</sup>Port Trust Hospital, Mumbai (INDIA), <sup>5</sup>Robert Debre University Children Hospital, Paris (FRANCE)

The increasing globalization and integration of the world's cultures require physicians to become more sensitive to the cultural needs of their patients when seeking treatment solutions. Goals of treatment for complex pediatric foot deformities are a plantigrade, pain-free foot that conforms to shoes. Such cases are traditionally treated with tenotomy, osteotomy, and fusion, with predictable results. The drawback of these approaches is a stiff, small foot which poses problems patients whose cultures demand flexibility in the foot and ankle for religious and hygienic purposes. The authors used a protocol of JESS Differential Distraction (DD), physical therapy, and bracing to allow the corrected foot to remain supple and maintain a degree of flexibility that would better suit these cultural needs. 22 cases of complex foot deformities (7 poliomyelitis, 3 syringomyelia, 6 myelomeningocele, 6 vertical talus), with a follow-up average of 4 year (range 2-10 years) were treated with this protocol. The average age of the patients was 9 years (range 4-22 years), M:F ratio was 3:1, and average period of DD was 6.5 weeks (average 6-8 weeks). A plantigrade, aesthetically appropriate foot was achieved in all cases with improved ankle range of motion averaging 20 degrees dorsiflexion - 20 degrees plantarflexion. A complication of tibial fracture occurred in a patient with poliomyelitis after frame removal. JESS Differential Distraction, physical therapy, and long-term bracing is a viable option for treatment of complex foot deformities, especially in patients with increased cultural or religious activities that involve squatting and kneeling.



**Date : 2008-08-25**  
**Session : IFPOS - Knee, Foot**  
**Time : 1100-1200**  
**Room: 606-607**

**Abstract number : 18312**

**SURGICAL TREATMENT OF HABITUAL PATELLAR DISLOCATION IN IMMATURE PATIENTS**

Morris DUHAIME<sup>1</sup>, Benoit MORIN<sup>1</sup>, Benoit BENOIT<sup>2</sup>, Dominique ROULEAU<sup>3</sup>, Georges-Yves LAFLAMME<sup>3</sup>

<sup>1</sup>Hôpital Sainte-Justine, Montreal (CANADA), <sup>2</sup>Clinique médicale, Montreal (CANADA), <sup>3</sup>Hôpital Sacré-Coeur, Montreal (CANADA)

Patella alta is one of the major causes known to predispose children to habitual patellar dislocation. However, the surgical treatment of such a condition, before skeletal maturity, is rare if ever mentioned in literature. Twelve knees in eight patients were treated by a single surgeon with a surgical procedure designated to correct patella alta, the major predisposing factor causing habitual patellar dislocation. The technique involves lowering of the patella by total tendon transfer, lateral release and vastus medialis obliquus advancement. All patients were complaining of habitual dislocation. Patellar height was assessed radiographically by the Koshino-Sugimoto and C.-Deschamps index. The average age was 10.9 years and mean follow-up was 14 years. One patient required an early surgical revision because of redislocation. Unfortunately, he was then overcorrected (patella baja) but his knee was stable and asymptomatic. The average preoperative rates for patella alta were corrected postoperatively in everybody but the previous patient. At the latest follow-up, all operated knees were functionally stable; all but one were pain free (mean Lysholm knee score 98/100). Two patients developed a patella baja as a late complication without any actual consequence. The mean sulcus angle improved from 160° to 147°. This technique offers a valid alternative to the immature patient presenting with habitual patellar dislocation associated with patella alta. Moreover, it seems to remodel the shallow trochlea and thus giving intrinsic patellofemoral stability at adult age. Tying back the patellar tendon to the tibial epiphysis might avoid the compl. of patella baja.

Date : 2008-08-25  
Session : IFPOS - Knee, Foot  
Time : 1100-1200  
Room: 606-607

Abstract number : 18701

**USEFULNESS OF ULTRASOUND IN THE ASSESSMENT OF METATARSUS ADDUCTUS DEFORMATIONS IN CHILDREN**

Guy GRIMARD, Marie-Claude MIRON, Morris DUHAIME, Benoit MORIN, Marie-Andrée CANTIN  
*Hopital Sainte-Justine, Montreal (CANADA)*

**PURPOSE:** Metatarsus adductus deformity (MAD) is common in infants. Most of the time, the evolution is toward regression. However, it is clinically difficult to identify the exact site of anatomical deformation. Two common causes of MAD are the "classical metatarsus adductus" and skew foot. The aim of this study was to differentiate "classical metatarsus adductus" from skew foot - a more complex foot deformity - using US. **MATERIAL AND METHODS:** Using a linear high frequency transducer, the talo-navicular joint and the first ray were studied by US from medial and dorsal approaches. The mobility of the talo-navicular joint was assessed. **RESULTS:** 23 patients were evaluated by US in order to characterize the MAD. Sixty-one percent were female and the deformity was bilateral in 55%. Among this cohort, 19 subjects had a skew foot and 4 patients had a diagnosis of "classical metatarsus adductus". Patients presenting a skew foot showed dislocation of the talo-navicular joint with lateral and plantar displacement of the navicular. The adduction of the forefoot in "classical metatarsus adductus" is localised at the junction between the first metatarsal and first cuneiform. There is no lateral displacement of the navicular. **CONCLUSION:** US assessment of the talo-navicular joint and the first ray in infants is helpful to distinguished skew foot from "classical metatarsus adductus". Identification of the cause of adduction of the foot in children is important for treatment and prognosis. It seems from our series that skew foot is more prevalent than previously thought.

**Date : 2008-08-25**  
**Session : IFPOS - Cerebral Palsy**  
**Time : 1400-1530**  
**Room: 606-607**

**Abstract number : 15750**

**ADDUCTOR TENOTOMY IN CEREBRAL PALSY. UNILATERAL OR BILATERAL?**

Federico FERNANDEZ-PALAZZI, Salvador RIVAS, Freddy CHAKAL  
*Paediatric Orthopaedics and Neuro-Orthopaedic Unit, Caracas (VENEZUELA)*

Retrospective study: patients operated between 1975 and 1995, in total 1474 patients. Age at surgery 6 months to 8 years with a mean of 4 years 3 months. Group I: 792 patients (53.7%) with unilateral adductor contracture, sustained a unilateral adductor tenotomy. Of these total, 619 (78.2%) required a contralateral adductor tenotomy at a mean of 3 years and 6 months. Group II: 682 patients (46.3%) with bilateral adductor contracture that had a bilateral adductor tenotomy in one stage. Of 792 patients that sustained two stage adductor tenotomy, 123 (20%) presented a unilateral dislocated hip, of these 115 (93%) occurred in the hip operated secondly at a mean of 1 year post. Of the 682 patients with bilateral adductor tenotomies 7 (1%) had a dislocated hip 2 years post tenotomy. Of the 72 dislocated hips, 12 (59%) were quadriplegics, 28 (22%) diplegic, 21 (18%) hemiplegics and 1 (1%) triplegic. Of 619 patients in two stages, in 143 the diaphyseal - cervical angle was 155° (23.1%), at mean of 6 and half years of age and 3 years post the second tenotomy. In 102 of these patients (71%) a varus derotation osteotomy was performed in the hip operated in the second act with further dislocation of the hip in 20 cases (20%). Of the 685 patients with bilateral tenotomy in one stage, varus derotation osteotomy was required in 68 (68%) at a mean of 6 years of age with only a 3% of dislocations in this group.

Date : 2008-08-25  
Session : IFPOS - Lengthening and axial deformity  
Time : 1400-1530  
Room: 606-607

Abstract number : 16201

**A NEW HINGE SYSTEM IN THE TREATMENT OF LIMB LENGTHENING AND AXIAL DEVIATIONS**

Ghassan SALAMEH<sup>1</sup>, Michael SCHMIDT<sup>2</sup>

<sup>1</sup>Head of Limb Lengthening and Reconstruction Center, Damascus (SYRIA), <sup>2</sup>Valdhof Orthopaedic Center, Frankfurt (GERMANY)

For the treatment of limb lengthening and correction of axial deviations a special external hinge distraction system has been developed, which allows the combined treatment of congenital and acquired complex deformities of lower and upper limbs. Since 1995 until 2006 this new system was used in 280 patients with different indications in the lower limbs; they presented with limb length discrepancies and axial deviations. The External Fixation Hinge System/EFDLAS1, Salamehfix/, is an arch hinged system which consists of arches with various diameters and perimeters, to assemble the different sizes of the limb in the upper and distal part with connecting special hinges, different sizes of arcs to choose a special size for each patient with keeping an excellent technical functions; multiplanar multidirectional corrections; makes the fixator more suitable to each patient in size and allows the patient to move his joints freely. Stable fixation because of insertion wires and screws in nearly right angles, the insertion of wires and half pins in a minor painful region makes the tolerance to the fixator more acceptable. X-ray control is easy. Complications were mostly superficial pin infections. No nerve or vascular injuries. The new developed hinges are easy to use and allow the treatment of complex deformities with lengthening.

**Date : 2008-08-25**  
**Session : IFPOS - Cerebral Palsy**  
**Time : 1400-1530**  
**Room: 606-607**

**Abstract number : 16243**

**FACTORS ASSOCIATED WITH PELVIC RETRACTION IN DIPLEGICS WITH ASYMMETRIC GAIT**

Juan COUTO, Alfredo TOLEDO, Maria SEYLER, Marchos CRESPO, Eduardo SEGAL, Eduardo SAMARA, Gustavo VIOLLAZ  
*FLENI, Buenos Aires (ARGENTINA)*

The purpose of this study was to evaluate factors associated with pelvic retraction in diplegics with asymmetric gait. Gait laboratory data of 560 patients with cerebral palsy were studied retrospectively. 59 diplegics showed pelvic retraction greater than 2 standard deviations from normal. 31 males and 28 females, mean age 10+1 (4+9 a 20+9). Clinical and dynamical variables measured with gait analysis were recorded. 22 cases had the same S.M.C. bilaterally, in 32 cases the pelvic retraction and the lower S.M.C. side were ipsilateral. In 5 cases pelvic retraction was opposite to the lower S.M.C. side ( $\kappa$  0.71). Stepwise multiple regression showed the following predictors of pelvic retraction (difference between sides): difference of mean hip rotation in stance, standardized B coefficient: -0.65,  $p < 0.001$ , difference of peak hip extension, standardized B coefficient: -0.47,  $p < 0.001$ , difference of peak knee extension, standardized B coefficient: 0.46,  $p < 0.001$ , difference of mean foot progression angle, standardized B coefficient: 0.29,  $p < 0.001$ , difference of thigh foot angle, standardized B coefficient: 0.18,  $p < 0.02$ . ( $r^2$ : 0.72,  $F=31.9$   $p < 0.001$ ). Pelvic retraction seems multifactorial in origin and the best predictors in this series were differences of mean hip rotation in stance, peak hip extension, and peak knee extension.

Date : 2008-08-25

Session : IFPOS - Lengthening and axial deformity

Time : 1400-1530

Room: 606-607

Abstract number : 16463

**RECOGNITION AND MANAGEMENT OF HIP AND KNEE DISLOCATION DURING LIMB LENGTHENING FOR CONGENITAL SHORT FEMUR**

Mahmoud EL-ROSASY

*Tanta University Hospitals, Tanta (EGYPT)*

The development of hip and/or knee dislocation and contracture during lengthening of congenital short femur (CSF) would negate the value of limb lengthening. Among 42 children with unilateral CSF, who had limb lengthening using Ilizarov external fixator, the hip and/or knee dislocation developed in 17 (40%) cases. Preoperative radiographs and CT scan of the hip were examined for CE and neck-shaft angles and acetabular development. Preoperative radiographs and MRI of the knee were examined for tibial spine and distal femoral epiphysis development and cruciate ligaments integrity. Clinically, Trendelenberg's test, periarticular soft tissue contracture and pivot shift phenomenon were tested. The iliotibial tract was used for extra-articular stabilisation of the knee. The hip was reduced and stabilised by adductor tendon release and pericapsular osteotomy. A unilateral hip spica was applied for 8-12 weeks. A tight iliotibial tract with its bi-articular attachment was considered to be a dislocating force to both the hip and knee. A center edge angle  $\leq 20^\circ$  was the threshold for hip dislocation. Deficiency of cruciate ligaments and hypoplastic lateral femoral condyle were the main predisposing factors for knee dislocation. At follow-up the extra-articular reconstruction of the knee was found to yield with recurrence of instability in eleven (65%) cases. In limb lengthening for CSF the pre-lengthening preparatory procedures are necessary to prevent hip and knee dislocation, however, the effect of extra-articular knee stabilisation is not long lasting in most cases and intra-articular ligament reconstruction may be needed at skeletal maturity.

**Date : 2008-08-25**  
**Session : IFPOS - Cerebral Palsy**  
**Time : 1400-1530**  
**Room: 606-607**

**Abstract number : 16486**

**SINGLE-STAGE SURGICAL TREATMENT OF LOWER LIMB DEFORMITIES IN CEREBRAL PALSY**

Hakana OMEROGU, Ulukan INAN, Nusret KOSE

*Eskisehir Osmangazi University Faculty of Medicine, Eskisehir (TURKEY)*

Thirty-seven CP patients with a mean age of 12.2 years (3-27) were operated on by the same surgeon due to dynamic or static lower limb deformities. The clinical type was spastic CP in all but one patient. Preoperative gross motor function classification system (GMFCS) level was I in 7 patients, II in 6, III in 7, IV in 11 and V in 6. The performed operations per patient were: Iliopsoas tenotomy: 0.46, Adductor tenotomy: 1.0, Open hip reduction: 0.05, Iliac osteotomy: 0.14, Proximal femoral osteotomy: 0.41, Proximal femoral resection: 0.05, Medial hamstring release: 0.95, Lateral hamstring release: 0.11, Medial transfer of the rectus femoris: 0.11, Gastrocnemius release: 0.78, Subtalar arthrodesis: 0.16, Triple arthrodesis: 0.03, Bunionectomy and 1st metatarsophalangeal arthrodesis: 0.05. Mean number of operations per patient was 4.3. Mean follow-up was 19.9 months (3 to 48 months). Mean decrease in hip adduction contracture was 26, in hip flexion contracture, 19, in popliteal angle, 51 and in ankle equinus deformity, 35. Mean Reimers index improved from 39% to 9% in hips, operated on due to subluxation. Acetabular index improved from 39 to 21 in hips in which an iliac osteotomy was performed. Mean intraoperative proximal femoral derotation to correct the femoral antetorsion was 33 and mean intraoperative proximal femoral varisation was 32. An evident improvement in GMFCS level could be detected in 6 patients. Revision surgery was performed in 2 patients.

**Date : 2008-08-25**  
**Session : IFPOS - Lengthening and axial deformity**  
**Time : 1400-1530**  
**Room: 606-607**

**Abstract number : 16710**

**POSTEROMEDIAL ANGULATION OF TIBIA. DOES IT MERIT ATTENTION?**

Kiran Kumar SINGISETTI<sup>1</sup>, Sathish K. BALASUBRAMANIAN<sup>2</sup>

<sup>1</sup>*Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM)*, <sup>2</sup>*South Tyneside District Hospital, South Shields (UNITED KINGDOM)*

Posteromedial angulation of tibia is a rare paediatric disorder. We report a series of 6 children who had presented at varying age with such a problem. The deformity consisted of posteromedial bowing of leg and varying degrees of calcaneovalgus deformity of foot. Soft tissue enlargement in posterior aspect of affected legs in early life and atrophy in later years were noted. Importance of the disorder is its amenability to nonoperative treatment and difference from anterolateral bowing which has a liability to fracture and develop pseudoarthrosis. All children were treated effectively by serial casting technique with considerable improvement of deformity clinically and radiologically. Degree of limb shortening at follow-up related to the degree of initial bowing. Thus, we conclude that though benign it needs close observation to note and predict the shortening at an early age, when limb lengthening procedures can be sought.



**Date : 2008-08-25**  
**Session : IFPOS - Lengthening and axial deformity**  
**Time : 1400-1530**  
**Room: 606-607**

**Abstract number : 17432**

**DEFORMITY CORRECTION BY SUBMUSCULAR PLATING TECHNIQUE**

Chang-Wug OH, Joon-Woo KIM, Hee-Soo KYUNG, Byung-Chul PARK  
*Kyungpook National University Hospital, Daegu (KOREA)*

**BACKGROUND:** Although an external fixator can successfully treat angular or rotational deformities in children, many complications are inevitable due to the long duration of the external fixation. Intramedullary nails also have limited indications in pediatric deformities, with risks of physeal injuries. The purpose of this study is to report the outcomes of submuscular plating technique in a series of patients with low extremity deformities. **METHODS:** Sixteen patients with femoral or tibial deformities (18 cases) from various causes were treated. The mean age of the patients was 9.8 years old. The causes of their deformities were spastic cerebral palsy (8), malunion (4), rickets (3), and osteochondroma (1). After percutaneous osteotomy and correction of the deformity by manual traction or temporary external fixation, the locking plate was percutaneously fixed with a submuscular insertion. **RESULTS:** With an average follow-up of 25 months, all deformities united without bone grafts. The mean union time was 12 weeks. The average correction of deformity was 22.5° (angular correction: 22.6°, rotational correction: 22.5°). All patients recovered the pre-operative motion of their adjacent joints. There was a fatigue fracture, which arose from the previous hole made by an external fixator. No neurologic or infectious complications and physeal damage occurred. **CONCLUSIONS:** This technique is a minimally invasive and efficient method for lower extremity deformities which preserves periosteal bone healing and provides adequate stability, thus avoiding the disadvantages of an external fixator and intramedullary nailing.

Date : 2008-08-25

Session : IFPOS - Lengthening and axial deformity

Time : 1400-1530

Room: 606-607

Abstract number : 17560

**CORRECTION OF AXIAL DEVIATIONS WITH EIGHT-PLATE TECHNIQUE: FIRST RESULTS IN ITALY**

Silvio BOERO<sup>1</sup>, Maurizio DE PELLEGRIN<sup>2</sup>, Francesco Maria LOTITO<sup>3</sup>, Francesca VITTORIA<sup>1</sup>

<sup>1</sup>Orthopaedics and Traumatology Department, I.R.C.C.S. Giannina Gaslini, Genova (ITALY), <sup>2</sup>I.R.C.C.S San Raffaele, Milan (ITALY),

<sup>3</sup>Orthopaedic Clinic, University "Federico II", Napoli (ITALY)

In 2003, Stevens introduced the eight-plate technique as an alternative to staples for the treatment of epiphyseodesis. This technique is safe and minimally invasive, and represents an evolution of the already used techniques. The eight-plate technique has the following advantages: great flexibility; extraphyseal fulcrum; low invasiveness and low risk of breaking, migration and deformation; simple technique. Postoperative follow-up is performed every three months until removal of the plates when the deformity is corrected. The eight-plate technique is contraindicated in case of physiological angular deformities and deformities with closed physis (due to reached skeletal maturity or to trauma or infection). PURPOSE: A preliminary multicentre study about this technique. MATERIALS: From October 2005 to December 2007, 63 patients (35 males and 28 females) with axial deviations were treated with the eight-plate technique. The patients had different types of disease and their mean age at surgery was 9.3 years (range 2.3-14.9). Postoperative complications were few and not severe. The plates were removed after mean 10.2 months (range 6-18 months) when the axis was aligned. CONCLUSION: At present, follow-up is too short to draw definitive conclusions. However, this preliminary study showed that the eight-plate technique allows a more flexible treatment. When plates are removed, the growth process starts again normally; in case of deformity relapse, surgery can be repeated during growth. This two-year experience in the use of the eight-plate technique in 3 Italian centres proved to be successful.

Date : 2008-08-25  
Session : IFPOS - Lengthening and axial deformity  
Time : 1400-1530  
Room: 606-607

Abstract number : 17817

**PROPHYLACTIC INTRAMEDULLARY RODDING AFTER FEMORAL LENGTHENING IN CONGENITAL DEFICIENCY OF THE FEMUR**

Amr ABDELGAWAD<sup>1</sup>, John E. HERZENBERG<sup>2</sup>, Dror PALEY<sup>2</sup>, Shawn C. STANDARD<sup>2</sup>

<sup>1</sup>Toledo University Medical Center, Dept. of Orthopaedic Surgery, Toledo, Ohio (UNITED STATES), <sup>2</sup>Rubin Institute for Advanced Orthopedics, Sinai Hospital of Baltimore, Baltimore, Maryland (UNITED STATES)

**INTRODUCTION:** Femoral fracture after fixator removal for lengthening of the congenitally short femur is a well-known and devastating complication. Its incidence is approximately 33%. We introduce a method of prophylactic rodding to prevent this complication. **METHODS:** Forty-five femoral lengthenings (43 patients) were performed using external fixation. At the time of frame removal (or shortly after), prophylactic intramedullary rods were inserted. Special reaming techniques were used to pass a Rush rod through the solid regenerate bone and past sclerotic pin sites. Mean age at time of surgery was 9.4 years (range 4.4-40.4 years). **RESULTS:** Mean duration of treatment with external fixation was 184 days. Mean follow-up was 22 months (range 7-53 months). Three cases (6.7%) developed infection. All were treated by debridement and removal of the rod and all healed uneventfully. Eight cases (17.8%) developed fracture despite rodding (one case with relatively high-energy trauma, 3 cases during physical therapy, and 4 cases spontaneously). Only 4 of these fractures required intervention. Two patients had mild discomfort over the trochanteric region and had the rods removed. **CONCLUSION:** Prophylactic IM rodding after lengthening for congenital femoral deficiency is a safe and effective method to prevent femoral fracture. Infection developed after a few months in a small number of cases, was easily treated, and did not result in permanent sequelae. Fractures can occur despite the Rush rodding; however, they are usually minimal and can be easily treated.

**Date : 2008-08-25**  
**Session : IFPOS - Cerebral Palsy**  
**Time : 1400-1530**  
**Room: 606-607**

**Abstract number : 17844**

**RESTORATION OF WRIST EXTENSION IN CEREBRAL PALSY**

Nagy A SABET

*Head of Orthopaedic Department, Faculty of medicine, Cairo (EGYPT)*

Cerebral palsy is a nonprogressive disease of the central nervous system in which the most common disorder is spasticity. Flexion deformity and ulnar deviation of the wrist and pronation of the forearm is a common deformity of cerebral palsy due to increase muscle tone in the flexor carpi ulnaris and weakness of the wrist extensors. From June 2001 to June 2006 thirty-two wrists in twenty-seven patients had spastic cerebral palsy with flexion and ulnar deviation were treated by flexor carpi ulnaris transfer to the extensor carpi radialis longus (17 hands), brevis (7 hands), both together (8 hands). Right hand was involved in 12 cases and left hand in 10 cases. Five cases were bilateral. Seventeen cases were males and ten were females. The age at surgery was ranged from five to thirteen years. As regards the results, ten cases had active dorsiflexion of the wrist against the gravity; fifteen cases had dorsiflexion to the neutral position. In five cases the wrist became neutral but without active movement and two cases had no changes. As regards complication, four cases had superficial wound infection, two cases had a painful lump on the dorsal aspect of the lower third of the forearm. From this study we can conclude that the flexor carpi ulnaris transfer to extensor carpi radialis longus or brevis is a reliable procedure to restore dorsiflexion of the wrist and prevent ulnar deviation in cases of cerebral palsy.

**Date : 2008-08-25**  
**Session : IFPOS - Cerebral Palsy**  
**Time : 1400-1530**  
**Room: 606-607**

**Abstract number : 17863**

**RECTUS TRANSFER IN CP CHILDREN: LONG-TERM OUTCOME**

Freeman MILLER, Dinesh THAWRANI, Chris CHURCH, Nancy LENNON, Kirk DABNEY  
*Al duPont Hospital for Children, Wilmington (UNITED STATES)*

Distal Rectus Transfer (DRT) is commonly used in the treatment of stiff knee gait in spastic cerebral palsy (CP) patients to prevent toe drag and improve knee range of motion. Literature supports that the site of transfer does not impact outcome. A significant question remains unanswered: does the improvement persist long term? The goal of this study is to find preoperative parameters that predict good long-term results of DRT. **METHOD:** A retrospective cohort study of 56 spastic CP patients (92 limbs) who underwent DRT at the age of 7.2 ( $\pm$  2.3) yrs. Each patient has 3 sets of Gait analyses (GA): Preoperative, Postoperative (<3yrs of surgery) and final follow-up GA ( $\geq$ 7 yrs post-surgery). **RESULTS:** We divided patients into 3 categories: Good ( $\geq$ 5° PKFS), No change (° PKFS between -5 and +5) and Poor ( $\leq$  PKFS <-5°). Forty-nine of 92 limbs (53.5%) had a significant improvement in PKFS (17.6°) and TROM (6.2°) in a short-term follow-up. Among 9 preoperative predictors for long-term results, a significant positive contribution was seen with regard to age (higher values yielded better results), while a significant negative contribution was seen with regard to Popliteal angle, PKFS and TROM (smaller values yielded better results). **DISCUSSION:** We recommend DRT in spastic CP patients with stiff knee gait. Preoperative PKFS and TROM should be the deciding factors for the final outcome. Influence of Age and Popliteal angle cannot be ignored for long-term success, though they do very little for short-term results.

Date : 2008-08-25  
Session : IFPOS - Cerebral Palsy  
Time : 1400-1530  
Room: 606-607

Abstract number : 18603

**THE DIFFERENCE BETWEEN HEMIPLEGIC AND DIPLEGIC FOOT POSTURE DEVELOPMENT**

Freeman MILLER, Nancy LENNON, Chris CHURCH, John HENLEY  
*Al duPont Hospital for Children, Wilmington (UNITED STATES)*

The evolution of foot posture is not well documented for children with cerebral palsy (CP). We have found pes valgus present in newly walking children with CP which tends to diminish over the first year of walking, similar to the trend in typical development. This research is focused on the differences in foot posture development between hemiplegic and diplegic CP. METHODS: The current analysis includes a sample of 26 children (diplegic limbs=28, hemiplegic involved limbs=12, hemiplegic uninvolved limbs=12) in GMFCS levels I, II and III, followed at 6-month intervals from age 2.5 to age 6.5. Dynamic foot pressure measurements were collected at each visit using the F-Scan measurement system (Boston, MA). A varus-valgus index was utilised to identify dynamic foot valgus or varus pressure patterns during walking. RESULTS: Diplegic limbs and hemiplegic limbs demonstrate clear difference in foot valgus measures as walking patterns evolve. Diplegic feet started in valgus (37 Valgus index (VI)) at 33 months then were at 39 VI at 48 months and at 37 at 66 months of age. The hemiplegia involved went from 31 to 10 to 4 and the normal side was unchanged at 14 to 17 to 13. DISCUSSION: This study confirms the tendency for persistent valgus in the diplegic limbs, a trend away from valgus toward varus in the involved hemiplegic limbs, and normal values in the uninvolved hemiplegic limbs through the early walking years. Between ages 2 and 6 years, the trends of individual patients may vary.

**Date : 2008-08-25**  
**Session : IFPOS- Trauma III**  
**Time : 1600-1730**  
**Room: 606-607**

**Abstract number : 15719**

**A 10-YEAR EXPERIENCE OF ELASTIC STABLE INTRAMEDULLARY NAILING FOR UNSTABLE FOREARM FRACTURES IN CHILDREN**

Moez BALLAL, Neeraj GARG

*Royal Liverpool Children's NHS Trust, Liverpool (UNITED KINGDOM)*

**INTRODUCTION:** The majority of paediatric diaphyseal fractures are treated conservatively, while some forearm fractures require osteosynthesis using plates. We present our ten-year experience with Elastic Stable Intramedullary Nailing (ESIN) for displaced and unstable paediatric diaphyseal fractures. **METHODS:** 60 patients treated with ESIN between 1996 and 2005 have been reviewed retrospectively. There were 43 boys and 17 girls with a median age of 11.5 years. Forty-nine fractures were stabilised using ESIN of both bones, 10 of the Radius alone and one of the Ulna alone using a standard nailing technique under tourniquet control. All fixations were protected in an above elbow plaster cast. Patients were followed up for average of nine months. **RESULTS:** Clinical and radiological union was achieved within 13 weeks in 58 children. One patient had delayed union of the ulna which united at nine months postop. Another patient had nonunion of ulna that required autologous bone marrow injection after one year before full consolidation occurred. **CONCLUSION:** We believe that ESIN of forearm unstable fractures is a minimally invasive technique, maintains the fracture haematoma, less time consuming procedure and easier metal work removal with low complication rate.

**Date : 2008-08-25**  
**Session : IFPOS- Varia**  
**Time : 1600-1730**  
**Room: 606-607**

**Abstract number : 16315**  
**PELVIC SUPPORT OSTEOTOMY**  
Gamal HOSNY  
*Benha University, Cairo (EGYPT)*

Hip instability in the young age is difficult to treat especially if it is accompanied by pain. Subtrochanteric valgus osteotomy to support the pelvis was suggested in 1838. The aim of this study is to evaluate the results of this operation highlighting the predictability of the results. From 1993 till 2005, 34 cases had been treated by pelvic support osteotomy in our institution. Age of patients ranged from 10 to 26 years [average 14.5y]. There were 20 female. The aetiology was in 7 cases, paralytic hip dislocation in 9 cases, septic arthritis in 10 cases, OA in 2 cases, neglected fracture neck femur in 2 cases, proximal femoral focal deficiency in 3 cases and TB in one case. External fixation time ranged from 4-12m. All patients had a positive Trendelenburg test and 31 patients had hip pain preoperatively. Evaluation parameters included were pain, Trendelenburg test, limping, walking distance, ROM, L.L discrepancy and satisfaction of the patients. After an average follow-up of 6.5y [1-13y], there were 6 excellent, 23 good and 5 poor results. Trendelenburg sign disappeared in 20 patients. Pain disappeared in 28 patients. Magnitude of lengthening ranged from 3.5 to 12cm. **COMPLICATIONS INCLUDED:** Some sort of pin tract infection in all cases, knee stiffness in 3 cases, fracture of the regenerate in 4 cases and knee subluxation in one case. Early results of Ilizarov modification of pelvic support osteomy may be encouraging. However, the possibility of deterioration with time and the unpredictability of improvement of Trendelenburg gait should be considered.



**Date : 2008-08-25**  
**Session : IFPOS- Varia**  
**Time : 1600-1730**  
**Room: 606-607**

**Abstract number : 16859**

**FIBULAR TRANSFERENCE FOR TIBIAL DEFECTS IN CHILDREN - A SALVAGE PROCEDURE**

Mahomed Noor RASOOL

*Nelson R Mandela School of Medicine, Durban (SOUTH AFRICA)*

Treatment of tibial shaft defects secondary to pyogenic osteomyelitis and infected compound fractures in children is challenging. Exposed bone, sequestra, unhealthy skin and sinuses make routine grafting procedures difficult. AIM: To report on the outcome of fibular transference for tibial defects, following chronic osteomyelitis and compound fractures. MATERIALS AND METHODS: In 17 years, 15 children aged 4-13 years underwent fibular transfer for tibial defects. Nine had defects following primary pyogenic osteomyelitis, and in 6, the defects were due to compound fractures. The defect ranged from 5 to 20cm. Reconstruction was performed in 2 stages. All children had repeated debridement, sequestrectomy, curettage and 7 required skin cover. This was later followed by proximal fibular transfer to the tibial metaphysis in 13 children and distal fibular transference to the talus in 2. Further procedures included distal fibulo-tibial synostosis in 6 patients. RESULTS: All transfers united by 8-12 weeks. Fibular hypertrophy was seen in all patients. Follow-up ranged from 1-18 years. Shortening ranged from 4-18 cm. Complications of equinus (3), varus (3), ankylosis ankle (4) were related to the initial infection or injury. All patients are weight-bearing. CONCLUSION: Ipsilateral fibular transference to the tibia bypasses scarred and infected defects and is a useful salvage procedure in difficult pseudarthrosis in children and avoids ablation of the limb.

**Date : 2008-08-25**  
**Session : IFPOS- Infection**  
**Time : 1600-1730**  
**Room: 606-607**

**Abstract number : 16863**

**HAEMATOGENOUS OSTEOMYELITIS OF THE CALCANEUS IN CHILDREN**

Mahomed Noor RASOOL

*Nelson R Mandela School of Medicine, Durban (SOUTH AFRICA)*

**INTRODUCTION AND AIMS:** Primary haematogenous osteomyelitis of the calcaneus is uncommon and can lead to serious complications. The aim of this paper is to report the clinical manifestations of acute haematogenous osteomyelitis of the calcaneus and to highlight the consequences of delayed diagnosis. **MATERIALS AND METHODS:** Eighteen children (6-12 years) were seen in 17 years. Clinical features were pain, fever, swelling and fluctuance around the foot and ankle. The diagnosis was missed initially in 12 cases because the patients were treated for cellulitis, septic arthritis and subcutaneous abscess. Five patients seen early healed well following incision and drainage. The remaining 12 children had chronic osteomyelitis with discharging sinuses and healed after repeated debridement and wound care. The causative organism was *Staphylococcus aureus* in all cases, except one with *pseudomonas*. Total calcaneotomy was performed in 4 patients and two had, in addition, talectomies. All patients are ambulant. Follow-up ranged from 1-14 years. Shortening of the foot, limb length discrepancy, fusion of the subtalar, calcaneocuboid and ankle joints, avascular necrosis of the talus and phalangeal loss were seen in several patients. **CONCLUSION:** Acute haematogenous calcaneal osteomyelitis may be difficult to diagnose early. A high index of suspicion is necessary to prevent long term complications. Calcaneotomy is a useful alternative to amputation and results in satisfactory functional outcome.

**Date : 2008-08-25**  
**Session : IFPOS- Infection**  
**Time : 1600-1730**  
**Room: 606-607**

**Abstract number : 17170**

**ROLE OF MRI TO ASSESS THE PHYSEAL PLATE AFTER PERIARTICULAR/ INTRA-ARTICULAR INFECTIONS AROUND THE KNEE**

Emal WARDAK, S.S. GILL, Ramesh SEN, Paramjit SINGH, M.S. DHILLON  
*Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh (INDIA)*

Acute osteoarticular infections could lead to potential long-term sequelae, principal among which could be physeal plate damage. Many reports exist in the literature recounting these issues, and radiography has been the commonest modality used to evaluate the physis. The advent of MRI has led to better evaluation of this area, even when the changes are not visible on x-rays. **MATERIALS:** The authors used this modality to prospectively evaluate 15 cases seen over an 18-month period, which were confirmed cases of pyogenic infection either in the knee or in the periarticular metaphysis. MRI was done 6 months after medical management, when the x-rays were considered to be normal for any physeal damage. **RESULTS:** 13 cases had no positive signs on standard X-rays, while 2 had evidence of chronic osteomyelitis in the metaphyseal region of Tibia and Femur respectively. MRI showed abnormalities in 5 cases in the form of signal changes in metaphysis/ epiphysis, one showed osseous bar formation across the growth plate, and 3 had partial physeal destruction. **DISCUSSION:** The literature revealed no similar study focused on MRI as an assessment tool for residual physeal damage after pyogenic infection. Our MRI revealed a 33% incidence of residual changes affecting the physeal plate, which was much higher than was seen on x-rays. This has the potential to pick up such lesions earlier, and possible interventions could be planned at an earlier date. The advantage that an MRI offers far outweighs the additional cost of the procedure.

Date : 2008-08-25  
Session : IFPOS- Trauma III  
Time : 1600-1730  
Room: 606-607

Abstract number : 17342

**ELASTIC STABLE INTRAMEDULLARY NAIL FIXATION FOR MODERATELY AND SEVERELY DISPLACED FRACTURES OF THE RADIAL NECK IN CHILDREN**

Xiang Xin ZHANG, Ruixue MA

*Children's Hospital of Fudan University, Shanghai (CHINA)*

OBJECTIVE: To analyse the method of using elastic stable intramedullary nailing (ESIN) to treat the moderately and severely displaced fractures of the radial neck in children. METHODS: Twelve patients with moderately and severely displaced fractures, aged from 3 and half to 8 years old, were treated by using ESIN from November 2005 to July 2007. There were 3 cases of moderate degree and 9 of severe degree according to O'Brien classification. All cases had exceeded 45° angulations. Three cases associated with another fractures included 2 proximal ulna fractures and 1 medial epicondylar avulsion fracture. All cases were treated initially by closed manipulation (method of Patterson or Kaufman) to improve the position, then directly followed by an ESIN or under the assistance of percutaneous K-wire. The nails were removed from 52 days to 9 months. RESULTS: Fracture was directly reduced by ESIN only in 1 case. All others were required the assistance of percutaneous K-wire. All patients were followed up from 2 to 24 months. All had full range of motion in elbow joint and wrist joint. The complications included 1 with skin irritation, 2 overgrowths of the radial head and 2 early close of epiphyseal plate. Without AVN, re-fractures, stiffness of joint, conjunction of upper ulnar-radial joint, non-union, osteomyelitis, overgrowth of radius or iatrogenic superficial radial nerve injuries. CONCLUSIONS: It is a good method to use ESIN for the closed reduction and fixation of moderately and severely displaced fractures of the radial neck in childhood.

**Date : 2008-08-25**  
**Session : IFPOS- Infection**  
**Time : 1600-1730**  
**Room: 606-607**

**Abstract number : 17743**

**USING THE POSTERIOR ROTATIONAL HIP OSTEOTOMY IN TREATMENT OF POSTSEPTIC MULTIPLANE DEFORMITY IN CHILDREN**

Lyudmila PASHKEVICH, Aleg SAKALOUSKI, Igor SHPILEUSKI, Yury LIKHACHEUSKI, Roman GOLDMAN  
*State Union The Republican Scientific and Practical Center of the Traumatology and Orthopedy, Minsk (BELARUS)*

We used intertrochanteric osteotomy with posterior 45°-90° rotation of the femoral head and neck proposed by Anatoly Sokolovsky in 15 cases of multiplane deformity of the proximal part of the femur in children with postseptic deformity. The indications for surgery were multidimensional deformities of the proximal part of the femur with significant destruction of the superior segment of the femoral head with articular surface incongruity. The aims of the surgical intervention were reconstruction of the maximal sphericity of a loaded segment of a femoral head, normalization of the greater trochanter position, lengthening of the femoral neck. Negative influence of the osteotomy on a function of a growth plate is not revealed in one case that is confirmed by a number of radiological parameters. The mean value of the epiphyseal quotient increased from 48 to 98. Its improvement was marked and further during all time till the moment of bone maturing. The epiphyseal-neck quotient increased to 99 against 58 before the intervention, the neck-shaft angle became 130° against 120°. The Wiberg angle increased from 18° to 30°. The posterior femoral rotational osteotomy cannot eliminate the defects of the femoral head but allows maximal use of its intact segments. This operation can be very useful in treatment of postseptic multiplane deformity of the proximal part of the femur in children. Advantages of operation are absence of negative influence on a growth plate, lengthening of the femoral neck, improvement of a congruity in a hip joint.

Date : 2008-08-25  
Session : IFPOS- Infection  
Time : 1600-1730  
Room: 606-607

Abstract number : 17831

**DISTAL TIBIAL GROWTH ARREST FOLLOWING MENINGOCOCCAL SEPTICAEMIA; MANGEMENT AND OUTCOME OF A SERIES OF 14 ANKLES**

Ravisankar KIRUBANANDAN, Fergal MONSELL, Caspar AYLOTT, James BARNES  
*Bristol Royal Hospital for Sick Children, Bristol (UNITED KINGDOM)*

Survivors of meningococcal septicaemia often develop progressive skeletal deformity secondary to physeal damage at multiple sites, particularly in the lower limb. Distal tibial physeal arrest typically occurs with sparing of the distal fibular physis leading to a rapidly progressive varus ankle deformity. There is no previous literature reporting this ankle deformity following meningococcal septicaemia. We report the management of this deformity in 14 ankles in 10 consecutive patients 36 months after meningococcal septicaemia. Plain radiographs and MRI were used to define the deformity and the extent of growth plate involvement. The Taylor Spatial Frame (TSF) with a distal tibial metaphyseal osteotomy was used to restore the distal tibio-fibular joint. Distal fibular epiphysiodesis was performed in all ankles at the initial procedure. Distal tibial epiphysiodesis was performed at the time of fixator removal. The age at operation ranged from 3-14 years (mean 8). The preoperative ankle varus deformity ranged from 9-29 degrees (mean 19). The differential shortening of the tibia with respect to fibula was on average 1.9cm. The mean time in frame was 136 days. After a mean follow-up of 1.7 years results were excellent in all patients with complete correction of deformity and shortening. Complications included, 4 superficial pin site infections, 1 lateral peroneal nerve palsy which recovered completely. There were no major nerve or vascular complications. We consider that this approach provides a powerful method of correction for this difficult group of patients.

**Date : 2008-08-25**  
**Session : IFPOS- Varia**  
**Time : 1600-1730**  
**Room: 606-607**

**Abstract number : 17950**

**THE MODIFIED SOFIELD-MILLAR OPERATION IN OSTEOGENESIS IMPERFECTA - A REVIEW OF TEN-YEAR EXPERIENCE**

Michael TO, C.K. CHEN, Wang CHOW

*The Duchess of Kent Children's Hospital at Sandy Bay, Hong Kong (CHINA)*

**OBJECTIVE:** This is a retrospective review of our ten-year experience of the modified Sofield-Millar operation in treating long bone deformity of patients with osteogenesis imperfecta. **METHODS:** All patients with osteogenesis imperfecta who had undergone modified Sofield-Millar operation at our institute between September 1995 and December 2006 were retrospectively reviewed. **RESULTS:** Nine patients including two males and seven females were reviewed retrospectively. The mean age at first operation was eight years and eight months. The mean follow-up was 72.7 months. 35 operations were performed including 12 exchanges of rods, 7 fracture fixations, and 16 deformity corrections. These operations were done on 35 long bones including 13 femurs, 17 tibia, 3 radii and 2 ulnas. Among these 35 long bones, 31 (88.6%) long bone deformity were corrected by no more than two osteotomies. 80% of the osteotomies healed within 12 weeks after the operation. There was no significant diaphyseal resorption as a result of the surgery even using more than three osteotomies in our series. Four patients with seven long bones required reoperation (20%) as a result of the bone growth. The only complication in the series involves a patient with compartment syndrome of the leg requiring fasciotomy and wound debridement. **CONCLUSION:** Modified Sofield-Millar operation is safe and effective in treating long bone deformities in patients with osteogenesis imperfecta. It preserves the periosteum and blood supply of the bone, hence avoid unnecessary surgical trauma.

**Date : 2008-08-25**  
**Session : IFPOS- Trauma III**  
**Time : 1600-1730**  
**Room: 606-607**

**Abstract number : 18129**

**S-100 A SERUM MARKER FOR TRAUMATIC BRAIN INJURY IN CHILDREN**

Annelie-Martina WEINBERG, Elke RUTTENSTOCK, Christoph CASTELLANI, Eva Elisa FISCHERAUER, Ute KRAITSY, Michael E. HÖLLWARTH

*Department for Paediatric and Adolescent Surgery, Medical University of Graz, Graz (AUSTRIA)*

**BACKGROUND:** The management of diagnostic investigations of paediatric patients with minimal-head-trauma is still an unsolved problem. Clinical symptoms cannot differentiate between simple skull-trauma and/or intracerebral injury. In American literature a primary CCT-scan is often recommended while in European countries either skull-x-rays and/or observation at the ward are performed. This study evaluated whether S-100B, an astrocyte protein is useful as a diagnostic biomarker to detect traumatic brain injury (TBI) in children and consequently to avoid unnecessary skull-x-rays or CCT-scans in minimal-head-trauma. **METHOD:** Children (0-18 years), presenting clinical symptoms of TBI (nausea, vomiting, fainting, amnesia), were included in the prospective clinical study. Analysing the levels of TBI by x-rays or/and CCT, the results were evaluated for existing correlations with serum levels of S-100B. **RESULTS:** A total of 338 children (1y to 18y) with elevated serum S-100B levels were investigated from 12/2004 to 10/2007. In 99 patients (29.2%) a CCT was performed. All patients with pathology (43.4%) presented an increased S-100B level above the cut-off-value of 0.16mg/l. This showed a sensitivity of S-100B of 97% and a specificity of 61% and a positive predictive value of 0.53 and a negative predictive value of 0.98. **CONCLUSION:** Due to the high sensitivity and the high negative predictive value of S-100B, integration of S-100B in the standard patient management of TBI eases the decision for the indication of a CCT and subsequently reduces the number of applied CCTs as well as the duration of hospitalisation.



**Date : 2008-08-25**  
**Session : IFPOS- Trauma III**  
**Time : 1600-1730**  
**Room: 606-607**

**Abstract number : 18198**

**REMANIPULATION OF PAEDIATRIC FOREARM FRACTURES**

Colm TAYLOR, Phillip BRADY, Anthony MCGUINNESS  
*Cork University Hospital, Cork (IRELAND)*

Fractures of the wrist and forearm in children are usually uncomplicated. Reported causes for redisplacement vary. We undertook a retrospective analysis of paediatric wrist and forearm fractures remanipulated in our unit within the past three years. Radiographs were reviewed to identify characteristics of the initial fracture and the subsequent loss of reduction. 660 fractures underwent early initial manipulation and casting. Of these, 29 were remanipulated (4.4%), at a mean of 12.8 days later (range 4-23 days). Based on fracture pattern, four distinct groups were identified: 1. Metaphyseal fracture of the distal radius and ulna with complete displacement ("pronator quadratus" injuries, 10 fractures, mean 8.6 years). All had some residual dorsal displacement after initial reduction. 2. Metaphyseal fracture of the distal radius with minimal ulnar deformity (7 fractures, mean 10.1 years). Dorsal angulation was the main reason for remanipulation. 3. Salter Harris II fracture of the distal radius with complete dorsal displacement (5 fractures, mean 10.1 years). Recurrence occurred despite complete initial reduction; remanipulation was suboptimal in four. 4. Diaphyseal fractures of the middle/distal radius with variable displacement (7 fractures, mean 5.6 years). No fracture resulted in significant restriction, with good capacity for remodelling observed in both sagittal and coronal planes. Despite this small cohort, redisplacement was noted in distinct fracture patterns. Complete reduction is essential in displaced fractures, but adequate treatment of angulated fractures seems to depend more on casting technique. Patterns prone to redisplacement should be closely monitored after initial reduction.

**Date : 2008-08-25**  
**Session : IFPOS- Varia**  
**Time : 1600-1730**  
**Room: 606-607**

**Abstract number : 18211**

**UPDATE ON HURLER SYNDROME**

Colm TAYLOR, Katherine BROWNE, Ann O'MEARA, Esmond FOGARTY  
*Our Lady's Hospital, Dublin (IRELAND)*

Hurler syndrome is a metabolic storage disease, with specific musculoskeletal abnormalities termed dysostosis multiplex. Haematopoietic Stem Cell Transplant (HSCT) increases life expectancy, but effects on the progression of dysostosis multiplex are less certain. We detail the ongoing follow-up of 23 patients (range 2.6-20.7 years) at a mean of 8.5 years after HSCT, the largest series reported in the literature to date. All patients were examined at an annual clinic, and serial radiographs were reviewed to assess development and management of hip dysplasia and genu valgum. All patients demonstrated characteristic acetabular dysplasia. Thirteen patients have undergone hip containment, including eight bilateral combined pelvic osteotomy and femoral derotation, at a mean of 4.4 years. Mean preoperative acetabular angle was 34 degrees. Long term follow-up of older patients (>8 years, mean 9.9 years after surgery) demonstrated adequate femoral head cover, with mean centre-edge angle of 40 degrees (range 32-48 degrees). More recently, innominate osteotomy has been used. Genu valgum was more variable, and seven patients underwent medial epiphyseal stapling at a mean of 7.8 years, decreasing tibiofemoral angle by a mean of 7 degrees. Staple dislodgment was seen in four children. All patients remain independently mobile, but hip stiffness and valgus knees contribute to early fatigue and hip discomfort in older children. We conclude that hip containment surgery has been successful into early adolescence, with overall mobility well preserved. We recommend plating of the proximal tibial epiphysis. Further follow-up will monitor progression.

Date : 2008-08-25  
Session : IFPOS- Varia  
Time : 1600-1730  
Room: 606-607

Abstract number : 18217

**SEVERE JOINTS DISABILITIES AND INTRACRANIAL HEMORRHAGE (ICH) IN HEMOPHILIC CHILDREN IN CHINA: A REVIEW OF 179 PATIENTS AT BEIJING CHILDREN'S HOSPITAL**

Runhui WU<sup>1</sup>, Xinyu QI<sup>2</sup>, Xinyi WU<sup>1</sup>, Tao FENG<sup>1</sup>

<sup>1</sup>Haematology Center, Beijing (CHINA), <sup>2</sup>Orthopaedic department, Beijing Children's Hospital, Beijing (CHINA)

**PURPOSE:** To analyse the current condition, joints bleeding and joints disabilities of hemophilic children in China. **MATERIAL AND METHODS:** In 2007, the Hemophilia Group at Beijing Children's Hospital (BCH) conducted a clinical review of the current health and care status of 179 children with Hemophilia followed from 2003 to 2007. **RESULTS:** Of the 179 patients, 83% were Hemophilia A and 13% were Hemophilia B. 54 patients (30%) were severe (<1%), 75 (41%) moderate (1-5%) and 41 (23%) mild (5-35%). Family history was positive in 35%, and 31 patients tested for inhibitors were negative. Significant observations were: 1. Severe joints disabilities: 81% of severe and 65% of moderate patients had severe joints bleedings. Chronic joints disabilities occurred in 65% and 61% of severe and moderate hemophiliacs respectively. Disabilities deteriorated rapidly with age. Most alarming is that by 7 years of age all patients suffered from multiple (3-5) joints disabilities. 2. High incidence of ICH: 19 patients (10.6%) of which two had surgery. Three patients died and 5 suffered severe neurological sequelae. One young patient of 15 with severe joints and neurological disabilities committed suicide. 3. Poor self-esteem (96%), poor school attendance (100%) and an 18% drop out rate were observed. Little or no participation in social activities or sport (75%) and severe family burden (68%) were noticed. **DISCUSSION AND CONCLUSION:** This study showed the critical risk of joints disabilities, intracranial hemorrhage and poor care status of the hemophilic children in China and the urgent need for better support.

Date : 2008-08-25  
Session : IFPOS- Infection  
Time : 1600-1730  
Room: 606-607

Abstract number : 18245

**THE ROLE OF HIP ARTHROSCOPY IN THE TREATMENT OF SEPTIC HIP IN CHILDREN**

Vikas TRIVEDI<sup>1</sup>, Tomonori KENMOKU<sup>2</sup>

<sup>1</sup>*Subharti Medical College, Meerut (INDIA)*, <sup>2</sup>*Chiba Children's Hospital, Chiba city (JAPAN)*

INTRODUCTION: The use of arthroscopic techniques to diagnose and treat hip disorders in children provides the potential to limit the morbidity of current techniques. PURPOSE: To report the technique of Arthroscopic irrigation in the management of septic arthritis of the hip in children and to analyse the short-term results of this technique. MATERIAL AND METHODS: 7 cases, 8 hips. Mean age at the operation: 4.4y, (11m~10y). Mean follow-up period: 1 year (6m~1.5y). All patients had high fever, CRP raised, underwent USG evaluation and aspiration. 2.8mm to 3.5 mm arthroscopes were used and step up cannulation done. Irrigation and drainage performed after visualization and confirmation. RESULTS: All 8 hips showed complete resolution of infection and at about 1 year follow-up were clinically and radiologically normal. CONCLUSION: Hip arthroscopy is feasible and a very useful minimal invasive modality for management of septic hip in children and does not result in short-term complications, although the portal locations and traction techniques must be modified from the standard positions.

**Date : 2008-08-25**  
**Session : IFPOS- Infection**  
**Time : 1600-1730**  
**Room: 606-607**

**Abstract number : 18773**

**SEPTIC ARTHRITIS OF THE HIP IN 78 CHILDREN**

Anil ARORA<sup>1</sup>, Apurv MEHRA<sup>1</sup>, Anil AGARWAL<sup>2</sup>, S. KUMAR<sup>1</sup>

<sup>1</sup>University College of Medical Sciences, University of Delhi, New Delhi (INDIA), <sup>2</sup>CNBC Hospital, New Delhi (INDIA)

**INTRODUCTION:** Septic arthritis of hip in children is sinister. In developing countries, early diagnosis may be missed in want of sophisticated investigations. I present my experience of managing 78 children over last 17 years. **MATERIAL AND METHOD:** 78 children with septic hips (1990-2005). Age: 3 days-4 years at the time of septic hip episode. 18 cases reported >15 days after onset. Bilateral involvement was seen in 6 cases. All but five hips drained. Follow-up 2-17 years. **RESULTS:** Complications- Subluxation/Dislocation (14), Variable destruction of femoral head (10), Pathological epiphyseal separation (4), AVN (7), Vanishing Head Sign (1), Coxa vara (3). Subluxed/Dislocated hips - reduced at the time of drainage (5 cases), later traction (1 case), late open reduction (5 cases) and late close reduction (1 case) - after variable duration up to 2 years. Other reconstructive procedures: Valgus osteotomy (3 cases); Fibular grafting (1 case), Varus Osteotomy (1 case), Staheli's Acetabular Augmentation (2 cases). **CONCLUSIONS:** Sixty percent infants are afebrile, hip rotations are free in early stages. Fullness on either side of adductor longus tendon is consistent finding. Iliac fossa abscess may mimic septic hip. In former it was difficult to pinch the iliac table clinically between fingers and thumb. Ultrasound was extremely useful to differentiate between Dislocated/Destroyed/Dissociated unossified (cartilaginous) proximal femoral nucleus (femoral head) guiding management. Degree of damage directly proportion to delay. If sizeable femoral head is available, reduce dislocation as late as 2 years. Deformed heads remodel on long term. Extraarticular procedures work better with small remnant of femoral head like a stump.

**Date : 2008-08-25**

**Session : Spine: basic science - trauma spine**

**Time : 0900-1030**

**Room: 608**

**Abstract number : 15373**

**RECAPPING LAMINOPLASTY AND MONOSEGMENTAL POSTERIOR SPONDYLODESIS FOR SPINAL CORD INJURIES**

Tarek ALY

*Tanta University School of Medicine, Tanta (EGYPT)*

Patients with spinal cord injuries have been treated in the past by laminectomy in an attempt to decompress the spinal cord. The result has been insignificant improvement or even a worsening of neurologic function and decreased stability without effectively removing the anterior bone and disk fragments compressing the spinal cord. The primary indication for anterior decompression and grafting is narrowing of the spinal canal with neurologic deficits that cannot be resolved by any other approach. One must think of subsequent surgical intervention for increased stability and compressive posterior fusion with short-armed internal fixators. The aim of this study to analyse the short-term results and efficacy of the recapping laminoplasty combined with intersomatic fusion technique for decompression and fusion of spinal cord injuries. Seven patients with traumatic fractures of dorsolumbar spine with neurological deficit are presented. All had radiological evidence of spinal cord or quada equina compression, with either paraplegia or paraparesis. Patients underwent recapping laminoplasty in the thoracic or lumbar spine for decompression of spinal cord. The T-saw was used for division of the posterior elements. After decompression of the cord and removal of the extruded bone fragments and disk material, the excised laminae were replaced exactly in situ to their original anatomic position. Then application of a compression force via monosegmental transpedicular fixation was done, allowing vertebral end plate compression and intersomatic fusion. Lateral Cobb angle (T10-L2) was reduced from 26 to 4 degrees after surgery. The shortened vertebral body united and no loss of correction was seen. The preoperative vertebral kyphosis averaged +17 degrees and was corrected to +7 degrees at follow-up with the sagittal index improving from 0.59 to 0.86. The segmental local kyphosis was reduced from +15 degrees to -3 degrees. Radiography demonstrated anatomically correct reconstruction in all patients, as well as solid fusion This technique permits circumferential decompression of the spinal cord through a posterior approach and posterior interbody fusion. **KEYWORDS:** Laminoplasty, Spondylodesis, Spine, trauma.

Date : 2008-08-25  
Session : Spine: basic science - trauma spine  
Time : 0900-1030  
Room: 608

Abstract number : 15705

**ROBOTIC ASSISTED VERTEBROPLASTY: OUR EXPERIENCE WITH A NOVEL APPROACH TO THE TREATMENT OF VERTEBRAL COMPRESSION FRACTURES**

Yaron ZAULAN<sup>1</sup>, Vitali ALEXANDROVSKY<sup>1</sup>, Moshe ROFFMAN<sup>1</sup>, Moshe SHOHAM<sup>2</sup>, Boris ZILBERSHTAIN<sup>1</sup>, Alexander BRUSKIN<sup>1</sup>  
<sup>1</sup>Department of Orthopaedic Surgery, Carmel hospital, Haifa (ISRAEL), <sup>2</sup>Robotic laboratory, Department of Mechanical Engineering, Technion, Israel / MAZOR Surgical Technologies, Haifa (ISRAEL)

Vertebral compression fractures constitute a major health care problem, due to negative impact on the patient's function life and the costs to the health care system. Patients can be treated conservatively or by conventional fluoroscopic assisted vertebroplasty. Conventional vertebroplasty imposes technical challenges with possible complications including cement extravasations, the possibility of breaching the walls of the pedicle by the osteoplasty needle and prolonged fluoroscopic radiation exposure of the medical team at large. We present here a comparative study of 20 cases of thoracolumbar vertebral compression fracture, treated with robotic assisted vertebroplasty versus 30 cases of fractures treated by conventional fluoroscopic vertebroplasty. All patients were diagnosed as suffering from acute vertebral compression fractures (up to 3 weeks from the traumatic event). The mean overall operation time of the fluoroscopic assisted vertebroplasty was 35 minutes compared to a mean operation time of 45 minutes at the robotic assisted vertebroplasty. There was a significant difference in the fluoroscopic time and subsequent exposure time to radiation between the groups: in the research group we used only an average of 3 seconds of fluoroscopic exposure (an average of 5 fluoroscopic images) compared to an average of 7 seconds of exposure (an average of 12 fluoroscopic images). No difference was found between the groups in regard with overall admission time. CONCLUSION: Robotic assisted vertebroplasty is a new and safe approach aiming to shorten the duration of fluoroscopic exposure. This novel procedure reduces the potential complication of the operation.

Date : 2008-08-25  
Session : Spine: basic science - trauma spine  
Time : 0900-1030  
Room: 608

Abstract number : 16253

**A RANDOMIZED TRIAL OF BALLOON KYPHOPLASTY AND NONSURGICAL CARE FOR PATIENTS WITH ACUTE VERTEBRAL COMPRESSION FRACTURES: ONE-YEAR RESULTS**

Jan VAN MEIRHAEGHE<sup>1</sup>, Leonard BASTIAN<sup>2</sup>, Douglas WARDLAW<sup>3</sup>, Steven BOONEN<sup>4</sup>

<sup>1</sup>Dienst Orthopedie, Algemeen Ziekenhuis St Jan, Brugge (BELGIUM), <sup>2</sup>Klinikum Leverkusen, Leverkusen (GERMANY), <sup>3</sup>Woodend Hospital, Aberdeen (UNITED KINGDOM), <sup>4</sup>Leuven University Center for Metabolic Bone Diseases and Division of Geriatric Medicine, Katholieke Universiteit Leuven, Leuven (BELGIUM)

Balloon kyphoplasty (BKP) is a minimally invasive treatment for acute vertebral compression fractures (VCF) aiming vertebral deformity correction and fracture stabilisation. We performed the first multicenter randomized trial. Patients with 1-3 non-traumatic VCF (<3-month-old) were randomly assigned to receive BKP (N=149) or nonsurgical care (NSC) (N=151). Quality of life, back pain and function, days of disability and bed rest were assessed at baseline, 1, 3, 6 and 12 months. The difference between groups in change-from-baseline in the physical component summary of the SF-36, improved 3.5 points (95%CI:1.6 to 5.4; p=0.0004) more in the BKP group when averaged across 12 months of follow-up. Compared with the NSC group, those assigned to BKP also had greater improvement in quality of life (EuroQol-5D), back function (Roland-Morris), significant less back pain and reported fewer days of limited activity in the previous 2 weeks due to back pain. No difference was seen in radiographically detected subsequent VCF between groups (p=0.5). Compared to NSC, BKP improved life quality, back pain and disability that last at least one year after the procedure. No difference is seen between groups in radiographically subsequent VCF's.



**Date : 2008-08-25**  
**Session : Spine: basic science - trauma spine**  
**Time : 0900-1030**  
**Room: 608**

**Abstract number : 17503**

**LATE STRESS FRACTURE OF A WELL-CONSOLIDATED STRUT GRAFT AFTER TOTAL SPONDYLECTOMY IN THE THORACIC SPINE**

Takui ITO, Naoto ENDO, Toru HIRANO, Ren KIKUCHI, Osamu MORITA  
*Department of Orthopaedic Surgery, Niigata University Medical & Dental Hospital, Niigata (JAPAN)*

**BACKGROUND:** Union of the grafted bone is one of the purposes of most spine surgery, and in the adult patients it usually means stable spinal column. Delayed stress fracture of strut graft is rare and only a few cases were found in the published literature. Authors report three cases of late stress fracture of a well incorporated anterior strut graft after total en-bloc spondylectomy. **MATERIALS AND METHODS:** The authors reviewed the medical history and images of three cases with late stress fracture after total spondylectomy. **RESULTS:** All three cases had total spondylectomy as a treatment of malignant tumour of thoracic spine. Two cases had chondrosarcoma of upper thoracic spine and another had metastatic thyroid cancer of 12th thoracic spine. In all three cases, anterior grafted bone had enough cross-sectional area and anterior bone union was considered to be completed because it looked solid in plain radiograph, tomography or CT, and the patients had been doing well without any symptom for long period, 1.5, 3.5, and 12 years after spondylectomy. In order to support anterior column after removal of posterior implant, posterior bone graft was performed in two cases and unilateral posterior pedicle screw-rod construct was left in one case and a plastic corset was used in one case. However, after removal of posterior instrumentation, they had stress fracture of anterior strut which is already incorporated well. **CONCLUSIONS:** Removal of posterior instrumentation is not recommended after total spondylectomy because the high possibility of stress fracture of anterior strut graft.

**Date : 2008-08-25**  
**Session : Spine: basic science - trauma spine**  
**Time : 0900-1030**  
**Room: 608**

**Abstract number : 17889**

**INTEGRAL TREATMENT FOR TORACOLUMBAR FRACTURES**

Hector F. GUTIERREZ GUTIERREZ, Alfredo ORTIZ FLORES, Jannethe MORALES IBARRA  
*Hospital General de Pachuca, Pachuca (MEXICO)*

**OBJECTIVE:** Thoracolumbar fractures evaluation since 2000 to 2007 at the Hospital General de Pachuca. **ANALYSIS:** Thoracolumbar fractures (T10 to L3) present bone structural abnormalities at intervertebral ligaments and discs, from simple fractures to complex fractures, having repercussion over the spinal cord and cauda equina with characteristics based on Denis classification: flexocompression, burst, distraction and dislocation fracture and data of raquineurologic stability, using clinical valoration with ASIA scale, X-rays, MRI and TC, to determine an integral treatment, and by so, controlling damage and optimise results, starting with medical stabilisation (NASCIS scheme), to determine surgical treatment vs. conservative treatment. Conservative treatment: post-traumatic vertebral stability, no neurological compromise, xifosis lesser than 25%, loss of body height lesser than 30%, inmovilization with Doble Ensemble Corset. Surgical treatment: instability raquial and neurological, angulation greater than 25°, loss of the body height greater than 30%, invasion to the spinal cord: neural liberation, and rachideal restructuration with a posterior or anterior surgical approach, ligamentotaxis with or without arthrodesis, vertebral posterior shortening with transpedicular short instrumentation by a posterior surgical approach. **RESULTS:** 240 thoracolumbar fractures: 95 flexocompression fractures, 85 burst fractures, 40 dislocation fractures, 15 distractions, 5 Dobles. Injury level: T10 - 8, L1 - 99, T11 - 16, L2 - 20, T12 - 92, L3 - 7. Therapeutic guide: conservative 55, shortening 65, ligamentotaxis 119 (without arthrodesis 16, with arthrodesis 103), anterolateral 1. Neurological state: Frankel E - 101, Frankel D - 54, Frankel C - 35, Frankel B - 15, Frankel A - 35. Neurological recovery: Frankel D - 50, Frankel C - 28, Frankel B - 8, Frankel A - 4.

Date : 2008-08-25  
Session : Spine: basic science - trauma spine  
Time : 0900-1030  
Room: 608

Abstract number : 17969

**FEASIBILITY STUDY OF BIOACTIVITY ENHANCEMENT OF POLYETHERETHERKETONE (PEEK) USING PLASMA IMPLANTATION TECHNOLOGY**

So Ching LUI<sup>1</sup>, Kelvin YEUNG<sup>2</sup>, Yuen Yi CHAU<sup>1</sup>, Paul CHU<sup>2</sup>, Kenneth CHEUNG<sup>1</sup>

<sup>1</sup>The University of Hong Kong, Hong Kong (HONG KONG), <sup>2</sup>City University of Hong Kong, Hong Kong (HONG KONG)

Polyetheretherketone (PEEK) recently attracts many applications in orthopaedics such as intervertebral spacer, spinal cage and prosthesis. However, literatures suggest this material is bio-inert in nature. Its inferior bioactivity may lead to poor bone-implant interaction. Some researchers incorporated hydroxyapatite or tri-calcium phosphate in PEEK to enhance its bioactivity. Mechanical properties such as elasticity and fatigue may, however, alter as material micro-structure has been changed. To avoid it, surface modification is therefore an alternative. This pilot study aims to investigate the feasibility of bioactivity enhancement of PEEK using an advance surface technique named plasma immersion ion implantation (PIII). PEEK discs were polished and undertaken PIII treatment with plasma sources such as water, ammonia and strontium at 15kV at 50Hz for 2 hours. Afterwards, surface morphology, roughness, elemental chemical profile, chemical bonding and hydrophilicity were examined by SEM, AFM, XPS, FT-IR, and contact angle measurement respectively. Bioactivity was evaluated by simulated body fluid immersion test at day 21 and cytotoxicity was assessed by MC3T3E1 cell culturing at day 2 and 5. The surface roughness slightly decreases after water and ammonium PIII, whereas it increases after strontium PIII. The surface contact angle of the treated samples reduces, but surface energy increases. Literatures suggested these changes favour cell attachment and proliferation. In our cell culture experiment, cells have attached more on the treated surfaces. All these results preliminarily demonstrate the feasibility of PIII treatment to enhance bioactivity of PEEK. Further study will focus on in vivo testing.

Date : 2008-08-25  
Session : Spine: basic science - trauma spine  
Time : 0900-1030  
Room: 608

Abstract number : 18004

**IN VITRO STUDY OF A NEW SURFACE MODIFIED BIODEGRADABLE METALLIC MATERIAL FOR ORTHOPAEDIC IMPLANTATION**

Hoi Man WONG<sup>1</sup>, Kelvin YEUNG<sup>2</sup>, Kin On LAM<sup>1</sup>, Paul CHU<sup>2</sup>, Keith LUK<sup>1</sup>, Kenneth CHEUNG<sup>1</sup>

<sup>1</sup>The University of Hong Kong, Hong Kong (HONG KONG), <sup>2</sup>City University of Hong Kong, Hong Kong (HONG KONG)

INTRODUCTION: Some orthopaedics metallic implants require removal after healing so as to avoid stress shielding effect. The use of degradable metals such as magnesium-based alloys is therefore an alternative. However, rapid degradation and hydrogen gas release are the major obstacles. Surface modification can effectively tackle the problem of rapid degradation. Surface treatment using a novel substance, termed substance "X" has been recently applied by our team to enhance the corrosion resistance of AZ91 magnesium alloy. This study aims to investigate the corrosion resistance and biocompatibility of the untreated and treated alloys. METHODOLOGY: Immersion test using simulated body fluid for 14 days with the temperature controlled at 37°C was applied to simulate an in vitro corrosion environment. The concentration of the released ions was analysed by inductively-coupled plasma mass spectrometry. To evaluate cell attachment and proliferation, the treated and untreated samples were cultured for 1 and 3 days using green fluorescent protein mouse osteoblasts. RESULTS AND DISCUSSION: The Mg ions released by untreated sample are 9,920ppm which is about 14 folds higher than the treated at day 14. Gas bubble formation is not found on the treated sample at day 14, whereas severe corrosion and gas bubble formation are observed on the untreated one. It seems the treatment can successfully suppress the rapid degradation. In cell culturing, osteoblasts are well tolerated with the treated samples. However, no cell is found on the untreated surface. The next step is to observe in vivo degradation using animal model.

Date : 2008-08-25  
Session : Spine: basic science - trauma spine  
Time : 0900-1030  
Room: 608

Abstract number : 18073

**CORRELATION OF OSTEOBLAST ACTIVITY AND METALLIC IONS RELEASED FROM AN IMPLANTABLE AND BIODEGRADABLE METALLIC MATERIAL**

Hoi Man WONG<sup>1</sup>, Kelvin YEUNG<sup>2</sup>, Kin On LAM<sup>1</sup>, Paul CHU<sup>2</sup>, Keith LUK<sup>1</sup>, Kenneth CHEUNG<sup>1</sup>

<sup>1</sup>The University of Hong Kong, Hong Kong (HONG KONG), <sup>2</sup>City University of Hong Kong, Hong Kong (HONG KONG)

INTRODUCTION: Current implantable metallic materials consist of stainless steel, titanium and cobalt-chromium based alloys. To avoid stress shielding effect, degradable metallic materials such as magnesium based alloy are an alternative. However, its rapid degradation after implantation is a major obstacle in clinical use. In addition to hydrogen gas release, large amount of magnesium ions will release to the human body upon degradation. Mg ions may affect bone healing if the physiological balance is suddenly altered. Hence, this study aims to investigate the correlation of magnesium ion concentration and osteoblast activity in vitro. METHODOLOGY: With the use of cell culturing, different concentrations of magnesium ions ranging from 50 to 10,000ppm were tested against to the SaOs-2 human osteoblast activity. MTT assay (3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) was used to determine the cell viability and cell enzymatic activity. RESULTS AND DISCUSSION: The results suggest that the higher the magnesium ions concentration, the lower the osteoblast activity will be. The osteoblasts become inactivated at 200ppm and the cells cannot survive when the ion concentration reaches to 1,500ppm or above. However, the osteoblast activity is maintained at 150ppm or below. This study demonstrates the magnesium ions can inactivate human osteoblast activity as the concentration rises to 200ppm. In conclusion the use of magnesium based alloy as degradable orthopaedic implants is feasible if the degradation rate is controlled carefully.

Date : 2008-08-25  
Session : Spine: basic science - trauma spine  
Time : 0900-1030  
Room: 608

Abstract number : 18079

**ANTERIOR VERSUS POSTERIOR VERSUS COMBINED ANTERIOR AND POSTERIOR SURGERY FOR OSTEOPOROTIC VERTEBRAL PSEUDARTHROSIS IN THE THORACOLUMBAR SPINE**

Toru HIRANO<sup>1</sup>, Takui ITO<sup>1</sup>, Osamu MORITA<sup>1</sup>, Naoto ENDO<sup>1</sup>, Akiyoshi YAMAZAKI<sup>2</sup>, Yoichi YAJIRI<sup>3</sup>, Shinji SATO<sup>4</sup>, Noboru HOSAKA<sup>5</sup>  
<sup>1</sup>Division of Orthopaedic surgery, Niigata University Graduate School of Medical and Dental Sciences, Niigata (JAPAN), <sup>2</sup>Spine center, Niigata Central Hospital, Niigata (JAPAN), <sup>3</sup>Department of Orthopaedic Surgery, Nagaoka Central General Hospital, Nagaoka (JAPAN), <sup>4</sup>Department of Orthopaedic Surgery, Syonai Hospital, Tsuruoka (JAPAN), <sup>5</sup>Department of Orthopaedic Surgery, Niigata Rosai Hospital, Jyoetsu (JAPAN)

**BACKGROUND:** Despite several surgical procedures for osteoporotic vertebral pseudarthrosis were reported, the choice of surgery remains controversial. **OBJECTIVES:** The purpose of this study is to compare three procedures (anterior (A), posterior (P), and combined A&P) regarding their safety and efficacy. **PATIENTS AND METHODS:** Seventy-nine patients who underwent surgery (A: 25 patients, P: 29 patients, A&P: 25 patients) were retrospectively analysed. Operation time, blood loss, perioperative major complications were compared among three groups as safety evaluation. Neurologic recovery (modified Frankel), bony union, subsequent fracture, revision, change of local kyphosis were analysed for efficacy evaluation in patients with more than 24-month follow-up (A: 19 patients, P: 23 patients, A&P: 21 patients). **RESULTS:** Age was not significantly different among three groups. Significant difference was found only in operative time (A&P (414min) > A (230min) or P (285min)). Major complication (pneumonia, heart failure, etc.) was more frequent in A&P (6/25) compared to P (1/29), which, however, did not reach statistical significance ( $p=0.07$ ). Most patients recovered by one or more modified Frankel grade regardless of the procedures. **DISCUSSION:** Three major surgical procedures for osteoporotic vertebral pseudarthrosis equally effective in terms of neurologic recovery and maintenance of alignment. However, combined A&P surgery had potential risk for prolonged operation time and frequent major complications such as pneumonia, suggesting that combined A&P should be indicated only for selected cases.

**Date : 2008-08-25**  
**Session : Spine: basic science - trauma spine**  
**Time : 0900-1030**  
**Room: 608**

**Abstract number : 18687**

**TANTALUM COATING MAY IMPROVE THE PERFORMANCE OF STAINLESS STEEL PEDICLE SCREWS**

Haisheng LI<sup>1</sup>, Xuenong ZOU<sup>1</sup>, Cody BÜNGER<sup>2</sup>

<sup>1</sup>*Orthop Res Lab, Aarhus University Hospital, Aarhus (DENMARK),* <sup>2</sup>*Orthop Dept, Aarhus University Hospital, Aarhus (DENMARK)*

**STUDY DESIGN:** An experimental study with a randomised, paired control design was conducted using a porcine model. **OBJECTIVES:** The aim of this study was to investigate whether the tantalum coating can improve the mechanical and biological performance of stainless screws in vivo. **SUMMARY OF BACKGROUND DATA:** The bone-screw interface has been indicated as the weak link in pedicle screw spine fixation. We have previously shown that pedicle screws made of titanium have a better bone-screw interface binding than screws made of stainless steel in the porcine lumbar spine 3 months after implantation in a loaded situation. We hypothesize that a thin coating of tantalum could improve the bone-screw interface and thus improve the spine fusion. **METHODS:** 12 pigs were included in the study. Pedicle screws (50\*35mm) fixation was performed on each pig from L3 to L5. Three kinds of screws were used 1) stainless steel, 2) stainless steel coated with tantalum, 3) titanium screw. Screws were connected with rod of stainless steel. Pigs were killed 3 months postoperatively. Biomechanical torsion test and histomorphometric parameters of screw fixation were evaluated. **RESULTS:** The maximum torque under torsion testing show that tantalum coated stainless screws performed better than stainless steel, but the difference between 3 kinds of screws was not statistically significant. The bone-screw contact surface was from histology evaluation showed that tantalum coated stainless steel has a better and large contact surface than that of stainless steel alone. **CONCLUSIONS:** Tantalum coated may improve the overall performance of stainless steel pedicle screws.

Date : 2008-08-25  
Session : Spine: basic science - trauma spine  
Time : 0900-1030  
Room: 608

Abstract number : 18768

**SAGITTAL SPLIT AT THE LOWER HALF OF THE VERTEBRAL BODY IN DENIS TYPE B BURST FRACTURES**

Takeshi HOSHIKAWA, Eduardo YOSHIZAKI, Toshimi AIZAWA, Hiroshi OZAWA, Yasuhisa TANAKA, Shoichi KOKUBUN  
*Tohoku University School of Medicine, Sendai (JAPAN)*

INTRODUCTION: Sagittal split at the lower half of the vertebral body is occasionally detected in Denis Type B burst fractures in the thoracolumbar and lumbar spine. To our knowledge, there have been no studies involving a large number of patients having this split and thus, its mechanism is still uncertain. The purposes of this study were to compare the background of patients having Denis Type B burst fractures with or without this split and to discuss its possible mechanism. MATERIALS AND METHOD: Between 1988 and 2002, 43 surgeries were performed for Denis Type B burst fractures in the thoracolumbar or lumbar spine without posterior distraction injury at our affiliated hospitals. The medical records and images of those patients were retrospectively reviewed. RESULTS: Thirty-three fractures had the sagittal split at the lower half of the vertebral body and 10 did not have the split. The average age of the split group was  $39\pm 16$  years (range 17-68) compared to  $53\pm 16$  years (range 24-79) in the non-split group ( $P=0.0187$ ). There was no significant difference in the neurological deficit using Frankel's rating system between the two groups. CONCLUSION: The patients having Denis Type B burst fractures with a sagittal split at the lower half of the vertebral body were younger than those having the fractures without the split. Age-related changes in vertebral bone quality or strength should be closely related to the mechanism of this vertebral body split.



**Date : 2008-08-25**  
**Session : Spine: basic science - trauma spine**  
**Time : 0900-1030**  
**Room: 608**

**Abstract number : 18889**

**POSTERIOR LUMBAR INTERBODY FUSION USING ONE DIAGONAL FUSION CAGE WITH TRANSPEDICULAR SCREW/ROD FIXATION: MINIMUM 6-YEAR RESULTS**

Zhiming CHEN, Jie ZHAO

*Department of Orthopaedics, Changhai Hospital, Shanghai (CHINA)*

**OBJECTIVE:** To evaluate the long-term clinical and radiological outcomes of posterior lumbar interbody fusion using one diagonal fusion cage with transpedicular screw/rod fixation. **METHODS:** From April 2000 to January 2002, 127 patients with lumbar disorders underwent a PLIF using one single fusion cage on the symptomatic side. The mean age was 46 years. VAS, ODI were recorded pre- and post-operation and at the last follow-up. Complication rates and patient's satisfaction were analysed. **RESULTS:** Minimum 6-year follow-up was available on 109 patients. There were 3 cases of transient neurologic deficits who resolved within 3 months. There were three pseudarthroses and two of them had instruments failure at 2 years post-operation. The three patients had revision surgery and got solid fusion at the last follow-up. There were no significant subsidences of the cage. Disc space height and foraminal height were restored by the surgery and maintained at the last follow-up. Two patients had reoperation because of symptomatic adjacent segment stenosis. Mean preoperative measures of VAS and ODI was  $6.5\pm 2.3$  and  $48.5\pm 11.2$ , respectively, improved to  $2.6\pm 1.7$  ( $p < .001$ ) and  $27.2\pm 11.6$  ( $p < .001$ ) at the last follow-up. Ninety patients (82.6%) considered their outcome to be good or excellent. **CONCLUSIONS:** PLIF using diagonal insertion of a single cage with supplemental transpedicular screw/rod instrumentation enables sufficient decompression, solid interbody fusion and satisfactory clinical results with long-term follow-up.

Date : 2008-08-25  
Session : Spine: basic science - trauma spine  
Time : 0900-1030  
Room: 608

Abstract number : 18904

**SURGICAL APPROACH OPTIONS FOR TRAUMATIC SPONDYLOLISTHESIS OF THE AXIS (HANGMAN'S FRACTURE)**

Yu LIANG<sup>1</sup>, Yaocheng GONG<sup>2</sup>, Peng CAO<sup>3</sup>, WenJian WU<sup>3</sup>

<sup>1</sup>Dept. of Orthopedics, RuiJin Hospital, Medical College, JiaoTong University,, Shanghai (CHINA), <sup>2</sup>Dept. of Orthopedics, RuiJin Hospital, Medical College, Jiao Tong University, Shanghai (CHINA), <sup>3</sup>Dept. of Orthopedics, RuiJin Hospital, Medical College, JiaoTong University, Shanghai (CHINA)

**OBJECTIVE:** To compare the effectiveness and complications of anterior and posterior approach to treat the traumatic spondylolisthesis of the axis. **METHODS:** This study retrospectively analysed the results of 25 patients with unstable traumatic spondylolisthesis of the axis randomized to either anterior or posterior stabilisation and fusion. Of the patients, 11 cases have been treated with anterior C2/3 ACDF, the other 14 cases have been treated by posterior plates with C2 pedicle screws and C3 lateral mass screws. All patients had achieved reduction and had unstable injuries that were thought to require surgical stabilisation. Frankel grades D in 5 patients, no neurological deficits in 20. Average age was 45.7yrs. There were 17 men and 8 women. The neck pain had been evaluated with VAS. All patients have been checked with plain X-ray films, CT 2D images and MRI preoperatively and postoperatively. 17 cases were found C2/3 disc injured on MRI preoperatively. **RESULTS:** 24 patients have been confirmed fusion on radiological assessment (ant. 11 and post. 13). Average preoperative VAS was 8.2 and had been improved to 3.1 postoperatively. 2 patients of anterior approach had temporary hoarseness and disappeared 2 weeks later. Average blood losing was 245 ml for posterior approach and 45ml for anterior approach. Average operation time was 115min for posterior approach and 65min for anterior approach. **CONCLUSIONS:** There were no obvious differences between anterior and posterior approach regarding the effectiveness and complications.

**Date : 2008-08-25**  
**Session : Spine: basic science**  
**Time : 1100-1200**  
**Room: 608**

**Abstract number : 16390**

**MICROSTRUCTURAL DEVELOPMENT IN TRABECULAR FORMATION IN AN ALIF MODEL WITH EQUINE BONE PROTEIN EXTRACT, RHBMP-2 AND AUTOGRAFT**

Casper FOLDAGER, Michael BENDTSEN, Xuenong ZOU, Cody BÜNGER  
*Orthopaedic Research Laboratory, Aarhus University Hospital, Aarhus C (DENMARK)*

**INTRODUCTION:** In the search of bone graft alternatives, several growth and differentiation factors are investigated for spinal fusion procedures. There is a wide range of products varying from single factors such as rhBMP-2 and lyophilized bone material containing several different factors, products like COLLOSS E. Even though they are widely used, several principal mechanisms of new bone formation using these bone graft substitutes remain unknown. **MATERIAL AND METHODS:** An anterior lumbar interbody fusion (ALIF) was performed on 11 Danish female landrace pigs. Three PEEK cages containing autograft, INFUSE (rhBMP-2) dissolved on collagen or COLLOSS E was inserted in the intervertebral spaces. They were divided into two groups. 6 pigs were observed for 4 weeks and 5 pigs for 8 weeks postoperatively. MicroCT (Scanco 40 $\mu$ CT) was performed. Principal directions of the trabeculae inside the cage was measured as vectors and standardized before comparison. The percentage of the trabeculae directed along the axis of the spine (TDS) was compared using paired T-test. **RESULTS:** Four weeks postoperatively COLLOSS E had a mean TDS of 57%, which was significantly higher than both rhBMP-2 (44%;  $P>0.01$ ) and autograft (41%;  $P>0.001$ ). Eight weeks postoperatively rhBMP-2 had a TDS of 57%, which was higher than both COLLOSS E (52%;  $P=0.07$ ) and autograft (51%;  $P=0.08$ ). The results corresponded to the findings on the histological samples. **CONCLUSION:** We have demonstrated important differences of the mechanisms responsible for the trabecular development in new bone formation using COLLOSS E or rhBMP-2.

Date : 2008-08-25  
Session : Spine: basic science  
Time : 1100-1200  
Room : 608

Abstract number : 17168

**AUTOLOGOUS STEM CELL TREATMENT HALTS INTERVERTEBRAL DISC DEGENERATION. A PORCINE STUDY**

Michael BENDTSEN<sup>1</sup>, Zou XUENONG<sup>1</sup>, Casper FOLDAGER<sup>1</sup>, Hans Stodkilde JORGENSEN<sup>2</sup>, Cody BÜNGER<sup>1</sup>  
<sup>1</sup>Orthopaedic Research Laboratory, Aarhus C (DENMARK), <sup>2</sup>MR-Research Center, Aarhus N (DENMARK)

INTRODUCTION: Early in IDD there is a loss of notochordal cells and later a change in phenotype. Mesenchymal stem cells can be differentiated in vitro towards a nucleus phenotype. METHODS: 10 Göttingen minipigs were included. IDD was induced by scalpel incision to annulus fibrosus. Autologous bMSC's were stained with fluorescent dye (PKH-26, Sigma Aldrich), and injected percutaneously 12 weeks postoperatively. Quantitative real time RT-PCR (Nucleus pulposus: TRAIL, Col2A1, CD34, Eng, Sox9, HIF1&#945;, Aggrecan; Endplate: Casp8, TRAIL, Osteopontin, Alkalic Phosphatase, Osteocalcin, RUNX2). Safranin-O staining was performed. RESULTS: Modic type II changes were seen in 4 pigs. Stabbed discs were mild to moderately degenerate after 12 weeks (Pfirrmann grade 2-3). 18 weeks after stem cell injection, the intervention group maintained NP size (8.068 vs. 6.738mm<sup>2</sup>, p<0.05) compared to degenerative control. Real time RT-PCR showed significant difference in NP in TRAIL (Control 1.889, Stem cell 3.651, Degenerative control 6.118; p=0.019 C vs DC, p=0.004 C vs SC, p=0.0721 DC vs SC). In endplates the only significant difference were in Osteocalcin (Control 3.400, Stem cell 4.573; p=0.0493). There was no difference in CD34. Fluorescent bMSC's were found in clusters in levels treated with cell injection. DISCUSSION: Autologous stem cell treatment is able to stop progression but not normalize nucleus area. Stem cells were found in clusters with no difference in CD34 suggesting differentiation of stem cells. This is supported by histology.

Date : 2008-08-25  
Session : Spine: basic science  
Time : 1100-1200  
Room: 608

Abstract number : 17275

**THE NUTRIENT ARTERY ENTRANCE ON THE POSTEROLATERAL WALL OF THORACIC VERTEBRAL BODIES: ANOTHER POTENTIAL LANDMARK FOR VERTEBRAL SCREW INSERTION?**

Yong QIU<sup>1</sup>, Biyu RUI<sup>2</sup>, Zezhang ZHU<sup>2</sup>, Feng ZHU<sup>2</sup>, Bin WANG<sup>2</sup>, Yang YU<sup>2</sup>, Bangping QIAN<sup>2</sup>, Weiwei MA<sup>2</sup>, Xu SUN<sup>2</sup>

<sup>1</sup>Spine Surgery, the Affiliated Drum Tower Hospital of Nanjing University Medical School; The Joint Scoliosis Research Center of Nanjing University & Chinese University of Hong Kong, Nanjing (CHINA), <sup>2</sup>Spine Surgery, the Affiliated Drum Tower Hospital of Nanjing University Medical School, Nanjing (CHINA)

**OBJECTIVE:** To investigate the possibility of the nutrient artery entrance (NAE) as an alternative landmark for thoracic vertebral screw insertion on the posterolateral wall of thoracic vertebral bodies, and to evaluate the anatomic safe zones and appropriate starting point for safe screw insertion into the thoracic spine. **METHODS:** In twenty normal adult dry thoracic spine specimens, NAE locations were studied anatomically. Measurement parameters included the number of NAE on left or right side of thoracic vertebral bodies from T5 to T12, the diameter of the maximal NAE (d), the distance from NAE to the superior (D-ES) or posterior (D-EP) margin of the vertebral body, the distance between the posterior edge of the vertebral body, the upper costal facet line (CF-Canal-D) or NAE line (NAE-Canal-D), the length between left and right side of NAE (L-NAE), and the length between left and right side of upper costal facet (L-CF). **RESULTS:** From T5 to T12, NAEs were all underneath the costal facet. There were no significant differences between left and right side in terms of anatomic parameters of each vertebral body from T5 to T12. The D-ES increased from T5 to T12, and the diameter and D-EP showed no significant differences from T5 to T12. Significant differences were found between the parameters of CF-Canal-D and NAE-Canal-D from T5-T10. **CONCLUSION:** The anatomical location of NAE is relatively constant. The nutrient artery entrance could be served as a useful landmark for anterior screw insertion. **KEYWORDS:** Idiopathic scoliosis, the nutrient artery entrance, anatomical location, vertebral screw.

Date : 2008-08-25  
Session : Spine: basic science  
Time : 1100-1200  
Room: 608

Abstract number : 17301

**ABNORMAL EXPRESSION AND ETIOLOGICAL SIGNIFICANCE OF RUNX2 IN MSCS FROM ADOLESCENT IDIOPATHIC SCOLIOSIS**

Yong QIU, Qiang SUN, Zhen LIU, Weiguo LI, Zezhang ZHU, Bin WANG, Yang YU, Bangping QIAN, Weiwei MA  
*Spine Surgery, the Affiliated Drum Tower Hospital of Nanjing University Medical School, Nanjing (CHINA)*

**BACKGROUND:** The etiology of adolescent idiopathic scoliosis (AIS) remains unclear. Increased evidences suggested an enhanced endochondral ossification might be involved in pathogenesis of AIS. Runx2 is a critical transcription factor for osteogenesis but also has some influence on chondrogenesis. **OBJECTIVE:** To investigate a possible molecular mechanism of pathogenesis of AIS from mesenchymal stem cells (MSCs) level. **METHODS:** Twenty AIS patients, ten CS patients and ten volunteers were included. From anterior superior iliac spine, the human bone marrow was obtained with anticoagulation by heparine. And the MSCs were isolated by density gradient centrifuge from the mononuclear cells, and then were cultivated and serial subcultivated in vitro. Expression intensity of Runx2 of MSCs from 3 groups was detected by RT-PCR. **RESULTS:** Mononuclear cells were cultivated and subcultivated to P3 culture in vitro, which were analyzed by the flow cytometry, and demonstrated that the expanded mononuclear cells expressed mesenchymal cell marker. Expression of transcription factor Runx2 of MSCs had increased obviously in AIS group compared with CS group and control ( $P < 0.01$ ). And there was no statistical difference between CS group and control ( $P > 0.05$ ). **CONCLUSION:** The abnormal expression of transcription factor Runx2 of MSCs may be related to the molecular mechanism of the pathogenesis of AIS. **KEYWORDS:** Runx2, adolescent idiopathic scoliosis, pathogenesis, mesenchymal stem cells, expression.

**Date : 2008-08-25**  
**Session : Spine: basic science**  
**Time : 1100-1200**  
**Room: 608**

**Abstract number : 17870**

**IN VIVO CHONDROCYTIC DIFFERENTIATION OF THE ALLOGENIC STEM CELLS IN THE MURINE INTERVERTEBRAL DISC**

Fan YANG, Danny CHAN, VYL LEUNG, William LU, Keith LUK, Ken CHEUNG  
*University of Hong Kong, Hong Kong (HONG KONG)*

Various kinds of biological therapeutic methods have been used to treat DDD. Some in vitro studies have shown that bone marrow derived mesenchymal stem cells (BMSC) could differentiate toward a nucleus-pulposus (NP) phenotype. Some in vivo studies also showed that the autograft of BMSC could regenerate the rabbit disc. However, the fate and differentiation status of injected cells are still not very clear. This is partly due to the lack of a stable marker of BMSC; we overcome this by isolating BMSC from green fluorescent protein (GFP) mice. The viable cells can express stable green fluorescent protein. We have also established a mouse model of disc degeneration through annular puncturing method under microscopic guidance. BMSC were injected into the murine discs two weeks after the degeneration was induced by annular puncture. Serials analysis including radiograph, histology, immunostaining and biochemical analysis were performed at 4 and 24 weeks after the transplantation. Radiograph analysis and histological grading confirmed that progressive degeneration of the discs was arrested after the transplantation of the BMSC. Gene expression analysis showed that the proteoglycan genes were upregulated significantly in the regenerated NP. Double staining method suggested the in vivo chondrocytic differentiation of the BMSC in the regeneration process. Our study showed that the allogenic BMSC could arrest the degeneration of the murine discs and increase the extracellular matrix in the NP region. The accumulation of the ECM is caused by the in vivo chondrocytic differentiation of the stem cells.

Date : 2008-08-25  
Session : Spine: basic science  
Time : 1100-1200  
Room: 608

Abstract number : 17913

**IDENTIFICATION OF SMALL MOLECULES FOR THE TREATMENT OF INTERVERTEBRAL DISC DEGENERATION BY CHEMICAL GENETICS**

Kiki YK TSUI<sup>1</sup>, Victor YL LEUNG<sup>1</sup>, Richard YT KAO<sup>1</sup>, Koichi MASUDA<sup>2</sup>, Danny CHAN<sup>1</sup>, Kenneth MC CHEUNG<sup>1</sup>

<sup>1</sup>The University of Hong Kong, Hong Kong (HONG KONG), <sup>2</sup>Rush Medical College at Rush University Medical Center, Chicago (UNITED STATES)

Intervertebral disc (IVD) degeneration has been associated with low back pain. The degeneration is characterized in part by a progressive loss of proteoglycans and water content in the cartilaginous nucleus pulposus [1,2]. Strategies that can restore the proteoglycan content of the IVD may be of therapeutic benefit to delay or even reverse the progression of disc degeneration. This study aims at identifying small molecules which are able to modulate the proteoglycan content in IVD using high throughput chemical genetic screening. Small molecules together with porcine chondrocytes were plated into individual well of each microtiter plate using the robotic liquid handling machine. The plates were incubated at 37°C in 5% CO<sub>2</sub> for 72 hours. Proteoglycan was quantified as glycosaminoglycan using a modified dimethylmethylene blue assay [3-5]. From the primary screen of 50, 240 structurally diverse small molecules at 20µg/ml, over 15 candidates have been identified to induce more than 20% increment of glycosaminoglycan content. The primary hits will undergo a secondary screening for validation, and then further screenings in human IVD cells to evaluate their efficacies. This study shall uncover compounds relevant to glycosaminoglycan metabolism and the biological pathways involved in IVD degeneration/regeneration. Our ultimate goal is to identify small molecules that have the potential to be developed into orally-administrated novel drugs to treat IVD degeneration. References: [1] Urban JPG, et al. 1985 [2] Urban JPG, et al. 1988 [3] Farndale RW, et al. 1986 [4] Barbosa I, et al. 2003 [5] Tomiosso TC, et al. 2005.



**Date : 2008-08-25**  
**Session : Spine: basic science**  
**Time : 1100-1200**  
**Room: 608**

**Abstract number : 17964**

**INTERVERTEBRAL DISC CRYOPRESERVATION**

Samantha CW CHAN, Victor YL LEUNG, William W LU, Danny CHAN, Keith DK LUK, Kenneth MC CHEUNG  
*University of Hong Kong, HongKong (HONG KONG)*

Cryopreserved allogeneic intervertebral disc (IVD) transplantation has been performed clinically for treating disc degeneration. However, the transplanted allograft has undergone progressive degeneration. Conventional disc cryopreservation method has been shown to greatly decrease the disc cell viability and hence may be a cause of the degeneration. In this study, we aim to search for a freeze-thaw protocol that is able to retain a maximal cell viability and metabolic activity in the cryopreserved IVD. Porcine lumbar IVDs with endplates were harvested and cryopreserved in various freezing medium 1) 45% Cryo-protective agents (CPAs) (DMSO (dimethylsulfoxide) + propylene glycol), 2) 20% CPAs (DMSO + glycerol), 3) 10% DMSO with synthetic ice-blocker, 4) 10% DMSO, or 5) without CPA. IVDs were incubated at 4°C for 1 hour, frozen at -80°C overnight, and then stored in liquid nitrogen. The frozen IVDs were thawed quickly at 37°C for analysis. Cell proliferation and proteoglycan production rate were evaluated using Alamar blue and <sup>35</sup>S-sulphate incorporation respectively. The distribution of live and dead cells was determined microscopically using a LIVE/DEAD staining. IVD cryopreserved in freezing medium composed of 45% CPAs showed higher disc cell viability compared with that in 10% DMSO. Cell viability was 50% of the fresh IVD tissue when cryopreserved in 45% CPAs but merely 20% when cryopreserved with 10% DMSO. Combination of DMSO and propylene glycol as CPAs for IVD cryopreservation has an advantage over conventional cryopreservation protocol in maintaining disc cell viability. Reference: 1. Ruan D, et al. Lancet 2007; 369:993-9.

Date : 2008-08-25  
Session : Spine: basic science  
Time : 1100-1200  
Room: 608

Abstract number : 18005

**FACET JOINT MOTION ANALYSIS OF L4-5 BY USING FINITE ELEMENT MODELLING**

Wing Kit TANG<sup>1</sup>, Kelvin YEUNG<sup>2</sup>, Keith LUK<sup>1</sup>

<sup>1</sup>The University of Hong Kong, Hong Kong (HONG KONG), <sup>2</sup>City University of Hong Kong, Hong Kong (HONG KONG)

BACKGROUND: Transfacet joint screw fixation has been used to facilitate spinal fusion. However, facet screws offer inferior stability compared to pedicle screw fixation. Establishing restraints on range of motion is always essential to maintain segment stability during fusion. This study aims to develop a finite element model of lumbar segments so as to investigate the effect of facet joint fixation on overall segment motion. METHODS: A finite element model of L4-L5 spinal segment was created by laser scanning digitizer. Testing conditions included compressive preloads from 0 to 1200N, pure moments up to 15Nm for flexion, extension and axial rotation, and horizontal forces of  $\pm 600$ N simulating shear loading. To study the effect on overall motion, additional clamping forces of 0-2000N were applied normal to the facet joint surfaces. Quantitative measures on the angle of rotation were supported with statistical analysis at  $P < 0.05$ . RESULTS: The angles of rotation were reduced in the spinal segment with clamping forces under all loading conditions except for pure flexion. However, the differences between trials were not significant ( $P = 0.832$ ). Linear regression revealed that association existed between angle of rotation under extension and additional clamping force ( $R = 0.781$ ,  $P = 0.022$ ). CONCLUSIONS: The concept of applying clamping forces at facet joints as a means of fixation method is manifested and the angle of rotation under extension is found to be associated with additionally applied forces. Further study will focus on facet kinematics so as to help develop an effective facet joint fixation device.

Date : 2008-08-25  
Session : Spine: basic science  
Time : 1100-1200  
Room: 608

Abstract number : 18435

**NANO-SCALE STRUCTURE OF COLLAGEN II FIBRILS OF THE HUMAN INTERVERTEBRAL DISC AND ITS CORRELATION WITH THE MACRO-SCALE DISC MECHANICS**

Darwesh MK ALADIN, William W LU, Kenneth MC CHEUNG, Danny CHAN, Victor YL LEUNG, Keith DK LUK, Alfonso HW NGAN  
*The University of Hong Kong, Hong Kong (HONG KONG)*

INTRODUCTION: Collagen fibrils are the main structural components of the intervertebral discs. So far, the mechanical properties of the disc collagens have been studied only through ensemble measurements on bulk pieces of disc tissues. The aim of this study was to quantify the morphology of the individual collagen fibrils of the nucleus pulposus and to evaluate the relationship between these nano-structural properties and the macro-mechanical properties of the disc tissues. METHODS: Collagen fibrils were extracted from the nucleus pulposus of discs retrieved from adolescents during scoliosis surgery and confirmed by SDS-PAGE. The diameter and the width of D-periodic bands of the individual collagen fibrils were measured through Atomic Force Microscope imaging. The relationship between the nano-scale morphology of the collagen fibrils and the macro-scale mechanical properties of the nucleus pulposus tissues was evaluated. RESULTS: The extracts were composed largely of collagen II. The mean diameter of the fibrils was 116.4nm and the D-periodicity was 68.6nm. The trend in the majority of samples showed a positive correlation ( $r=0.99$ ) between the fibril diameter and the compressive mechanical properties of the nucleus pulposus, although not very significant ( $P=0.08$ ). CONCLUSION: This is the first study, to our knowledge, to evaluate the nano-structure of the individual collagen fibrils of the disc and their relationship with macro-scale mechanical properties of the corresponding disc tissues. This study suggests a possible correlation between the collagen II fibril diameter and the compressive mechanical properties of the nucleus pulposus tissue.

**Date : 2008-08-25**  
**Session : Symposium - Hand & Wrist**  
**Time : 1400-1530**  
**Room: Theater 1**

**Abstract number : 19145**

**PROXIMAL ROW CARPECTOMY FOR TREATING CHRONIC WRIST PAIN**

Zhou XIANG, Ming LIU, Haitao ZHOU, Fuguo HUANG, Fuxing PEI, Shiqiong ZHANG, Zhiming YANG  
*West China Hospital, Sichuan University, Sichuan (CHINA)*

**PURPOSE:** To investigate the long-term clinical results of proximal row carpectomy and wrist arthroplasty as a treatment of chronic wrist injuries. **METHOD:** The long-term post-surgical functions of the wrists in ten patients undergoing proximal row carpectomy at our hospital between January 1978 and June 1996 were evaluated. The evaluation was based on Gartland and Werley Wrist Scoring System and the modified Green and O'Brien Wrist Joint Scoring System, including pain relief, range of wrist motion, grip strength, and the radiographic findings of the radiocarpal joints. **RESULTS:** The follow-ups ranged from ten to 29 years in duration, 16.5 years on average. All the patients were able to perform activities of daily living properly. Only two patients experienced occasional minimal pains while one moderate pains. The remaining cases were free from pains. The rate of excellent/good post-surgical results was 100% assessed with Gartland and Werley Scoring System, and 70% according to Green and O'Brien Scoring System. **Radiographic findings:** No apparent degenerative change was found in the radiocapitate joints (joint built between the distal radial and proximal capitate facets). **CONCLUSIONS:** Proximal row carpectomy is a dependable and durable procedure that results in satisfactory pain relief, improved functional wrist motion and grip strength, high patient satisfaction, and allows most patients to resume previous work.

**Date : 2008-08-25**  
**Session : CTL - Spine: Spine Fractures**  
**Time : 0800-0900**  
**Room: Theatre 1**

**Abstract number : 19097**

**THORACOLUMBAR BURST FRACTURES 'NECESSITY OF ANTERIOR COLUMN SUPPORT-**

Manabu ITO

*Department of Orthopaedic Surgery, Hokkaido University Graduate School of Medicine, Sapporo (JAPAN)*

Burst fractures at the thoracolumbar junction were commonly produced by pure compressive load or sometimes combined with flexion or lateral bending moment. According to Denis' three-column theory, burst fractures are the injury to the anterior column and middle column of the spine, which are highly associated with neurological problems due to the retropulsed bony fragment into the spinal canal. Therefore, surgical treatment of the thoracolumbar burst fracture includes both decompression of the neural tissue and restabilization of the anterior element of the spine. Since the anterior element at the thoracolumbar spine plays an important role of load transmission, reconstruction of crushed anterior element of the spine is indispensable for the surgical treatment of burst fractures at the thoracolumbar region. When the degree of vertebral body destruction is minimal, posterior spinal reconstruction surgery can restore kyphotic deformity and maintain the spinal alignment. If the destruction of vertebral body is severe, however, posterior instrumentation without reconstruction of anterior column may lead screw loosening and progression of kyphosis after surgery. McCormack and Gaines proposed the load-sharing classification to clarify the need for anterior column reconstruction in patients with thoracolumbar burst fractures. By assessing the degree of vertebral body comminution, apposition of bony fragments, and local kyphosis measured on radiographs or CT images, the classification suggests that the patients need anterior column reconstruction when the points exceed 7 points. In the lecture, indication and surgical technique of anterior column reconstruction at the thoracolumbar region will be presented.

**Date : 2008-08-25**  
**Session : CTL - Spine: Spine Fractures**  
**Time : 0800-0900**  
**Room: Theatre 1**

**Abstract number : 19154**  
**OSTEOPOROTIC VERTEBRAL FRACTURES**

Yat Wa WONG

*Department of Orthopaedics and Traumatology, the University of Hong Kong, Queen Mary Hospital, Hong Kong (HONG KONG)*

Osteoporotic vertebral fracture is common among elderly. Successful management requires accurate diagnosis, understanding of the natural history and selection of the right patients for the most appropriate treatment. Management of the underlying osteoporosis should not be overlooked. Differentiating osteoporotic vertebral fracture from malignancy or infection especially tuberculosis is sometimes difficult. Suspicion arises when there are constitutional symptoms or history of malignancy. Physical examination should include the organ systems likely to give spinal metastasis. Serum tumour markers, infective parameters and complete blood picture help to exclude malignant diseases and infection. Calcium and phosphate profile assist the clinicians to determine the necessity for dietary replacement. Although there is no pathognomonic radiographic feature for the osteoporotic vertebral fractures, bony erosion, burring of the pedicles, soft tissue swelling and atypical location should alert the attending surgeons. Most patients recover uneventfully. Conservative treatment in forms of simple analgesics, calcitonin, orthosis and appropriate rest partially relieve the pain. Some patients may suffer from more severe pain in prolonged duration. Vertebroplasty or kyphoplasty are increasingly common in the recent one to two decades to treat these patients. A small group of patients continue to have intractable pain or even neurological deterioration. Surgical intervention is indicated to decompress the nerve tissue, reconstruct the vertebral column strong enough to support the trunk and restore the sagittal alignment. The usual procedures are either pedicle subtraction osteotomy or posterior fixation with fusion plus anterior strut grafting. Various anchor reinforcement are advocated to secure the instrumentation. Early post-operative mobilization is encouraged to prevent complications. Treatment of the underlying osteoporosis is essential. Although there are laboratory studies that bisphosphonate impairs bone healing, clinical evidence is not strong and it is mandatory to start the osteoporotic treatment as soon as possible to prevent new fractures.

**Date : 2008-08-25**  
**Session : CTL - Spine: Spine Fractures**  
**Time : 0800-0900**  
**Room: Theatre 1**

**Abstract number : 19264**

**CONTROVERSIES IN THE MANAGEMENT OF THORACOLUMBAR FRACTURES**

Ahmet ALANAY

*Hacettepe University Faculty of Medicine, Sıhhiye Ankara (TURKEY)*

Fractures of the thoracolumbar spine with or without neurological deficit continue to be an area of major interest in traumatology. There is still a lot of controversies about thoracolumbar fractures despite the ongoing extensive research on this topic. Controversy starts with the classification of these injuries which is important to help guide the surgeon in choosing the appropriate intervention. AO classification of injuries still remains to be the mainly used classification for guiding the treatment. However, its complexity and low intra-interobserver reliability are the main problems. TLICS (thoracolumbar injury classification and severity scale) has recently been defined as a simple and comprehensive classification system including the morphology, discoligamentous status and neurological status. In general the treatment of these fractures for those with no neurological compromise, changed dramatically with the pendulum swinging between conservative methods and more aggressive surgical treatment. There is strong evidence to support satisfactory outcomes with both non-operative and operative treatment for neurologically intact thoracolumbar fractures. Non-operative treatment is not recommended for patients with posterior ligamentous complex (PLC) injuries. Surgical management of fractures with neurological compromise is commonly suggested although there is not yet strong evidence to support the efficacy of both decompression of the spinal canal and its timing on the rate of neurological recovery. Novel minimal invasive instrumentation techniques are promising in the management of thoracolumbar fractures with no neurological compromise. Balloon assisted endplate reduction (BAER) and augmentation of the fractured vertebra by using kyphoplasty and calcium phosphate cements combined by short segment instrumentation (percutaneous or open) demonstrated promising results avoiding early implant failure or correction loss typical for short segment instrumentation. Percutaneous instrumentation techniques also enabled the surgeons to do damage control thoracolumbar trauma surgery by performing immediate temporary minimal invasive posterior stabilization for the those multiple injured patients.

**Date : 2008-08-25**  
**Session : Symposium - Spine: Biologic Motion Preservation**  
**Time : 0900-1030**  
**Room: Theatre 1**

**Abstract number : 19163**

**CERVICAL DISC TRANSPLANTATION**

Keith Dip-Kei LUK<sup>1</sup>, D.K. RUAN<sup>2</sup>

<sup>1</sup>University of Hong Kong, HONG KONG (HONG KONG), <sup>2</sup>Beijing Navy General Hospital, Beijing (CHINA)

**BACKGROUND:** Spinal fusion is one of the most commonly performed procedures on the spine. However there are known long term effects on the juxta-fusion segments. Many non-fusion strategies have been attempted in the past 2 decades aiming at preserving the stability, mobility of the spinal segment while relieving the clinical symptoms of neural compression. The authors have over the past 15 years performed a series of experiments in primates and have recently conducted a pilot trial in the human.**OBJECTIVES:** This is a report on the history of the development in the experimental model and the early clinical results of a pilot series of disc allograft transplantation in the human.**Methods:** Eight patients, 6 with degenerative and 2 with traumatic cervical disc protrusions, underwent fresh frozen disc allograft transplantation. The longest follow up was 68 months.**RESULTS:** The average operating time was 1.8 hours and blood loss was 93 mls. There was no clinical evidence of rejection of the allograft and no immunosuppressive agent was used. All patients had relief of the preoperative neurological symptoms. The mean JOA score improved from 8 preoperatively to 13.2 at the final follow up. None of them had significant neck pain requiring analgesics. Bony union of the endplate interfaces was seen at 2 months postoperatively. Radiological examination revealed moderate loss of disc height but the segments remained mobile on dynamic radiographs even at 5 years postoperatively. One additional observation was the ability of remodeling of malpositioned grafts with time without compromising outcome, a significant advantage over artificial disc replacements.**CONCLUSIONS:** Intervertebral disc allograft transplantation appeared to be a viable alternative to spinal fusion or artificial disc replacement.



**Date : 2008-08-25**  
**Session : Symposium - Spine: Biologic Motion Preservation**  
**Time : 0900-1030**  
**Room: Theatre 1**

**Abstract number : 19182**  
**TISSUE ENGINEERED DISC REPLACEMENT**

Kenneth M.C. CHEUNG, Victor LEUNG  
*University of Hong Kong, Queen Mary Hospital, Hong Kong (HONG KONG)*

Motion preservation in the spine has become a major area of research over the past few years. While prosthetic intervertebral disc replacement has been approved for clinical use, they are not without problems. Biologic motion preservation, on the other hand, may have the potential to overcome some of these, since the disc architecture and cell populations are preserved. This talk will discuss the meaning of tissue engineering in the context of the intervertebral disc, including the options of disc regeneration in which the endogenous cells and scaffold are made use of, and a tissue engineered replacement, in which the a disc is manufactured and grown outside the body (*ex-vivo*) and then implanted. Overall, we feel that this area of research is promising and may herald new treatments for intervertebral disc degeneration in the future. Concepts will be explained so that the general orthopaedic surgeon will understand how this branch of science will be relevant to their clinical practice.

**Date : 2008-08-25**  
**Session : Symposium - Spine: Recent Advances**  
**Time : 1100-1215**  
**Room: Theatre 1**

**Abstract number : 19134**

**RESEARCH AND CLINICAL RESULTS IN THE USE OF PEDIGUARD**

Andre J. KAELIN

*Children's Hospital, HUG, GENEVA 14 (SWITZERLAND)*

**INTRODUCTION:** Pedicle screw fixation is the method of choice for spinal instrumentation for fusion and corrective spinal deformities surgery. Complications can occur if screws are misplaced with neurological deficit, vascular injuries or insufficient bone purchase. Screw ideal position depends on location of entry point and direction of perforation. Post-operative X-Rays and CT scan demonstrate that up to 15% are misplaced. Free hand technique relies only on surgeon experience, it has the higher proportion of out of the bone frame, followed by fluoroscopy and CAOS. PediGuard(TM) is a wireless electronic hand held pedicle hole preparation instrument who monitors the electrical conductivity of the tissues around its tip. Variation of a sound signal warns the surgeon of the proximity of cortical bone, high frequency signal is triggered when the cortex is violated. **STUDIES:** In a multicentric study, in 11 hospitals involving 28 surgeries with 147 drillings done by senior surgeons we compare PediGuard(TM) information to other means of detection (per- or post-operatively). For 16% (23/147) of drillings we confirmed cortex fractures. 22 out of 23 cortex fractures were detected by PediGuard(TM), the surgeon himself detected only 12 out of the 23 cortex fractures. Our personal series in Geneva, involves 326 drillings, perforation occurs in 78 cases (24%), in 37 episodes the surgeon detects the perforation and in 41 occasions the perforation is only detected by PediGuard(TM). **CONCLUSION:** PediGuard(TM) used as pedicle awl is a useful help for insertion of screws. We found a decreased number of cortex breaches, a side effect is also a reduction of fluoroscopic time.

**Date : 2008-08-25**  
**Session : Symposium - Spine: Recent Advances**  
**Time : 1100-1215**  
**Room: Theatre 1**

**Abstract number : 19157**

**THE USE OF PERCUTANEOUS PEDICLE SCREWS IN VARIOUS SPINAL PROBLEMS**

Pui-Yau LAU, L.K. SUN

*United Christian Hospital, Kowloon (HONG KONG)*

Pedicle screws have been used in spinal operations for many years. The initial indications were for stabilization in degenerative diseases and later expanded to trauma. Previously the insertion of pedicle screws required an extensive soft tissue dissection and muscle retraction. The post-operative pain and morbidity was quite substantial and thus retarded the rehabilitation. With the introduction of minimal invasive concept in orthopaedics, pedicle screw inserted percutaneously was an inviting idea to many surgeons to minimize post-operative complications. We started to use percutaneous pedicle screws in 2004 to augment the stability of the spines that required posterior decompression with concomitant instability (e. g. TLIF). After we acquainted with the technique well we expanded the applications to fusion in neuropathic spine, spinal fracture and tuberculosis infection that need anterior spinal fusion. The short term results are promising in terms of fusion rate and early mobilization.

**Date : 2008-08-25**  
**Session : Symposium - Spine: Recent Advances**  
**Time : 1100-1215**  
**Room: Theatre 1**

**Abstract number : 19213**

**ROLE OF NAVIGATION IN SPINE SURGERY**

S. RAJASEKARAN

*Ganga Med. Centre & Hosp. PVT, COIMBATORE (INDIA)*

Pedicle screw fixation is a demanding procedure when performed with cervical spine, pediatric spine and in the presence of congenital anomalies with altered anatomy or instability. Computer navigated surgery offers the possibility for virtual tracking of instruments and implants thereby increasing safety during these challenging procedures. The actual procedure, its applications and limitations will be discussed.

**Date : 2008-08-25**  
**Session : Plenary Lecture - Spine**  
**Time : 1215-1300**  
**Room: Theatre 1**

**Abstract number : 19011**  
**EVOLUTION OF SPINE DEFORMITY SURGERY IN THE WORLD AND ASIA**  
Se-II SUK  
*Seoul Spine Institute, Inje University Sanggye-Paik Hospital, Seoul (KOREA)*

Hippocrates(460-377 B.C.) devised ladder and board for correction of spine deformity and this principles are applied until today. Hibbs(1911) and Albee(1911) initiated spine fusion, Cobb(1948) corrected deformity with turnbuckle cast, and Risser(1958) applied localizer cast for early mobilization. Harrington(1958) opened a modern era of spinal deformity correction introducing posterior instrumentation with hook and rod. Luque(1977) used segmental sublaminar wiring and Cotrel and Debousset (1982) developed CD system using multiple hooks. Suk(1988) applied pedicle screws for the correction of thoracic AIS. Thomasen(1985) and Bradford (1990) reported vertebral resection for severe deformity with combined anterior and posterior procedure and Suk(1997) reported one stage posterior procedure, PVCR. Non-fusion strategies were reported for young severe deformity; growing rod(Akbarnia 2005), Shilla (McCarthy 2005), VEPTR(Emans 2005, Campbell 2007) and vertebra body stapling(Betz 2003). Dwyer(1964) performed anterior instrumentation using a cable, Zielke(1975) modified it with a threaded rod, and Kaneda(1991) and Harms(1991) used rigid rods. McAfee and Newton(1993) reported endoscopic anterior instrumentation. Spine deformity surgery in Asia Pacific developed rapidly since 1960s. Western Pacific Orthopedic Association (WPOA, the old name of APOA) was established in 1962 and Spinal Section of Asia Pacific Orthopedic Association (APOA) was founded in 1980 with the aims on providing continuing medical education and supporting research in spinal conditions, holding scientific meetings for 17 times, and also had the Operative Spinal Surgery Course 12 times since 1983. Pacific Asian Minimally Invasive Spinal Surgery (PASMIS) was formed in 2001 and has meeting every year. A large number of spine surgeons in Asia did a great contribution for the innovative development of spine deformity surgery; Ito(1934) and Hodgson(1956) did spinal anterior debridement, Dwyer(1964) anterior correction for scoliosis, Yau and Leong osteotomy for severe kyphosis, Tomita(1977) posterior resection for vertebral tumor, Suk(1988, 1997) pedicle screws for thoracic AIS and PVCR, Kaneda(1988) anterior rigid rod instrumentation, etc.

**Date : 2008-08-25**  
**Session : Symposium - Foot & Ankle: Arthroscopy**  
**Time : 1600-1730**  
**Room: Theatre 1**

**Abstract number : 19268**  
**OSTEOCHONDRAL LESIONS OF THE TALUS**

Tsukasa KUMAI  
*Department of Orthopaedic Surgery, Nara Medical University, Kashihara (JAPAN)*

Treatment of osteochondral lesions of the talus (OLT) depends on the size of the lesion, location, duration of the symptom, age and activity level of the patient, presence of the subchondral cyst etc. We have evaluated the treatment of OLT in many patients, and concluded that an appropriate treatment must be selected from various alternatives for each patient. In this symposium, we show both arthroscopic and open approaches to the OLT and discuss their indication in view of the histopathological principle.

**Date : 2008-08-25**  
**Session : Symposium - Foot & Ankle: Arthroscopy**  
**Time : 1600-1730**  
**Room: Theatre 1**

**Abstract number : 19269**  
**ENDOSCOPIC CALCANEOPLASTY**

Tsukasa KUMAI

*Department of Orthopaedic Surgery, Nara Medical University, Kashihara (JAPAN)*

The surgical approach around Achilles insertional region is associated with some complications, mainly surgical wound healing problems - painful scars when shoes are worn. We show the endoscopic approach which contribute to the reduction of those problems and discuss its fundamental indication from the anatomical view point.

**Date : 2008-08-25**  
**Session : CTL - Trauma: Pelvic Acetabular Fractures**  
**Time : 0800-0900**  
**Room: Theatre 2**

**Abstract number : 19081**  
**SCREW PLACEMENT IN ACETABULAR FRACTURES**  
Frankie LEUNG  
*the University of Hong Kong, Pokfulam (HONG KONG)*

Acetabular surgery is one of the more complicated and difficult surgeries encountered in orthopaedics. The approach itself can be difficult and visualization of the bone is often limited. A thorough understanding of the anatomy, the thickness of the bone at different site and the position of the hip joint are crucial in performing a successful fixation. Preoperative planning with plastic bone should be done and the correct entry points should be planned as a good screw cannot be placed without a proper entry site. It is important to know where to put in your screws as a building block of fixation, to be supplemented with plates. Some common screws patterns can be used to fix iliac crest fractures, anterior or posterior column screws. In anterior approach, a segment of 4-5cm around the iliopectineal eminence should not be used for screw placement. Otherwise, the screws need to be perfectly parallel to the quadrilateral surface. In fixing posterior wall fragments, a more tangential placement of screws should be used. A safe method is to pre-drill the track in the fragment first. All attempts must be made to avoid joint perforation which will destroy any good surgery.



**Date : 2008-08-25**  
**Session : CTL - Trauma: Pelvic Acetabular Fractures**  
**Time : 0800-0900**  
**Room: Theatre 2**

**Abstract number : 19176**  
**SURGICAL APPROACHES TO THE ACETABULUM**  
James KELLAM  
*Carolinas Medical Centre, Charlotte (UNITED STATES)*

A complete understanding or diagnosis of an acetabular fracture is imperative before one undertakes surgical treatment. The diagnosis or classification of the injury will determine what surgical approach is necessary. As the acetabulum consists of two columns, it is necessary to understand that two approaches posterior or anterior are necessary. What part of the acetabulum is accessible through each of the approaches must be understood so that a proper choice of approach may be determined. Although the goal is to approach these fractures through one incision, occasionally, an extensile approach needs to be chosen to expose both columns simultaneously. This talk will highlight the indications, specific points of technique and complications that one should be aware of in choosing the various approaches for surgical fixation of acetabular fractures.

**Date : 2008-08-25**

**Session : Symposium - SICOT Trauma / ARTOF: Open Fractures I**

**Time : 0900-1030**

**Room: Theatre 2**

**Abstract number : 17140**

**OPEN FRACTURES, STABILISATION OPTIONS**

Galal SAID, Osama FAROUK, Hatem SAID

*Assiut University Hospitals, Assiut (EGYPT)*

There are changes in concepts and practice of managing open fractures due to improved surgical techniques, better evaluation of results and evidence-based medicine. Immediate debridement, leaving only clearly alive tissues, is getting more universal acceptance. This allows internal fixation and early closure of the wound. Internal fixation is gold standard. IMN is indicated for femur, tibia and sometimes the humerus. Unreamed nails were introduced for open fractures. Reamed nails however, are stronger, have fewer mechanical problems and higher union rate. Plates are used for other long bones and periarticular fractures. External fixation should be avoided whenever possible. It has the drawback of transfixion of muscles leading to stiffness of joints. It also interferes with plastic repairs and may cause problems in internal fixation later on. External fixator is indicated in polytrauma to fix long bones as it saves time, and adds minimal surgical trauma. External fixator, preferably unilateral frame, is preferred if there is soft tissue or bony defect. It is also indicated in heavily contaminated wounds. It is to be converted into nail or plate as early as possible.

**Date : 2008-08-25**  
**Session : Symposium - SICOT Trauma / ARTOF: Open Fractures I**  
**Time : 0900-1030**  
**Room: Theatre 2**

**Abstract number : 19096**  
**DECISION MAKING TO SALVAGE OR AMPUTATE A SEVERELY INJURED LIMB**  
Dariush GOURAN SAVADKOOHI  
*Sina hospital Tehran University of Medical Science, Tehran (IRAN)*

The decision to salvage or amputate a severely injured limb is one of the most difficult an orthopaedic surgeon may face. The inclination to undertake heroic measures to save the limb should be tempered by the realization that doing so may lead to repeated hospitalizations, extensive complications, and a poor functional outcome. Such a decision is rarely clear-cut. Several factors require consideration: the degree of damage to the extremity and the severity of the overall injury, as well as the nature of the patient's physical, psychologic, social, and economic status, including such aspects as age, previous state of health, attitude, wishes, reliability, support system, life-style, occupation, and financial resources. In this study We present 36 cases of severe limb injury with arterial damage. In our cases we evaluate the efficacy of limb injury scoring system like MESS score, MESI score, NISSA score , LSI and PSI system in predicting results of limb saving surgery. Scoring systems should be used only as a guide for decision making. The relative importance of each of the associated trauma parameters (with the exception of prolonged, warm ischaemia time or risking the life of a patient with severe, multiple organ trauma) is still of questionable predictive value. A good understanding of the potential complications facilitates the decision-making process in limb salvage versus amputation. The subjective factors include such aspects as life-style, occupation, age, wishes, attitude, reliability, social support system, and financial resources. These considerations are perhaps more subjective, but undoubtedly important, for man is more than his framework of tendons, veins, and bones.

**Date : 2008-08-25**

**Session : Symposium - SICOT Trauma / ARTOF: Open Fractures I**

**Time : 0900-1030**

**Room: Theatre 2**

**Abstract number : 19274**

**SOFT TISSUE COVERAGE - SOFT TISSUE INJURIES WITH AND WITHOUT DEVASTATION OF THE BONE**

Vilmos VécSEI, Harald K. WIDHALM, S. ARBES

*Medical University of Vienna, Vienna (AUSTRIA)*

Trauma with devastated bone injuries are always a delicate situation, which requires a lot of knowledge and experience. Correct therapeutical strategies are asked, but the opinions about that are widely divided. After injury, which resulted in open fractures and devastated bone morphology, an urgent call for action is needed, otherwise the injured bone and soft tissue gets dehydrated, which can happen between some hours and 2 days. To minimize the risk sustaining a complication like infection or posttraumatic osteitis and osteomyelitis, a lot of measures according the coverage of exposed parts of the bone should be adopted. Whereby the manner of doing soft tissue coverage is as important as the point of time of the operative intervention. Because of the fact that the classification of open fractures by Gustilo and Anderson gets replenished by Caudle and Stern, which has also a graduation of the fractures in IIIB fractures, the surgical therapy got modified. Whereas the soft tissue coverage of open B1 fractures should be done within one week, the surgical intervention at B2 fractures could not be realized within 8 days. Aim of the soft tissue coverage is the reduction of the infection as the highest complication, whereby the same seems to be applicable to long exposed muscles. There exist many possibilities to perform the soft tissue coverage, like conducting a skin graft or covering the defect with different types of flaps. For this purpose a fasciocutane flap, a muscle-rotation flap with or without covering with skin graft, or a free flap plastic flap with micro vessel anastomosis is used. When a lengthening of an extremity is needed, an operative shifting of the bone in addition with soft tissue coverage is useful. Whether which kind of soft tissue covering is used, is highly dependent on the type of open fracture, the experience of the treated doctor and the manner of the local circumstances. Further research is needed, especially establishing new algorithm according the correct treatment of soft tissue defect.

**Date : 2008-08-25**  
**Session : Symposium - SICOT Trauma / ARTOF: Open Fractures II**  
**Time : 1100-1215**  
**Room: Theatre 2**

**Abstract number : 19014**  
**THE OPEN PELVIC FRACTURE**

James KELLAM  
*Carolinas Medical Center, Cahrlotte (UNITED STATES)*

The open pelvic ring injury remains a serious and lethal injury. Acute mortality secondary to uncontrollable hemorrhage and late mortality due to infection and multiple system failure are common. An understanding of the pathoanatomy of the injury will identify the loss of the tamponade effect and potential for fecal contamination due to the wounds in the perineum as important factors in determining the need for a rapid and appropriate response to this injury. Guidelines for the use of a colostomy and internal fixation will be discussed. With a proper well planned protocol for the management of this injury, it is hoped that its mortality and morbidity will be decreased.

**Date : 2008-08-25**

**Session : Symposium - SICOT Trauma / ARTOF: Spine Injuries I**

**Time : 1400-1530**

**Room: Theatre 2**

**Abstract number : 19267**

**COMPLICATIONS AND REVISION SURGERY OF THE CERVICAL SPINE**

Vilmos Vécsei, H. WIDHALM, Stephanie ARBES

*Medical University of Vienna, Vienna (AUSTRIA)*

Injuries to the cervical spine (C1 - C7) occur mostly from traffic accidents and in recreational activities. Such lesions that appear on roentgen logical or magnetic resonance images must be classified according to stability. Neurological deficits, accompanying injuries and the patient's general condition play major roles in the choice of therapy. Anterior and posterior spine fusion and stabilisation with plating is a well established procedure for cervical spine trauma. Complications in the cervical spine can occur pre-, intra-, or postoperatively. Instrumentation is associated with complications resulting in screw pull-out, plate rupture or loosening. Various complications are associated to oesophageal perforation such as mediastinitis, pneumonia, sepsis and fistula. Cerebrospinal fluid leaks occurring in approximately 1% of patients, who have cervical spine surgery. The risk factors for development are revision surgery or ossifications. Vertebral artery injuries are rare complications, but it can result in catastrophic consequences such as massive bleeding, brain stem infections, or thrombosis in combination with brain stem infarction. The incidence of cervical spine injuries in the elderly is greater than that among all other age groups. Associated neurological injuries are less common due to the higher incidence of odontoid fractures, but complications can occur in delayed osseous union. Poor results will occur from operating for poor indications - the wrong patient, operating at the wrong level or in the wrong way, or even operating at the wrong time. An exact clinical and neurological check-up and following the standard protocol can minimize complications in patients with cervical spine injuries.

**Date : 2008-08-26**  
**Session : Symposium - Paediatrics: Elbow Fractures in Children**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 19202**  
**MONTEGGIA FRACTURES: ACUTE AND LATE DIAGNOSIS**

André KAELIN  
*Children's Hospital, University of Geneva, Switzerland, Geneva (SWITZERLAND)*

Acute treatment for Monteggia fracture is easy. The main problem is the diagnosis. Isolated ulnar fracture or bending must lead to true orthogonal X-ray of the elbow showing perfect alignment between the radial head and the humeral condyle. A high proportion of Monteggia fractures are missed at the acute phase and delayed treatment represent a challenge. We present the panel of treatments described in the literature and our protocol which involves only ulnar osteotomy (angulation and lengthening) providing a close radial reduction. Our results show that there is no need for open reduction of the radio-ulnar joint, thus we avoid the risk of ankylosis or synostosis.

**Date : 2008-08-26**  
**Session : IFPOS- Hip: DDH I**  
**Time : 1400-1530**  
**Room: 403**

**Abstract number : 16307**

**ULTRASOUND STUDY OF NEONATES AT RISK FOR DEVELOPMENTAL DYSPLASIA OF THE HIP (DDH)**

Marina GERSH, Miriam HERSHKOVICH, Gershon VOLPIN, Haim SHTARKER  
*Western Galilee Hospital, Nahariya (ISRAEL)*

**INTRODUCTION:** Developmental dysplasia of the hip (DDH) may cause serious disability in childhood and may result in severe degenerative arthritis in young patients. Early treatment of DDH yields good results and decreases the danger of future degenerative arthritis. Our purpose was to determine the prevalence of DDH in neonates - boys and girls - of different ethnic groups and to correlate findings from clinical examination and findings from sonography. **PATIENTS:** This study included 11.500 neonates born between 1.1.05-31.12.06. Sonography was performed in 437 neonates with suspicious physical examination or in neonates of high-risk groups, as multiple-fetus pregnancy, breech delivery, skeletal deformities, family history of DDH and oligohydramnios. **RESULTS:** The prevalence of DDH was 0.6% (5.9 per 1000 births per year). Left hip was involved in 70.8%, the right in 14.6% and bilateral in 14.6%. Female neonates comprised 77% of affected infants and male neonates 23%. No statistically significant difference was found among ethnic groups. In neonates with abnormal physical examination, 79% had positive sonography for DDH. In 47% of neonates with abnormal sonography physical examination had been normal. **CONCLUSIONS:** Sonography is the first line imaging examination to discover DDH in neonates. The combination of physical examination and sonography reduces the number of undiagnosed cases of DDH. Prevalence of DDH is significantly higher in females compared to males and higher in the left hip than on the right. There is no significant difference in prevalence of DDH among various ethnic groups.



**Date : 2008-08-26**  
**Session : IFPOS- Hip : S.C.F.E.**  
**Time : 1400-1530**  
**Room: 403**

**Abstract number : 16813**

**SLIPPED CAPITAL FEMORAL EPIPHYSIS AND INSULIN RESISTANCE: IS THERE A RELATIONSHIP?**

Claudio SANTILI, Luis Eduardo CALLIARI, Alexandre Penna TORINI, Miguel AKKARI, Gilberto WAISBERG, Susana dos Reis BRAGA, Wilson LINO JUNIOR

*Santa Casa São Paulo—Faculty of Medical Sciences, Sao paulo (BRAZIL)*

Mechanical and endocrines factors have been related as responsible for the slipped capital femoral epiphysis (SCFE). The objective of this study was to evaluate the hormonal status including the incidence of insulin resistance (IR) in patients with SCFE. We evaluate 77 patients treated in our service between 2002 and 2007. We analyse the patients with regard to sex, age, weight, height and body mass index; serum measures of insulin and glucose, beyond the hormonal status. The patients were divided into two groups: obeses and non obeses. The measures of insulin, the glucose/insulin ratio (G/I), and the homeostasis model assessment (HOMA) were used to analyse the IR. As a result, we verify that there is a significant relationship between SCFE and IR, no matter if the patient is obese or not. We conclude that this high incidence of IR found in both groups (obeses and non obeses) seems to be implied in the etiology of the SCFE.

Date : 2008-08-26  
Session : IFPOS- Hip: DDH I  
Time : 1400-1530  
Room: 403

Abstract number : 17118

**MORPHOLOGICAL DEVELOPMENT OF THE HIP AND ITS PROGNOSIS AFTER CLOSE REDUCTION IN DDH**

Ruixue MA

*Children's Hospital of Fudan University, Shanghai (CHINA)*

OBJECTIVE: To observe the developmental changes of the hip after close reduction in developmental dislocation of the hip (DDH) requires evolutionary regularity of acetabular dysplasia and its prognosis. METHODS: A follow-up in average of 7.4 years was carried out in 117 (161 hips) with DDH after close reduction under 3 years old, which were separated in three groups respectively under 1 year old, two years old and three years old. By the series of X-ray films, acetabular index, acetabular-head index and shape of the hip were observed. At the same time center-head distance discrepancy was measured. RESULTS: Acetabular index returned to nearly normal gradually as the time went by and significantly within one year after close reduction in developmental dislocation of the hip. The process of recovery was nearly stable three years later. There are no obvious difficulties among three groups. But the final result was relative with acetabular index before reduction. Acetabular index in residual dysplasia group was more than 39° before close reduction and decreased slowly after close reduction. However, it was still up to 30° after three-year observation. The value of centre-head distance discrepancy decreased gradually as the years went by after close reduction. CONCLUSIONS: If acetabular index is above 39° before close reduction in DDH and is still up 30° three years later after close reduction. Residual acetabular dysplasia can be developed later. Close reduction could be done in under three-year-old child with DDH, especially for suffering of both hips. KEYWORDS: DDH, Close reduction, Prognosis.

**Date : 2008-08-26**  
**Session : IFPOS- Hip: DDH I**  
**Time : 1400-1530**  
**Room: 403**

**Abstract number : 17196**

**THE EVALUATION OF GRAF'S TYPE IIA OF THE NEWBORN HIP**

Marek SYNDER, Emil ADAMCZYK

*Clinic of Orthopaedics and Paediatric Orthopaedics, Medical University of Lodz, Lodz (POLAND)*

Developmental Dysplasia of the Hip is one of the most widely discussed disease in neonates. Since ultrasonography was employed in the early diagnosis the incidence of late diagnosed cases significantly decreased. Ultrasound is an excellent tool for hip evaluating and for follow-up during and after treatment. On the other hand, that sonographic screening of the hip joint can lead to overdiagnosis followed by over-treatment. The purpose of this study was to evaluate the Graf's type Ila of the newborn hip from the first diagnosis to the walking age. MATERIAL AND METHODS: We evaluated 130 children, who were diagnosed of DDH type Ila between 1 and 3 months of life. All children were conservatively treated by means of Pavlik harness or other abduction splints. All of those children were evaluated till the full rebuilding of the hip joint. All children were asked to show up for follow-up in our Institution. The average age at the follow-up was 8 years. During the follow-up the clinical and radiological examination was performed. RESULTS: All children started walking late, after 12 months of age. Clinically, all of them had increased internal hip rotation. X-ray revealed increased CCD and antetorsion angles. In about 40% of all cases the small dysplastic changes in acetabulum were also - AC angles above 240. In 3% of all cases the Wiberg angle was also slightly increased. CONCLUSIONS: The type Ila hips should be regularly monitored till the skeletal maturity to avoid further arthritic changes in the hip joint.

Date : 2008-08-26  
Session : IFPOS- Hip: DDH I  
Time : 1400-1530  
Room: 403

Abstract number : 17750

**RESULTS OF A TRIPLE PELVIC OSTEOTOMY FROM ANTERIOR APPROACH IN ADOLESCENTS WITH DDH**

Alexander BELETSKI, Aleg SAKALOUSKI, Georgy BRODKO, Yury LIKHACHEUSKI, Roman GOLDMAN  
*State Union The Republican Scientific and Practical Center of Traumatology and Orthopedics, Minsk (BELARUS)*

In most cases acetabular insufficiency is a prevailing component of developmental dysplasia of the hip in adolescents. We used our own technology of a triple pelvic osteotomy from only one anterior approach for normalization of spatial position of the acetabulum. The distinctive features of our operative technique are angle-shaped ilium cut line, pubic paraacetabular osteotomy with preservation of the pubo-capsular ligament, ischium osteotomy-osteoclasty, minimal pelvic muscles damage, avoidance of direct contact with large nerve trunks and vessels, high mobility of the acetabulum. After the operation the Wiberg angle became on the average  $41^\circ$  against  $-15^\circ$  to  $+15^\circ$  in the pre-operation period, the loading area increased in 1.5 times, the Sharp angle decreased on the average from  $50^\circ$  to  $25^\circ$ , the angle of vertical correspondence increased on the average from  $72^\circ$  to  $88^\circ$ . The system of Tschauer et al. has been applied to an estimation of the follow-up results. The long-term results were good and excellent in 79% cases, satisfactory in 15%, bad in 6%. Displacement of the acetabulum fornix into a nearly horizontal or horizontal position is the most important biomechanical result, as it considerably increases the joint tolerance to load. So, the triple pelvic osteotomy provides stability of a hip joint and can be the operation of choice in cases of developmental dysplasia of the hip in adolescents.

Date : 2008-08-26  
Session : IFPOS- Hip: DDH I  
Time : 1400-1530  
Room: 403

Abstract number : 18210

**GROWTH DISTURBANCE OF THE PROXIMAL FEMUR AS A COMPLICATION OF TREATMENT FOR DEVELOPMENTAL DYSPLASIA OF THE HIP WITH THE "FROG-LEG POSITION" BRACE**

Yanzhou WANG<sup>1</sup>, Weiqiang ZHANG<sup>2</sup>, Yonghong ZHANG<sup>2</sup>

<sup>1</sup>Department of Paediatric Orthopaedics, Shandong (CHINA), <sup>2</sup>Yuncheng Chengguan Hospital, Chengguan (CHINA)

PURPOSE: To observe the incidence of growth disturbance of the proximal femur in DDH patients who were treated with the "frog-leg position" brace. MATERIAL: Between June 2006 and December 2007, 817 DDH patients have been seen at Yuncheng Chengguan Hospital and 115 patients of them had been treated with the "frog-leg position" brace before. Among 115 patients: male 33, female 82. The average age at the time of reduction and brace was 8.4 months (range 3 to 24), and the average time with the "frog-leg position" brace was 7.9 months (range 7 day to 24 months). RESULTS: 89 patients had growth disturbance of the proximal femur out of 115 patients (77%). 80 patients (121 hips) have avascular necrosis of the femoral head. According to the Kalamachi and MacEwen classification system: group I: 12 cases (23 hips), group II: 25 patients (36 hips), group III: 25 patients (35 hips), group IV: 18 patients (27 hips). Residual deformity of the femoral head and neck: coxa magna 56 patients (89 hips), large of femoral head 33 patients (46 hips), coxa vara 42 patients (70 hips). CONCLUSION: The "frog-leg position" brace is still used to treat DDH in some rural areas of China. It causes the severe growth disturbance of the proximal femur.

Date : 2008-08-26  
Session : IFPOS- Hip: DDH I  
Time : 1400-1530  
Room: 403

Abstract number : 18255

**TREATMENT OF CONGENITAL HIP DISLOCATION (CHD) IN CHILDREN UNDER SCHOOL AGE**

Oleg KOZHEVNIKOV, Svetlana KRALINA, Alexey IVANOV, Inna GRIBOVA

*Central Scientific Research Institute of Traumatology and Orthopaedics named after N.N.Priorov, Moscow (RUSSIAN FEDERATION)*

The aim of the study was to elaborate an adequate sparing effective technique for surgical correction of high congenital hip dislocation in children under school age. During the period 2000-2007 surgical treatment was performed in 85 patients, aged 1.5-7 years. Complex surgical treatment included: first step - shortening detorsion-varus-forming osteotomy of the femur followed by application of distraction pin-rod device to the pelvis and lower third of the femur. The size of resected fragment depended upon the degree of femoral head cranial displacement and made up 30% of that displacement height. Residual degree of femoral head displacement was eliminated during gradual distraction in the apparatus within 10-15 days. As a second step pelvic osteotomy with simultaneous reduction of femoral head into acetabulum was performed. This technique enabled us to achieve correction of dislocation in 98.7% of cases. In 52% of patients no extremity length discrepancy was present and in the rest of observations that discrepancy did not exceed 1.2cm. Thus, the use of elaborated technique of two-step treatment of high congenital hip dislocation enables to restore the relation in the hip joint without development of significant asymmetry of lower extremities length.

**Date : 2008-08-26**  
**Session : IFPOS- Hip : S.C.F.E.**  
**Time : 1400-1530**  
**Room: 403**

**Abstract number : 18307**

**SLIPPED CAPITAL FEMORAL EPIPHYSIS**

Mehmet F&#305;rat YAGMURLU, Temel TACAL, Umit TUHANOGLU, Mehmet Nurullah ERM&#304;S, Eyup Selahattin KARAKAS  
*Baltalimani bone disease hospital, istanbul (TURKEY)*

Slipped upper femoral epiphysis (SUFE) is usually a disease of teenagers. The treatment of slipped capital femoral epiphysis varies with the degree of slippage. Treatment options include in situ pin fixation, closed reduction and pinning, open epiphysiodesis, osteotomy of the femoral neck, and intertrochanteric or subtrochanteric osteotomy. Thirteen consecutive children (16 hips) who had slipped capital femoral epiphysis of a mild degree (slip angle less than 30°) were treated with dynamic screw fixation. Before operation straight leg traction has applied 5 days (3-10 days). Screw fixation is to achieve physeal stability to prevent additional slippage and to avoid premature physeal closure. Ten boys and three girls were followed up for an average of 7 years (range 2-20 years). There were 11 chronic slips, four acute slips, and one preslip. Most patients had satisfactory results. No avascular necrosis occurred. Limitation of motion remained in 3 hips, but no hip pain, and normal gait was attained. This form of therapeutic management shows good clinical results with low complication rates. Patients with acute or acute-on-chronic SCFE can be safely managed with straight-leg traction for up to 5 days, followed by in situ screw fixation without manipulation.

Date : 2008-08-26  
Session : IFPOS- Hip: DDH I  
Time : 1400-1530  
Room: 403

Abstract number : 18636

**EARLY RESULTS OF TRIPLE PELVIC OSTEOTOMY IN THE TREATMENT OF RESIDUAL DDH**

Bobby Kin-Wah NG, Vivian W. Y. HUNG, Jack C.Y. CHENG

*Department of Orthopaedics & Traumatology, Prince of Wales Hospital, The Chinese University of Hong Kong, Shatin, N.T. (HONG KONG)*

INTRODUCTION: Residual developmental dysplasia of hip is a rare condition. The symptoms are variable during adolescence. We review the outcome of these symptomatic patients treated with triple osteotomy. METHODS: 7 patients had been treated over last two years. The surgical technique consisted of: a) 8cm medial groin incision centred over adductor longus for the superior pubic ramus and inferior pubic ramus - ischium osteotomies; b) bikini incision for ilium osteotomy, graft harvesting, redirection of acetabulum and fixation with cannulated screws. Being followed up at three monthly intervals after operation, the patients were assessed clinically for complications, length of stay, union time, FAB range of motion, leg length discrepancy with lower limb scanogram, Severin classification, Harris Hip Score to evaluate the pre and postoperative changes. RESULTS: The average age at time of operation was 17.4 years (10.5-31). There were no wound infections or neurovascular complications. The LOS average 23.9 (17-34) days, pre and postoperative Severin class changes from 1III, 1IVa, 5IVb, to 4IIa and 3 IIb, Harris hip score preop 69 (21-94) to postop 89.2 (66-97). Preoperative and postoperative FAB averaged 50% (30-60) and 90% (85-100) of normal. DISCUSSION: Residual DDH may exaggerate during pubertal growth spurt. The c/b ratios of Smith of these patients before operation showed an increase at the onset of puberty. The preoperative Harris score of these patients were highly variable in this group of patient. Operative treatment markedly reduced symptoms and functional range of the affected hip.



**Date : 2008-08-26**  
**Session : IFPOS- Hip: DDH II**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 16464**

**DEGA OSTEOTOMY IN THE REVISION SURGERY FOR DEVELOPMENTAL DYSPLASIA OF THE HIP IN OLDER CHILDREN**

Mahmoud EL-ROSASY

*Tanta University Hospitals, Tanta (EGYPT)*

**AIM OF THE STUDY:** To evaluate the results of using Dega procedure in the management of hip dysplasia in older children after previously failed surgery. **MATERIALS AND METHODS:** The study included 21 patients with a total of 23 hips. Sixteen patients were females and five males. Their ages ranged from 4.5 years to 9.8 years. The hip joint was dislocated in ten cases and subluxed in 13 cases. The femur was longer on the affected side (range from one to 2.4 cm) in seven patients who had derotation osteotomy in infancy. In 17 hips the pelvic osteotomy was combined with open reduction and femoral osteotomy with or without shortening. In six cases the osteotomy was combined with open reduction only. **RESULTS:** The acetabular index improved from average 35° preoperatively to average 13° postoperatively. The centre edge angle improved from -32° to 16° preoperatively to 19° to 39° postoperatively. The Shenton's line was intact in all cases at the time of last follow-up. In one case the femoral head was inadequately covered due to graft dislodgement and reoperation was needed. Another case of over-correction of femoral anteversion needed reoperation. The follow-up ranged from 30 to 83 months (average 47 months). **CONCLUSIONS:** Dega pelvic osteotomy effectively reshapes and reorients the acetabulum to cover the reduced femoral head. The Dega procedure presents a comprehensive approach to both acetabular and femoral components of the dysplasia. Careful attention to the technical details and use of fluoroscopy are mandatory.

Date : 2008-08-26  
Session : IFPOS- Hip : LCPD (Perthes)  
Time : 1600-1730  
Room: 403

**Abstract number : 16579**

**LONG-TERM RADIOLOGICAL RESULTS OF FEMORAL VARIZATION AND DEROTATION OSTEOTOMY FOR LEGG-CALVE-PERTHES DISEASE**

Kerem AYDIN, Sarper GURSU, Turgay ER, Bilal DEMIR, Vedat SAHIN  
*Baltalimani Metin Sabanci Bone and Joint Diseases Education and Research Hospital, Istanbul (TURKEY)*

There is still controversy on the treatment of Legg-Calve-Perthes Disease (LCPD). We looked through the long-term radiological results of 20 patients who had femoral varization and derotation osteotomy (FVDO) because of LCPD. In our institution, FVDO was performed for 109 patients with LCPD between 1985 and 1994. We could get in touch with 34 of these patients and among these X-rays of 20 patients (21 hips) accepting to be involved in this study were evaluated. CE angle, acetabular index (AI) and femoral shaft-neck angle (FSNA) values before the operation and also at the time of the final evaluation were measured for each patient. The mean follow-up period was 18.3 years (13.5-22.5 years). The mean age was 8.65 (4-14) years at the time of operation whilst 26.7 (21-32) at the time of the last examination. Mean value of the CE angle was 19.1 degrees before the operation. The AI was 14.9 degrees and the FSNA was 129.1 degrees. At the last control mean CE angle was found to be 24.2 degrees, AI 16.8 degrees and FSNA 126.1 degrees. LCPD could result with osteoarthritis. Appropriate treatment either conservative or surgical is essential. Another key-point for a successful end-result is the necessity of a long-term follow-up. Long-term results of this procedure are in favour of an increase of the CE angle meaning better femoral head coverage. FVDO seems to be an effective treatment of LCPD.

**Date : 2008-08-26**  
**Session : IFPOS- Hip : LCPD (Perthes)**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 17329**

**RESTORATION HIP JOINT ANATOMY FOLLOWING SOKOLOVSKY TRIPLE PELVIC OSTEOTOMY IN PERTHES PATIENTS FROM ANTERIOR APPROACH**

Andrei DZEMIANTSOU, Michail GERASIMENKO, Roman GOLDMAN

*State Institution «Republican Scientific-Practical Centre of Traumatology and Orthopaedics», Minsk (BELARUS)*

If Perthes disease is following an unfavorable course, the main object of treatment is «containment» the femoral head within the acetabulum to preserve and restore joint correlations. We achieve this with the help of Sokolovsky triple pelvic osteotomy (TPO), which has a number of advantages: it causes only minor trauma; operation time varies between sixty and ninety minutes, there is no increase in joint force and need for blood transfusion, and any angle of acetabular fragment forward and outward inclination can be achieved including overcompensation. From 1998 to 2007, 37 TPOs were performed on 36 patients (28 boys and 8 girls) aged 6 to 18. Boys were 28, girls - 8. Two patients underwent surgery at the stage of impression fracture, 18 at the stage of fragmentation, 6 at the stage of healing, and 10 at the residual stage. Indications for TPO include signs of poor prognosis at stages II-III. The indication for triple pelvic osteotomy at residual stages is secondary acetabular dysplasia and decentration. When observed clinically, in all cases, the diseased limb was lengthened by 0.5 to 1 centimetres and the patients' gait improved. On the average, the volume of movement in the joint was as follows: flexion 110°, extension 10°, abduction 30°, adduction 35°, external rotation 37°, internal rotation 30°. The Wiberg angle has increased from 15° to 35°, the Eyre-Brook index increased by 20%, the index of acetabular coverage from 72% to 100%. TPO produces positive clinical and radiological results.

Date : 2008-08-26  
Session : IFPOS- Hip : LCPD (Perthes)  
Time : 1600-1730  
Room: 403

Abstract number : 17335

**IS RECURRENT LEGG-CALVE-PERTHES DISEASE ASSOCIATED WITH THROMBOPHILIC ABNORMALITIES? - A CASE REPORT**

Andrzej GRZEGORZEWSKI, Andrzej BOROWSKI, Marek SYNDER  
*Orthopaedics Department, Medical University of Lodz, Lodz (POLAND)*

Recurrence in Legg-Calve-Perthes disease is seldom reported and rarely discussed. This is the ninth reported case in the literature. In all previous cases, onset age ranged from 2 to 6 years. We present a case of a fifteen-year-old Caucasian boy with a fully radiologically documented recurrent Legg-Calve-Perthes disease on the left side who primary underwent a bilateral LCPD. First time he was presented at the age of 7 years and the diagnosis was the right femoral head necrosis. Four months later Perthes disease on the right side was observed. Both hips were classified into Herring group B. Patient underwent bilateral adductor tenotomy and Petri cast was applied at the beginning of treatment, followed by bed rest and traction in abduction and physical therapy. Five years after first symptoms and 2 years after femoral head remodeling we observed all clinical and radiological symptoms recurrence LCPD on the left side at the age of 12 years, confirmed by MRI. Accordingly, we performed hemostasis assessment included screening for routine coagulation parameters: prothrombin time (PT), activated partial thromboplastin time (APTT), fibrinogen concentration, thrombin time (TT) and screening for thrombophilia: antithrombin activity (AT), protein C activity (PC), free- protein S antigen (PS), resistance to activated protein C (APC-R), mutation of prothrombin gene (G20210A), level of factor VIII, testing for lupus anticoagulant and levels of anticardiolipin antibodies immunoglobulin G and M. All hemostatic parameters: routine and thrombophilic remained in reference range. We did not identify any risk factors for recurrence.

**Date : 2008-08-26**  
**Session : IFPOS- Hip: DDH II**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 17547**

**LATE DIAGNOSED DDH IN SWEDEN 2000-04: RESULTS FROM A NATIONAL REGISTRY**

Lars DANIELSSON, Henrik DUPPE, Carl Johan TIDERIUS

*Dpt of Orthopaedics, Malmö University Hospital, Malmö (AFGHANISTAN)*

**BACKGROUND:** Before screening, the prevalence of hip dislocation in Sweden was 1.7/1000. All cases of late diagnosed DDH (>1 month) in Sweden were collected by Palmén between 1948-1960 and 1973-1979 (Palmén 1984). In 1999, the Swedish Paediatric Orthopaedic Association entrusted the senior author (L.D.) to take up the incidence study. **MATERIAL AND METHODS:** All orthopaedic clinics in Sweden that are involved in the treatment of DDH in Sweden (36 clinics) were involved in the study. The number of children born in Sweden during the study period was rather constant with about 100.000 live births annually. The study period was seven years (2000-06) and includes children born between 2000 and 2004. All children with late diagnosed DDH (>1 month) were registered. **RESULTS:** The total number of late diagnosed dislocations was 49 during the study period, giving an annual average incidence of 0.10/1000 living newborns. The age at diagnosis was low; 6 cases >15 and only 3 cases >24 months of age when diagnosed. **INTERPRETATION:** In comparison with previous studies, the incidence of late diagnosed DDH in Sweden has further decreased and is now definitely among the lowest in the world. The cause for this, as well as the low age at diagnosis, is probably an adequate screening system. Recommendations on infant positioning may also contribute to the low incidence. The supine position is currently recommended, which we believe decreases the number of late diagnosed DDH.

Date : 2008-08-26  
Session : IFPOS- Hip : LCPD (Perthes)  
Time : 1600-1730  
Room: 403

Abstract number : 17755

**POST-SURGICAL RESTORATION OF HIP JOINT FUNCTION IN SEVERE CASES OF PERTHES DISEASE**

Alexander BELETSKY, Ludmila PASHKEVICH, ALEG SAKALOUSKI, Andrei DZEMIANTSOU

*State Institution «Republican Scientific-Practical Centre of Traumatology and Orthopedics», Minsk (BELARUS)*

Some patients, due to the peculiarities of their pathological course, despite treatment, suffer from expressed triaxial joint deformities, partial joint dislocations, and hinge abduction as a result of femoral-head flattening. From 1998 to 2007, 8 patients with signs of an unfavorable course and suffering from restriction of joint movement - from 0° to 15° for abduction and up to 10° on the average for external and internal rotation, underwent Sokolovsky triple pelvic osteotomy (TPO). Gradual increase in joint movement was observed in the post-surgical period of 3 to 6 months: up to 20° for abduction, and up to 25° and 15° for external and internal rotation, respectively. In order to restore the hip, we performed two-stage treatment on three patients. At the first stage, the patients underwent Sokolovsky femoral posterior rotational osteotomy. It enabled unloading the part of the femoral head that sustained the most damage and improving its spherical shape. But since the outcome of the disease is coxa magna, expectedly poor coverage of the femoral head was observed after the first stage. Therefore, TPO was performed at the second stage. This treatment resulted in full volume of movement in the joint slight claudication, and leg length difference of 0.5 centimeters. Three other patients rejected the second stage of the treatment indicating that they were satisfied with the functional result after the first stage. Our surgical techniques enable restoring the structure and function of the hip joint, slowing down deforming arthrosis, and possibly, postponing the need for hip replacement.

**Date : 2008-08-26**  
**Session : IFPOS- Hip: DDH II**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 18238**

**TONNIS TYPE ACETABULOPLASTY FOR ACETABULAR DYSPLASIA OF THE HIP IN THE PAEDIATRIC AGE GROUP**

Aysegul BURSALI, Kerem AYDIN, Sarper GURSU, Timur YILDIRIM, Ahmet Sukru MERCAN, Vedat SAHIN  
*Baltalimani Metin Sabanci Bone and Joint Diseases Education and Research Hospital, Istanbul (TURKEY)*

Acetabular dysplasia of the hip is a predisposing situation for arthrosis of the hip, if not treated appropriately. There are various types of periacetabular osteotomy techniques described for this deformity. In this paper we are presenting the results of Tonnis type acetabuloplasty (TTA) operations we have performed on our patients with dysplasia of the hip. Between September 2005 and August 2007 we have performed TTA for 34 hips of 20 patients. 16 of these patients were females whilst 4 were males. 14 patients had bilateral acetabular dysplasia of the hip. The mean age at the time of operation was 48.3 (18 months - 8 years) months. The mean follow-up period was 15.9 (6-32 months) months. Acetabular Index (AI), Center-Edge Angle (CE) and Sharp Angle were measured for each patient both preoperatively and postoperatively. The mean preoperative value of AI was 35.1 degrees and 19.1 postoperatively. CE was measured to be -9.1 degrees preoperatively and 18 degrees postoperatively. The mean value of Sharp Angle was 58.1 degrees preoperatively and 47.8 degrees postoperatively. Acetabular dysplasia of the hip is a congenital problem causing coxarthrosis in the adulthood, if not treated. TTA is an easy procedure and our results show that TTA is an effective treatment alternative to overcome this deformity.

**Date : 2008-08-26**  
**Session : IFPOS- Hip: DDH II**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 18427**

**NON-INVASIVE TREATMENT OF LATE-DIAGNOSED HIP DISLOCATION**

Azriel BENAROYA

*Mt Sinai School of Medicine, Elmhurst Hospital Center, Elmhurst, New York (UNITED STATES)*

The unique healing and remodelling dynamics in children challenges us to seek new minimally invasive techniques to treat pediatric joint disorders. A method of closed reduction by two-phase traction was used by the author to treat late diagnosed hip dislocation in 12 patients (age at diagnosis: 5 to 16 months). Ultrasonography was used to assess hip pathology and to monitor treatment. The treatment protocol consisted of 8 weeks of traction according to Craig, followed by application of spica cast for 8 additional weeks. This was followed by the full-time use of Scottish-Rite brace for 2 to 4 months, until acetabular maturation was confirmed on x-rays. Ten of the patients treated by this method completed the protocol. One patient did not tolerate the traction and another patient had to be discharged for non-medical reasons. Both patients were treated by open surgery. The 10 patients that completed the treatment protocol had their hips reduced in the acetabulum while in spica cast and maturation required 4-6 months. M/F ratio was 1/9. Length of treatment averaged 7 months; follow-up was between 8 months-10 years. In all cases, treatment produced a normally developed acetabular socket with no signs of AVN of the femoral head on follow-up. Our results suggest that more focus needs to be given to the role of the soft-tissue envelope in treatment of DDH. This approach may contribute to new ideas for minimally invasive surgery in pediatric joint disorders.



**Date : 2008-08-26**  
**Session : IFPOS- Hip: DDH II**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 18507**

**ARTHRODIASTASIS OF THE HIP WITHOUT SOFT TISSUE RELEASE**

Gamal HOSNY<sup>1</sup>, Mohamed FADEL<sup>2</sup>, Khamis EL-DEEB<sup>3</sup>

<sup>1</sup>*Benha University, Egypt, Cairo (EGYPT)*, <sup>2</sup>*Minia University, Cairo (EGYPT)*, <sup>3</sup>*Alexandria University, Alexandria (EGYPT)*

In this study we report our results after application of athrodiastasis without soft tissue release in cases with Perthes disease. From 1994 till 2006, 26 cases with Perthes disease were treated with arthrodiastasis in our institution. All cases were older than 7 years old. The age of patients ranged from 7 to 14 years. There were 18 males. 13 patients had previous operations [range 1-3]. All patients were assessed clinically and radiographically before and after the operation. Clinically, the presence and degree of pain, gait, ROM, satisfaction of the patients were recorded. The patients were classified according to Herring lateral pillar classification and Catterall head at risk signs. Ilizarov Ext. Fixator was applied to the supra-acetabular area and the femur and gradual distraction usually starts 3 days afterwards without any soft tissue release. The average fixation period was 3 months [2-4.5m]. 22 patients showed improved clinical results with 7 excellent and 18 good outcomes. There was improvement of the degree of pain in all cases except 2. Complications include pin tract infection specially in the acetabular half pins, knee stiffness in one case, chondrodiastasis occurred instead of arthrodiastasis in one case with resultant lengthening of the femoral neck. Arthrodiastasis without soft tissue release is a valid option of treatment in cases with Perthes disease who would normally expect to have poor prognosis with conventional treatment.

Date : 2008-08-26  
Session : IFPOS- Hip : LCPD (Perthes)  
Time : 1600-1730  
Room: 403

Abstract number : 18536

**RADIOGRAPHIC AND MRI DISSOCIATION IN LEGG-CALVÉ-PERTHES' DISEASE**

Eiffel Tsuyoshi DOBASHI, Carlos Eduardo UTUMI, Paulo Ivan MIYAGI, Patricia Corey YAMANE, Akira ISHIDA, Carlo MILANI  
*Universidade Federal de São Paulo, São Paulo (BRAZIL)*

This paper is purposed to demonstrate the results of the acetabulum-femoral-head index in 60 hips with LCP disease using plain x-rays and MRI. Then compare the obtained results to demonstrate whether there is correlation or not of the calculated index between these two different methods as we called dissociation. MATERIAL AND METHODS: Constituted by 60 patients (60 hips) with Legg-Calvé-Perthes disease with 46 male and 14 female, with mean age of 6y10m (2y6m to 12y10m), 46 white patients and 14 non-white. Regarding to the affected side 34 were on the right and 26 on the left. We applied the classification proposed by WALDENSTRÖM and modified by JONSÄTER. 34 hips were considered in necrotic phase, 13 in fragmentation, 9 in reossification and 4 in the final stage of the disease. To measure the femoral head coverage index we applied the knowledge of HEYMAN & HERDON using computed program software developed for this purpose in x-ray and in MRI images. RESULTS: In 23 hips there are disagreements in the information concerned to the femoral head coverage because there were considered sufficient according to plain x-ray but insufficient when MRI images were analysed. CONCLUSION: Many orthopedic services use to apply plain x-ray for diagnosis, treatment and follow-up. The information regarding this method does not provide the real state of the femoral head concerning the femoral head cartilage and labrum coverage. The results obtained for us suggest that MRI provides trustworthy information to conduct the treatment of LCP disease, independent of the chosen method.

**Date : 2008-08-26**  
**Session : IFPOS- Hip : LCPD (Perthes)**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 18538**

**MRI LABRUM ANGLE AND FEMORAL HEAD EXTRUSION IN LEGG-CALVÉ-PERTHES DISEASE**

Eiffel Tsuyoshi DOBASHI, Patricia Corey YAMANE, Francesco Camara BLUMETTI, Akira ISHIDA, Carlo MILANI  
*Universidade Federal de São Paulo, São Paulo (BRAZIL)*

**INTRODUCTION:** Many aspects of Legg-Calvé-Perthes disease (LCPD) are still unsolved since first description after almost one century. The femoral head lesion extension and lateral subluxation and labrum's position are considered important parameters for prognosis and treatment and these aspects are earlier and more precisely detected by MRI. The purpose was to compare MRI's assessment of the femoral head extrusion and the labral angle in a scale of severity. **MATERIAL AND METHODS:** Data of sixty normal hips were compiled to determine normal labrum angular average values. Hip MRI of 60 patients with LCPD (46 males, 14 females and average age 6.83 years) was performed. The MRI labrum angle and femoral head extrusion (Dickens & Menelaus) were measured on the coronal image by one computer software and these findings were compared. **RESULTS:** Average MRI labrum angle was 39.91° (group I), 26.53° (group II), 19.48° (group III) and 2.38° (group IV). The femoral head extrusion was 17.45 in group I, 21.39 in group II, 25.05 in group III and 42.92 in group IV. Labral inclination measurements have an inverse correlation with femoral extrusion according to Pearson coefficient ( $r=-0.6853$ ,  $p=0.020$ ). **DISCUSSION:** The establishment of group definitions can be useful in the outcome prediction and treatment choice of LCPD. **CONCLUSION:** The labral angle can be measured by a simple method and is related and comparable to femoral head extrusion in LCPD. These findings determined a new MRI classification.

Date : 2008-08-26

Session : Shoulder and elbow: humerus and elbow fractures

Time : 0900-1030

Room: 404-405

Abstract number : 15657

**SURGICAL MANAGEMENT OF INTERCONDYLAR FRACTURES OF THE HUMERUS USING TRICEPS REFLECTING ANCONEUS PEDICLE (TRAP) APPROACH**

Rajesh MALHOTRA<sup>1</sup>, Surya BHAN<sup>1</sup>, Amite PANKAJ<sup>2</sup>

<sup>1</sup>AIIMS, New Delhi (INDIA), <sup>2</sup>University College of Medical Sciences and GTB Hospital, Delhi (INDIA)

**INTRODUCTION:** Operative fixation of intra-articular fractures of distal humerus requires adequate exposure and transolecranon approach is a commonly used approach. However, olecranon osteotomy has the potential complications related to prominence/migration of hardware, displacement/nonunion of osteotomy and triceps weakness. The purpose of study was to determine the functional outcome of fixation of displaced intra-articular distal humeral fractures with use of triceps reflecting anconeus pedicle approach. **METHODS AND MATERIAL:** We reviewed the functional and radiological results of 40 consecutive patients with intercondylar fractures of humerus treated by internal fixation through TRAP approach. There were 28 males and 12 females and the average age was  $32\pm 4.5$  years. Right elbow was involved in 27 patients and left elbow in 13 patients. The mechanism of injury was a fall in 20 patients, a motor-vehicle accident in 16 patients, and direct trauma in 4 patients. **RESULTS:** At a minimum follow-up of 12 months (average  $18\pm 4$  months) 87.5% patients had good triceps strength. The average range of motion was  $118.4\pm 7$  degrees. The average time to union was  $3.2\pm 1.6$  months (range 2 to 6 months). No patient had triceps rupture, implant failure, neurovascular deficit or nonunion. Two patients needed removal of the implant because of subcutaneous prominence. **CONCLUSIONS:** TRAP approach provides good visualization for fixation of intercondylar fractures of humerus, without any noticeable untoward effect on triceps strength and postoperative rehabilitation; and one can avoid iatrogenic fracture of the olecranon and its associated complications.

**Date : 2008-08-26**  
**Session : Shoulder and elbow: humerus and elbow fractures**  
**Time : 0900-1030**  
**Room: 404-405**

**Abstract number : 16465**

**NONUNITED HUMERUS SHAFT FRACTURES TREATED BY EXTERNAL FIXATOR AUGMENTED BY INTRAMEDULLARY ROD**

Mahmoud EL-ROSASY

*Tanta University Hospitals, Tanta (EGYPT)*

Nonunion of humeral shaft fractures after previously failed surgical treatment presents a challenging therapeutic problem especially in presence of osteoporosis, bone defect, joint stiffness and infection. Eighteen patients with atrophic nonunion of the humeral shaft were treated using a standardized treatment. No cases of active infection were included. The procedure included exploration of the nonunion, insertion of intramedullary rod (IM rod), autogenous ICBG and application of external fixator for compression. Ilizarov fixator was used in seven cases and monolateral fixator in eleven cases. The fixator was removed after clinical and radiological healing of the nonunion but the IM rod was left indefinitely. The evaluation of results included union rate, treatment-related complications, pain, function and patient's satisfaction. Bone union was obtained in all cases. In one case a second bone grafting was needed. The time to bone healing averaged 4 months (range 2.8 to 7 months). The external fixator time averaged 4.5 months (range 3.2 to 8 months). The results were satisfactory in 16 (89%) cases and unsatisfactory in two (11%) due mainly to residual shoulder and/or elbow stiffness. Superficial pin tract infection occurred in 39% of the pins. No cases of nerve palsy, refracture or deep infection were encountered. The follow-up ranged from 24 to 52 months (average 35 months). The proposed technique is effective in treating difficult humeral nonunion in presence of osteoporosis and short bone segments. The inclusion of intramedullary rod as internal splint prevents refracture after fixator removal.

**Date : 2008-08-26**

**Session : Shoulder and elbow: humerus and elbow fractures**

**Time : 0900-1030**

**Room: 404-405**

**Abstract number : 16529**

**USE OF INTRAMEDULLARY FIBULAR STRUT GRAFT: A NOVEL ADJUNCT TO PLATING IN THE TREATMENT OF OSTEOPOROTIC HUMERUS SHAFT NONUNION**

Vidyadhara S, James GNANADOSS

*MGMC & RI, Pondicherry (INDIA)*

Humerus shaft fractures respond well to conservative treatment and unite without much problem. Being rare there is not much discussion regarding the management of its nonunion in the literature and hence it is challenging to the treating orthopedic surgeon. Osteoporosis of the fractured bone and stiffness of the surrounding joints compounds the situation further. Ilizarov fixator, locking compression plate and vascularised fibular graft are viable options in this scenario but are technically demanding. We used fibular strut graft bridging the fracture site in order to enhance the pull-out strength of the screws of the dynamic compression plate. Six patients in the study had successful uneventful union of the fracture at the last follow-up. Fibula is easy to harvest and produces the least graft site morbidity. None of the study patients needed additional primary or delayed iliac crest bone grafting.

**Date : 2008-08-26**

**Session : Shoulder and elbow: humerus and elbow fractures**

**Time : 0900-1030**

**Room: 404-405**

**Abstract number : 17266**

**CLINICAL COMPARISON OF INTRAMEDULLARY FIXATIONS VERSUS PLATE OSTEOSYNTHESIS FOR HUMERAL SHAFT FRACTURES**

Hiroshi HASHIGUCHI, Hiromoto ITO, Kazufumi MINAMI, Takao NAKAJIMA, Yoshinaga EGAWA, Ryoichi MURASHIGE

*Department of Orthopaedic Surgery, Nippon Medical School Chiba Hokusoh Hospital, Chiba (JAPAN)*

Intramedullary fixation or plate osteosynthesis is the major surgical method for humeral shaft fractures. The purpose of this study was to compare clinical outcomes of intramedullary fixations and plate osteosynthesis for humeral shaft fractures. The subjects were 102 patients with acute humeral shaft fracture whose average age was 50.6 years. According to AO classification, type A was observed in 74 patients, type B in 24 and type C in 4. 12 patients had radial nerve palsy preoperatively. 80 patients underwent intramedullary fixations, and 20 patients underwent plate osteosynthesis. Intramedullary fixations were performed as follows: antegrade interlocking nails in 14 patients, retrograde interlocking nails in 19, Hackethal stacked nailing in 42 and Ender nailing in 5. Nonunion was demonstrated in 7 patients who underwent intramedullary fixations, including an antegrade interlocking nail in one patient, Hackethal stacked nailing in 4 and Ender nailing in 3. All patients who underwent plate osteosynthesis obtained complete bone union. Postoperative radial nerve palsy, which eventually recovered, was observed in one patient who underwent plate osteosynthesis. Based on this study, Hackethal stacked nailing and Ender nailing do not provide satisfactory stability, resulting in nonunion due to displacement of the fracture site. Therefore, interlocking nailing is the first-line method as intramedullary fixation to humeral shaft fracture. Plate osteosynthesis provides anatomical reduction and rigid stability, although some complications such as radial nerve palsy may be caused. It is important to apply adequate devices in each case individually according to the fracture type and site.

**Date : 2008-08-26**  
**Session : Shoulder and elbow: humerus and elbow fractures**  
**Time : 0900-1030**  
**Room: 404-405**

**Abstract number : 17599**

**OUR EXPERIENCE IN THE TREATMENT OF PROXIMAL HUMERUS FRACTURES - ANALYSIS OF 127 CASES**

Jaroslav BRUDNICKI, Tadeusz NIEDZWIEDZKI

*Orthopaedics and Trauma Clinic Collegium Medicum UJ, Cracow (POLAND)*

The outcomes and treatment of 127 patients with proximal humerus fractures treated in the Orthopaedics and Trauma Clinic of Collegium Medicum UJ. The following factors were considered in the assessment: age, type of fracture according to the AO and Neer classification, accompanying and previous injuries, coexisting diseases, type of treatment, participation in the rehabilitation programme, ROM in the shoulder, muscle strength in Lovett scale, personal assessment. There were 87 females and 40 males in presented group of patients. The average age was 59.8 years old (63.3 females and 48.4 males). The following methods of treatment were applied: plating with standard plates, percutaneous wire fixation, plating with LCP plates and also conservative treatment. The final assessment consisted of: detailed interview, physical examination and X-ray examination. In majority of patients we observed decreased range of motion in the injured shoulder comparing with uninjured extremity. Also some degree of pain was observed in all patients, but in majority of cases it did not affect the usual activity of patient. Proximal humerus fractures are one of most difficult and still not solved problems in trauma surgery. Due to complexity of shoulder joint stabilization should be as minimal as possible and as stable as possible. In our observations, shoulder as a hanging joint better tolerates any deformities which may occur during treatment, and functional outcome may be quite good even with poor X-ray results. All mentioned methods of treatment can lead to good functional outcomes if applied according to proper indications.



**Date : 2008-08-26**

**Session : Shoulder and elbow: humerus and elbow fractures**

**Time : 0900-1030**

**Room: 404-405**

**Abstract number : 17949**

**FIXATION OF DISTAL HUMERAL FRACTURE IN ELDERLY PATIENTS BY LOCKING COMPRESSION PLATING TECHNIQUE**

Chi Fat CHAN, TW LAU, KLF LEUNG

*Queen Mary Hospital, Hong Kong (HONG KONG)*

Fractures involving the distal part of the humerus are difficult to treat. These fractures are even worse in elderly patients with osteoporotic bone. Stable internal fixation is a pre-requisite for early mobilisation and therefore to have a better functional result. Locking compression plate is thought to be beneficial for fracture fixation with osteoporotic bone. The results of fracture distal humerus fixation by LCP in elderly patients were reviewed. From October 2001 to March 2006, 33 patients older than 60 years old with distal humerus fracture had been treated in our unit by using a locking compression plate. Those fractures involving an isolated capitellum or trochea fracture were excluded from our study. The results of this fixation were evaluated. 29 patients were available for review. 34% fracture had intra-articular involvement. The mean time to follow-up was 26 months (12 months to 72 months). The average range of motion was 91 degrees (ranged 60-150 degree). Complications included delay union, wound infection and ulna nerve symptoms were encountered. No implant related problems were noticed. Locking compression plate could provide a stable internal fixation for osteoporotic fracture involving the distal humerus. Good result and low complication rate can be achieved.

Date : 2008-08-26

Session : Shoulder and elbow: humerus and elbow fractures

Time : 0900-1030

Room: 404-405

Abstract number : 18117

**RETROGRADE INTERNAL FIXATION OF DISPLACED DISTAL EXTRAARTICULAR FRACTURES OF HUMERUS USING "HALDER HUMERAL NAIL"**

Prajwal DAS, Graham WALSH, J.A. CHAPMAN, S.C. HALDER

*Calderdale and Huddersfield NHS Trust, Halifax (UNITED KINGDOM)*

INTRODUCTION: Displaced distal humerus fractures are difficult to treat. Numerous techniques have been developed for fixation. Conventional "antigrade" nailing sometimes causes damage to the rotator cuff. This new nail is inserted by a closed retrograde technique using a special interlocking system to avoid axillary nerve and rotator cuff damage; it gives stable fixation due to its distal transverse plate, which gives better rotational stability. MATERIALS AND METHODS: Since 1997 we have treated 55 displaced extraarticular fractures of distal humerus using this device. 41 of them were widely displaced with butterfly segments, 10 of them are short spiral fractures and 4 were osteolytic lesions. The nail is inserted through the roof of the olecranon fossa leaving the rotator cuff of the shoulder free from iatrogenic injury. Proximal rotation stability is maintained by a unique "Trio Wire", which passes through the nail itself and fans out in the head of humerus. Distal rotational stability is maintained by transverse plate, which was welded on the distal end of nail. RESULTS: All the cases early pain relief was obtained with return of shoulder elbow functions. By six weeks 95% of patients could perform the majority daily tasks. No significant complications except three nonunions, which united with revision-surgery. There was average loss of extension of the elbow by 10-15 degrees. CONCLUSION: This new nail provides stable fixation of difficult humeral fractures. Early pain relief and rapid return of shoulder and elbow functions denote a successful outcome.

**Date : 2008-08-26**  
**Session : Shoulder and elbow: humerus and elbow fractures**  
**Time : 0900-1030**  
**Room: 404-405**

**Abstract number : 18273**

**HOW OFTEN IS IMPLANT REMOVAL REQUIRED FOLLOWING TENSION BAND WIRING OF OLECRANON FRACTURE?**

Praveen MEREDDY, Geraint WILLIAMS, Dakshinamoorthy SUNDERAMURTHY, Alfred MORRIS  
*Wirral University Teaching Hospital, Merseyside (UNITED KINGDOM)*

**OBJECTIVE:** To assess the outcome and implant removal rate following tension band wiring of olecranon fracture. **METHODS:** Seventy-seven patients who underwent surgical stabilisation of olecranon fracture between 2001 and 2006 were reviewed to determine the adequacy of fracture fixation, fracture union and implant removal rate. **RESULTS:** Forty-eight men and 29 women with a mean age of 52 years (range 12-94 years) were included. Injuries resulted from a fall in 67 patients and RTA in 10 patients. Mayo classification was used to categorise the fractures (Type 2a - 42, 2b - 20, 3a - 7 and 3b - 8). All fractures except one united even though the fixation was sub-optimal in eight patients. Superficial infection in six patients responded to implant removal and oral antibiotics. Delayed deep infection in one patient settled with implant removal and debridement. Twenty-two patients required implant removal between 2 and 28 months (average 11 months) for implant related symptoms. Of the 22 (30.5%) patients requiring implant removal, 14/48 (29%) were less than 60 years and 8/24 (33%) were over 60 years. Mean follow-up in asymptomatic patients was 9 months (2 to 18 months) and in symptomatic patients was 18 months (12 to 36 months). Sixty-three patients regained full range of movement. Five patients were lost to follow-up. **CONCLUSION:** Tension band wiring of olecranon fracture demonstrated satisfactory fracture union. However, approximately one in three required second surgery for implant related symptoms. Meticulous surgical technique could possibly reduce the skin irritation and hopefully reduce the implant removal rate.

Date : 2008-08-26

Session : Shoulder and elbow: humerus and elbow fractures

Time : 0900-1030

Room: 404-405

Abstract number : 18366

**FRACTURES OF ADULT DISTAL HUMERUS: A CHALLENGING RECONSTRUCTIVE DILEMMA**

A GULATI<sup>1</sup>, A K SARAN<sup>2</sup>, M K MAM<sup>2</sup>, A DIXIT<sup>3</sup>

<sup>1</sup>Nuffield Orthopaedic Centre, Oxford (UNITED KINGDOM), <sup>2</sup>Christian Medical College, Ludhiana (INDIA), <sup>3</sup>Weston General Hospital, Weston-Super-Mare (UNITED KINGDOM)

OBJECTIVE: Fractures of distal humerus in adults present challenging reconstructive dilemmas. Ever since then have been described, their best treatment has remained a subject of controversy. The purpose of this study was to compare the long-term clinical and radiological outcomes of distal humerus fractures treated by different methods. MATERIALS AND METHODS: 34 patients with fused epiphysis and isolated fracture of distal humerus were prospectively followed for up to 11 years. Fractures were classified based on the classification system of Muller et al. and the functional outcome was assessed by the criteria of Jupiter et al. Various modalities of treatment were compared. RESULTS: Range of motion (ROM) at elbow was comparable in patients treated by open reduction and internal fixation (ORIF), closed reduction and plaster (CRPOP) and skeletal traction. However, CRPOP was mainly used in patients with extraarticular fractures or minimally displaced unicondylar intra-articular fractures, while most patients treated by ORIF had displaced intra-articular fractures. Patients treated by external fixation had significantly reduced elbow ROM ( $p=0.001$ ). The duration of immobilisation was least in patients treated by ORIF (mean=11 days,  $p=0.02$ ). CONCLUSIONS: The treatment of distal humerus fractures should be selective and individualised depending on the age and functional demands of patients, character of bone and personality of the fracture. Severely comminuted fractures which do not lend themselves to surgery are best treated by mobilisation on a skeletal traction. If ORIF is contemplated, the fixation has to be stable enough to allow early physiotherapy.

**Date : 2008-08-26**

**Session : Shoulder and elbow: humerus and elbow fractures**

**Time : 0900-1030**

**Room: 404-405**

**Abstract number : 18418**

**CLOSED ANTEGRADE HUMERAL NAILING FOR DISTAL-THIRD HUMERAL SHAFT FRACTURE**

Banchong MAHAISAVARIYA

*Faculty of Medicine Siriraj Hospital Mahidol University, Bangkok (THAILAND)*

Fixation of distal humeral shaft fractures by intramedullary nail is difficult. This paper presents the trick to make closed humeral nailing procedure easier. The patient is placed in beach chair position on a radiolucent table and the C-arm image intensifier is positioned at the contralateral side with the radiation source under the table. The entry point is perforated by a small curved awl reamer at the junction between the humeral head and greater tuberosity. A 6-7mm T-reamer is used for gentle reaming after manual reduction. The appropriate AO-UHN is then inserted manually and deep enough with no any protruding of the proximal part out of the bone. Proximal locking is performed using the targeting device under fluoroscopic control. The distal locking screw is carried out using free-hand technique. Between 2001 and 2007, the authors have experienced with the method in 12 patients whose ages ranged from 15 to 66 years (average 38 years) with non pathologic fractures. The mean operation time was 29 minutes (range 15 to 40). The radiation exposure to the surgeon averaged 6.5 micro-Sievert per procedure. There was one case that had cortical splitting of the distal fragment during nail insertion which required open reduction and cerclage wiring. All patients could be follow-up with an average of 11 months (range 6 to 38 months). The range of motion of the elbow and shoulder were satisfactory with almost full range of motion at the time of last follow-up. Only one case had delay union and need revision.

**Date : 2008-08-26**

**Session : Shoulder and elbow: humerus and elbow fractures**

**Time : 0900-1030**

**Room: 404-405**

**Abstract number : 18563**

**OUR EXPERIENCE IN OPERATIVE TREATMENT OF THE HUMERAL SHAFT FRACTURES WITH LCP**

Asen BALTOV, Danail LILYANOV, Nedelcho TZACHEV, Borislav ZLATEV, Andrey IOTOV

*Military Medical Academy, Sofia (BULGARIA)*

AIM: To present our early experience in treatment of the HSF with locking plating with fixed-angle screws /LCP/. MATERIAL AND METHODS: We treated 10 male at the average age of 37 (19-80) and 7 female at the average age of 32 (17-77). The initial trauma in 11 cases was high energy. According to AO there were 4 Type A, 9 Type B and 4 Type C. Two of the cases were grade II open fracture and 5 cases with primary neurological deficit. In 2 cases MIPO technique was performed. Five cases were plated with 4.5/5.0 reconstructive LCP, ten cases with 4.5/5.0 narrow LCP and 2 cases with 3.5/4.5/5.0 LCP pro distal tibia. RESULTS: The mean operative time was 125min and blood loss 260ml. Healing occurred in 16 fractures (94%) for the average period of 90 days (75-110). Complications noted were iatrogenic nerve palsy 1 (6%), delayed union 1 (6%) with breakage of the locking screw, nonunion 1 (6%) with breakage of locking plate, shoulder impingement 1 (6%). The patients were followed up for 6 months after bone union - clinical and X-ray examinations. We rated the final functional result according to Constant-Murley score: excellent - 11, good - 4, satisfactory - 1, bad - 1. CONCLUSION: Locking plating with fixed-angle screws is an effective and safe method for treatment of HSF, providing stable fixation and early function without immobilisation and achieving high percentage of good results with low rate of complications.

**Date : 2008-08-26**

**Session : Shoulder and elbow: humerus and elbow fractures**

**Time : 0900-1030**

**Room: 404-405**

**Abstract number : 18941**

**SUPRACLAVICULAR SCALENECTOMY AND TRANSAXILLARY FIRST RIB RESECTION FOR THE TREATMENT OF THORACIC OUTLET SYNDROME**

jie XU

*orthopedics 2, Fujian Provincial Hospital, Fuzhou (CHINA)*

**OBJECTIVE:** To report supraclavicular scalenectomy and transaxillary first rib resection for the treatment of thoracic outlet syndrome. **METHODS:** Seven cases of lower plexus type of thoracic outlet compression syndrome were treated with the supraclavicular scalenectomy and transaxillary first rib resection. **RESULTS:** One year after operation, the symptoms were relieved in all of 7 cases and no recurrence. For the 4 cases with muscle atrophy of the first dorsal interosseous muscle, complete restoration was achieved in 2 cases, partial restoration in 2 cases. **CONCLUSIONS:** Supraclavicular scalenectomy and transaxillary first rib resection for the treatment of thoracic outlet syndrome, lower in recurrent rate, with concealed incision for treatment of thoracic outlet syndrome.

**Date : 2008-08-26**

**Session : Symposium - General Orthopaedics: Non-union**

**Time : 1400-1530**

**Room: 404-405**

**Abstract number : 16270**

**MANAGEMENT OF DIAPHYSEAL DELAYED AND NON-UNION**

Galal SAID

*Assiut University Hospitals, Assiut (EGYPT)*

In delayed union timely surgical intervention might be needed to augment mechanical stability and/or stimulate osteogenesis to save time and increase the chance of success. TYPES OF NONUNION: Hypertrophic nonunion: This needs stable fixation to proceed to union. Atrophic nonunion: This requires in addition to stable internal fixation, stimulation of osteogenesis by raising osteoperiosteal flaps and cancellous bone grafting. Nonunion is sometimes associated with other problems: Severe osteoporosis: I.M.N. especially in the femur is preferred. If one fragment is small, condylar plate is a good alternative. Locked plates are also a good option. Shortening: Up to 5cm shortening could be managed by acute distraction at the nonunion site and bone graft. Larger amounts need callus distraction (external lengthening). Bony defect: In addition to stable internal fixation, small defects are packed with cortico-cancellous bone graft. Larger defects need bone segment transport (internal lengthening). For defects larger than 10cm, free vascularised fibular bone graft. Infected nonunion: Sequestrectomy, alignment of the fragments and external fixator are done. Parenteral antibiotics are administered. In 10-20 days, after cessation of drainage, cancellous plasty is done. The fixator is kept until union is achieved. Reconstructive measures may be needed later on. Previously infected nonunion: after about 2-3 months, clean surgery is done. This includes excision of avascular bone and scar tissue, and stabilisation by internal or external fixation. Bone graft might be needed.



Date : 2008-08-26  
Session : General orthopaedics: Imaging techniques  
Time : 1600-1730  
Room: 404-405

Abstract number : 16434

**INTER- AND INTRAOBSERVER ERROR IN DISTAL FEMUR TRANSEPICONDYLAR AXIS MEASUREMENT WITH COMPUTED TOMOGRAPHY**

Wai Hung LIE<sup>1</sup>, Wai Pan YAU<sup>2</sup>, Kwong Yuen CHIU<sup>2</sup>, Hon Bong LEUNG<sup>1</sup>, Lei Sha WONG<sup>1</sup>, Ho Man WONG<sup>1</sup>

<sup>1</sup>Queen Mary Hospital, Hong Kong (CHINA), <sup>2</sup>Queen Mary Hospital, The University of Hong Kong, Hong Kong (CHINA)

**INTRODUCTION:** Correct rotational alignment of the femoral component in total knee replacement is essential for satisfactory patellar tracking. Measurement of the rotation of the femoral components by computed tomography (CT) with reference to the transepicondylar axis (TEA) is regarded as the gold standard in most reports. However, the paucity of evidence validating the accuracy of it is surprising. **METHODS:** On 2 separate occasions at least 1 week apart, 6 independent observers (4 orthopaedic surgeons and 2 radiologists) studied the inter- and intraobserver error in identification of the TEA using CT in 10 cadaveric knees. The angle between TEA and posterior condylar line was measured in both conventional two-dimensional axial CT images and three-dimensional CT reconstruction images. The reference surgical TEA was established by dissection of specimens. **RESULTS:** We found an average error of 2.6° (external rotation) when the TEA was identified by CT. The error was significantly smaller when it was identified by using a conventional axial image than when a three-dimensional reconstruction image was used ( $P < 0.001$ ; paired t-test). No significant intraobserver error ( $P = 0.814$ ; Wilcoxon rank test) was found when the measurement was performed using conventional two-dimensional CT images. However, significant interobserver difference was evident ( $P < 0.001$ ; Friedman test). **DISCUSSION AND CONCLUSION:** The average error in identification of the TEA by CT is 2.6° external rotation. The use of three-dimensional reconstruction images did not provide any additional benefit over the two-dimensional CT measurement; we observed significant interobserver differences with it.

**Date : 2008-08-26**  
**Session : General orthopaedics: Imaging techniques**  
**Time : 1600-1730**  
**Room: 404-405**

**Abstract number : 16842**  
**COMPUTER RELATED MUSCULOSKELETAL INJURIES**

Surendra KAMATH  
*Kasturba Medical College, Dept. of Orthopaedics, Mangalore (INDIA)*

Repetitive Stress Injury can be truly regarded as a modern day epidemic, a gift of industrialization. We have done a study to find the prevalence of musculoskeletal injuries in computer professionals with the aim to present data on the problem. The initial data were collected by a self-administered questionnaire inquiring about years of work and per day working hours, symptomatology with their duration and severity, their own appreciation of work output. These individuals were assessed according to their symptomatology, relevant investigations and different modalities of treatment were advised. The study was conducted in one of the leading information technology company in Mangalore. A total of 1159 questionnaires were collected. 624 (53.8%) had at least one positive symptom. 46.6% had stage 1 symptoms, 38.5% had stage 2 and 8.1% had stage 3 symptoms at the time of presentation. 206 patients were examined clinically by the senior author and a definitive clinicoanatomical diagnosis could be made only in 43 patients. Median age in our study group was 24 years. 22.17% (98) of positive patients concluded decrease work output due to their symptoms, but only 11.3% (50) patients had consulted a doctor. 204 patients (46.15%) contributed their symptoms to an ill designed workstation. We conclude that repetitive stress injuries are a definitive problem in computer professionals. The median age in our study group was lower than many international studies. Nearly half of these patients were in stage 2 and stage 3 at presentation.

**Date : 2008-08-26**  
**Session : General orthopaedics: Imaging techniques**  
**Time : 1600-1730**  
**Room: 404-405**

**Abstract number : 17559**

**RESURFACING ARTHROPLASTY USING A COMPUTER-ASSISTED HIP NAVIGATION SYSTEM**

Kang-II KIM, Myung-Chul YOO, Yoon-Je CHO, Kee-Hyung RHYU, Young-Soo CHUN  
*Center for Joint Disease, East-West Neo Medical Center, Kyung Hee University, Seoul (KOREA)*

The exact alignment of the femoral component is crucial for the success of hip resurfacing. The purpose of this study was to verify the efficacy of an imageless navigation system for the positioning of the femoral component in hip resurfacing compared to a conventional-mechanical guided system. A randomized prospective study of two groups of 20 patients each was performed with Birmingham hip resurfacing system. In the conventional group, femoral component positioning was assisted by mechanical alignment guides and in the navigation group, femoral component positioning was assisted by imageless computer-assisted surgical system of Vectorvision®. We measured the operation time, ROM, and the difference between the preoperative plan of femoral component's position and postoperative results on X-rays in two groups. In the conventional group, a median difference of stem alignment was 5.4° (0°-10.7°) and a median difference of stem anteversion was 2.6° (0°-6.5°). In the navigated group, a median difference of stem alignment was 2.3° (0°-4.3°) and a median difference of stem anteversion was 1.0° (0°-3.5°). These differences of the 2 groups were statistically significant ( $P < 0.05$ ). The average operation time was measured 144 minutes in the conventional group and 140 minutes in the navigation group ( $P > 0.05$ ). There was no significant difference in ROM between the 2 groups. In resurfacing with a hip navigation, the procedure showed a good performance and reliability. It is achieved with greater precision with a navigation system than a mechanical alignment system.

Date : 2008-08-26  
Session : General orthopaedics: Imaging techniques  
Time : 1600-1730  
Room: 404-405

Abstract number : 17808

**MEASUREMENT PRECISION OF A SEMI-AUTOMATED METHOD FOR PAIRED IMAGE CARTILAGE SEGMENTATION**

Matthias H. BREM<sup>1</sup>, Philipp LANG<sup>2</sup>, Philipp SCHLECHTWEG<sup>3</sup>, Gesa NEUMANN<sup>2</sup>, Erika SCHNEIDER<sup>4</sup>, R. JACKSON<sup>5</sup>, J. YU<sup>5</sup>, CB EATON<sup>6</sup>, Friedrich F. HENNIG<sup>1</sup>, G. PAPPAS<sup>2</sup>, Hiroshi YOSHIOKA<sup>2</sup>, Jeffrey DURYEA<sup>2</sup>

<sup>1</sup>Friedrich-Alexander University Erlangen-Nuremberg, Division of Trauma and Orthopaedic Surgery, Erlangen (GERMANY),  
<sup>2</sup>Department of Radiology, Brigham and Women's Hospital, Harvard Medical School, Boston, MA (UNITED STATES), <sup>3</sup>Department of Neuroradiology, Friedrich-Alexander University Erlangen-Nuremberg, Erlangen (GERMANY), <sup>4</sup>SciTrials, LLC, Rocky River, OH and The Cleveland Clinic, Imaging Institute, Cleveland, OH (UNITED STATES), <sup>5</sup>The Ohio State University, Dept. Endocrinology, Diabetes and Metabolism and Radiology, Columbus, OH (UNITED STATES), <sup>6</sup>Memorial Hospital of Rhode Island, Center for Primary Care and Prevention and the Warren Alpert Medical School of Brown University, Providence, RI (UNITED STATES)

**PURPOSE:** To evaluate test-retest analysis precision of a semi-automated cartilage segmentation software tool modified to quantify paired images for eventual use in longitudinal studies of knee OA. **METHODS:** Test-retest knee MR images of 12 subjects (6 healthy, 6 with knee osteoarthritis (OA)) from an Osteoarthritis Initiative pilot study were obtained after removing the subject from the magnet between scans. 3D DESS (sagittal, 0.456mm x 0.365mm, 0.7mm slice thickness, TR 16.5msec, TE 4.7msec) images were obtained on a 3T Siemens Trio with a USA Instruments quadrature transmit-receive extremity coil. Segmentation of one 3D image series was performed; the corresponding retest series was segmented by viewing both image series concurrently in two adjacent windows. After manual registration of the series, the first segmentation served as an initial estimate of the second segmentation. We evaluated cartilage morphometry measures of bone and cartilage surface area (AB/AC), cartilage volume (VC) and mean thickness (ThC.me) for medial/lateral tibia (MT/LT), total femur (F) and patella (P). Test-retest reproducibility was assessed using the root-mean square coefficient of variation (RMS-CV). **RESULTS:** For the paired analyses test-retest RMS-CV ranged from 0.9%-1.2% for VC, from 0.3%-0.7% for AC, from 0.6%-2.7% for AB and 0.8%-1.5% ThC.me. **CONCLUSION:** Paired image analysis improves the measurement precision of cartilage segmentation. Our results are in agreement with that of other authors supporting use of paired analysis for longitudinal studies of knee OA.

**Date : 2008-08-26**  
**Session : General orthopaedics: Imaging techniques**  
**Time : 1600-1730**  
**Room: 404-405**

**Abstract number : 18801**

**A NEW TYPE OF OSSEOINTEGRATED PROSTHESIS FOR THE REHABILITATION OF TRAUMATIC AMPUTEES: THE PÉCS EXPERIENCE**

O. MÓRICZ, Zoltán NYÁRÁDY, T. MÁTHÉ, József NYÁRÁDY  
*University of Pécs, Pécs (HUNGARY)*

Direct anchorage of lower-limb prosthesis to the bone through an implanted fixation (osseointegration) has been suggested as an excellent alternative for amputees experiencing complications from use of conventional socket-type prosthesis. The osseointegrated lower-limb prostheses, developed by Rickard Branemark, are used from 1990's. The foundation of the technique, osseointegration is well-documented. It is a widely accepted method in dentistry from 1965. After implantation, bone develops a direct connection to the titanium surface of the prostheses, without intervening connective tissue. After a healing period, following the implantation of the intramedullary component, in a second surgery the transcutaneous part of the prosthesis is inserted, and rehabilitation of the patient begins. Between June 2005 and January 2006, 4 patients were operated on with osseointegrated intramedullary femoral lower-limb prostheses in our department. In this paper we are to share and introduce our experiences with this operative and rehabilitation of intramedullary osseointegrated prostheses.

Date : 2008-08-26  
Session : Foot and ankle: Hindfoot  
Time : 0900-1030  
Room: 406-407

Abstract number : 15834

**MID-TERM RESULTS OF TOTAL ANKLE PROSTHESES IN RHEUMATOID ARTHROPATHY**

Huub VAN DER HEIDE<sup>1</sup>, Bernard SCHUTTE<sup>2</sup>, Jan Willem LOUWERENS<sup>2</sup>, Frank VAN DEN HOOGEN<sup>2</sup>, Maarten DE WAAL MALEFIJT<sup>1</sup>  
<sup>1</sup>Radboud University Nijmegen Medical Centre, Nijmegen (NETHERLANDS), <sup>2</sup>Maartenskliniek, Nijmegen (NETHERLANDS)

BACKGROUND: The standard treatment for end-stage arthritis of the ankle joint due to Rheumatoid Arthritis (RA) has been an ankle fusion. Total ankle replacement (TAR) had a very poor reputation especially due to early loosening. However, in RA the loss of motion of the ankle joint after fusion has some disadvantages and in recent years much progress has been made in TAR. This study was undertaken to evaluate all TARs implanted with Rheumatoid Arthritis (RA) as indication. PATIENTS AND METHODS: 58 total ankle prostheses were implanted in patients with Rheumatoid Arthritis (n=53) or Juvenile Inflammatory Arthritis (n=5) in 54 patients (4 bilateral). After a mean follow-up of 2.7 (range 1-9) years all patients were reviewed by two orthopaedic surgeons. Standard AP and lateral X-rays were made and a Kofoed ankle score was obtained; this is a clinical score ranging from 0-100. RESULTS: Two patients died of an unrelated cause, from the 52 patients (56 prostheses) who were alive, 51 implants (91%) were still in place after a mean follow up of 2.7 years (range 1-9 years) and showed no sign of loosening on the latest X-ray. The mean Kofoed ankle score at follow-up was 72.8 points (SD 16.2, range 21-92). Four patients showed a poor result (kofoed ankle score <50). The main reason for removal of the implant was infection. CONCLUSION: Midterm results of the currently used type TAR are satisfactory; the main reason for failure of the implant was infection.

**Date : 2008-08-26**  
**Session : Foot and ankle: Hindfoot**  
**Time : 0900-1030**  
**Room: 406-407**

**Abstract number : 15979**

**TREATMENT OF A UNICAMERAL BONE CYST OF CALCANEUS WITH ENDOSCOPIC CURETTAGE AND PERCUTANEOUS FILLING WITH CORTICOCANCELLOUS ALLOGRAFT**

Cengiz YILDIRIM<sup>1</sup>, Kenan KEKLIKCI<sup>2</sup>, Mahir MAHIROGULLARI<sup>2</sup>, Ahmet KIRAL<sup>2</sup>, Fatih ÜNÜVAR<sup>1</sup>, Mesih KUSKUCU<sup>2</sup>

<sup>1</sup>Ankara Mevki Military Hospital, Ankara (TURKEY), <sup>2</sup>Gülhane Military Medical Academy, Istanbul (TURKEY)

Simple bone cysts of the calcaneus are relatively uncommon. There is no clear consensus on either their etiology or management. In most cases, these lesions are asymptomatic and can be treated conservatively. Pathological fractures of such cysts are exceptionally rare. The traditional method of treating unicameral cysts has been curettage with or without bone grafting. Aspiration of the cyst followed by instillation of methylprednisolone has been found to produce satisfactory results. Surgical management is indicated when the lesion is symptomatic or if proximity to cortical bone threatens fracture. In such cases, curettage with subsequent autologous bone grafting or filling with corticocancellous allograft is typically performed. Corticocancellous allograft have been shown to have comparable results with autografts when used to fill cancellous bone defects, and their use obviates the need for harvesting autogenous bone graft and eliminates problems associated with donor site morbidity. We report a case wherein a different surgical intervention was used to treat a symptomatic unicameral cyst of the calcaneus with endoscopic curettage and percutaneous filling of the lesion with corticocancellous allograft. A 21-year-old man presented with pain in the left heel. Plain radiographs and computerized tomography revealed a unicameral cyst of the calcaneus. Endoscopic curettage of the lesion and endoscopically assisted filling of the lesion with corticocancellous allograft were performed. After 10 months, no recurrence was noted and the patient was symptom free. This approach to the surgical treatment of a unicameral calcaneal cyst appears to be unique in the literature.

**Date : 2008-08-26**  
**Session : Foot and ankle: Hindfoot**  
**Time : 0900-1030**  
**Room: 406-407**

**Abstract number : 16444**

**TALUS NECROSIS FOLLOWING ANKLE-ARTHRODESIS: FAIRY TALE OR REAL DANGER?!**

Sven JUNG, Marlon COULIBALY

*Department of Trauma Surgery, BG Kliniken Bergmannsheil, Ruhr-University, Bochum (GERMANY)*

**PROBLEM:** Talus necrosis following upper ankle arthrodesis done with screws and an additional plate is reported to be one of the major complications with an incident up to 2% of the cases. This is significant higher than in other practised methods. Therefore, we surveyed if this otherwise very reliable method is so insecure. **STUDY:** At least 115 arthrodesis of the upper ankle joint performed with at least to screws and an additional plate have been surveyed. Follow-up time was 48 to 72 months. In those operated method the rate of revision surgery especially concerning the talus, nonunions and functional ability were surveyed. **RESULTS:** The reviewed patients consisted of 68 male and 47 female with an average age of  $58 \pm 17$  years. A necrosis of the talus was seen in none of the revisited cases. Complications could be seen in 12% of the cases, in 6 percent a nonunion of the upper ankle joint. The functional ability rated in the AOFOS-Score is good to very good. **CONCLUSION:** The arthrodesis of the upper ankle joint performed with screws and an additional plate is a reliable method in which no significant higher rate of talus necrosis is seen. The achieved functional ability and the rate of nonunions are comparable to other practised methods.



**Date : 2008-08-26**  
**Session : Foot and ankle: misc**  
**Time : 0900-1030**  
**Room: 406-407**

**Abstract number : 16516**

**MADURA FOOT, REPORT OF A RARE DISEASE**

Sarper GURSU, Bilal DEMIR, Kerem AYDIN, Timur YILDIRIM, Vedat SAHIN

*Baltalimani Metin Sabanci Bone and Joint Diseases Education and Research Hospital, Istanbul (TURKEY)*

Maduramycosis is a rare chronic disease forming nodular swellings and multiple draining sinuses. It may either be caused by a bacteria or a fungus. In this study we are reporting our experience about a case with mycotic Madura foot. A 65-year-old woman presented with subcutaneous nodular swellings and multiple draining sinuses on her right foot. The patient had a habit of barefeet walking in her village and she had a difficulty in wearing her shoes. The x-rays revealed severe destruction of both the metatarsal and the tarsal bones as well. An MRI was performed and the findings were fitting with the x-rays. After an open biopsy the specimen obtained was submitted for cultures. After 12 days of incubation at room temperature *madurella grisea* was isolated. With a second operation an extensive debridement of the infected tissues was made. The fistulas were excised. Antifungal drug therapy was started on the first postoperative day for 4 months. 6 months after the first operation another debridement was necessary because of local recurrence with a draining sinus. Antifungal therapy was administrated for another 3 months. It has been 3 years after the last operation and there is no sign of another recurrence and the patient is functioning rather well. Madura foot is a rather rare disease. Treatment of fungal mycetomas is often unsatisfactory. The important points for better results are; early diagnosis, an adequate debridement and a careful follow-up.

Date : 2008-08-26  
Session : Foot and ankle: Ankle  
Time : 0900-1030  
Room: 406-407

Abstract number : 16557

**LONG-TERM RESULTS OF SURGICAL TREATMENT OF ACHILLES TENDON RUPTURE USING THE PERCUTANEOUS TECHNIQUE**

Marek SYNDER, Andrzej GRZEGORZEWSKI  
*Medical University, Lodz (POLAND)*

In the treatment of Achilles tendon injury, surgical methods are superior because of restoring the natural tension of the muscle and relieving the patient from long-term cast immobilization. There is no single, uniformly accepted surgical technique for Achilles tendon repair. The purpose of our study was to present long-term clinical and functional results in patients treated because of subcutaneous Achilles tendon rupture using the percutaneous surgical technique. MATERIAL AND METHODS: During the years 1989-2007, 135 subcutaneous Achilles tendon ruptures were treated in our Institution, employing the percutaneous technique. There were 95 men and 40 women at the average age of 38 years. All of those patients were surgically treated in the first 1-3 days after injury. The mean follow-up period was 12 years. RESULTS: The final examinations revealed 96% of very good and good results and only 4% satisfactory. There were no poor results. We did not observe either any complications or rerupture of the tendon or any other disturbances associated with this technique. The patients' satisfaction after surgery was very high. During the last 5 years, this method has been performed at outpatient clinic, sparing the patient hospitalization stress and reducing the general costs of treatment. CONCLUSIONS: Attempting a comprehensive history and physical examination, the orthopaedic surgeon can select the most appropriate treatment option, including the surgical technique to maximize the functional outcome of affected region. The percutaneous technique seems to be a good recommendation for fresh subcutaneous Achilles tendon ruptures.

**Date : 2008-08-26**  
**Session : Foot and ankle: Ankle**  
**Time : 0900-1030**  
**Room: 406-407**

**Abstract number : 17112**

**COMPARISON OF OUTCOME FOLLOWING EITHER ONE OR TWO SCREWS FOR MEDIAL MALLEOLAR FRACTURE FIXATION**

Yousaf SHAH, Turab SYED, Tomasz MYSZEWSKI, Fauzia ZAFAR, Andrew FLOYD, Martin WETHERILL  
*Milton Keynes General Hospital, Milton Keynes (UNITED KINGDOM)*

**INTRODUCTION:** Ankle fractures are common in trauma practice. Traditional teaching is to use two screws for medial malleolar fixation for better rotational control. However, the evidence for this is limited. This study compares the outcome following either one or two screws for medial malleolar fracture fixation. **MATERIALS AND METHODS:** Retrospective analysis of case notes and x-rays of medial malleolar fracture fixations performed between 2002 and 2007. Two groups were formed with either one or two screw fixation, respectively. Both groups were age and sex matched. Fracture pattern and its orientation, position of screw in relation to fracture, post-operative displacement and union were assessed. **RESULTS:** There were 76 patients (group-I, 37 and group-II, 39), mostly females with ages between 19 and 84 years. In group-I, 15 patients had bi-malleolar Dennis-Webber type-B fractures, 9 had type-C and 10 had tri-malleolar fractures. 3 had uni-malleolar fractures. In group-II, 20 patients had bi-malleolar type-B fractures, 9 had type-C fractures and there were 5 tri-malleolar fractures. 5 had uni-malleolar fractures. The fracture orientation in both the groups was mostly horizontal and the screw placement was at an angle to the fracture in the majority of cases in both of them. There was no significant difference between the two groups, in terms of clinical union, post-operative fracture displacement and return of patients to their pre-injury level of activity. **CONCLUSION:** Medial malleolar fractures can be efficiently fixed with one screw only, which does not increase the risk of post-operative fracture fragment displacement, compared to using two screws.

**Date : 2008-08-26**  
**Session : Foot and ankle: Hindfoot**  
**Time : 0900-1030**  
**Room: 406-407**

**Abstract number : 17367**

**JAPAS' OSTEOTOMY FOR THE CORRECTION OF POST POLIO PES CAVUS DEFORMITY IN ADOLESCENT AGE GROUP**

Prottyush CHATTERJEE

*Rehabilitation Centre for Children, Calcutta (INDIA)*

Pes cavus is an ugly deformity of the foot, particularly when they present at adolescence. Idiopathic cases can be treated satisfactorily with corrective shoes, or foot exercises, provided the deformity is diagnosed early. But in post polio cases, the deformity progressively increases due to progressive contracture of the tendo achilles and plantar fascia. Operative correction is imperative in these patients. We present our series of 18 patients of pes cavus in adolescent age group, treated by Japas' V-osteotomy of the tarsus. The operations were done during the period March 1997 - March 2005 (8 years; mean follow-up 5.4 years); the age of the patients ranged from 8.6 to 15 years (mean 11.3); 10 were boys and 8 girls. All had unilateral involvement, and all were post polio cases. 2 patients did not turn up for follow-up. In the remaining 16 patients, the parents and the patients were largely happy. They were able to wear normal footwear, because the deformity had been corrected, and the gait was satisfactory. But the feet were stiff at the midtarsal level. 4 patients had ugly scar, following keloid formation. None had discrepancy in the size of the feet. Japas' osteotomy is a satisfactory option for correction of pes cavus deformity in adolescents. Although polio is almost extinct from the World, post polio residual paralysis cases pose a formidable challenge in the developing World, and will continue to remain so in the coming few years.

**Date : 2008-08-26**  
**Session : Foot and ankle: Ankle**  
**Time : 0900-1030**  
**Room: 406-407**

**Abstract number : 17812**

**FIBULAR LOCKED INTRAMEDULLARY NAIL FIXATION FOR ANKLE FRACTURE - A SUITABLE OPTION**

Gautam J K TAWARI, Rajeshkumar KAKWANI, Rajeev AYSHA, Shankar KASHYAP  
*Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM)*

**INTRODUCTION:** Intramedullary devices like Rush pins and recently flexible titanium nails have been tried for fixation of unstable lateral malleolar fractures. We describe our experience with interlocking fibular intramedullary nail for the treatment of lateral malleolar ankle fracture. **METHODS AND MATERIAL:** A series of 21 consecutive fibular interlocking nails used for lateral malleolar ankle fracture were included in this retrospective study. The minimum follow-up period was 12 weeks. Post operative management of the patients was identical to routine lateral malleolar fracture fixation with plate and screws. Clinical and radiographic reviews were performed at 2, 6 and 12 weeks. **RESULTS:** The study involved 13 females and 8 males with an average age of 56.6 years (age range 33-89 yrs). The average operating time was 22min (+/- 6.1min). There was 100% union rate, no incidence of infection or loss of fracture reduction. **CONCLUSION:** Fibular interlock nail is an effective alternative to routine invasive internal fixation. They pose advantages by having a shorter learning curve and respect the fracture biology due to its minimally invasive technique. In contrast to titanium flexible nails and rush pins they provide rotational stability because of the distal locking provided and also prevent valgus/varus displacement. A theoretical concern on proximal locking of the nail was identified but this was found to be of no clinical significance in our study.

Date : 2008-08-26  
Session : Foot and ankle: Ankle  
Time : 0900-1030  
Room: 406-407

Abstract number : 17860

**EVALUATION OF THE ARTICULAR CARTILAGE OF THE ANKLE USING DELAYED GADOLINIUM - ENHANCED MR IMAGING OF CARTILAGE**

Takeshi YAMASHITA, Atsuya WATANABE, Nobuhiro MATSUMOTO, Tomoaki TOYONE, Yuichi WADA  
*Teikyo university Chiba medical center, Ichihara city (JAPAN)*

OBJECTIVES: The objectives of this study were to evaluate the articular cartilage lesion due to the chronic lateral ankle instability noninvasively using dGEMRIC, and correlate between MRI and arthroscopic examination. METHODS: Two cases of anterior talofibular ligament (ATFL) reconstruction using gracilis tendon graft, which were operated for the chronic lateral ankle instability, were examined. After injection of the gadolinium, dGEMRIC was performed to show the colour image of the articular cartilage layers of distal tibia and talus, pre and post operation. GAG concentrations of cartilage lesions were calculated by gadolinium (MRI) concentrations. Arthroscopic examination was performed prior to ATFL reconstruction with ICRS articular cartilage injury grading system. RESULTS: In both cases, cartilage lesion was detected in the distal tibia using dGEMRIC before the operation. Arthroscopic findings showed ICRS grade II and grade III cartilage lesions, which were also observed in dGEMRIC as low GAG concentration areas. In one case with grade III cartilage lesion, drilling was performed as a mesenchymal stimulating method to form fibrocartilage. CONCLUSIONS: This study suggested that dGEMRIC had the potential to detect the cartilage lesions of the ankle even in an early stage. For the clinical application of cartilage repair techniques, our evaluation method using MR imaging may be useful for observing the maturation process and long-term durability of reparative cartilage noninvasively.

**Date : 2008-08-26**  
**Session : Foot and ankle: Hindfoot**  
**Time : 0900-1030**  
**Room: 406-407**

**Abstract number : 18618**

**EXTENSOR TENDON TRANSFER OF THE ANKLE USING BIOTENODESIS SCREW TECHNIQUE**

Chi Yuk LAU<sup>1</sup>, Alexander CHOI<sup>1</sup>, Ngai Chung KWOK<sup>2</sup>

<sup>1</sup>*Tuen Mun Hospital, Hong Kong (HONG KONG)*, <sup>2</sup>*Dept O&T, Hong Kong (HONG KONG)*

Loss or imbalance of ankle dorsiflexor is a common sequel of many neuromuscular diseases affecting the lower limb. We explored the use of Biotenodesis screw as interference fixation of the transferred tendon for such reconstruction. From 5/1/2007 to 4/1/2008, a total of 7 patients underwent extensor tendon transfers in 8 feet. The goal is to improve ankle dorsiflexion in swing phase and balance foot during heel strike. The procedure was combined with other soft tissue procedure and/or osteotomy to achieve a one-stage reconstruction. The transferred tendon was tailored to the optimal length and passed into a 5mm pre-drilled bone tunnel. Correct tensioning was achieved by pulling a holding suture through the sole. 4.75mm Biotenodesis screw was chosen as interference fixation for its ease of use, strength and biocompatibility. A knot was further secured over a cushioned button in the sole without extra tensioning. A short leg walking cast was applied. The mean age is 17 years old (11-42 years old). Split tibialis anterior was transferred to the cuboid (n=3). Extensor hallucis longus was transferred to first metatarsal (n=4) and lateral cuneiform (n=1). All patients are allowed to have partial weight bearing walking except when osteotomy was performed. The mean duration of cast immobilisation was 40 days (n=6). On follow-up all transferred tendons provide the desirable action as planned preoperatively. No wound infection or ulceration detected. The use of Biotenodesis screw has facilitated tendon transfer in the foot and subsequent rehabilitation.

**Date : 2008-08-26**  
**Session : Symposium - Foot & Ankle: Trauma**  
**Time : 1100-1215**  
**Room: 406-407**

**Abstract number : 18165**

**TRIMALLEOLAR ANKLE FRACTURES WITH SYNDESMOTIC INJURIES, A HIGH RISK ASSOCIATION**

Thami BENZAKOUR, Abderrazak HEFTI, Mohamed LEMSEFFER, Ahmed BENZAKOUR  
*Zerkouni Orthopaedic Clinic, Casablanca (MOROCCO)*

**INTRODUCTION:** Reports on surgical treatment and long term follow-up outcome after trimalleolar fractures with ankle syndesmotiic injuries and on how bad is prognosis in case of this association. **MATERIALS AND METHODS:** 82 patients were available for evaluation (follow-up 12.9). Average age is 39.6 years. Weber-A.O. type B: 50 cases including 6 syndesmotiic lesions, type C: 32 cases, with syndesmotiic lesions. Before syndesmosis screwing, our patients had internal fixation of malleoli by screws, wires or plates. **RESULTS:** A scoring system including clinical and radiological exams assesses the outcome of fractures, any instability of syndesmosis and osteoarthritis. As far as the syndesmosis could be considered as a virtual forth malleolus because of its apical topography, it seems then logical that it should be also well reduced and fixed. This is related to the significant adequacy found between the initial reduction of the syndesmosis and its late complications such as stability and arthritis. Global results look quite better in absence of syndesmotiic injury. - Group 1: 44 ankles without syndesmotiic lesions: good and very good are 72.7%, fair is 20.4% and poor is 6.8%. - Group 2: 38 ankles with syndesmotiic lesions showing good and very good in 57.9%, fair in 23.7% and poor in 18.4%. **CONCLUSIONS:** - Syndesmotiic injuries aggravate trimalleolar ankle fractures and require their accurate reduction and fixation. - We could then reduce the risks of instability and range of motion loss, and also avoid or delay arthritis changes.



**Date : 2008-08-26**  
**Session : Foot and ankle: Forefoot**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 15444**

**FIXATION OF MITCHELL OSTEOTOMY WITH BIOABSORBABLE PINS FOR TREATMENT OF HALLUX VALGUS DEFORMITY**

Nicolas EFSTATHOPOULOS, Dimitrios KORRES, Fragiskos XYPNITOS, Stergios LALLOS, Vassilios NIKOLAOU  
*2nd Department of Orthopaedics - Athens University, Athens (GREECE)*

INTRODUCTION: This study presents the outcome of the use of bioabsorbable pins in Mitchell's osteotomy for the treatment of Hallux Valgus deformity. PATIENTS AND METHODS: 25 patients (36 feet) were treated between 2004 and 2006 suffering of Hallux Valgus. 11 patients (17 feet) had concomitant deformities (metatarsalgia - hammer toes) and were treated at the same session. We used pins made of poly-p-dioxanone in fixation of Mitchell's osteotomy. Hallux valgus angle, intermetatarsal angle and the AOFAS' hallux - metatarsophalangeal - interphalangeal score were measured preoperatively and postoperatively. Sterile sinus formation, infection, osteolysis and fixation failure were evaluated clinically and radiographically. RESULTS: The mean follow-up was 24 months (range: 12-36 months). The average hallux valgus angle significantly decreased from  $19.4\pm 5.2$  to  $6.3\pm 6.0$  while the intermetatarsal angle significantly decreased from  $13\pm 2.1$  to  $9\pm 1.8$ . The preoperative AOFAS' hallux - metatarsophalangeal - interphalangeal score averaged  $42.1\pm 13.2$  which increased significantly to  $89.3\pm 11.8$  postoperatively ( $p < 0.001$ ). No sinus formation, infection, osteolysis or fixation failure was reported until the time of the latest follow-up. CONCLUSIONS: We believe that bioabsorbable pins can be used for fixation of Mitchell's osteotomy because clinical results and patient satisfaction are excellent or very good.

**Date : 2008-08-26**  
**Session : Foot and ankle: Forefoot**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 15846**

**MANAGEMENT OF DIABETIC FOOT BY NATURAL HONEY**

Asad MAKHDOOM

*Liaquat University of Medical & Health Sciences Jamshoro, hyderabad (PAKISTAN)*

Honey has antibacterial activity in vitro, and a small number of clinical case studies have shown that application of honey to severely infected cutaneous wounds is capable of clearing infection from the wound and improving tissue healing. Research has also indicated that honey may possess anti-inflammatory activity and stimulate immune responses within a wound. The overall effect is to reduce infection and to enhance wound healing in burns, ulcers, and other cutaneous wounds. AIMS OF STUDY: To find out the results of topical wound dressings in diabetic wounds with natural honey. MATERIALS AND METHODS: The study was conducted at department of Orthopaedics unit 1 Liaquat University of Medical & Health Sciences Jamshoro from July 2006 to June 2007. Total number of patients was 12 with 14 feet. There was no age limit and the study did not impose any gender bar. There were 08 males and 04 females. All the patients were assessed on the basis of Wagner's grading system for diabetic foot. Initially all wounds were washed thoroughly and necrotic tissues removed and dressings with honey were applied and continued up to healing of wounds. All wounds healed well and only one patient went into amputation. CONCLUSION: Screening programs and foot care education is of paramount importance to decrease the amputation rate and mortality. Natural honey is one of the best topical dressings to prevent the amputations of diabetic foot.

**Date : 2008-08-26**  
**Session : Foot and ankle: Forefoot**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 16295**

**RESECTION ARTHROPLASTY WITH AND WITHOUT CAPSULAR INTERPOSITION FOR TREATMENT OF SEVERE HALLUX RIGIDUS**

Roland MEIZER<sup>1</sup>, Siegfried SCHENK<sup>2</sup>, Rudolf KRAMER<sup>1</sup>, Nicolas AIGNER<sup>1</sup>, Elisabeth MEIZER<sup>3</sup>, Franz LANDSIEDL<sup>1</sup>, Gunther STEINBOECK<sup>1</sup>

<sup>1</sup>*Orthopaedic Hospital Vienna-Speising, Vienna (AUSTRIA)*, <sup>2</sup>*Herz-Jesu Krankenhaus, Vienna (AUSTRIA)*, <sup>3</sup>*Medical University of Vienna, Vienna (AUSTRIA)*

Resection arthroplasty - known as "Keller procedure" - is used for treatment of severe hallux rigidus. As a modification of this procedure, resection arthroplasty is combined with cheilectomy and interposition of the dorsal capsule and extensor hallucis brevis tendon, which are then sutured to the flexor hallucis brevis tendon on the plantar side of the joint (capsular interposition arthroplasty). In this study the clinical and radiological outcome of 22 feet treated with interposition arthroplasty were investigated and compared to 30 feet on which the Keller procedure was performed. The mean follow-up period was 15 months. No statistically significant difference was found between both groups concerning patient's satisfaction, clinical outcome and increase in range of motion of the first metatarsophalangeal joint. At follow-up, patients who had undergone interposition arthroplasty did not show statistically significant better AOFAS forefoot-scores compared to the Keller procedure group. A high rate of osteonecrosis of the first metatarsal head was found in both groups. These radiological findings did not correlate with the clinical outcome at follow-up. In conclusion, no significant benefit in clinical or radiological outcome was found for capsular interposition arthroplasty compared to the Keller procedure.

Date : 2008-08-26  
Session : Foot and ankle: Forefoot  
Time : 1400-1530  
Room: 406-407

Abstract number : 16614

**RETROSPECTIVE STUDY AFTER SURGICAL CORRECTION OF HALLUX VALGUS DEFORMITY USING A SUBCAPITAL METATARSAL OSTEOTOMY WITH AN INTRAMEDULLARY DYNAMIC OSTEOSYNTHESIS**

Carl KOLVENBACH, Alexander OLK, Friedrich Frank HENNIG, Matthias BLANKE  
*University Hospital Erlangen, Dept. of Trauma and Orthopedic Surgery, Erlangen (GERMANY)*

INTRODUCTION: The aim of that study was to examine the efficiency of the subcapital metatarsal osteotomy in combination with a dynamic osteosynthesis with regard to the adjustment of the Hallux valgus deformity. MATERIAL AND METHODS: Between 2003 and 2007, 133 feet with Hallux valgus deformity have been operated in our Department using the metatarsal osteotomy according to Stoffella. The patient population comprises 83 women (125 Feet) and 6 men (8 Feet) with a mean age of 54.9 years. Object of analysis were x-rays in a.p. and lateral radiation done under full weight bearing conditions. The Hallux valgus-angle and the 1st-2nd intermetatarsal-angle were compared pre- and postoperational in 133 cases on these x-rays. RESULTS: The Hallux valgus-angle was minimized postoperationally at an average of 23.8° to an physiological angle (8.9°). The 1st-2nd intermetatarsal-angle could be minimized at an average of 8° to an average of 6.1°. Using the paired t-test there was a significant improvement of the postoperational Hallux valgus-angle as for the 1st-2nd intermetatarsal-angle. In an variance analysis (ANOVA) a statistic significant influence on the patient's age could not be found for both of these angles. CONCLUSION: The subcapital metatarsal osteotomy in combination with a dynamic osteosynthesis is an established method to correct the deformity of the Hallux valgus. It could be used in a wide range of conditions from gentle to severe deformities. The measurements done in that study showed significantly good results with no higher rate of complications.

**Date : 2008-08-26**  
**Session : Foot and ankle: Forefoot**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 17411**

**100 HALLUX VALGUS TREATED BY THE PERCUTANEOUS TECHNIQUE OF BÖSCH. PROSPECTIVE CLINICAL STUDY OF THE HEALING OF THE OSTEOTOMY**

Armando PEINADO, Rodolfo ROMERO, Francesc HORRACH  
*Hospital Sant Joan de Deu de Martorell, Martorell. Barcelona (SPAIN)*

Treatment of hallux valgus by a percutaneous laterally displaced subcapital first metatarsal osteotomy without bunionectomy and no distal soft tissue release was published by Bösch in 2000. Several authors have published different final results with this technique. No formal data has been released about the bone healing features depending on the level and the amount of displacement of the osteotomy. We designed a prospective clinical study of 30 trans-epiphyseal (high-distal level), 30 metaphyseal (mid-distal level), 30 diaphyseal (low-distal level) subcapital osteotomies, and 10 fully dislocated heads into the first intermetatarsal space. Follow-up to one year. The epiphyseal osteotomies healed without apparent periosteal callus; 19 (63.3%) showed osteolysis and impaction of the subcapital fragment against the diaphysis and metatarsal bone shortening. 2 seudarthrosis, 2 delayed healing. The metaphyseal osteotomies healed with no or variable amount of visible periosteal callus; 9 (30%) showed osteolysis and impaction of the subcapital fragment. 1 seudarthrosis. All diaphyseal osteotomies healed with abundant periosteal-medullar callus; 5 (16.6%) showed slight bone impaction. The diaphyseal osteotomies and dislocated heads healed with abundant periosteal-medullar callus. 1 (10%) asymptomatic delayed healing at 12 months. 7 (70%) sustained bone shortening over 3mm (3mm-7mm). The healing rate of the Bösch osteotomy has been of 97%. The type of healing and the bone shortening depends on the kind of bone tissue between the bone fragments: cancellous bone (epiphyseal osteotomies), cancellous, or cancellous-cortical (metaphyseal osteotomies), cortical-cortical bone (diaphyseal osteotomies). All osteotomies were fixed with a 2-mm diameter periosteal-intramedullar K-wire.

Date : 2008-08-26

Session : Foot and ankle: Forefoot

Time : 1400-1530

Room: 406-407

Abstract number : 17427

**LOSS OF POSTOPERATIVE OSTEOTOMY POSITION AFTER PERCUTANEOUS HALLUX VALGUS SURGERY BY THE TECHNIQUE OF BÖSCH. CLINICAL STUDY OF 124 CASES FOLLOWED UP TO ONE YEAR**

Armando PEINADO, Rodolfo ROMERO, Francesc HORRACH

*Hospital Sant Joan de Deu de Martorell, Martorell. Barcelona (SPAIN)*

124 feet (44 patients-1 foot) (40 patients-both feet-one session) by the Technique of Bosch. Average age: 68 years (19-82). 91% women. Full weight bearing allowed postoperatively. Whenever possible the K-wire was left in place for 6 weeks. First metatarsal length; center first metatarsal head - second metatarsal axis distance; % osteotomy line displacement related to metatarsal neck diameter; sesamoid bones position; and first metatarsal axis on the lateral view were measured pre and post-operatively. 82% of the osteotomies redisplaced medially an average of 2.5mm (1-10mm); 92% of the cases after removal of the K-wire. The first metatarsal was shortened an average of 3mm (0.5-8mm), in 68% of the cases. Dorsal displacement of the metatarsal head > than 5° was seen in 14.5% of cases. Plantar displacement of the metatarsal head > than 5° was seen in 9.6% of cases. In 93% of these cases some dorsal and plantar displacement was evident intra-operatively. Sesamoid bones position was completely reduced in 33.9% of the cases; in 41.1% improved by 2-3 positions, and in 25% improved by 1 position or did not improve. Shortening of the metatarsal occurred mainly in epiphyseal and epiphiso-metaphyseal osteotomies. Dorsal and plantar head displacements were due mainly to technical errors. The amount of medial redisplacement of the head was due to early K-wire removal or nearly always to a poorly sesamoid bones reduction. Sesamoid bones reduction depends on enough lateral head displacement and supination of the metatarsal head.

**Date : 2008-08-26**  
**Session : Foot and ankle: Forefoot**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 17428**  
**DIABETIC FOOT GANGRENE AT UNIVERSITY OF NIGERIA**

Stanley OFFIA

*University of Nigeria, Orthopaedic Unit, Department of Surgery, Enugu (NIGERIA)*

**BACKGROUND:** Diabetic foot gangrene is the commonest cause of non-traumatic lower extremity amputation in the developed, and recently in the developing countries. Poverty and ignorance are still a big problem. Therefore, emphasis is shifting from amputation to prevention. Diabetic foot clinics where those at risk would be discovered early and preventive measures instituted are advocated. **AIMS AND OBJECTIVES:** To review lower extremity amputations, indications, problems and ways of reducing those problems. **METHODS:** Retrospective study of lower extremity amputations at the University of Nigeria Teaching Hospital, Enugu, Nigeria (A referral hospital), from December, 2004 to November, 2007, a period of 3 years was analysed. **RESULTS:** 66 lower limb amputations were carried out in the period under review. 48(72.7%) were males and 18 (27.2%) were females. Age range is between 25 to 75years. Diabetic foot gangrene accounted for 48 (72.7%), Traumatic amputations, Gunshots and road accident accounted for 9 (13.6%), Atherosclerosis 6 (9.1%), and cancer 3 (4.5%). Follow up were difficult because of inability of the patients to keep up to appointments. **CONCLUSION:** Diabetic foot gangrene is the commonest cause of non-traumatic lower extremity amputation. Emphasis should be on prevention by establishment of Diabetic foot clinics in order to reduce incidence of gangrene. **KEYWORDS:** Diabetes mellitus, Diabetic foot gangrene, Lower extremity amputation, Diabetic foot clinics.

**Date : 2008-08-26**  
**Session : Foot and ankle: Forefoot**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 17708**

**SURGICAL TREATMENT OF FOREFOOT DEFORMITIES IN RHEUMATOID ARTHRITIS**

Mikhail GERASIMENKO, E. MIKHNOVICH, S. ALEKSEICHIK  
*Belarussian State Medical University, Minsk (BELARUS)*

From 1996 till 2007 surgery has been performed on 38 feet in 28 patients (25 women and 3 men) with rheumatoid arthritis. Age of patients varied from 25 to 66 years (average 43 years). Patients were divided into two clinical groups. The first group included 4 patients without signs of pes planus transversus and hallux valgus. The second group consisted of 24 patients with severe forefoot deformity. Patients in the first clinical group (4 feet) underwent synovectomy and arthroplasty of the II-III metatarsophalangeal joints with the resection of the heads of metatarsal bones. After resection we fixed toes with the Kirschner's wires or performed traction of the toes in the corrected position. Patients in the second clinical group (34 feet) also underwent resectional arthroplasty of the II-V metatarsophalangeal joints. Simultaneously, we eliminated hallux valgus deformity with Schede or Schede-Brandes techniques. In 28 cases of severe medial deviation of the first metatarsal its pathological position was corrected. In case of flexible forefoot deformity (5 feet) we performed forefoot soft-tissue reconstruction using a transfer of the long extensor tendon of the fifth toe. In 23 cases of «rigid» forefoot we used combined technique, including the first metatarsal base osteotomy and the adductor hallucis transfer. Results of the surgical treatment were assessed in 20 patients on 28 feet during a period from 6 months to 10 years (average 5 years 4 months). Good results were obtained in 18 cases, satisfactory in 7, unsatisfactory in 3 cases.



**Date : 2008-08-26**  
**Session : Foot and ankle: Forefoot**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 18000**

**DISADVANTAGES OF SCREW FIXATION IN DISTAL HORIZONTAL METATARSAL OSTEOTOMY FOR CORRECTION OF BUNIONETTE**

Roman RADL, Andreas LEITHNER, Max ZACHERL, Wolfgang KOEHLER, Reinhard WINDHAGER  
*University Clinic of Orthopaedic Surgery, Graz (AUSTRIA)*

**BACKGROUND:** The objective of the present study was to evaluate the results of a distal horizontal metatarsal osteotomy for correction of symptomatic bunionette. **METHODS:** We operated on 32 feet in 24 patients (18 females, 6 males) with an average age of 42 years (range, 20 to 70) at the time of operation. For stabilisation of the osteotomy titanium twist-off screws were used in all patients. The follow-up was on average 50 months (range, 24 to 72). **RESULTS:** The average preoperative Lesser Toe Metatarsophalangeal-Interpalangeal Scale of the American Orthopaedic Foot and Ankle Society increased from 41 points (range, 24 to 50) preoperatively to 88 points (range, 59 to 100) at the last follow-up. The fifth metatarsophalangeal angle averaged 18° (range, 5° to 41°) preoperatively, and 6° (range, -5° to 26°) at final follow-up. The 4-5 intermetatarsal angle averaged 15° (range, 10° to 21°) preoperatively, and 8° (range, 5° to 12°) at final follow-up. Reoperation with hardware removal was performed in 8 feet due to symptomatic skin irritation. **CONCLUSIONS:** The distal horizontal metatarsal osteotomy using screws for stabilisation presents a good and reliable method for correction of the bunionette. Reoperations and unsatisfactory results seen in the patients of the current study might be related to the disadvantages of prominent hardware.

Date : 2008-08-26  
Session : Foot and ankle: Forefoot  
Time : 1400-1530  
Room: 406-407

Abstract number : 18179

**DYNAMIC LONGITUDINAL TRACTION - IMPROVEMENT OF KELLER-HOFFMANN PROCEDURE FOR FOREFOOT DEFORMITIES IN PATIENTS SUFFERING OF RHEUMATOID ARTHRITIS**

Veljko JOVANOVIC, Branimir KRALJEVIC, Predrag STOSIC, Daniel MILOSAVLJEVIC, Boris GLUSCEVIC, Radomir RADIVOJEVIC  
*Institute for Orthopaedic Surgery "Banjica", Belgrade (SERBIA)*

INTRODUCTION: Forefoot deformity in patients suffering of rheumatoid arthritis (RA) consists of valgus of great toe and luxation of MTP and IP joints. In many patients they are combined with varus of the first metatarsal bone. MATERIALS AND METHODS: We analysed medical records of 197 patients who were operated in our department in the last 23 years because of forefoot deformity caused by RA. Mean follow-up period was 14.8 years. Clinical and radiographic findings and personal assessment of patients were analysed. RESULTS: There were 197 operated patients (373 feet), operated for forefoot deformity caused by RA. In most of patients both foot were operated simultaneously. Final result was excellent in 42%, satisfying in 50% and poor in 8% of operated feet. Complications include recidivism of deformity in 31, superficial skin infection in 105 and ischemic necrosis of skin in 16 feet. Since 1988 we have started with dynamic longitudinal traction and since then we did not have vascular complications. If the first metatarsal angle is over 12 degrees, we perform corrective osteotomy for prevention of recidivism. CONCLUSION: Keller-Hoffmann procedure gives excellent or good results in over 90% of forefoot deformities caused by RA. Dynamic longitudinal traction shortens duration of surgery and lowers risk of vascular complications.

**Date : 2008-08-26**  
**Session : Foot and ankle: Forefoot**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 18306**

**FIRST METATARSOPHALANGEAL JOINT ARTHRODESIS USING A COMBINATION OF LAG SCREW AND DORSAL TITANIUM PLATE**

Praveen MEREDDY, Santosh HAKKALAMANI, Michael HENNESSY  
*Wirral University teaching Hospital, Merseyside (UNITED KINGDOM)*

AIM: To assess the patient satisfaction, radiological outcome and hardware failure using the Synthes modular hand system for the first metatarsophalangeal joint (MTPJ) arthrodesis. METHODS: Between 2001 and 2006, 56 patients (45 Women and 11 Men) with a mean age of 67 (age range 40 to 84) underwent 64 first MTPJ arthrodeses (Left - 21, Right - 27 and Bilateral - 8). The joint surfaces were fixed with a single lag screw and a 2.7mm titanium dorsal plate. Radiographs were analysed to determine various angles and foot width. Patient satisfaction survey was conducted at a mean of 24.3 months (median 12.4 months). RESULTS: The hallux valgus angle (from 26 to 16 degrees) and dorsiflexion angles (from 13 to 22 degrees) improved. There was a decrease in the intermetatarsal angle of 2.25 degrees. The first ray was shortened by 4mm and foot width reduced by 7mm. All patients had union at mean time of 7.6 weeks, except three requiring revision surgery. Forty-two (75%) patients completed the telephone survey. Thirty-six (85%) rated their result as excellent or good. Three patients (7.5%) rated their result as fair and three (7.5%) rated their result as poor. Two superficial infections responded to oral antibiotics. Asymptomatic broken screws were noted in five patients. Four patients had screw removal for skin irritation. CONCLUSIONS: Combination of lag screw with dorsal plate resulted in successful fusion, with no implant failure. Currently, newer implants designed for foot surgery are used frequently for first MTPJ arthrodesis.

**Date : 2008-08-26**  
**Session : Foot and Ankle: fracture**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 15351**

**POST-TRAUMATIC EQUINUS DEFORMITY IN CHILDREN - A LONG-TERM FOLLOW-UP**

Khaled EMARA

*Ain Shams University, Cairo (EGYPT)*

AIM: Assess the risk of recurrence after correction of equines using Ilizarov technique & soft tissue release. The equines fixed deformity can be treated by soft tissue release. In cases with extensive scarring as post traumatic and burn management need gradual distraction histogenesis. Recurrence in such cases is expected if the deforming force is not prevented after frame removal. We present 12 cases with equines deformity treated by Ilizarov external fixation and followed for 5-6 years after frame removal. RESULTS: Recurrence in cases that were non-compliant with AFO after removal of external fixation while cases with continued AFO use and patients who had ankle fusion did not get recurrence. CONCLUSION: AFO or ankle fusion should be considered in young patients with post-traumatic equines after correction with Ilizarov. The younger patients have more risk for recurrence. SIGNIFICANCE: This information should be discussed with the family and patients of post traumatic equines and scarring to know the risk of recurrence and the importance of AFO use or ankle fusion to avoid recurrence.

**Date : 2008-08-26**  
**Session : Foot and Ankle: fracture**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 15354**

**MANAGEMENT OF OPEN COMPOUND COMMUNUTED INJURIES AROUND HINDFOOT USING RING FIXATOR: A NEW TECHNIQUE**

Emal WARDAK, Mussa WARDAK

*Dept. of Orthopaedics and traumatology, Wardak Hospital, Kabul (AFGHANISTAN)*

Crush injuries of the foot are one of most difficult and challenging task for a trauma surgeon to manage in terms of limb salvage, and providing a painless functional foot. Injuries to the foot specially the hindfoot account for almost 24.6% of all the warfare injuries in Afghanistan, of which more than 70% land up in amputation due to various reasons. We devised a method by using the principles of Ilizarov's distraction osteosynthesis to salvage the limbs with bony defects in hindfoot which otherwise were candidates for amputation. The procedure is done in two stages. Initially, the ring fixator is applied for the soft tissue reconstruction and infection control, and then the next stage consists of percutaneous "inverted L" shaped osteotomy in the posterior half of lower tibia. The study consisted of 32 patients with hindfoot crush injuries involving talus, calcaneum, combination of both, or even involving the adjacent tarsal bones. All these crush injuries were classified using Gustilo & Anderson classification. The functional assessment of operated feet was done using the Maryland foot score (MFS) system with a minimum follow-up of 4 years. We had good results in 53%, fair in 34% and failure in 13% of our cases. The complications of this procedure were the same as with the use of ring fixator elsewhere in the body. This method envisages a technique to salvage the foot and provide a painless, stable, fused foot in one of the most difficult settings of a hindfoot crush injury.

Date : 2008-08-26  
Session : Foot and Ankle: fracture  
Time : 1600-1730  
Room: 406-407

Abstract number : 16257

**USE OF VACUUM ASSISTED-CLOSURE DEVICE (VAC) IN TREATMENT OF DIABETIC, ISCHAEMIC AND POST-TRAUMATIC WOUNDS OF THE LOWER EXTERMITIES**

Gershon VOLPIN, Leonid KOGAN, Haim SHTARKER  
*Western Galilee Hospital, Nahariya (ISRAEL)*

INTRODUCTION: Topical negative pressure (TNP) in the form of vacuum-assisted closure (VAC) has been used for wound management in patients with diabetic ulcers and wounds following high-energy open fracture. We report our experience with VAC therapy in patients with such non-healing wounds. PATIENTS: This study includes 58 patients, 3-79 years old (mean 46 Y). 46/58 with non healing diabetic or ischaemic wounds were treated by wound debridement and then by VAC until wound cleansing. 12/58 Pts with soft tissue injuries following RTA and war injuries post high energy open fractures were treated by wound debridement and external fixation of fractures and then by VAC. The next stage included secondary direct closure of wounds or use of skin grafts. Exposed bone was covered with local or cross-leg random fasciocutaneous flap. RESULTS: Limb saving was observed in 40/46 Pts with non-healing diabetic ulcers or ischaemic feet. In the post-trauma patients all flaps survived, but one of them developed cellulites near the flap that resolved after antibiotic treatment. CONCLUSION: It seems that use of vacuum-assisted closure device (VAC) in treatment of diabetic, ischaemic and post-traumatic wounds of the extremities may be useful in most patients. The use of improved wound care technology by VAC can simplify post-traumatic soft tissue reconstruction of lower extremity and treatment of diabetic non healing ulcers. Last studies demonstrate current use of fewer free flaps and more delayed closures with frequent use of Vacuum Assisted-Closure (VAC).

**Date : 2008-08-26**  
**Session : Foot and Ankle: fracture**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 16371**

**PERIPHERAL TALAR FRACTURES**

Dusko PERICIC<sup>1</sup>, Slaven BABIC<sup>1</sup>, Tomislav SMOLJANOVIC<sup>2</sup>

<sup>1</sup>*University Hospital of Traumatology Zagreb, Zagreb (CROATIA)*, <sup>2</sup>*Dept. of Orthopaedics, School of Medicine, Zagreb University, Zagreb (CROATIA)*

INTRODUCTION: Talar fractures can be classified into central and peripheral fractures. Peripheral fractures occur in an extreme position of the ankle, or the "coxa pedis" with subluxation or complete dislocation of one or more those joints. CT scan has become mandatory and is necessary for deciding on the treatment. The aim of treating peripheral talar fractures is precise and stable reduction and fixation of the fragments. METHODS: Between 1995 and 2005 we treated 26 patients for dislocation fracture of the talus. Seven were peripheral fractures. Open reduction and internal fixation was performed in four patients. Subtalar arthroscopic assisted reduction and cannulated screw fixation were applied in one patient. Minimally displaced and extraarticular fractures were treated non-operatively in two patients. RESULTS: Seven patients underwent clinical and radiological follow-up examination using the Kiel score. Four patients had good to excellent results. One patient had a poor result. Two patients had satisfactory results. CONCLUSION: Peripheral talar fractures are uncommon and often overlooked. CT is necessary to determine the need for operative or non-operative management. Early diagnosis and timely treatment of peripheral fractures of the talus are best to avoid long-term complications.

**Date : 2008-08-26**  
**Session : Foot and Ankle: fracture**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 16568**

**OPEN REPAIR OF ACHILLES TENDON RUPTURE PERFORMED BY ORTHOPAEDIC TRAINEE SURGEONS**

Shakir SYED, Riazuddin MOHAMMED, Aun MIRZA  
*Royal Orthopaedic Hospital, Birmingham (UNITED KINGDOM)*

**PURPOSE:** To retrospectively review the postoperative complications following open repair of complete Achilles tendon ruptures performed by orthopaedic trainee surgeons at a busy trauma centre. **METHODS:** Thirty-five open Achilles tendon repairs were performed from 1998 to 2005 by orthopaedic trainee surgeons. The medical records of these patients were analyzed for any postoperative complications. **RESULTS:** Twenty-nine male and six female patients with a mean age of 45 years (23 years - 84 years) were included in this study. Acute tendon rupture presented at an average of twenty-six hours (02 hours-120 hours) post injury in twenty-eight (80%) patients. Chronic ruptures in seven (20%) patients presented at an average of twenty-seven days (14 days - 42 days). The procedure was performed at a mean of nineteen hours within presentation. Thirty-two (91%) repairs were performed by Registrar grade trainee and in three (9%) cases; the Senior House Officer performed the procedure under the supervision of the senior surgeon. The average follow-up for the study group was twenty-four weeks (six months). Superficial wound infection occurred in four cases (11%) which were treated by antibiotics. No deep infections or re-rupture of the Achilles tendon was identified in the follow-up period. **CONCLUSION:** The significant complication rates of open repair of Achilles tendon rupture were not different to the current evidence in literature. With careful attention to surgical technique and postoperative care, the repair of Achilles tendon rupture is an effective treatment even in the hands of junior orthopaedic trainee surgeons.



**Date : 2008-08-26**  
**Session : Foot and Ankle: fracture**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 16595**

**INTRA-ARTICULAR FRACTURE OF CALCANEUM - A STUDY OF FUNCTIONAL OUTCOME FOLLOWING SURGICAL OR CONSERVATIVE MANAGEMENT**

Abhijeet SHROFF, Pankaj PATNI, Vishal RAJPUT, Ashish SINGH  
*Sancheti Institute of Orthopaedic and Rehabilitation, Pune (INDIA)*

AIM: To compare Functional outcome in Intra-Articular Fractures of calcaneum after Surgery and conservative management correlating the Bohler's angle. MATERIAL AND METHODS: - All patients with intra-articular fractures of calcaneum were included. - Patients investigated with radiography and CT scan. X-ray included calcaneum lateral and axial views. Bohler's angle was calculated. Geographic pattern of the fracture studied. - Sander's classification and Essex Lopresti classification used. - The patients were grouped into 3 according to the Bohler's angle. Group A treated conservatively with cast application. Group B treated with closed reduction as per Essex Lopresti maneuver with below knee cast. Group C treated operatively with open reduction and recon plating with or without bone grafting Bohler's angle was calculated postoperatively and functional outcome was assessed at 12 weeks, 3 months, 6 months and 1 year and 18 months with the Ankle and Foot Society Scoring System. OBSERVATION AND RESULTS: A total of 44 patients with intra-articular fractures were reviewed. 20 patients were in group 1. 11 patients were in group 2, 11 patients were in group 3. Postoperative complication of osteomyelitis was observed in 1 patient included in group 3. Good functional outcome in group 1 was observed. In group 2 early Limitation of movement at the subtalar joint was seen and one patient (9%) required early arthrodesis in view of persistent pain. Good early Functional outcome in patients with group 3 until date. CONCLUSION: study suggests that there is definitive Prognostic co-relation between Functional outcome and Bohler's angle restoration.

Date : 2008-08-26  
Session : Foot and Ankle: fracture  
Time : 1600-1730  
Room: 406-407

Abstract number : 16725

**SURGICAL TREATMENT OF EXTENSIONAL ANKLE CONTRACTURE RESULTING FROM HARD CALCANEAL FRACTURE, CONSOLIDATED IN MALPOSITION**

Igor PAHOMOV, Michail SADOVOY, Valery PROHORENKO

*Scientific Research Institute of Traumatology and Orthopaedics, Novosibirsk (RUSSIAN FEDERATION)*

Patients suffering from consequences of displaced calcaneal fractures should be operated on. The subthalar arthrodesis is a method of choice. Subthalar arthrodesis tends to pain relief, but fails in the correction of "horizontal thalus" and, useless in correction of ankle contracture. What should we do? Control group: 22 patients after Carr subthalar arthrodesis. Investigation group: 35 patients after remodelling osteotomy, subthalar arthrodesis. Patients evaluated clinically (pain, hindfoot deformations, ROM). METHODS: Functional X-ray films, MSCT, podometry. All patients operated on by remodelling calcaneal osteotomy and subthalar arthrodesis, cavity filling with NiTi. Results were estimated (Clinical effect, X-ray reduction, VAS, AOFAS scale), compared. COMPLICATIONS: 1 deep infection, 1 recurrence of deformity. RESULTS: Subthalar pain rate was less in investigation group and made 15+-2.5 compared with 38+-3.4 in control group. Thalar inclination angle changed in investigation group and was 30+-3.5 degrees compared with 10+-2.5 in control group. AOFAS rates were as follows: 42+-6.6 in control group, 77+-5 in investigation group. Difference was statistically approved,  $p<005$ . Results in an investigation group were better due to correction of ankle contracture. ISSUES: 1. Horizontal thalar position is the reason of ankle contracture. 2. Remodelling calcaneal osteotomy and subthalar arthrodesis, cavity filling with NiTi is a method of choice for the treatment of calcaneal fractures.

**Date : 2008-08-26**  
**Session : Foot and Ankle: fracture**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 17126**

**THE NEW CONSTRUCTION FOR TREATMENT OF FRACTURE OF CALCANEUM BONE**

Sabyrbek DJUMABEKOV, Erkin SADYKOV

*Scientific Research Center of Traumatology and Orthopaedics, Bishkek (KYRGYZSTAN)*

Open reposition and fixation of fracture splinters by screws, plates has advantages and differs from others by anatomic and X-ray results, but adverse effects of operative intervention significantly decrease the quality of treatment. When small fragments are present, fixation becomes unstable, and requires additional methods of fixation. Besides, prolonged immobilisation of joints and muscles leads to switching off of "muscular-venous pump of shin", and, as a result, to chronic venous congestion, edema, and muscular contractures. There is necessity of repeated operation for removing of metal devices. We elaborated and introduced into clinical practice original devices for transosseus osteosynthesis of calcaneum bone fractures (licence of KR No.811, 30.08.2005 Djumabekov S.A., Sadykov E.S.). The differential peculiarities of our device are: simplification of construction, opportunity for reposition of fragment in all three-dimensional flatness, absence of fixation of ankle and subtalar joints, universality, less amount of trauma, easiness of using apparatus, cheap cost of production. According to this method, we operated 50 patients with different kinds of compression calcaneus fractures. Good results were achieved in 37 (74%) cases, satisfactory in 2 (4%), dissatisfactory results in 8 (16%) patients due to severe intra-articular fractures. The device allows us to make exact reposition in comminuted and compression calcaneus fractures, to begin in early period function of lower limb, and to decrease time of disability.

**Date : 2008-08-26**  
**Session : Foot and Ankle: fracture**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 17272**

**RESULTS OF CALCANEAL LOCKING PLATE FOR DISPLACED INTRA-ARTICULAR CALCANEAL FRACTURES**

Vikas SHARMA, Mohammad MAQSOOD  
*Lincoln County Hospital, Lincoln (UNITED KINGDOM)*

The authors report their experience and early results using side specific Calcaneal Locking Plate in 27 consecutive patients with 28 displaced intra-articular fractures of calcaneum treated between October 2002 and October 2006. 28 consecutive displaced intra-articular fractures were included in the study (one bilateral, two open). All fractures were classified according to Essex-Lopresti classification. CT scan was performed in 22 of these fractures and these were classified according to Sanders classification. The mean age of the patients was 40.4 years. Surgery was performed at a mean duration of 7.4 days from the date of injury. The fractures were fixed using low profile Calcaneal Locking Plate. Fixation was achieved using LCP locking screws and built in "tabs" in the plate. The average hospital stay following surgery was 7.8 days. Patients were mobilised non-weight bearing for 8-12 weeks. At follow-up, clinical results were evaluated using Calcaneal Fracture Scoring System, Maryland Foot Score and SF-36. Radiological evaluation was done by measuring Bohler angle. The mean follow-up duration was 23.6 months. All fractures healed without infection at 12 weeks. Posterolateral impingement due to plate was seen in four cases necessitating plate removal. Based on clinical scoring systems nine (32%) cases had excellent, eleven (40%) had good, five (18%) had fair and three (10%) had poor results. Calcaneal Locking Plate acts as a stable internal fixator allowing early movements and preventing secondary displacement of the fracture. We achieved excellent to good results in 72% of cases and a low complication rate.

**Date : 2008-08-26**  
**Session : Foot and Ankle: fracture**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 17407**

**CLINICAL AND RADIOGRAPHIC OUTCOMES AFTER FIXATION OF ANKLE FRACTURES WITH SYNDESMOTIC INJURIES:  
SHOULD THE SYNDESMOTIC SCREW BE REMOVED?**

James KELLAM, Nady HAMID, Stephen SIMS, Brian LOEFFLER, Michael BOSSE  
*Carolinas Medical Center, Charlotte (UNITED STATES)*

**PURPOSE:** The purpose was to compare clinical and radiographic outcomes between patients with intact, broken, and removed syndesmotom screws after treatment of ankle fractures with a syndesmotom injury. **METHODS:** A retrospective review was performed on 142 patients with a syndesmotom injured ankle fracture. Routine removal was based on surgeon preference. Clinical outcomes were measured by a Visual Analogue Pain Score (VAS), tenderness at the syndesmotom screw, and the AOFAS ankle-hindfoot score. Radiographic assessment included tibiofibular clear space, screw breakage, and syndesmotom screw radiolucency. **RESULTS:** 52 patients returned for clinical and radiographic follow-up one year following treatment. 27 patients had intact screws, 10 patients had broken screws, and 15 patients had screw removed. Screws were removed for pain (n=2), broken (n=1), or on a routine basis (n=12). Two of 37 patients (5%) with retained screws had syndesmotom screw tenderness and 25 of 37 (68%) had radiolucencies around the screw. When comparing patients with intact screws versus broken or removed screws, the intact screw group VAS was 2.51 vs 0.82, (p=0.06), while the AOFAS score in the intact screw group was 83.4 vs 88.4 in the screw broken/removed group (p=0.08). Patients with broken screws had favourable outcomes in our study (AOFAS 92.4, compared to 85.8 in the removed group and 83.4 in the intact group). **CONCLUSIONS:** There was no statistical difference in outcomes of patients with intact, broken, or removed syndesmotom screws.

**Date : 2008-08-26**  
**Session : Foot and Ankle: fracture**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 17641**

**FUNCTIONAL OUTCOME IN INTRA-ARTICULAR FRACTURES OF CALCANEUM AFTER SURGERY AND CONSERVATIVE MANAGEMENT**

Ashish SINGH, Raghav Sunil KAMMA, Sachin KAD, Sharukh DOTIVALA  
*Sancheti Institute, Patna(Bihar) (INDIA)*

A prospective short-term study was conducted to compare functional outcome in intra-articular fractures of calcaneum after surgery and conservative management. All patients with intra-articular fractures of the calcaneum that confirmed to the inclusion criteria were included in the study. Patients were investigated with plain radiography and CT scan. Bohler's angle was calculated and geographic pattern of the fracture was studied and classified using Essex Lopresti classification. Patients were treated conservatively which included below knee cast application. Operative treatment protocol included either Essex Lopresti maneuver or open reduction and internal fixation with a reconstruction plate, depending upon the surgeon. All surgeries which were aimed to restore the Bohler's angle and were done by a single surgeon patients were given a below knee cast after subsidence of swelling. Bohler's angle was calculated postoperatively and functional outcome was assessed at 12 weeks, 3 months, 6 months, and 1 year and 6 months respectively. The results were evaluated with the Ankle and Foot Society Scoring System and reviewed. SF 36 questionnaires. RESULTS: 26 patients were reviewed. According to the AOFAS scale, 63.6% of all patients developed good and fair results. The SF 36 Score this present study suggested better quality of life in the operated group ( $p=0.011$ ) which was statistically significant at the end of two years. CONCLUSION: All displaced intra-articular fractures of calcaneum should be treated with anatomical reduction and restoration of the Bohler's angle so to have a better and early functional outcome.

**Date : 2008-08-26**  
**Session : Foot and Ankle: fracture**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 17711**

**OPERATIVE TREATMENT OF DISPLACED INTRA-ARTICULAR CALCANEUS FRACTURES**

Mikhail GERASIMENKO, Evgeny MIKHNOVICH, Andrey SKRYPNIK  
*Belarussian State Medical University, Minsk (BELARUS)*

Intra-articular fractures of the calcaneus are the most difficult for the treatment of all calcaneus fractures. In 6th Clinical Hospital, from December 2003 to November 2007, we treated 89 patients with intra-articular calcaneus fractures. In 79 cases we used different methods of operative treatment. The fractures were classified according to Essex-Lopresti classification (1952). Indications for operative treatment were: displacement of the posterior facet more than 2mm and Bohler angle less than 20°. 12 patients with tongue-type were treated by percutaneous Essex-Lopresti reduction and fixation with Kirschner's wires. 8 patients with similar fractures were treated with the Nikhityn's method (Belorussian Research Republic Institute of Traumatology and Orthopaedics). 55 fractures type B2-C2 with joint-depression and moderate comminution were treated with open reduction and internal fixation through the lateral L-shaped approach. The depressed posterior facet fragments are elevated after identification of all articular fragments. The quality of the reduction was evaluated on the Bohler angle, reduction of the posterior articular facet and the length of the calcaneus. The fractures were fixed with four or five Kirschner's wires. K-wires are drilled through the posterior facet into the talus and cuneiforms. 4 fractures type D with extensively comminution were treated with subtalar arthrodesis. The results were analysed during 1-year period in 54 cases. There were 42 excellent, 9 good, 2 fair results. In our opinion, the open reduction and fixation of displaced intra-articular fractures gives the best results for anatomic reconstruction of the calcaneus including articular surfaces, height, length, Bohler angle.

**Date : 2008-08-26**

**Session : Foot and Ankle: fracture**

**Time : 1600-1730**

**Room: 406-407**

**Abstract number : 18231**

**IRREDUCIBLE FRACTURE DISLOCATION OF THE ANKLE DUE TO TIBIALIS POSTERIOR TENDON INTERPOSITION**

Eyup Selahattin KARAKAS, Mehmet Nurullah ERM&#304;S, Ahmet Sadi KILINC, Akif ALBAYRAK

*Baltalimani bone disease hospital, istanbul (TURKEY)*

An 18-year-old girl had a traffic accident and got to our emergency department. We found out open fracture-dislocation (pronation-eversion fracture) of the left ankle. We tried to reduce dislocation by closed manipulation immediately resulting in incomplete reduction and the ankle was not stable and could be dislocate itself easily. Neurovascular status was intact. Roentgenograms showed the distal 1/3 fibular fracture and lateral displacement of talus and medial malleol fractures. At operation we first opened and explored the fibular fracture. After fracture reduction we stabilised it with tubular plate, we could not gain complete reduction of the ankle that was controlled with scopy. To understand the problem, we extended the incision distally and explored the ankle and syndesmosis. The anterior and posterior tibiofibular ligaments and interosseous membrane were torn and the talus was displaced anteriorly. Tibialis posterior tendon was passing through posteriorly to anteriorly between the distal tibia and fibula, and laterally to medially across the anterior surface of the distal tibia. And it was passing into the tibiotalar joint that was impeded the reduction of the talus into the mortis. The tendon was manipulated to its anatomic position behind the medial malleolus. After open reduction of the ankle mortis, internal fixation of the syndesmosis and medial malleolus performed. Three similar cases of irreducible fracture dislocation of the ankle due to interposition of the tibialis posterior tendon have been reported in the literature. This uncommon injury should be considered for unstable and irreducible fracture dislocations of the ankle.



**Date : 2008-08-26**  
**Session : Foot and Ankle: fracture**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 18640**

**DISPLACED INTRA-ARTICULAR FRACTURES OF THE CALCANEUM: OPERATIVE VERSUS NONOPERATIVE MANAGEMENT**

Devdatta NEOGI, Vivek TRIKHA, Ashish JAIMAN, Chandra Shekhar YADAV  
*All India Institute of Medical Sciences, New Delhi (INDIA)*

INTRODUCTION: Open reduction and internal fixation (ORIF) is the treatment of choice for displaced intra-articular calcaneal fractures (DIACF) at many orthopaedic trauma centers. METHODS: This is a prospective study carried out at the AIIMS, New Delhi from March 2004 to December 2006 wherein patients were randomised into operative and nonoperative groups. ORIF was done by lateral approach. None of the cases received bone grafting. Nonoperative treatment involved an attempt at closed reduction, and the patients were treated only with ice, elevation, rest followed by below knee cast for 6 weeks. We obtained anteroposterior, lateral and skyline views and computed tomography scans of all patients preoperatively and all fractures were classified. The Creighton-Nebraska Health Foundation Assessment score for fractures of the calcaneus was used for evaluation. RESULTS: 80 DIACF in 68 patients were treated of whom ORIF was done in 39 fractures and nonoperative in 41 fractures. 31 had anatomic reduction on postoperative radiographs. The average age was 34 years and was followed for an average 27 months. 7 cases of ORIF developed some form of wound complication, of which 3 required surgical management, 3 cases went in subtalar fusion. Nonoperative group showed calcaneal malunion in almost all cases and subtalar arthritis in 16. The average score for ORIF group was 80 while for the nonoperative group was 70. CONCLUSIONS: Anatomic reduction and stable fixation of DIACF show better outcomes in follow-up. In spite of the best attempts Sanders IV fractures show high incidence of complications.

Date : 2008-08-26  
Session : Joint: Hip 1  
Time : 0800-0900  
Room: 408

Abstract number : 15646

**CONVERSION OF FAILED HEMIARTHROPLASTY TO TOTAL HIP REPLACEMENT: A SHORT TO MID-TERM FOLLOW-UP STUDY**

Amite PANKAJ

*University College of Medical Sciences, Delhi (INDIA)*

INTRODUCTION: Hemiarthroplasty (unipolar or bipolar) of the hip is associated with poor functional outcome in active patients and conversion to total hip replacement is needed in a large number of patients. Conversion surgery is reported to be associated with very high rates of intra and postoperative complications. MATERIAL AND METHODS: Forty-four cases, thirty women and fourteen men, average age 62 years (range 42-75 years) of failed hemiarthroplasty were converted to total hip replacement. Groin pain was the main presenting complaint in majority of the patients, 24 out of 44. Six patients had infection and were operated with staged procedure. All acetabular and majority (86.5%) of femoral components used in our series were uncemented. RESULTS: After an average follow up of 6.4 years (range 2 to 9 years) Harris hip scores improved from 38 (range 15-62) preoperatively to 86 (range 38 to 100) and 22 (50%) patients were community ambulators without support while 17 (38%) needed minimal support. Fifteen out of 18 (83%) patients who had isolated groin pain preoperatively experienced no pain postoperatively while three patients (17%) reported only partial improvement. The rate of loosening in our series was 2.3% (one out of 44) after a mean follow-up of 6.4 years with a mean survival of 97.4% at 72 months. CONCLUSION: Conversion of symptomatic hemiarthroplasty to THA is a safe option that gives good functional results, but patients should be warned of the possibility of incomplete relief of groin pain postoperatively.

Date : 2008-08-26  
Session : Joint: Hip 1  
Time : 0800-0900  
Room: 408

Abstract number : 15730

**NAVIGATED NON IMAGE BASED POSITIONING OF THE ACETABULUM DURING THR**

Jean-Yves JENNY<sup>1</sup>, Cyril BOERI<sup>1</sup>, Jean-Claude DOSCH<sup>1</sup>, Marius USCATU<sup>1</sup>, Yann DIESINGER<sup>2</sup>

<sup>1</sup>University Hospital Strasbourg, Illkirch (FRANCE), <sup>2</sup>Centre de Chirurgie Orthopédique et de la Main, Illkirch-Graffenstaden (FRANCE)

OBJECTIVE: We hypothesized that a non-image based navigation system was able to measure accurately the 3D positioning of the acetabular cup of a THR. MATERIAL AND METHODS: We studied 50 consecutive navigated implantations of a THR, The desired orientation of the cup was chosen to be  $45 \pm 10^\circ$  of inclination and  $15 \pm 10^\circ$  of flexion. The final orientation of the cup after cement polymerization was registered. A postoperative CT-scan was performed before discharge. The position of the acetabular cup was recorded in the three directions (inclination, rotation and flexion). The inclination and flexion angle measured on postoperative CT were compared to the intraoperative measurement with a paired t-test and a correlation test at a 0.05 level of significance. The number of "outliers" (measurement out of the safe zone) was also recorded for each individual direction and as a whole. RESULTS: The mean difference between navigated and CT-scan measurement for cup inclination was  $2^\circ$ ; 87% of the cases were within the safe zone of CT measurement. The mean difference between navigated and CT-scan measurement for cup flexion was  $4^\circ$ ; 58% of the cases showed a difference less than  $5^\circ$  between the two measurements. These differences were significant but considered clinically irrelevant in most cases. 73% of the cases were within the 3D safe zone defined prior to the study. CONCLUSION: The non-image based system used allowed us defining the intraoperative positioning of the acetabular cup of a THR in comparison to the CT reference measurement.

Date : 2008-08-26  
Session : Joint: Hip 1  
Time : 0800-0900  
Room: 408

Abstract number : 16015

**FIXATION IN CEMENTLESS TOTAL HIP ARTHROPLASTY: A PROSPECTIVE RANDOMIZED CLINICAL TRIAL WITH RADIOSTEREOMETRIC ANALYSIS COMPARING THE TAPERLOC® AND MALLORY-HEAD POROUS® PROSTHESIS**

Julius WOLKENFELT, B KAPTEIN, S.W. WITVOET-BRAAM, ER GARLING, ER VALSTAR, RGHH NELISSEN  
*Leiden University Medical Centre, Leiden (NETHERLANDS)*

The last three decades development in uncemented hip arthroplasty has resulted in different stem designs. Excellent clinical results have been reported on both the Taperloc® and the Mallory-Head Porous® prostheses. These prostheses with a different design rationale should be evaluated for performance and migration stability. In order to compare the Taperloc and Mallory-head Porous prostheses 40 consecutive patients receiving an uncemented total hip arthroplasty were evaluated in a prospective randomised clinical trial with radiographic and radiostereometric analysis. The main objective of this study is to observe and compare the micro-motion after 24 months between the Taperloc hip prosthesis and the Mallory-Head Porous hip prosthesis. The secondary objective is to predict the long-term differences based on the two-year prosthetic migration. The average age at the time of surgery was 60 years for both groups of 20 patients. Patients were evaluated for clinical, radiographic and radiostereometric assessments at six weeks, at three months, at six months, at 12 months and 24 months. Four patients were lost to follow-up. Both groups had excellent clinical results. There were no signs of radiographic complications such as osteolysis, subsidence or scalloping. In The Mallory-Head group radiostereometric migration analysis showed three points fixation contributes to less variability in subsidence. The Taperloc group proved to have higher initial rotational stability in the self-settling period. This study confirms excellent clinical and radiographic results in literature. Migration patterns also confirm the vertical stability of an anatomical shaped prosthesis and the rotational stability of flat and wedge-shaped design.

Date : 2008-08-26  
Session : Joint: Hip 1  
Time : 0800-0900  
Room: 408

Abstract number : 16478

**COMPARISONS OF THREE DIFFERENT TECHNIQUES IN MINIMALLY INVASIVE TOTAL HIP ARTHROPLASTY**

Shigeru NAKAMURA<sup>1</sup>, Masaaki MATSUBARA<sup>2</sup>, Kazuo HIRAKAWA<sup>3</sup>

<sup>1</sup>Department of Orthopaedic Surgery, Teikyo University School of Medicine, Tokyo (JAPAN), <sup>2</sup>Institute of Adult Reconstruction Hip Service, Nissan Tamagawa Hospital, Tokyo (JAPAN), <sup>3</sup>Shonan Kamakura Joint Reconstruction Center, Kamakura-shi (JAPAN)

We studied the postoperative data of 290 hips in early days after three different techniques of minimally invasive total hip arthroplasty to find possible differences in functional recovery patterns. Mini-incision anterior-lateral approach was used for 112 hips (Mini-AL group), mini-incision posterolateral approach for 55 (Mini-PL group), and muscle sparing anterolateral approach was used for 123 hips (MIS-AL group). All patients were encouraged to walk with full weight-bearing as soon as possible. Recovery of the hip function for walking with a cane and putting on socks was analyzed. Pain during resting at one, three, five, seven and 14 days after surgery was assessed using a visual analog scale. The data among the three groups was compared using a Wilcoxon non-parametric test (level of significance set at  $p < 0.05$ ). RESULTS: Mean of the postoperative days until able to walk 100 meters with a cane was 4.09 days for MIS-AL group, 4.82 for Mini-AL group, and 5.57 for Mini-PL group. MIS-AL group showed a significantly earlier recovery than Mini-AL and Mini-PL groups. Mean of the postoperative days until able to put on socks was 5.86 days for MIS-AL group, 7.37 for Mini-AL group, and 9.9 for Mini-PL group. MIS-AL group showed a significantly earlier recovery than Mini-AL and Mini-PL groups. There were no differences for resting pain at any days among the three groups. CONCLUSION: Patients after total hip arthroplasty using muscle sparing anterolateral technique showed earlier recovery than those using mini-incision techniques.

Date : 2008-08-26  
Session : Joint: Hip 1  
Time : 0800-0900  
Room: 408

Abstract number : 17195

**DISLOCATION AFTER PRIMARY TOTAL HIP REPLACEMENT IN A DISTRICT GENERAL HOSPITAL IN SOUTH WALES - AN ANALYSIS**

Ashok MARUDANAYAGAM, Mohammad YAQOOB, Kiran NAIKOTI  
*Withybush General Hospital, Haverfordwest (UNITED KINGDOM)*

AIM: To find out the incidence, causes and management of dislocation following primary total hip replacement. MATERIALS AND METHODS: This is a retrospective study analysing patients who had dislocation following THA, over a period of 9 years. Case notes and radiographs were analysed to get the details of THA. RESULTS: We had a total of 30 dislocations, over 9 years. 26.6% were 76-80 years of age. 56.6% were female and 63.3% had on the right side. Common indication was primary osteoarthritis (86.6%). 76.6% had posterior dislocation. 33.3% had it in the 1st 6 weeks after surgery. 76.6% had the primary surgery by posterior approach. 63.3% had standard femoral head (28mm) while 26.6% had smaller femoral head (22mm). 86.6% had acetabular cup inclination 35-55. 66.6% had cup version of <15. Trendelenburgh test was positive in 13 patients. Reduction of dislocation achieved by closed method in all patients except one. 73.3% of the patients used brace after relocation. Nine had the cup revised, three had total revision. CONCLUSION: The incidence of dislocation after THA was 2.3% and higher in patients who had posterior approach. Component position and femoral head size also played a role. Weak abductors found to affect the outcome of surgery. Majority of dislocation occurred in early postoperative period. Wearing the brace reduced the incidence of recurrent dislocation. Closed treatment was successful in half and remaining required surgical management.

**Date : 2008-08-26**  
**Session : Joint: Hip 1**  
**Time : 0800-0900**  
**Room: 408**

**Abstract number : 17569**

**QUANTITATIVE ANALYSIS OF TISSUE INJURY LEVELS IN MINIMALLY INVASIVE TOTAL HIP ARTHROPLASTY**

Yoon Je CHO, Kang Il KIM, Ki Hyung YOO, Young Soo CHUN, Joon Ha ROH, Myung Chul YOO  
*Department of Orthopedic Surgery, College of Medicine, Kyung Hee University, Seoul (KOREA)*

To clarify minimally invasive total hip arthroplasty (THA) has less tissue injury and systemic inflammatory response than conventional THA. We conducted prospective study of 30 simple primary THA between September 2005 and May 2006. 15 cases that had the minimally invasive THA were enrolled in a study group and 15 cases that had the conventional THA were enrolled in a control one. The mean ages for the study and the control groups were 55.3 years and 55.1 years respectively. Most common diagnosis for both groups was an osteonecrosis of head as 11 cases. We checked the serum creatinine kinase and aldolase as a skeletal muscle injury marker enzyme, IL-6 and IL-8 as a pro-inflammatory cytokine and IL-10 and IL-1ra (receptor antagonist) as a anti-inflammatory cytokine on the day before the operation and 1, 3, 7 and 14 days after the operation in both groups. The mean skin incision lengths for both groups were 7.7cm and 14.7cm respectively. All markers showed no significant difference preoperatively and serum creatinine kinase and most of the inflammatory cytokines for the study group showed significantly lower level than that for the control group on 1 and 3 days after the operation. Serum aldolase for the study group showed significantly lower level than that for a control group on 1 day postoperatively and IL-8 for the study group was lower significantly on 7 days after operation. Analysis suggested minimally invasive THA may decrease tissue injury, systemic inflammatory response and medical complications after THA.

Date : 2008-08-26  
Session : Joint: Hip 1  
Time : 0800-0900  
Room: 408

Abstract number : 17607

**RELATION BETWEEN IN-VIVO METAL TAPER CONDITIONS AND THE FRACTURE LOAD OF CERAMIC BALL HEADS**

Thomas PANDORF, Tobias NEUN, Roman PREUSS  
*CeramTec AG Medical Products, Plochingen (GERMANY)*

INTRODUCTION: Ceramic ball heads are well-known for their outstanding properties of wear resistance and fracture loads which are significantly higher than the maximum in-vivo loads acting on the human hip. Nevertheless, occurring in-vivo fractures of ceramic ball heads are a cause for concern and are often explained by the brittle nature of ceramics. This paper shows that the in-vivo metal taper conditions strongly influence the actual fracture load of ceramic ball heads. METHODS: Ceramic ball heads made of pure alumina as well as alumina matrix composites have been loaded until fracture strength under various metal taper conditions. Parameters under investigation are greased and wetted tapers as well as damaged tapers. Additionally, theoretical and numerical calculations are used to explain and support the experimental findings. RESULTS: The reduction of the friction coefficient due to greased and wetted conditions of the metal taper leads to significantly higher stresses within the ceramic ball head lowering the fracture load by almost 55%. Damaged tapers may lead to point loads stressing the ceramic locally, therefore, exceeding the fracture strength under certain conditions. Theoretical and numerical calculations support these findings for greased and wetted taper conditions as well as for damaged tapers. DISCUSSION: Good taper conditions are essential for the ceramic ball heads to fully use their strength abilities. An advice for intraoperative handling will also be presented.



**Date : 2008-08-26**  
**Session : Joint: Hip 1**  
**Time : 0800-0900**  
**Room: 408**

**Abstract number : 17669**

**PRIMARY TOTAL HIP ARTHROPLASTY WITH METAL-ON-METAL ARTICULATION**

Wing Keung WONG, Hok Leung WONG

*Department of Orthopaedics and Traumatology, Tuen Mun Hospital, Hong Kong (HONG KONG)*

From 1994 to 1999, we had performed 106 consecutive total hip arthroplasty in 98 patients using 28mm diameter head metal-on-metal (Metasul) articulations with hybrid fixation. The patients were evaluated preoperatively and postoperatively with the Harris Hip Score and standard radiographs. The patient's average age at operation was 56 (range 18-82). The preoperative average Hip Score was 49 (range 25-72). Eight patients defaulted after follow-up for at least 5 years. Fourteen patients were dead by the time of the assessment and the average follow-up period in this group is 7.2 years (range from 4-12 years). None of these twenty-two patients required revision surgery. Fourteen hips were revised. These included two early and seven late infections. The remaining seven cases were revised due to aseptic loosening (five cases), component malposition (one case) and periprosthetic fracture (one case). Osteolysis was found in all the aseptic loosening cases and metallosis was noted in four of these seven cases. One patient had late infection but revision surgery was declined. The remaining 62 patients with 67 arthroplasty have an average follow-up of 11 years (range 7-13 years). Postoperative average hip score was 90.2 (range 70-100). Osteolysis has been observed in six of these sixty-two patients. They have no symptom and the implants are stable in radiological assessment. Metal-on-metal articulation is a viable alternative bearing surface for total hip arthroplasty. Young patient can have excellent clinical outcomes. However, aseptic loosening and osteolysis still occurred in some young patients.

Date : 2008-08-26  
Session : Joint: Hip 1  
Time : 0800-0900  
Room: 408

Abstract number : 17768

**METASUL V/S METAL-ON-POLYETHYLENE HIP ARTHROPLASTY - A RANDOMISED CONTROLLED STUDY**

Rajeshkumar KAKWANI<sup>1</sup>, Shankar KASHYAP<sup>1</sup>, A. NANU<sup>2</sup>, G. ROYSAM<sup>3</sup>, H. EPSTEIN<sup>3</sup>, Chris WAINWRIGHT<sup>3</sup>

<sup>1</sup>Queen Elizabeth Hospital, Gateshead, Birmingham (UNITED KINGDOM), <sup>2</sup>Sunderland, Birmingham (UNITED KINGDOM), <sup>3</sup>North East, Birmingham (UNITED KINGDOM)

**INTRODUCTION:** A single blind prospective randomised controlled trial comparing the Metal-on-polyethylene articulation with the "Metasul" metal-on-metal articulation in THA. **METHOD:** The clinical and radiological findings of the consecutive patients who were enrolled in the RCT at the participating centres were recorded prospectively. The clinical evaluation was performed with the Harris scoring system as well as the Oxford Hip Scoring Sheet. The computer randomised option was revealed to the operative surgeon only after the patient was anaesthetised, during the recruitment period (from June 1998 to July 2004). Of the total of 378 patients, 2 died prior to the final review and 63 were lost to follow-up. The final study group contained 315 patients (159 in metal-on-polyethylene group and 156 in metal-on-metal group). **RESULTS:** The indication for the hip arthroplasty for majority (309 patients) was primary osteoarthritis. The average age at the time of the surgery was 68.2 years and the average duration of follow-up was 85 months (42-115). There was an improvement of the Oxford hip scores from an average of 37 pre-operatively to 16 postoperatively. The Harris hip scores also improved from an average of 47.0 preoperatively to 87.3 postoperatively. The patient groups were statistically similar with respect to age, sex and duration of follow-up, and the final outcome scores revealed no statistical difference between the two groups. **DISCUSSION:** The clinical results obtained with the use of the "Metasul" articulation are comparable to those obtained by the metal-on-polyethylene articulation encouraging the use of this alternative bearing surface.

Date : 2008-08-26  
Session : Joint: Hip 1  
Time : 0800-0900  
Room: 408

Abstract number : 17955

**CLINICAL RESULTS OF TOTAL HIP PROSTHESES WITH ALUMINA CERAMIC HEAD COMBINED WITH UHMWPE SOCKET FOR 19-21 YEARS BY RADIOGRAPHICAL STUDY**

Hiroyuki OONISHI<sup>1</sup>, Sok Chol KIM<sup>1</sup>, Masayuki KYOMOTO<sup>2</sup>, Mikio IWAMOTO<sup>2</sup>, Masaru UENO<sup>2</sup>, Hironobu OONISHI<sup>1</sup>

<sup>1</sup>H. Oonishi Memorial Joint Replacement Institute, Tominaga Hospital, Osaka (JAPAN), <sup>2</sup>Japan Medical Material Corporation, Osaka (JAPAN)

The commonly used bearing couple of total hip prosthesis (THP) consists of a metal head with a UHMWPE socket. We have been using alumina ceramic heads to reduce polyethylene wear debris. In this study, we studied the long-term clinical results of THPs with an alumina ceramic head. A total of 285 joints (212 patients) were implanted with an alumina ceramic head (28mm in diameter) and UHMWPE socket by one senior surgeon from 1986 to 1988, and, 265 joints (192 patients) could be followed. Patient age at surgery was 29-81 years old (mean: 64), and the diagnoses were osteoarthritis in 227 hips (168 patients), rheumatoid arthritis in 30 hips (19 patients), and necrosis of femoral head in 8 hips (5 patients). Radiolucent line, loosening, osteolysis, and wear of the UHMWPE socket were observed using radiographs. A radiolucent line appeared as a "space" on the acetabulum in three joints (1.4%) and on the femur in four joints (1.8%). A loosening appeared as a "separation" on the acetabulum in three joints (1.4%). Osteolyses were noted in one joint (0.5%) on the acetabulum and in two joints (0.9%) on the femur. There was no revision surgery. In our previous study, we reported that the wear rate of sockets against alumina ceramic head was 20% lower than that of sockets against metal head. With reduction of wear debris by ceramic heads, osteolysis could be reduced. As a result, the long-term clinical results of THP with alumina ceramic head were excellent.

Date : 2008-08-26  
Session : Joint: Hip 1  
Time : 0800-0900  
Room: 408

Abstract number : 18425

**PRIMARY CEMENTLESS TOTAL HIP ARTHROPLASTY FOR BONY ANKYLOSIS IN PATIENTS WITH ANKYLOSING SPONDYLITIS**

Rajesh MALHOTRA, Vijay KUMAR, Surya BHAN  
*All India Institute of Medical Sciences, NEW DELHI (INDIA)*

**INTRODUCTION:** This study is an endeavour to evaluate the clinical and the radiological results of cementless THA in patients with bony ankylosis of hip due to ankylosing spondylitis. **MATERIALS AND METHODS:** We retrospectively reviewed 54 patients (92 hips) who underwent cementless total hip arthroplasty for bony ankylosis in ankylosing spondylitis between September 1988 and 2002. Clinical assessment was done at follow-up using the Harris Hip Score. Radiographic analysis was done. Kaplan-Meier survivorship analysis was done at 5 and 8.5 years using the revision for the removal of femoral component, acetabular component or both due to any cause as the end point. **RESULTS:** The mean age of the patients was 25.5 years. The mean duration of follow-up was 8.5 years. The average preoperative Harris Hip Score of 49.5 improved to 82.6 postoperatively. Postoperatively 10 hips had mild to moderate pain. Anterior dislocation occurred in four hips (4.3%) and sciatic nerve palsy in one hip. Heterotopic ossification was seen in 12 patients, reankylosis rate was 0%. Thirteen arthroplasties were revised due to aseptic loosening. Kaplan-Meier survivorship analysis with revision as end point revealed 98.8% survival at 5 years and 85.8% survival at 8.5 years 11 follow-up. **CONCLUSION:** Cementless THA in osseous ankylosis in ankylosing spondylitis is a worthwhile surgical intervention in bony ankylosis. Newfound mobility, maneuverability and improved ability to sit comfortably were the outcomes, which alleviated the patients' daunted morale.

**Date : 2008-08-26**  
**Session : Joint: Hip 1**  
**Time : 0800-0900**  
**Room: 408**

**Abstract number : 18431**

**SPECIMEN SPECIFIC PREDICTION OF MUSCLE STRAIN DURING 3-DIMENSIONAL COMPUTER SIMULATED MIS TOTAL HIP ARTHROPLASTY**

Michael GRECULA, William BUFORD

*University of Texas Medical Branch, Galveston (UNITED STATES)*

**INTRODUCTION:** Total hip arthroplasty (THA) involves extreme positioning of the limb to accomplish the tasks of hip dislocation, acetabular preparation, femoral preparation, and component insertion. With the increasing interest in minimally invasive "muscle sparing" THA, knowledge of the strain and elongation of the individual muscles around the hip during these maneuvers is important. **METHODS:** Five fresh cadaver dissections were performed to obtain resting muscle fibre lengths and overall dimensions of the periarticular hip muscles. The information was used with a whole-body kinematic simulation programme to interactively move the lower limb into the positions needed to perform a total hip arthroplasty using a minimally invasive posterior approach. During the simulation, joint angles, muscle origin to insertion path lengths, and moment arms were monitored. Muscle strain was then calculated as change in fibre length relative to resting length. **RESULTS:** Over all of the muscles studied, the measured strain ranged from 89% to 277%. The lowest strain was seen in the anterior fibres of the gluteus medius and the quadratus femoris underwent the greatest strain in the femoral component insertion position. **CONCLUSION:** Much of the posterior muscle architecture was placed at or beyond the ultimate tensile strength of fresh cadaver or living muscle as reported in the literature. This highlights the importance of considering the potential for indirect trauma to the periarticular muscles during a minimally invasive approach. This 3D kinematic simulation can be a valuable tool in developing and evaluating different MIS approaches which can minimise direct and indirect tissue trauma.

**Date : 2008-08-26**  
**Session : Joint: Hip 2**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 16410**

**FEMORAL BONE REMODELING IN HA COATED STEMS WITH 20-YEAR FOLLOW-UP**

Jens BOLDT

*Orthopaedic Department Munsingen, Guemligen (SWITZERLAND)*

Femoral stress shielding in cementless THA is a potential complication commonly observed in distally loading press-fit stems. This prospective study describes long-term femoral bone remodelling in cementless THA at a mean of 17 years (range: 15 to 20) in 208 consecutive fully HA-coated stems (Corail, DePuy Int. Ltd, Leeds, UK). All THA were performed by one group of surgeons between 1986 and 1991. The concept of surgical technique included impaction of metaphyseal bone utilizing bland femoral broaches until primary stability was achieved without distal press-fit. Radiographic evaluation revealed a total of five (2.4%) stems with periprosthetic osteolysis, which were associated with eccentric polyethylene wear. They were either revised or awaiting revision surgery. The remaining 97.6% stems revealed biologic load transfer in the metaphysis alone (52%) or in both metaphysis and diaphysis (48%). Stem survival of 97.6% after 15 to 20 years without stress shielding were considered to be related to: impaction of metaphyseal bone, bland broaches, HA coating and unique prosthetic design.

**Date : 2008-08-26**  
**Session : Joint: Hip 2**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 16527**

**RANDOMISED CONTROLLED TRIAL OF THE USE OF TOPICAL APPLICATION OF TRANEXAMIC ACID IN PRIMARY CEMENTED TOTAL HIP REPLACEMENT**

Sattar ALSHRYDA, B ILANGO, S ODAK, Amit SHAH  
*Fairfield General Hospital, Bury (UNITED KINGDOM)*

Significant blood loss in relation to total hip replacement surgery is associated with high risk for patients. Allogenic blood transfusion carries the risk of immunological and non-immunological adverse effects, such as a higher rate of postoperative infections and transmission of disease. Also autologous blood transfusion has a high medical cost. Tranexamic acid is a drug used to stop bleeding by inhibiting the fibrinolysis. It has been successfully used to stop bleeding after dental extractions, removal of tonsils and prostate surgery. Previous studies have shown a decrease in blood loss using IV Tranexamic acid for total knee and hip replacement. Despite the fact the systemic side effects (including DVT and pulmonary embolism) were no higher than in control groups, clinicians are still reluctant to use it. In this study Tranexamic acid was administered by applying topically to the exposed tissue around the hip joint prior to the wound closure. It is quicker, easier and has less systemic side effects. OBJECTIVES: To find out whether Tranexamic acid will reduce blood loss significantly after total hip replacement when applied topically. DESIGN: A double blind controlled randomised trial of 20 patients who underwent unilateral primary cemented total hip replacement. A half received Tranexamic acid and the other half received a Placebo. OUTCOME MEASURES: - Theatre blood loss (Suction and swabs weight); - Drain blood loss; - Haemoglobin and Haematocrit level, pre and postoperatively; - Volume of any blood transfused. RESULTS: There has been no significant difference in blood loss, Haemoglobin drop and blood transfusion rates between the two groups.

Date : 2008-08-26  
Session : Joint: Hip 2  
Time : 0900-1030  
Room: 408

Abstract number : 16604

**FEMORAL APPROACH FOR THR IN DDH, IN HIGH DISLOCATED HIPS, COMPARISONS BETWEEN TWO SURGICAL TECHNIQUES**

Stefan CRISTEA, Andrei PRUNDEANU, Florin GROSEANU, Tudor ATASIEI, Vlad PREDESCU, Vlad GEORGEANU, Gheorghe PANAIT

*Clinic for Orthopedic Surgery "Saint Pantelimon", Bucharest (ROMANIA)*

INTRODUCTION: We present only the difficult cases of THR in DDH: grade III DUNN, type IV CROWE, or stage C and D EFTEKHAR and our classification also. MATERIALS AND METHODS: Our goal is to compare the preliminary results of two surgical techniques: I) cemented femoral stem with trochanterotomy, femoral shortening osteotomy and trochanteroplasty Kerboul-Postel versus II) uncemented femoral stem with femoral subtrochanteric triple osteotomy - shortening, correction of valgus and rotation. RESULTS: I) Between 1993-2001 we have operated 61 patients, average age 42, using the first technique. The relatively high percentage of pseudarthrosis of greater trochanter (9%) has led us to adopt the technique of triple femoral osteotomy. II) Between 2001-2007, 31 cases have been done by the technique of triple femoral osteotomy. We have used Merle D'Aubigne-Postel criteria to evaluate our patients. We present our complications in these series. DISCUSSIONS: For the preoperative planning we used the Ranawat criteria. Uncemented stem had the same function like a proximal locked nail. CONCLUSIONS: These are the preliminary results; we have not enough follow-up for uncemented femoral prostheses, but this technique seems to be attractive though femoral complications have not yet been noticed.



**Date : 2008-08-26**  
**Session : Joint: Hip 2**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 16899**

**EFFICACY, SAFETY AND PATIENT COMPLIANCE OF FOOT-PUMPS WITHOUT GRADUATED COMPRESSION STOCKINGS FOR PREVENTION OF DEEP-VEIN THROMBOSIS IN TOTAL JOINT REPLACEMENT**

Rocco PITTO

*Dept. of Orthop. Surg., Middlemore Hospital, Auckland (NEW ZEALAND)*

Mechanical prophylaxis with foot-pumps provides an interesting alternative to chemical agents in the prevention of thromboembolic disease following major orthopaedic surgery procedures. Recent studies have suggested that simultaneous use of graduated compression stockings (GCS) may hinder the pneumatic compression effect of foot-pumps. The hypothesis of this prospective study was that the use of foot-pumps without GCS does not affect the efficacy of DVT prophylaxis, and improves patient compliance. 846 consecutive patients admitted at a single institution undergoing total hip (THR) or knee replacement (TKR) were included in the study. The A-V Impulse System® foot-pump units (Orthofix Vascular Novamedix, Andover, UK) were used in all patients. Forty-six patients discontinued the use of foot-pumps, leaving 400 patients who received foot-pumps in combination with GCS and 400 patients with foot-pumps alone. Eleven patients of the stocking group (2.7%) and 9 patients of the no-stockings group (2.3%) developed postoperative symptomatic DVT ( $p=0.07$ ). DVT was more frequent in TKR (10 of 364; 2.7%) than in THR (10 of 436; 2.3%). Non-fatal pulmonary embolism occurred in 4 patients out of 20 with symptomatic DVT, 2 each of the stockings and no stockings groups. The foot-pump discontinuation rate of patients treated with stockings was 7%, versus 4% of patients treated without stockings ( $p<0.05$ ). In conclusion, management of patients with foot-pumps without GCS does not reduce efficacy of DVT prophylaxis after THR and TKR, and improves patient compliance.

**Date : 2008-08-26**  
**Session : Joint: Hip 2**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 17084**

**INTERMEDIATE TERM RESULTS OF FC2 HIP ARTHROPLASTY**

Aniruddha MITRA, Farschid MALEKI, David MULCAHY  
*Cork University Hospital / St Mary's Orthopaedic Hospital, Cork (IRELAND)*

**INTRODUCTION:** Various femoral implants are available for total hip arthroplasty. In vitro studies may predict a long time survival, however in vivo this may not prove to be as successful. FC2 femoral components were used in our institution for total hip arthroplasty. We sought to assess the clinical results of this procedure after a minimum of 5 years. **METHODS:** Between 1997 and 2001, 150 patients (164 hips) underwent total hip arthroplasty using a cemented FC2 femoral component via a transtrochanteric approach. 78 patients (81 hips) were available for clinical and radiological review at a mean of 82 months post operatively. Patients were assessed clinically using the Harris Hip score. Standing uniplanar hip radiographs were obtained to evaluate radiographic outcome. **RESULTS:** At latest follow-up, 4 patients had undergone revision (2 aseptic, 1 infection and 1 recurrent dislocation). 1 further patient had acetabular augmentation for recurrent dislocation. 23 patients had radiological evidence of aseptic loosening of the femoral or acetabular component. The rate of implant survival with revision due to any cause as the end point was 92% at 110 months. The cumulative radiological and clinical survivorship was 44% at 110 months. Further 35 patients complained of pain around their trochanteric cable grip system used to reattach their greater trochanter and 11 underwent removal of the device. **CONCLUSION:** Use of FC2 femoral components is associated with unacceptable high rates of osteolysis and early failure. We do not recommend the use of this implant for the treatment of degenerative arthritis of the hip.

**Date : 2008-08-26**  
**Session : Joint: Hip 2**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 17271**

**SURVIVAL RATES OF EACH COMPONENT IN METAL-ON-METAL RESURFACING HIP ARTHROPLASTY**

Fujio HIGUCHI, Yumiko ISHIBASHI, Shinichi ITOH, Kenjiro NAKAMA, Masafumi GOTOH  
*Kurume University, Medical Center, Kurume (JAPAN)*

Since 1994 until 2005 we performed metal-on-metal cemented resurfacing arthroplasty in twenty-two cases. For the first eleven cases, we carried out cement fixation for both components between 1994 and 1995, and for the next eleven cases we carried out namely hybrid fixation; uncemented fixation for acetabular component and cement fixation for femoral component. Here we evaluated the mid-term clinical results by Kaplan-Meier's survival analysis. The survival rate of the cement acetabular component was 53% at five years, and only 28% at ten years. Most cases needed revision surgery to treat early loosening in the acetabular components which occurred in both the cement-bone junction and the component-cement junction. The survival rate of the hybrid acetabular component was 100% at five years. The survival rate of the cement femoral component was 88% at five years, and only 88% at ten years. Our histological findings suggested that the main concerns in the long-term are proximal migration of the acetabular component and osteolysis in the femoral neck caused by free-floating cement particulates. The clinical results of the metal-on-metal resurfacing arthroplasty are highly-dependent on the fixation method of the acetabular component to the bone and the cement femoral component was slowly influenced by cement and metal particle.

**Date : 2008-08-26**  
**Session : Joint: Hip 2**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 17906**

**PARTICULAR INDICATIONS IN HIP RESURFACING ARTHROPLASTY - A MID-TERM REVIEW OF SELECTED CASES**

Andrei FIRICA, Marius NICULESCU, Mihai NEGRUSOIU, Mihai MAGUREAN  
*Colentina Clinical Hospital, Bucharest (ROMANIA)*

AIM: To assess short and mid-term outcome of hip resurfacing in cases that exceed normal indications for this type of surgery. MATERIAL: Patients were selected from a consecutive series of 221 cases of resurfacing hip arthroplasty. There were 4 main categories taken into account: - Extended AVN of the femoral head - 19 cases;- Crowe 2 and 3 hip dysplasia - 17 cases;- Acute acetabular fracture - 2 cases;- Old acetabular fractures and pseudarthrosis - 8 cases;- Previous osteotomies of the hip - 2 cases. There were 48 patients in this group with mean age of 37.6 years (ranging from 21 to 47 years old). The average follow-up time was 38 months (16 to 57 months). METHOD: Patients were assessed using the Oswestry score at 3, 6, 12 months postoperatively and then annually. RESULTS: The results at follow-up were 69% excellent results (forgotten hips), 22% good and 9% fair. The results were correlated with the type of lesion: the best results were noted in the group with AVN of the femoral head and the poorest in the group with previous proximal femoral osteotomies. No mechanical complications were recorded, and no septic complications occurred.

**Date : 2008-08-26**  
**Session : Joint: Hip 2**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 18066**

**CEMENTLESS TOTAL HIP ARTHROPLASTY FOR HEMOPHILIC ARTHROPATHY - MINIMUM 5-YEAR FOLLOW-UP**

Kee Hyung RHYU<sup>1</sup>, Myung Chul YOO<sup>1</sup>, Yoon Je CHO<sup>2</sup>, Kang Il KIM<sup>1</sup>, Young Soo CHUN<sup>1</sup>

<sup>1</sup>Center for Joint Disease, Kyung Hee University East-West Neo Medical Center, Seoul (KOREA), <sup>2</sup>Department of Orthopaedic Surgery, Kyung Hee Medical center, Seoul (KOREA)

We performed this study to analyse the mid-term result of cementless THA for hemophilic coxarthropathy. Among 23 hemophilic coxarthropathies underwent cementless THA from June 1995 to January 2003, 22 hips were enrolled. All had type A hemophilia. There was no patient who had antibody for factors or a positive test for HIV. The mean follow-up period was 95 months. We evaluated Harris hip score, range of motion, amount of transfusion and factor replacement, and the problems associated with the disease itself. As a radiological assessment, we evaluated stability and fixation of the components, bone responses around the implants and complications. The average Harris hip score and hip range of motion improved significantly. An average of 3.2 units of RBC was transfused and an average of 46000 units of coagulation factors was injected. All patients obtained significant pain relief and improved walking ability after the operation. Four patients experienced significant re-bleeding. All but one cup showed stable fixation. Osteolysis for any reason was noted in three cups and three stems each. As a re-operation, two bone graft procedures for each case of osteolysis and bone loss after pseudotumour, and one revision for a loosened cup were performed. A case of pseudotumour died 11 years after the surgery. Meticulously performed cementless THA for the moderate or severe hemophilic arthropathy is safe and greatly effective in reducing the pain and increasing the range of hip motion and walking ability. However, special attention should be paid to the possible complications associated with re-bleeding.

Date : 2008-08-26  
Session : Joint: Hip 2  
Time : 0900-1030  
Room: 408

Abstract number : 18140

**HIP ARTHROPLASTY BY ANTERIOR APPROACH: A SOLUTION TO HIP DISLOCATION?**

Marc JAYANKURA, Alain POTAZNIK, Marcel ROOZE, Katia CERMAK, Nathalie BILTIAU, Bruno GILLARD, Pascal REMY, Valérie GANGJI, Pierre PANDIN, Frédéric SCHUIND  
*Hôpital Erasme, Brussels (BELGIUM)*

Early dislocation after total hip arthroplasty remains a major complication for which surgical approach, implant positioning, specific indications and patient's comorbidities (neurological pathology, alcoholism) have been identified as associated factors. This study aims to evaluate if the anterior approach improves stability after hip arthroplasty. Fifty-six consecutive primary hip arthroplasties implanted in 52 patients through a direct anterior approach on orthopaedic table have been prospectively followed in order to evaluate the complication rate associated to the learning curve. Patients were unselected except for overweight (BMI>38). There were 3 hybrid and 52 uncemented hips implanted for arthritis, osteonecrosis and fracture. The average patient age was 61 years. At six month, the mean Harris Hip Score was 95/100 for Charnley A and B hips. Despite the fact that in this series 40% of the patients presented with dislocation risk factors, one single dislocation occurred in a patient suffering of a Marfan syndrome who was treated by closed reduction and transient bracing. Other complications comprised two wound infections, two partial greater trochanter injuries and two occult femoral shaft fractures (one associated to secondary stem sinking). Neither deep infection nor nerve palsy was observed. Despite the shaft fractures, more probably related to the uncemented technique, anterior approach on orthopaedic table is a safe technique applicable to all primary hip patients. Even during a learning curve in an unselected population, the dislocation rate (1.8%) is low in comparison to that observed generally by posterior approach (5%) in the same population.

**Date : 2008-08-26**  
**Session : Joint: Hip 2**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 18383**

**THE ANATOMY OF HIP RESURFACING PATIENTS: PREOPERATIVE RADIOGRAPHIC ANALYSIS OF A COHORT OF 200 HIPS**

Jameson SIMON, David LANGTON, Antoni NARGOL

*University Hospital of North Tees, Stockton (UNITED KINGDOM)*

Implant position guidance for hip resurfacing is based on historical reports, wear analysis and in vitro studies. Reducing dislocation rate in THR has driven the need to find a "safe zone". A CT analysis study previously showed the mean acetabular inclination angle was 39° (range 27-51) in the non-arthritis population. Little is documented in the literature regarding natural hip anatomy in patients requiring surgery for end stage hip disease. Before establishing the perfect position for resurfacing hip implants we thought it necessary to determine the natural architecture of our patient group. This knowledge may aid the accurate positioning of all hip implants. We retrospectively analysed a consecutive series of 200 hips on 181 standardised anteroposterior pelvic X-rays. Acetabular inclination angle and femoral neck-shaft angles (NSA) were measured. Mean male anatomical acetabular inclination was 39.7° (standard deviation 3.9, range 30-49) and NSA was 130.3° (SD 5.7, range 118-141). Mean female anatomical acetabular inclination was 42.1° (SD 4.9, range 31-59) and NSA was 133.2° (SD 6.6, range 124-145). Our results showed a surprisingly wide variation of native acetabular inclination angles and NSAs. We believe that femoral and acetabular anatomy should be measured routinely as part of the preoperative planning process. We question the belief that one specific cup angle range "fits all". Some outliers may not be appropriate for hip resurfacing.

**Date : 2008-08-26**  
**Session : Joint: Hip 2**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 18423**

**FEMORAL PERIPROSTHETIC STRESS-SHIELDING FOLLOWING CEMENTLESS TOTAL HIP REPLACEMENT**

Vijay KUMAR, Lalit SHARMA, Rajesh MALHOTRA  
*All India Institute of Medical Sciences, New Delhi (INDIA)*

**AIMS AND OBJECTIVES:** This study aims to analyse the femoral periprosthetic stress-shielding following unilateral cementless total hip replacement using DEXA scan by quantifying the changes in bone mineral density around femoral component. **MATERIAL AND METHOD:** Femoral periprosthetic bone mineral density was measured in the seven Gruen Zones with DEXA scan at 2 weeks, 1 year and 2 year after surgery in 60 patients who had undergone unilateral cementless total hip replacement, of which 30 patients had been implanted with 4/5th porous coated CoCr stems and other 30 patients with 1/3rd porous coated titanium alloy stems. **RESULTS:** At both one and two years postoperatively, bone loss due to stress-shielding was seen in both stems with maximum loss in zone VII and minimum in zone III, IV, V. The maximum mean percentage bone mineral density loss in 4/5th porous coated CoCr stems in zone VII was 16.03% at one year and 22.42% at 2 years as compared to loss of 10.07% and 16.01% in 1/3rd porous coated Ti alloy stems. Increased bone loss was seen in patients who had larger diameter stem (>13.0mm) and in patients with low bone mineral density in the unoperated hip.



**Date : 2008-08-26**  
**Session : Joint: Hip 2**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 18585**

**MEASUREMENT OF ANTERIOR ELEVATION OF THE FEMUR IN THA THROUGH DIRECT ANTERIOR APPROACH**

Masanori MATSUURA, Hirotsugu OHASHI, tsuneyuki EBARA, Yuusaku OKAMOTO, shinnji TAKAHASHI, Kouzou KITANO  
*Department of Orthopaedic Surgery, Saiseikai Nakatsu Hospital, Osaka (JAPAN)*

In total hip arthroplasty (THA), direct anterior approach (DAA) is a muscle splitting approach that can avoid muscle damage during operation and can accelerate postoperative recovery. Through this approach, exposure of the acetabulum is facilitated, while anterior elevation of the femur is critical to provide sufficient access to the femoral canal. Enough capsulotomy and extension-adduction-external rotation of the femur are recommended, however the strategy for anterior elevation of the femur is not well recognized. In cadavers and in clinical cases, the capsulotomy was performed step by step and we measured the distance of anterior elevation of the femur in each step. By changing the angle of hip extension, the effect of hyperextension on the anterior elevation of the femur was also investigated. In cadaver study, capsulotomy at acetabular side did not affect the anterior elevation of the femur, while the distance increased after capsulotomy at femoral insertion. The effects of release of internal obturator tendon were clearly observed when the hip was in 25-degree extension with maximum external rotation. In clinical cases, the same tendency was observed. The capsulotomy at femoral insertion facilitated the reaming and rasping of femoral canal. In both cadaver study and clinical cases, these results indicated that capsulotomy at femoral insertion is the most important step for anterior elevation of the femur. The second step is release of internal obturator tendon with excessive extension of the hip joint.

**Date : 2008-08-26**  
**Session : Joint: Hip 2**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 18660**  
**LONG-TERM RESULTS WITH THE UNCEMENTED RIBBED HIP SYSTEM**

Heiner THABE  
*Orthop. Department, Diakonie Hospital, Bad Kreuznach (GERMANY)*

We present a retrospective study of cementless anatomically shaped "Ribbed Stem" with HA coating. We compared our results with total hip arthroplasties which were operated during 1986 and 1991 with a toothed stem without coating. (93% with an average follow-up of 13.6 years). During 1994 and 1995, 143 patients underwent 165 total hip arthroplasties with a HAtm-coated Ribbed Stem (mean follow-up was 10.2 years). The Merle-d'Aubigné score for group I averaged 6.9 points preoperatively and 15.7 points postoperatively. The Merle-d'Aubigné score for the HAtm-coated stems in group II increased from 7.2 points preoperatively to 17.3 points. The absolute functional scoring was excellent and good in 92%. Great and good functional improvement was seen in 97.8%. The zonal radiographic analysis for stems without HAtm-coating revealed in 14.6% progressive radiolucent lines >2mm in zones 5 and 6 due to varus migration of the stem. In contrast the HAtm-coated stems never showed varus migration and in only 2.9% small radiolucent lines <1.5mm for zone 5 and 6 were observed. Total revision rate of 5.2% for aseptic loosening after 10 years in group I, additionally 2 two-stage exchange arthroplasty for late periprosthetic infection. The estimated cumulative success rate of the first group was 87.6% after 13.6 years. In the second population we observed one periprosthetic infection. There was no aseptic cup or stem loosening. The estimated cumulative success rate including septic revision surgery was 95.3% after 10-year follow-up.

**Date : 2008-08-26**  
**Session : Joint: Hip 3**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 16043**

**ONE-STAGE BILATERAL UNCEMENTED HIP ARTHROPLASTY - A SIMULTANEOUS PROCEDURE FOR DYSPLASTIC OSTEOARTHRITIS**

Atsushi KUSABA, Saiji KONDO, Yoshikatsu KUROKI  
*Institute for Joint Replacement, Ebina General Hospital, Ebina, Kanagawa (JAPAN)*

**MATERIALS:** We evaluated 102 (3 male and 99 female) dysplastic patients with the minimum of two-year follow-up. The average of follow-up was 2.9 (2-5.0) years. The average age at the surgery was 55 (43-73). The diagnosis at the surgery was dysplastic osteoarthritis for all hips, including 29 hips of subluxation, one hip of unreduced congenital dislocation, ten hips of failed osteotomy and eight hips of avascular head necrosis after congenital dislocation. Uncemented implants (82 Spongiosa Metal cup, 20 Zweymüller cup, 74 Spongiosa Metal stem, 130 Zweymüller type stem) were adapted for all patients. Acetabuloplasty was adapted for five hips. Against the severe contracture, 48 hips required adductor tendon release and 10 hips extensive tendon release. **RESULTS:** We had no severe peri- and postoperative complications. All implants were stable. The average hip score was 45 (21-83) before the surgery and 88 (68-98) at the final follow-up. The score was improved in all patients. **DISCUSSION:** In comparison with two-staged surgery, the advantage of the simultaneous surgery was easier after treatment, better improvement in hip score, better range of motion, and the saving cost and time. On the other hand, the one-stage surgery is systematic-invasive and the after treatment in very early stage was a little bit difficult for the patients. The results more than made up for all the other faults. It is concluded that in selected patients with bilateral dysplastic hip necessitating bilateral hip replacement, the simultaneous bilateral surgery is advantageously carried out in one session.

**Date : 2008-08-26**  
**Session : Joint: Hip 3**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 16215**

**TOTAL HIP ARTHROPLASTY IN YOUNG PATIENTS. 10 TO 16-YEAR RESULTS USING FIN HIP ARTHROPLASTY**

Giovanni ANNARATONE, Fabrizio RIVERA  
*Presidio Sanitario Gradenigo, Torino (ITALY)*

The purpose of this study was to evaluate the 10- to 16-year results, with regard to osteolysis and durability of fixation, of total hip arthroplasty performed using an uncemented hip arthroplasty in patients who were 50 years of age or younger. The Fin stem (Gruppo Bioimpianti, Milano, Italy) is a straight collar stem designed with a proximal dorsal fin ensuring rotational stability. Fin cup is a pres-fit cup with three fins stabilising the cup against rotational forces. Between October 1990 and March 1997, 84 total hip arthroplasties were performed in 78 patients. In all cases Fin stem were implanted. In 79 cases Fin cup was implanted. In 4 cases the preoperative diagnosis was aseptic loosening of femoral and/or acetabular components. In 80 cases was primary total hip arthroplasty. The average age of the patients at the time of surgery was 43.8 years (range 25-50 years). The average follow-up was 12.2 years (range 10-16.7 years). Seven patients were lost to follow-up. This left 77 hips in 71 living patients. Among these, two acetabular components have undergone revision due to post-traumatic causes: a ceramic head rupture was observed 1 year postoperatively, and one polyethylene liner rupture was observed 8 years postoperatively. Two cups and one stem have required revision due to aseptic mobilisation, for a cup survival rate of 97.4% and a stem survival rate of 98.8%. Our results are encouraging and support the continued use of this implant in young patients.

**Date : 2008-08-26**  
**Session : Joint: Hip 3**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 16714**  
**TOTAL HIP ARTHROPLASTY AFTER HIP ARTHRODESIS**  
Zoran POPOVIC  
*Military Medical Academy, Belgrade (SERBIA)*

Conversion of the hip arthrodesis to total hip arthroplasty is rare and technically demanded surgical procedure. Generally approved indications for conversion of the hip arthrodesis in total hip arthroplasty are disability with severe low back pain, ipsilateral knee pain and painful opposite hip. In multicentric study from January 2002 to May 2007 we performed 7 conversions of the hip arthrodesis to total hip arthroplasties. Average age was 59.5 years and average durability of the hip arthrodesis was 35 years. We performed one cemented and six cementless total hips. There were 2 males and 5 females. Average follow-up was 3.5 years. We had no infection, dislocations and components' loosening. Abbreviation of affected extremity was 1 to 3cm. All patients have positive Trendelenburg sign and weakness of the pelvitrochanteric muscles. Interview showed that all patients were satisfied with painless, stable and mobile hip and improved quality of life. It is reasonable to convert hip arthrodesis to total hip arthroplasty at selected patients with right indications. The high risk of complications is the reason to perform this kind of surgery in special orthopaedic centres.

**Date : 2008-08-26**  
**Session : Joint: Hip 3**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 17352**  
**MODULAR NECK PROSTHESIS**

Antonio CROCE, Marco OMETTI  
*Istituto Ortopedico Gaetano Pini, Milan (ITALY)*

Obtaining the best results is essential setting the prosthesis in the more correct anatomic position, to reduce the stress that cause components' wear. The neck orientation is one of the responsables of the mechanic load of the implant; in fact, to this are correlated the relation with the cup (centre of rotation), the position on the frontal plan (varus/valgus middle/lateral) and the position on the translateral plan (ante/retroversion). The modular necks act on three spatial variables (length-offset-version) independently and sequentially, allowing reaching 27 points in the space; furthermore, disposing of heads with 3 lengths, the real disponibility become of 81 points in the 3 dimensions. When we have a minimum error about cup's position, the use of modular necks allows correcting this and so we can use the tribology ceramic-ceramic. The stem's preoperative planning maintains a great importance, but, in any case, the surgeon also must have the possibility to intra-operationally correct malpositioning. Usually, we estimate the implant's orientation and length both manually and through a radiographic intra-operationally control, so we can choose the best tribology neck/head. Fretting's proves have shown that the modular tribology produces negligible debris. In conclusion, the modula neck allows correcting the length and the version independently and sequentially, to use the ceramic-ceramic tribology also with light cup's malpositioning, to intra-operationally correct the implant's orientation; modular components produce negligible debris; there is a reduction of the mechanic stress through the sandglass form.

**Date : 2008-08-26**  
**Session : Joint: Hip 3**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 17417**

**CLINICAL EVALUATION OF THE CEMENTED COLLARLESS DOUBLE-TAPERED TITANIUM STEM. 3-8-YEAR FOLLOW-UP**

Sergey NIKITIN, Nikolay ZAGORODNY, Khalit MAGOMEDOV, Eugeny LOMTATIDZE  
*People's Friendship University of Russia, Moscow (RUSSIAN FEDERATION)*

**INTRODUCTION:** So called force-closed stem fixation philosophy has been successfully used since 1970. Material of stem has the same value as its shape and type of surface finish. The use of titanium is perspective due to the fact that its stiffness is closer to that of the bone and also due to its biological inertness. However, low durability to abrasive wear contributes to early aseptic loosening. Thermohydrogen treatment technology used to change surface quality enables the titanium stem to resist wear. **MATERIAL AND METHODS:** Since 1999 until 2007, more than 600 cemented collarless double-tapered titanium stems "SPHEN" have been implanted. We selected a cohort of 120 patients who underwent primary THA for osteoarthritis. Average age was 68 yrs (44-87). Average follow-up period was 6 yrs (3-8). In all cases distal femoral plug and cement pressurization were used. Postoperative radiographic analysis was carried out of the stem-cement and cement-bone contact in the Gruen zones. Functional results were registered according to the Harris scale. **RESULTS:** Distal migration was observed in the first two years postoperatively. In all cases subsiding was less than 3mm. Evaluation of the radiographs showed absence of debonding in the cement-bone interface. Average HHS was about 88. There were no cases that required revision surgery for aseptic loosening. **CONCLUSION:** We observed promising results over a period of 3 to 8 yrs postoperatively. However, it is necessary to analyse long-term follow-ups of this particular stem.

Date : 2008-08-26  
Session : Joint: Hip 3  
Time : 1100-1215  
Room: 408

Abstract number : 18172

**ACETABULAR PROTRUSION AND TOTAL HIP REPLACEMENT IN PATIENTS SUFFERING OF RHEUMATOID ARTHRITIS**

Branimir KRALJEVIC, Veljko JOVANOVIC, Predrag STOSIC, Daniel MILOSAVLJEVIC, Boris GLUSCEVIC, Radomir RADIVOJEVIC  
*Institute for Orthopaedic Surgery "Banjica", Belgrade (SERBIA)*

INTRODUCTION: Acetabular protrusion is frequent in patients suffering of rheumatoid arthritis (RA). Total hip replacement (THR) in these patients is connected with some technical difficulties and risk of early migration of acetabular component. MATERIALS AND METHODS: Retrospective analysis was performed in medical records of 268 patients who were operated in our department between 1976 and 2007 because of RA affection of hip. THR was performed in all of these patients. RESULTS: Age of patients ranged between 21 and 79 years. They were followed from three to 235 months. Strengthening of medial acetabular wall was performed with bone cement in 12, metal shell was used in 12, solid bone graft was used in 51 and spongioplasty was performed in 213 patients. Final result, concerning pain, range of motion and ability of walking, was excellent in 19%, good in 71%, satisfying in 7% and poor in 3% of patients. CONCLUSION: Acetabular protrusion is still one of the leading problems in THR in patients suffering of RA. Best results in our group of patients were in group where medial acetabular wall was strengthened using spongioplasty.



**Date : 2008-08-26**  
**Session : Joint: Hip 3**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 18185**

**PERIPROSTHETIC FRACTURES IN A REGIONAL ORTHOPAEDIC UNIT**

Colm TAYLOR, Philip BRADY, David MULCAHY  
*Cork University Hospital, Cork (IRELAND)*

Periprosthetic fractures after total hip arthroplasty are challenging, with potential difficulties associated with the fracture, implant loosening and bone loss. Overall incidence is increasing. We undertook this study to evaluate periprosthetic fractures presenting to our unit in terms of mechanism, classification and treatment. Charts of patients presenting within the past six years were retrospectively analysed for demographic and injury details and corresponding radiographs were reviewed for classification and treatment. 45 fractures were identified, with an average age of 78.3 years. The male to female ratio was 5:4. Only 4 fractures occurred in revision prostheses. Two fractures were intraoperative. The Vancouver system was used for classification. Three fractures of Vancouver type A were managed conservatively. Thirteen fractures were Vancouver type B1, 12 of which underwent internal fixation, mostly plate osteosynthesis; two of these subsequently failed. Recently, locking plates have been used with no recorded failures. Fifteen fractures were Vancouver type B2, 11 of which were over 5 years post arthroplasty. Most underwent femoral revision. Five of these patients had reported pain preceding fracture. Seven fractures were Vancouver type B3, all greater than 7 years post-arthroplasty. Most underwent femoral revision. Seven fractures were Vancouver type C, all underwent plate fixation. Although there is variability within the group studied, this series demonstrates gradual standardisation of treatment with locking plates and a preferred revision femoral stem. The reports of pain preceding fracture in some of the Vancouver B2 group prompts greater postoperative surveillance in patients with early signs of femoral loosening.

**Date : 2008-08-26**  
**Session : Joint: Hip 3**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 18424**

**TOTAL HIP REPLACEMENT FOLLOWING ACETABULAR FRACTURES**

Vijay KUMAR, Lalit SHARMA, Rajesh MALHOTRA  
*All India Institute of Medical Sciences, NEW DELHI (INDIA)*

Twenty total hip arthroplasties were performed with use of a cementless cup in 17 patients and cemented cup in a cage in 3 patients for the treatment of post-traumatic osteoarthritis following acetabular fracture. The average age of the 4 women and 16 men was 49 (range: 26 to 86 years) at the time of the arthroplasty. The median interval between the time of injury and the total hip arthroplasty was 37 months (range: 8 to 144 months). The average operative time was 120 minutes and average intraoperative blood loss was 700ml. Eight patients had previous open reduction and internal fixation of the acetabular fracture and twelve had been treated nonoperatively. Following total hip replacement, each patient was evaluated clinically and radiographically at six weeks, three months, six months and twelve months, and then yearly following total hip replacement. The average duration of clinical and radiographic follow-up was 40 months (range: 26 to 60 months). At the time of final follow-up, of twenty acetabular components, 10 had no evidence of periacetabular radiolucency, 7 components had a partial radiolucency that was <1mm wide, 2 had a complete radiolucency <1mm wide and 1 component was surrounded by a complete radiolucency of >2mm in width without showing component migration. According to Engh's criteria, 16 (80%) femoral stems had bony ingrowth and 4 (20%) stems had stable fibrous ingrowth. The average preoperative Harris hip score improved from 35 points to 78 points at the time of final follow-up.

**Date : 2008-08-26**  
**Session : Joint: Hip 4**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 15933**

**MINIMALIZED DIRECT LATERAL APPROACH TO THE HIP**

László BUCSI, Ferenc DOBOS

*St. George County Hospital, Székesfehérvár (HUNGARY)*

**OBJECTIVE:** Authors introduce their results with the "one incision" minimally invasive THR and they introduce their radiological evaluation in this subject. **METHODS:** There were 94 one incision minimally invasive THR performed in their institution from 01.06.2003 to 31.07.2007. The size of the skin incision, the blood loss and the hospitalisation time were measured the postoperative pain was compared to the pain in the cases of standard lateral approach. They analysed the cup and the stem positioning radiologically. **RESULTS:** The average skin incision was 8 (6.5-9) cm. The average postoperative blood loss was 473 (150-960) ml. In the control group the postoperative blood loss was 822 (350-1250) ml. The postoperative pain was 55% less intensive. The average hospitalisation time was 4.2 (3-11) days. The radiological position of the cup did not show significant difference between the MIS and the conventional groups, neither between the different prosthetic designs. 28% of the MIS Exeter stems were in group I (varus <5°), 8% of the cases were in group II (varus >5°). **CONCLUSIONS:** In well-selected cases, where the anatomical condition is suitable for minimally invasive procedure the postoperative blood loss is much less and the postoperative pain mainly due to the size of the approach is diminished and the hospitalisation time was definitely less as well. Due to the rather high percentage of stem malposition to start with, the operative technique and the patient selection could be rather important.

Date : 2008-08-26  
Session : Joint: Hip 4  
Time : 1400-1530  
Room: 408

Abstract number : 15972

**IMPROVED CEMENTING TECHNIQUE - INTERFACE BIOACTIVE BONE CEMENT (IBBC)**

Hiroshi FUJITA, Ryouichi NAGAHARA, Tomoo OKUMURA, Makoto YOSHIDA, Satoru YAMAMURA

*Institute for Joint Replacement, Department of Orthopaedic Surgery, Kyoto Katsura Hospital, Kyoto (JAPAN)*

**PURPOSE:** One of the drawbacks of cemented total hip arthroplasty (THA) is aseptic loosening after long period, major reason for which is bioinertness of PMMA bone cement. To improve longevity of THA, interface bioactive bone cement technique combined with modern cementing technique has been used in our institute, and was evaluated clinically and radiologically. **METHOD:** The present study includes 44 cases of primary THA with an average age at operation of 64 years old (ranging 48 to 81). Mean postoperative follow-up period was 4 (ranging 3.5 to 5) years. **RESULTS:** Pre- and postoperative evaluation using Japan Orthopaedic Association (JOA) hip score were 38, and 89 points, respectively. Postoperative cementing grade using Barrack's classification was A or B. At final follow-up, radiolucent line at bone-cement interface was not observed, except one case of rheumatoid arthritis patient at zone 3 described by Delee and Charnley in the acetabular side. Neither osteolysis nor loosening was observed in every case. No major complications, such as infection, dislocation, pulmonary embolization, were observed. **CONCLUSION:** The present study revealed excellent short-term result was obtained by IBBC technique combined with modern cementing technique for primary THAs. Most important technical point required for IBBC is to obtain dry bony surface just before cementing. Compressive reamed bone and gauze packing was effective for complete hemostasis just before cementing for the acetabular side, and plugging the isthmus using bone chips was effective for reducing bleeding for the femoral side.

**Date : 2008-08-26**  
**Session : Joint: Hip 4**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 16755**

**RESULT AT A MINIMAL 12-YEAR FOLLOW-UP OF A CONTINUING TOTAL HIP ARTHROPLASTY SERIES WITH HIGH CARBON METAL/METAL PAIRING**

Philippe TRICLOT

*CHP Saint Gregoire, Fougères (FRANCE)*

The aim of this study is to verify if the objective with osteolysis prevention is met and to specify what the concerns relative to the risks with metal ions are. 41 hips less than 65 years old, operated in 1995, were enrolled in the study. The patients were all operated with the same hybrid implants. Cause of patients not reviewed. Survival curve (aseptic failure). Clinical results (Merle; Harris; WOMAC). Conventional radiological results (Barrack cement grading). CT-Scan results (peri-prosthetic osteolysis). Toxicology results (serum Co; whole blood Co and Cr). 32 hips were studied. These results are significant (Student test <0.05). Survival curve: 100%. Clinical results: 75%  $\geq$  17 Merle; 87%  $\geq$  80 Harris Satisfactory index: 87%  $\geq$  70% WOMAC Change in Barrack cement grading: 12.5% Peri-prosthetic osteolysis: 12.5%. It is in any case centered on a hole of the optional screw implying a back-wear tied to the polyethylene sandwich. Biological results: Cr on whole blood: mean 2.08 $\mu$ g/l; Cr on plasma: mean 2.27 $\mu$ g/l; Co on whole blood: mean 1.58 $\mu$ /l. These toxicological results appear similar to those observed in the trade at risk and directly related to the metal load (47% of patients had at least 2 hip prosthesis). 12-year follow-up seems to confirm the relevance of this metal/metal generation in preventing the failure by peri-prosthetic osteolysis and does not confirm complications related to high levels of circulating metal ions.

**Date : 2008-08-26**  
**Session : Joint: Hip 4**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 17214**

**THR AFTER FAILED DHS**

Ahmed ABDEL-AAL, Aly MOHAMEDEIN, Khaled ELBALAM  
*Assiut university hospitals, Assiut (EGYPT)*

**BACKGROUND:** Most intertrochanteric hip fractures usually heal with internal fixation. Patients with failed internal fixation of trochanteric fractures have profound functional disability. Treatment with repeated attempts to gain union and preserve the host femoral head is preferred for young patients, but salvage treatment with hip arthroplasty may be considered for selected older patients with poor bone quality, bone loss, or articular cartilage damage. The purpose of the current study was to evaluate the results and complications of hip arthroplasty procedures for treatment of failed internal fixation of trochanteric fractures. **MATERIALS AND METHODS:** Between 2003 and 2007, 23 hips in 22 patients with trochanteric fractures who had initial internal fixation that failed were treated with hip arthroplasty. 7 were males, 15 were females, the mean age was 66 years, the mean time before THR was 6.6 months, the left side was affected in 14 cases, the right side in 7 cases and both hips in one patient, cemented THR were done in 17 cases, cementless THR were done in 5 cases, with hybrid THR used in one patient. **RESULTS:** Patients were followed up for a mean of 2 years (range 1 to 4 years), all patients were evaluated according to Harris Hip Score. **CONCLUSIONS:** THR after failed DHS may be considered for selected older patients with poor bone quality, bone loss, or articular cartilage damage.

Date : 2008-08-26  
Session : Joint: Hip 4  
Time : 1400-1530  
Room: 408

Abstract number : 17307

**COMPARISON OF POLYETHYLENE WEAR RATE AND RADIOGRAPHIC STABILITY BETWEEN CONVENTIONAL AND HIGHLY CROSS-LINKED POLYETHYLENE IN UNIFORM CEMENTLESS TOTAL-HIP-ARTHROPLASTY FOR SUBLUXATED OSTEOARTHRITIS - PROSPECTIVE CONSECUTIVE STUDY FOR 12 YEARS**

Hiroshi FUJII<sup>1</sup>, Hideo OHNISHI<sup>1</sup>, Hajime UTSUNOMIYA<sup>1</sup>, Satoshi OKABE<sup>2</sup>, Hiroshi TSURUKAMI<sup>3</sup>, Shinya TANAKA<sup>1</sup>, Soshi UCHIDA<sup>1</sup>, Toshitaka NAKAMURA<sup>1</sup>

<sup>1</sup>Department of Orthopaedic Surgery University of Occupational and Environmental Health, Kitakyushu (JAPAN), <sup>2</sup>Department of Orthopaedic Surgery of Niigata Rosai Hospital, Jouetsu (JAPAN), <sup>3</sup>Tsurukami Clinic of Orthopaedic and Rheumatology, Tamana (JAPAN)

**PURPOSE:** In performing THA, we use Mallory-Head type component, which has ling-lock system for metal shell and a polyethylene insert. From 1993 to April 1995, we used conventional polyethylene insert. Then we changed the polyethylene insert by replacing the conventional type with highly cross-linked type. The aim of this study was to ascertain whether or not there are any differences in polyethylene wear rate and radiographic stability between conventional polyethylene and highly cross-linked polyethylene at the mean 12-year (7-14) follow-up period. **METHOD:** We divided 61 hip-cases to two groups: 30 standard polyethylene (std group) and 31 highly cross-linked polyethylene (cross group). Radiographic signs of cup instability were defined as the development of radiolucent line (>2mm) or the shift (>4mm). Stem instability involved progressive subsidence (>3yrs) or radiolucent line on porous surface. Polyethylene wear rate was calculated by migration distance of the inner-head-centre through anteroposterior radiograph. **RESULTS:** In both groups, there was no significant difference in terms of age (yrs) (std vs. cross = 55, 59), cup abduction angle (49, 48), and cup size (mm) (46, 46). In cross group, the wear-rate (mm/yr) 0.103 was not significantly smaller than 0.118 of std group. No case in both groups showed any sign of implant instability. **CONCLUSION:** In Mallory-Head type cementless THA, cross-linked polyethylene showed no significant polyethylene wear-rate compared with standard type. Both groups showed stable implant fixation during the 12-year follow-up period.

**Date : 2008-08-26**  
**Session : Joint: Hip 4**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 17347**  
**BIOBALL MODULAR ADAPTERS**  
Antonio CROCE, Marco OMETTI  
*Istituto Gaetano Pini, Milan (ITALY)*

The hip prosthesis dislocation, in spite of the continuous progress of implants' materials and design, is again an actual event in the orthopaedic clinical practice, both after a total or endoprosthesis and after total hip replacement. Furthermore, dislocation has an important social-economic impact because of a protracted hospitalization and rehabilitation and elevated costs of an eventual revision. Neck modular adapters (Bioball) allow correcting easily the biomechanical parameters of the dislocated prosthetic joint, avoiding a new important operation. Other indications for the use of the neck modular adapter are total hip replacement and intraoperative correction of the limb length. Vantages are the possibility to obtain a great range of motion through a small thickness of the 12/14 adapter, the possibility to extend the limb length up to 21mm and to use ceramic heads during revisions, because the combination head/neck has a tribological unworn surface. In fact, in normal conditions, if the stem is not mobilized, the use of ceramic head is rash; the Bioball adapter, instead, can be used with an old stem, so we can set a ceramic head. We have also proving heads and necks. The proving and definitive heads have to be of the Bioball system because these are inserted on a modular neck with a no-standard diameter.



**Date : 2008-08-26**  
**Session : Joint: Hip 4**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 17516**

**EARLY OSTEOLYSIS IN ALUMINA-ON-ALUMINA ARTICULATION TOTAL HIP ARTHROPLASTY. A PROSPECTIVE STUDY OF 60 PATIENTS WITH AVERAGE 3-YEAR FOLLOW-UP**

Pui Yan LAI<sup>1</sup>, W.L. SHA<sup>1</sup>, M.Y. LUI<sup>1</sup>, W.H. SHEK<sup>2</sup>, H.L. WONG<sup>1</sup>

<sup>1</sup>Tuen Mun Hospital, Department of Orthopaedics & Traumatology, Hong Kong (HONG KONG), <sup>2</sup>Queen Mary Hospital, Department of Pathology, Hong Kong (HONG KONG)

This is a prospective clinical and radiological analysis of 60 patients who had Trident Alumina-on-Alumina cementless total hip arthroplasty done with average 3-year follow-up. One patient with significant acetabulum osteolysis was found. This patient has incomplete seating of the Trident metal backed ceramic insert. This complication was reported before with no significant clinical implication. In this patient, component revision and bone grafting operation was required. The osteolytic cavity lining tissue was examined under electron microscope with Energy Dispersive X-ray spectroscopy (EDX). Only Alumina particles but no Titanium particles were found. This case is suggestive of alumina particles induced osteolysis. No other revision for aseptic loosening was performed.

**Date : 2008-08-26**  
**Session : Joint: Hip 4**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 17774**

**THE NEW STEMMED CUP IN REVISION ARTHROPLASTY AND CDH: EXPERIENCE IN 307 IMPLANTS**

Francesco Saverio SANTORI, Nicola SANTORI

*S. Pietro Hospital, ROME (ITALY)*

Stemmed cup is a cementless implant with a very good primary stability. The stemmed cup is an evolution of the ring cup. It allows an optimal stability in the iliac bone relieving the stresses from damaged acetabular region. Since 5 years this cup has been modified to make his use more safe and easy. We report on 307 stemmed cup implants, 226 for revision surgery and other 81 for CDH as a primary implant (23 bilateral patients). The new stemmed cup has a cannulated stem and a dedicated instrumentation to avoid wrong ways. In CDH is now available a new cup with a short stem which is indicated in the mild dysplastic hips. In severe bone loss cases, (Paprosky grade 3-4), we used auto or homologous impacted bone grafts to fill the bone defect. Average age is 65 years (range 38-87). Mean follow-up is 8.2 y (range 1 year-15 years). We had relatively few complications (7.8%). 13 cases were revised in this paper will be done a methanalysis of this cup. The good mid and long-term results reported confirm that stemmed cup is not only a valid solution in revision surgery with mild and severe bone loss but also in CDH when conventional cups are not indicated.

**Date : 2008-08-26**  
**Session : Joint: Hip 4**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 17840**

**BIRMINGHAM MODULAR TOTAL HIP REPLACEMENT: CLINICAL RESULTS AT A MINIMUM 2-YEAR FOLLOW-UP**

Simon JAMESON, Elaine ROBINSON, Helen VINT, Ian CARLUKE, Mike REED, Paul PARTINGTON, Jameson SIMON  
*Wansbeck Hospital, Durham (UNITED KINGDOM)*

Excellent medium term results have been seen with the Birmingham Hip Resurfacing. In young, active patients with contraindications to resurfacing a Birmingham modular head THR may be the solution. We present the clinical results from the first independent series of the Birmingham/Synergy THR. One hundred and seventy-five consecutive primary THRs were performed in 162 patients between December 2004 and June 2007 by the 3 senior surgeons. The mean age at implantation was 59 years (33-74) and 51% were female. All patients were followed-up prospectively. Harris and Oxford Hip Scores, UCLA activity scores, and satisfaction scores were obtained at the two-year review of a subgroup of 90 hips (the first 83 patients). Mean follow-up of this group was 28 months (24-35). There were no patients lost to follow-up. Two patients died. In our entire series of 175 there were four (2.3%) revisions (two for aseptic cup loosening, one for infection, and one sustained a peri-prosthetic fracture). Deep infection rate was 1.1%. There were no dislocations. At the two-year follow-up assessment of the first 90 hips, two had been revised. HHS improved to 90.5, Oxford score to 4.4, and UCLA activity score to 5.9. 97% were satisfied with the outcome. This study confirms the good early clinical results and survival of large bearing metal-on-metal THRs, with a failure rate of 2.3% and no dislocations. These early results justify the continued use of this implant for young patients in whom a resurfacing is contra-indicated.

**Date : 2008-08-26**  
**Session : Joint: Hip 4**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 17970**

**THE MIS APPROACH IN SUPINE POSITION, TIPS AND TRICKS AFTER 1200 CASES**

Sabine JUNK-JANTSCH, Gerald PFLÜGER, Johannes BONOMO  
*Orthopaedic Clinic, Vienna (AUSTRIA)*

**PROBLEM DEFINITION:** The conventional surgical procedure of the original Watson Jones or transgluteal approach injures the gluteal muscle tendons, increases the risk of postoperative gluteal insufficiencies or dehiscence. A consequence of the conventional procedure may be trochanteric pain and persisting limping. Minimally invasive technique helps to prevent these complications by preserving the gluteal medius and minimus tendons insertion. **PATIENTS AND METHODS:** Since November 2004 we performed 1200 THR for osteoarthritis, dysplastic hips, necroses of the femoral head and femoral neck fractures using a minimally invasive anterolateral Watson-Jones approach in supine position. The goal for success is an extensive capsule release (especially in the trochanteric fossa). The leg is externally rotated, hyperextended and adducted without detachment of the gluteal tendons while broaching the femoral shaft. This method required a modification of the shaft rasps with double offset handle. Positioning and covering are described. **RESULTS:** The functional early results are impressive and any time reproducible. A positive Trendelenburg sign at time of discharge from hospital no longer exists. Without changing the implant system (Zweymüller SL Plus stem/SL PLUS MIA and Bicon threaded cup) no quality loss regarding implant position in comparison to the conventional technique occurred. **CONCLUSION:** The minimally invasive operation technique by using the anterolateral Watson-Jones approach in supine position is perfectly applicable in the hands of experienced surgeons, but is a more demanding procedure. It offers the patient an essential improvement of comfort in the immediately postoperative time and no late insufficiency problems.

Date : 2008-08-26  
Session : Joint: Hip 4  
Time : 1400-1530  
Room: 408

Abstract number : 18357

**TOTAL HIP REPLACEMENT VERSUS HIP RESURFACING: RESTORATION OF OFFSET AND LEG LENGTH USING THE BIRMINGHAM BEARING SURFACE**

Helen VINT, Simon JAMESON, Ian CARLUKE, Paul PARTINGTON, Mike REED  
*Wansbeck Hospital, Newcastle (UNITED KINGDOM)*

The use of larger bearing surfaces for primary hip arthroplasty is increasing for younger, active patients. There are good medium term results following hip resurfacing. One of the perceived benefits of larger bearings is accurate restoration of hip mechanics. However, recent reports have suggested that hip resurfacing does not restore femoral offset as accurately as 28mm head hybrid total hip replacement (THR). Accurate leg length restoration is also important in this group of patients. We compared standardised anteroposterior radiographs of patients with unilateral hip disease who had undergone either an uncemented THR with a modular Birmingham head and Synergy stem (89 patients) or a Birmingham Hip Resurfacing (BHR, 41 patients). We measured femoral offset with reference to the normal contralateral hip and compared the 2 groups for restoration of offset and leg length discrepancy. In the BHR group there was no significant difference in femoral offset when compared with the contralateral hip ( $p=0.26$ ). However, in the THR group there was a significant reduction in femoral offset when compared with the contralateral hip ( $p<0.001$ ). Mean reduction in offset was 0.5mm in the BHR group and 4.5mm in the THR group ( $p=0.006$ ). There was no significant difference between the two groups ( $p=0.86$ ) for leg length discrepancies. In our group of patients, we conclude that BHR does restore femoral offset accurately. However, the THR caused a significant reduction in offset despite the ability to adjust offset intraoperatively.

**Date : 2008-08-26**  
**Session : Joint: Hip 4**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 18621**

**FEMORAL HEAD CENTRE IN CHINESE ADULTS: RADIOLOGICAL ANALYSIS OF 415 PATIENTS**

Pak Ho Andrew CHAN, Yuk Yin CHOW, Hok Leung WONG, King Hay Arthur MA  
*Tuen Mun Hospital, Hong Kong (HONG KONG)*

**INTRODUCTION:** Restoration of the normal hip joint centre is important, but the original hip centre may not be evident in the arthritic or collapsed femoral head. A common assumption that the hip centre is levelled with the tip of the greater trochanter is in fact not supported by cadaveric and radiological studies in American and Japanese patients (actually, a mean of 10mm and 6mm inferior respectively.) This study is probably the first large-scale radiological analysis targeted on Chinese patients. **METHODS:** Records and standardised radiographs of patients undergoing unilateral hip arthroplasty from 2003 to 2007 in Tuen Mun Hospital were reviewed. Patients with contralateral hip disease or deformity were excluded. A total of 415 patients were included. Various measurements around the hip were recorded. **RESULTS:** Hip centers ranged from 12.1mm superior to 15.9mm inferior to the tip of greater trochanter, with a mean value of 5.0mm inferior to the tip of greater trochanter. **DISCUSSION AND CONCLUSION:** The common belief of an equal level of the femoral head centre and tip of the greater trochanter is not entirely true in the Chinese population. In view of the wide range of the value, the contralateral hip joint, if normal, should be considered as reference in individual patient. If contralateral hip joint is abnormal, one should consider avoiding placing the hip centre superior to the tip of the greater trochanter.

**Date : 2008-08-26**  
**Session : Joint: Hip 5**  
**Time : 1600-1730**  
**Room: 408**

**Abstract number : 16759**

**PROTRUSIO ACETABULI IN THE ADULT - TREATMENT WITH IMPACTION BONE GRAFTING AND TOTAL HIP ARTHROPLASTY WITH UNCEMENTED CUP. TWO-YEAR RESULTS**

Sukhman KALRA, Ashok Lal RAMAVATH, Ashok K SINHA  
*North West Wales NHS Trust, Bangor (UNITED KINGDOM)*

The treatment of protrusio acetabuli has traditionally been with use of impaction bone grafting and a cemented acetabular cup in adult patients with arthritis. We present the early results of a similar technique of restoring the hip centre with impaction bone grafting of the medial wall but with an uncemented total hip arthroplasty using a porous coated uncemented metal backed cup with screws. Twelve patients (Females: 9, Males: 3) with 15 hips (three had bilateral hip involvement) were treated by this technique by a single surgeon (AKS) over a five-year period. Mean age of the cohort was 70 years (range: 52-92). The etiology of the protrusio was osteoarthritis in the majority (n=11) and rheumatoid arthritis in one patient. Bone graft was taken from the patient's own femoral head in all patients except one in whom it was fresh frozen allograft. The degree of protrusio was 14.7mm (range: 6-25 mm) with 40% of the hips having Grade-III protrusio and 60% with Grade-II protrusion. Patients were reviewed clinically and radiographically at a mean follow-up of 24 months (range: 2-37 months). All patients had graft incorporation at 6 months with hip centre restored to normal. There was a reduction in the Oxford Hip Scores by 45% (range: 22-72%). There was no evidence of cup migration or loosening at last follow-up. Early results of this treatment method demonstrate that it is a useful technique for treating this difficult problem.

Date : 2008-08-26  
Session : Joint: Hip 5  
Time : 1600-1730  
Room: 408

Abstract number : 16807

**POSTOPERATIVE QUALITY OF LIFE IN THE PATIENTS WITH HETEROTOPIC OSSIFICATION AFTER TOTAL HIP REPLACEMENT**

Artur STOLARCZYK<sup>1</sup>, Lukasz NAGRABA<sup>2</sup>, Tomasz MITEK<sup>2</sup>, Jarosław DESZCZYŃSKI<sup>2</sup>

<sup>1</sup>Department of Clinical Rehabilitation, Physiotherapy Division, 2nd Medical Faculty of Warsaw Medical University, Warsaw (POLAND),

<sup>2</sup>Department of Orthopedic Surgery and Rehabilitation, 2nd Medical Faculty of Warsaw Medical University, Warsaw (POLAND)

**INTRODUCTION:** The main aim of the total hip replacement is the best final clinical effect of the treatment which is not only correct prosthesis implantation but also patients' optimal postoperative quality of life. For this reason clinicians should determine these factors with negative influence on operated patients' life quality in order to eliminate them in the treatment process. **AIM OF THE STUDY:** To evaluate the incidence of heterotopic ossification after THR and the influence of heterotopic ossification in Brooker classification on the range of hip passive motion and postoperative quality of life. **MATERIALS AND METHODS:** 113 patients in the mean age 67 were included into the study. Preoperative radiological pictures and postoperative radiograms were used to assess heterotopic evaluation. Brooker classification was used. The range of hip passive motion was measured with use of standard goniometer during a control examination. Postoperative quality of life was evaluated in WOMAC Global Index. **RESULTS:** Initial study showed 47% incidence of heterotopic ossification after total hip replacement. Patients with III and IV grade of ossification according to Brooker acquired shorter range of passive motion than patients with lower grades. Patients without heterotopic ossification and patients with ossifications of grade I and II evaluated the quality of life higher than patients with grade III and IV. **CONCLUSIONS:** Occurring in a significant percentage of patients who underwent THR, heterotopic ossification is a major clinical issue. Heterotopic ossification influences the quality of life and impair function of the operated hip joint.



**Date : 2008-08-26**  
**Session : Joint: Hip 5**  
**Time : 1600-1730**  
**Room: 408**

**Abstract number : 17034**

**RECONSTRUCTION DIFFICULTIES IN THR FOR DDH**

Mihai Viorel POPESCU, Razvan-Silviu CISMASIU, Emil George HARITINIAN, Daniel GEAMANU  
*Clinical Hospital of Orthopaedics, Bucharest (ROMANIA)*

INTRODUCTION: In our clinic almost 50% of total hip arthroplasties, in patients under 55 yrs, are performed because of osteoarthritis secondary to an abnormality of hip development. MATERIAL AND METHODS: We have analysed 97 cases, treated in our clinic within the period 2002-2006. We used the Hardinge lateral approach  $\pm$  trochanterotomy. The following parameters have been used: Harris score, position of rotation centre, degree of cup coverage, postoperative femoral offset, limb length discrepancy (LLD). RESULTS: The average postoperative Harris score was 72 (39 preoperatively). The rotation centre was lowered in anatomical position (between 0-50 mm) requiring an acetabuloplasty in 33% of the patients. The postoperative femoral offset was increased between 0-90% by the femoral component or by the lateralization of the greater trochanter (31% of the patients). Limb length discrepancy was corrected by trochanterotomy or subtrochanteric "Z" osteotomy. COMPLICATIONS: 4 cases with femoral nerve palsy, 1 case with peroneal nerve palsy (after lengthening >30mm), remitted within 3-6 months. DISCUSSIONS AND CONCLUSIONS: The arthroplasty with uncemented total hip prosthesis is an effective solution in the treatment of dysplastic hip in patients under 55 yrs. The factors that influence most the results are: the position of the rotation centre, the acetabular bone stock reconstruction, the restoration of femoral offset and the LLD.

Date : 2008-08-26  
Session : Joint: Hip 5  
Time : 1600-1730  
Room: 408

Abstract number : 17201

**OSSEOINTEGRATION OF SLPS (SELF LOCKING POROUS SYSTEM) HIP JOINT ENDOPROSTHESIS**

Alexander RUTSKY<sup>1</sup>, Alexander BELETSKY<sup>2</sup>, Alexey MASLOV<sup>3</sup>

*<sup>1</sup>Belarussian Medical Academy for advanced training of doctors, Minsk (BELARUS), <sup>2</sup>State Scientific and practical centre of Trumatology and Orthopaedics, Minsk (BELARUS), <sup>3</sup>Minsk Regional Clinic, Minsk (BELARUS)*

A new construction of cementless SLPS hip implant is created under the guidance of Prof. A. Rutsky. This implant provides a press-fit fixation and has an ability of osseointegration due to implant design and surface features. The stem has a three-dimensional tapered shape which provides the better fixation in medullar channel and reliable rotational stability. In order to increase proximal fixation of the stem, two porous titanium inserts - thickness from 2 up to 5mm - are used. They are connected among themselves with apertures passing perpendicularly to the longitudinal axis of the stem. The specified inserts provide, unlike the other implants known to us, a deep throughout growing of the bone tissue and strong fixation of an implant. In order to improve biocompatibility, a technology of vacuum multilayered titanium oxide spraying on the atomic pure titanium stem is used. A created 2-3 microns oxide layer serves as a barrier on a way of migration of alloying components and microelements from implant to organism. The advantages of described technology as compared with the traditional are proved by means of microprobe x-ray spectral analyzer MS-46 and investigations of isotonic solutions carried on. A throughout growth of bone tissue into the titanium inserts was investigated using the implants which were removed according to various reasons. Porous inserts and break surface passed the microphotography with light microscope. Research of ingrown bone tissue was performed with scanning electronic microscopy with chemical analysis system. All the investigated samples of tissue proved to be the bone tissue.

**Date : 2008-08-26**  
**Session : Joint: Hip 5**  
**Time : 1600-1730**  
**Room: 408**

**Abstract number : 17385**

**METASUL LDH FOR YOUNG PATIENTS WITH DISPLASTIC HIP**

Michael ZIMLITSKI, Levan NATCHKEBIA, Vaga GAPRINDASHVILI  
*Gudushauri National Medical Center, Tbilisi (GEORGIA)*

We describe the clinical and radiological short-term outcomes of 87 (11 male and 72 female) total hip replacements using the Metasul Large-Diameter Heads in young patients (age between 21 to 55 years old) for displastic hips (all together 83 patients). In all cases uncemented Zweymuller stem has been used. All the cases performed between July 2007 and January 2008 and all of them are followed up. Until now no case needed to be revised and just in one patient superficial ligature infection occurred, which was successfully treated and three other cases with deep-vein thrombosis, which were also treated conservatively. Proximally posteriorly curved skin incision performed for easier approach, which is obviously helpful for femoral reaming. For better position towards the acetabulum we started with femoral part, reaming it first and leaving the last reamer in femoral canal. Accordingly socket is inserting in corresponding position and just after that the original Zweymuller stem is fixing in femoral canal. On the second day after surgery patients were allowed to walk with full weight bearing, using the crutches and were allowed as well to keep sitting position as tolerated. Subjectively patients felt very comfortable, just slight incision pain. About three weeks since the operation most patients were able to walk without crutches, or just used the cane. At three and six month follow-up remarkable improvement was observed. At this moment we can conclude that the Metasul LDH is an extremely good solution for young patients with displastic hips.

**Date : 2008-08-26**  
**Session : Joint: Hip 5**  
**Time : 1600-1730**  
**Room: 408**

**Abstract number : 17753**

**A STEMLESS-NECK PRESERVING HIP IMPLANT WITH VERY LARGE CLINICAL INDICATIONS**

Francesco Saverio SANTORI, Nicola SANTORI

*S. Pietro Hospital, ROME (ITALY)*

Almost all conservative neck preserving or resurfacing implants are restricted to young patients or to elderly patients with a good bone stock. The purpose of this stemless prosthesis is to give a physiologic load distribution in the proximal femur, to save good bone stock to have. With this in mind, we began, in 1993, the development of a new femoral implant. The main features are an almost complete absence of the diaphyseal portion of the stem, a high femoral neck cut which allows the preservation of most of the anterior, posterior and medial wall of the femoral neck, a well defined lateral flare with load transfer allowing complete proximal circumferential stress distribution and bone in-growth. These innovations resulted in an extremely conservative implant making it particularly indicated for minimally invasive surgery. This implant, which we began to implant in June 1995 as a custom-made prosthesis, and later as a standard prosthesis was, at the beginning, recommended only for young patients, then extended to elderly ones. Actually the authors use this implant as their standard implant. In this study, we present the rationale, the biomechanical studies and the clinical results so far obtained with this implant in our first 400 cases and reported the results of the first 3000 cases done in the world.

**Date : 2008-08-26**  
**Session : Joint: Hip 5**  
**Time : 1600-1730**  
**Room: 408**

**Abstract number : 17761**

**THE PROXIMA HIP - A CONSERVATIVE HIP IN OVERSEVENTIES**

Francesco Saverio SANTORI, Nicola SANTORI  
*S. Pietro Hospital, ROME (ITALY)*

The maintenance of a good bone stock is of fundamental importance in total hip prosthesis, also in consideration of a possible, future revision. This implant (PROXIMA De Puy-J&J) has been realised on purpose to get a more physiological distribution of the strengths that act on the proximal femur. The prosthesis proxima is a conservative implant both of bone and soft tissues. Proxima, for its very good initial mechanical stability and for its physiological load distribution, can be applied not only in young people but also in the elderly ones. Is this the difference between this implant and all the other neck- preserving or resurfacing prostheses which can be used only in younger patients. The clinical and functional results of this implant have been very satisfactory. In the present study we present the clinical results gotten in a population of patients with age superior to seventy years. We have considered 161 patients of varying age between 70 and 87 years. The clinical acceptance of the patients has been very good, no revisions are present in this series, neither cases of thigh pain. The radiographical picture has shown the absence of stress shielding and the appearance, at one year of distance, of progressive reinforcement in the trabecular bone around the prosthesis. **KEYWORDS:** Uncemented, metaphyseal loading, lateral flare, neck preserving, stemless, total hip arthroplasty.

Date : 2008-08-26  
Session : Joint: Hip 5  
Time : 1600-1730  
Room: 408

Abstract number : 17786

**THE EMERGENCE OF A NEW TYPE OF CERAMICS IN TOTAL HIP ARTHROPLASTY: THE ALUMINA MATRIX COMPOSITE (AMC)**

Bernard MASSON, Thomas PANDORF  
*CeramTec, Pechabou (FRANCE)*

Demand for ceramic bearings is increasing rapidly because of excellent clinical results. Alumina offers advantages such as chemical resistance, excellent biointertness and tribology. However, alumina has limited strength; therefore the applications are restricted to certain designs. Zirconia materials have been used clinically but reveal problems due to poor hydrothermal stability. Thus, there is a strong need for new bearing material that combines strength and stability. The ceramic named Alumina Matrix Composite (AMC) uses the following principle of transformation toughening: firstly, the dispersing of small particles of Y-TZP Zirconia in the alumina matrix and secondly the reinforcement by introduction of an anisotropic crystal like whiskers. This process dissipates the crack energy that is associated with an increase of strength. The examination of the tribological situation of AMC, especially under challenging conditions of hydrothermal ageing and under severe micro separation, shows the aptitude of this material in wear applications. Alumina Matrix Composite offers a better mechanical resistance than alumina while maintaining the structural stability and equivalent tribological qualities. This ceramic composite will enable new application possibilities to be offered in orthopaedics. This is a material that has been evaluated and tested for the last 9 years. The results of this evaluation and testing process have been included in the manufacturer's Master File at the F D A and approved. Its first clinical use in the United States was in June 2001. Since its introduction, the Alumina Matrix Composite has been implanted in more than 65,000 patients around the world.

**Date : 2008-08-26**  
**Session : Joint: Hip 5**  
**Time : 1600-1730**  
**Room: 408**

**Abstract number : 17824**

**EARLY RESULTS AND EXPERIENCES WITH PROXIMA HIP ARTHROPLASTY**

Kálmán TÓTH, Gellért SOHÁR, Ferenc GREKSA, László MÉCS  
*University of Szeged, Szeged (HUNGARY)*

For young and active patients conventional total hip arthroplasty is not advisable, as the patient will outlive the prosthesis. The bone preserving procedures and hip replacement alternatives have several advantages over THR. In Proxima hip replacement, a stemless stem is impacted in the top end of the femur. Neck-preserving implants through a lateral or posterior mini-approach seem to be the most consolidated solution in minimally invasive total hip replacement. The authors will present the learning curve results of 20 consecutive Proxima hip arthroplasty procedures. RESULTS: In two cases slight varus positioning, because of fear of breaking the femur. One intra-operative peri-prosthetic fracture, because of excessive implantation, which was treated by plate OS. Average age of the patients was: 49 year (36-68), men to women ratio: 60/40. The diagnosis was: 40% osteoarthritis, 30% dysplasia, 25% AVN, 5% post-trauma patient. The presentation will be aided by video recordings to demonstrate the paramount errors that were faced during the learning experiences. After average 6 months of follow-up all the implants are stable. The positive subjective outcome of the patients can be measured in the genuine changes in their daily living.

Date : 2008-08-26  
Session : Joint: Hip 5  
Time : 1600-1730  
Room: 408

Abstract number : 18243

**RESULTS OF TOTAL HIP ARTHROPLASTY IN TREATMENT OF DEVELOPMENTAL DISLOCATION OF THE HIP**

Mehmet Ali DEVECI, Aykin SIMSEK, Erdal CILA, Alparslan SENKÖYLÜ, Erdiç ESEN, Ertugrul SENER, Selcuk BÖLÜKBASI  
*Gazi University Faculty of Medicine, Department of Orthopaedics and Traumatology, ANKARA (TURKEY)*

Total hip arthroplasty surgery in patients developing degenerative arthritis with developmental dislocation of the hip is a major treatment option but technically difficult because of many dysplastic structures of the hip joint. The aim of this study is to evaluate the results of total hip arthroplasty in patients with developmental hip dislocation. Between 2002 and 2007 total hip arthroplasty applied to thirty-nine hips of twenty-seven patients with developmental hip dislocation. Twenty-five patients were female and five were male. Average age of the patients at the time of operations was 48 years. According to Hartofilakidis classification 12 hips were type 3, 20 hips were type 2 and 7 hips were type 1. Average follow-up time was 26 months. Visual pain scale was 7 preoperatively and became 2 at the last follow-up. Mean Harris hip score which was 35 preoperatively became 90 at the last follow-up. Femoral shortening osteotomy applied to ten hips and average amount of shortening was 3.6cm. Because of insufficiency of acetabular bone stock in thirteen hips femoral head autograft used to reconstruct the superolateral acetabulum. Except 3 acetabular components 36 acetabular and all femoral components applied cementless. In two hips one at postoperatively second month and other at sixth month dislocation happened. In one hip late onset of prosthesis infection occurred and treated with two step revision surgery. Total hip replacement surgery applied with the right indications is the treatment option that allows a better life quality to these patients.



**Date : 2008-08-26**  
**Session : Joint: Hip 5**  
**Time : 1600-1730**  
**Room: 408**

**Abstract number : 18407**

**LIAW'S VERSION - A NEW STANDARDISED VERSION OF ACETABULAR PROSTHESIS**

Chen-Kun LIAW<sup>1</sup>, Chiou-Shann FUH<sup>2</sup>, Rong-Sen YANG<sup>3</sup>, Sheng-Mou HOU<sup>3</sup>, Tai-Yin WU<sup>4</sup>, Chun-Han HOU<sup>5</sup>

<sup>1</sup>*Department of Orthopaedics 1, Tao-Yuan General Hospital, Taipei (TAIWAN)*, <sup>2</sup>*Institute of Computer Science and Information Engineering, National Taiwan University, Taipei County (TAIWAN)*, <sup>3</sup>*National Taiwan University & Hospital, Taipei (TAIWAN)*, <sup>4</sup>*Taipei City Hospital, Renai Branch, Taipei (TAIWAN)*, <sup>5</sup>*National Taiwan University & Hospital, Yun Lin Branch, Taipei (TAIWAN)*

We invented a standardisation method to measure the cup's anteversion after total hip arthroplasty without the influence of patient's position. We measured 68 radiographs of 10 patients after THR and calculated the error of each measurement, defined as difference with the average of the same measuring method on the same patient. We also calculated the repeatability standard deviation (RSD) of each method according to the ASTM E691. Mean absolute inter-examination angle error, defined as the average of the absolute deviations, was 0.75 degree for standardised anteversion (range 0.03-2.51 degrees), as compared with those without standardisation, 2.30 degrees (range 0.04-13.04 degrees). The inter-examination measurement reliability (precision), defined as one RSD, was 0.99 degree for standardised anteversion, as compared with those without standardisation, 3.50 degrees. There is no difference between patient #4 and #5 without ( $p=0.097$ ). There is significantly difference with standardisation ( $p<0.0001$ ). Our study demonstrated that this mathematical method is a precise tool to measure the anteversion of the acetabular cup. We hope it can be used widely in the future.

**Date : 2008-08-26**  
**Session : Joint: Hip 5**  
**Time : 1600-1730**  
**Room: 408**

**Abstract number : 18413**

**THE ROLE OF ARTHROSCOPY IN RESURFACING ARTHROPLASTY OF THE HIP**

Vikas KHANDUJA<sup>1</sup>, Kristian SISAK<sup>2</sup>, Richard VILLAR<sup>2</sup>

<sup>1</sup>Cambridge University Hospitals NHS Trust, Cambridge (UNITED KINGDOM), <sup>2</sup>The Wellington Hospital - South Building, London (UNITED KINGDOM)

Resurfacing arthroplasty of the hip has become a successful alternative to a total hip replacement in the young and active adult, in the medium-term. However, problems do occur and the radiologically sound but symptomatic resurfacing often can pose a diagnostic challenge and a therapeutic dilemma. In this difficult situation, especially when all investigations are normal or indeterminate, the surgeon is left with no choice but to proceed with a revision of the resurfacing arthroplasty with a presumptive diagnosis of loosening. However, based on the large experience of arthroscopic hip surgery in our unit, we attempted to arthroscope the symptomatic resurfacing arthroplasty and found the procedure very useful both in terms of aiding to clinch a diagnosis and being of therapeutic value. This report describes our experience with eight consecutive patients who underwent an arthroscopy of the hip for a painful resurfacing arthroplasty.

**Date : 2008-08-26**  
**Session : Joint: Hip 5**  
**Time : 1600-1730**  
**Room: 408**

**Abstract number : 18443**

**ENDOPROTEZIS OF COXAL JOINT ON TECHNOLOGY OF THE NEW GENERATION**

Sabyrbek DJUMABEKOV, Sovetbek KAZAKOV, Bakyt KALCHAEV, Taalay KULUEV, Abdumavlyn ASAMIDINOV  
*Scientific Research Center of Traumatology and Orthopaedics, Bishkek (KYRGYZSTAN)*

In the period from 2004 to 2008 in the research centre of traumatology and orthopedics is executed beside 317 sick 336 (100%) operation all-out replacement coxal joint. They were used endoprotezis companies: - "Aesculap" 12 (3.5%), - "DePuy" 2 (0.5%), - "ESI" 202 (60.3%), - "SFEN" 12 (3.5%), - "Implant" 15 (4.4%), - "Stryker" 68 (20.4%), - "Bioimpianti" 25 (7.4%). In 238 (70.8%) events endoprotezis fixed by means of bone cement, in 64 (19%) events no cement by method and in 34 (10.2%) events used hybrid fasciations of implant. The age sick was from 21 to 75 years. The average age of the patient has formed 47 years; of them men were 135 and women 182. Endoprotezis of coxal joint was produced sick coxarthrosis 146 (43.5%), displastic coxarthrosis 73 (21.7%), aseptic necrosis of the head to thighbone 50 (14.9%), false joint shakes to thighbone 36 (10.8%), rheumatoid arthritis 12 (3.5%) and spondiloarthritis with ankylosis is 19 (5.6%). The remote results from 3 month before 2 years beside 135 patients were regarded good, but beside 4 - as satisfactory. The total of the introduction endoprotezis of coxal joint in our medical institution was a reception good result beside 98.8% and satisfactory beside 1.2%. The divined experience to implantations endoprotezis above specified companies, made on modern technology, is indicative of reliability and low traumatically operations with good upshot.

**Date : 2008-08-26**

**Session : AO Foundation Jubilee Symposium: New Concepts in Osteoporotic Fractures**

**Time : 0800-1030**

**Room: 603-604**

**Abstract number : 19013**

**AO CLINICAL PRIORITY PROGRAM: OSTEOPOROSIS**

James KELLAM

*Carolinas Medical Center, Charlotte (UNITED STATES)*

Over the past four years, the AO Foundation has developed a translational research program based upon clinically relevant problem of osteoporosis. Issues of diagnosis, fracture fixation, determination of bone strength and overall care are all issues that need answers. This talk will review the Clinical Priority Program in osteoporosis and highlight some of the new results. The use of a probe to intraoperatively determine bone strength which will help implant choice has been developed and is in clinical trials. A new technique in augmentation for improving screw fixation in metaphyseal bone is in the final research stage prior to clinical trials. As well overall concept of diagnosis and management of these patients is a very important part of the whole program. With this program the AO Foundation plans to advance the specific and general care of the patient with fragility fractures.

**Date : 2008-08-26**

**Session : AO Foundation Jubilee Symposium: New Concepts in Osteoporotic Fractures**

**Time : 1100-1215**

**Room: 603-604**

**Abstract number : 19065**

**DEVELOPMENT OF NEW IMPLANTS FOR OSTEOPOROTIC FRACTURES**

Norbert P. HAAS

*Charite, Universitaetsmedizin Berlin, Berlin (GERMANY)*

Osteoporosis is defined as a systemic skeletal disease of men and women characterized by low bone mass, decreased bone strength, micro architectural bone tissue deterioration, and increased fracture risk. The main problem for fracture treatment is low bone mineral density in osteoporotic bone which implies less bony material for screws to hold on to. This increases the risk of screws to cut out. Consequently the osteosynthesis might not be stable enough. The pull-out of regular plate-screw-constructs happens as the result of a bending load. Under this load the screws are pulled out sequently. The clinical results of anatomically pre-shaped, angular stable plate-screw-constructs has been very successful in the treatment of fractures of the proximal humerus, distal radius, proximal femur and distal femur, especially if combined with minimal-invasive OR technique minimizing the damage of the soft tissues. Using angular stable constructs provides higher resistance against bending load due to higher resistance area. Furthermore, the blood supply is less disturbed due to the distance between bone / periosteum and plate. In proximal humerus and proximal femur fractures, the use of an intramedullary device in combination with a spiral blade provides improved fixation in osteoporotic bone and enhanced control of rotational instability due to rotational and angular stability.

**Date : 2008-08-26**

**Session : SICOT Sports Medicine Symposium - Current Trends in Sports Medicine: An international Perspective on Managing Sports Injuries to the Knee**

**Time : 1400-1530**

**Room: 603-604**

**Abstract number : 19211**

**PREVENTION STRATEGIES FOR SPORTS INJURIES TO THE KNEE**

Wilson LI<sup>1</sup>, Patrick YUNG<sup>2</sup>, Lars ENGBRETSSEN<sup>3</sup>

<sup>1</sup>Queen Elizabeth Hospital, Hong Kong (HONG KONG), <sup>2</sup>Prince of Wales Hospital, Hong Kong (HONG KONG), <sup>3</sup>Medical Commission, IOC, Hong Kong (HONG KONG)

The incidence of anterior cruciate ligament (ACL) injury at sporting activities remains high, especially in the young and athletic population. The incidence of non-contact ACL tears as a function of gender shows that female subjects have a much higher incidence in some sports. In spite of the fact that some successful ACL injury prevention programmes have been introduced, the ACL injury continues to be the largest single problem in Orthopaedic Sports Medicine. We now know that, based on recent studies, there can be a quantifiable reduction in ACL risk for athletes, particularly females, who complete a well designed injury prevention programme. Most of these programmes attempt to alter dynamic loading of the tibiofemoral joint through neuromuscular and proprioceptive training. They have focused on increasing hamstring, gluteus medius and hip abductor strength, and addressing proper deceleration techniques. Proper neuromuscular training can decrease peak landing forces. Training will significantly enhance hamstring strength and power, and reduce hamstrings-to-quadriceps and side-to-side strength imbalances. However, very little is known about the effect of sport-specific factors such as rules, referees, coaching, meteorological conditions such as the traction at the shoe-playing surface interface, playing surfaces, and protective equipment on the risk of suffering an ACL injury. These potential risk factors merit further investigation. Everybody can participate in the fight to prevent the ACL injury, especially in the young female athlete. Successful implementation of these prevention programmes requires the collaboration of governing bodies, sports scientists, physicians, coaches, parents and athletes. Increased and substantial support from the sports medicine community as well as from the sporting world is required to ensure success in this battle so that ACL injuries are eradicated, or at least substantially reduced.

**Date : 2008-08-26**

**Session : SICOT Sports Medicine Symposium - Closing and Close-up on the Beijing Games: What we learnt from 2008?**

**Time : 1600-1730**

**Room: 603-604**

**Abstract number : 19148**

**INJURY SURVEILLANCE DURING THE 2008 OLYMPIC GAMES**

Wilson LI<sup>1</sup>, Patrick YUNG<sup>2</sup>, Lars ENGBRETSSEN<sup>3</sup>

<sup>1</sup>Queen Elizabeth Hospital, Hong Kong, Hong Kong (HONG KONG), <sup>2</sup>Chinese University of Hong Kong, Hong Kong (HONG KONG),

<sup>3</sup>International Olympic Committee, 1001 Lausanne (SWITZERLAND)

1. To Evaluate different methods to collect injury data during the 2008 Olympic games by evaluating the number of submitted forms compared to the expected number & the completeness of the forms; and comparing submitted forms to NOC data in selected teams (20 of 205).2. To survey the injury and injury pattern during the Olympic games by documentation and video analysis

**Materials and Method :**Medical representatives of International Federations and National Olympic Committees are informed of this study by the IOC. A booklet with detailed information is distributed and instructional meetings are held for NOC physicians. Through personal contact during the Games, feedback on completeness and quality of injury reports during the Games are collected. NOC physicians are required to submit a daily report concerning all injury in competition and training. The injury report form comes in 8 languages and is collected in the Olympic village. The Medical centres report on a daily basis the injuries of all treated athletes

**Results :**The frequency and characteristics of injuries during the 2008 Beijing Olympic Games will be reported, with analysis for specific groups (competition/training, different sports) in the form of a written report to NOC physicians, physiotherapists, NOCs and IFs, with possible proposals for prevention of injuries

**Conclusion :**The logistics and data management of more than 200 national teams with a total of ca. 12 000 athletes is a formidable task. Maintenance of the compliance of NOC physicians during the Games is crucial to success of the endeavour.

**Date : 2008-08-26**

**Session : SICOT Sports Medicine Symposium - Closing and Close-up on the Beijing Games: What we learnt from 2008?**

**Time : 1600-1730**

**Room: 603-604**

**Abstract number : 19199**

**MEDICAL COVERAGE OF THE OLYMPIC EQUESTRIAN GAMES**

Wilson LI

*Queen Elizabeth Hospital, Hong Kong (HONG KONG)*

Anxieties surrounding equine quarantine and health have led to the relocation of the 2008 Olympic equestrian disciplines from Beijing to Hong Kong. The change of venue was due to concerns that a disease-free zone, which would allow the horses to return home after the games, could not be delivered in mainland China. Hong Kong's quarantine procedures allowed the equine athletes to compete without concerns for their health. Orthopaedic surgeons played an important role in coordinating the manpower and training for the medical coverage of the Olympic equestrian event. One of the two Assistant Chief Medical Officers, responsible for medical decisions on site at the competition venue, was an orthopaedic consultant. The author, an equestrian athlete himself, played a pivotal role in organizing a team physician advanced course themed on equestrian sports with the help of the International Federation of Sports Medicine ( FIMS ) and the Asian Federation of Sports Medicine ( AFSM ), and a Prehospital Equestrian Extraction and Life Support Course with the help of the the British Medical Equestrian Association and the local Emergency Medicine College as well as veterinary surgeons. Orthopaedic surgeons also helped out in training the local St. John Ambulance Brigade and Auxiliary Medical Services, who were taking care of the spectators. The preparation in medical coverage, actual implementation, and preliminary injury data will be discussed in this presentation, together with reflections on what lessons could be learnt. Issues on athlete safety such as the use of collapsible jumps / frangible pins in cross country fences during the competition to prevent severe injuries will also be discussed, with input from the International Equestrian Federation ( FEI ).



**Date : 2008-08-26**  
**Session : Spine: disc prosthesis**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 16310**

**TOTAL LUMBAR DISC REPLACEMENT**

Arvind KULKARNI<sup>1</sup>, Ashish DIWAN<sup>2</sup>

<sup>1</sup>*Bombay Hospital, Mumbai (INDIA)*, <sup>2</sup>*St George hospital, Sydney (AUSTRALIA)*

INTRODUCTION: Chronic low back pain can be disabling, needing definitive surgical treatment. The aim of this paper is to present the results of TDR for chronic low back pain secondary to degenerative disc disease. MATERIAL AND METHOD: Prospective study of patients undergoing TDR for chronic low back pain secondary to degenerative disc disease between 2002 and 2004. The frequency of back pain, quality of life and pain intensity (VAS) were used as measurement tools. RESULTS: Seventeen males and 16 females with a mean age of 44 years (range 29 to 65 years) underwent surgery. A total of 37 discs were replaced. Significant improvements in patients' symptoms of pain, quality of life and frequency of back pain were noted. One patient developed psoas hematoma as a complication which underwent natural resolution. CONCLUSIONS: TDR is an option in the treatment for patients with chronic discogenic low back pain.

Date : 2008-08-26  
Session : Spine: disc prosthesis  
Time : 0900-1030  
Room: 605

Abstract number : 16993

**PREDICTORS OF DURAL TEARS IN POSTERIOR SPINAL FUSION**

Markus MELLOH<sup>1</sup>, Thomas ZWEIG<sup>2</sup>, Lukas STAUB<sup>2</sup>, Emin AGHAYEV<sup>2</sup>, Thomas BARZ<sup>3</sup>, Peter RIEGER<sup>3</sup>, Jean-Claude THEIS<sup>1</sup>, Christoph ROEDER<sup>2</sup>

<sup>1</sup>University of Otago, Dunedin (NEW ZEALAND), <sup>2</sup>MEM Research Center/ University of Berne, Berne (SWITZERLAND), <sup>3</sup>Asklepios Klinikum Uckermark, Schwedt/ Oder (GERMANY)

INTRODUCTION: Dural tears are one of the most frequent types of complications in posterior spinal fusion with little known about their predictors. METHOD: Prospective consecutive study with an evidence level 2++ of 929 patients in the international spine registry Spine Tango, who had been treated between 05/2005 and 11/2006 with posterior spinal fusion after opening of the spinal canal. Median age was 62.7 yrs (min 12.5, max 90.5 yrs) with a female to male ratio of 2:1. In 18 of 929 cases a dural tear occurred being the most frequent type of complications in our study sample. Multiple linear regression was performed on potential predictor-variables of the occurrence of dural tears. RESULTS: Hospital ( $p=0.02$ ) and number of segments of fusion ( $p=0.018$ ) were found to be predictors of the occurrence of dural tears in posterior spinal fusion. Number of fusions per hospital (min 25, max 526) and academic status of hospital had no influence on the rate of dural tears. Fusions of four and more segments showed an increase of the rate of dural tears by three compared to fusions of less than four segments. CONCLUSION: Predictors of dural tears in posterior spinal fusion are hospital, independent of number of spinal surgeries and academic status of hospital, and number of segments of fusion. In fusions of four and more segments a threefold higher risk of dural tears in comparison to fusions of less than four segments should be taken into consideration.

Date : 2008-08-26  
Session : Spine: disc prosthesis  
Time : 0900-1030  
Room: 605

Abstract number : 16996

**THE DIAGNOSTIC VALUE OF A TREADMILL TEST IN PREDICTING LUMBAR SPINAL STENOSIS**

Markus MELLOH<sup>1</sup>, Thomas ZWEIG<sup>2</sup>, Peter RIEGER<sup>3</sup>, Lukas STAUB<sup>2</sup>, Emin AGHAYEV<sup>2</sup>, Christoph ROEDER<sup>2</sup>, Jean-Claude THEIS<sup>1</sup>, Thomas BARZ<sup>3</sup>

<sup>1</sup>University of Otago, Dunedin (NEW ZEALAND), <sup>2</sup>MEM Research Center/ University of Berne, Berne (SWITZERLAND), <sup>3</sup>Asklepios Klinikum Uckermark, Schwedt/ Oder (GERMANY)

INTRODUCTION: Lumbar spinal stenosis is a frequent indication for spinal surgery. The predictive quality of treadmill testing and MRI for diagnostic verification is not yet clearly defined. The aim of the current study was to assess correlations between treadmill testing and MRI findings in the lumbar spine. METHOD: 25 patients with lumbar spinal stenosis were prospectively examined. Treadmill tests were performed and the area of the dural sac and neuroforamina was examined with MRI for the narrowest spinal segment. Visual Analogue Scale (VAS) and Oswestry Disability Index (ODI) were used for clinical assessment. RESULTS: The median age of the patients was 67 years. In the narrowest spinal segment the median area of the dural sac was 91mm<sup>2</sup>. The median ODI was 66 percent. The median walking distance in the treadmill test was 70 mts. The distance reached in the treadmill test correlated with the area of the dural sac (Spearman's rho=0.53) and ODI (rho=-0.51), but not with the area of the neuroforamina and VAS. CONCLUSION: The distance reached in the treadmill test predicts the grade of stenosis in MRI but has a limited diagnostic importance for the level of clinical symptoms in lumbar spinal stenosis.

Date : 2008-08-26  
Session : Spine: disc prosthesis  
Time : 0900-1030  
Room: 605

Abstract number : 18170

**THE CLINICAL DIFFERENCE OF SPONDYLOTIC MYELORADICULOPATHY**

Yuan XUE, Pei WANG, Xinlong MA, Shifu GUO

*Department of Orthopaedic Surgery, Tianjin Medical University Hospital, Tianjin (CHINA)*

To distinguish the clinical differences of spondylotic myeloradiculopathy among the different levels in the lower thoracic spine. METHODS: 37 lower thoracic spondylotic myeloradiculopathy cases (21 males, 16 females; 56 years in average) were diagnosed by the radiological images, operative findings. Among the 37 patients, compression of 21 cases were caused by OLF, 5 cases were OPLL, 3 cases were Scheuermann diseases, the other 8 cases were OLF and OPLL coexisting. Beside, the JOA score system was applied to evaluate, motor, sensory, sphincter function. The common neurological physical examinations were conducted in detail in all patients. RESULTS: Among the 12 cases of T9,10 compression 11 cases had all the patellar clonus, ankle clonus and the positive Babinski's sign, 1 case only had the radiculopathy. Among the 14 cases of T10,11 compression, 10 cases had both the ankle clonus and the positive Babinski's sign, but patellar clonus absented; 4 cases only exhibit the radiculopathy. Among the 11 cases of T11,12 compression, 6 cases only the Babinski's sign was positive, but the patellar clonus and ankle clonus were absent; 5 cases show the pure radiculopathy. CONCLUSION: The pure radiculopathy is not the absolute criterion for excluding the thoracic spondylotic stenosis. The positive of Babinski's sign but lack of the patellar clonus and ankle clonus may indicate the compression from the T11,12 disc level. The positive of Babinski's sign and the ankle clonus but patellar clonus negative with may indicate the compression from the T10,11 disc level.

**Date : 2008-08-26**  
**Session : Spine: disc prosthesis**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 17570**

**CONTRAST MEDIA INJECTION BEFORE PERCUTANEOUS VERTEBROPLASTY: IS IT REALLY EFFECTIVE?**

Alpaslan SENKOYLU, Ahmet ATEŞ, Aykin SIMSEK, Necdet ALTUN  
*Gazi University, Department of Orthopaedics and Traumatology, Ankara (TURKEY)*

AIM: To evaluate the effectiveness of contrast injection before the cement application in the vertebroplasty procedure. BACKGROUND DATA: Cement leakage is a common problem during percutaneous vertebroplasty and can lead to complications such as pulmonary embolism, nerve root and cord compression. Between 38-85% of cement leakage rate has been reported during vertebroplasty. MATERIALS AND METHODS: Thirty percutaneous vertebroplasty procedures had been done between 2005 and 2007 in our department. Twenty-six of the patients suffered from osteoporotic vertebral fractures. Eighteen were female and nine were male. The average age was 72 (41-87). Mean follow-up was 17 months (3-51). Contrast injection was performed as an integral part of procedure to all patients. 2 ml of contrast media was injected after the placement of Jam-sheddy needle transpedicularly to the vertebral corpus. RESULTS: VAS and Oswestry scores were used for the clinical evaluation. For the radiological assessment the sagittal index was measured for all the patients preoperatively, postoperatively and in the last follow-up. VAS and Oswestry scores were improved in most of the patients significantly ( $p < 0.05$ ). There were no significant difference between the preoperative and postoperative radiographic measurements ( $p > 0.05$ ). Only one patient had contrast leakage to the epidural space. In this patient, cement was injected only from the contralateral side. No patient has allergic reaction because of the contrast media. DISCUSSION AND CONCLUSION: Non-ionic contrast media injection seems to be an effective and safe trick of trade for the prevention of the cement leakage in percutaneous vertebroplasty.

Date : 2008-08-26  
Session : Spine: disc prosthesis  
Time : 0900-1030  
Room: 605

Abstract number : 17944

**ACUTE AORTIC DISSECTION OR RUPTURED AORTIC ANEURYSM ASSOCIATED WITH BACK PAIN AND PARAPLEGIA**

Katsuhito YOSHIOKA<sup>1</sup>, Yasumitsu TORIBATAKE<sup>2</sup>, Norio KAWAHARA<sup>1</sup>, Katsuro TOMITA<sup>1</sup>

<sup>1</sup>Department of Orthopaedic Surgery, School of Medicine, Kanazawa University, Kanazawa (JAPAN), <sup>2</sup>Department of Orthopaedic Surgery, Kouseiren Takaoka Hospital, Takaoka (JAPAN)

**PURPOSE:** Acute aortic dissection and a ruptured aortic aneurysm are both catastrophic events that usually present suddenly. Although these conditions are relatively uncommon compared to other diseases treated by the orthopedists as a primary practitioner, they are of primary importance. The purpose of this study was to investigate the key points that differentiate these conditions from spinal disease. **METHODS:** A review of 50 patients suffering from aortic dissection (n=40) or a ruptured aortic aneurysm (n=10) was carried out to find the manifestations such as back pain and paraplegia. We also evaluated predisposing factor, blood pressure on admission, and reviewed clinical imaging (X-ray, CT scan) retrospectively. **RESULTS:** Sudden severe isolated back pain was present in 18/40 patients (45.0%) and 31/40 patients (77.5%) had at least some back pain in aortic dissection, while one patient had sudden paraplegia with a ruptured aortic aneurysm. Hypertension was the most predisposing factor and was present in 29/50 patients (58.0%). At admission, hypertension was present in 26/46 patients (56.5%), and hypotension was present in 14/46 patients (30.4%). In all cases the correct diagnosis was made from the CT scan. **CONCLUSIONS:** For a patient with an abrupt onset of severe back pain, acute aortic dissection and a ruptured aortic aneurysm should always be considered in the differential diagnosis from spinal disease. The most reliable tool for imaging diagnosis was a CT scan.

Date : 2008-08-26  
Session : Spine: disc prosthesis  
Time : 0900-1030  
Room: 605

Abstract number : 18144

**CLINICAL RESULTS AND INFLUENCE OF COMORBIDITY IN LUMBAR TOTAL DISC REPLACEMENT MEASURED IN A MANDATORY REGISTRY - SWISSSPINE: 378 INTERVENTIONS - 439 IMPLANTS**

Thomas ZWEIG<sup>1</sup>, Markus MELLOH<sup>2</sup>, Lukas STAUB<sup>1</sup>, Emin AGHAYEV<sup>1</sup>, Patrick MOULIN<sup>3</sup>, Max AEBI<sup>1</sup>, Christoph ROEDER<sup>1</sup>

<sup>1</sup>Institute for Evaluative Research in Orthopedic Surgery, University of Bern, Bern (SWITZERLAND), <sup>2</sup>University of Otago, Dunedin (NEW ZEALAND), <sup>3</sup>Swiss paraplegic center Nottwil, Nottwil (SWITZERLAND)

**BACKGROUND:** Due to a high rate of complications in Total Disc Replacement (TDR) reported in the literature, Swiss health system demanded an obligatory national Health Technology Assessment-registry for TDR. Thus, SWISSspine was founded in 2003. **PURPOSE:** Assess efficiency, cost effectiveness, safety and predictors of comorbidity for surgery-outcome. **STUDY DESIGN AND METHODS:** Data were collected from March 2005 to December 2007. Observational multicenter mode with frequency statistics, multivariate regression analysis and preoperative assessment and 3 month and 1 year FU using EQ-5D, NASS-Instrument and comorbidity-form for patients. The surgeons filled in the OR- and FU-forms. Patient sample: 378 interventions with 439 implants. **RESULTS:** A significant reduction of back pain: 71 to 31 ( $p<0.001$ ) and leg pain 54.7 to 20.7 ( $p<0.001$ ) was documented (VAS, 1 year postop). Quality of life increased from 0.32 to 0.73. Opiate-usage decreased from 31.7% to 7.7%. Increasing ROM and re-established lordosis were seen. Overall 19 complications occurred, 12 revisions were performed. Medicamentous treated depression had a negative influence on the outcome. **CONCLUSIONS:** SWISSspine, as a mandatory instrument, was successfully implemented in the treatment-programme of degenerative lumbar disc-diseases. The results provide evidence for patients benefit. Back- as well as leg pain was reduced. Complication- and revision rates were low. Medicamentous treated depression seems to have a negative influence on postoperative pain outcome in TDR. Our results obtained from SWISSspine provide a reasonable potential supporting surgeon in decision making for TDR especially in patients with medicamentous treated depression.

**Date : 2008-08-26**  
**Session : Spine: disc prosthesis**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 18240**

**L5-S1 STABILISATION BY MEANS OF A "PROTECTED" INTERLAMINAR DEVICE**

Paolo PALUMBI, Roberto ROSSI, Gaetano GIUDICE, Piergiorgio VASINA  
*Mazzolani Vandini, Argenta Ferrara (ITALY)*

Stabilisation of the lumbo-sacral rachis is achieved by a time-hallowed, well-established surgical technique: anterior arthrodesis through posterior access implemented with an internal fixer, with cages and bone or a bone replacement. Quite often, when performing a classical intersomatic arthrodesis with removal of the lamina and stabilisation by means of screws in the instance of an L5-S1 pathology, one ends up with a significant load transfer onto the upper space. That is why vertebral arthrodesis has remarkably decreased in the latter. As a result, "elastic stabilisations" such as interspinous have been used more and more. Unfortunately the L5-S1 space lends itself to the use of cushioning interlaminar devices in but a few instances. Indeed, the assumption for the implant of such a device at that particular stage is for the S1 spinosa to have a sufficiently large size and for the sacrum to be very horizontal inasmuch as the anti-gravity impact of the device would be remarkably lessened. Since 2005 we have begun an L5-S1 stabilisation which we have styled "interlaminar" because we keep the lamina and the L5 spinosa removing only the articulars. We also call it "protected" because we implant a cushioning device at the upper level(s). We have carried out ever since 18 such interventions with patients aging between 41 and 68 years. This "hybrid" technique has enabled us to reduce surgical times and bleeding and also allowed patients to resume normal working activities much earlier.



**Date : 2008-08-26**  
**Session : Spine: disc prosthesis**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 18293**

**MINIMALLY INVASIVE PEDICLE SCREW FIXATION WITH USING STANDARD INSTRUMENTS DESIGNED FOR THE OPEN APPROACH**

Temel TACAL, Mehmet Nurullah ERM&#304;S, Ahmet Sadi KILINC, Umit TUHANIOGLU, Ozgun ERCELT&#304;K  
*Baltalimani bone disease hospital, istanbul (TURKEY)*

**BACKGROUND:** Percutaneous vertebral stabilisation procedures, including vertebroplasty and kyphoplasty, have become a widely used for the treatment of osteoporotic vertebral compression fractures, primary and metastatic vertebral tumors, and traumatic burst fractures. We used percutaneous internal pedicle screw fixation with standard instruments for thoracolumbar vertebra fractures. **AIM:** To evaluate outcome and potential advantages of a percutaneous posterior approach to vertebra fractures with conventional pedicle screws. **MATERIAL AND METHOD:** We performed minimally invasive posterior stabilisation technique using standard instruments designed for the open approach for four thoracic and one lumbar vertebra fractures between 2003 and 2005. Two superior and two inferior vertebrae were stabilised with pedicle screws used transmuscularly, nearly 2cm incision, and rods were pushed into the screws at the level of the end incision. **RESULTS:** The incision length was significantly shorter than that of the conventional pedicle screw fixation. Operation time was decreased nearly 1 hour. Blood losses were decreased significantly, and no patient needed to blood transfusion. There were not any neurologic complications. Postoperatively mobilisation started at the first day for all the patients. At their last follow-up there was not any loose of correction. **CONCLUSION:** This study shows that percutaneous internal pedicle screw fixation using standard instruments is feasible and safe for posterior stabilisation of the thoracic and lumbar spine.

Date : 2008-08-26  
Session : Spine: disc prosthesis  
Time : 0900-1030  
Room: 605

Abstract number : 18916

**CERVICAL ARTIFICIAL DISC REPLACEMENT FOR THE TREATMENT OF CERVICAL SPONDYLOSIS**

Jian-de XIAO, Yang CHEN, ZhenYu LI, Hongyin YAN, Zheng YU, Changqing TIAN  
*Dept of Orthopaedics, Shenzhen Second People's Hospital, Shenzhen (CHINA)*

OBJECTIVE: Aggregate cervical artificial disc replacement for the treatment of cervical disease in the early clinical efficacy, and indications of the problems. MATERIALS AND METHODS: 2004.5 to 2007.12 total artificial cervical disc replacement for the treatment of cervical disease in 12 cases, a total of 12 segments, among them, cervical spondylotic myelopathy one cases, nerve root type of cervical spondylosis one case. Of all cases of cervical spine surgery before and after X-force Line films, measuring the scope of their activities by Japan and Odom JOA score rating on the patients before and after operation spinal nerve function and efficacy assessment, and the results for statistical analysis. RESULTS: All patients received follow-up one month after the surgery, spine functional recovery rate of 80%, the Composite effect Odom score after 11 patients for the gifted; one patient good. Replacement surgery after the sagittal section of activities was  $9.16\pm 2.12^\circ$  and  $5.10\pm 2.02^\circ$ : Replacement of the upper section near disc scope of activities was  $7.15\pm 2.56$  and  $7.27\pm 2.13^\circ$ : Replacement segments of the disc near the scope of activities were  $6.32\pm 2.14$  and  $6.30\pm 2.16^\circ$ . CONCLUSION: Disorders of the cervical spine anterior decompression of the cervical artificial disc replacement for the reconstruction of the recent disc can effectively retain cervical lesions segment of the activities and restore stability, not to increase the scope of activities of approaching disc, replacement surgery operations objectively to the spinal cord and nerve root decompression. Expected cervical artificial disc replacement can prevent or mitigate disease segment near the intervertebral disc degeneration, and treatment of cervical disease is a new and effective method. KEYWORDS: Cervical spondylosis; artificial disc; replacement.

Date : 2008-08-26  
Session : Spine: scoliosis correction  
Time : 1100-1215  
Room: 605

Abstract number : 17291

**DO ADOLESCENTS WITH A SEVERE IDIOPATHIC SCOLIOSIS HAVE HIGHER LOCATIONS OF THE CONUS MEDULLARIS THAN HEALTHY ADOLESCENTS?**

Xu SUN<sup>1</sup>, Winnie C.W. CHU<sup>2</sup>, Jack C.Y. CHENG<sup>3</sup>, Feng ZHU<sup>1</sup>, Zezhang ZHU<sup>1</sup>, Yang YU<sup>1</sup>, Bin WANG<sup>1</sup>, Yong QIU<sup>1</sup>

<sup>1</sup>Spine Surgery, the Affiliated Drum Tower Hospital of Nanjing University Medical School, Nanjing (CHINA), <sup>2</sup>Department of Diagnostic Radiology and Organ Imaging, Chinese University of Hong Kong; The Joint Scoliosis Research Center of Nanjing University & Chinese University of Hong Kong, Hong Kong (HONG KONG), <sup>3</sup>Department of Orthopaedics and Traumatology, Chinese University of Hong Kong; The Joint Scoliosis Research Center of Nanjing University & Chinese University of Hong Kong, Hong Kong (HONG KONG)

**BACKGROUND:** There are no case-control studies with large samples regarding the conus position in adolescent idiopathic scoliosis (AIS) patients. **OBJECTIVE:** To compare the distribution of the conus locations for AIS patients and the controls. **METHODS:** Two hundred and forty AIS patients with a Cobb angle greater than 40° were included in this study, and 120 age-matched healthy adolescents were recruited to serve as controls. On sagittal MR images of the spine in both groups, the position of the conus medullaris relative to lumbar vertebrae and intervertebral disc space was measured according to a standard method. **RESULTS:** No significant difference was found in the distributions of the positions of the conus medullaris in AIS patients and healthy controls. In both groups, the mean position of the conus medullaris located at the same level, the lower 1/3 of L1 (range: the middle third of T12 to L2-3 disc space). There were no significant correlations between the position of the conus medullaris and age or sex in AIS and control subjects. It was shown that the positions of the conus medullaris were not significantly different among AIS patients with different curve severity and curve patterns. **CONCLUSIONS:** The distribution of the conus locations was similar for AIS patients and the controls. There were no significant associations between the conus position with curve severity and curve patterns, indicating the conus location might not be involved in the pathogenesis and curve progression of AIS. **KEYWORDS:** Idiopathic scoliosis, conus medullaris, position, adolescent, measurement.

Date : 2008-08-26  
Session : Spine: scoliosis correction  
Time : 1100-1215  
Room: 605

Abstract number : 17305

**ABNORMAL EXPRESSION AND ETIOLOGICAL SIGNIFICANCE OF BMPR-IA/IB IN MESENCHYMAL STEM CELLS FROM ADOLESCENT IDIOPATHIC SCOLIOSIS**

Bin WANG, Qiang SUN, Zhen LIU, Yong QIU, Zezhang ZHU, Feng ZHU, Yang YU, Bangping QIAN, Weiwei MA  
*Spine Surgery, the Affiliated Drum Tower Hospital of Nanjing University Medical School, Nanjing (CHINA)*

BACKGROUND: The etiology of adolescent idiopathic scoliosis (AIS) remains unclear. Increased evidences suggested an enhanced endochondral ossification might be involved in pathogenesis of AIS. OBJECTIVE: To investigate a possible related molecular mechanism between pathogenesis of AIS and expression of BMPR-IA/IB from mesenchymal stem cells (MSCs) level. METHODS: Twenty AIS patients and ten volunteers were included. From anterior superior iliac spine, the human bone marrow was obtained with anticoagulation by heparine. And the MSCs were isolated by density gradient centrifuge from the mononuclear cells, and then were cultivated and serial subcultivated in vitro. Expression intensity of BMPR-IA/IB of MSCs from 2 groups was detected by RT-PCR and Western blotting. RESULT: The expression of hyphenosurface molecule BMPR-IA/IB of MSCs increased obviously in AIS group as compared with control group ( $P < 0.01$ ). CONCLUSION: Abnormal expression of hyphenosurface molecule BMPR-IA/IB of MSCs and the important member of BMPs signalling pathway may be related to the molecular mechanism of the pathogenesis of AIS. KEYWORDS: BMPR-IA/IB, adolescent idiopathic scoliosis, mesenchymal stem cells, pathogenesis.

Date : 2008-08-26  
Session : Spine: scoliosis correction  
Time : 1100-1215  
Room: 605

Abstract number : 17320

**RIB LENGTH DISCREPANCY IN ADOLESCENTS WITH IDIOPATHIC SCOLIOSIS AND WITH SCOLIOSIS ASSOCIATED WITH CHIARI MALFORMATIONS**

Guangquan SUN, Yong QIU, Bin WANG, Yang YU, Zezhang ZHU, Feng ZHU, Bangping QIAN, Weiwei MA, Xu SUN, Zhen LIU  
*Spine Surgery, the Affiliated Drum Tower Hospital of Nanjing University Medical School, Nanjing (CHINA)*

BACKGROUND: There have been very few studies on the measurements of rib length in patients with adolescent idiopathic scoliosis (AIS). OBJECTIVE: To explore the rib length discrepancy in AIS patients, and analyse its association with the pathogenesis of AIS. METHODS: There were totally 113 scoliosis patients aged between 10 and 18 years, with the apex location from T5 to T10. 84 patients with AIS were divided into three subgroups: Subgroup A, Cobb angle <40°; Subgroup B, Cobb angle <60°; and Subgroup C, Cobb angle >=60°. There were 29 patients with scoliosis associated with Chiari malformation, with a Cobb angle from 25° to 105°. In all patients, the lengths of the ribs at the apical vertebral region were measured on CT three-dimensional reconstruction images. RESULTS: In AIS and Chiari patients, the rib on the concave side were significantly longer than those on the convex side in the apical region ( $p < 0.01$ ). In AIS group, the mean difference in rib length was 6mm (range 0-28mm), and the rib length difference was correlated with the curve magnitude. In Subgroups A, B and C, the ribs on the concave side were significantly longer than the concave ones in the apex region, and the difference remained significant in the subjacent vertebrae in Subgroup A. CONCLUSION: There is a rib length discrepancy of the apex vertebral region in AIS, and which may be secondary to AIS. KEYWORDS: Idiopathic scoliosis, rib length, discrepancy, CT, measurement.

Date : 2008-08-26

Session : Spine: scoliosis correction

Time : 1100-1215

Room: 605

Abstract number : 17598

**CLINICAL OUTCOME OF CORRECTION SURGERY USING KANEDA ANTERIOR SCOLIOSIS SYSTEM FOR IDIOPATHIC SCOLIOSIS**

Daichi ISHIMARU, Katsuji SHIMIZU, Hideo HOSOE, Kei MIYAMOTO, Kenichiro TANAKA, Chizuo IWAI  
*Gifu University School of Medicine, Gifu (JAPAN)*

INTRODUCTION: On anterior surgery for scoliosis there is an advantage of effective correction by short fusion, but a risk of the screw penetration to aorta. The purpose of this survey is to evaluate clinical results of anterior surgery using Kaneda anterior scoliosis system (KASS or KAPSS) and appropriate screw position. MATERIALS AND METHODS: Between 2000 and 2007, anterior surgery using Kaneda anterior scoliosis system was performed for 22 patients with idiopathic scoliosis (18 women and 4 men; the mean age 14.6 years; the follow-up period 43.7 months). Evaluations of Cobb angle, migration of aorta, screw position were performed. RESULT: Cobb angle improved from 58 degrees before surgery to 14 degrees just after surgery, but it decreased to 30 degrees at the final follow-up. There was no severe complication except for one pneumothorax. CT showed that aorta moved 5.1mm anteriorly, 1.5mm medially at the level of apical vertebra after surgery, and that the spinal canal-aorta distance changed 15.8mm to 16.3mm at the most caudal vertebra of the fusion, -0.2mm to 5.0mm at the apical vertebra, and -0.8mm to 2.7mm at the most cephalad vertebra after surgery. CONCLUSION: The spinal canal-aorta distance at the level of the most cephalad vertebra was relatively narrow. It seemed important to screw, paying attention to the position of the screw tip to avoid vascular complication.

**Date : 2008-08-26**  
**Session : Spine: scoliosis correction**  
**Time : 1100-1215**  
**Room: 605**

**Abstract number : 17985**

**AGGREGAN GENE EXPRESSION ABNORMALITY AS ETIOLOGIC FACTOR OF IDIOPATHIC SCOLIOSIS AND SCHEUERMANN'S DISEASE DEVELOPMENT**

Alla ZAIDMAN, Michael SADOVOY, Tatyana SADOVAYA, Anastasiya KOREL, Michael MIKHAILOVSKY  
*Novosibirsk Research Institute of Traumatology and Orthopaedics, Novosibirsk (RUSSIAN FEDERATION)*

**OBJECTIVE:** To study etiological factors and pathogenetic mechanisms involved in the development of idiopathic scoliosis (IS) and Scheuermann's disease (SD). **MATERIALS AND METHODS:** Growth plates from the convex and concave sides of vertebral deformity obtained from 100 patients aged 10-14 years having III-IV grade IS or Scheuermann's disease (surgical material) were studied. Investigation of glycosaminoglycans (GAG), oxidation-reduction enzymes, alkaline and acid phosphatases, RNA, DNA, and qualitative and quantitative GAG composition were performed by means of morphohistochemistry, biochemistry, and ultrastructural analysis. Molecular-genetic methods were used to study the levels of cartilage tissue-specific expression of main proteoglycan genes and their protein products. **RESULTS:** The study has shown that IS and SD development is caused by abnormalities in regulation of proteoglycan synthesis and formation in vertebral growth plates. Decrease in levels of chondroitin sulphate and increase in these of keratan sulphate components of proteoglycans indicate the alteration of proteoglycan spectrum in idiopathic scoliosis and Scheuermann's disease. The detected keratan sulphate-related fraction is a result of increased expression of lumican gene, of aggrecan gene expression abnormality, and of decrease of its protein product content in chondroblasts of patients with III-IV grade IS and Scheuermann's disease. Thus, mutation in aggrecan gene is an etiological factor of spinal deformity development. Time parameters of scoliosis deformity development are considered in view of multilevel genetic control of cell specialization. A concept of idiopathic scoliosis development is presented, as well as IS definition. **KEYWORDS:** Scoliosis deformity, Scheuermann's disease, proteoglycans, gene expression, etiological factor.

**Date : 2008-08-26**

**Session : Spine: scoliosis correction**

**Time : 1100-1215**

**Room: 605**

**Abstract number : 18204**

**POSTERIOR INSTRUMENTATION AND FUSION FOR IDIOPATHIC SCOLIOSIS THAT CURVES MORE THAN 70 DEGREES**

Temel TACAL, Mehmet Nurullah ERMIS, Osman CIMEN, Hüseyin Emre AKDENİZ, Eyup Selahattin KARAKAS  
*Baltalimani bone disease hospital, Istanbul (TURKEY)*

**OBJECTIVE:** To evaluate outcomes of posterior instrumentation and thoracic fusion in thoracic idiopathic scoliosis that curves over 70 degrees. **METHODS:** Between 2003 and 2005, twenty-seven severe thoracic scolioses that curved over 70 degrees treated by posterior thoracic fusion with segmental pedicle screw and hook (hybrid) instrumentation. The mean thoracic curve was 77.87 degrees ranges from 70-116 degrees. Patients' ages ranged from 11 to 21 years and average age at the time of operation was 14.75 years. 15 were male and 12 were female. Preoperative and postoperative radiographs were measured and evaluated by Cobb method. **RESULTS:** All the patients were followed up for 2-4 years (average 3.3 years). We used hook instrumentation for upper thoracic region and screws for middle and lower thoracic region. Before surgery, the mean thoracic curve was 77.87 degrees ranges from 70-116 degrees, and postoperatively it was decreased to average 38.16 degrees ranges from 16-60. Average correction rate was 51.0%. There was only one re-operation for implant failure. There were no neurological or visceral complications related to hook or pedicle screw instrumentation. **CONCLUSION:** Adequate posterior release, hybrid (hook and screw) instrumentation and fusion are sufficient for the treatment of severe thoracic scoliosis and we do not need any anterior treatment method. Our results are nearly equal with anterior release and posterior instrumentation combined method when compared with the literature.



**Date : 2008-08-26**  
**Session : Spine: scoliosis correction**  
**Time : 1100-1215**  
**Room: 605**

**Abstract number : 18456**

**EPIDEMIOLOGY AND RISK FACTORS ASSOCIATED WITH LUMBOSACRAL JUVENILE DEGENERATIVE DISC DISEASE (JDDD)**

Dino SAMARTZIS<sup>1</sup>, Jaro KARPPINEN<sup>2</sup>, Florence MOK<sup>3</sup>, Daniel Y.T. FONG<sup>4</sup>, Keith D.K. LUK<sup>3</sup>, Kenneth M.C. CHEUNG<sup>3</sup>

<sup>1</sup>*Shriners Hospital for Children, Chicago (UNITED STATES)*, <sup>2</sup>*Department of Physical Medicine and Rehabilitation, University of Oulu, Oulu (FINLAND)*, <sup>3</sup>*Department of Orthopaedics & Traumatology, The University of Hong Kong, Hong Kong (HONG KONG)*, <sup>4</sup>*Department of Nursing Studies, The University of Hong Kong, Hong Kong (HONG KONG)*

Juvenile degenerative disc disease (JDDD) has been highly associated with spinal deformities. However, little is known regarding JDDD in the context of non-spinal deformities. In addition, the role of associated risk factors in JDDD in comparison to normal subjects remains speculative. As part of the largest population genetic-based study in Southern Chinese (n=1,989), subjects aged 13 to 21 years were grouped into JDDD and non-JDDD cases to assess the epidemiology and risk factors associated with JDDD of the lumbosacral spine. T2-weighted MRI findings were evaluated. Subject demographics and clinical profiles were collected by a standardised questionnaire. JDDD was present in 34.9% (n=29) of the study sample (n=83). The prevalence of single-level JDDD and two-level JDDD were 69% and 20.7%, respectively. The L5/S1 level was predominantly involved in single (48.3%) and in multi-level (77.8%) JDDD. Radiological abnormalities of disc bulge/extrusion (OR: 100; 95% CI: 25.00-400.02) and high-intensity zones (OR: 8.2; 95% CI: 1.17-56.59) were significantly more prevalent in JDDD, without occurrence in non-JDDD. BMI (OR: 1.2; 95% CI: 1.00-1.37), history of lumbar injury (OR: 6.1; 95% CI: 1.9-19.4), and a significantly worse clinical historical profile of back pain and/or sciatica were strongly associated with JDDD. In non-spinal deformity cases, individuals with lumbosacral JDDD are noted to be more symptomatic, have higher BMIs, and a significant history of previous lumbar injury in comparison to non-JDDD subjects.

Date : 2008-08-26  
Session : Spine: scoliosis correction  
Time : 1100-1215  
Room: 605

Abstract number : 18597

**RISK FACTORS FOR POSTOPERATIVE PANCREATITIS IN CEREBRAL PALSY PATIENTS AFTER SPINE FUSION WITH UNIT ROD INSTRUMENTATION**

Battugs BORKHUU, Durga KOWTHARAPU, Aaron LITTLETON, Kirk DABNEY, Freeman MILLER  
*Alfred I dupont Hospital for children, Wilmington (UNITED STATES)*

**PURPOSE:** Postoperative pancreatitis is a recognised complication after spinal fusion in children with cerebral palsy. There is limited data available regarding predisposing risk factors. The objective of this study is to identify the risk factors that influence the onset of pancreatitis after spinal fusion in Cerebral palsy patients. **MATERIALS AND METHODS:** 355 cerebral palsy children with neuromuscular scoliosis, who underwent posterior spine fusion with unit-rod instrumentation from 1995 to 2006, were retrospectively reviewed. Depending on presence or absence of postoperative pancreatitis, patients were divided into two groups A and B respectively. Thirty-five variable risk factors were analysed to find the relation between risk factors and pancreatitis. **RESULTS:** Patients with pancreatitis had more preoperative feeding tube presence, preoperative GERD with feeding difficulty, seizure disorder. There was a significant difference in presence of feeding tube before surgery ( $p < 0.05$ ) fasting days until oral or G-Tube feeding initiated (8 vs. 5.2 days and duration of hospital stay (23 vs. 15.6 days). There were no significant differences in age at surgery, gender, duration of surgery, EBL and scoliosis curve correction and other risk factors. **CONCLUSIONS:** Pancreatitis is a major complication after spinal fusion in cerebral palsy patients. Patients with pancreatitis had more preoperative feeding tube presence, preoperative GERD with feeding difficulty, seizure disorder. **SIGNIFICANCE:** Pancreatitis is a major cause of morbidity after spinal fusion in cerebral palsy patients; this further delays the feeding and duration of the hospital stay. Clinicians should be more aggressive in dealing postoperative pancreatitis.

**Date : 2008-08-26**  
**Session : Spine: scoliosis correction**  
**Time : 1100-1215**  
**Room: 605**

**Abstract number : 18669**

**LUMBAR HEMIVERTEBRA EXCISION BY SINGLE STAGE POSTERIOR APPROACH WITH TRANSPEDICULAR INSTRUMENTATION: A CASE SERIES, SURGICAL TECHNIQUE, RESULTS AND LITERATURE REVIEW**

Ashok GAVASKAR<sup>1</sup>, Rajamani ACHIMUTHU<sup>2</sup>

<sup>1</sup>*Mahatma Gandhi Medical College and Research Institute, Chennai (INDIA),* <sup>2</sup>*Government Rajaji Hospital, Madurai (INDIA)*

Congenital scoliosis is a slow but relentlessly progressive condition. We operated upon 14 patients with congenital scoliosis due a hemivertebra in the lumbar spine at our institution. The age of the patients ranged from 2-5 years. The follow-up period ranged from 12-36 months. The indication for surgery was a non incarcerated hemivertebra with intact growth plates where we expected a high chance for progression. All cases were fully segmented defects. No formation defects were included. All patients were screened for intraspinal and other anomalies. All patients underwent excision of the hemivertebra from posterior approach and transpedicular instrumentation in the form of 3.5mm cortical screws on the excised side. Closure of the gap after excision was done by compression applied by a stainless steel wire encircled around the screw heads. In two patients we used a one third tubular plate in addition to screws to maintain the reduction. The Cobb's angle before surgery ranged from 24 degrees to 55 degrees. We achieved correction ranging from 95% to 98%. Postoperatively all patients wore an extension brace for a period of three months. At the last follow-up there were no incidences of implant failure or significant loss of correction. Early surgical treatment is the only proven method of preventing progression of this condition. Excision at an early age provides a reliable solution and use of posterior approach with instrumentation provides an opportunity for single stage correction without the morbidities associated with anterior and staged procedures.

**Date : 2008-08-26**

**Session : Spine: scoliosis correction**

**Time : 1100-1215**

**Room: 605**

**Abstract number : 18918**

**MANAGEMENT OF NEGLECTED CONGENITAL SCOLIOSIS**

Wun-Jer SHEN, Jianmin SUN, Young-Shung SHEN

*Po-Cheng Orthopaedic Institute, Kaohsiung (TAIWAN)*

**INTRODUCTION:** Congenital scoliosis is best treated when the patient is young. If it is neglected, adjacent normal vertebral bodies and ribs will deform, and progressive rigidity makes surgery much more complicated. **MATERIALS:** 29 patients, age range 13 to 34 years old, with varying combinations of hemivertebrae, lateral bars, and conjoint ribs. 17 of the patients had associated spinal dysraphism, diastematomyelia, syringomyelia, and/or tethered spinal cord. **RESULTS:** After puberty, skeletal traction is less effective. Combined anterior/posterior surgery utilizing pedicle screw instrumentation gives the best results. Color enhanced 3D reconstructions allow much better pre-op decision making. Hemivertebrae excision, decancellation (egg-shell) procedures, and apical osteotomies are the mainstay of treatment. After puberty, the deformed vertebrae adjacent to the hemivertebrae should be included in the fusion zone. A convex thoracoplasty flattens the hump and releases the rib restraining forces. Spinal cord anomalies should be carefully assessed. If a diastema is within the surgical correction zone, we routinely excise it. If it is proximal, the spur may be safely ignored. Syringomyelias may be ignored, especially if the curve is flexible. **CONCLUSION:** The extremely varied presentation of cases makes it very difficult to make generalized statements, still it appears that for patients with diastematomyelia and tethered cords that went through puberty and remained neurologically stable, the neurological risks of scoliosis surgery is not as high as commonly believed. Detethering or shunting is not mandatory in all cases; surgery has to be individually tailored. If the curve is obviously progressing it should be treated early.

Date : 2008-08-26  
Session : Spine: cervical spine 1  
Time : 1400-1530  
Room: 605

Abstract number : 15383

**A PROSPECTIVE ANALYSIS OF STAND-ALONE ANTERIOR COLUMN RECONSTRUCTION AND INSTRUMENTATION IN SEVERE CERVICAL KYPHOSIS**

Nanjundappa S HARSHAVARDHANA<sup>1</sup>, Mihir BAPAT<sup>2</sup>, Umesh METKAR<sup>3</sup>, Kshitij CHAUDHARY<sup>4</sup>, Satyajit MARAWAR<sup>5</sup>, Vinod LAHERI<sup>6</sup>  
<sup>1</sup>Queen's Medical Centre University Hospital NHS Trust, Nottingham (UNITED KINGDOM), <sup>2</sup>P D Hinduja Hospital & Research Centre, Mumbai (INDIA), <sup>3</sup>Medical College of Wisconsin, Milwaukee (UNITED STATES), <sup>4</sup>King Edward Memorial Hospital, Univ of Mumbai, Mumbai (INDIA), <sup>5</sup>Hospital for Sepcial Surgery, New York (UNITED STATES), <sup>6</sup>Seth GS Medical college and KEM Hospital, Univ of Mumbai, Mumbai (INDIA)

INTRODUCTION: Prospective analysis of stand-alone anterior surgery for cervical kyphosis is sparse. Our aims and objectives were hence to evaluate the role the same and analyse complications. METHODS: 42 consecutive patients aged 6-70 years (mean 31.4 years) who had a Kyphosis angle >10 with its apex between C2 and C7 and underwent anterior surgery over 6 years (2000-06) formed the study group. The average follow-up was 2.2 years (1-5 years). The mean preop kyphosis was 20.82 (10-78). Etiology was tuberculosis (25), dysplasia (7), trauma (6) and tumours (4). 39 of the 42 patients had myelopathic signs. Mean preop JOA score was 7.4 (0-11). Tricortical iliac crest strut graft was used in 40 and cage in 2 cases respectively. Postoperatively all wore cervical orthosis for 3 months. RESULTS: 1 patient was lost for follow-up. The average number of corpectomies performed were 2.5 (1-3) and the mean anterior column reconstructed was 27.3mm (22-42mm). The average graft subsidence was 3mm (0-10mm). 2 patients required revision surgery within 6 weeks for implant/graft failure. Fusion occurred in rest of 39 patients. The average correction achieved was 15.22 (-4-73). 1 patient died owing to postop complications. Visceral complications occurred in 3 cases (esophageal perforation (1) and RLN palsy (2)). The average postoperative JOA score was 14 (9-17). There were 2 infections (1 each superficial and deep). CONCLUSION: Anterior decompression and reconstruction with instrumentation facilitates neurological recovery and restores alignment.

Date : 2008-08-26  
Session : Spine: cervical spine 1  
Time : 1400-1530  
Room: 605

Abstract number : 16331

**PROGNOSIS OF THE OPERATED CERVICAL SPINE WITH VERTICAL SUBLUXATION IN RHEUMATOID ARTHRITIS**

Masanori FUJIYA

*Hokkaido Orthopaedic Memorial Hospital, Sapporo (JAPAN)*

PURPOSE: To evaluate the prognosis of patients with vertical subluxation in rheumatoid arthritis according to the degree of vertical subluxation and the operative method used. MATERIALS AND METHODS: Using wiring technique, forty-two patients underwent atlantoaxial fusion and 8 patients received occipitocervical fusion from 1979 to 1995 with a follow-up rate of 78%. Eighteen patients underwent occipitocervical fusion using cervical pedicle screw systems from 1996 to 2002 with a follow-up rate of 89%. RESULTS: 1) Survival rate at 5 years after atlantoaxial fusion was 69%. However the survival rate was lower (50%) in 16 patients with a postoperative Redlund-Johnell (R-J) scale less than 26mm. 2) Four of the 7 patients who underwent occipitocervical fusion had low R-J scales (22-26mm), however they were still alive at 17.7 years after surgery on average. The mean survival period for the other 3 patients with R-J scale less than 20mm was 1.5 years postoperatively. 3) The average R-J scale of 16 patients who underwent occipitocervical fusion using pedicle screws was improved from 22.4 to 28.8mm. Survival rate of those patients was higher (94%) compared to the patients treated by wiring methods, even though 7 patients with a preoperative R-J scale less than 20mm were included. CONCLUSION: Occipitocervical fusion should be indicated for patients with an R-J scale less than 26mm, and occipitocervical fusion using pedicle screws is more highly recommended for patients with an R-J scale less than 20mm.

**Date : 2008-08-26**  
**Session : Spine: cervical spine 1**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 16308**

**VERTICAL ATLANTOAXIAL INDEX: A NEW CRANIOVERTEBRAL RADIOLOGICAL INDEX**

Arvind KULKARNI<sup>1</sup>, Atul GOEL<sup>2</sup>

<sup>1</sup>*Bombay Hospital, Mumbai (INDIA)*, <sup>2</sup>*KEM Hospital, Mumbai (INDIA)*

**INTRODUCTION:** Deduction and application of vertical atlantoaxial index (VAAI) for quantifying the vertical atlantoaxial relationship of atlas and axis and classifying basilar invagination based on the VAAI. A theory for pathogenesis of basilar invagination is proposed. **METHOD:** Mid-sagittal CT (Computerized Tomography) scan films of ninety cases of basilar invagination treated by us between October 1999 and May 2005 with distraction and lateral mass plate and screw fixation were analysed before and after surgery. The age of the patients ranged from 8 to 55 years and the male:female ratio was 2.5:1. Additionally, mid-sagittal CT scan films of hundred normal subjects in the same age group were analysed as a control group. The vertical atlantoaxial index was measured in all cases. The images were compiled and two copies of the compilation were made. Two observers independently performed the measurements and inter-observer agreement was assessed using the ICC (intra-class co-relation) test (SigmaStat). **RESULTS:** The postoperative mean and mode values of VAAI are 0.78 (range 0.60-0.89) and 0.80 respectively. The mean and mode values of VAAI in general population were 0.80 (range 0.76-0.85) and 0.80 respectively. The results showed excellent inter-observer co-relation (ICC=0.97). **CONCLUSIONS:** Vertical atlantoaxial index can be an excellent measurement tool for the assessment of relationship of atlas and axis. Non-rheumatoid basilar invagination is probably developmental in origin and can be graded and classified depending on the preoperative vertical atlantoaxial index.

Date : 2008-08-26  
Session : Spine: cervical spine 1  
Time : 1400-1530  
Room: 605

Abstract number : 16496

**ANTERIOR PLATE FIXATION OF LOWER CERVICAL SPINE FRACTURES COMPARING TWO ANGULAR STABLE IMPLANTS**

Florian KUTSCHA-LISSBERG, Patrick PLATZER, Christian GÄBLER, Vilmos VÉCSEI  
*Dept. for Traumasurgery- Medical University of Vienna, Vienna (AUSTRIA)*

**INTRODUCTION:** The purpose of this study was to analyse the functional and radiographic long-term results following anterior plate fixation of the lower cervical spine comparing the outcome of two angular stable plating procedures. **METHODS:** 65 patients (23f, 42m), average age 37.1 (15-87) years, were enrolled in this series. 30 patients were treated by the Morscher Plate (study group A), 35 patients were stabilised with the Cervical Spine Locking Plate (CSLP) and entered group B. All patients were monitored for two years. X-Rays were performed at each follow-up. The Smiley- Webster Scale was used in order to quantify clinical results. ASIA Grades were provided. **RESULTS:** Union was achieved in 62 patients (95%). Nonunion rate was 7% (n=2) in group A, and 3% (n=1) in group B. The rate of failures of reduction and fixation was 20% (n=6) in group A, and 14% (n=5) in group B respectively. Reoperations were necessary in 3 patients (3%). 58 (89%) patients were fully satisfied with their treatment. 7 patients (11%) complained about occasional or chronic pain and a decrease of motion. The overall functional outcome score was 1.70 in Group A, 1.65 in group B (Smiley Webster Scale). **CONCLUSION:** Our data reveal that angular stable anterior plating is a suitable treatment option for fractures and/or instabilities of the lower cervical spine. Comparing Morscher plate and the CSLP, we found no significant differences in terms of technical failures, complications or outcome in our dataset.



**Date : 2008-08-26**  
**Session : Spine: cervical spine 1**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 16552**

**ANTERIOR PLATE FIXATION OF ODONTOID FRACTURES**

Patrick PLATZER, Gerhild THALHAMMER, Florian KUTSCHA-LISSBERG, Christian GAEBLER, Vilmos VECSEI, Rupert SCHUSTER  
*Medical University of Vienna, Department for Trauma Surgery, Vienna (AUSTRIA)*

**OBJECTIVES:** To determine the clinical and radiographic long-term results following anterior plate fixation of odontoid fractures that were not suitable for anterior screw fixation. **MATERIAL AND METHODS:** We analysed the clinical and radiographic records of seven patients with an average age of 54 years at the time of surgery who had undergone anterior plate fixation of their odontoid fractures. Indications for using a plate system were type II odontoid fractures with anterior oblique fracture lines, as well as type III fractures with comminution or major displacement. **RESULTS:** Six patients returned to their pre-injury activity level and were satisfied with their treatment. Using the Smiley-Webster scale to quantify the clinical outcome of the patients we had an overall functional outcome score of 1.9. Bony fusion was achieved in all seven patients. Failures of reduction or fixation occurred in two patients. In one patient we failed to achieve correct anatomical reduction of the odontoid and in the other patient we found a slight mal-positioning of the implant. Re-operation due to technical failures was not necessary in any of the patients. One patient was additionally stabilized by posterior wiring and bone grafting. **CONCLUSION:** We had promising results using anterior plate fixation for surgical treatment of odontoid fractures that did not allow interfragmentary fracture compression. As this method spares the rigid fixation of the atlanto-axial joint in contrast to techniques of posterior cervical fusion, it appears to be a practicable option for the management of fracture types that require additional stabilization of the odontoid.

Date : 2008-08-26  
Session : Spine: cervical spine 1  
Time : 1400-1530  
Room: 605

Abstract number : 16870

**COMPARISON OF EXPANSION OF THE SPINAL CANAL IN TWO SURGICAL METHODS FOR CERVICAL MYELOPATHY - TENSION-BAND LAMINOPLASTY AND DOUBLE-DOOR LAMINOPLASTY**

Shigeru HIRABAYASHI, Makoto MIURA, Hiromu YAMAMOTO, Tomoyuki IWAHORI, Takashi MATSUSHITA  
*Teikyo University School of Medicine, Tokyo (JAPAN)*

The purpose of this study was to compare the conditions of expansion of the spinal canal and to refer to appropriate indications of the two surgical methods for cervical myelopathy, that is, Tension-band laminoplasty (TBL) and Double-door laminoplasty (DDL) by schematic analysis and clinical study. In schematic analysis using the soft program of Auto CADLIT 2005, the schema of the cervical spine of almost same size as clinical cases was used and imaginary operations were performed by the two methods. The same expansion rate of the spinal canal was obtained in TBL using a spacer of 13mm and DDL using a spacer of 19mm set at 8mm superficial from the base of the spinous process. In clinical study (TBL in 33 patients, DDL in 20 patients) using the soft program of Image J, the spinal canals at both C5 and C6 levels in CT were analysed. The expansion rate was about 150-160% in TBL and about 140-150% in DDL. It was almost the same in TBL and DDL at C5 level, and slightly larger in TBL than DDL at C6 level. Even now, it is unclear what is the least expansion rate of the spinal canal to obtain adequate decompression of the spinal cord. In comparison to TBL, DDL has more advantages such as easier fixation of spacers and anatomical symmetrical expansion of the spinal canal. However, in patients with great prominence such as large OPLL, it is better to perform TBL because of the slightly larger expansion rate.

**Date : 2008-08-26**  
**Session : Spine: cervical spine 1**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 17942**

**MULTILEVEL OBLIQUE CORPECTOMY WITH IMAGE-GUIDED NAVIGATION FOR MULTISEGMENTAL CERVICAL SPONDYLOTIC MYELOPATHY - NEW MINIMALLY INVASIVE CERVICAL SURGERY WITHOUT FUSION OR INSTRUMENTATION**

Sang-Ho LEE, Ho Yeon LEE, Hyeong-Kweon SON, June Ho LEE, Oon Ki BAEK, Tae Joon AHN, Chan Shik SHIM  
*Wooridul Spine Hospital, Seoul (KOREA)*

STUDY DESIGN: A retrospective review of cases from May to December 2007. OBJECTIVE: To evaluate the efficacy of image-guided navigation (IGN) in multilevel oblique corpectomy (MOC). BACKGROUND: MOC is an emerging technique in treatment of multisegmental cervical spondylotic myelopathy including extensive ossified posterior longitudinal ligament. But oblique angle is not familiar with surgeons and no anatomic landmark is present on posterior portion of vertebral body. To overcome these difficulties, authors used intra-operative C-arm-based IGN (ION, Medtronic Sofamor Danek, Memphis, TN). METHODS: Since the application of IGN on MOC, 22 patients have had postoperative MR images; among them, eleven patients underwent MOC with IGN. The completeness of MOC was measured at the most compressive level; sum of bilateral remaining posterior body minus remaining approach side anterior body in millimeter. Result was considered better when the value is smaller. Outcomes were measured preoperatively and on the 5th day after operation by the scoring system of Japanese Orthopaedic Association (JOA) with several perioperative parameters. RESULTS: Mean completeness of MOC was 0.89mm in navigation group, 5.9mm in control group. Mean change of JOA score is 4.27 and 2.91 respectively. In control group, two patients underwent re-exploration due to remaining OPLL. Even extra time was spent to set up the navigation, mean operative time was shorter in the study group (248min vs. 259min). Treated levels were 3.55 and 3.36 respectively. CONCLUSION: With image-guided navigation, authors could achieve faster and more complete MOC.

Date : 2008-08-26  
Session : Spine: cervical spine 1  
Time : 1400-1530  
Room: 605

Abstract number : 18032

**CLINICAL RESULTS IN CERVICAL TOTAL DISC REPLACEMENT (TDR) - 557 IMPLANTS IN A SWISS-SPINAL HTA REGISTRY**

Thomas ZWEIG<sup>1</sup>, Markus MELLOH<sup>2</sup>, Emin AGHAYEV<sup>1</sup>, Patrick MOULIN<sup>3</sup>, Max AEBI<sup>1</sup>, Christop ROEDER<sup>1</sup>

<sup>1</sup>Institute for Evaluative Research in Orthopedic Surgery, University of Bern, Bern (SWITZERLAND), <sup>2</sup>University of Otago, DUNEDIN (NEW ZEALAND), <sup>3</sup>Swiss Paraplegic Center Nottwil, Nottwil (SWITZERLAND)

The Swiss health insurance demanded a HTA-registry due to reported high complication rates to reimburse TDR. Following this regulation SWISSspine as a nationwide TDR-register had recorded data from March 2005 to October 2007. STUDY DESIGN: Assessment preoperative, 3 months postoperative, 1 year postoperative and continuing in observational multicenter-mode. PATIENTS: 557 cervical Implants/464 patients documented. Female 320 (56.7%), male 244 (43.3%), mean-age: 46.5 years, average-number of follow-ups: 1.99/P, median-time: 106d. EQ-5D 1629 (558 preop, 1071 follow-up) and 1152 COSS (565 preop, 587 follow-up) forms. 556 comorbidity questionnaires were analysed. METHODS: Frequency statistics, multivariate regressions analysis. RESULTS: A significant reduction of neck pain (VAS preop: 60.2, one-year-postop: 23.2,  $p < 0.0001$ ) and arm pain (VAS preop: 66.3, one-year-postop: 21.5,  $p < 0.0001$ ), increasing quality of life, reduced analgesic medication, reestablished cervical lordosis and better ROM. A clinically relevant pain reduction of >20 points was most probable in patients with preoperative pain levels >40 points on VAS. Distribution of comorbidities showed that 14% of the patients suffered from depression, 74% were under treatment. Depression had significant influence on postop neck ( $p = 0.0027$ ) and arm pain relief ( $p < 0.001$ ). 3 complications and 14 revisions were reported during mono- and bisegmental TDR recorded. CONCLUSION: Cervical TDR is efficient for pain reduction and improvement of quality of life, reestablishment of mobility and alignment of the cervical spine. Clinically relevant pain alleviation is more probable if preoperative pain levels are >40 points of VAS.

**Date : 2008-08-26**  
**Session : Spine: cervical spine 1**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 18180**

**FLIP-COIN-TEST IS SIMPLE, OBJECTIVE AND EFFECTIVE IN MONITORING THE HAND FUNCTION OF PATIENTS SUFFERING FROM CERVICAL MYELOPATHY**

Ying Kei CHAN

*Department of Orthopaedics & Traumatology, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR (CHINA)*

Patients with cervical myelopathy often have hand clumsiness. Widely used modified Japanese-Orthopaedic-Association score (mJOA) does not reflect non-dominant hand function or provide quantitative data for case comparison or serial monitoring. Moreover, it is applicable only to population using chopsticks. This study validated the quantitative Flip-Coin-Test (FCT), in monitoring hand function of these patients. Patients with cervical myelopathy were prospectively recruited and tested over both hands, on duration they spent flipping five coins across and back the edge of a paper on top of five other coins of different size (FCT). They were also tested with 9-hole-peg test, 10-second test, mJOA score and grip power strength. Patients treated operatively were assessed every 3 months afterwards. 96 patients were studied. The FCT correlated significantly with 9-hole-peg test, 10-second test, mJOA and mJOA-fm scores. 28 patients underwent surgery. They had improvement in global and hand function. The FCT, 10-sec test, grip strength, mJOA and mJOA-fm (fingers motor) scores improved significantly postoperatively but were not in phase. This prospective study validates the effectiveness of Flip-Coin-Test in reflecting the severity of hand clumsiness in cervical myelopathy. It provides quantitative data for disease progression and treatment outcome monitoring. It is more sensitive than 9-hole-peg-test in monitoring post-operatively changes. It is superior to the mJOA score, which did not indicate non-dominant hand function. It requires no subjective judgment on the quality of hand movement as for the 10-second test. Its simplicity makes it applicable to most clinical settings not limited to use by population using chopsticks.

Date : 2008-08-26  
Session : Spine: cervical spine 1  
Time : 1400-1530  
Room: 605

Abstract number : 18323

**ODONTOID FRACTURES IN ELDERLY COMPARING OPERATIVE AND NONOPERATIVE TREATMENT**

Gerhild THALHAMMER, Patrick PLATZER, Florian KUTSCHA-LISSBERG, Anna KRUMBOECK, Christian GAEBLER, Vilmos VécSEI  
*Medical University of Vienna, Department of Trauma Surgery, Vienna (AUSTRIA)*

**OBJECTIVES:** To determine the functional and radiological results after operative and nonoperative treatment of Type II odontoid fractures in patients over 65 years of age and to compare the outcome of these treatment options. **MATERIAL AND METHODS:** We reviewed the clinical and radiographic records of 146 patients aged 65 years or older (average age of 74.9 years) with type II odontoid fractures. Sixty-one patients were treated operatively either by anterior screw fixation (n=42) or posterior atlanto-axial arthrodesis (n=19). Eighty-five patients were treated nonoperatively by a halo vest (n=82) or Minerva cast (n=3). The follow-up time was in both groups at least 1 year after treatment. **RESULTS:** Pseudoarthrosis was seen in 19 patients (13%). Five of these patients were stabilised by anterior screw fixation, fourteen patients were treated by a halo vest. 106 patients (73%) returned to their pre-injury activity level. Patients of the nonoperative group had lesser limitations in daily life activities and in range of motion. The morbidity and mortality rate was also lower in the nonoperatively treated group. **CONCLUSION:** We had encouraging results in both treatment groups according to the literature. Patients in the operatively treated group had a lower nonunion rate than nonoperatively treated patients, but they had more limitations in daily life activities and in cervical spine movement. Although we prefer operative stabilisation of type II odontoid fractures in all patients irrespective of their age, nonoperative management appears to be an appropriate treatment option in patients with significant comorbidities.

Date : 2008-08-26  
Session : Spine: cervical spine 1  
Time : 1400-1530  
Room: 605

Abstract number : 18777

**FACTORS AFFECTING THE LENGTH OF LIFE AFTER CERVICAL SPINE SURGERY IN RA PATIENTS: COMPARISON BETWEEN PATIENTS WHO HAD LIVED SHORTER THAN 5 YEARS AND THOSE WHO HAD BEEN LIVING MORE THAN 10 YEARS AFTER SURGERY**

Yutaka KOIZUMI, Yushin ISHII, Naoki MOROZUMI, Kentaro ISHIBASHI, Takashi KUSAKABE, Shigetsune MATSUYA, Tatsuro SASAJI, Shoichi KOKUBUN

*National Hospital Organization Nishitaga Hospital, Sendai (JAPAN)*

**PURPOSE:** To know factors affecting the length of life after cervical spine surgery in RA patients. **MATERIALS AND METHODS:** Out of 195 patients, who underwent surgery from 1979 to 2002, 21 had been living more than 10 years after surgery (Group L) and 55 had died at the final follow-up. Twenty of the latter lived shorter than 5 years (Group S). The average ages at onset of RA and surgery, duration of RA disease, functional classification and Steinbrocker's stage, pre- and postoperative walking ability were retrospectively compared between the two groups. **RESULTS:** The average ages at onset of RA and surgery were ten years older in Group S than in Group L. The functional classification and Steinbrocker's stage were severer in Group S despite the same disease duration. The number of ambulant patients in Group S increased and reached one in Group S after surgery. Cardinal causes of death were pneumonia and cardiac diseases. The average ages at death in Group S and at the final follow-up in Group L were both 66.0. **DISCUSSION:** The average age and the cardinal causes of death in Group S were similar to those reported in ordinary RA patients, which means that vital prognosis of RA patients after cervical spine surgery is rather affected by their comorbidities. In this group, RA started later but progressed faster. The intense disease course seems to expand to the cervical spine and disturb it earlier to cause myelopathy. **CONCLUSION:** Cervical spine surgery makes patients with cervical lesions regain the natural life span as RA patients. **KEYWORDS:** Rheumatoid arthritis, cervical spine, prognosis.

Date : 2008-08-26  
Session : Spine: cervical spine 1  
Time : 1400-1530  
Room: 605

Abstract number : 18925

**THE DIAGNOSIS AND TREATMENT OF ADOLESCENT FATIGUE CERVICAL DISLOCATION AND KYPHOSIS**

Jian-sheng ZHOU, Zhen-hua LIU, Guo-qi NIU

*Department of Orthopaedics, the first Affiliated Hospital of Bengbu Medical College, Bengbu, Anhui (CHINA)*

**OBJECTIVE:** To discuss the diagnosis and treatment in adolescent fatigue cervical dislocation and kyphosis. **METHODS:** Retrospective analysis from March 2002 to October 2007 our hospital treatment of adolescent fatigue cervical dislocation and kyphosis of 17 cases; 7 cases were male and 10 cases were female; the average age was 16.5 years (14-19 years). All patients have a long time (8-14 hours a day) and long-term (more than half a year) playing electronic games or working bow, and with headache and neck discomfort or dizziness, cervical deformities, et al. Cervical lateral X-ray Cobb angle was average of  $39.8^{\circ}$  (11.9-67.9 $^{\circ}$ ). There were 13 cases of single level and 4 cases of multiple levels, conservative treatment for 9 cases and surgical treatment for 8 cases who maintain effective brace three months. **RESULTS:** Cobb angle of resumption average 79% (-19.2~17.5 $^{\circ}$ ), by an average of 15.7 months (6-66 months) follow-up, all patients cured, but two cases of conservative treatment relapse cured after taking traction and brace again. **CONCLUSION:** The adolescents are not mature enough to appear fatigue dislocation of cervical kyphosis and have a history of long time playing computer games or working bow, their neck were discomfort meanwhile headaches and dizziness, nausea and other symptoms can diagnose it combined X-ray of cervical instability or deformity. The early traction or surgical was effective to resume physiological curvature and to prevent the secondary of nerve function damage. **KEYWORDS:** Cervical; dislocation; kyphosis; fatigue; adolescent; surgery.



Date : 2008-08-26  
Session : Spine: cervical spine 2  
Time : 1600-1730  
Room: 605

Abstract number : 15582

**INTEGRATED OUTCOME ASSESSMENT AFTER ANTERIOR CERVICAL DISCECTOMY, FUSION (ACDF) WITH AUTOGRAFT AND PLATING IN CERVICAL SPONDYLOMYELOPATHY**

Emal WARDAK<sup>1</sup>, Vishal KUMAR<sup>2</sup>, Raj BAHADUR<sup>2</sup>, Mohd. Mussa WARDAK<sup>1</sup>

<sup>1</sup>Wardak Hospital, Kabul (AFGHANISTAN), <sup>2</sup>Postgraduate Institute of Medical Education and Research, Chandigarh (INDIA)

INTRODUCTION: Cervical spondylotic myelopathy (CSM) is the most common cause of cord dysfunction in patients over 55 years of age. The diagnosis of cervical spondylotic myelopathy is primarily based on a thorough clinical and radiological examination. Anterior cervical discectomy and fusion (ACDF) is the standard of care for cervical spondylomyelopathy. Autogenous cancellous bone and plating provides rigid fixation, resists setting and development of segmental kyphosis, and promotes higher fusion rates. METHODS: Twenty patients with mean age of 58.5 years with clinical and radiological evidence of CSM underwent ACDF with autograft and plating were prospectively studied for a mean duration of 2.8 years. Clinical outcome was assessed using signs and symptoms based on selected items of Odom's criteria, Japanese Orthopaedic Association score and Nurick's grading. All patients received preoperative and postoperative radiographs and MRI. RESULTS: At final follow-up, symptoms resolution remained greater than 92% and fusion occurred in 94% of the disc spaces operated on. No graft extrusion, migration or implant complications are yet reported. Postoperatively, MRI signs of myelopathy defined as high signal foci of spinal cord in T2 - weighted images with or without a focal dimensional change in T1 - weighted images disappeared in 90% of the patients. All preoperative and postoperative differences are significant at the  $p < 0.001$  levels. CONCLUSION: There is integrated improvement of radiologic signs, clinical signs and symptoms and quality of life in patients with cervical spondylotic myelopathy after anterior cervical discectomy and fusion with autograft and plating.

**Date : 2008-08-26**  
**Session : Spine: cervical spine 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 15943**

**EARLY DIAGNOSTICS OF CONGENITAL AND DISPLASTIC SCOLIOSIS AND SPRENGEL'S DISEASE**

Dmitriy KOLCHIN

*Clinical Hospital 5, Children Orthopaedic Department, Togliatti (RUSSIAN FEDERATION)*

We have revealed the visual symptom of displasia of skeleton: non-typical growth of the hair on the skin of the back, like an eddy, like a snail shell. Nine children with such symptom situated above the lower corner of the shoulder blade have Sprengel's disease on the side of the symptom. We received the patent for the invention No.2223041RU "The method of early diagnostics of the congenital high position of the shoulder blade (Sprengel's disease)". Since 1989 this symptom has been revealed on the skin of every third person among 3110 patients with scoliosis. The middle of the eddy is situated on the line of spinous branches at the top of the deformation, and above open vertebral arches, aplasia and hyperplasia of the transverse and spinous branches, ribs, knitted vertebrae, wedge-shaped semi-vertebrae with additional ribs. We have received the patent for the invention No.2144309RU "The method of early diagnostics of congenital and displastic scoliosis". Echocardiography of 90 patients with pectoral scoliosis and the symptom above thoracic spine revealed: myxomatous degeneration (14%) and lengthening of the leaves of the mitral and tricuspidal valves (78%), prolapse of the semilunar aortal valve (10%), and unexpressed dilatation of aorta (5%). Intravenous urography of 55 children suffering the lumbar scoliosis revealed: one sided thoracolisation or lumbalisation on the level of the skin symptom (35%), duplex kidney pelvis (13%), nephroptosis (21%), hydronephrosis (6%), and hydroureter (9%). Thus, this symptom is the marker of localization of skeleton displasia and sometimes of cardiac and renal anomalies.

**Date : 2008-08-26**  
**Session : Spine: cervical spine 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 16309**

**PAEDIATRIC CERVICAL TRAUMA - PATTERNS OF INJURY AND MANAGEMENT**

Arvind KULKARNI<sup>1</sup>, Andrew CREE<sup>2</sup>

<sup>1</sup>*Bombay Hospital, Mumbai (INDIA),* <sup>2</sup>*The Children's Hospital Westmead, Sydney (INDIA)*

**INTRODUCTION:** The aim of this study was to review the management of paediatric cervical trauma at a major teaching hospital. **METHODS:** The clinical charts and imaging studies of children with cervical spine injuries managed between January 2000 and July 2006 at a tertiary children's hospital were retrospectively analysed. **RESULTS:** 33 cases had structural injury needing bracing or surgical intervention, the ages of the patients ranging from 1 year to 15 years (average-8.7 years). There were 21 males and 12 females. A total of 12 patients (36.4%) were managed operatively, 5 patients (15%) died as a result of trauma and the rest (16 cases, 48.5%) were treated conservatively. Modern spinal titanium instrumentation utilising locking screws, cables was employed for operative stabilisation. **DISCUSSION:** Cervical trauma, although rare, is the commonest region involved in paediatric spinal injuries. Motor vehicle accidents form the commonest cause of cervical injuries. Preoperative CT scans and MRI are critical for accurate diagnosis and meticulous planning. Proximal cervical trauma, especially atlantooccipital dissociation can be a challenging diagnosis, but modern instrumentation can be utilised successfully. Although the cases are limited, preliminary experience shows that rigid internal fixation with modern instrumentation is safe and effective in paediatric cervical trauma for all age groups. Customisation of routine inventory as well as adaptation of miniature instrumentation systems utilised in other fields of orthopaedics is necessary for successful instrumentation in the paediatric cervical spine. Development of specialized paediatric cervical instrumentation is a prospective area of further research.

Date : 2008-08-26  
Session : Spine: cervical spine 2  
Time : 1600-1730  
Room: 605

Abstract number : 16365

**MANAGEMENT OF THE TANDEM OSSIFICATION OF THE POSTERIOR LONGITUDINAL LIGAMENT AND LIGAMENTUM FLAVUM: A SYSTEMATIC REVIEW OF THE LITERATURE**

Jiong Jiong GUO, Huilin YANG, Tiansi TANG

*Dept of Orthopaedics, The First Affiliated Hospital of Soochow University, Suzhou (CHINA)*

Tandem ossification of the posterior longitudinal ligament (OPLL) and ligamentum flavum (OLF) is a rare and thorny disease which creates diagnostic and therapeutic problems. We undertook a systematic review of the literature to evaluate the effect of treatment on outcome and try to provide appropriate guidelines for treatment of tandem OPLL and OLF (TOO). METHODS: An English literature search from January 1980 to December 2006 was conducted. The key-words for search were OLF or OLF and OPLL. Only 13 reports of TOO were identified by the second detailed review. Two new classifications on the basis of geographic regions of TOO have been introduced. One was according to the different distributive spinal regions of ossifications (type I-VII). The other was based on the pattern of whether OPLL and OLF were at the same levels (type a-c). CONCLUSIONS: All studies were case series or case report and advocated that the primary therapy for TOO should be operative. The clinical outcomes of surgery were evaluated in most reports, predominantly using the JOA scores. Gender is the only factor which has prognostic value. A higher rate of women was found in the failure group. All patients with suspected ossification of the spine should undergo routine MRI screening of the whole spine. Besides target ossifications, all non-target lesions should be necessarily investigated for possible decompression to prevent further neurological deterioration. The correlation of the classifications with surgical treatments is likely but needs to be examined in further studies.

**Date : 2008-08-26**  
**Session : Spine: cervical spine 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 16995**

**PROGNOSTIC VALUE OF DELTOID M-WAVE MEASUREMENT FOR SHOULDER GIRDLE WEAKNESS IN CERVICAL SPONDYLOTIC RADICULOPATHY**

Toshikazu TANI, Shinichirou TANIGUCHI, Kenji ISHIDA, Masahiko IKEUCHI, Tatsunori IKEMOTO  
*Kochi Medical School, Nankoku (JAPAN)*

**OBJECTIVES:** A prominent weakness of shoulder abduction characterizes some cases of cervical spondylosis as an easily recognizable disability. This condition called "cervical spondylotic amyotrophy", or "the dissociated motor loss" probably results from segmental cord or root involvement. As one of the basic principles of nerve conduction studies, the size of the muscle action potentials (M-waves) evoked by stimulating the nerve below the lesion several days after the injury determines the degree of axonal loss for accurate assessment of prognosis. We tested the utility of supraclavicular stimulation as a prognostic measure of deltoid function after cervical spondylotic radiculopathy. **METHODS:** Electrophysiological study consisted of supramaximally stimulating the brachial plexus and recording M-waves from deltoid in 32 patients with unilateral weakness of 3 months or shorter duration as compared to 69 healthy subjects. **RESULTS:** Despite considerable individual variability and age-related reduction in amplitude of deltoid M-waves, the side-to-side amplitude ratios yielded useful, reproducible values. The measures recorded initially correlated significantly with the eventual recovery of deltoid strength but, interestingly, not with the initial degree of weakness. In particular, the M-waves greater than 50%, even in the face of severe weakness, predicted a nearly complete return of function. **CONCLUSIONS:** Supraclavicular stimulation provides a useful measure in monitoring deltoid weakness and predicting its recovery in patients with cervical spondylosis. The technique plays an important role in patient care and management, especially in determining the possible need and timing of surgical intervention, which may be indicated to resolve persistent compression not responding to conservative therapy.

Date : 2008-08-26  
Session : Spine: cervical spine 2  
Time : 1600-1730  
Room: 605

Abstract number : 16997

**COMPARISON OF CERVICAL DISC REPLACEMENT AND FUSION OF ADJACENT SEGMENTS VS. DISC REPLACEMENT ALONE**

Markus MELLOH<sup>1</sup>, Thomas ZWEIG<sup>2</sup>, Peter RIEGER<sup>3</sup>, Emin AGHAYEV<sup>2</sup>, Lukas STAUB<sup>2</sup>, Christoph ROEDER<sup>2</sup>, Jean-Claude THEIS<sup>1</sup>, Thomas BARZ<sup>3</sup>

<sup>1</sup>University of Otago, Dunedin (NEW ZEALAND), <sup>2</sup>MEM Research Center/ University of Berne, Berne (SWITZERLAND), <sup>3</sup>Asklepios Klinikum Uckermark, Schwedt/ Oder (GERMANY)

INTRODUCTION: Combination of cervical disc replacement and fusion of adjacent degenerative segments is an option in spinal surgery of multi-level degenerative disc disease without any evidence so far. METHOD: Prospective cohort study of 41 patients, treated with cervical disc replacement between 06/2005 and 08/2006. Follow-up after 8-10 months. 15 patients received disc replacement combined with fusion in adjacent segments (COMB) vs. 26 patients with disc replacement alone (CDR). Neck and arm pain on the Visual Analogue Scale (VASneck and VASarm) were chosen as primary outcome variables. RESULTS: Median age in the COMB-group was 49.6 years (min 41.6, max 63.1) with a female/male ratio of 7:8 vs. 46.6 years (min 32.8, max 58.6) with a female/male ratio of 16:10 in the CDR-group. VASneck and VASarm showed a similar improvement in both groups (COMB: VASneck pre/postop 6.5/1.8, VASarm pre/postop 5.6/1.6; CDR: VASneck pre/postop 5.4/1.3, VASarm pre/postop 5.5/1.2). CONCLUSION: Short-term outcomes of cervical disc replacement in combination with fusion of adjacent segments vs. disc replacement alone show a similar pain reduction in neck and arm. Disc replacement in combination with fusion is a fair alternative to multi-level disc replacement of the degenerative cervical spine.

**Date : 2008-08-26**  
**Session : Spine: cervical spine 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 17207**

**POSTERIOR ATLANTO-AXIAL ARTHRODESIS FOR FIXATION OF ODONTOID NONUNIONS**

Patrick PLATZER, Gerhild THALHAMMER, Anna KRUMBOECK, Florian KUTSCHA-LISSBERG, Stefan DITTRICH, Christian GAEBLER, Manuela JAINDL, Vilmos VECSEI

*Department for Trauma Surgery, Medical University of Vienna, Vienna (AUSTRIA)*

**OBJECTIVES:** To determine the clinical and radiographic outcome after posterior atlanto-axial arthrodesis of odontoid non-unions at our level-I trauma centre. **MATERIAL/METHODS:** We reviewed the clinical and radiographic records of nine (four female and five male) patients with an average age of 68 years at the time of injury who had undergone posterior atlanto-axial arthrodesis for surgical treatment of odontoid non-unions. For posterior atlanto-axial arthrodesis, we performed either C1-C2 transarticular screw fixation, or posterior wiring and bone grafting, or a combination of these two techniques. **RESULTS:** 18 patients achieved a satisfactory clinical outcome and returned to their pre-injury activity level. The Smiley-Webster scale showed an overall functional outcome score of 2.2, which was 0.9 points superior to the outcome score before surgery. Neurological deficits after operative treatment of the odontoid non-union were evaluated in two patients. In all the other patients with primary neurological deficits or delayed neurological sequelae we saw a full recovery. Solid bony fusion of the cervical arthrodesis was achieved in all patients. Failures of reduction or fixation were noted in two patients, but no re-operations were necessary. **CONCLUSION:** In summary, we had a satisfactory outcome after surgical treatment of odontoid non-unions in patients with atlanto-axial instability and severe motion pain at the cervical spine. With a bony union rate of 100% and a noticeable improvement of clinical results and neurological function, posterior atlanto-axial arthrodesis appears to be an appropriate option for non-united odontoid fractures that require surgical stabilization.

Date : 2008-08-26  
Session : Spine: cervical spine 2  
Time : 1600-1730  
Room: 605

Abstract number : 17873

**CLINICAL SIGNIFICANCES OF THE CERVICAL SPINAL STENOSIS IN TRAUMATIC CERVICAL SPINAL CORD INJURY - ANALYSIS WITH PLAIN RADIOGRAPHS AND MRI**

Byung-Wan CHOI<sup>1</sup>, Ji-Hun SONG<sup>2</sup>, Kyung-Jin SONG<sup>2</sup>

<sup>1</sup>Gwangju Veterans Hospital, Gwangju (KOREA), <sup>2</sup>Chonbuk university Hospital, Jeonju (KOREA)

**PURPOSE:** We performed this study to compare the relationship between Pavlov's ratio, cord area and spinal canal area in traumatic spinal cord injury and to analyse the correlation between the parameters of stenosis and clinical symptoms. **MATERIALS AND METHOD:** Fifty-five patients, 212 levels with cervical spinal cord injury were included in this study. We measured four parameters: the Pavlov's ratio on the lateral radiographs, sagittal diameters, spinal cord areas and spinal canal areas on MRI. The Pearson correlation ratios were assessed between each parameter at the same level and between each level at the same parameter. Correlation was measured between radiographic parameters and spinal cord injury status grouped as A (Complete), B (Incomplete), C (radiculopathy) and D (Normal). **RESULTS:** Mean Pavlov's ratio was 0.84, sagittal diameter 12.9mm, spinal cord area 82.8mm<sup>2</sup> and spinal canal area was measured as 236.8mm<sup>2</sup>. Correlation between Pavlov's ratio and sagittal diameter, cord area and spinal cord area were significant. In correlation between spinal stenosis and spinal cord impairment state, stenosis was more severe in group A than group D in all four parameters. But Pavlov's ratio was the only parameter that showed statistically significant (P=0.006) correlation with clinical status. **CONCLUSION:** Cervical spinal stenosis was correlated with clinical impairment status caused by traumatic spinal cord injury. Especially Pavlov's ratio could be used as a clinical indicator for determining and predicting the clinical outcome.



Date : 2008-08-26  
Session : Spine: cervical spine 2  
Time : 1600-1730  
Room: 605

Abstract number : 17883

**ANTERIOR CERVICAL ARTHRODESIS WITH AUTOGENOUS ILIAC BONE GRAFT WITH OR WITHOUT PLATE FIXATION FOR THE DEGENERATIVE CERVICAL SPINAL DISORDERS**

Gyu-Hyung KIM<sup>1</sup>, Kyung-Jin SONG<sup>1</sup>, Kwang-bok LEE<sup>2</sup>, Byung-Wan CHOI<sup>1</sup>

<sup>1</sup>Departments of Orthopaedic Surgery, Chonbuk National University, College of Medicine, Jeonju (KOREA), <sup>2</sup>Department of Orthopaedic Surgery, Jeju National University, College of Medicine, Jeju (KOREA)

**INTRODUCTION:** This study compared the results of anterior cervical discectomy and fusion with autogenous bone graft (AFA) with or without plate fixation through a retrospective review of one or two-level degenerative cervical disorder, and the average follow-up was 6 years. **MATERIALS AND METHODS:** Group A (n=40) underwent one-level (A-1/26) or two-level (A-2/14) fusion and AFA alone. Group B (n=36) underwent one-level (B-1/24) or two-level (B-2/12) fusion and AFA with plate construct. The following parameters were analysed: the fusion rate, the change of Cobb's angle, the adjacent level degeneration (ALD), the clinical outcome and the rate of complications. **RESULTS:** There was a significant difference in the fusion rate between group A and B (p=0.028). Group B had a significant increase in the change of Cobb's angle compared to groups A (p=0.004). ALD were developed in 16 of 40 cases (40%) in group A, and in 4 of 36 cases (11%) in group B. There was a significant difference in ALD between group A and group B (p=0.004). **CONCLUSION:** We think that plate augmentation is necessary for the maintenance of lordosis, for reducing the pseudarthrosis and adjacent level degeneration, and to improve the clinical outcome for the treatment of one or two-level degenerative cervical spinal disorders. **KEYWORDS:** Degenerative cervical disorder, anterior cervical fusion, autogenous iliac bone graft, plate fixation.

**Date : 2008-08-26**  
**Session : Spine: cervical spine 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 18053**

**CERVICAL RADICULOPATHY CAUSING DROP FINGERS**

Yasuhisa TANAKA, Osamu YAMAGUCHI, Takumi TSUBAKINO  
*Tohoku Central Hospital, Yamagata (JAPAN)*

Drop fingers can be caused by cervical radiculopathy, as well as myelopathy or posterior interosseous nerve palsy. Hand dysfunction due to drop fingers is probably the most severe symptom among the variable symptoms that can result from cervical radiculopathies. However, symptomatology, nerve root levels involved, and results of surgical treatment of the radiculopathies that cause drop fingers have not been clarified. A retrospective review of 12 cases in which posterior foraminotomy had been performed to treat the radiculopathy led to the following conclusions. 1: Pain in the interscapular or scapular region precedes the occurrence of drop fingers. 2: Not infrequently there is no arm or finger pain at the time of the first examination. 3: The triceps and intrinsic muscles of the hand are affected in all patients, and the weakness of the intrinsic muscles predominates. 4: The nerve root involved is almost always C8, and seldom C7. 5: Recovery of drop fingers after surgery was good in half the patients and poor in the other half. 6: It is recommended that patients with drop fingers secondary to radiculopathy promptly be treated surgically without conservative intervention because better results can be obtained.

**Date : 2008-08-26**  
**Session : Spine: cervical spine 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 18397**

**THE DISCOCERV CERVICAL DISC REPLACEMENT - PRELIMINARY TWO-YEAR CLINICAL EXPERIENCE**

Zaki CHOUDHURY, Dan PLEV

*King's College Hospital, London (UNITED KINGDOM)*

We report our experience of intervertebral disc replacement surgery on a group of patients at Kings College Hospital. We present our outcomes along with a discussion of patient selection. We conducted a retrospective study of patients who underwent disc replacement surgery between 2005 and 2007. Case notes were reviewed for demographics and presenting symptoms. Mean range of preoperative movement was assessed radiologically on flexion/extension views for each disc level affected. We reviewed patients postoperatively and re-assessed their symptoms using visual analogue scores pain and re-assessed range of movement radiologically. We also assessed whether there had been any change in position of the prosthesis. 21 patients underwent surgery with 27 implants used (same surgeon, senior author). Average age of patients was 46.5. There were 14 males and 7 females. 11 patients had single level arthroplasty, three had two level and seven patients had "hybrid" constructs of combination with anterior cervical discectomy and fusion. Range of movement is tabulated as shown. Our study illustrates that disc replacement is a useful technique in this relatively young patients both in terms of symptomatic relief, thereby allowing return to normal function, and preservation of movement at the vertebral segmental level.

Date : 2008-08-26  
Session : Spine: cervical spine 2  
Time : 1600-1730  
Room: 605

Abstract number : 18917

**THE CLINICAL APPLICATION OF AO/ASIF LATERAL MASS PLATE IN THE TREATMENT OF MIDDLE OR LOWER CERVICAL FRACTURE AND DISLOCATION**

Jian-de XIAO, Yang CHEN, Zhen Yu LI

*Dept of Orthopaedics, Shenzhen Second People's Hospital, Shenzhen (CHINA)*

OBJECTIVE: To evaluate the application of AO/ASIF Lateral mass plate system in the treatment of middle or lower cervical spinal fracture and dislocation. METHODS: Twenty-two cases of middle or lower cervical spine fracture and dislocation were fixed with AO/ASIF lateral mass plate system. RESULTS: All cases were followed up for more than twelve months. There were no complications related to the operation. No screw-plate loosen, displacement and breakage were found. CONCLUSION: AO/ASIF lateral mass screw-plate system has the characteristic of stable, relatively simple and safe advantages. It is a good choice for the treatment of middle or lower cervical fracture and fracture-dislocation. KEYWORDS: Cervical vertebrae; Lateral mass plate; Internal fixation.

Date : 2008-08-26  
Session : Spine: cervical spine 2  
Time : 1600-1730  
Room: 605

Abstract number : 18947

**POSTERIOR C1-C2 FUSION WITH PEDICLE SCREW AND ROD FIXATION IN TRAUMATIC ATLANTOAXIAL DISLOCATION WITH DENS FRACTURE**

xuhua LU<sup>1</sup>, Dinglin ZHAO<sup>2</sup>

<sup>1</sup>Department of Orthopedic Surgery, Changzheng Hospital, Shanghai (CHINA), <sup>2</sup>Department of Orthopedic Surgery, Changzheng Hospital, Shanghai (CHINA)

**OBJECTIVE:** To clarify the characteristics of the clinicopathological factors in cases of traumatic atlantoaxial instability dens fracture and to induce a new method for the treatment of this disease. **METHODS:** 27 patients with traumatic atlantoaxial instability and dens fracture treated with posterior pedicle screws and rod to obtain reduction and immediate rigid fixation of C1-C2. In this series of patients, skull traction was made to restore the normal atlantoaxial joint before the operation. Screws and rod fixation was augmented with interspinous C1-C2 strut graft which to facilitate bone fusion in the operation. **RESULT:** In each patient fixation was satisfactory, and C1-C2 alignment or stability were restored without complication due to instrumentation. All patients showed osseous union (a mean follow-up period of 24 months, range 12-48 months). **CONCLUSION:** Posterior atlantoaxial pedicle screws and rod fixation provide immediate three dimension rigid fixation of C1-C2 that seems to be a reliable technique and should be considered an efficient alternative to the previously reported techniques.

**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 0905-1035**  
**Room: 606-607**

**Abstract number : 15724**  
**PATELLAR SECONDARIES - A CASE REPORT**  
Hydar KUNNUMMAL  
*Relief Hospital, kondotty (INDIA)*

The skeleton is one of the commonest sites for metastasis. The incidence is probably higher than that recorded. Skeletal metastasis may present with pain localised tenderness or pathological fracture. The present case, a 55-year-old male patient presented with complaints of pain and swelling (Rt) knee following a trivial trauma. Clinically it was diagnosed as haemarthrosis. As symptoms was not subsided patient again came with same complaints with increase effusion around the knee after 10 days. X-ray was repeated and that shows a lytic area on the anterior aspect of the patella. On general examination detected a small soft tissue swelling over the left leg. FNAC was done; result came as spindle cell neoplasm, with advice for excision biopsy. HPR results came as Alveolar soft part sarcoma. FNAC from the lesion of the patella is suggestive of secondaries. Patient was sent for nuclear study, which also shows secondaries in the patella. Alveolar soft part sarcoma is highly malignant even though it is a slow growing tumour. Metastasis may be the first manifestation of the disease. Patient usually presented as painless mass, may misdiagnose as haematoma or pulled muscle. Patellar metastasis is a rare presentation. There have been approximately 20 cases reported in the literature. This may present clinically as septic arthritis or meniscal injuries. Low blood flow to the patella may be the explanation why patellar secondaries are rare. The aim of this presentation, patellar secondaries may also keep as a differential diagnosis of the knee pain.

**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 0905-1035**  
**Room: 606-607**

**Abstract number : 19017**

**A NEW OPERATION IN THE TREATMENT OF NEGLECTED DISLOCATED HIPS IN CHILDREN IN DEVELOPING COUNTRIES**

Ger OLYHOEK<sup>1</sup>, Willard J. RIJNBERG<sup>2</sup>

<sup>1</sup>WOC, Arnhem (NETHERLANDS), <sup>2</sup>Rijnstate Hospital, Arnhem (NETHERLANDS)

**Introduction:**The prevalence of neglected dislocated hips is unknown but presumably high in countries where most of the poor people don't have access to proper early treatment. More and more experienced orthopaedic surgeons participate in orthopaedic projects in developing countries where external conditions are poor and follow up is unpredictable. **Purpose:**To provide a safe procedure with low risk we developed a new salvage technique in neglected dislocated hips in order to improve hip stability, gait and walking distance. **Material and methods:**We have used in Peru and Indonesia a simple shelf plasty which is stable with the use of simple K wires that has not been described to our knowledge. An U form shelf was made from the outer iliac crest, and supported with an autologous cortical strut and reinforced by a homologous cancellous bone graft (Opteform ®. Oudshoorn chirurgische techniek b.v.Oss, the Netherlands) in between the shelf and the split iliac crest. The construction was immobilised with two, 4 mm K wires. No plaster of Paris had been used. **Aftertreatment** consisted of six weeks of traction, thus immobilising the child. After six weeks the K wires were removed and the child was mobilised. (weight bearing allowed). In this way we treated 7 patients (age 4-16 years). Follow up varies from 12 weeks to 2 years. In all cases a solid shelf developed within six weeks, as is demonstrated on X-rays. The operative technique will be demonstrated in detail. **Conclusion:**This salvage procedure is fast and relatively safe and can be considered as a good alternative in circumstances where conventional operations such as Chiari osteotomy or derotation, varisation and shortening osteotomy are no options due to difficult external circumstances.

**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 0905-1035**  
**Room: 606-607**

**Abstract number : 19115**  
**LIMB SALVAGE FOR MALIGNANT BONE TUMOURS: OUR EXPERIENCE**

Alok C. AGRAWAL  
*N.S.C.B. MEDICAL COLLEGE, JABALPUR (INDIA)*

**INTRODUCTION:** Long-term studies in the literature show that limb salvage surgeries performed with adequate margins and chemotherapy have a patient survival and local control of disease comparable to a radical amputation (Sim 1985 and Rougart 1994). With this background we are reporting our results of limb salvage in primary bone tumours/ secondaries.**MATERIAL AND METHODS:** 9 cases of malignant bone tumours i.e., 2 cases of osteogenic sarcoma, 3 cases of Ewing's sarcoma, 1 case of chondrosarcoma, 1 case of malignant fibrous histiocytoma and 2 cases of recurrence in previously operated GCT of the limbs were treated with en-mass excision and reconstructions. The cases were selected based on local pathology, acceptable biopsy scars and absence of metastasis. Cost effective strategies of reconstruction including Enneking's procedure, arthrodesis, Ilizarov and bone grafting done are evaluated.**DISCUSSION:** In patients with malignant bone tumours the patient's survival depends upon eradication of primary disease process either by amputation or excision followed by reconstruction. We have found that at times achieving radical margins becomes very difficult and even wide margins are difficult to obtain as neurovascular bundle, the skin and soft tissues adjacent to the swelling and the introsseus membrane in cases of radius- ulna and proximal tibia -fibula act as limiting factors. We feel that, especially in high grade malignant bone tumours definitive procedures giving early function are better compared to limb reconstruction by Ilizarov as it gives the patient more functional days of life till survival.



**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 0905-1035**  
**Room: 606-607**

**Abstract number : 19116**  
**MRI EVALUATION OF TB SPINE LESION**

Anil JAIN  
*University College of Medical Sciences, New Delhi, GHAZIABAD (INDIA)*

The spinal tuberculosis is an indolent infection, hence diagnosis often remain elusive. The disease is far advanced when it is diagnosed radiologically. MRI is a sensitive modality to diagnose bone and soft tissue inflammation. We present an analysis 150 cases of spinal TB to ascertain utility of MRI in diagnosis and treatment. 150 cases of spinal TB in different stages of disease were treated longitudinally, 80 cases were diagnosed clinico radiologically and on MRI while in 70 cases diagnosis was as ascertained histologically. 15 cases were diagnosed before a classical radiological lesion developed. 65 cases had no neural deficit while 85 had varying grade of neural deficit. The patients were treated by &#65533;middle path regimen&#65533;. 25 cases were followed longitudinally by MRI upto the healing of the lesions. The vertebral body showed low signal in T1W1 and high signal in T2WI. Contagious vertebral body involvement with sparing of IV disc space, subligamentous extension of cold abscess, intraosseous abscess, pre and paravertebral septate abscess, epidural involvement were the most observed. In 10% cases asymptomatic skip lesions were detected. The liquid compression can be differentiated from heterogenous compression. The spinal cord showed features of edema/myelitis, myelomalacia, cord atrophy and syringomyelia. The healing of vertebral lesion is observed as high signal intensity on T1WI on treatment. MRI is an sensitive modality early detection TB lesion, bone lesion. The MRI features are characteristic to diagnose a tuberculous lesion, prognosticate for neural outcome and ascertain the healing of the tuberculous bone lesion.

**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 0905-1035**  
**Room: 606-607**

**Abstract number : 19118**  
**LEARNING CURVE IN SPINE SURGERY: A BEGINNER'S EXPERIENCE**

Janardhana AITHALA  
*Kasturba Medical College, Manipal, Udupi, Karnataka (INDIA)*

Aim of the study: To study the various technical difficulties faced and complications from spine surgery during the first 2 years of practice of a beginner. Materials and Methods: 19 patients who underwent surgery (lumbar spine) in the first 2 years were included in the study. These procedures included Minimal incision discectomy (9 patients), single/multiple level laminectomy and decompression (6 patients), fusion with instrumentation (2 patients) and Kyphoplasty (2 patients). Data entered in spine surgery proforma regarding technical difficulties faced during surgery, peroperative findings, duration and blood loss, postoperative complications and their eventual outcome in the final follow-up were used for analysis. Results: Average duration of surgery for minimal incision discectomy was 157 minutes with blood loss of 279 ml. Average duration of surgery for single level decompression and laminectomy was 125 minutes with average blood loss of 615 ml. Technical problems noticed during surgery included difficulty in separating nerve root from adhesions, separating adhesions from dura with hypertrophied ligamentum flavum, identification of nerve root at higher levels and control of bleeding. Complications included dural tear (3 patients), nerve root injury (1), postoperative deficits (Transient 4, Residual 2) and hypotension due to excessive blood loss (1 case). At the last follow-up 18 patients were satisfied with the final result. Conclusions: Learning curve in spine surgery is longer and patience is required especially during decompression stage in view of possible complications due to adhesions and bleeding in patients with stenosis.

**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 0905-1035**  
**Room: 606-607**

**Abstract number : 19120**

**MANAGEMENT OF FRACTURES OF FEMORAL SHAFT IN PEDIATRIC AGE GROUP UNDER FEMORAL NERVE BLOCK AND IMMEDIATE HIP SPICA APPLICATION**

Lalit MAINI

*Maulana Azad Medical College, Delhi (INDIA)*

We treated fifty children each, in two groups, with closed femoral shaft fractures between the age of 5 and 12 years who were subjected for therapeutic evaluation. In the study group, all the patients were applied one and half hip spica under femoral nerve block within 72 hours of admission to hospital. Initial splintage was given with Thomas splint and fixed skin traction. With the splint in place femoral block was administered in the presence of the parents. No sedation or premedication was given to have an accurate evaluation of the effect of the block. After 10 minutes of giving the block, the splint was removed and the pain relief of the block evaluated by Visual Analog Scale. The patients were then applied a hip spica after shifting to the spica table. Excellent pain relief is possible with femoral nerve block in femoral shaft fractures in pediatric age group. Fractures of middle and lower end had better pain relief than proximal 1/3rd fractures. There were no complications attributable to femoral block. Acceptable reduction was achieved in all patients supporting good muscle relaxation. In the second group, all the patients were treated with standard protocol of traction for 2-3 weeks followed by hip spica application. Femoral nerve block should be used as the preferred modality for achieving pain relief and relaxation of quadriceps mechanism in pediatric femoral shaft fractures for hip spica application. This could be more relevant for third world countries as the cost of the treatment is less; the procedure doesn't demand high level of competency is free from side effects of general anesthesia and takes a lesser time for the whole procedure to be executed, so the high patient load can easily be handled. Keywords: Children, shaft femur fracture, femoral nerve block, hip spica cast

**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 0905-1035**  
**Room: 606-607**

**Abstract number : 19121**

**CLINICAL EXPERIENCE OF INTRAMEDULLARY SPLINTAGE FOR SUPRACONDYLAR FRACTURES OF FEMUR**

Amatava Narayan MUKHERJEE, Debadyuti BAKSI  
*J.N.Roy Hospital, Anandalok Hospital, KOLKATA (INDIA)*

Open methods of surgical stabilization of Supracondylar fractures of femur have high morbidity, we attempted closed anatomical reduction of fractures and int. splintage. A study was conducted to evaluate the clinicoradiological outcome of SIGN supracondylar nailing by minimal invasive approach for closed & open fractures. Unreamed Supracondylar nail, average 10 mm with length: 190 mm (Average), in 27 patients with 24 closed fractures and 3 open fractures (GA.I : 2 & GA.III A: 1), Fracture Pattern Type A1 &#65533; 16, A2 &#65533; 7, A3 &#65533; 2, C1 - 2 in 21-75 yr age group (av. 47). Closed reduction of the fracture was done to align the axis of the femur, retrograde approach was made through an entry point in the intercondylar notch just above the insertion of PCL using bone awl to enter the medullary canal. Closed reduction is confirmed under image, reaming was done depending on the size and shape of the medullary canal, intramedullary insertion of the appropriate size the SIGN nail is carried out, proximal and distal lockings were done with the help of zig, per-operative range of motions and stability of knee joint were tested. Follow-up period 16-36 months (av. 25); good 23, fair 3, poor 1, infection (supf.) 1, distal migration of nail with malunion &#65533; 1. SIGN supracondylar nailing procedure is simple, easy, fast & easily reproducible by an average orthopaedic surgeon. As the SIGN nail has got unique advantage in locking mechanism, hence can be used in peripheral centres where C-ARM is not available.

**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 0905-1035**  
**Room: 606-607**

**Abstract number : 19123**  
**PERCUTANEOUS PINNING OF DISPLACED SUPRACONDYLAR FRACTURES OF THE HUMERUS IN CHILDREN- A RETROSPECTIVE STUDY OF 42 PATIENTS**

Rajeev NAIK  
*tbc, Bangalore (INDIA)*

Since most of these injuries are treated by residents we developed a protocol for the safe treatment of displaced but uncomplicated extension fractures in children. Closed reduction under general anesthesia and percutaneous fixation with two parallel smooth lateral pins was performed under fluoroscopic control, but if the closed reduction failed a malunion was achieved and later on corrected. This study does not include those cases where we failed in getting a close reduction and hence did not undergo Percutaneous pinning. We have not performed immediate open reductions in case of failed closed reductions on any children. The mean follow up was 24 months. The clinical result was considered excellent in 55% of the cases, good in 23% of the cases and remaining 22% poor according to Flynn's criteria. Any cubitus varus deformity is considered to be a poor result. Technical error in interpretation of the fluoroscopic image by the residents was thought to be the main factor for the increased percentage of poor results. Training residents in radiography has been instituted since this study.

Date : 2008-08-26

Session : World Orthopaedic Concern (WOC)

Time : 0905-1035

Room: 606-607

Abstract number : 19124

**MANAGEMENT OF INTRA ARTICULAR FRACTURES IN THE UPPER AND LOWER LIMBS BY JESS (JOSHI'S EXTERNAL STABILISATION SYSTEM) - A MINIMALLY INVASIVE TECHNIQUE**

Ram PRABHOO

*Mukund Hospital, Andheri, JESS Research and Development Centre, Bandra, Mumbai, Mumbai (INDIA)*

The introduction of external fixation devices has brought significant improvement in the management of complex open fractures. Its importance and versatility ranges from its use as a temporary/ definitive fixation device in fractures with soft tissue and vascular injuries to its use in definitive correction of acquired limb deformities and congenital malformations. It avoids extensive soft tissue damage and enhances easy management of associated soft tissue injuries. We present here the Joshi External Stabilisation System (JESS) a mini External Fixator developed in India by Dr. B.B. Joshi, which is a quick and simple method which avoids open reduction of fractures and problems thereof.. Morbidity due to surgical exposure and potential risks are diminished while functional results are comparable to open reduction and internal fixation with the advantages of reduced risk using a minimally-invasive technique. Patients showed good acceptance of the external fixator due to the fact that it caused them little incapacity during treatment. We consider JESS a viable treatment option for a patient population which has osteoporotic bones and comminuted fractures and also where surgeons work under constraints particularly those in rural areas. The use of this simple appliance is possible after minimal training. Operative time is short, and postoperative complications are less, and stability of fixation is good. We have effectively used the JESS system for intraarticular fractures of the lower end radius fractures, lower end humerus, proximal humerus fractures, upper end tibia fractures, pilon fractures and calcaneum fractures.

**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 0905-1035**  
**Room: 606-607**

**Abstract number : 19126**

**TREATMENT OF NEGLECTED CTEV BY PONSETI METHOD**

Sakti Prasad DAS, P.K. SAHOO, R.N. MOHANTY, S.K. DAS  
*tbc, tbc (INDIA)*

**BACKGROUND:**Neglected CTEV is very prevalent in our state of Orissa as well as in India. In an elderly child soft tissue release alone is not sufficient for full correction.Complications of bony procedures as well as fractional distraction are well known.We aimed to study the results of twenty five CTEV patients with thirty five deformed feet as per the principles of Ponseti by serial manipulation and plaster cast from June 2005 to December 2007 at SVNIRTAR, Cuttack, India. **METHODS:**Randomly selected patients above the age of one year were included in the study. Age range of patients varies from one to eighteen years. The standard protocol described by ponseti was used except in child more than three years of age. In that cases POP casting was done under GA at an interval of two weeks. Percutaneous tenotomy was performed in the operating theatre. **RESULTS:**Excellent results were obtained in 85% of cases and good results in 12% cases and poor in 3% of cases. There were no major complications associated with this procedure. Criteria used was described by Main et. al(1977). **CONCLUSION:**serial manipulation and cast immobilization with percutaneous tenotomy of Achilles tendon provides excellent results in terms of clinical appearance of foot, foot function and deformity correction as measured radiographically at a minimum of two years in patients with neglected CTEV.

**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 0905-1035**  
**Room: 606-607**

**Abstract number : 19128**

**CHALLENGES IN THE DIAGNOSIS AND MANAGEMENT OF MUSCULOSKELETAL TUMOURS IN AN AFRICAN COUNTRY**

Samuel Uwale EYESAN, M.E. UGBEYE, D. OBALUM, O. UGUEGBULAM, I.E.O. ALABI, O.E. NNODU, E.B. ABDULKAREEM  
*National Orthopaedic Hospital, LAGOS (NIGERIA)*

Large number of tumours can develop from bone and from soft tissues covering them. The management of these tumours are important because of the high rate of mortality in the treatment modalities offered. A 5 years prospective study of bone and soft tissue tumours is presented with the difficulties encountered in diagnosis and treatment. 71 patients with a male to female ratio of 1.7:1, range of 5yrs &#65533; 85yrs, mean age 32 yrs. Average duration before presentation was 24.7weeks, range 1 day to 34yrs. The anatomic location and literacy level did not affect time of presentation. No patient had Scan /MRI as they could not afford them. 95% of them had biopsies and Xrays. 70% presented in stage III. 15% could afford chemotherapy /radiotherapy. 50% agreed to have amputation. Limb sparing surgeries offered to 3 patients in the soft tissue sarcoma . Only 1 could afford the bill. 50% rejected amputation. In the benign group, 65% had limb sparing surgeries. 15% of them had amputation. 50% were lost to follow up within 3 months. 39% died within the same period. Musculoskeletal tumours is a reality in our environments. A significant proportion of our population have financial limitations as additional burden is placed on the family. Ignorance and cultural beliefs continue to promote late presentation to the hospital. Our hospitals are poorly equipped to give optimal care despite presence of trained personnel.



**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 0905-1035**  
**Room: 606-607**

**Abstract number : 19137**

**A NEW OPERATION IN THE TREATMENT OF NEGLECTED DISLOCATED HIPS IN CHILDREN IN DEVELOPING COUNTRIES**

Surijanto MUSKITA<sup>1</sup>, Ger OLYHOEK<sup>2</sup>, Debora Theodesia MUSKITA<sup>1</sup>

<sup>1</sup>*Harapan Jaya Rehabilitation Center, North Sumatera (INDONESIA)*, <sup>2</sup>*World Orthopaedic Concern, Arnhem (NETHERLANDS)*

Statistical and prevalence data of neglected dislocated hips in children in developing countries remain unknown. The global burden of musculoskeletal disease in low and middle-income countries is large, growing, and neglected. While there is considerable funding for the control of communicable disease, there has been little attention paid either the prevention or the treatment of orthopaedic problems in developing countries. Neglected traumatic dislocation of the hip is extremely rare in children, and the preferred treatment remains unclear. Most of the cases had been treated previously by traditional bone setter. This occur due to most patient live in remote area in which medical help is rare and not appropriate, parents can not effort for the hospital cost, and lack of knowledge and awareness. However several new techniques have been developed to achieve stability of the gait, and minimize complication of the operation. The purpose of the treatment is to provide a safe procedure under poor external procedure. This paper present two cases of neglected dislocated hips. Both cases are 7 years old girls who had been treated by traditional bone setter. The first case had been neglected for six year while the other one had been neglected for one year. Both cases are managed using the same procedures and the patients still under follow up for the result. Keywords: neglected hip dislocation, traditional bone setter, new techniques

**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 1045-1205**  
**Room: 606-607**

**Abstract number : 19119**

**RESULTS OF SURGICAL RECONSTRUCTION FOR FRACTURES OF THE DISTAL HUMERUS PRESENTING LATE**

John MUKHOPADHAYA, Swastik SHIVAPURI

*n/a, n/a (INDIA)*

**INTRODUCTION:**Intra-articular fractures of the distal humerus are a challenging problem. When they present late surgical reconstruction can be difficult, results less predictable. Controversy remains about the management of these patients. This study analyses the functional outcomes after Open Reduction and Internal Fixation with autologous bone grafting where required in these patients. **MATERIALS & METHODS:**Between January 1995 and September 2007, 68 patients underwent surgical reconstruction with ORIF for distal humerus fractures presenting more than 4 weeks after injury. 17 patients required bone grafting. The average time between injury and presentation was 14 weeks (Range 4 wks to 104 wks). 18 patients had undergone previous surgical treatment. As per the AO classification, 5 fractures were Type A, 11 Type B and 52 Type C. Indications for surgery included significant pain, joint incongruence, abnormal mobility at the fracture site and stiffness of the elbow joint. Posterior approach with Olecranon osteotomy was used. **RESULTS:**Average follow-up was 26 months (Range 6 months to 9 years). The results according to the Mayo elbow Performance Index was excellent in 33 patients, good in 22 patients, fair in 9 patients, and poor in 4 patients. There was 1 non-union 1 deep infection and 1 avascular necrosis of the lateral condyle. **CONCLUSION:**The results show that delayed reconstruction of these fractures can give consistently good results. Angle stable implants may enhance stable fixation in osteoporosed bones. The surgeon's experience with these fractures and supervised physiotherapy play a pivotal role in the final functional outcome.

**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 1045-1205**  
**Room: 606-607**

**Abstract number : 19125**

**CONCURRENT BILATERAL FEMORAL NECK FRACTURES FOLLOWING PELVIC IRRADIATION**

Raphael Omotayo AYORINDE

*Olabisi Onabanjo University Teaching Hospital (OOUTH), IBADAN (NIGERIA)*

**INTRODUCTION:**Fracture of the femoral neck in the elderly often results from osteoporosis or osteomalacia. It is often precipitated by minor injuries, only few results from major trauma. Whereas, few radiation induced hip fractures have been reported in the literature, diagnosis is often made late.**CASE REPORT:**We report a case bilateral femoral neck fracture that occurred that in a 74 year old woman. She presented at our Surgical Outpatient Department (SOPD) with 5 month history of pains in both hips and 4 months history of inability to walk. She was diagnosed with Stage 1b squamous cell carcinoma of the cervix two years prior to presentation. She was treated with chemo-radiation and has been disease free. Pelvic radiograph showed subcapital fracture of both femurs, with osteonecrosis of the heads. She had bilateral Hemiarthroplasty, non-cemented Austin Moore stem, at 8 weeks interval. Patient is now pain free and now ambulates with Zimmer frame.**CONCLUSION:**Patients with radiation to the hip should be critically evaluated for fracture of femoral neck when they complain of hip/pelvic pain.

**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 1045-1205**  
**Room: 606-607**

**Abstract number : 19127**  
**CHRONIC OSTEOMYELITIS IN BONE SUBSTITUTES**  
Muhammad TARIQ SOHAIL  
*Services Institute of Medical Sciences, LAHORE (PAKISTAN)*

Chronic Osteomyelitis is a very difficult and disabling condition especially in a situation where there is a cavity within the bone because of sequestration. The conventional treatment of Osteomyelitis with bone loss is very difficult, time consuming and fraught with a lot of complications. In situations I propose treatment with Debridement followed by Bone Substitution (Laden with antibiotic). A series of cases is presented with very gratifying results and the treatment is strongly recommended specially in underdeveloped countries because of efficacy Economy and safety

**Date : 2008-08-26**  
**Session : World Orthopaedic Concern (WOC)**  
**Time : 1045-1205**  
**Room: 606-607**

**Abstract number : 19129**

**LARGE GAP NON-UNIONS OF TIBIA: RESULTS OF ONE STAGE TIBIALIZATION OF FIBULA**

Zile Singh KUNDU

*Post Graduate Institute of Medical Sciences, Rohtak, Haryana (INDIA)*

**INTRODUCTION:** Gap non-unions are commonest in tibia, due to its subcutaneous location and open fracture with bone loss in the leg. Various methods of bone transport and bone grafting have been described. We present our results of tibialization of fibula after trauma and tumor excisions.

**METHOD:** Seventeen patients, with age 13 to 44 years, with gap non-union of tibia (gap = 2 to 8 inches) were treated with this method. These were either due to tumours or post-traumatic. One stage tibialization, using two screws in proximal and two in distal fragments of tibia was performed. Additional support with POP cast was given and continued till 6 months. After that patients were given PVC braces. Partial weight bearing was started after 3 months and full weight bearing with brace after 6 months.

**RESULTS:** Good results i.e. union at both ends and hypertrophy of fibula was achieved in 15 patients. One patient had backing out of screws and non-union at both ends while the other had infection and non-union at one end. Shortening of 1 to 1½ inches was noted in all cases. Follow-up ranged from 2-8 years.

**DISCUSSION:** Fibula being covered all around with muscles makes a very good live graft to be fused to tibia. It achieves fast union and starts hypertrophy in one year of time and in young after 3-4 years of transfer it becomes full weight bearing bone. The method is biological, cost effective and simple technically at a difficult anatomical site.

Date : 2008-08-26  
Session : SICOT/ Scoliosis Research Society (SRS): Paediatric Deformity  
Time : 1400-1530  
Room: 606-607

**Abstract number : 19188**  
**AIS - SELECTION OF FUSION LEVELS**

Kamal IBRAHIM  
*Loyola University Chicago, Chicago (UNITED STATES)*

DECISION MAKING WOULD INCLUDE; Which curve/curves to be fused (Lenke classification) Proximal level of instrumentation (depends on the shoulders level) Distal instrumented level (depends on the side bending x-rays, lumbar curve flexibility and apical vertebral deviation of the central sacral line), fusion to end vertebra vs. stable vertebra Distribution of anchor points along the curve/s (aiming to achieve coronal/sagittal correction and direct vertebral rotation) Sagittal alignment consideration in decision making not to end fixation at apex of kyphosis  
SURGICAL GOALS: -Curve correction -Leveled shoulders -Coronal balance -Sagittal balance -Hump improvement  
PLANNING: -Pedicule screws in thoracic and lumbar spine, transverse process hooks at the cephalad end of the fusion to allow with subsequent screws -Monoaxial screws on the concave side and polyaxial on the convex side -Proximal level of fusion will influence shoulders level:- Preoperative leveled shoulders or left is lower- extend fusion to one level proximal of the cephalad end vertebrao Higher left shoulder (Type V curve)- fuse upper left curve extend to T2 or T1- Distal extension of the fusion will determine coronal balance; fuse to lowest mobile lumbar vertebra on side bending x-ray - Transverse plane correction (hump correction): spine translation with pedicle screws and direct vertebral rotation of the apical vertebrae- Sagittal correction: achieved by the proper bending the rods for thoracic kyphosis and lumbar lordosis and avoid ending at kyphosis apex

**Date : 2008-08-26**  
**Session : SICOT/ Scoliosis Research Society (SRS): Paediatric Deformity**  
**Time : 1400-1530**  
**Room: 606-607**

**Abstract number : 19195**

**VEPTR: PERSPECTIVE FROM A GROWING ROD EXPERT**

George H. THOMPSON

*Rainbow Babies' and Children's Hospital, Cleveland (UNITED STATES)*

VEPTR or vertically expandable prosthetic titanium rib, is a newer implant used in children with early-onset scoliosis (EOS). It was designed specifically for thoracic insufficiency syndrome (TIS). Common indications include, flail chest syndrome; constrictive chest wall syndrome, such as fused ribs and scoliosis, hypoplastic thorax syndromes (Jeune syndrome, achondroplasia, Jarcho-Levin syndrome, progressive scoliosis of congenital or neurogenic origin), and infantile idiopathic scoliosis or syndromic EOS with constrictive chest wall syndrome. The primary indication is to increase lung volume and to improve pulmonary function testing. It also results in secondary improvement in spinal height and scoliosis. There are three types of implants: rib to rib, rib to spine, and rib to pelvis. A major advantage that is applied remote from the spine except for the foundation in the rib to spine construct. This is felt to produce less autofusion. The operative strategy is to maximize thoracic volume and symmetry by lengthening the constricted hemithorax by opening wedge thoracostomy on the concave side, either through osteotomy of fused ribs in congenital scoliosis or intercostal muscle lysis. No bracing is used postoperatively. The device is lengthened at 6 month intervals. Because 50 percent of the final thoracic volume depends on growth between age 10 - 15 years, final fusion is preferably delayed until skeletal maturity. Pulmonary outcome of patients with EOS treated with VEPTR is encouraging, as they have decreased clinical respiratory insufficiency and a mean percent increase in normal vital capacity of approximately 60%. However, the complication rate is high. Migration of the cradle through the ribs, necessitating revision, is the major complication. The implants are prominent and skin erosion and infections can occur. Neurologic complications are rare. The major disadvantages of the system is that it is difficult to contour. This limits its usefulness as a growing rod system.

Date : 2008-08-26  
Session : SICOT/ Scoliosis Research Society (SRS): Paediatric Deformity  
Time : 1400-1730  
Room: 606-607

Abstract number : 17263

**TREATMENT OF CONGENITAL SCOLIOSIS ASSOCIATED WITH THORACIC DEFORMITY, PRIMARY REPORT OF VEPTR APPLICATION**

Bochang CHEN

*Shanghai Children's Medical Center, Medical School of Shanghai, Jiaotong University, Shanghai (CHINA)*

SUBJECT: Report our primary experiences in the treatment of congenital scoliosis associated with thoracic deformity by using VEPTR technique. METHOD: Five cases, three male and two female. Mean age is 8.30 (4.75-12.25 years) at surgery. They all have spine deformity since born and get progressive with growth. Because of thoracic restrictive, all cases have their pulmonary function failure. Three cases appear pelvic oblique. Radiography shows all of them are mixed unsegmental and unformative deformities in vertebrata and four cases have fused ribs. Cobb's angles are average at 77.6 degrees. CT reconstruction shows that their thoraxes have complicated deformity. During the surgery, four fused ribs had osteotomy and all cases had opening-wedge thoracostomy with one rib-to-rib and one rib-to-spine instrumentation under cord monitoring. RESULTS: Average follow-up is 12 months. Four cases have had spine elongation once and one had twice. Their pulmonary function gets improved and daily activities increased. Sitting height increased after surgery and elongation. Cobb's angle corrected to average 57 degrees and cases with pelvic oblique get balance after surgery. Patients are satisfied with their shape change and get more self-confident after surgery. Elongation was performed six to eight months after first operation based on their sitting height growth. No other serious complication happens. CONCLUSION: VEPTR treatment does have effect on the congenital scoliosis associated with thoracic deformity in our primary experiences. Pulmonary function improves, spine curve control and continue spine growth are main advantages. But long-time results still need further observation.



Date : 2008-08-26

Session : SICOT/ Scoliosis Research Society (SRS): Paediatric Deformity

Time : 1400-1730

Room: 606-607

Abstract number : 17296

**ACCURACY OF VERTEBRAL SCREW INSERTION IN THORACIC AIS PATIENTS: A COMPARISON BETWEEN THE THORACOSCOPIC AND THE THORACOTOMY APPROACH**

Yong QIU, Weijun WANG, Zezhang ZHU, Feng ZHU, Bin WANG, Yang YU, Bangping QIAN, Weiwei MA  
*Spine Surgery, the Affiliated Drum Tower Hospital of Nanjing University Medical School, Nanjing (CHINA)*

BACKGROUND: The important issue whether screws inserted thoracoscopically are as accurate as those inserted through open thoracotomy has not been well studied. OBJECTIVE: To compare the accuracy of vertebral screw insertion in the thoracic spine for adolescent idiopathic scoliosis (AIS) patients between the mini-open thoracotomy and the thoracoscopic approach. METHODS: Thirty-one patients with thoracic AIS receiving thoracoscopic spinal fusion and anterior spinal fusion with mini-open thoracotomy were included in this study. They were divided into two groups: A (mini-open thoracotomy) and B (thoracoscopic). Screw entry points, trajectory and its relationship with the aorta and vertebral canal, and the position of screw tips relative to the aorta and the bicortical purchase of screw, were measured on post-operative CT images. RESULTS: There were 73 and 162 thoracic vertebral screws inserted in group A and group B respectively. Parameters measured on CT images showed no difference between the two groups. 89.0% of screw tips in group A and 80.2% in group B were distant from the aorta, 89.0% and 87.0% of screws got bi-cortical purchase in group A and group B respectively. No significant difference was found in all thoracic levels including the upper thoracic, periapical or lower thoracic vertebrae. 74.0% and 66.7% screws were in good positions in group A and group B respectively, without statistically significant difference. CONCLUSION: The accuracy of screw insertion is similar between those vertebral inserted thoracoscopically and those inserted through a mini-open thoracotomy approach. KEYWORDS: Idiopathic scoliosis, vertebral screw, thoracoscopic, accuracy.

Date : 2008-08-26  
Session : SICOT/ Scoliosis Research Society (SRS): Paediatric Deformity  
Time : 1400-1730  
Room: 606-607

Abstract number : 17311

**COMPARISON OF EFFECTIVENESS OF HALO-FEMORAL TRACTION AFTER ANTERIOR SPINAL RELEASE IN SEVERE IDIOPATHIC AND CONGENITAL SCOLIOSIS**

Zhen LIU, Yong QIU, Zezhang ZHU, Bin WANG, Yang YU, Feng ZHU, Bangping QIAN, Weiwei MA, Xu SUN  
*Spine Surgery, the Affiliated Drum Tower Hospital of Nanjing University Medical School, Nanjing (CHINA)*

BACKGROUND: The management of severe and rigid scoliosis remained a big challenge to spine surgeon. OBJECTIVE: To assess the effectiveness of Halo-femoral traction after anterior spinal release in the management of severe scoliosis. METHODS: Sixty patients with severe and rigid curves were treated with anterior spinal release, Halo-femoral traction, and second-stage posterior spinal fusion. Thirty patients were in idiopathic scoliosis (IS) group, with average coronal Cobb angle  $91.6^{\circ}$  and mean global thoracic kyphosis was  $50.6^{\circ}$ . Another thirty patients were in congenital scoliosis (CS) group, with average coronal Cobb angle  $95.7^{\circ}$  and average thoracic kyphosis  $70.2^{\circ}$ . All patients had a minimum 12-month follow-up. RESULTS: The average traction time was 23 days. Four patients experienced brachial plexus palsy and complete nerve functional restoration was achieved at two-month follow-up. In the IS group, the correction rate of major curve averaged 57.5%. In the CS group, the mean correction rate of major curve was 45.2%. Significant difference was found in curve magnitude between IS and CS patients after posterior correction. The correction rate of kyphosis between IS and CS patients was also statistically significant. CONCLUSION: Halo-femoral traction is a safe, well-tolerated and effective method for the treatment of severe and rigid scoliosis patients. The posterior correction rate obtained after anterior release and traction was significantly superior to that recorded from side bending film. KEYWORDS: Scoliosis, Halo-femoral traction, correction rate, sagittal restoration, staged operation.

Date : 2008-08-26

Session : SICOT/ Scoliosis Research Society (SRS): Paediatric Deformity

Time : 1400-1730

Room: 606-607

Abstract number : 17314

**THE INFLUENCE OF THORACIC KYPHOSIS ON THE SAGITTAL ALIGNMENT AND THE BALANCE OF THE LUMBOSACRAL SPINE IN ADOLESCENT IDIOPATHIC THORACIC SCOLIOSIS PATIENTS**

Gang YIN, Zhen LIU, Yong QIU, Bin WANG, Yang YU, Zezhang ZHU, Bangping QIAN, Feng ZHU

*Spine Surgery, the Affiliated Drum Tower Hospital of Nanjing University Medical School, Nanjing (CHINA)*

BACKGROUND: The influence of thoracic kyphosis to sagittal alignment and balance of the lumbosacral vertebrae has never been studied in detail in patients with adolescent idiopathic thoracic scoliosis (T-AIS). OBJECTIVE: To investigate the influence of thoracic kyphosis on the sagittal alignment and balance of the lumbosacral spine in T-AIS patients. METHODS: Standing posteroanterior and lateral x-rays of a cohort of 55 patients with T-AIS were studied. The patients were classified according to their thoracic kyphosis: Group A  $TK < 10^\circ$  and Group B  $10^\circ \leq TK \leq 40^\circ$ . The following parameters were measured: lumbar lordosis (LL), upper and lower arc of lumbar lordosis, sagittal vertical axis (SVA), sacral slope (SS), pelvic incidence (PI), pelvic tilt (PT). Sagittal plane parameters were analysed using t-test between the two groups and linear correlations between parameters were calculated using Pearson correlation. RESULTS: There were smaller LL and upper arc of lumbar lordosis in the first group. Significant linear correlations were found between each single adjacent shape parameter. Significant correlations were also found between TK, LL and upper arc of lumbar lordosis. CONCLUSION: There does exist the influence of thoracic kyphosis on the sagittal alignment and the balance of the lumbosacral spine in T-AIS patients. The mechanism of change may through the adaptation of upper arc of lumbar lordosis. KEYWORDS: Idiopathic scoliosis, thoracic kyphosis, sagittal alignment, lumbosacral spine.

Date : 2008-08-26

Session : SICOT/ Scoliosis Research Society (SRS): Paediatric Deformity

Time : 1400-1730

Room: 606-607

Abstract number : 17887

**ACCURACY AND UTILITY OF SCHOOL SCREENING FOR SCOLIOSIS IN HONG KONG**

Chun Fan LEE<sup>1</sup>, Daniel Yee Tak FONG<sup>1</sup>, Kenneth Man Chee CHEUNG<sup>2</sup>, Kwok Hang MAK<sup>3</sup>, Jack Chun Yiu CHENG<sup>4</sup>, Paul Siu Fai YIP<sup>5</sup>, Bobby Kin Wah NG<sup>5</sup>, Keith Dip Kei LUK<sup>2</sup>

<sup>1</sup>Department of Nursing Studies, The University of Hong Kong, Hong Kong (HONG KONG), <sup>2</sup>Department of Orthopaedics & Traumatology, The University of Hong Kong, Hong Kong (HONG KONG), <sup>3</sup>Department of Health, The Government of the Hong Kong SAR, Hong Kong (HONG KONG), <sup>4</sup>Department of Orthopaedics & Traumatology, The Chinese University of Hong Kong, Hong Kong (HONG KONG), <sup>5</sup>Department of Social Work and Social Administration, The University of Hong Kong, Hong Kong (HONG KONG), <sup>6</sup>Prince of Wales Hospital, Hong Kong (HONG KONG)

School screening for adolescent idiopathic scoliosis (AIS) remains controversial and evaluation was mostly performed on small cohort or without long follow-up. Therefore, we aimed to evaluate the school screening in Hong Kong, started in 1995, based on a large cohort of children who were followed up until the age of 19. Scoliosis screening in Hong Kong was voluntary and composed of FBT, measure of ATR and Moire topography. Children who failed the tests were assessed by radiography. These screening results for the cohort of students who were studying Grade 5, aged 9-14, in 1995 or 1996 were extracted. The cohort included 157444 students and 115161 (56669 boys and 58602 girls) were screened at least once between 1995 and 2005. Of which 2414 failed and were referred for radiography. The sensitivity, i.e. the proportion of AIS by age of 19 detected by screening, was 64.7% (95% CI = 62.9% to 66.4%) for curves  $\geq 10^\circ$ ; and 55.3% (95% CI = 52.8% to 57.8%) for curves  $\geq 20^\circ$ . The positive predictive value, i.e. the proportion of true positives by 19, was 76.4% (95% CI = 74.6% to 78.1%) for curves  $\geq 10^\circ$ ; and 36.3% (95% CI = 34.4% to 38.3%) for curves  $\geq 20^\circ$ . 8% (95% CI = 7% to 9%) of children referred were eventually treated. In this large cohort, scoliosis screening had moderate accuracy with more than half AIS detected by screening. Moreover, most referred children were true AIS cases.

**Date : 2008-08-26**

**Session : SICOT/ Scoliosis Research Society (SRS): Paediatric Deformity**

**Time : 1400-1730**

**Room: 606-607**

**Abstract number : 17999**

**SCREENING SCOLIOSIS IN SHENZHEN SCHOOLS AND GENE EXPRESSION PROFILE OF ADOLESCENT IDIOPATHIC SCOLIOSIS**

Guibing FU, Shengping TANG, Dan LIU, Ke SHUN, Xifeng DU, Chao YOU, Jingming HAN

*The 1st Dept. of Surgery, Shen Zhen Children's Hospital, Shenzhen (CHINA)*

**OBJECT:** The aim of the present studies was to set screening approach for AIS, to screen spinal deformity in primary and middle schools in Shenzhen, and to study gene expression peripheral blood leucocyte in AIS with different severity. **METHODS:** Adams bending test and Scoliometer were used to screen vertebral malformation. Examiners were trained to match the same standard screen methods by forward bending test and scoliometers. The students with suspicious malformation were informed to go to Shenzhen children hospital for further professional assessment at outpatient clinics. Gene chip was used to test their gene expression of peripheral blood leucocyte. **RESULTS** by Adams bending test and Scoliometer were used to perform survey, 40579 students in 29 schools in FuTian District were screened in 2004. Eight hundred and fifty-one students were screened with suspicious spinal malformation. The incidence rate of suspicious spinal deformity in current study was 2.136%. Gene expression by gene chip show that 42 gene in 17 chromosomes were found to be associated with severity of AIS. **CONCLUSION:** Vertebral deformity is a common abnormality in callan. Gene expression in peripheral blood leucocyte show AIS is polygenetic disease. Gene expression assayed by gene chip is a method studying pathogenesis and pathologic change.

Date : 2008-08-26

Session : SICOT/ Scoliosis Research Society (SRS): Paediatric Deformity

Time : 1400-1730

Room: 606-607

Abstract number : 18598

**RISK FACTORS FOR PROGRESSION OF THORACOLUMBAR KYPHOSIS IN CHILDREN WITH ACHONDROPLASIA**

Battugs BORKHUU, Durga KOWTHARAPU, Gilbert CHAN, Aaron LITTLETON, William G MACKENZIE

*Alfred I dupont Hospital for children, Wilmington (UNITED STATES)*

BACKGROUND OF THE STUDY: Thoracolumbar kyphosis (TLK) is a frequent skeletal deformity in patients with achondroplasia. Limited studies have been published on the risk factors for progression of thoracolumbar kyphosis and sagittal alignment in patients with achondroplasia. MATERIALS AND METHODS: Forty-eight children with achondroplasia were retrospectively reviewed to assess the various clinical and radiological risk factors in the progression of thoracolumbar kyphosis. Two groups were created based on the presence or absence of spontaneous resolution (TLK<20 degrees) of the deformity. RESULTS: Thoracolumbar Kyphosis was spontaneously resolved by 3 years of age in 31 children. In the remaining seventeen children, 14 were treated with bracing, two missed for follow-up and one underwent posterior decompression and fusion. Patients who resolved kyphosis started walking at an early age (17.9 vs. 22.7 months) compared to other group (p=0.017). Developmental delay was common in children with persistent kyphosis than spontaneous regression group (56% vs. 23%) (P=0.049). Apical vertebral wedging (78% vs. 60%) and translation (41% vs. 6%) were more in persistent kyphosis group than in spontaneous regression group. Lumbar lordosis below the kyphosis is more in persistent kyphosis group (75 vs. 67) (P=0.036). CONCLUSION: Spontaneous correction of thoracolumbar kyphosis is seen in patients with achondroplasia. Persistent thoracolumbar kyphosis is most common in patients who walk late, have developmental delays, and apical vertebral wedging. The apical vertebral wedging percentage and apical vertebral translation percentage is an important radiological marker for assessing the progression of thoracolumbar kyphosis.

Date : 2008-08-26

Session : SICOT/ Scoliosis Research Society (SRS): Paediatric Deformity

Time : 1400-1730

Room: 606-607

Abstract number : 19272

**AIS - OVERVIEW AND HOW TO AVOID REPEAT SURGERY**

B. Stephens RICHARDS

*Texas Scottish Rite Hospital, Dallas (UNITED STATES)*

3.9% to 12.9% incidence of Repeat surgery in AIS. Two-thirds of these unanticipated repeat operations are due to: Infection (more are delayed than are acute) Symptomatic implants Pseudarthroses One-third of unanticipated repeat operations are due to: Dislodged implants, curve progression, incision-related, rib prominence (thoracoplasty), other HOW TO DECREASE THE INCIDENCE OF UNANTICIPATED REPEAT SURGERY IN AIS Straight forward answers: 1) Proper preoperative planning 2) Consistency of surgical approach: barriers for surgery, antibiotics, drains 3) Lower profile implants 4) Improved distal fixation points using pedicle screws 5) No more single rod constructs posteriorly 6) Awareness of screw placement in anterior thoracic instrumentation 7) Structural support for anterior thoracolumbar instrumentation 8) Fewer thoracoplasties needed with the use of pedicle screws 9) Decrease chance of pseudarthroses a. Thoracolumbar junction b. Excessive implants at a single area c. Avoid use of Ketorolac (Toradol) Not so straight forward answers: 1) Who should do spine surgery? 2) Technical/analytical approaches that come with experience Future problems that likely will become more evident &#65533;. 1) Pedicle screws in wrong places SUMMARY: Lowering the rate of repeat surgery in AIS requires attention to every small detail with regard to planning, technique, the use of newer instrumentation, and experience.

**Date : 2008-08-26**  
**Session : SICOT/ Scoliosis Research Society (SRS): Paediatric Deformity**  
**Time : 1600-1730**  
**Room: 606-607**

**Abstract number : 19164**  
**CONGENITAL SCOLIOSIS' OVERVIEW AND HEMIVERTEBRA EXCISION**

Keith Dip-Kei LUK, Kenneth M.C. CHEUNG  
*University of Hong Kong, HONG KONG (HONG KONG)*

Congenital failure of formation, segmentation of the spinal column or a combination of them may give rise to spinal deformities. The prognosis depends on the growth differential between the two sides of the spine. Treatment of this condition has to be individualized based on the anatomical derangement. With improvements in surgical techniques, implants and perioperative management, hemivertebra excision has been increasing in popularity. For those that are indicated, this procedure has the advantage of immediate deformity correction, spinal motion preservation by short segment fixation, and prevention of progression. The techniques available include a combined anterior and posterior approach, for those with large anterior components, and posterior only, particularly useful for the quadrant vertebra. With the use of pedicle screws, which allow anterior column control from posterior, the posterior only approach is favored. This talk will discuss the indications and techniques for both these approaches.



**Date : 2008-08-26**

**Session : SICOT/ Scoliosis Research Society (SRS): Paediatric Deformity**

**Time : 1600-1730**

**Room: 606-607**

**Abstract number : 19169**

**KYPHOSIS IN CHILDREN, SCHEUREMANN'S AND OTHER KYPHOSIS**

Oheneba BOACHIE-ADJEI

*Hospital for Special Surgery, Briarcliff Manor, NY (UNITED STATES)*

Most common causes of Kyphosis in children include Scheuermann's disease, Congenital malformation and neuromuscular disease. Typical characteristic findings in Scheuermann Kyphosis include irregular endplates, vertebral wedging and Schmorl's nodes. Congenital Kyphosis usually result from defects of formation with resultant posterior hemivertebra and segmentation defects with anterior bar. Neuromuscular Kyphosis in children result from muscular imbalance due to a myopathic condition or neurologic dysfunction with asymmetric paralysis or weakness. Surgical indications in Scheuermann's Kyphosis include kyphosis  $> 75^\circ$  in adolescents and adults, pain, deformity unresponsive to brace and Cosmesis. Most cases can be adequately treated with current posterior segmental instrumentation such as pedicle screws and obviate the need for anterior releases in order to reduce postoperative morbidity. A recent study comparing Kyphosis correction by anterior versus Posterior only pedicle screw approach showed that Posterior only conserved and maintained better kyphosis correction than with combined fusion; with less complications. Surgical treatment is the mainstay for congenital Kyphosis. Posterior only procedures are adequate for formation defects with deformity  $< 50^\circ$ , Age  $< 5$  years. Consider augmentation of fusion if no implant is used. Combined procedures are considered for older child or adult. Complex rigid deformities. Consider kyphectomy/resection and anterior strut graft with posterior stabilization for sharp angular deformities and segmentation defects. Surgical indications for neuromuscular Kyphosis include progressive postural deformity, pain and loss of function. Most patients can be treated with posterior only procedures to reduce morbidity. Primary goal is curve stabilization. In general surgery for Kyphosis has a higher complication than Idiopathic scoliosis surgery and ranges from 0.6 to 15 percent.

**Date : 2008-08-26**  
**Session : SICOT/ Scoliosis Research Society (SRS): Paediatric Deformity**  
**Time : 1600-1730**  
**Room: 606-607**

**Abstract number : 19196**  
**BLOOD LOSS IN SCOLIOSIS SURGERY**

George H. THOMPSON  
*Rainbow Babies' and Children's Hospital, Cleveland (UNITED STATES)*

Decreasing perioperative blood loss during scoliosis surgery is important. It decreases operative time, cost and the possibility of transfusion related diseases. Special operative frames, hypotensive anesthesia and injection of vasoconstrictive agents have been used to decrease intraoperative blood loss. Cell-saver systems and autologous blood donations are utilized to decrease intraoperative and postoperative transfusions. The use of pharmacological agents is a natural extension of this concern. Three pharmacological agents have been used to decrease perioperative blood loss. These include Amicar, Aprotinin and tranexamic acid. The most experience has been with Amicar. It has been highly effective, inexpensive, and has a very low complication rate. We have completed five studies at our institution demonstrating its effectiveness: a preliminary prospective study; a prospective, randomized double blind study; a fibrinogen study; same day anterior and posterior spinal fusion study; and a neuromuscular scoliosis study. In each, Amicar was found to be highly effective. There is a marked rise in fibrinogen levels postoperatively. Aprotinin is probably more effective than Amicar but it is much more expensive and has a significant increase of complications in adults. Because of the latter it was recently removed from the market. Complications in children have been quite low. Tranexamic acid, which is also an antifibrinolytic agent, but more powerful, than Amicar, has recently been shown to be effective, particularly in Duchenne's muscular dystrophy. It too, is expensive but has a low complication rate. The use of pharmacologic agents can be a significant adjunct in decreasing perioperative blood loss and the need for transfusion in scoliosis surgery. I recommended that either Amicar or tranexamic acid be utilized. These agents result in a decreased need for autologous blood donation and perioperative transfusion. Our current transfusion rate in idiopathic scoliosis is 0.3 units of autologous blood per patient.

**Date : 2008-08-26**

**Session : SICOT/ Scoliosis Research Society (SRS): Paediatric Deformity**

**Time : 1600-1730**

**Room: 606-607**

**Abstract number : 19203**

**POTTS DISEASE/SPINAL TUBERCULOSIS IN CHILDREN**

André KAELIN

*Children's Hospital, University of Geneva, Switzerland, Geneva (SWITZERLAND)*

Tuberculosis is still a common disease in undeveloped countries. Spinal involvement is more often found in children than in adult. The treatment is based on the following principle. 1) Bacteriological diagnosis 2) Assessment of the effectiveness of multiple antibiotic therapy ( quadritherapy if available) 3) Assessment of bone destruction, deformity and extend of soft tissues abscess 4) Assessment of residual growth Early conservative treatment can control the disease locally and avoid extensive destructuon. Most of the patients needing orthopaedic and surgical care demonstrate involvement of multiple vertebral bodies and disks, acute cyphosis and neurologic deficit Remaining growth is a factor of further deformities and risk of neurologic deficit. We present our series of long term result of surgical treatment for patient operated before then of growth.

Date : 2008-08-26  
Session : Trauma: hip fracture 1  
Time : 1400-1530  
Room: Theater 1

Abstract number : 15315

**A FORTY-YEAR REVIEW OF TRENDS AND GEOGRAPHICAL VARIATIONS OF MORTALITY FOLLOWING HIP FRACTURE**

Shahnawaz HALEEM<sup>1</sup>, Reza MAYAHI<sup>2</sup>, Lennel LUTCHMAN<sup>3</sup>, Martyn PARKER<sup>2</sup>

<sup>1</sup>Royal Sussex County Hospital, Brighton (UNITED KINGDOM), <sup>2</sup>Peterborough District Hospital, Peterborough (UNITED KINGDOM),

<sup>3</sup>Norfolk and Norwich University Hospital, Norwich (UNITED KINGDOM)

A review of all articles published on the outcome after hip fracture over the last 40 years was undertaken to determine any changes that had occurred in the demographics of patients and mortality over this time period. In addition data was used from a database of 3094 consecutive patients treated at one centre over the period 1989 to 2000. The mean age of patients sustaining hip fractures was found to be steadily increasing over the study period at a rate of one year of age for every five-year time period has increased from a mean of 72 years in the 1960's to the current mean of 79 years. No notable differences were seen in the proportion of intracapsular fractures or male patients. The mortality at six and twelve months after injury remained essentially unchanged over the four decades reviewed. The mean age of patients in the USA was 76 compared to 79 in the UK. This difference may account for the lower one-year mortality reported in series from the USA (24%) compared with that in the United Kingdom literature (29%). Mortality after a hip fracture remains significant, being 11-23% at six months and 22-29% at one year from injury. Geographical variations exist in the mortality after hip fracture. More detailed international comparisons are required to determine if these differences in outcome are accounted for by the variations in the demographics of patients or due to diversities in treatment methods.

**Date : 2008-08-26**  
**Session : Trauma: hip fracture 1**  
**Time : 1400-1530**  
**Room: Theater 1**

**Abstract number : 15869**

**224 UNSTABLE PERTROCHANTERIC FRACTURES TREATED WITH THE TROCHANTERIC GT NAIL (SURGIVAL) AND A SINGLE 9MM DIAMETER ROTATIONALLY UNLOCKED HIP SCREW**

Armando PEINADO, Conrad BERTRÁN  
*Hospital Sant Joan de Deu, Martorell, Barcelona (SPAIN)*

One hundred seventy-seven 31 A-2 fractures treated without distal locking screw. Forty-seven 31 A-3 fractures treated with a single distal dynamically locked screw. Screw-tip migration (Doppelt's method). Tip-apex-distance (Baumgaertner). Hip-screw sliding and proximal screw sliding (A-3 fractures) was studied up to six months of follow-up. 162 A-2 and 40 A-3 fractures could be followed up to six months. In 89.7% of the fractures the hip screw was located in the lower half of the head-neck and centered in the lateral view. In 92% of the cases the TAD was <25mm. In the 31A-2 fractures, two preoperatively unknown comminuted neck fractures ended with a bipolar hip arthroplasty. In two old patients (97 and 92 years) the screw cut-in and then screw-back. All but one of the 31 A-3 fractures healed uneventfully. One case with a missed distal drilling sustained two weeks later a shaft fracture and had a long nail exchange. No screw cut-out. No bone remodelling and pain at nail-tip level. In 24% of the 31 A-3 fractures the distal screw slid proximally more than 10mm. A single 9-mm rotationally unlocked hip screw well placed into the head-neck, works very well through the healing process of these unstable fractures. Most of the 31 A-3 fractures need a proximal sliding of the distal fragment to get a closed bone contact and in 24% of our cases the sliding exceeded 10mm.

**Date : 2008-08-26**  
**Session : Trauma: hip fracture 1**  
**Time : 1400-1530**  
**Room: Theater 1**

**Abstract number : 16474**

**TREATMENT OF TROCHANTERIC NONUNIONS FOLLOWING DHS FIXATION - A PROSPECTIVE STUDY USING AN IMPROVED SELECTION SCORE**

Amit BANDYOPADHYAY

*Sanjeevani Medical Institute, Calcutta (INDIA)*

Nonunion of trochanteric fractures is uncommon, more so since the advent of fixation with DHS, which accommodates for collapse at the fracture site. Between 1995 and 2005, 21 patients of trochanteric nonunion developed after fixation with DHS were treated at the author's institute; they were prospectively placed in either of two groups - re-fixation following an abduction inter-trochanteric osteotomy and bone grafting, or hemi-arthroplasty - based on an improvised score that took into account age, level of osteoporosis as shown by Singh index, comorbidities, condition of the femoral head and acetabulum. 10 patients were treated with hemi-arthroplasty (4 had cemented Thompson's prosthesis and 6 had a modular bipolar prosthesis) and 11 were treated with osteotomy, bone grafting and refixation with a screw-barrel plate combination. 3 patients of the 21 studied died within six months of operation (2 from the re-fixation group and one from the hemiarthroplasty group). The remaining 18 were followed-up for one to ten years (mean 4.9 years). All the fractures that were fixed united. There was no deep infection in either of the two groups. There was no case of dislocation or loosening of prosthesis. Postoperatively, Harris hip score improved in all the patients, more in the re-fixation group, though the difference was not statistically significant. It was concluded that consistently good results could be achieved in trochanteric fracture nonunions that develop following failure of treatment with DHS by prospectively selecting the patients for either re-fixation or hemiarthroplasty using an improvised selection score.

**Date : 2008-08-26**  
**Session : Trauma: hip fracture 1**  
**Time : 1400-1530**  
**Room: Theater 1**

**Abstract number : 17060**

**LARGE DIAMETER METAL ON METAL HIP REPLACEMENT IN THE TREATMENT OF LATE PRESENTING SUB-CAPITAL FRACTURE NECK OF FEMUR**

Karthik SELVARAJAN, West SIMON, Michael TWIGG  
*Northampton General Hospital NHS Trust, Northampton (UNITED KINGDOM)*

**AIMS:** To evaluate the functional outcome of Large diameter metal on metal total hip arthroplasty in the treatment of displaced sub-capital neck of femur fracture with a delayed presentation in young adults. **MATERIALS AND METHODS:** Six patients with displaced sub-capital neck of femur fracture with a late presentation underwent large diameter metal on metal THA (Corin Cormet on Endoplus SL Stem) by one consultant Orthopaedic surgeon. Mean age was 63 yrs (50 to 67). Presentation was delayed from 7 to 16 days. All patients were reviewed prospectively and followed in outpatients at 6 weeks and one year. Scoring was undertaken using Oxford Hip Score and Harris Hip score at 6 weeks and 1 year. **RESULTS:** Both Harris Hip Score and Oxford hip score showed good to excellent results in the immediate review period for all patients. Scores at one year showed excellent results for all patients. There were no failures at 1 year. **DISCUSSION:** Treatment of displaced sub-capital fracture neck of femur in young adults remains controversial. Reduction and fixation is favoured but is associated with avascular necrosis. Subsequent revision to total hip arthroplasty is necessary. **CONCLUSION:** In this cohort of young patients given the delayed presentation, their pre-injury levels of activity and the possible need for revision surgery we consider large diameter metal on metal hip arthroplasty the best treatment with good to excellent functional outcome and advocate its use over reduction and fixation.

Date : 2008-08-26  
Session : Trauma: hip fracture 1  
Time : 1400-1530  
Room: Theater 1

Abstract number : 17065

**EFFECTIVENESS OF THE OSTEOSYNTHESIS IN CERVICAL NECK FRACTURES WITH OR WITHOUT USING THE TROCHANTERIC PLATE**

Ichiro NAKAYAMA

*Matsue red cross hospital, Shimane (JAPAN)*

**PURPOSES:** We have been treating cervical neck fractures using the CCHS (Canulated Cancellous Hip Screw). The Trochanteric Plate (TP) was developed to use instead of using washers. This plate was designed to effectively disperse the torque around the screw heads. **PATIENTS AND METHODS:** We treated 74 cases of cervical neck fractures classified using Garden classification, from January 1st, 2002 to December 31st, 2006. 55 cases used the TP and in 19 cases the TP did not. We compared the bone union ratio, non-union, subtrochanteric fracture and LSC (Late Segmental Collapse) between the cases using and not using the TP. **RESULTS AND DISCUSSIONS:** Garden 1 and 2 had bone union ratios of 94% and 91%, while Garden 3 and 4 had ratios of 75% and 85%. In cases using the TP and not using the TP, the bone union ratios were almost identical because the TP does not impact the effectiveness of the bone union ratios. There was one case of subtrochanteric fracture within 1 week after the surgery in a case not using the TP. This could be a technical error resulting from over tightening the CCHS. This sometimes causes small fractures around the CCHS and consequently may cause a subtrochanteric fracture. These results demonstrate that the TP is effective in preventing a subtrochanteric fracture in post operations.



**Date : 2008-08-26**  
**Session : Trauma: hip fracture 1**  
**Time : 1400-1530**  
**Room: Theater 1**

**Abstract number : 17156**

**COMPARATIVE STUDY BETWEEN DYNAMIC CONDYLAR SCREW AND DYNAMIC HIP SCREW IN THE MANAGEMENT OF SUBTROCHANTERIC FRACTURES**

Devdatta NEOGI<sup>1</sup>, Chandra Shekhar YADAV<sup>1</sup>, Vivek TRIKHA<sup>1</sup>, Saurabh SINGH<sup>2</sup>

<sup>1</sup>All India Institute of Medical Sciences, New Delhi (INDIA), <sup>2</sup>BHU - Institute of Medical Sciences, Varanasi (INDIA)

**INTRODUCTION:** Subtrochanteric fractures possess clinical, structural, anatomical and biomechanical characteristics that distinguish them from the other proximal femoral fractures. A variety of extramedullary and intramedullary implants have evolved over the years for the management of these fractures. **MATERIAL AND METHODS:** This is a prospective randomised study of 55 patients between 22 to 68 years who sustained subtrochanteric fracture and were treated surgically with fixation by dynamic hip screw (DHS) in 28 patients and by dynamic condylar screw (DCS) in 27 patients at AIIMS hospital between January 2003 and December 2006 and were followed-up for an average of 32 months. Early fracture reduction and fixation were carried out by standard method. **RESULTS:** The mean duration of union was 4.5 months in 49 patients. Non-union was evident in 3 patients, 2 patients developed delayed union, which was successfully united after re-operation by autogenous bone graft. 1 patient had wound infection. Implant failure occurred in the 2 non-union patients. Sander's grading was used to evaluate the results, overall results being good to excellent in 78% cases. **CONCLUSIONS:** We concluded that DHS and DCS are reliable fixation devices in the armamentarium for subtrochanteric fracture management. Though the incidence of complications was higher in DCS group, the superiority of DHS among the two methods could not be established.

Date : 2008-08-26  
Session : Trauma: hip fracture 1  
Time : 1400-1530  
Room: Theater 1

Abstract number : 18184

**SUBTOTAL HIP REPLACEMENT IN FEMORAL NECK FRACTURES IN THE ELDERLY - EARLY RESULTS**

Radomir RADIVOJEVIC, Branimir KRALJEVIC, Veljko JOVANOVIC, Predrag STOSIC, Daniel MILOSAVLJEVIC, Boris GLUSCEVIC  
*Institute for Orthopaedic Surgery "Banjica", Belgrade (SERBIA)*

INTRODUCTION: Femoral neck fracture is among the most frequent injuries in the elderly. Old people suffer of numerous diseases (internal, neurological etc.). Trauma can provoke complications of diseases and endangers life of the patient. MATERIALS AND METHODS: We analyse data of 1037 patients older than 65 years hospitalized in our department between 1992 and 2007 for femoral neck fracture. RESULTS: Average age of patients was 78.14 years. Subtotal hip replacement was performed in 740 (average age 77.46 years), and 297 were not operated (average age 79.82 years), mostly because of anaesthesiological contraindications. Intra-hospital mortality was 5.67% in operated, and 20.86% in nonoperated group. Nonsurgical complications (excluding fatal outcome) appeared in 14.53% in operated and in 14.11% in nonoperated group. Complications were (operated vs. nonoperated group): cardiovascular (9.09%/30.43%), pulmonary embolism (9.09%/13.04%), gastrointestinal (5.45%/8.70%), DVT (3.63%/8.70) and decubital ulcers (4.54%/17.35%). CONCLUSION: Subtotal hip replacement is treatment of choice for femoral neck fracture in group over 65 years. This operation diminishes frequency of post-traumatic complications and intra-hospital mortality, and improves quality of life in patients.

**Date : 2008-08-26**  
**Session : Trauma: hip fracture 1**  
**Time : 1400-1530**  
**Room: Theater 1**

**Abstract number : 18295**

**IRREDUCIBLE SUBTROCHANTERIC FRACTURES TREATED BY OPEN REDUCTION AND INTERNAL FIXATION WITH CABLES AND PROXIMAL FEMORAL NAILING**

Praveen MEREDDY, Raheel SHARIFF, Birender KAPOOR, Muthukrishnan RAMAKRISHNAN  
*Wirral University teaching Hospital, Merseyside (UNITED KINGDOM)*

AIM: To assess the fracture union and complications following open reduction and internal fixation (ORIF) of irreducible subtrochanteric fractures with cables and the long Proximal Femoral Nail (PFN). METHODS: Thirty-nine patients who underwent ORIF between 2001 and 2006 were reviewed to determine the mechanism of injury, associated injuries. Fracture pattern, quality of reduction, technical difficulties and fracture union were analysed. ASA grading and other postoperative complications were recorded. RESULTS: Thirty-nine patients (17 men and 22 women) with a mean age of 73 (range 21 to 93) were included. Associated injuries were noted in 12 (31%) patients. There were 17 subtrochanteric, 17 intertrochanteric with subtrochanteric extension, and five reverse oblique fractures. Open reduction was performed only when closed reduction failed or when there was medial comminution. Technical difficulties were encountered in eight patients. Sixteen patients died within one year because of complications not related to the fracture. Four patients were transferred to other hospitals for rehabilitation. Seventeen fractures united between 3 and 12 months. All survived patients recovered expected degree of mobility. Two patients required revision (One nonunion and one proximal screw migration). There was no infection. CONCLUSION: Treatment of subtrochanteric fractures is technically demanding. Factors including comorbidities, pre-injury mobility, fracture configuration and bone quality need consideration. The importance of obtaining a satisfactory reduction in these fractures to facilitate early mobilisation and fracture union could not be overemphasised. Treatment of irreducible subtrochanteric fractures with the long PFN and Dall Miles cables produced satisfactory fracture union.

**Date : 2008-08-26**  
**Session : Trauma: hip fracture 1**  
**Time : 1400-1530**  
**Room: Theater 1**

**Abstract number : 18592**

**HANSSON TWIN HOOK VERSUS COMPRESSION HIP SCREW IN TREATMENT OF TROCHANTERIC FRACTURE**

Ovidiu ALEXA, Tudor COZMA, Constantin IANCU  
*University of Medicine and Pharmacy Iasi, Iasi (ROMANIA)*

Hansson Twin Hook is a new implant with a design based on Hansson Hook used for femoral neck fractures. The plate with barrel is similar to those of classic compression devices, but the fixation into the femoral head is achieved by two hooks, anterior and posterior. METHODS: Forty-five consecutive patients with A1 and A2 trochanteric fractures were included in the study. Compression screw (DHS) was used for internal fixation in 23 patients (Group A) and Hansson Twin Hook was the implant of choice for 22 patients (Group B). RESULTS: The 2 groups were similar in terms of their preoperative data. The median follow-up was 8.8 months (range 7-14 month). Average incision dimensions were 8.7cm in group A and 6.3cm in group B. The operating and the fluoroscopy times were significantly shorter for group B ( $p < 0.05$ ,  $t = 1.73$ , respectively  $p < 0.05$ ,  $t = 1.84$ ). The results show no difference in the number of patients transfused and the mean of units of blood transfused. We noted one important complication in group A that consisted in a cut-out with articular penetration. The postoperative walking ability was significant better for group B ( $p < 0.05$ ,  $t = 1.87$ ). CONCLUSION: We believe that fixation with Hansson Twin Hook is an effective method for the treatment of trochanteric fractures. It allows a less invasive approach and the rehabilitation is faster than in the case of a classic compression hip screw.

**Date : 2008-08-26**  
**Session : Trauma: hip fracture 1**  
**Time : 1400-1530**  
**Room: Theater 1**

**Abstract number : 18711**

**FIBULAR GRAFTING IN FRACTURE NECK OF FEMUR - A CLINICAL STUDY**

Aftab IRAQI

*JN Medical College, Aligarh (INDIA)*

Despite the advances made in treatment of fractures, fracture neck of femur still remains a challenge for most of us. The problem is compounded if the patient is having neglected/non-union. We did a study in 36 patients, with above-mentioned problems, where fibula was used. Out of these, 11 had failed primary fixation and rest were neglected nonunions. Fibula was used in all those patients where 6 weeks had passed since injury. The patients was operated on fracture table under radiological control either supine or prone position. Prone position was used for open reduction by posterior approach. Average time required for union was about 5 months. All patients were followed up for a minimum of 2-year period. Results were evaluated by Harris hip scoring system. Excellent to good result in 30 patients no patient develop avascular necrosis. From the results we could conclude that Fibula helps us to give our patients a biological hip, which is not only economical but also suits the traditional life-style.

**Date : 2008-08-26**  
**Session : Trauma: hip fracture 1**  
**Time : 1400-1530**  
**Room: Theater 1**

**Abstract number : 18712**

**MANAGEMENT OF NEGLECTED ACETABULAR FRACTURES IN THE INDIAN SCENARIO**

Wajahat ASHRAF

*Ujala Medical Center, Lucknow (INDIA)*

**INTRODUCTION:** This study presents a prospective analysis of a series of displaced acetabular fractures presenting more than 10 days after sustaining the trauma. **METHODS:** 35 displaced acetabular fractures reporting >10 days after initial trauma were included in this series. These cases were initially either treated with traction or neglected. All cases were subjected to open reduction and internal fixation. Tri-radiate/Maryland's surgical approach was employed in all cases. Trochanteric osteotomy was done if required. **RESULTS:** Reduction leaving displacement of less than or equal to 4mm was achieved in 10 hips (29%). Good or excellent functional results were obtained in 12 patients (34%). Early complication of wound infection occurred in two cases both of which were earlier kept on skeletal traction in the femoral neck. Total hip arthroplasty was performed in 6 patients (17%) who had late symptomatic degenerative changes. **CONCLUSION:** Displaced acetabular fractures are complex problems. They are uncommon, and often associated with musculoskeletal, neurologic, and multi-organ injuries. It is difficult to achieve an anatomical reduction if surgery is performed after 10 days of initial trauma. And even if near anatomical reduction is achieved an excellent/good functional outcome is unlikely. Failure to obtain accurate reduction was the most important factor leading to a poor result, but heterotopic calcification and avascular necrosis also contributes to poor results even in cases in which an anatomical reduction is achieved. However the results of surgical fixation are better than those which are managed conservatively.

**Date : 2008-08-26**  
**Session : Trauma: hip fracture 1**  
**Time : 1400-1530**  
**Room: Theater 1**

**Abstract number : 18753**

**A DOUBLE-BLIND, PROSPECTIVE RANDOMIZED CONTROLLED CLINICAL TRIAL OF MINIMALLY INVASIVE DYNAMIC HIP SCREW FOR FIXATION OF INTERTROCHANTERIC FRACTURES**

Tak-Chuen WONG, Yi CHIU, Priscilla LEUNG OI YEE, Wai-Leuk TSANG, Wai-Yeung LEUNG, Sai-Hung YEUNG  
*Dept. of Orthopaedics and Traumatology, Pamela Youde Nethersole Eastern Hospital, Chai Wan (HONG KONG)*

**INTRODUCTION:** We performed a double-blind, prospective randomized controlled clinical trial to provide evidence on theoretical advantages of minimally invasive dynamic hip screw (MIDHS) for fixation of intertrochanteric fractures. **METHODS:** With approval from institutional review board, sixty-six patients (66 hips) admitted for intertrochanteric fractures (Kyle's I-III) between August 2006 and April 2007 were randomly allocated by sealed envelopes to undergo surgery through a short incision (MIDHS) of  $\leq 3$ cm (n=35) or a standard incision (CDHS) of ~10-15cm (n=31). Informed written consent was obtained from all patients. The anesthetic, analgesic, and postoperative physiotherapy protocols were standardized, with the staff also blinded to the technique used. Outcome measurements included perioperative data, functional and radiological results, and complications. **RESULTS:** The two groups were matched for demographic data, confounding medical conditions, pre-morbid ambulatory status, fracture pattern, time between injury and surgery, grade according to ASA, BMI and FU period. Patients in MIDHS group had significantly smaller wound size, less intraoperative blood loss, less haemoglobin drop, less blood transfusion requirement; lower VAS, less total analgesic consumption, faster achievement of rehabilitation milestones. The operative time, adequacy of fracture reduction, screw position, TAD, fracture union rate and union time, and complications were similar in both groups. **CONCLUSION:** Compared with a standard incision, patients who underwent a minimally invasive DHS demonstrated decreased blood loss and less pain with faster achievement of rehabilitation milestones without sacrifice of operative time, screw alignment, fixation stability and bone union.

Date : 2008-08-26  
Session : Trauma: hip fracture 2  
Time : 1600-1730  
Room: Theater 1

Abstract number : 16418

**RESULTS OF INTERLOCKING NAILING AND ALLOGRAFTS IN MANAGEMENT OF NON-UNITED FRACTURES SHAFT OF FEMUR AND TIBIA**

Osama FARAG

*Saudi German Hospital, AlMadinah AlMonourah (SAUDI ARABIA)*

OBJECTIVES: To evaluate the use of interlocking nail and allograft in redo fixation of nonunited fractures of femur and tibia in cases of implant failure after plating or previous nailing, neglected cases with conservative treatment and after external fixator and to assess the union rate and the return to functional activity. MATERIAL AND METHODS: 75 patients underwent this study, 30 cases with nonunited fracture femur out of which 2 cases after external fixator, 22 cases after implant failure with plating and 6 cases after implant failure with nailing. 35 cases with nonunited tibial fracture out of which 4 cases after external fixator, 8 cases after neglected conservative treatment 21 cases after implant failure with plating and 2 cases implant failure after nailing. The age of patients ranged from 19 to 62 years the sex male to female 54:21. The study was carried out at Saudi German Hospitals between July 2003 and December 2006 with follow-up ranged from 6 months to two years. RESULTS: The patients were assessed according to union rate, return to functional activity and range of motion. The functional result was assessed according to the criteria of Schatzker and Lambert (1979). CONCLUSION: The use of interlocking nail with allograft in fixation of nonunited femoral and tibial fractures is an excellent choice with early return to weight bearing and functional activities.



**Date : 2008-08-26**  
**Session : Trauma: hip fracture 2**  
**Time : 1600-1730**  
**Room: Theater 1**

**Abstract number : 16535**

**VALGUS INTERTROCHANTERIC OSTEOTOMY WITH DYNAMIC HIP SCREW FOR THE TREATMENT OF VARUS NONUNION OF INTERTROCHANTERIC FRACTURE: THE TECHNIQUE, A CASE SERIES AND LITERATURE REVIEW**

Vidyadhara S  
*MGMC & RI, Pondicherry (INDIA)*

Nonunion of intertrochanteric fracture is rare and hence there is not much literature describing the best way to treat them. In general, principles of treatment of nonunion are open reduction of the fracture, freshening of fracture fragments, opening of medullary canals, stabilization and bone grafting. However, this is not always needed. Nonunion of intertrochanteric fracture usually goes in to varus and thus deranging the biomechanics of the hip. Hence it becomes very important to re-orient the abductor lever arm to achieve biomechanically sound configuration allowing the fracture healing. We herewith describe for the first time in literature a prospective study of valgus intertrochanteric osteotomy in addition to dynamic hip screw osteosynthesis in the successful management of seven patients with varus trochanteric nonunion. All fractures and osteotomies had healed uneventfully at the last follow-up without the need for additional bone grafting.

Date : 2008-08-26  
Session : Trauma: hip fracture 2  
Time : 1600-1730  
Room: Theater 1

Abstract number : 16962

**THE VALUE OF TIP APEX DISTANCE IN PREDICTING FAILURE OF FIXATION OF EXTRAARTICULAR AND EXTRACAPSULAR FRACTURES OF HIP. 5 YEARS OF EXPERIENCE. HOSPITAL ESPAÑOL DE MÉXICO**

Luis Manuel OCHOA GÓMEZ, Félix GIL-ORBEZO

*Hospital Español de México, Mexico (MEXICO)*

Failure of fixation of extraarticular and extracapsular fractures of the hip that have been treated with a fixed-angle sliding hip-screw device is frequently related to the position of the lag screw in the femoral head. In 1995 TAD developed as a simple measurement to describe the position of the screw, and it is recommended by the authors that must be less than 25mm. To determine the value of this measurement in the prediction of so-called cutout of the lag screw, 259 patients were included, the middle age were 81.5 years in women and 76 years in men. The minimum duration of follow-up was six months, period during which all of the fractures either healed or had failure of the fixation. The results were analysed by the SPSS 15.0 statistical program version, and were expressed as percents and averages. We concluded that Tip Apex Distance developed in 1995 by Baumgaertner et al. does not have the predictive value it was supposed to, because our results show that despite the TAD average of 26.56mm in stable and 28.66mm in unstable fractures the cutout percent is of 0.77 and only happened in unstable patterns. We also concluded that it must be considered the reduction quality, and that must be taken the time to make it almost perfect. It is important the follow-up of the patients in the success of the management in this kind of fractures.

**Date : 2008-08-26**  
**Session : Trauma: hip fracture 2**  
**Time : 1600-1730**  
**Room: Theater 1**

**Abstract number : 17133**

**RESULTS OF TREATMENT OF TROCHANTER FRACTURE OF FEMUR BONE BY THE NEW DEVICE AND THEIR EFFICIENCY**

Sabyrbek DJUMABEKOV, Bektur ANARKULOVA

*Scientific Research Center of Traumatology and Orthopaedics, Bishkek (KYRGYZSTAN)*

The scientific research is based on the results of the treatment of 137 patients with trochanter fracture of femur bone at the Bishkek Scientific Research Centre of Traumatology and Orthopedics. Since 2003 the device has been especially developed by us for fixing trochanter fracture of femur. Also by us is developed and introduced the new way of osteosynthesis trochanter fracture of femur bone, on the basis of development of the new device. The new device for osteosynthesis trochanter fracture of femur bone in 94 injured (basic group) is applied, and 43 patients were applied analog implants. We carry out (spent) the comparative analysis of the nearest and remote results of operative treatment trochanter fracture of femur bone with application of an original new design and analog implant for a period from 6 months to 3 years. As marked above, at the patients in the control group, where analog implants were applied, good results are seen in 17 patients - 39.5%, and in the basic group, at 68 patients - 72.3%. The unsatisfactory results in control group are marked at 4 patients, that has made 9.5% from general number treat of the patients, at the same time in the basic group the unsatisfactory result is received only from one patient, that has made 1.2% from their general number. Thus, the above-stated data convincingly prove advantages of the new device and way of operative treatment trochanter fracture of femur bone.

**Date : 2008-08-26**  
**Session : Trauma: hip fracture 2**  
**Time : 1600-1730**  
**Room: Theater 1**

**Abstract number : 17423**

**INTRAMEDULLARY HIP SCREW FIXATION IN PROXIMAL FEMORAL FRACTURES**

Ruth DELANEY, Colm TAYLOR, Farshid MALEKI, Mark DOLAN

*Department of Trauma & Orthopaedics, Cork University Hospital, Cork (IRELAND)*

The intramedullary hip screw (IMHS) has been used as an implant for fixation of selected proximal femoral fractures in our unit since late 2004. Potential advantages over a standard sliding hip screw include a less invasive insertion and shorter lever arm. We retrospectively reviewed our initial 100 procedures. Patients were identified using operating theatre logbooks, and medical records were examined for demographic details and follow-up (mean 7.5 months). Radiographs were examined to determine the fracture pattern and adequacy of subsequent fixation. Average patient age was 72 years at operation, with a male:female ratio of 1:2.3. Most (59%) falls occurred within the home. Indications for IMHS fixation included subtrochanteric fractures in 48 patients and intertrochanteric fractures in 39 patients. Eleven patients had pathological fractures. Average operative time was 55.9 minutes. There were four nonunions and four distal femoral fractures, of which two were secondary to iatrogenic causes. At final review, 42 patients regained their preoperative mobility. The IMHS has important biomechanical and anatomical advantages, particularly for fixation of subtrochanteric and unstable intertrochanteric fractures. The introduction of a subtrochanteric screw in 2006 is a technical improvement.

**Date : 2008-08-26**  
**Session : Trauma: hip fracture 2**  
**Time : 1600-1730**  
**Room: Theater 1**

**Abstract number : 17537**

**A PROSPECTIVE RANDOMISED TRIAL COMPARING THE HOLLAND NAIL VERSUS DYNAMIC HIP SCREW IN THE TREATMENT OF INTERTROCHANTERIC HIP FRACTURES**

Nick LITTLE, V VERMA, C FERNANDO, D ELLIOTT, A KHALEEL

*Rowley Bristow Unit, Surrey (UNITED KINGDOM)*

**OBJECTIVES:** To compare the efficiency of the locked, long intramedullary nail with two small-diameter lag screws against the dynamic hip screw (DHS) in the operative stabilisation of inter-trochanteric femoral neck fractures. **STUDY DESIGN:** Ethically approved randomised prospective study. **METHOD:** All patients presenting to our unit with an extra-capsular hip fractures were randomised on admission by computer number generation to operative stabilization with either a DHS or long intramedullary Holland nail (HN). There were 98 patients treated with a DHS and 92 patients treated with the HN. **RESULTS:** There was no significant difference in the pre-operative variables. Surgical and radiation time were significantly lower in the DHS group. However, there was significantly lower intra-operative blood loss (160 vs 78mls) and post-operative transfusion (23 vs 7 patients) in the HN group. The time to mobility with frame in the HN group was significantly quicker (3.6 vs 4.3 days). There were two cases of screw cut out in the DHS group, of which one underwent revision to a HN. There were no revisions in the HN group. All fractures in both groups had united at one year follow-up. **CONCLUSION:** In this study the DHS affords a faster overall operative procedure time and less radiation exposure compared with the HN. However there is increased blood loss and post-operative blood transfusion in the DHS cohort. Moreover, the HN group afforded a faster time to frame and an improved mobility score at one year. The HN is therefore preferred in our institution.

**Date : 2008-08-26**  
**Session : Trauma: hip fracture 2**  
**Time : 1600-1730**  
**Room: Theater 1**

**Abstract number : 17596**

**THE TREATMENT OF COMPLEX FEMUR FRACTURES WITH INTRAMEDULLARY DEVICES - ANALYSIS OF 50 CASES**

Jaroslav BRUDNICKI, Tadeusz NIEDZWIEDZKI

*Orthopaedics and Trauma Clinic Collegium Medicum UJ, Cracow (POLAND)*

Fractures of proximal femur are one of the most frequent problem in every trauma department. Some of them: highly unstable pertrochanteric fractures, per- and subtrochanteric fractures and ipsilateral fractures of the shaft and proximal end of femur require particularly careful assessment and proper treatment due to their complexity and exceptional biomechanics. The analysis of treatment and outcomes of 50 cases of complex proximal femur fractures treated in the Orthopaedics and Trauma Clinic of Collegium Medicum of Jagiellonian University between 1997 and 2006 are presented. There were 16 female and 34 male in presented group of patients. All were treated with intramedullary devices (UFN with spiral blade or PFN). In the assessment the following factors were considered: age, type of fracture, accompanying injuries and coexisting diseases, time of hospitalization, time since injury to full weight bearing. Standard follow-up was conduct with the X-ray examination every 6 weeks. No infections and DVT complications were observed in presented group of patients. The implant failure was observed in 6 cases (2 spiral blade and 4 PFN). Bone union was obtained in 44 cases. One patient never participated in the follow-up. 5 required surgery because of implant loosening. 3 of them are still followed up. Intramedullary fixation of complex proximal femur fractures is an effective method of treatment. It decreases the extension of surgical procedure and respects the biomechanical consideration in this part of femur. Due to our experience with intramedullary fixation of complex proximal femur fractures we consider it as a method of choice.

**Date : 2008-08-26**  
**Session : Trauma: hip fracture 2**  
**Time : 1600-1730**  
**Room: Theater 1**

**Abstract number : 17707**

**IMPROVING OUTCOMES IN TROCHANTERIC FRACTURES: MINIMALLY INVASIVE TECHNIQUE**

Alejandro FLORES-CARRILLO, Felix GIL-ORBEZO, Cesareo TRUEBA-DAVALILLO  
*Hospital Español de Mexico, Mexico City (MEXICO)*

Hip fractures are among the most common fractures elderly related and the complications for a long stay in hospital increase the cost of medical health care programmes. Our objective was to minimize those complications by reducing surgical time as well as blood loss in and after surgery. We perform a retrospective study with 40 patients with pertrochanteric fractures during January 2005 and December 2006 including AO/ASIF 31- A1 fractures in patients with a mean age of 76 years who were randomized into two groups: those treated with standard DHS (control group) and those treated with percutaneous compression plating (PCCP). Every group had 20 patients with a proper cardiovascular evaluation and preoperative hemoglobin; the operating time was measured from the incision to skin closure. Each patient had postoperative hemoglobin and a full weight bearing on the first postoperative day as well as a standard protocol for postop hip fracture management. Comparison was determined for surgical wound pain, blood loss (mean hemoglobin drop), range of movement (Merle D'Aubigne scale) and surgical operating time. There was a slight difference in surgical time in PCCP group (mean 28.5min) and DHS (mean 37min) but a significant mean hemoglobin drop of 1.2gr/dL more in standard DHS technique. Being less invasive PCCP plating patients have lesser pain with two 2cm surgical wound than a conventional 10cm DHS. PCCP is a good implant option that provides excellent outcome in pertrochanteric fractures and minimizes potential complications for a long stay hospital related.

Date : 2008-08-26  
Session : Trauma: hip fracture 2  
Time : 1600-1730  
Room: Theater 1

Abstract number : 18108

**THE RISK FACTORS ON MORTALITY IN ELDERLY PATIENTS WITH HIP FRACTURES: THE SHORT-TERM RESULTS OF PROSPECTIVELY DESIGNED STUDY**

Alpaslan ÖZTÜRK<sup>1</sup>, Yüksel ÖZKAN<sup>1</sup>, Recai ÖZDEMİR<sup>1</sup>, Nazan YALÇIN<sup>1</sup>, Serkan AYKUT<sup>1</sup>, Semra AKGÖZ<sup>2</sup>

<sup>1</sup>Bursa High Specialty Research and Training Hospital Clinic of Orthopaedics and Traumatology, Bursa (TURKEY), <sup>2</sup>Çanakkale University Medical School Department of Biostatistics, Çanakkale (TURKEY)

INTRODUCTION: There are multiple factors leading to mortality in the elderly. We aimed to investigate the factors affecting mortality in elderly hip fracture patients. PATIENTS AND METHODS: Between 2005 and 2006, 74 patients (52 women-22 men) with hip fracture who were  $\geq 65$  years of age, ambulatory before fracture and whose fracture was nonpathologic were included. Age, gender, comorbidities, ASA, total lymphocyte count (tlc), albumin (alb), haemoglobin (hg) and haematocrit (hct) levels at admission, hospital length of stay, mobilisation time after surgery and time period between injury and surgery were recorded. The patients were followed 12 months postoperatively or until death. RESULTS: The mean age was  $77.9 \pm 8.3$  (65-105) and the mean hospitalization period was  $8.1 \pm 2.9$  days (4-18). The median time between injury and surgery was 1 day (1-13). The mean mobilisation time after surgery was  $2.2 \pm 0.7$  days (0-5). Fifteen (20.3%) patients were recorded as dead through 12-month period. Forty-one patients (55.4%) were malnourished based on  $\text{alb} < 3.5 \text{g/dl}$  and 13 of them (31.7%) were dead ( $p=0.006$ ). Twenty-three patients (31.1%) were classified as such based on  $\text{tlc} < 1500$  and 10 of them (43.5%) were dead ( $p=0.002$ ). Decrease in albumin in dead patients was higher than survivors ( $p < 0.012$ ). When ASA was adjusted  $\text{tlc} < 1500$  and mortality were statistically significant. CONCLUSION: There are different factors for mortality in these patients. It is significantly related to malnutrition, female gender, ASA 3-4 and low haemoglobin.



**Date : 2008-08-26**  
**Session : Trauma: hip fracture 2**  
**Time : 1600-1730**  
**Room: Theater 1**

**Abstract number : 18114**

**PFN VS. GAMMA NAIL IN THE SURGICAL TREATMENT OF LATERAL FEMURAL NECK FRACTURE**

Antonio CROCE, Andrea MONDINI, Patrizia MANTELLI, Luca PARRAVICINI  
*Istituto Ortopedico G.Pini, Milan (ITALY)*

The aim of this study is to compare the results obtained using two different kinds of intramedullary nails for the surgical treatment of fractures of the trochanteric region of the femur: the Gamma nail and the Proximal Femoral Nail (PFN). Fractures were classified according to the AO system, and the indications were 3A1, 3A2 and 3A3. Lateral femoral neck fractures represent one of the most common traumatic event, mostly affecting patient over 65 years old (67%) and female (63%). In our Institute, in the period between 1994 and 2005, 2500 patients with femoral neck fracture have been treated with intramedullary nailing procedures. Our data show a significant increase in the use of PFN (from 4% up to 57%), in comparison to a decrease in the use of g-Nail (30% to 22%). In our experience the main advantages of the PFN in comparison to g-Nail are related to the antirotational stability, intrinsic titanium elasticity, smaller diameter, distal dynamic or static screw, less bleeding and unreamed procedure.

Date : 2008-08-26  
Session : Trauma: hip fracture 2  
Time : 1600-1730  
Room: Theater 1

Abstract number : 18284

**TREATMENT OF PROXIMAL FEMORAL FRACTURES WITH A PROXIMAL FEMORAL NAIL ANTIROTATION (PFNA):  
EVALUATION OF EARLY RESULTS OF THIS NEW DESIGN**

Praveen MEREDDY, Sri KAMATH, Hamad MALIK, Nigel DONNACHIE  
*Wirral University teaching Hospital, Merseyside (UNITED KINGDOM)*

AIM: We evaluated the early results of PFNA fixation for proximal femoral fractures. METHODS: Sixty-two patients underwent PFNA fixation between 2006 and 2007. Fractures were categorised according to the AO/ASIF classification. The quality of fracture reduction and PFNA blade position were assessed. The tip-apex distance was measured (TAD). Intra-operative technical difficulties and complications were recorded. RESULTS: Sixty-two patients with an average age of 78 years (range 44 to 94 years) were reviewed (20 men and 42 women). Most fractures (48) resulted from low energy injury. Associated injuries were noted in 15 patients. Majority of the fractures were AO/ASIF types 31A2 (26) and 31A3 (33). Closed reduction was successful in 50 patients and 12 patients required open reduction. Fracture reduction was good in 41, acceptable in 19 and poor in 2 patients. PFNA blade position was central in 52 patients. Twenty-four patients had TAD of less than 10mm, 25 had 10-25mm and 13 had >20 mm. Technical difficulties were encountered in 14 operations. Fifty-two fractures united between 3 and 4 months. Four patients had delayed union (6 to 8 months). Two patients were lost to follow-up. Five patients died. PFNA blade cutout was noted in two patients. There was no infection. CONCLUSIONS: Proximal femoral fractures (intertrochanteric and subtrochanteric) were treated successfully by using the new design. PFNA blade appears to provide additional anchoring, which is especially important in osteoporotic bone. However, meticulous surgical technique and familiarity with the PFNA are essential to maximise outcome.

**Date : 2008-08-26**  
**Session : Trauma: hip fracture 2**  
**Time : 1600-1730**  
**Room: Theater 1**

**Abstract number : 18291**

**RESULTS OF A NEW DYNAMIC LOCKING PLATE AND SCREW SYSTEM FOR INTRACAPSULAR HIP FRACTURES**

Deepu BHASKAR<sup>1</sup>, Kieran SINGISETTI<sup>1</sup>, Martyn PARKER<sup>2</sup>

<sup>1</sup>*Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM)*, <sup>2</sup>*Peterborough District Hospital, Peterborough (UNITED KINGDOM)*

Internal fixation of intracapsular fractures of neck of femur has been associated with high failure rates (10-35% Nonunion and 10-20% Avascular Necrosis). The Targon FN is a new implant launched in 2007 which has been designed to improve the fixation of intracapsular hip fractures. We present the use of this new implant for the first 50 patients. The mean age of the patients was 77 years (range 46-103), 15 (30%) were male. 25 fractures were undisplaced, 6 had minimal displacement and 19 were displaced on both AP and lateral radiographs. The mean length of surgery was 44 minutes (range 25-95) and the mean length of anesthesia 56 minutes (range 35-110 minutes). The mean length of hospital stay was 10 days (range 3-32). Three telescoping screws were used in 31 cases and four screws in 19 patients. Follow-up of patients at present is a mean of six months. To date there has been three complications, a case of nonunion in a displaced intracapsular fracture for which conversion to an arthroplasty was undertaken. One case of implant failure due to back out of distal femoral fixation screws. One case of wound haematoma in a patient on warfarin. Sepsis followed and the implant was subsequently removed after the fracture had healed. This preliminary study provides very encouraging results suggesting that the Targon FN Dynamic Locking Screws provides a better mechanical fixation with less implant Failure and need for revisions for intracapsular fractures of the proximal femur.

Date : 2008-08-26

Session : Joint: Total knee replacement 4

Time : 0900-1030

Room: Theater 2

Abstract number : 15729

**PRECISION OF THE POSITIONING OF AN UNICOMPARTMENTAL KNEE PROSTHESIS BY A MINI-INVASIVE NAVIGATED TECHNIQUE**

Jean-Yves JENNY, Eugen CIOBANU, Cyril BOERI  
*University Hospital Strasbourg, Illkirch (FRANCE)*

INTRODUCTION: It seems logical to combine minimal invasive techniques with navigation systems for UKR. MATERIAL AND METHODS: We prospectively studied 60 patients who underwent navigated minimally invasive UKR for primary medial osteoarthritis, and compared them to a navigated control group of 60 patients who underwent conventional implantation of a UKR. There were no differences in all preoperative parameters between the two groups. The accuracy of implant positioning was determined using pre-discharge standard anteroposterior and lateral radiographs. The primary criterion was the radiographic accuracy index on the postoperative radiograph evaluation. RESULTS: The mean accuracy index was similar in the two groups:  $4.1 \pm 0.8$  in the study group and  $4.2 \pm 1.2$  in the control group. 36 patients (60%) in the control group and 37 patients (62%) in the study group had the maximum accuracy index of five points. All measured angles were similar in the two groups. DISCUSSION: The used navigation system enhances the quality of implantation of the prosthetic components and avoids the inconvenient of a smaller incision with potential less optimal visualization of the intra-articular reference points. However, all centres observed a significant learning curve of the procedure, with a significant additional operative time during the first implantations. The postoperative rehabilitation was actually easier and faster, despite the additional percutaneous fixation of the navigation device. This system has the potential to allow the combination of the high accuracy of a navigation system and the low invasiveness of a small skin incision and joint opening.

**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 4**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 16128**

**THE ANTEROLATERAL SKIN INCISION FOR PRIMARY TOTAL KNEE REPLACEMENT: A PROSPECTIVE RANDOMISED STUDY**

Vijay SHETTY

*Dr LH Hiranandani Hospital, Mumbai (INDIA)*

**INTRODUCTION:** Anterolateral incision for routine total knee replacements (TKRs) appears to be an attractive option to overcome problems associated with midline incision. We wished to compare the use of midline and anterolateral skin incisions for routine, primary TKRs. **METHODS:** In a prospective, randomised study, we studied 34 (42 TKRs) consecutive patients who underwent TKR. Patients received either midline incision (15 patients; 19 TKRs) followed by anteromedial arthrotomy (Group A) or anterolateral incision (19 patients; 23 TKRs) followed by anteromedial arthrotomy (Group B). All operations were performed by a single surgeon under epidural anaesthesia. Postoperatively, the patients were assessed at two weeks and six weeks in both groups for a) incision length b) wound dehiscence c) time for wound healing d) range of movements e) superficial infection and f) lateral flap numbness. **RESULTS:** Our results showed that the length of incision was shorter in Group A ( $p < 0.0001$ ), more wound dehiscence in Group A with a 95% confidence interval (95% CI) between 6.2% and 76.1%. Wound healing took longer in Group A ( $p = 0.0004$ ). Group B demonstrated more flexion at six weeks ( $p = 0.0002$ ), less rate of superficial infection (95% CI: 17.4%, 85.0%) and no lateral flap numbness (95% CI: -1.4%, 70.0%). **CONCLUSION:** We conclude that the anterolateral skin incision for TKR has the advantages of rapid wound healing, less tension on the anterior aspect of the knee facilitating immediate postoperative flexion.

Date : 2008-08-26

Session : Joint: Total knee replacement 4

Time : 0900-1030

Room: Theater 2

Abstract number : 16341

#### THE COMPARISON OF ROM WITH AND WITHOUT TOURNIQUET IN THE TOTAL KNEE REPLACEMENT

Dariush GOURAN SAVADKOOHI<sup>1</sup>, Mohammad GOURAN SAVADKOOHI<sup>2</sup>, Armin AALAMI HARANDI<sup>3</sup>

<sup>1</sup>Sina Hospital, Tehran University of Medical Sciences, Tehran (IRAN), <sup>2</sup>Shaheed Beheshti University of Medical Science, Tehran (IRAN), <sup>3</sup>Shaheed Beheshti University of Medical science, Akhtar Hospital, x (IRAN)

**BACKGROUND:** Use of tourniquet has been introduced to secure a bloodless field for orthopedic surgeries but the use of this instrument has been accompanied by some complications such as nerve paralysis or DVT. The effect of the tourniquet on the latter is well-documented in previous studies. **MATERIALS AND METHODS:** 62 patients were randomly allocated into two groups which were matched for age, preoperative knee score, gender and radiographic grading. They were operated by the same surgeon and with the same knee prosthesis. Evaluation of early ROM, blood loss, operation time, wound infections and DVT was conducted. ROM in the 4th, 10th day and 5 weeks after the operation, perioperative and postoperative blood loss were recorded. CPM was started in the second postoperative day. Evaluations consisted of the determination of a Knee Society clinical score, and radiographic surveillance. The time to achieve straight leg rising and ROM was compared in both groups. **RESULTS:** Intraoperative blood loss was lower when the tourniquet was inflated but the overall blood loss was not different when the postoperative blood loss was added. Knee extension, straight leg raising and knee flexion were higher when tourniquet was not inflated. Our study shows that early knee movements were significantly higher when tourniquet was not inflated and the pain was significantly lower. In conclusion, TKA can be safely and effectively be done without tourniquet and the early ROM postoperatively is significantly higher while potential adverse effects associated with the use of tourniquet is avoided.

**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 4**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 16379**

**PROSPECTIVE RANDOMIZED CONTROLLED TRIAL COMPARING RANGE OF MOTION AFTER STANDARD AND HIGH-FLEXION POSTERIOR STABILIZED TOTAL KNEE PROSTHESIS**

Wai Pan YAU, KY CHIU

*The University of Hong Kong, Hong Kong (HONG KONG)*

**INTRODUCTION:** There is an increasing demand for a better ROM in patients receiving TKR. The design of the prosthesis has been modified to allow deep flexion to occur. However, there is still controversy whether this can lead to a clinically significant improvement in flexion range. **METHODS:** A prospective randomized controlled trial comparing ROM after standard and high-flexion designed prosthesis was done in 24 patients receiving one-stage bilateral TKR (high-flexion NexGen LPS Flex in one knee and a standard version NexGen LPS in another knee). All the operations were done by the same surgeon with the same operative and rehabilitation protocol. The maximum knee flexion was measured at the final follow-up. **RESULTS:** The mean preoperative knee flexion was 106°. There was no difference between the high-flexion designed group and standard version group in terms of the preoperative knee flexion, preoperative mechanical alignment, postoperative mechanical alignment, position of the implanted components in coronal and sagittal plane, change in joint line, flexion gap balance and presence of residual posterior femoral condyle osteophyte. At a minimum follow-up of four years, there was no difference in the maximum knee flexion between the high-flexion designed group (115°) and standard version group (114°) ( $p=0.606$ , paired t test;  $\beta$  error=0.055). **CONCLUSION:** In a group of patients having a preoperative knee flexion <130°, the use of a TKR of a high-flexion design exhibited no additional benefit in terms of postoperative knee flexion when compared with a standard version prosthesis.

**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 4**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 16625**

**RESULTS OF 41 TKA IMPLANTED IN KNEES WITH UP TO 10° OF VALGUS DEFORMITY**

Dominique SARAGAGLIA, Johannes BARTH, Dan GORDUZA, Charbel NEMER  
*University of Grenoble, South Teaching Hospital., Échirolles (FRANCE)*

The aim of this paper was to present the clinical and radiological results of 41 Total knee arthroplasties (TKA) implanted between 1993 and 2003, in knees with up to 10° of valgus deformity. The series included 38 patients (41 Knees : 26 right and 15 left), 33 women and 5 men whose mean age was 70.9±8 years (55-82). The mean HKA angle was 195.4±4.9° (190°-206°) and 20 patellas were subluxed on skyline views. The mean preoperative IKS global score was 97±22.5 points (60-143). All knees were approached through a medial parapatellar approach and in 16 cases (39%) we performed an intra-articular lateral release. In all the cases we used a gliding prosthesis. 26 patients (29 knees) were available for follow-up at a median of 67.8±10 months (15-120). The mean IKS global score was 170.2±15.12 points (135-199) and the mean flexion was 111.2±10.05° (90°-130°). The mean postoperative HKA angle was 182.1±3.0° (172°-188°). Furthermore, 5 patellas were subluxed (3 out of 5 were asymptomatic). The results of TKA in knees with up to 10° of valgus deformity are as satisfactory as in other deformities. Medial parapatellar approach is safe enough to perform a lateral release through an intra-articular approach. The subluxation rate could further decrease by using the Keblish lateral approach in selected cases.



**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 4**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 16854**

**PENTOSAN POLYSULFATE, A RATIONAL THERAPY FOR THE TREATMENT OF KNEE OSTEOARTHRITIS**

Kenji KUMAGAI<sup>1</sup>, Noriaki MIYATA<sup>1</sup>, Masami NIWA<sup>1</sup>, Masakazu MURATA<sup>1</sup>, Hiroyuki SHINDO<sup>1</sup>, Shirabe SUSUMU<sup>1</sup>, Yasuhumi KATAOKA<sup>2</sup>, Atushi YAMAUCHI<sup>2</sup>

<sup>1</sup>Graduate school of Biomedical Science, Nagasaki University, Nagasaki (JAPAN), <sup>2</sup>School of Pharmaceutical Sciences, Fukuoka University, Fukuoka (JAPAN)

**INTRODUCTION:** Pentosan Polysulfate Sodium (NaPPS) is a semi-synthetic drug manufactured from beechwood hemicellulose by sulfate esterification of the xylopyranose hydroxyl groups. From in vitro and animal model studies, NaPPS has been proposed as a DMOAD. The objective was to assess the efficacy and safety in the patients had mild radiographic knee osteoarthritis (OA) findings and OA-associated symptoms. **METHODS:** NaPPS used in this study was manufactured and supplied in sterile injectable vials (100mg/ml) by Bene GmbH, Munich, Germany. The study was held in a single-centre, open-label trial. Treatment consisted of 6 weekly subcutaneous injections (sc) of NaPPS (2mg/kg). Patients were clinically assessed at entry and 1 to 8, 11, 15, 24 and 52 weeks post treatment. Statistical examination was mainly performed by one way ANOVA and Dunnett's method. **RESULTS, DISCUSSION AND SUMMARY:** The dose of this study affected the blood coagulation test, but the value in the study was within safety area. A tiny abnormal finding is noted in serum triglyceride. The hydroarthroses were reduced quickly in all cases. And R.O.M. was improved. The clinical assessments, i.e. knee flexion, pain at walking, pain just after climb up and down stairs etc. were improved significantly and the clinical effect was continued for almost one year. This good result was thought to be due to the improvement of cartilage metabolism, synovium condition and anti-inflammatory function by NaPPS. In spite of a different injection fashion, the result was as good as, or better than the previous study in Australia.

Date : 2008-08-26  
Session : Joint: Total knee replacement 4  
Time : 0900-1030  
Room: Theater 2

Abstract number : 16858

**RANDOMISED CONTROLLED TRIAL SHOWING SINGLE DOSE OF HYLAN G-F 20 IS SAFE AND EFFECTIVE IN PATIENTS WITH KNEE OSTEOARTHRITIS PAIN**

François BAILLEUL<sup>1</sup>, Joerg JEROSCH<sup>2</sup>, Niek C. VAN DIJK<sup>3</sup>, René VERDONK<sup>4</sup>, Andrew PRICE<sup>5</sup>, Karel PAVELKA<sup>6</sup>, Xavier CHEVALIER<sup>7</sup>

<sup>1</sup>Genzyme Biosurgery, St Germain en Laye Cedex (FRANCE), <sup>2</sup>Johanna Etienne Krankenhaus, Klinik für Orthopädie, Neuss (GERMANY), <sup>3</sup>Orthopaedic Research Center Amsterdam, Amsterdam (NETHERLANDS), <sup>4</sup>Universitair Ziekenhuis Gent, Orthopaedic Dpt, Gent (BELGIUM), <sup>5</sup>Nuffield Orthopaedic Center, Dpt of Orthopaedic Surgery, Oxford (UNITED KINGDOM), <sup>6</sup>Institute of Rheumatology, Dpt of Rheumatology, Prague 2 (CZECH REPUBLIC), <sup>7</sup>Hôpital Henri Mondor, Creteil Cedex (FRANCE)

**BACKGROUND:** Viscosupplementation is an effective treatment for patients suffering from knee osteoarthritis (OA). Most available products use 3-5 injections. Clinicians and patients would prefer single injections from the perspective of costs and convenience. **METHODS:** In this prospective, multicenter, blinded study, patients diagnosed with knee OA were randomised to one 6-mL injection of hylan G-F 20 or saline. The primary outcome was WOMAC pain scores (Likert version 3.1) over the 6-month study period. Intent-to-treat analysis was based on a repeated-measures model. **RESULTS:** 253 patients were enrolled. Mean age was 63 years (42-84), 71% were female and all had primary knee OA of Kellgren-Lawrence grade 2 (45%) or 3 (55%). Patients in the hylan G-F 20 group experienced a mean change from baseline in their WOMAC A over 26 weeks of -0.84 versus -0.69 in the saline group (p=0.047). Statistically significant differences favouring hylan G-F 20 were also reported for most of the secondary efficacy criteria: WOMAC A1 Walking Pain, patient and clinical observer global assessment. There were no serious or severe adverse events (AEs) related to treatment. Local AEs were similar in both groups, mainly post-injection pain. **CONCLUSIONS:** This double-blind placebo-controlled study showed one injection of hylan G-F 20 was safe and provided symptomatic relief lasting up to 6 months in patients with knee OA. A single injection simplifies this treatment option in knee OA.

**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 4**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 17510**

**MID-TERM RESULTS OF A SERIES OF 180 UNICOMPARTMENTAL KNEE ARTHROPLASTIES**

Nicolas LAPIE, Philippe CHIRON, Jean-Michel LAFFOSSE, Jean-Louis TRICOIRE, François MOLINIER, Jean PUGET  
*Service d'Orthopédie et de Traumatologie, CHU Rangueil, Toulouse (FRANCE)*

**MATERIAL AND METHODS:** This was a retrospective and monocentric analysis of 180 unicompartmental knee arthroplasties (in 155 patients) using the cemented HLS® model. Mean age was 66 years. The IKS knee and function scores were noted. Involvement of the opposite compartment presence of femoropatellar osteoarthritis and residual femorotibial misalignment and age over 80 years were studied. **RESULTS:** Mean follow-up was 71 months (range 15-200). Mean IKS knee score was 85 (range 44-100) and mean function score 89 (range 25-100). Ninety percent of patients were very satisfied (58%) or satisfied (32%). Mean flexion was 125° (50-150°). Asymptomatic femoropatellar osteoarthritis did not have a negative effect on clinical scores unlike involvement of the opposite femorotibial compartment. Twenty-one percent of the tibial components were too low due to an excessive tibial cut with a less satisfactory subjective score. There were two tibial fractures under the implant, confirming the deleterious effect of overcorrection and the protective effect of moderate undercorrection. Ninety-six percent of patients aged over 80 years were satisfied or very satisfied despite a statistically inferior function score. The Kaplan-Meier survival rate was 92% at nine years. **DISCUSSION AND CONCLUSION:** The mid-term outcomes of unicompartmental prostheses have shown an excellent rate of satisfaction, good clinical scores and remarkable joint mobility. The selection criteria should be rigorous for young patients but greater tolerance is possible for older subjects and in case of asymptomatic osteoarthritis of the femoropatellar joint or degradation of the opposite compartment. Height of tibial cut appears as fundamental for success.

**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 4**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 18269**

**REVISION OF MEDIAL KNEE HEMIARTHOPLASTY - WORSE THAN PRIMARY TKA?**

Lutz ECKART, Volker FUCHS, Hans-Ekkehard STAY  
*St. Salvator Hospital, Halberstadt (GERMANY)*

The aim of our study was to compare the results of primary TKA with revision of medial hemiarthroplasty. Between 3/2000 and 3/2005 40 patients with an ENDO-sled hemiarthroplasty were revised to a total knee due to aseptic loosening or ongoing lateral gonarthrosis. Clinical results and implant features were compared to primary TKA using the same implant system (GEMINI Mk2). Clinical data showed no significant differences in both groups. Implant sizes were also similar, regarding the gender distribution. The height of the polyethylene insert was taken as measurement of bone loss due to destruction of the medial tibial condyle. In 57% of the revision cases the smallest insert (12mm) was used, compared to 75% in primary TKA. Higher inserts of 16mm were used in 6% of the primary and 20% of the revision cages. There was 1% 18mm in primary and none in revision cages. There was no need to use augmentation devices or stem lengthening. Femoral preparation was no difference in both groups due to the resurfacing philosophy of the ENDO-sled. CONCLUSION: The revision of the ENDO-sled leads in 25% of the cases to an additional resection of 2mm of the tibial head. Clinical outcome showed no difference. The hemiarthroplasty shows its value as "first-step" implant leading to "primary results" without significant bone loss in revision. That gives it an advantage on HTO in the treatment of medial knee arthrosis. To optimize revision results implants with minimized bone reaction should be used.

**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 4**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 18476**

**UNICOMPARTMENTAL ARTHROPLASTY: INFLUENCE OF SIZE OF THE TIBIAL COMPONENT ON CLINICAL AND RADIOLOGICAL OUTCOMES**

R CHAU, A GULATI, H G PANDIT, C A F DODD, RICHIE GILL, D W MURRAY, D J BEARD, A J PRICE  
*Nuffield Orthopaedic Centre, Oxford (UNITED KINGDOM)*

**PURPOSE:** This study was performed to evaluate the effects of underhanging/overhanging tibial components on clinical and radiological outcome following the Oxford unicompartmental knee arthroplasty (UKA), and to identify an acceptable sizing limit. **METHOD:** 161 knees which had undergone the medial UKA were prospectively studied and were categorised according to whether they had minor (<3mm, 69.6%), or major ( $\geq$ 3 mm, 8.7%) tibial overhang or underhang (21.7%). Clinical outcome was assessed by the Oxford Knee Score (OKS) and pain score (PS) at 5 years and the radiolucency under the tibial component was assessed on an anteroposterior radiograph. **RESULTS:** One year post-surgery, there was no significant difference in outcome. Five years after surgery, those with major overhang had significantly worse change in the OKS ( $p=0.001$  and  $0.021$  respectively) and total PS ( $p=0.0010$  and  $0.014$  respectively) than those with minor overhang or underhang. The difference in scores was substantial (OKS=10 points). There was no difference between the "minor overhang" and the "underhang" group. **CONCLUSION:** Appropriate sizing of the tibial component is essential to optimise load bearing in UKA. Excessive undersizing of the prosthesis may lead to subsidence and loosening, whilst excessive overhanging component may cause local soft tissue irritation and pain. We conclude that surgeons must try to avoid tibial overhang  $\geq$  3mm. Although this study showed no difference between minor overhang and underhang, we would advice against underhang, because of theoretical risk of loosening.

**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 4**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 18483**

**REVISION TOTAL KNEE ARTHROPLASTY FOR CHRONIC STIFFNESS**

Raymond WALLS, Terence MURPHY, Kevin MULHALL  
*Cappagh National Orthopaedic Hospital, Dublin (IRELAND)*

Chronic stiffness is an uncommon complication of total knee arthroplasty (TKA) with an incidence of 1-5%. Surgical options include manipulation under anaesthesia (MUA) and arthrolysis. There is concern regarding revision surgery given the potential for stiffness recurrence. Patients undergoing revision TKA for stiffness were prospectively identified with inclusion criteria being flexion contracture greater than 10° and/or less than 70° motion arc. WOMAC and SF-36 questionnaires were completed pre and post revision surgery. Between July 2005 and December 2006, 7 aseptic, primary TKA's were revised at 17.1 months (range: 7-25 months). The cohort involved 5 female and 2 male patients (mean age: 57.6 years). All had failed MUA, with additional open arthrolysis unsuccessful in 1 knee. A medial parapatellar approach was performed and 3 cases necessitated additional quadriceps snip for exposure. Gap imbalance with increased soft tissue tension was noted intra-operatively in 5 cases with arthrofibrosis found in the remainder. At 6 months follow-up, mean motion arc increased from 41.3° preoperatively to 81.4° ( $p=0.001$ ) while mean flexion contracture decreased from 17.4° to 2.1° ( $p=0.004$ ). Subjective improvement was also demonstrated: mean WOMAC decreased from 46.5 to 22.5 ( $p=0.023$ ) and SF-36 scores increased by a mean of 35.8 ( $p=0.001$ ). When conservative, implant preserving measures fail, revision surgery can be considered a viable option in addressing restricted movement following primary TKA. Aggressive physiotherapy and good patient compliance are required to minimise the recurrence of stiffness.

**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 4**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 18694**

**EARLY FAILURE OF UNICONDYLAR KNEE ARTHROPLASTY (UKA) - A FACTOR TO BEAR IN MIND**

Kayode ODUWOLE, Murali SAYANA KRISHNA, Funso ONAYEMI, Tom MCCARTHY, John O'BYRNE  
*Cappagh National Orthopaedic Hospital, Dublin (IRELAND)*

Unicondylar knee arthroplasty (UKA) is being expanded to include younger patients with more active lifestyles because of its minimally invasive nature. Prior to expanding this role, it is important to examine mode of failure and implication of conversion to TKA in the low demand elderly patients. AIM: To ascertain the modes of early failure of UKA and assess whether the conversion to TKA improved the functional scores, range of motion, pain, and patient satisfaction. METHOD: A review of 14 revision procedures after UKA. Patients' operative charts were reviewed, and details of modes of failure, technical difficulty of the TKA and management of bone loss. Follow-up using WOMAC osteoarthritis index and SF-36 to measure outcome. RESULT: 14 failed medial unicondylar knee arthroplasty underwent conversion to total knee arthroplasty. The mean age was 61.9 years. 86% required revision within the first 3 years. The modes of failure were aseptic loosening (4), progression of osteoarthritis (3), instability (3), infection (2), persistent pain (2). Tibia insert exchange was done in 1 patient, 11 converted to primary Scorpio and 1 to PFC. Three patients had significant defect in femoral condyle. 14% percent of cases required femoral stem extension or metal wedge augmentation. Eleven of the 14 knees (78.6%) were followed for an average of 15 months. The mean WOMAC and SF-36 scores at latest follow were 33.33 and 63.79 respectively. Despite the luxury of minimally invasive UKA, early failure does occur and patients should be warned of its possibility.

Date : 2008-08-26

Session : Joint: Total knee replacement 5

Time : 1400-1530

Room: Theater 2

Abstract number : 15728

**OSTEOPHYTES HAVE LITTLE INFLUENCE ON THE LIGAMENTOUS BALANCING DURING TKR**

Jean-Yves JENNY<sup>1</sup>, Cyril BOERI<sup>1</sup>, Yann DIESINGER<sup>2</sup>

<sup>1</sup>University Hospital Strasbourg, Illkirch (FRANCE), <sup>2</sup>Centre de Chirurgie Orthopédique et de la Main, Illkirch-Graffenstaden (FRANCE)

INTRODUCTION: Osteophytes are thought to influence ligamentous balancing during TKR. METHODS: We studied 20 cases of varus gonarthrosis operated on for TKR under navigation control. The coronal mechanical femoro-tibial angle was first measured in maximal extension according to the standard technique. A second measurement was made with a maximal manual stress to valgus in order to passively reduce the deformation. Then the medial femoral and tibial osteophytes were carefully removed, and the third measurement was made, again with a maximal manual stress to valgus. The difference between the laxity before and after osteophytes resection was studied with a paired Wilcoxon test at a 0.05 level of significance. RESULTS: There was no difference between pre- and post-resection coronal mechanical femoro-tibial angle in maximal valgus stress by 10 patients. We observed a 1 degree difference in 9 patients, and a 2 degree difference in one patient. The paired difference between pre- and post-resection coronal mechanical femoro-tibial angle in maximal valgus stress was significant ( $p < 0.001$ ). There was no correlation between this difference and the thickness of the resected osteophytes. DISCUSSION: The observed difference between the medial laxity of the knee before and after medial osteophytes resection was statistically significant. However, the value of this difference is probably clinically irrelevant. There is no need for routine medial osteophytes resection only for the purpose of ligamentous balancing during TKR.



**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 5**  
**Time : 1400-1530**  
**Room: Theater 2**

**Abstract number : 15731**

**NAVIGATED REVISION TOTAL KNEE REPLACEMENT**

Jean-Yves JENNY, Cyril BOERI, Yann DIESINGER, Eugen CIOBANU  
*University Hospital Strasbourg, Illkirch (FRANCE)*

**INTRODUCTION:** We tested the hypothesis that the navigated implantation of a revision TKR was more accurate than the conventional implantation. **MATERIAL AND METHODS:** We used an image-free system (ORTHOPILOT TM, AESCULAP, FRG) for routine implantation of primary TKA. Registration of anatomic and kinematic data was performed with the index implant left in place. The components were then removed. New bone cuts as necessary were performed under the control of the navigation system. The system did not allow navigation for centromedullary stem extension and any bone filling which may have been required. This technique was used for 54 patients. The accuracy of implantation was assessed intraoperatively by measuring the limb alignment and orientation of the implants on the postoperative radiographs. **RESULTS:** Limb alignment was restored in 88%. The coronal orientation of the femoral component was acceptable in 92% of the cases. The coronal orientation of the tibial component was acceptable in 89% of the cases. The sagittal orientation of the tibial component was acceptable in 87% of the cases. Overall, 78% of the implants were oriented satisfactorily for the five criteria. **DISCUSSION:** The navigation system enables reaching the implantation objectives for implant position and ligament balance in the large majority of cases, with a rate similar to that obtained for primary TKA. The navigation system is a useful aid for these often difficult operations, where the visual information is often misleading.

Date : 2008-08-26

Session : Joint: Total knee replacement 5

Time : 1400-1530

Room: Theater 2

Abstract number : 16343

**COMPARISON OF RESECTION PATELLOPLASTY WITH PATELLAR REPLACEMENT IN TOTAL KNEE REPLACEMENT**

Dariush GOURAN SAVADKOOHI<sup>1</sup>, Mohammad GOURAN SAVADKOOHI<sup>2</sup>

<sup>1</sup>*Sina hospital Tehran University of Medical science, Tehran (IRAN),* <sup>2</sup>*Shahid Beheshti university of Medical Science, Tehran (IRAN)*

BACKGROUND: Whether to resurface the patella during a primary TKA performed for the treatment of OA remains a controversial issue. Concerns include fracture, dislocation, loosening, and extensor mechanism injury. Residual anterior knee pain has been reported when the patella is not resurfaced. METHOD: Eighty-six patients (118 knees) undergoing primary TKA for OA were enrolled in this prospective, randomized study. All patients received the same posterior-cruciate-sparing prosthetic components. Patients were randomized to treatment with resurfacing of the patella in one group and patelloplasty in the other group. Evaluations consisted of the determination of a Knee Society clinical score, completion of a patient satisfaction questionnaire, questions regarding patellofemoral symptoms and radiographs. Follow-up was one year. RESULTS: We found no significant difference between the groups treated with resurfacing with regard to the overall Knee Society score or the pain and function subscores to the group which were treated with patelloplasty. Preoperatively, the mean Knee Society score was 89.7 points (r33-132); postoperatively, it improved to a mean of 172.7 points (r98-200). There was no significant difference between groups with regard to the overall score ( $p=0.73$ ), the subscore for pain ( $p=0.63$ ) or function ( $p=0.77$ ). The patient's satisfaction or the function of the patellofemoral joint, including the ability to exit from an automobile, to rise from a chair, and to climb stairs were same in both groups. Thus, TKA with patelloplasty yielded clinical results that were comparable with those after TKA with patellar resurfacing.

Date : 2008-08-26  
Session : Joint: Total knee replacement 5  
Time : 1400-1530  
Room: Theater 2

Abstract number : 16617

**INDEPENDENT STUDY OF THE OXFORD PHASE 3 UNICOMPARTMENTAL ARTHROPLASTY (UCA) FOR TREATMENT OF ANTEROMEDIAL OSTEOARTHRITIS OF THE KNEE: 8-YEAR RESULTS**

Lukas LISOWSKI<sup>1</sup>, Inez CURFS<sup>2</sup>, Andrzej LISOWSKI<sup>3</sup>

<sup>1</sup>Academic Medical Center Amsterdam, Utrecht (NETHERLANDS), <sup>2</sup>University of Maastricht Medical School, Heerlen (NETHERLANDS), <sup>3</sup>Atrium Medical Center Kerkrade, Heerlen (NETHERLANDS)

**OBJECTIVES:** The aim of this prospective study was to analyse the clinical results of the first eight years of experience with the Oxford Phase 3 unicompartmental prosthesis for anteromedial osteoarthritis of the knee joint. **MATERIAL AND METHODS:** Between January 1999 and May 2007, 223 consecutive Oxford arthroplasties were implanted by a single surgeon. A total of 191 cases met the required follow-up period of one year. Pain, function of the knee and health-related quality of life were evaluated by the WOMAC-Questionnaire, the Knee Society Score (KSS), Oxford score and VAS for pain and satisfaction. **RESULTS:** Mean age at operation was 69 years and mean follow-up time was 35 months. The mean pre-and postoperative knee society knee scores were 46 and 91 respectively. The pre-and postoperative knee society function scores were 47 and 87. The WOMAC-scores, the Oxford-score and the VAS for pain and satisfaction all improved significantly. Major complications that occurred in our series were: dislocation of the meniscal insert in three patients\* of which two were revised to TKA and Vanguard-UCA respectively, and one reduced by an open procedure successfully. Three patients\* with persisting identified pain complaints due to failure of proper patient selection were revised to TKA. Five others with identified moderate pain are still being followed. **CONCLUSION:** Evaluation of our patients after a mean follow-up of 35 months reveals a significant improvement of the clinical and function scores. Patients' satisfaction is high and the rate of major complications (\*n=6, 3.1%) is low.

**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 5**  
**Time : 1400-1530**  
**Room: Theater 2**

**Abstract number : 16622**

**COMPUTER-ASSISTED TKA FOR SEVERE GENU VARUM DEFORMITIES**

Dominique SARAGAGLIA, Brice RUBENS-DUVAL, Christophe CHAUSSARD  
*University of Grenoble, South Teaching Hospital, Échirolles (FRANCE)*

Between December 2001 and December 2003, we implanted 31 E-Motion prostheses using Orthopilot™ for severe genu varum deformities ( $\geq$  or  $>$  to  $10^\circ$ ). The mean preoperative HKA angle was  $167.48^\circ \pm 2.08^\circ$  ( $163^\circ$ - $170^\circ$ ). Regarding the IKS score, the mean knee score was  $21.13 \pm 9.23$  points (0-20), the mean function score was  $35.32 \pm 18.53$  points (5-85), and the mean global score  $56.23 \pm 23.86$  points (20-108). The main goal of the operation was to obtain a radiological HKA angle comprised between  $177^\circ$  and  $183^\circ$ . The standing long leg X-Rays were made at 3 months postoperatively. A tibial medial collateral ligament (TMCL) «release» was performed every time the reducibility tests showed a medial to lateral side difference equal or superior to 4 degrees. The mean follow-up was  $30.81 \pm 7.23$  months (24-46). We had to perform TMCL release in 10 cases (32.25%). In 5 cases we released only the deep MCL and in the last 5 cases we released the deep and superficial MCL (16.1%). The postoperative radiological HKA angle was of  $179.89^\circ \pm 1.83^\circ$  ( $175^\circ$ - $184^\circ$ ), which means we reached our goal in all cases but 2 (93.55%). The mean knee score was  $93.89 \pm 6.21$  points (74-100), the mean function score was  $92.22 \pm 11.21$  (65-100), and the mean global score  $185.74 \pm 15.56$  points (144-200). Moreover, the mean flexion score was  $114.07 \pm 10.56^\circ$  ( $90^\circ$ - $140^\circ$ ), quite close to the preoperative flexion ( $116^\circ$ ).

**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 5**  
**Time : 1400-1530**  
**Room: Theater 2**

**Abstract number : 16708**

**TOTAL KNEE ARTHROPLASTY AFTER FAILED MEDIAL UNICOMPARTIMENTAL PROSTHESES: 33 CASES**

Dominique SARAGAGLIA, Gilles ESTOUR

*University of Grenoble, South Teaching Hospital., Échirolles (FRANCE)*

The aim of this study was to evaluate the clinical and radiological results of 33 total knee arthroplasties (TKA) performed between January 1993 and March 2005 after failed medial unicompartmental prostheses. The mean preoperative IKS global score was  $99 \pm 23.76$  points (0-130). The causes of failure were: 15 tibial plateau and 5 femoral implant loosening, 2 femoral and tibial loosening, 5 polyethylene wear, 2 lateral gonarthrosis, 2 femoro-patellar gonarthrosis, 1 dislocation of the polyethylene (mobile bearing plateau) and 1 infection. In 12 cases we used a metallic wedge to fill in the bone loss (4mm: 2 cases, 6mm: 3 cases, and 8mm: 7 cases). In 7 cases we used an allograft (a piece of frozen femoral head) and in 1 case a metallic wedge plus an allograft. Otherwise we used 19 long tibial stems and 2 femoral stems. The results were based on 27 cases (5 deceased and 1 lost to follow-up) and the mean follow-up was  $73 \pm 41.7$  months (8-153). We had to perform 4 revisions: 2 for tibial loosening and 2 for patellar button loosening. The mean IKS function score was  $80.4 \pm 16$  points (40-100), the mean knee score was  $86.3 \pm 10.6$  points (63-100), and the global score  $166.72 \pm 21.3$  points (128-200). All the allografts fitted perfectly in the bone without osteolysis. The distinctive feature of medial unicompartmental prosthesis revision is the tibial bone loss, which was present in 60.5% of our cases.

**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 5**  
**Time : 1400-1530**  
**Room: Theater 2**

**Abstract number : 16855**

**STIFFNESS AFTER TOTAL KNEE ARTHROPLASTY: MID TO LONG-TERM FOLLOW-UP**

Michael SOUDRY, Gabriel NIERENBERG, Mazen FALAH  
*Rambam Health Care Campus, Haifa (ISRAEL)*

**PURPOSE:** To evaluate the results of revision TKA due to stiffness. **MATERIALS AND METHODS:** Between 1992 and 2005, 23 cases of stiff knees after TKA were revised. Seventeen cases were followed more than 2 years. Mean age at revision was 62.2 years. Postoperatively, patients were asked about their subjective satisfaction. Objective results were graded according to HSS score. The differences between preoperative and postoperative HSS score, arc of motion, average flexion and extension, were checked by t-test variance. **RESULTS:** Average time interval between primary and revision procedures was 24.5 months. Average preoperative arc of motion was 30.2 degrees. Preoperative HSS score was 43. Seventeen patients were available for last FU. Mean follow-up time was 5.8 years (range: 2-13 years). Subjective satisfaction was reported by 88% of patients. Postoperatively, HSS increased to 73.6 with 23% excellent, 36% good, 23% fair and 18% poor results. Postoperative arc of motion increased to 73.8 degrees. Low arc of motion (<30) was recorded in 2 patients. Postoperatively, significant increase in average flexion ( $p=0.0052$ ) and arc of motion ( $p=0.0003$ ) were recorded in relation to preoperative status. No significant change was found in HSS score ( $p=0.078$ ) and in extension ( $p=0.65$ ). **DISCUSSION:** At 5.8 years FU in average, better results of flexion and arc of motion were recorded postoperatively, but still with a low arc of motion. Revision of stiff TKA resulted in good subjective results and less than optimal objective results.

**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 5**  
**Time : 1400-1530**  
**Room: Theater 2**

**Abstract number : 17172**

**CROSSLINKED POLYETHYLENE IN FIXED- AND MOBILE-BEARING TOTAL KNEE PROSTHESES**

Sandra UTZSCHNEIDER<sup>1</sup>, Norbert HARRASSER<sup>1</sup>, Wolfgang PLITZ<sup>2</sup>, Volkmar JANSSON<sup>1</sup>

<sup>1</sup>*Orthopaedic Department, University of Munich, Munich (GERMANY),* <sup>2</sup>*Institute of Biomechanics, University of Munich, Munich (GERMANY)*

Compared with conventional UHMWPE crosslinked polyethylene (XPE) shows a reduced wear rate in a hip simulator, but the crosslinking process reduces the mechanical properties of UHMWPE. This is achieved by gamma or electronic radiation, followed by heat treatment. UHMWPE fatigue occurs more typically in total knee compared with total hip arthroplasty. This is why XPE is still controversially discussed for use in total knee prostheses. QUESTION: Is XPE suitable for use in total knee prostheses both for fixed- and mobile-bearing? METHOD: In a knee joint simulator 6 different types of knee inserts (4 crosslinked polyethylenes [A: sequential irradiation and annealing technique/fixed-bearing, B and C: two different remelting techniques/fixed-bearing, D: remelting technique/mobile-bearing], E: UHMWPE mobile-bearing, F: UHMWPE fixed-bearing) were tested according to the ISO standard. For 5 million cycles the gravimetric wear rates were measured and the wear mechanism was analysed by means of a scanning electron microscope. RESULTS: All inserts showed signs of abrasion, scratching and wear polishing, but no traces of delamination or other fatigue reactions. All types of XPE including the mobile-bearing insert produced significantly ( $p < 0.05$ ) lower wear rates (0.6-4.3 mg/year) than the conventional UHMWPE (8.4-8.5 mg/year). CONCLUSION: XPE is suitable for both fixed- and mobile-bearing total knee prostheses. Simulator testing showed overall reduced wear rates compared to conventional UHMWPE and fatigue symptoms were not observed, so that a monitored clinical investigation can be recommended.

**Date : 2008-08-26**

**Session : Joint: Total knee replacement 5**

**Time : 1400-1530**

**Room: Theater 2**

**Abstract number : 17742**

**INTRA- AND INTEROBSERVER VARIATION IN THE MEASUREMENT OF PATELLAR HEIGHT AFTER TOTAL KNEE**

Benedict ROGERS, Nick LITTLE

*St Peter's Hospital, WOKING (UNITED KINGDOM)*

**INTRODUCTION:** Accurate measurements using Picture Archiving and Communication System (PACS) have been shown to be difficult to obtain arthroplasty templating, and in this study we assess the reproducibility and accuracy of 4 ratios used to measure patellar height, quantified by manual and digital measurement before and after total knee arthroplasty. **METHODS:** Patella height was measured pre- and post-surgery in the lateral knee radiographs of 48 patients who had undergone total knee arthroplasty (TKA) using the Insall-Salvati, modified Insall-Salvati, Blackburn-Peel and Caton-Deschamps ratios. Two independent observers measured patella using the films and digitally using the PACS system, in identical conditions. Measurements were repeated at 3 months, totalling 3072 measurements per observer. Statistical analysis of the results, comparing observers, ratios and imaging modality, was performed using intra-class correlation coefficient (ICC) on SPSS v12. **RESULTS:** A greater correlation was obtained for all patella height measurements using digital imaging. Whilst the improvement was minimal for the Insall-Salvati ratios, it was marked for the Blackburn-Peel and Caton-Deschamps ratios. Digital imaging afforded greater intraobserver correlation in comparison to interobserver correlation; however this was not replicated for conventional radiographs. **CONCLUSION:** Digital imaging produces universal improvements in interobserver error. However the choice of method employed to assess patella height should reflect the differing correlations inherent to each ratio. The Blackburn-Peel and Caton-Deschamps ratios yield an excellent interobserver and intraobserver correlation, although neither directly measures the patellar tendon length.



**Date : 2008-08-26**  
**Session : Joint: Total knee replacement 5**  
**Time : 1400-1530**  
**Room: Theater 2**

**Abstract number : 18020**

**EARLY RESULTS OF PATELLO-FEMORAL JOINT ARTHROPLASTY IN A DISTRICT GENERAL HOSPITAL**

Jagan Mohana Reddy VELPULA, A. MALHOTRA, Peter DENN  
*Macclesfield hospitals, Macclesfield (UNITED KINGDOM)*

Isolated patellofemoral arthritis is a well recognised variant of the osteoarthritic knee. We present early follow-up results of patellofemoral arthroplasty in a district general hospital. A retrospective study was undertaken based on notes of 12 patients operated in the past 24 months. All twelve patients were investigated initially with an arthroscopy by a consultant who identified the patellofemoral arthritis. They were further operated by the same surgeon and the same type of implant was used in all the patients. A clinical and radiological follow-up was carried out which showed patellar tracking was normal and there was not any evidence of loosening. Oxford knee score was used to judge patient satisfaction. Average age of the patients was 60 years with the range being from 42-83 years. Average length of hospital stay was 4 days with the range being 3-7 days. Average follow-up was 14 months with the range being 7-24 months. The average oxford score was 18. Average range of postoperative movements attained for the knee was 0-120 degrees. The visual analogue score was 9/10. Thus here we are highlighting the encouraging early results we have attained using isolated patellofemoral arthroplasty in a district general hospital.

**Date : 2008-08-26**

**Session : Joint: Total knee replacement 5**

**Time : 1400-1530**

**Room: Theater 2**

**Abstract number : 18683**

**MINIMALLY INVASIVE UNICOMPARTMENTAL KNEE REPLACEMENT - TEN-YEAR SURVIVAL**

David MURRAY, Hemant PANDIT, Chris DODD, Cathy JENKINS, David BEARD, Harinderjit GILL, Andrew PRICE  
*Nuffield Orthopaedic Centre, Oxford (UNITED KINGDOM)*

About ten years ago we introduced sophisticated instrumentation and an increased range of component sizes for the Oxford Unicompartmental Knee Replacement (UKR) to facilitate a minimally invasive approach. The device is now routinely implanted through an incision from the medial pole of the patella to the tibial tuberosity. This has resulted in a more rapid recovery and an improved functional result. As the access to the knee is limited there is a concern that the long-term results may be compromised. The aim of this study was to determine the 10-year survival. A prospective follow-up of all Phase 3 minimally invasive Oxford UKR implanted by DM & CD has been undertaken. So far we have implanted 938 for anteromedial osteoarthritis. At ten years the survival of this cohort is 97%. We conclude that the Oxford Knee can be implanted reliably through a minimally invasive approach, giving excellent long-term results.

**Date : 2008-08-26**  
**Session : CTL - Spine: Spinal Deformities**  
**Time : 0800-0900**  
**Room: Theatre 1**

**Abstract number : 19012**  
**ROLE OF VERTEBRECTOMY IN SPINAL DEFORMITY CORRECTION**

Se-II SUK

*Seoul Spine Institute, Inje University Sanggye-Paik Hospital, Seoul (KOREA)*

Severe fixed spine deformity cannot be corrected well with conventional posterior or anterior procedure. Combined anterior and posterior surgery may correct better but still unsatisfactory. Severe rigid deformity better treated with vertebrectomy; osteotomy or vertebral column resection. Osteotomy can be done with open wedge or closing wedge. Open wedge osteotomy (Smith-Petersen) shorten posterior column and lengthen anterior column with hinges on the middle column, but has risk of neurovascular injury with anterior opening. Closing wedge osteotomy (posterior pedicle subtraction, decancellation or eggshell) shorten posterior and middle column with hinges on the anterior column (Thomasen). After the entire neural arch is resected, remove pedicles, decancellate vertebral body and collapse the body correcting the deformity. Decancellation osteotomy can correct 30–40° in one level. This procedure is safe with shortening and cancellous bone contact at osteotomy site. Very severe fixed, decompensated deformity is best treated by circumferential osteotomy with vertebral column resection. VCR was performed with combined anterior and posterior procedures (Leatherman, Kostuik, Bradford). Author devised a new technique of posterior vertebral column resection (PVCR), which is a single posterior approach reducing operating time, pulmonary and visceral complications of anterior approach and versatile from cervical to sacrum. PVCR can be applied in all kinds of spine deformities; scoliosis, kyphosis, congenital, degenerative, post-traumatic, etc. It is imperative to obtain rigid fixation with pedicle screws, preferably 3 levels above and below. PVCR is technically demanding procedure with possible risk of major complications and has to be performed for indicated patients by experienced surgeon.

Date : 2008-08-26  
Session : CTL - Spine: Spinal Deformities  
Time : 0800-0900  
Room: Theatre 1

**Abstract number : 19094**  
**SOLUTIONS FOR DIFFICULT SPINAL DEFORMITY PROBLEMS**

John C.Y. LEONG  
*The Open University of Hong Kong, Hong Kong (HONG KONG)*

Severe and rigid kyphoscoliosis (>100°inflexible), can only be corrected by SPINAL COLUMN RESECTION (VERTEBRECTOMY) in one/two stages, by combined anteroposterior approach, removing an apical vertebra under direct vision. To avoid damaging blood supply of the spinal cord, careful dissection at the intervertebral foramina is needed, avoiding diathermy. After vertebrectomy a medial hinge must be preserved so that upper and lower limbs of the curvature translate towards the midline together. Instrumentation should aim at concave distraction to maintain medial hinge, and convex compression for correction. The author had NOT experienced any neurological complication. Rigid angular kyphosis causing cord compression. Anterolateral approach is difficult in the upper thorax because of cone-shaped chest cavity; and in the lower lumbar spine big vessels bowstring anterior to the internal kyphus. We described a DIRECT INTERNAL KYPHECTOMY, allowing safe decompression under direct vision. Through a paraspinal curved longitudinal incision, several ribs are exposed, and the posterior two inches of three ribs are removed, preserving the intercostal vessels, which lead to the pedicles, bunched together by the kyphosis. Pedicle removal exposes the internal kyphus directly. Removal is by high-speed burr. Cervicothoracic junction approach is difficult. We described UNILATERAL/ BILATERAL MANUBRIOTOMY. Midline longitudinal incision from the manubrial notch to 3cm caudad to the manubriosternal angle. The manubrium is osteotomized, with the transverse limb exiting at the second intercostal space. An 8cm-wide exposure to the spine is possible, between the major blood vessels. REFERENCES: Strategies for Difficult Spinal Problems. Proceedings 67th AAOS Meeting 2000 &#8211; Symposium on International Contributions in Orthopaedics, p160. Anterior approach to the cervicothoracic junction by unilateral or bilateral manubriotomy. JBJS 84A/1013-1017, 2002. &#8220;Adult Spine Tuberculosis&#8221;, in &#8220;Inflammatory Diseases of the Spine&#8221;, Govender S and Leong JCY. TTG Asia Media Pte Ltd, Chapter 11/1-14, 2003. Direct internal kyphectomy for severe angular tuberculous kyphosis. Clin. Orthop. 460/124-129, 2007.

**Date : 2008-08-26**  
**Session : CTL- Spine: Spinal Deformities**  
**Time : 0800-0900**  
**Room: Theatre 1**

**Abstract number : 19197**  
**DEVELOPMENT OF SCOLIOSIS SURGERY IN CHINA**  
Guixing QIU  
*Peking Union Medical College Hospital, Beijing (CHINA)*

This talk will give an overview of how Chinese surgeons have dedicated themselves to scoliosis surgery in the past 20 years. 1. RESEARCH regarding idiopathic scoliosis classification In 2003, Peking Union Medical College Hospital Department of Orthopedics designed and introduced a new classification for adolescent idiopathic scoliosis. This Peking Union Medical College (PUMC) classification provides a guideline for the selection of surgical approaches and fusion area. 2. SELECTIVE FUSION CRITERIA Using the PUMC classification, if there is no thoracolumbar kyphosis  $>10^\circ$ ; while scoliosis parameters fulfill the following: lumbar curve Cobb angle  $<45^\circ$ ; lumbar curve flexibility  $>70^\circ$ ; apical vertebral rotation of the lumbar curve  $<11^\circ$ ; then selective thoracic fusion can be safely performed. 3. INTERNAL FIXATION SELECTIONS Instrumentation has paralleled global development with the more recent introduction of thoracic pedicle screws. However, up till now there is no matched, comparable large sample research regarding the advantages of an all screws fixation system. 4. ANTERIOR APPROACHES (open and video-assisted thoracoscopic surgery, VATS) Anterior correction and fusion surgery has several advantages compared to posterior, in particular the more recent development of VATS. Although surgical trauma is reduced, this technique is only indicated in a small percentage of patients with mild to moderate scoliosis, with normal or mildly abnormal pulmonary function. 5. EARLY ONSET SCOLIOSIS Can be dealt with by a number of modern techniques including hemivertebra resection, vertical expandable prosthetic titanium rib (VEPTR) and growing rods. All these techniques will be outlined and their relative advantages and disadvantages discussed.

**Date : 2008-08-26**

**Session : Symposium - Spine: Spinal Deformities**

**Time : 0900-1030**

**Room: Theatre 1**

**Abstract number : 19180**

**FUSION LEVEL DETERMINATION IN ADOLESCENT IDIOPATHIC SCOLIOSIS**

Kenneth M.C. CHEUNG, Keith Dip-Kei LUK

*University of Hong Kong, Queen Mary Hospital, Hong Kong (HONG KONG)*

A number of different methods have been described to determine the upper and lower fusion levels in adolescent idiopathic scoliosis (AIS). These include the stable zone, neutral vertebra, use of bending films to assess mobility of adjacent discs, traction radiographs and prone-push radiographs, etc. Whichever method is used, the selection ultimately relies a great deal on the surgeons experience. We propose that the most important determinant of fusion level is the spines flexibility, such that shorter fusions can be performed for flexible curves, while more rigid curves require longer fusions to achieve balance. Use of the fulcrum bending radiograph could reliably predict spinal flexibility before surgery, and we have successfully used this to determine fusion levels. The principle and technique involved will be discussed in detail.

**Date : 2008-08-26**  
**Session : Symposium- Spine: Spinal Deformities**  
**Time : 0900-1030**  
**Room: Theatre 1**

**Abstract number : 19265**  
**MANAGEMENT OF CONGENITAL SCOLIOSIS WITH SPINAL DYSRAPHISM**

Ahmet ALANAY  
*Hacettepe University Faculty of Medicine, Sıhhiye Ankara (TURKEY)*

Spinal dysraphism may be a common finding associated with congenital scoliosis (range, 3.8%-58%). Higher risk of neurological injury may be expected for congenital scoliosis patients with spinal dysraphism after posterior instrumentation and correction because of more frequent tethering of the spinal cord. Major forms of spinal dysraphism seen in congenital scoliosis patients are split cord malformations. Split cord malformations (SCM) can be classified in two different types, as type I SCM (diastematomyelia with 2 hemicords in double dura and with bony/cartilaginous septum) and type II SCM (diastematomyelia with 2 hemicords in a single dura and without septum). The release of the tethering structures before applying any correction forces over the spinal column is a widely accepted indication. However, there is some controversy on the management of dysraphic state regarding the correction and instrumentation of congenital scoliosis. The key issues to enhance safety in our hands are as follows: (1) address spinal dysraphism in a proper way; resect the septum and reconstruct the dura by forming a single dura for type I SCM while there is no need for any intervention for type II SCM (2) prefer staged procedures for the treatment of spinal dysraphism and correction of scoliosis; (3) avoid distraction forces as a means for correction maneuver; (4) avoid, as much as possible, instrumentation intruding into the canal; and, finally, (5) aim an acceptable curve correction in accordance with a balanced spine. Considering the relatively higher risk of complication, preventing curve progression by early intervention with optimal surgical approach is still the ideal solution for managing congenital scoliosis and spinal dysraphism.

Date : 2008-08-26

Session : Symposium & Free Papers - Basic Science: Biomechanics

Time : 1100-1215

Room: Theatre 1

Abstract number : 16731

**AXIAL ALIGNMENT OF THE LOWER EXTREMITY IN INDIAN ADULTS**

Lalit MAINI<sup>1</sup>, Hemant SHARMA<sup>2</sup>, Ajay BAHL<sup>3</sup>, VK GAUTAM<sup>1</sup>

<sup>1</sup>Maulana Azad Medical College, Delhi (INDIA), <sup>2</sup>Aruna Asaf Ali Hospital, Delhi (INDIA), <sup>3</sup>Lok Nayak Hospital, Delhi (INDIA)

BACKGROUND: The restoration of normal axial alignment of the lower extremity is important to surgeons who perform reconstructive surgery of the knee. However, data on the normal alignment of the lower extremity in Indian adults are not available. METHODS: The axial alignment of the lower extremity in one hundred young male adults was measured on the weight bearing scanogram of the entire lower limb under standardized conditions. The angles measured were neck shaft angle, lateral distal femoral angle, medial proximal tibial angle, tibiofemoral angle, valgus angle. The mean age was twenty-three years. The results were compared with three similar published studies in Chinese and American whites. RESULTS: Medial inclination of the tibial plateau in our subjects was 4.2 degrees; this was greater than reported for American subjects but less than that for the Chinese. It was significantly noted that valgus angle was 6.1 degree at an average with the variation of 5-7 degrees. The average neck shaft angle was 128.4 and varied from 120-140 degrees. CONCLUSION: Compared with white subjects described in the studies by Moreland et al., and Hsu et al., the Indian subjects had larger medial inclination but lesser when compared with the Chinese subjects. Thus 4 degrees of external rotation of femoral component, instead of the commonly reported 3 degrees, may be required to obtain a rectangular flexion gap in total knee arthroplasty in our subjects.



**Date : 2008-08-26**  
**Session : Symposium & Free Papers - Basic Science: Biomechanics**  
**Time : 1100-1215**  
**Room: Theatre 1**

**Abstract number : 18152**

**COMPARISON OF VARIOUS AXES USED TO DETERMINE FEMORAL ROTATION DURING TOTAL KNEE REPLACEMENT - A MRI STUDY**

Paraskumar MOHANLAL, Sarah LOWER, Sunil JAIN  
*Medway Maritime Hospital, Kent, Rochester (UNITED KINGDOM)*

**INTRODUCTION:** Various reference axes are used in total knee arthroplasty to determine the femoral rotation including transepicondylar axis, posterior condylar axis and Whiteside's line. However, there are currently no golden standards as to the ideal axes to determine the true femoral rotation. **MATERIAL AND METHODS:** A prospective observational study was performed to analyse the various axes used to determine the femoral rotation during total knee replacement. All consecutive patients who underwent MRI of the knee between December 2006 and May 2007 were considered to be included in the study. The transepicondylar, posterior condylar, posterior femoral cortical, anterior femoral cortical and tibial anteroposterior axes were measured on the PACS system. **RESULTS:** Of the 100 patients, there were 75 males and 25 females with a mean age of 31 (20-39) years. The mean relation between the posterior condylar axes and transepicondylar axes was 3.9 (SD-1.71, 95% CI 3.58-4.26), posterior condylar axes and posterior femoral cortical axes was 5.85 (SD-2.76, CI 5.3-6.4), posterior condylar axis and anterior cortical axis was 6.21 (SD-3.09, CI 5.6-6.8) and posterior condylar axes and tibial antero-posterior axes was 89.6 (SD-5.18, CI 88.5-90.6). **CONCLUSION:** The transepicondylar axis appears to be the most consistent amongst the landmarks used to determine femoral rotation. However, even the transepicondylar axis shows a significant variation. If transepicondylar axis is not available we suggest the use of femoral anterior cortical axes as a reference landmark.

**Date : 2008-08-26**

**Session : Symposium & Free Papers - Basic Science: Biomechanics**

**Time : 1100-1215**

**Room: Theatre 1**

**Abstract number : 18406**

**ACCURACY EVALUATION FOR COMPUTER-ASSISTED NAVIGATION TOOLS IN TOTAL KNEE REPLACEMENT**

Rocco PITTO, Andrew GRAYDON

*Dept. of Orthop. Surg. and Biomechanics, Auckland (NEW ZEALAND)*

The purpose of our study was: 1) to develop a method to assess the accuracy of an image-free TKR navigation system; 2) to assess its accuracy in a leg with normal or abnormal mechanical axis. The system chosen was an image-free system based on electromagnetic technology, the MedTronic AxiEM TKR navigation system. An artificial leg (phantom) was constructed from machined Plexiglas with simulated hip and knee joints. Additional joints located at the midshaft of the tibia and femur allowed deformation in the flexion/extension (y), varus/valgus (x) and rotational (z) planes. Using a highly accurate digital calliper unit to precisely measure co-ordinates with pre-machined points on the phantom, a software program was developed to convert these local co-ordinates into a determination of actual leg alignment. Simulated procedures were then performed with both normal and abnormal leg mechanical axis. At specific points in the procedure, information was compared between the FaroARM digital measurements and the CAS system. Repeated serial measurements were undertaken. In the setting of normal alignment, accuracy to within one degree was demonstrated. In the setting of abnormal x, y and z plane alignment in both femur and tibia, accuracy to within two degrees was demonstrated. The study demonstrates the high level of in-vitro accuracy of the MedTronic AxiEM navigation system in both normal and abnormal mechanical leg alignment settings.

**Date : 2008-08-26**

**Session : Symposium & Free Papers - Basic Science: Biomechanics**

**Time : 1100-1215**

**Room: Theatre 1**

**Abstract number : 19136**

**IMPLANTED SYSTEM IN ORTHOPAEDICS AND TRAUMATOLOGY**

Franz BURNY, Yves Armand ANDRIANNE, Monique DONKERWOLCKE, Maurice G. HINSENKAMP, Jean P.H. QUINTIN, Frédéric A. SCHUIND

*Cliniques Universitaires de Bruxelles, Hôpital Erasme, BRUXELLES (BELGIUM)*

**INTRODUCTION:**To be efficient and meet their indication the different osteosyntheses and prosthetic replacement must respect some imperatives. Clinical experience, experimental and theoretical studies formulate principles of implantation without, however, any synthesis or formulation of basic principles. It should consider mechanical and biological aspects of any implant, define the behaviour of subsets, forming the "implanted system", defined by a succession of constituting elements and interfaces.**MATERIAL AND METHOD:**The systemic approach is a new interpretation of reality, a new paradigm for the understanding of complex phenomena, whatever their nature (chemical, biological, psychical, etc). Each component or interface is itself a system submitted to general principles but also to its specific environment, including the medical staff. All components of the system are time related (unlike the mechanistic, analytical, and mono-causal paradigm of the classical science). The nature of the elements in presence assumes - material objects or interfaces; - constraints proper to the nature of the elements; - conditions of interaction; - production of organization.**RESULTS:**We propose to give an account, by examples, of the interrelations of the different elements between them, inside implanted systems. **DISCUSSION:**The interaction between the elements is the reciprocal action changing behaviour or nature of its elements. Numerous interactions link the elements:- a causative relation (influence of the rigidity of a fixation on the callus formation);- a temporal relation (fracture healing or loosening of implant);- a relation of "feedback" (compatibility is the control of the reciprocal influence between organism and implant).**CONCLUSION:**The systemic approach is a valuable tool to describe the evolution of orthopaedic implants in their environment.

**Date : 2008-08-26**  
**Session : Plenary Lecture - Trauma**  
**Time : 1215-1300**  
**Room: Theatre 1**

**Abstract number : 19175**  
**ORTHOPAEDIC TRAUMA: EVOLUTION IN CARE**  
James KELLAM  
*Carolinas Medical Centre, Charlotte (UNITED STATES)*

Orthopaedic Traumatology is a relatively new subspecialty in orthopaedic surgery. Beginning around the turn of the century Böhler, had the concept of coordinated specialized care for fractures and trauma patients. This was further developed with Müller and Allgöwer into the concept of early total care. From these beginnings a specialty in orthopaedic trauma has grown. Many changes have occurred over the past 20 to 30 years that has made the care given to the multiply injured patient and specific fracture significantly better and improved efficiencies in our care. This talk will deal with the changes in open fracture management and damage control as well as look at some of the issues that face orthopedic trauma in the future.

**Date : 2008-08-26**  
**Session : Symposium - Joint: Primary Total Knee Replacement I**  
**Time : 1100-1215**  
**Room: Theatre 2**

**Abstract number : 19107**

**TOTAL KNEE ARTHROPLASTY WITH COMPUTER-ASSISTED OR CONVENTIONAL TECHNIQUE. RADIOGRAPHIC AND THREE-DIMENSIONAL EVALUATION**

Young-Hoo KIM

*Ewha Womans University School of Medicine, Seoul (KOREA)*

Background: Whether total knee arthroplasty using computer-assisted surgical navigation can improve the limb and component alignment is a matter of debate. We hypothesized that total knee arthroplasty using computer-assisted surgical navigation is superior to the conventional total knee arthroplasty with regard to the precision of implant positioning. Methods: Sequential simultaneous bilateral total knee arthroplasties were carried out in 160 patients (320 knees). One knee was replaced using a computer-assisted surgical navigation system and the other conventionally without using computer-assisted surgical navigation. The two methods were compared for accuracy of orientation and alignment of the components determined by radiographs and computed tomographs. The mean follow-up was 3.4 years. Results: The mean preoperative Knee Society score was 26 points in the computer-assisted total knee arthroplasty group, which was improved to 92 points postoperatively and it was 25 points, which improved to 93 points postoperatively in the conventional total knee arthroplasty group. Ranges of motion of the knees were similar in both groups. The operating and tourniquet times were significantly longer in the computer-assisted total knee arthroplasty group than in the conventional total knee arthroplasty group ( $P < 0.001$ ). Accuracy and the number of outliers of component position between the two groups were not significantly different ( $P > 0.05$ ). Conclusions: Our data demonstrated that total knee arthroplasty using computer-assisted surgical navigation did not result in more accurate implant positioning than that achieved in conventional total knee arthroplasty, determined by both radiographs and computed tomographs.

**Date : 2008-08-26**

**Session : Symposium - Joint: Primary Total Knee Replacement II**

**Time : 1600-1730**

**Room: Theatre 2**

**Abstract number : 19109**

**PRIMARY TOTAL KNEE ARTHROPLASTY IN STIFF AND ANKYLOSED KNEES**

Young-Hoo KIM

*Ewha Womans University School of Medicine, Seoul (KOREA)*

Background: There have been conflicting reports regarding the clinical results and the range of motion achieved after total knee arthroplasties in patients with stiff and ankylosed knees. The purpose of this study was to investigate the clinical results, range of motion, function of patients, complication and revision rates after total knee arthroplasties in the patients with stiff (<50° flexion) and ankylosed knees. Methods: Seventy-four patients (eighty-six knees) with stiff knees (mean age, 63.7 years) and ninety patients (ninety-nine knees) with ankylosed knees (mean age, 58.1 years) underwent total knee arthroplasties with a posterior stabilized prosthesis. The mean duration of follow-up in the stiff knee group was 9.1 years (range, five to twelve years and it was 8.9 years (range, 6.6 to fourteen years) in the ankylosed knee group. Results: The mean preoperative Hospital for Special Surgery and Knee Society knee and functional scores in the stiff knee group (42, 11, and 42 points, respectively) were lower than those (60, 53, and 71 points, respectively) ( $P<0.0001$ ) in the ankylosed knee group. The mean postoperative Hospital for Special Surgery and Knee Society knee and functional scores in the stiff knee group (84, 90, and 84 points, respectively) were higher than those (74, 77, and 73 points, respectively) ( $P<0.029$ ) in the ankylosed knee group. Pre- and post-operative WOMAC scores in the stiff knee group were 73 and 34 points, respectively and those were 79 and 37 points, respectively, in the ankylosed knee group ( $P=0.213$  and  $0.12$ ). Complication rate was significantly higher (54%) in the ankylosed knee group than that (26%) in the stiff knee group ( $p=0.031$ ). Revision rate was higher in the ankylosed knee group (4%) than that in the stiff knee group (1%). Conclusions: The data presented here indicate that success in reconstructing a previously stiff or ankylosed knee is possible, but with compromised results and increased complications.

**Date : 2008-08-27**  
**Session : Sports: ligament reconstruction 1**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 15446**

**THE MODIFIED BOSWORTH TECHNIQUE FOR THE TREATMENT OF ACUTE TRAUMATIC ACHILLES TENDON RUPTURE**

Nicolas EFSTATHOPOULOS, Dimitrios KORRES, Fragiskos XYPNITOS, Stergios LALLOS, Vassilios NIKOLAOU  
*2nd Department of Orthopaedics - Athens University, Athens (GREECE)*

AIM: The aim of this study is to present the outcome of modified Bosworth technique for the treatment of acute traumatic Achilles tendon rupture over a 23 year period. PATIENTS AND METHODS: Between 1983 and 2006, 27 patients (23 males) (age 18-62 years) with acute traumatic Achilles tendon rupture, were treated surgically in our Department. The mechanism of injury was powerful dorsiflexion of the ankle during athletic (18 pts) or normal (9 pts) activity. The operation was performed 1-8 days post-injury. We employed a modified Bosworth technique. The modifications of the original Bosworth technique were the use of a shorter tendon strip and the additionally end-to-end tendon suture for the treatment of acute ruptures. Postoperatively an above-knee plaster cast was applied with the knee flexed 30°-40° and the foot in a relaxed equinus position. The plaster cast was changed to a below-knee after 4 weeks and the foot gradually dorsiflexed to a neutral position until the 6th week, and then the plaster cast was removed. RESULTS: The mean follow-up time was 15 years (1-23). No patient had wound separation, infection or skin slough. All the patients have returned to their activities within a mean time of 3 months. All the patients have a painless ankle, with an average reduction of dorsiflexion of approximately 5°. No re-rupture has been reported. CONCLUSIONS: We believe that modified Bosworth technique as a method is acceptable to the patients, without primary or later complications, and allows the patients to return to all pre-injury activities.

**Date : 2008-08-27**

**Session : Sports: ligament reconstruction 1**

**Time : 0900-1030**

**Room: 403**

**Abstract number : 15448**

**AGREEMENT BETWEEN MRI AND CLINICAL EXAMINATION CAN PREVENT UNNECESSARY ARTHROSCOPY**

Vassilios NIKOLAOU, Efsthios CHRONOPOULOS, Stergios LALLOS, Dimitrios KORRES, Nicolas EFSTATHOPOULOS  
*2nd Department of Orthopaedics - Athens University, Athens (GREECE)*

**AIM:** Magnetic resonance imaging (MRI) is frequently used as a diagnostic tool for the injuries of the knee joint. Many surgeons tend to believe that MRI is an accurate, non invasive diagnostic method, enough to lead to decisions for conservative treatment and save a patient from unnecessary arthroscopy. We conducted a retrospective study to investigate the diagnostic value of the MRI and clinical examination for the detection of injuries of the meniscus and cruciate ligaments of the knee in comparison with the intraoperative arthroscopic findings. **PATIENTS AND METHODS:** Between May 2005 and February 2006, 102 patients after clinical examination were diagnosed with meniscal or cruciate ligament injury and underwent definitive treatment with arthroscopy. 46 of these patients underwent additional examination with MRI and fulfilled the inclusion criteria. The accuracy, sensitivity, specificity and the predictive values of the MRI findings and preoperative clinical examination were correlated with the lesions identified during arthroscopy. **RESULTS:** The accuracy for tears of the medial, lateral meniscus, anterior and posterior cruciate ligaments were 81%, 77%, 86%, 98% respectively. The specificity was 69%, 88%, 89% and 75% respectively. The positive predictive value was 83%, 81%, 90% and 100% respectively. The clinical examination had significant lower reliability in the detection of these injuries. Nevertheless, when we identified the patients that MRI and clinical examination positively or negatively agreed the positive and negative predictive value reached as high as 98%, 94%, 97%, 100% and 96%, 98%, 100% and 100% respectively.



**Date : 2008-08-27**  
**Session : Sports: ligament reconstruction 1**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 15449**

**AXILLARY ARTERY AND BRACHIAL PLEXUS INJURY AFTER ANTERIOR SHOULDER DISLOCATION**

Vassilios NIKOLAOU<sup>1</sup>, Anastasia PILICHOU<sup>1</sup>, Dimitrios STARAMOS<sup>2</sup>, Dimitrios KORRES<sup>1</sup>, Nicolas EFSTATHOPOULOS<sup>1</sup>  
<sup>1</sup>2nd Department of Orthopaedics - Athens University, Athens (GREECE), <sup>2</sup>Department of Vascular Surgery, Athens (GREECE)

**AIM:** We present the case of an elderly man with a recurrent dislocation, transection of the axillary artery and an associated severe brachial plexus injury. **PATIENT AND METHODS:** A 74-year-old man presented to the accident and emergency department suffering from an anterior dislocated left shoulder. On clinical examination the radial and brachial pulses were absent and the neurologic examination revealed no motor or sensory function distal to the elbow joint. Swelling became apparent in the left axilla, which soon extended across the patients' chest wall. An arterial injury was confirmed by Doppler ultrasound and the patient was transferred immediately to the operating room where an angiography was performed under fluoroscopic control that revealed linear tear of the axillary artery at its third part, probably due to avulsion of its distal branches. An arterial graft was used to bridge the region proximally and distally to the injury. The brachial plexus was explored at the level of the transected artery and found to be in continuity. **RESULTS:** Four weeks after surgery full sensory recovery was noted and motor function was significantly improved but appeared still impaired. At the latest follow-up, 13 months after surgery full sensory and motor function has been restored. **CONCLUSION:** This kind of rare injury can be easily missed without a simple clinical examination. Physicians must be aware of the pathognomonic triad of anterior shoulder dislocation, absent peripheral pulse and expanding axillary haematoma in order to raise the index of suspicion for identifying this limb threatening injury.

Date : 2008-08-27

Session : Sports: ligament reconstruction 1

Time : 0900-1030

Room: 403

Abstract number : 15677

**AN EVIDENCE BASED REVIEW OF THE USE OF INJECTION THERAPY FOR TENDINOPATHIES OF THE SHOULDER AND ELBOW**

Nemandra SANDIFORD<sup>1</sup>, Crook TIM<sup>2</sup>

<sup>1</sup>The London Hip Unit, London (UNITED KINGDOM), <sup>2</sup>UWIC, Cardiff School of Sport, Cardiff (UNITED KINGDOM)

INTRODUCTION: The rotator cuff tendons as well as those of the common flexor and extensor origins at the elbow are prone to overuse with injuries. The rotator cuff is affected in 20-30% of cases and the elbow in 0.4-0.7% of cases. AIM: To provide current and evidence based review of the use of injection therapy for tendinopathies of the shoulder and elbow. METHOD: We performed PubMed and Medline searches using the phrases "injection", "tendon", "shoulder", "tennis elbow" and "golfer's elbow". The evidence was categorised, tabulated using Microsoft Excel and a critically appraised. RESULTS: Shoulder: Buchbinder and Van der Heijden revealed overall poor concordance among studies. They found no firm evidence for the beneficial use of injectable steroids in this region. One randomised controlled trial found steroids to be superior to intra articular lignocaine. Case series abound about various other treatment strategies such as suprascapular nerve blocks and needle fragmentation. Elbow: Lateral and Medial Epicondylitis: Verhar showed steroid injection to be superior to physiotherapy at six weeks. Crowther found similar success using triamcinolone over shock wave therapy at 3 months. Altay attributed his success to his "peppering" technique of injecting the steroid rather than to the injected compound itself. Two studies have reported success with autologous blood injection. CONCLUSION: A definite consensus could not be made due to variability in methodology and lack of long term. Further research is necessary.

**Date : 2008-08-27**  
**Session : Sports: ligament reconstruction 1**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 15679**

**A REVIEW OF THE CURRENT PRACTICE OF MENISCAL ALLOGRAFT TRANSPLANTATION**

Timothy B. CROOK<sup>1</sup>, Nemandra A. SANDIFORD<sup>2</sup>, Antonia ARDOLINO<sup>1</sup>, Lucy A.P. WILLIAMS<sup>1</sup>, Ian W. BARLOW<sup>1</sup>  
<sup>1</sup>*Cardiff School of Sport, Cardiff (UNITED KINGDOM)*, <sup>2</sup>*The London Hip Unit, London (UNITED KINGDOM)*

**INTRODUCTION:** Meniscal surgery accounts for approximately 50% of all arthroscopic procedures performed on the knee annually. Resection of only 20% of a meniscus results in a 350% increase in joint contact forces with the resultant joint degeneration hence a conservative approach is warranted. **AIM:** To perform an evidence-based review of meniscal allograft transplantation surgery. **METHOD:** A review of data over the last ten years was performed via PubMed and Medline using the key words "meniscal transplant surgery". Papers were grouped according to their levels of evidence and analysed. **RESULTS:** No Level 1 or 2 studies were identified and only 20% of studies looked at isolated meniscal transplantation. **GRAFT TYPES:** Four types of graft are used - fresh, fresh frozen, cryopreserved and freeze dried (lyophilized) graft. Cryopreserved and fresh frozen allografts are most frequently used. The process of freeze drying leads to graft shrinkage hence use of this type is discouraged. **FIXATION:** Best results occur when anterior using bony fixation vs soft tissue sutures. **OUTCOMES:** Cook reported a 75% improvement in pain and function over 4-6 years. The effect on future joint degeneration is still unknown. The ideal patient group includes patients under 40 years of age with knee pain, proven meniscal injury and a normally aligned, stable joint without severe degenerative changes. Roth reported that 36% of grafts tore after implantation. **CONCLUSION:** This is a relatively new high risk procedure with no long-term results. No statistically significant studies looking at isolated meniscal transplantations have been found.

Date : 2008-08-27

Session : Sports: multiple ligament injuries

Time : 0900-1030

Room: 403

Abstract number : 15999

#### THE INFLUENCE OF IL-1BETA ON THE BONE TUNNEL WIDENING AFTER ACL RECONSTRUCTION OF A KNEE JOINT

Nikica DARABOS<sup>1</sup>, Miroslav HASPL<sup>2</sup>, Carsten MOSER<sup>3</sup>

<sup>1</sup>Department of Traumatology, General Hospital Varazdin, Varazdin (CROATIA), <sup>2</sup>Department of Orthopaedic Surgery, School of Medicine, University of Zagreb, Zagreb (CROATIA), <sup>3</sup>Center for Molecular Orthopaedics, Duesseldorf (GERMANY)

Pro-inflammatory cytokines play a pivotal role in osteoarthritis, as well as in the bone tunnel widening after ACL reconstructive surgery. A new treatment option is to administer Autologous Conditioned Serum (ACS) containing endogenous anti-inflammatory cytokines including IL-1Ra and several growth factors. The purpose of this trial was to establish whether the osteoclastic effect could be affected by intra-articular application of ACS, thus resulting in a potential decrease of knee laxity and representing a better postoperative outcome. In a prospective, randomised, double-blind, placebo-controlled trial with two parallel groups, 62 patients were treated. Bone tunnel width was measured by CT-scans, whereas the clinical efficacy was assessed by patient-administered outcome instruments (WOMAC, IKDC 2000) up to two years following the ACL-reconstruction in patients receiving ACS (Group A) or Placebo (Group B). We compared the levels and dynamics of IL-1beta concentrations in the synovial liquid and examined the correlation between the levels of IL-1beta in three different postoperative periods. Bone tunnel dilatation in the first year was significantly lower (range 6-35%) in Group A than in Group B (range 41-98%). The clinical outcome (WOMAC, IKDC 2000) was significantly better in patients treated with ACS. A decrease of the IL-1beta synovial fluid concentration appeared more pronounced in absolute terms in Group A as compared with Group B. The intra-articular application of ACS tends to result in a decrease of widening of the bone tunnel and could prevent possible bad results after ACL reconstructive surgery.

**Date : 2008-08-27**

**Session : Sports Medicine: Multiple Ligament Injuries / Ligament Reconstruction**

**Time : 0900-1030**

**Room: 403**

**Abstract number : 16606**

**REPLACEMENT OF THE CLAVICULAR LIGAMENTS**

Sergey SERGEEV<sup>1</sup>, Andrey NEVZOROV<sup>2</sup>, Oleg GRISHANIN<sup>3</sup>, Sergey SHCHETININ<sup>3</sup>

<sup>1</sup>*Russian Friendship University, Moscow (RUSSIAN FEDERATION)*, <sup>2</sup>*DONA-M, Moscow (RUSSIAN FEDERATION)*, <sup>3</sup>*Hospital 20, Moscow (RUSSIAN FEDERATION)*

There are three types of the clavicular acromion end injury: 1) rupture of Lig. Acromioclaviculare with subluxation of the clavícula; 2) rupture of Lig. Coracoclaviculare and Lig. Acromioclaviculare with dislocation of the clavícula and 3) fracture of the acromion end of the clavícula. The second type is the indication for surgery for few reasons: pain and disturbance of the shoulder function, prominence and cosmetic defect. As far as the ligament junction is a dynamic structure we developed the special artificial ligament (DONA- M, Russia) and work up the reconstructive operation. The technique of the operation consists in the following steps: curved incision and revision of the Lig. Acromioclaviculare and the Lig. Coracoclaviculare, passing the artificial ligament under the Proc. Coracoideus and through the drill holes in clavícula, fixation of the ends of the new ligament with the screws. After the operation no immobilization and full range movements are available in three weeks. We have the experience of 12 operations with excellent follow-up results: no pain, full range of motion, no complication from the wound and signs of tissue reaction.

**Date : 2008-08-27**

**Session : Sports: multiple ligament injuries**

**Time : 0900-1030**

**Room: 403**

**Abstract number : 16633**

**KNEE INJURIES IN THE FLOATING KNEE**

Ulfin RETHNAM<sup>1</sup>, Rajam YESUPALAN<sup>2</sup>, Rajagopalan NAIR<sup>3</sup>

<sup>1</sup>*Glan Clwyd Hospital / St John's Medical College, Rhyl / Bangalore (UNITED KINGDOM)*, <sup>2</sup>*Glan Clwyd Hospital, Rhyl (UNITED KINGDOM)*, <sup>3</sup>*St John's Medical College, Bangalore (INDIA)*

**BACKGROUND:** There is a high incidence of ipsilateral knee injuries with the Floating knee, which makes these fractures even more challenging to manage. We present the impact knee injuries have on the final outcome of the floating knee. We propose a protocol for the assessment and management of knee injuries with the Floating knee. **MATERIALS AND METHODS:** This prospective study included 29 patients with floating knee injuries. Knee injuries encountered were divided into bony, ligamentous and soft tissue. Bony injuries were assessed with radiographs and managed surgically along with the floating knee injury. Patients were assessed clinically for knee ligament injuries after fixation of the fractures intra-operatively and managed surgically. Soft tissue injuries around the knee were managed conservatively. Final outcome was assessed using the Karlstrom criteria. **RESULTS:** 10/29 patients had knee injuries. 3 patella fractures, 2 anterior cruciate ligament injuries, 1 posterior cruciate ligament injury, 1 medial meniscus injury and 3 extensive soft tissue injuries to the knee were encountered. The complications were knee stiffness and superficial infection. The end results according to the Karlstrom criteria were: Good - 6, Acceptable - 1 and Poor - 3. **CONCLUSION:** The associated knee injuries in the Floating knee are an important prognostic indicator. Soft tissue injury seems to have a very poor prognosis. We propose clinical evaluation of the knee after fixation of the fractures, surgical management of ligament and bony injuries and a proper rehabilitation programme to improve outcomes.

**Date : 2008-08-27**  
**Session : Sports: multiple ligament injuries**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 16868**

**FIRST LINE ACL RECONSTRUCTION WITH QUADRICEPS TENDON**

Noureddine BAHRI, Oliver James BISPING, Christian QUEITSCH, Christian JÜRGENS, Arndt-Peter SCHULTZ  
*Bg-Trauma Hospital, Hamburg (GERMANY)*

**INTRODUCTION:** Established standard implants for ACL reconstruction remain the patellar BTB and hamstring grafts. Quadriceps tendon with patellar bone block is mainly used for revision procedures. The aim of this study was to determine the results of a bone free tendon as a first line transplant for ACL reconstruction. **MATERIAL AND METHODS:** From 2004 to 2005, 63 patients with an ACL deficiency were treated with an ipsilateral quadriceps graft. Fixation was with polylactid pins. Mean follow-up period was 17 months (11-30). Preoperative Tegner- and Lysholm Score as well as the IKDC form were evaluated. These tests were repeated at follow-up together with KT-1000 measurement. Study set-up was prospective, study hospitals were a University hospital, a Level 1 Trauma centre and a District General Hospital. **RESULTS:** In all cases the graft was sufficient for transplantation. In two female patients fixation with crosspins was not possible due to a small tibial head. In one case a hyperaesthesia in the area of the femoral crosspins developed; there was no case of DVT in this series. In 5 cases a extension deficit of 5° was seen at follow-up. The Tegner and Lysholm Score results were comparable with reported results of hamstring and BTB grafts. **CONCLUSION:** The free quadriceps tendon has shown to be a transplant that can be used in the first line treatment of ACL deficiency. There is a high primary stability. There was no patellar morbidity and the medial structures of the knee are not weakened.

Date : 2008-08-27

Session : Sports: multiple ligament injuries

Time : 0900-1030

Room: 403

Abstract number : 16946

**ACL TO PCL IMPINGEMENT. A CADAVER STUDY TO EVALUATE POSSIBLE IMPINGEMENT BETWEEN THE ACL AND PCL USING EXTENSION AND FLEXION MRI AND ARTHROSCOPIC EVALUATION**

Michael HEXEL<sup>1</sup>, Wei SHEN<sup>2</sup>, Eric KROPF<sup>2</sup>, Sheila INGHAM<sup>2</sup>, Jenny GROSZ<sup>2</sup>, Freddie FU<sup>2</sup>

<sup>1</sup>Orthopaedic Hospital Vienna Speising, Vienna (AUSTRIA), <sup>2</sup>Dep. of Orthopaedic Surgery, UPMC, Pittsburgh (UNITED STATES)

The authors evaluated anatomic findings in human cadaver knees concerning ACL-PCL Impingement in various settings of range of motions and dynamic changes and interaction between the ACL and PCL in the human knee joint. Six human cadaver knees, with no previous knee injury were examined, using a standardized MRI imaging protocol for ACL and PCL pre- and postoperatively. Imaging was performed using a special designated wrist coil at 0°, 45° and 90° of extension/flexion of the knee sagittal TSEweighted as well as two TSEweighted oblique coronal views. All picture files were measured concerning ACL and PCL length, width, distances in between the ligaments in correlation to notch width and areas above and in between the ligamentous structures, as well as shapes and angles of the ligaments. Images were analysed concerning any signs of Impingement. An arthroscopy of the knee joint was performed using a 6 portal approach afterwards. No signs of Impingement could be found in any of the cadaver knees between 0° and 90° of knee motion. MRI imaging as well as the arthroscopic and microscopic evaluation showed that the ACL and PCL showed an alteration of never before described various shapes and sizes in different positions of ROM, without ever touching in these static and dynamic evaluations. There is no Impingement in normal functioning human knees during movements between 0° and 90°. Events, for example trauma or ACL surgery with misplaced tunnels may cause Impingement and following structural damage to the cruciate ligaments in the knee.



**Date : 2008-08-27**  
**Session : Sports: multiple ligament injuries**  
**Time : 0900-1030**  
**Room: 403**

**Abstract number : 17248**

**NEGLECTED EXTENSOR MECHANISM DEFECTS OF THE KNEE: RECONSTRUCTION BY LARS LIGAMENT**

Mandeep DHILLON, Akshay GOEL, Devinder CHAUHAN

*Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh (INDIA)*

Methods for reconstruction of extensor mechanism deficits at the knee either require autograft or allograft tendons to bridge gaps/augment repairs. In underdeveloped countries, neglected injuries compound the problem, and patients often present with huge gaps due to the superiorly migrated proximal part. **MATERIALS:** We used LARS (Ligament Augmentation and Reconstruction System) for reconstruction of these complex deficits in 4 patients (all male, age 20-56 years, delays 4 months to 2 years). Preoperative fine wire traction was needed in all 4 to pull down the high riding patella; LARS ligament was used to stabilize patella to the tibial insertion, as an augment to extensor repair. This ligament was threaded through the patellar tendon to reinforce the repair in 3 cases and was used outside the tendon through drill holes in patella and tibia in 1 case. No case had residual extensor lag or failure of the construct at average 9-month follow-up. One case developed superficial infection, which needed debridement, but outcome was satisfactory. **DISCUSSION:** The problem of instability in neglected extensor mechanism deficits is tackled well by the strong Polyester fibers of LARS ligament; it has the advantage that no autograft or allograft is needed, with reduced donor morbidity and disease transmission risks. It also allows tissue in-growth into its scaffolding, which makes the construct stronger with time. Limitations may be the cost, which is moderately high; but this is offset by the excellent results and the reduced morbidity.

Date : 2008-08-27

Session : Sports: anterior cruciate ligament repair

Time : 1400-1530

Room: 403

Abstract number : 15732

#### MEASUREMENT OF THE ANTEROPOSTERIOR AND ROTATIONAL KNEE LAXITY BY A NAVIGATION SYSTEM

Jean-Yves JENNY<sup>1</sup>, Eugen CIOBANU<sup>1</sup>, Cyril BOERJ<sup>1</sup>, Yann DIESINGER<sup>2</sup>

<sup>1</sup>University Hospital Strasbourg, Illkirch (FRANCE), <sup>2</sup>Centre de Chirurgie Orthopédique et de la Main, Illkirch-Graffenstaden (FRANCE)

**INTRODUCTION:** Anteroposterior and rotational laxity are responsible for the knee functional instability after ACL rupture. The measurement of anteroposterior laxity by instrumental or X-ray techniques are accepted. However, the measurement of rotational instability is not commonly performed. Navigation systems might help in this measurement. **MATERIAL AND METHODS:** We routinely use a non-image based navigation system (ORTHOPILOT TM, AESCULAP, RFA) during ACL replacement. 20 cases of ACL replacement have been analysed. The anterior laxity was measured preoperatively by dynamic X-rays at 25° of knee flexion. Intraoperative navigation was performed as usual. The anterior and rotational laxity at 25° of knee flexion was measured under maximal manual force before and after ACL replacement. The anterior laxity was measured postoperatively by dynamic X-rays at 25° of knee flexion. X-rays and navigated measurements were compared by a Wilcoxon test with  $p=0.05$ . **RESULTS:** There was a significant difference between navigated and radiographic measurements. However, this difference was less than 2mm in most cases, and then considered as clinically irrelevant. There was a significant correlation between the two measurements. **DISCUSSION:** The navigation system used allowed us measuring anterior and rotational laxity during ACL replacement. This measurement of the anterior laxity was correlated to the pre and postoperative stress X-rays, and can therefore be considered as reliable. The intraoperative information might be relevant to control the quality of the procedure, and improve its reproducibility. Information about rotational laxity may be helpful, but their exact significance must be more precisely defined.

**Date : 2008-08-27**  
**Session : Sports: anterior cruciate ligament repair**  
**Time : 1400-1530**  
**Room: 403**

**Abstract number : 15734**

**MEASURING THE POSITION OF THE ACL FOOTPRINT WITH A NAVIGATION SYSTEM. COMPARISON WITH X-RAY AND CT MEASUREMENTS**

Jean-Yves JENNY<sup>1</sup>, Eugen CIOBANU<sup>1</sup>, Cyril BOERI<sup>1</sup>, Yann DIESINGER<sup>2</sup>

<sup>1</sup>University Hospital Strasbourg, Illkirch (FRANCE), <sup>2</sup>Centre de Chirurgie Orthopédique et de la Main, Illkirch-Graffenstaden (FRANCE)

**INTRODUCTION:** Navigation systems might enhance the accuracy of ACL replacement. **MATERIAL AND METHODS:** 10 cadaver knees with intact soft-tissue and without any intra-articular abnormalities were studied. We used a non-image based navigation system (OrthoPilot®, Aesculap, Tuttlingen, FRG). The most anterior, posterior, medial and lateral point of both tibial and femoral attachment of the ACL were marked with metallic pins. The navigated stylus was positioned on these points, and the system recorded its position in comparison to the bone contours. Subsequently, we performed conventional plain AP and lateral X-rays and a CT-scan, and measured the position of the pins in comparison to the bone contours. Finally, all measurements were made again with a caliper after disarticulating the knee joint. We calculated the center of the footprint as the mid-point between the four pins of both tibial and femoral attachment for each measurement technique. All measurements were expressed as percentages of the bone size to compensate for the different sizes. **RESULTS:** There were no significant differences between the paired measurements of the location of the ACL footprints on both femur and tibia with either measurement techniques. There was a significant correlation between the paired measurements of the location of the ACL footprints on both femur and tibia with either measurement techniques. **DISCUSSION:** The mediolateral position of the ACL footprint can be accurately assessed by the navigation system used. Intraoperative measurement of the tunnel location during ACL replacement should be accurate with the navigation system used.

Date : 2008-08-27

Session : Sports: anterior cruciate ligament repair

Time : 1400-1530

Room: 403

Abstract number : 16191

**DIRECT RADIAL TUBEROSITY COMPRESSION TEST FOR DISTAL BICEPS TENDON PATHOLOGY IS SENSITIVE AND SPECIFIC**

Joseph ABBOUD

*3B Orthopaedics, University of Pennsylvania Health System, Philadelphia (UNITED STATES)*

INTRODUCTION: While full thickness distal biceps ruptures often present with associated deformity and ecchymosis, partial thickness tears of the distal biceps are difficult to definitively diagnose on physical examination and MRI. PURPOSE OF THE STUDY: To review the sensitivity and specificity of the radial tuberosity direct compression test to determine whether the biceps tendon was injured distally. METHODS: Consecutive series of 43 patients with partial distal biceps tendon avulsions were examined. To perform the direct compression test, elbow is flexed 90 degrees and pronated maximally and radiocapitellar joint is identified. The examiner using his contralateral hand slides his thumb ~3cm distal to radiocapitellar joint to have the thumb overlying the radial tuberosity. Direct compression is applied by examiner's thumb to the tuberosity along with gentle passive pronation and supination of patient's forearm. This is repeated on the patient's contralateral arm. When the direct compression test is abnormal, indicating a diseased distal biceps tendon, patient has discomfort upon application of direct pressure along the radial tuberosity. RESULTS: All 43 patients in the study had a positive direct compression test for partial thickness biceps tear. Sensitivity and specificity were both higher with the direct compression test (both 100%) than with MRI (85% and 95% respectively). CONCLUSION: Direct compression test is highly sensitive and specific test for assessment of partial thickness biceps tears. The diagnosis of a partial thickness distal biceps avulsion can be made with accuracy using the direct compression test and appropriately compliments findings on MRI.

Date : 2008-08-27  
Session : Sports: anterior cruciate ligament repair  
Time : 1400-1530  
Room: 403

Abstract number : 16288

**SUEROLATERAL CONTRACTURE RELEASE AND PES-ANSERINUS TRANSPOSITION FOR HABITUAL DISLOCATIONS OF PATELLA IN FLEXION - LONG-TERM RESULTS**

Debadyuti BAKSI<sup>1</sup>, Durgapada BAKSI<sup>2</sup>, N.D CHATTERJEE<sup>3</sup>, Ananda Kisor PAL<sup>4</sup>

<sup>1</sup>Tort Centre, Ninewells Hospital, University of Dundee, Kolkata (INDIA), <sup>2</sup>Kothari Medical Centre, Kolkata (INDIA), <sup>3</sup>I.PG.M.E&R Hospital, Kolkata (INDIA), <sup>4</sup>Burdwan Medical College, Kolkata (INDIA)

INTRODUCTION: Habitual dislocation of patella occurs commonly during each flexion of knee. MATERIALS AND METHODS: Fifty eight patients had 76 habitual dislocations of patella. Mean age was 14.5 years (5 to 22). The surgical technique was reported by Baksi, 1993, JBJS (Br.), 75B, 305-310. Release of lateral patellofemoral capsule down to ligamentum patellae and vastus lateralis in all, rectus femoris in 55% and vastus intermedius in 57% cases is required to allow the patella to retain in the intercondylar groove in fully flexed position of knee. The proximally migrated cut ends of tendons are stitched back to their adjacent sides or distal cut ends to maintain the normal quadriceps length and mechanism. Then the medial stabilisation of patella is ensured by the detached lower three quarter of Pes-Anserinus transposed to the anterior surface and medial border of patella and to the ligamentum patella. RESULTS: Mean follow-up was 17.5 years (3 to 29). The cases were evaluated by clinical, radiological and electromyographic studies pre and postoperatively. Following a criteria, 52 (68.4%) showed excellent, 19(25%) good, 4(5.3%) fair and one (1.3%) poor results. Two early postoperative recurrences due to technical faults were rectified without further recurrence. Quadriceps lag disappears in average 3.2 months. Retropatellar asymptomatic osteoarthritis occurred in 11% cases. DISCUSSION: Realignment of dislocated patella followed by Pes-Anserinus transposition, being a relatively unstretchable physiological sling, provided dynamic stability of patella. This can be used before epiphyseal closure and in adult.

**Date : 2008-08-27**

**Session : Sports: anterior cruciate ligament repair**

**Time : 1400-1530**

**Room: 403**

**Abstract number : 17223**

**ANATOMIC DOUBLE-BUNDLE ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: SURGICAL TECHNIQUE**

Hesham EL-KADY

*Arthroscopy and Sports Medicine Unit, Orthopaedic Department, Assiut University Hospital, Assiut (EGYPT)*

**INTRODUCTION:** The conventional technique of anterior cruciate ligament (ACL) reconstruction was primarily designed to replace the anteromedial (AM) bundle only. Although the results obtained with this technique are successful in restoring anterior knee stability, recent laboratory studies using different investigation devices demonstrated that the single bundle reconstruction is not so effective in reducing the coupled anterior tibial translation resulting from a combined valgus and internal tibial torque. Various techniques of double-bundle ACL reconstruction have been developed, and promising preliminary results have been reported. However, no consensus exists on the number of bony tunnels required, on the proper tunnel positioning and on bundles tensioning. **AIM OF THE WORK:** In this article we will highlight our early experience in double bundle anterior cruciate reconstruction. **PATIENTS AND METHODS:** Since the first of July 2007, we have performed double bundle ACL reconstruction in 18 cases, using hamstring tendon autograft, endobuttons for femoral fixation and stables for tibial fixation. **RESULTS AND CONCLUSIONS:** We standardized our technique in double bundle ACL reconstruction. The average operative time is 80 minutes (ranged 60-90 minutes). We had no particular complication related to this technique. **KEYWORDS:** ACL, double bundle.

**Date : 2008-08-27**

**Session : Sports: anterior cruciate ligament repair**

**Time : 1400-1530**

**Room: 403**

**Abstract number : 17348**

**CHRONIC EXERTIONAL COMPARTMENT SYNDROME OF THE LEG IN YOUNG ATHLETES: OUR EXPERIENCE**

Pierfilippo BOTTIGLIA AMICI-GROSSI, Paolo FERRUA, Marco OMETTI

*Istituto Ortopedico Gaetano Pini, Milan (ITALY)*

Chronic Exertional Compartment Syndrome is a well defined pathological entity presenting marked differences with other chronic leg pain causes in athletes. Our study's objective is to validate direct intracompartmental pressure measurement as a unique and unreplaceable diagnostic instrument and to analyse results after surgical therapy with Fasciotomy according to Rorabeck. We performed in 15 athletes (mean age 25.5; min age 18 max 32) direct intracompartmental pressure measurement using, under echo-doppler control, a Slit Catheter System; we found 13 athletes positive for anterior compartment, according to Pedowitz's criteria modified. After failure of conservative therapy lasting at least 3 months, fasciotomy was performed on 13 patients by the same surgeon (PFB). Results were excellent in 53.8% of patients with return to the same level of the sport practiced before CECS's diagnosis, good in 30.7% of patients with return to a lesser level and poor in 15.3% of patients with abandon of sporting activity. We think that establishing valid diagnostic and therapeutic protocols would bring to a quicker diagnosis that should permit an earlier and more appropriated therapy with the aim of avoiding disadvantages of a delayed treatment, and permit a quicker return to sport at the same level practiced before illness.

**Date : 2008-08-27**

**Session : Sports: anterior cruciate ligament repair**

**Time : 1400-1530**

**Room: 403**

**Abstract number : 17373**

**REPAIR OF PROXIMAL END TEAR OF ANTERIOR CRUCIATE LIGAMENT**

Umesh Chandra SARMA

*Arya Hospital, Guwahati (INDIA)*

Proximal end tear of ACL is usually associated with substantial amount of ligament tissue in the distal part. Repair of proximal end tear of ACL was done in 35 cases during 1995-2005 within 3 weeks of injury; there were only 2 females in the series. MRI provided information of the remaining substance of the ligament. These were reconfirmed by arthroscopy. The ligament was approached by mini medial arthrotomy. Braided polyester suture (Ethibond No.2) was used in a 16mm half circle needle. Two sets of sutures are passed. The ends were delivered laterally through two drill holes located at the site of attachment of proximal end of ACL and tied. Knee immobilized in POP cylinder for 6 weeks. Weight bearing was permitted from the 2nd postop day. Knee mobilisation was done from 6 weeks onwards. Full range of motion was regained in 30 cases within 4 to 6 weeks, females required longer. Three had multiple ligament injury. Four cases had more than 1cm anterior laxity, 2 were advised reconstruction. None have submitted to repeat surgery. Arthroscopy done in 3 cases showed a good substance of the repaired ligament providing stability. MRI evaluation done in 6 cases showed an enlarged ligament proximally attached to nearly the original location. **CONCLUSION:** Difficulty in passing sutures with substantial hold can be overcome. Mini arthrotomy reduces the chance of knee stiffness considerably. Repair of proximal end tear of ACL is fairly successful, perhaps superior to reconstruction.



Date : 2008-08-27

Session : Sports: anterior cruciate ligament repair

Time : 1400-1530

Room: 403

Abstract number : 17459

**THE EFFECT OF ACL RECONSTRUCTION ON HAMSTRING ANTAGONIST MOMENTS**

Erik HOHMANN<sup>1</sup>, Kay CROSSLEY<sup>2</sup>, Laura BUCKLEY<sup>2</sup>, Marc CREABY<sup>2</sup>, Adam BRYANT<sup>2</sup>

<sup>1</sup>Musculoskeletal Research Unit, Central Queensland University, Rockhampton (AUSTRALIA), <sup>2</sup>Centre for Health, Exercise & Sports Medicine, Melbourne (AUSTRALIA)

INTRODUCTION: Despite the restoration of knee stability following anterior cruciate ligament reconstruction, hamstring co-contraction remains important to protect against re-injury. Patients who have stronger or an altered hamstrings muscle-firing patterns may have improved knee stability. The purpose of the study was to examine the effect of ACLR on hamstring antagonist moments in order to elucidate the dynamic restraint mechanism of ACLR patients. METHODS: Eleven females and 13 males (age 30.5±8.1 year, mass 74.3±21.5 kg, height 172.7±10.1) after ACL reconstruction 15.7±5.5 months prior were recruited. The control group was matched on the physiological variables of age, height, weight and physical activity. EMG, isokinetic torque and knee displacement data from the involved and matched control limbs were sampled. RESULTS: Statistical analyses revealed that the ACLR group produced significantly higher hamstring torque at 30-40° (p=0.044; Diff=21%), 30-20° (p=0.009; Diff=27%) and, 20-10° (p=0.001; Diff=38%) compared to the control group. DISCUSSION: An increased opposing force generated by the hamstrings of the ACLR subjects during the second part of the movement is thought to represent a protective mechanism mediated by the neuromuscular control apparatus. Given that ACL loads are typically high to very high within the range 40-10° knee flexion, increased antagonist torque would decrease ACL graft strain. The functional significance of an opposing torque in this range is to restrain and stiffen the knee during forceful acceleration of the lower limb.

Date : 2008-08-27

Session : Sports: anterior cruciate ligament repair

Time : 1400-1530

Room: 403

Abstract number : 17462

**DOES MUSCLE STRENGTH INFLUENCE KNEE FUNCTIONALITY IN ACL DEFICIENT AND ACL RECONSTRUCTED PATIENTS?**

Erik HOHMANN<sup>1</sup>, Michelle TAY<sup>1</sup>, Adam BRYANT<sup>2</sup>

<sup>1</sup>Musculoskeletal Research Unit, Central Queensland University, Rockhampton (AUSTRALIA), <sup>2</sup>Centre for Health, Exercise & Sports Medicine, Melbourne (AUSTRALIA)

INTRODUCTION: Anterior cruciate ligament reconstruction has become a standard procedure with a good and excellent outcome of 70-90%. It has been demonstrated previously that all patients following surgery demonstrate a strength deficit of almost 20%. However it is not known whether strength deficits have an influence on postoperative functionality. METHODS: 52 consecutive patients (38 males and 14 females) were selected (mean age 27.9 years). All subjects were tested prior and 12 month following anterior cruciate ligament reconstruction. Muscle strength was assessed using a dynamometer. Isometric strength was examined at 30 and 60 degrees of flexion. Isokinetic testing was performed at 180 degrees/sec and peak torque and symmetry indices were analysed. RESULTS: No correlations were found between the Cincinnati Score and isokinetic peak torque for extension. A moderate significant ( $p=0.001-0.007$ ) correlation ( $r=0.20-0.45$ ) was found for peak flexion torque in ACL reconstructed patients. In ACL deficient patients symmetry indices ( $r=0.36-0.43$ ,  $p=0.001-0.004$ ) were moderately related to functionality for both flexion and extension. DISCUSSION: The finding of this study suggests that quadriceps muscle strength does not seem to be an important predictor of knee function after anterior cruciate ligament reconstruction. However knee flexors seem to be important to protect the graft from overload. In the ACL deficient knee functionality is related to high symmetry indices suggesting that similar strength is necessary to perceive knee function as near normal. This is possibly a normal neuromuscular adaptation caused by contralateral quadriceps avoidance.

**Date : 2008-08-27**

**Session : Sports: anterior cruciate ligament repair**

**Time : 1400-1530**

**Room: 403**

**Abstract number : 18414**

**SHOULD POSTEROMEDIAL AND POSTEROLATERAL COMPARTMENT VISUALISATION BE A PART OF ROUTINE KNEE ARTHROSCOPY?**

Vikas KHANDUJA<sup>1</sup>, Zaher DANNAWI<sup>2</sup>, Mustafa EL-ZEBDEH<sup>2</sup>

<sup>1</sup>Cambridge University Hospitals NHS Trust, Cambridge (UNITED KINGDOM), <sup>2</sup>Newham University Hospital NHS Trust, London (UNITED KINGDOM)

**BACKGROUND:** Arthroscopic visualisation of the posteromedial and posterolateral compartments of the knee through the intercondylar notch using the anterolateral and anteromedial portals respectively is not commonly practiced. The purpose of this study was to prospectively evaluate whether these views are useful either diagnostically, therapeutically or both in a routine knee arthroscopy. **PATIENTS AND METHODS:** It is a prospective study of two hundred consecutive patients who underwent a routine knee arthroscopy in our unit using the standard portals following an appropriate clinical and radiological evaluation. Posteromedial and posterolateral compartment visualisation through the intercondylar notch was undertaken in all patients. An evaluation of the ease of the technique, the usefulness of visualisation and the morbidity associated with the procedure were recorded. **RESULTS:** The technique was deemed simple to perform in 91% of the patients. It was found to be more difficult in knees with degenerative joint disease. Posteromedial and posterolateral compartment visualisation was found to be useful for diagnosis or treatment in 15% and 6% of the diagnosed conditions respectively. The technique was most useful for tears of the posterior horn of the medial meniscus, most of which were not detected by visualisation from the anteromedial compartment alone. Visualisation of the compartments was deemed adequate in 98% of the patients. There was no morbidity associated with this procedure. **CONCLUSION:** We believe that visualisation of the posteromedial and posterolateral compartment in a routine knee arthroscopy is beneficial; and an easy and safe procedure to perform.

Date : 2008-08-27

Session : Sports: ligament reconstruction 2

Time : 1600-1730

Room: 403

Abstract number : 16129

**IMMEDIATE POSTOPERATIVE PAIN RELIEF AFTER KNEE ARTHROSCOPY: INTRA-ARTICULAR BUPIVACAINE VS BUPIVACAINE AND MORPHINE COMBINATION. A RANDOMISED CONTROL STUDY**

Vijay SHETTY

*Dr LH Hiranandani Hospital, Mumbai (INDIA)*

AIM: To evaluate the analgesic effect of intra-articular injection of bupivacaine alone or a combination of bupivacaine and morphine following arthroscopy of the knee joint. METHODS: In a prospective, randomised study, 34 (42 knees) patients who required elective knee arthroscopy were assigned to two groups: Group A consisted of 18 patients (24 knees) who received bupivacaine (0.5%, 10cc) alone and Group B consisted of 16 patients (18 knees) who received a combination of bupivacaine (0.5%, 10cc) and morphine (1mg). All procedures were performed by a single surgeon under spinal anaesthesia, using a combination of bupivacaine (3.5cc of 0.5 %) with fentanyl (25µg). Postoperative analgesic effect was evaluated by pain intensity (visual analogue scale; VAS) and analgesic requirements during the first four, eight, twelve and twenty-four hours. RESULTS: At 24 hours following the operation, the VAS score and the analgesic requirements were significantly higher in Group A compared to Group B ( $p < 0.01$ ,  $p < 0.01$ , respectively). Two patients in Group B complained of nausea in the first twelve hours. CONCLUSION: We conclude that a combination of bupivacaine and morphine is more effective in management of immediate postoperative pain following arthroscopy of the knee joint. This combination helps in immediate mobilisation, which is the main goal after these procedures. We therefore recommend the use of intra-articular injection of a combination of bupivacaine and morphine following knee arthroscopy.

**Date : 2008-08-27**  
**Session : Sports: ligament reconstruction 2**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 17020**

**CELLULAR AND HISTOLOGICAL DIFFERENCES BETWEEN AM AND PL BUNDLES OF GOAT ACL**

Ho LEE<sup>1</sup>, Tomoyuki MATSUMOTO<sup>2</sup>, Masahiro NOZAKI<sup>2</sup>, Freddie H. FU<sup>2</sup>

<sup>1</sup>*Eulji University, College of Medicine, Dept. of rehabilitation medicine, Daejeon (KOREA),* <sup>2</sup>*Department of Orthopaedic Surgery, University of Pittsburgh, Pittsburgh, PA (UNITED STATES)*

The purpose of this study was to investigate the differences in the cellular properties and histological structures between AM and PL bundle of goat ACL. Nine ACLs obtained from right goat knees were divided into two experiments: 3 for tissue explant culture and 6 for histological assessment. AM bundle was divided into 3 (proximal, middle, and distal) and PL into 2 (proximal, distal) zones according to the length for AM and PL bundle (n=3 in each). In the tissue explant culture, we identified 2 different cell types; fibroblast and fibrochondrocyte and could divide into three different cellular outgrowth patterns. The percentage of fibrochondrocytic pattern of AM bundle was significantly higher than that of PL bundle. In the section divided analysis of AM, the rate of fibrochondrocytic pattern in the mid portion was significantly lower than that in the proximal and distal portion. In the histological evaluation, we demonstrated that 3 distinguishable bundles divided by the septum, AM, PL, and intermediate (IM), could be identified in all ACLs and two different types of cells could be found in all portions of AM and PL. The number of fibrochondrocytes stained by toluidine blue in AM bundle was larger than that in PL bundle. Regarding crimp length, it was higher in AM bundle compared to PL bundle. Our finding demonstrated that the goat ACL was composed of 3 different bundles (AM, PL, and IM) and had the differences in cellular morphology, outgrowth pattern, and histological structure between AM and PL bundle.

**Date : 2008-08-27**

**Session : Sports: ligament reconstruction 2**

**Time : 1600-1730**

**Room: 403**

**Abstract number : 17054**

**SURGICAL TREATMENT OF THE RECURRENT PERONEAL TENDONS LUXATION IN YOUNG ATHLETES: OUR EXPERIENCE**

Pierfilippo BOTTIGLIA AMICI-GROSSI, Riccardo BENVENUTI, Andrea MONDINI, Giulia CARIMATI

*Istituto Ortopedico G. Pini, Milan (ITALY)*

Peroneal tendons luxation in the young athlete is an uncommon situation associated with cronical ankle instability after a severe sprain. The clinical evidence is represented by the luxation or subluxation of the tendons during running and/or walking in association with pain. In these cases in our experience surgical treatment is mandatory for restoring the physiological function to allow the return to the specific athletic gesture. Actually we perform the stabilization of the involved tendons with an anatomical reconstruction of the retinaculum through the repositioning of the fibulocalcaneal ligament. Surgery is followed by a specific programme of rehabilitation consisting in immobilization in a ROM orthosis for three weeks, and then complete restoration of ROM is obtained with hydrotherapy, proprioceptive exercise and strength exercises. The return to the sport activity is allowed after three months. We performed this surgical treatment on five athletes, three females and two males, performing basketball, soccer, ice-skating and rugby. After a follow-up of three years the five athletes showed no recurrence and they were able to return to the same sport at the same level.

**Date : 2008-08-27**  
**Session : Sports: ligament reconstruction 2**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 17378**

**RF FOR TREATMENT OF TENDINOSIS: 5-YEAR RESULTS**

James TASTO<sup>1</sup>, Renee HARDESTY<sup>1</sup>, David AMIEL<sup>2</sup>

<sup>1</sup>*SDSM, San Diego, Ca (UNITED STATES)*, <sup>2</sup>*UCSD, San Diego, CA (UNITED STATES)*

Rf has been used as a minimally invasive procedure in the operative treatment of tendinosis for the past 5 years. Clinical results have demonstrated 90-95% of Good and Excellent results with little or no complications. Length of time to return to sports has been accelerated by 80%. One hundred and forty-one (141) patients have been followed for a minimum of 6 months to 5 years. They had a variety of tendinosis ranging from elbow, knee, shoulder to achilles. Basic Science data from our lab have validated animal studies that show an increase in mitogenic growth factors and histological improvement after Rf application. We have also shown temporary suppression of nerve fibers which may explain the rather dramatic and immediate pain relief in a large number of patients.

Date : 2008-08-27  
Session : Sports: ligament reconstruction 2  
Time : 1600-1730  
Room: 403

Abstract number : 18023

**ACHILLES TENDON HEALING BY AUTOLOGOUS CONDITIONED SERUM**

Martin MAJEWSKI<sup>1</sup>, Peter OCHSNER<sup>2</sup>

<sup>1</sup>University of Basel, Basel (SWITZERLAND), <sup>2</sup>Sankt Anna Klinik, Luzern (SWITZERLAND)

Achilles tendon rupture is a common sports injury. Despite advances in its treatment, the imperfections of endogenous repair often leave patients symptomatic which delays return to work and sports activities. Local administration of autologous conditioned serum in patients with osteoarthritis, rheumatoid arthritis, spinal, or muscle injuries has shown beneficial effects. In view of the significant concentrations of growth factors that have been shown to favourably affect tendon healing; we evaluated the effect of autologous conditioned serum on the healing of the transacted rat Achilles tendon. Eighty Sprague-Dawley rats were assigned to an experimental and a control group of 40 rats each. The experimental group received ACS injections 24, 48 and 72 hours postoperatively, while the control group did not receive any injections. 1, 2, 4 and 8 weeks postoperative ten Achilles tendons were removed for testing (7 for biomechanical testing, 3 for histology). Our results document a 3 fold greater stimulation of collagen type I mRNA over collagen III mRNA, an up to 3 fold decreased collagen III content of treated over control tendons, and a much improved regenerate appearance with conditioned autologous serum treatment. There was a consistent significant improvement of regenerate thickness which reflects collagen deposition. Tendon treated with conditioned autologous serum reached stiffness values after 4 weeks seen after 8 weeks at the control group. Overall, our study demonstrates that treatment with autologous conditioned serum has the potential to improve Achilles tendon healing and should be considered as a treatment modality in man.



**Date : 2008-08-27**  
**Session : Sports: ligament reconstruction 2**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 18303**

**DEMOGRAPHICS AND PATTERN OF HORSE RIDING INJURIES**

Deepu BHASKAR<sup>1</sup>, Amit SINGLA<sup>2</sup>, Debashish CHAKRAVARTI<sup>2</sup>, Kieran SINGISETTI<sup>1</sup>, Jonathan JONES<sup>2</sup>, Gora PATHAK<sup>2</sup>  
<sup>1</sup>*Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM)*, <sup>2</sup>*Peterborough District Hospital, Peterborough (UNITED KINGDOM)*

Analysis of demographics and nature of horse riding injuries at a District General Hospital from November 2003 to December 2005. A total of 215 patients' records were analysed, of which two were excluded. There were 189 females (88.7%) and 24 males (11.3%). The patients were mostly young with average age being 26 years (range of 5-73 years). Maximum injuries were in the 10-15 years age group (48 patients - 22.5%) with paediatric age group forming 37.1% of the patients. The breakdown of the injuries were - Upper limb - 36.2%, Head and facial injuries - 16.9%, Lower limb 23.5%, Spine 15% and Chest and Abdomen - 8.4%. Of the 77 patients with upper limb injuries 40.3% of the patients had fractures or dislocations and in 50 patients with lower limb injuries, 20% had fractures. However in the foot and ankle group, of the 24 patients, 8 (33.3%) had fractures. 16 patients (7.5%) were admitted to hospital and a further 38 (17.8%) was referred to fracture clinic. Our study shows the high incidence of fractures in patients presenting with limb injuries especially the shoulder and the foot and ankle. The higher incidence of equine injuries in the paediatric age group may indicate the need for better training and age regulations on horse riding. The need for protective equipment should be considered as a part of the horse riding injury prevention strategies.

Date : 2008-08-27

Session : Sports: ligament reconstruction 2

Time : 1600-1730

Room: 403

Abstract number : 18387

**ANALGESIC EFFECT OF INTRA-ARTICULAR MAGNESIUM SULPHATE COMPARED WITH BUPIVACAINE AFTER KNEE ARTHROSCOPY**

Yasser RADWAN<sup>1</sup>, Atef ALFEKY<sup>2</sup>, Mohamed FARAMAWY<sup>3</sup>

<sup>1</sup>Orthopaedic department, Cairo University, Cairo (EGYPT), <sup>2</sup>Anaesthesia department, Ain Sams University, Cairo (EGYPT),

<sup>3</sup>Epidemiology Department, Menofya University, Cairo (EGYPT)

**OBJECTIVE:** To evaluate the analgesic efficacy of intra-articular injection of magnesium sulphate (4%) compared with equivalent volume of bupivacaine (0.5%) after outpatient knee arthroscopic meniscectomy. **MATERIALS AND METHODS:** Forty patients were randomly assigned to two groups. Group M (n=20) received intra-articular magnesium sulphate 4%, group B (n=20) received bupivacaine (0.5%). Analgesic effect was evaluated by analgesic duration, and by measuring pain intensity at 1, 2, 4, 6, 12, 24 hours both at rest and on knee movement to 90 degrees. **RESULTS:** The duration of postoperative analgesia was significantly longer in the patients treated with magnesium sulphate (628±148) minutes than in the bupivacaine group (317±114) minutes (P<0.0001), with less number of patients needing supplementary analgesia in magnesium group (8/20) than those of the bupivacaine group (16/20) (P<0.022.). Also analgesic consumption was significantly lower in the magnesium sulphate group (P<0.002). **CONCLUSION:** Intra-articular magnesium sulphate is a more effective analgesic when compared with bupivacaine after arthroscopic knee meniscectomy.

**Date : 2008-08-27**  
**Session : Sports: ligament reconstruction 2**  
**Time : 1600-1730**  
**Room: 403**

**Abstract number : 18490**

**MRI EVALUATION OF BIOABSORBABLE IMPLANTS IN ACL RECONSTRUCTION**

Amite PANKAJ

*University College of Medical Sciences and GTB Hospital, Delhi (INDIA)*

**INTRODUCTION:** The rate of resorption of biodegradable implant is of critical importance in predicting the success of the procedure and deciding an appropriate rehabilitation protocol. Resorption can only be assessed by MRI and it can help in correlating features with clinical outcome. **MATERIAL AND METHODS:** Thirty patients of ACL reconstruction with hamstrings graft using bio-transfix and bio-screw were analysed. Serial MRI evaluation was obtained at 6, 12, 18, 24 and 36 months and features related to implant, tunnels and reconstructed ligament noted. **RESULTS:** After an average follow-up of 20 months none showed any change in screw length while one showed reduction in diameter. No change was noted in the length of bio-transfix while decrease in diameter was observed in two. Fracture of the bio-transfix was noted in one knee (n=20). Two shapes of tibial tunnels were noted on transverse sections, O-shaped in 23 and 8-shaped in 7. Tibial tunnels were of three types in sagittal sections, parallel (23), cone (4) and cystic (3). Majority (8 out of 9) of tunnel enlargement was seen with cone/cystic patterns. 80 percent of knees showed graft healing at 6 months. **DISCUSSION:** Bio-transfix and PLLA-bioscrew do not show signs of resorption until 2 years in majority. Shape (8 shaped, cone like) of tibial tunnel is associated with screw divergence and tunnel widening although with no clinical significance. Evidence of graft-bone healing was found in majority (80%) at 6 months. Fracture of bio-transfix is a cause for concern and a larger study warranted.

**Date : 2008-08-27**

**Session : CTL - Trauma: Minimally Invasive Plate Osteosynthesis**

**Time : 0800-0900**

**Room: 404-405**

**Abstract number : 19100**

**DEVELOPMENT OF MIPO**

Theerachai APIVATTHAKAKUL

*Faculty of Medicine, Chiang Mai University, Chiang Mai (THAILAND)*

In 1969, the Dynamic Compression Plate or DCP was design and introduced for fracture treatment. The plate was applied to reduce fracture to achieve exact anatomical reduction and absolute stabilization. In order to achieve reduction, wide surgical exposure was necessary and fracture fragments were often stripped of their soft tissue that lead to delayed union, nonunion, infection or implant failure. Biological plating was developed to address the preservation of the biological tissue around the fracture zone. This technique described by Mast et al. by the use of indirect reduction; minimize direct exposure and muscle stripping, reducing the fracture by distraction using either distractor, tension device or lamina spreader. Once correct alignment, rotation, and length are established, the proximal and distal fragment were stabilized by bridge plating. In 1997, Wenda and Krettek introduced a surgical technique in which the plate is inserted through isolated proximal and distal incisions beneath the vastus lateralis, this was called Minimally invasive percutaneous plate osteosynthesis (MIPPO) or Minimally invasive plate osteosynthesis (MIPO). MIPO has gained popularity and continue to evolve in the last decade. The early MIPO techniques were developed for subtrochanteric and distal femoral fractures. Later, these methods were modified and adapted for use in periarticular fractures, metaphyseal diaphyseal fractures, periprosthetic fractures, multiple injuries or small medullary canal. Nowaday, MIPO can be done for the femoral fractures, tibial fractures and humerus fractures with acceptable outcomes. The most common complications are malalignment. This technique is a surgical demanding procedure and should be done with careful intraoperative control of the limb alignment.

**Date : 2008-08-27**  
**Session : CTL - Trauma: Minimally Invasive Plate Osteosynthesis**  
**Time : 0800-0900**  
**Room: 404-405**

**Abstract number : 19141**  
**MIPO IN PEDIATRIC FRACTURES AND DEFORMITY CORRECTION**  
Chang-Wug OH  
*Kyungpook National University Hospital, Daegu (KOREA)*

Long bone fractures are generally managed by intramedullary nails. However, the physal plate of the children should be saved to avoid complications. And, a small diameter of marrow is another obstacle to achieve IM fixation. A recent technique of fracture fixation, MIPO (minimally invasive plate osteosynthesis), may be a solution for long bone fractures in children. It provides a firm stability with locking plates in comminuted fractures of the femur or fractures of large children (adolescent), which may not be stabilized by flexible nails adequately. After making of a low-energy corrective osteotomy, MIPO can be a good technique of stabilization in the deformity correction of children. As the same viewpoint, MIPO can save the physal plates. It can also eliminate the problems of external fixator, such as pin track infection and joint stiffness, which are from the long duration of external fixation. As a similar concept, MIPO can be used in the limb lengthening technique. Conventional limb lengthening can arise many complications, because of long duration of external fixation. It places particular demands on patients and there is a high incidence of complications. The premature removal of the fixator may lead to refracture, deformity, shortening or nonunion. The gradual elongation nails or lengthening over an intramedullary nail techniques have been tried. But, it cannot be done in children due to a small diameter of marrow and open physal plate. A combined technique with MIPO and limb lengthening can solve this problem in deformities of pediatric population. It is an alternative that can reduce external fixation time, especially when an intramedullary nail is not appropriate for children.

**Date : 2008-08-27**

**Session : Symposium- Trauma: Minimally Invasive Plate Osteosynthesis**

**Time : 0900-1030**

**Room: 404-405**

**Abstract number : 19101**

**MIPO IN FEMUR**

Theerachai APIVATTHAKAKUL

*Department of Orthopaedic, Faculty of Medicine, Chiang Mai (THAILAND)*

Closed intramedullary nailing of the femur is now considered to be a standard treatment for a femoral shaft fracture. During the past decade there has been an evolution in the techniques used for plating of long bone fractures. Plate osteosynthesis is particularly advantageous in certain situations where an intramedullary nail may be contra-indicated or technically not feasible. These may include polytrauma patient, ipsilateral femoral neck and shaft fractures patient with pulmonary compromise, fracture in the proximal or distal shaft, pediatric femoral shaft fracture, periprosthetic femoral shaft fracture or an excessive narrow medullary canal. In 1997, Wenda and Krettek introduced a surgical technique called Minimally invasive plate osteosynthesis (MIPO). The plate is inserted by a percutaneous approach with separate proximal and distal incisions. Reduction is done by indirect method without opening the fracture zone. This method requires less soft tissue disruption and preserves the fracture hematoma and blood supply to the bone fragments, resulting in undisturbed rapid callus bone healing. Once correct alignment, rotation, and length are established, the proximal and distal fragments are stabilized by bridge plating. Healing is faster, less bleeding, and requires less bone graft compared to conventional open reduction and plating. However, malalignment is the common complication that must be carefully evaluated intraoperatively.

**Date : 2008-08-27**

**Session : Symposium- Trauma: Minimally Invasive Plate Osteosynthesis**

**Time : 0900-1030**

**Room: 404-405**

**Abstract number : 19102**

**MIPO IN HUMERUS**

Theerachai APIVATTHAKAKUL

*Faculty of Medicine, Chiang Mai University, Chiang Mai (THAILAND)*

Minimally invasive plate osteosynthesis (MIPO) has gained popularity in recent years with satisfactory clinical outcomes. This method requires less soft tissue disruption and preserves the fracture haematoma and blood supply to the bone fragments compared to open reduction and compression plating. MIPO of the humeral shaft can be done by anterior approach, its proximal fixation is limited by the biceps tendon. When the fracture extends into the proximal humerus the proximal incision moves toward the lateral part of the proximal humerus by using the deltoid split approach. Indications for MIPO of the humerus include: comminuted humeral shaft fractures, humeral shaft fractures extend to the proximal or distal shaft, small or deformed medullary canal or open growth plate. The danger zone in the proximal deltoid split is the axillary nerve. In the middle part of the anterior arm, the musculocutaneous nerve lies over the biceps that has to be identified and protected. In the distal humerus, the radial nerve runs between brachialis and brachioradialis that is usually protected by the lateral half of the brachialis during the surgery. This technique is a surgically demanding procedure, the surgeon must know the structure at risk and the danger zone to avoid complications.

**Date : 2008-08-27**

**Session : Symposium- Trauma: Minimally Invasive Plate Osteosynthesis**

**Time : 0900-1030**

**Room: 404-405**

**Abstract number : 19143**

**IS MIPO EVIDENCE-BASED ?**

Chang-Wug OH

*Kyungpook National University Hospital, Daegu (KOREA)*

MIPO (minimally invasive plate osteosynthesis) is a standard tool of today's and the future orthopedic surgeon. The last 10 years have established the MIPO as a promising technique in many areas of extremity fractures, which are not good for IM nailing or open reduction and plating. It started from the concept of biologic fixation. With a recent improvement of locking plates, MIPO is getting popularized. Even the fractures which are believed only for open reduction (such as humerus or pelvic fractures), have been treated with a good result. There is no doubt that very skilled surgeons are able to perform MIPO with results that compare with the open approach. But, most articles are case series or retrospective study. And, many of them are from experienced surgeons. Only a few studies are comparative studies until now. From these facts, there is an ongoing debate whether MIPO is better in every fracture, or does not influence the functional outcome. We should keep in mind that MIPO requires both the knowledge and skills of open reduction/plating of fractures, and advanced skills in MIPO. Also, case load has been repeatedly demonstrated to be a major factor of the radiologic and functional outcome. Evidence-based analysis and randomized controlled trials are the academic ways to assess the value of different treatment concepts. So, we need well-designed studies of MIPO about fracture types, surgical techniques, the outcome, and complications. It will facilitate daily decisions, and patients will undergo treatment depending upon the fracture personality, individual risks, surgical expertise in open and MIPO and institutional experience.



**Date : 2008-08-27**  
**Session : Trauma: tibial fractures 2**  
**Time : 1100-1215**  
**Room: 404-405**

**Abstract number : 15548**

**SURGICAL IMPLANT GENERATION NETWORK (SIGN) NAIL**

Anthony OLASINDE<sup>1</sup>, Kehinde OLUWADIYA<sup>2</sup>

<sup>1</sup>*Federal Medical Centre, Owo (NIGERIA)*, <sup>2</sup>*Ladoke Akintola Teaching hospital, Osogbo (NIGERIA)*

We present our experience of 104 consecutive patients with 37 fractures of femur and tibia using Surgical Implant Generation Network (SIGN) nail without the use of image intensifier over a period of two years, from June 2004 to December 2006. There were 72 males and 32 females giving a ratio of 2.25:1. The mean age was 36.6 years  $\pm$ 15.2SD and there were 88 (81.5%) femoral and 20 (18.5%) tibia fractures (4 patients had two fractures that were operated). Fractures grade was closed and open in 86 (79.6%) and 22 (20.4%) respectively. Gustillo and Andersen grades of open fractures was I 7 (31.8%), II 8 (36.4%), IIIA 4 (18.2%) and IIIB 3 (13.6%). We used the open method of reduction in all cases. Indications for fixation were: Recent fractures in 73 (67.6%) and Nonunion in 35 (32.4%). The average time to union was 4.5 $\pm$ 1.92SD with a range of 3 to 9 months. Duration of follow-up averaged 15 months. The complications were deep wound infection in 4, knee joint stiffness 2, stitch sinus 1, broken implant necessitating removal 1, and loosened screws in 2 patients. The mean duration of hospital stay was 36.8 days  $\pm$ 39.2SD. We concluded that locked intramedullary nailing using SIGN nail was safe.

**Date : 2008-08-27**  
**Session : Trauma: tibial fractures 1**  
**Time : 1100-1215**  
**Room: 404-405**

**Abstract number : 16026**

**THE ILIZAROV FRAME AND FIXATION OF DIFFICULT TIBIAL FRACTURES IN A DISTRICT GENERAL HOSPITAL**

Andy ROCHE, Mike MCNICHOLAS

*North Cheshire Hospitals NHS Trust, Dept. of Orthopaedics, Warrington (UNITED KINGDOM)*

In the management of difficult tibial fractures, the Ilizarov fixator is an invaluable resource providing fracture fixation with minimal soft tissue insult. We reviewed the practice of a surgeon in a district general hospital with the use of the Ilizarov frame. The outcomes of 23 patients treated in Warrington Hospital between 2001 and 2007 were reviewed, with admission demographics, operation details, rehabilitation, radiographic and clinical follow-up. Follow-up periods averaged 36 months. Fractures of the tibial plafond and the proximal tibial plateau were classified using recognized systems (Reudi and Allgower/Schatzker/AO). Outcomes were assessed using the validated IOWA knee score and AOFAS score. As a review of a single-handed surgeon in a district general hospital we found that our results and clinical scores for the patients were comparable to international standards from large trauma centres in peer-reviewed journals.

**Date : 2008-08-27**  
**Session : Trauma: tibial fractures 1**  
**Time : 1100-1215**  
**Room: 404-405**

**Abstract number : 16467**

**APPRAISAL OF THE ROLE OF EXTERNAL SKELETAL FIXATION IN THE MANAGEMENT OF SEQUELAE OF OPEN TIBIAL FRACTURES**

Mahmoud EL-ROSASY

*Tanta University Hospitals, Tanta (EGYPT)*

Severe open tibial fractures are more apt to be followed by complications even with the universally accepted lines of treatment. The use of external fixation, employing the tension stress effect, would help salvage limbs previously considered candidates for amputation. We reviewed the results of treatment of 148 cases of complicated open tibial fractures. Their ages ranged from 12 to 74 years (average 34 years). Active infection was present in 40 cases. Acute shortening and re-lengthening was used in 60 cases; excision of nonunion, acute deformity correction and lengthening for nonunion with deformity in 30 cases; segmental excision and bone transport in 20 cases; gradual deformity correction after osteotomy in 15 cases and distraction and gradual deformity correction for hypertrophic nonunion with deformity in 23 cases. Ilizarov external fixator was used in 96 (65%) cases and monolateral fixator in 52 (35%) cases. The follow-up ranged from 24 to 118 months (average 35 months). Fracture union was obtained in all cases (100%). Evaluation of results included both objective (clinical and radiological) and subjective criteria and patient's satisfaction. The results were satisfactory in 139 cases (94%) and unsatisfactory in nine (6%) cases due to residual leg length discrepancy, joint stiffness and persistent pain. The use of external fixation, based on Ilizarov techniques, is invaluable in the management of difficult open tibia fractures; however, the technique should be tailored to the requirements of each case. The functional outcome is predetermined by the soft tissue status before treatment.

Date : 2008-08-27  
Session : Trauma: tibial fractures 1  
Time : 1100-1215  
Room: 404-405

Abstract number : 16596

**MANAGEMENT OF COMMUNATED FRACTURES OF LOWER EXTREMITY WITH MINIMALLY INVASIVE PLATE OSTEOSYNTHESIS**

Pankaj PATNI, Abhijeet SHROFF, Vishal RAJPUT, Raghav KAMMA  
*Sancheti Institute of Orthopaedic and Rehabilitation, Pune (INDIA)*

AIMS: This study evaluates the results of the technique "Minimally Invasive Plate Osteosynthesis" in comminuted long bone fractures of lower extremity. SETTINGS AND DESIGN: Single centre prospective study. METHODS AND MATERIAL: 15 patients with 17 multifragmentary fractures of long bones of lower extremity were treated in the present study using the technique of minimally invasive plate osteosynthesis (MIPO). There were 11 cases of supracondylar fracture femur, two intra-articular, 3 cases of proximal tibial fractures, 2 cases of tibial shaft fractures and 1 cases of subtrochanteric fracture. Mean age of the patients was 45.6 years, with 13 male and 2 female patients. RESULTS: All fractures went on to union. Overall 93.33% cases had excellent to good results. Average period of union was 19.17 weeks and average period for full weight-bearing was 15 weeks. CONCLUSIONS: Using MIPO there is a definitely decreased incidence of infection, nonunion, and implant failures as compared to conventional plating techniques for similar fractures. KEYWORDS: MIPO, Biological, Comminuted, Periosteal Stripping. KEY-MESSAGE: MIPO seems to be an excellent technique used in fixation of periarticular comminuted fractures.

**Date : 2008-08-27**  
**Session : Trauma: tibial fractures 1**  
**Time : 1100-1215**  
**Room: 404-405**

**Abstract number : 17712**

**THE EFFECT OF C.DIFFICILE INFECTION ON MORBIDITY AND MORTALITY FOLLOWING FRACTURE NECK OF FEMUR SURGERY**

Kakwani RAJESHKUMAR, Dip CHAKRABARTI, Apurva SINHA, Gautam TAWARI  
*Good Hope Hospital NHS Trust, Birmingham (UNITED KINGDOM)*

**INTRODUCTION:** Clostridium difficile diarrhoea has emerged as a healthcare associated infection of great clinical and economic significance especially in the frail and vulnerable group of fracture neck of femur patients. The major risk factor is peri-operative antibiotic exposure especially cephalosporins. **METHODS AND MATERIALS:** All the patients who were diagnosed with C. Difficile infection after an operated fracture neck of femur at the District General Hospital from April 2004 till March 2007 were included in the present study. All patients received the routine peri-operative antibiotic prophylaxis of three doses of intra-venous cefuroxime. **RESULTS:** A total of 1023 patients underwent surgery for fracture neck of femur during the three years of the study period. The average age of the patients was 81 years. 80% of patients were females. A total of 62 patients suffered from C. Difficile diarrhoea (6%) after the arthroplasty procedure, and within this cohort, 29 patients died during the same admission to the hospital (47%). The average length of stay for a patient with fracture neck of femur was increased from 23.4 to 60 days in those affected with C. Difficile. **DISCUSSION:** The patients with fracture neck of femur are generally the elderly, with poor body reserves. C.Difficile infection in such patients causes significant increase in the morbidity and mortality. Propagation of simple infection control measures such as hand-washing and isolation and change of peri-operative antibiotic protocol led to a statistically significant reduction in the incidence of C.Difficile infections after fracture neck of femur surgery.

Date : 2008-08-27  
Session : Trauma: tibial fractures 1  
Time : 1100-1215  
Room: 404-405

Abstract number : 17822

**MANAGEMENT OF JOINTS CLOSED AND OPEN FRACTURES USING TRANSARTICULAR OR EXTRAARTICULAR EXTERNAL FIXATION WITH OR WITHOUT MINIMAL INTERNAL FIXATION**

Yasser ELBATRAWY<sup>1</sup>, Mahmoud FAYED<sup>2</sup>

<sup>1</sup>Azhar university, Cairo (EGYPT), <sup>2</sup>Ain Shams university, Cairo (EGYPT)

36 intra-articular fractures of lower and upper limbs in 35 patients were treated using external fixation. Among them, 6 were intra-condylar femoral fractures, 12 were in tibial plateau, 6 were in tibial plafond and 12 were in distal radius. Minimal internal fixation was used for fixation in 27 fractures in addition to the external fixation. Two techniques were used. First is transarticular and second is extraarticular. Joint movement started just 3 weeks after the operation by opening the locked hinges and allowing the patient to swing his joint passively at the beginning and actively later. All patients were followed for at least 12 months. Clinical evaluation of joints mobility, time to healing, pain, return to the full previous activities and radiological evaluation after the operation and at the time of the follow-up were done for all patients. The results were satisfactory compared to the nature of the intra-articular fracture in all patients except 4. There were no joint infections in any of all patients included in this study. There were no significant pin tract infection problems in our patients as described in some other literatures as we use always hybrid technique combining pins and wires. We are completely satisfied with the results of this technique and we recommend using it in future patients instead of the classic open reduction and internal fixation. It allows stable accurate fixation of the fracture with early weight bearing and joint mobility possible.

**Date : 2008-08-27**  
**Session : Trauma: tibial fractures 1**  
**Time : 1100-1215**  
**Room: 404-405**

**Abstract number : 18163**

**PERSISTANCE WITH RIGID INTERNAL FIXATION IN INFECTED COMPOUND COMMUNUTED FRACTURE**

Kumar Shantanu ANAND

*Anand Hospital, Punea (INDIA)*

**INTRODUCTION:** Primary internal fixation in a compound fracture warrants prudent and judicious handling of complex problems. If infection occurs, the surgeon faces the dilemma of removing or continuing with the internal fixation device. When the fixation is secure and rigid, then continuation with the fixation device, until reasonable callus forms, may indeed be the right approach. The clinico-radiological evidence of acceptable degree of union is signal for removal of fixation hardware. This particular case, with total of twelve serial radiographs, done at interval of four weeks, illustrates this. **METHODOLOGY:** A 25-year-old male sustained railway-track accident, with compound grade 3B (Gustillo and Anderson) comminuted fracture (approx. 9 fragments) of lower third of right femur. Primary internal fixation with Supracondylar nail was done. The patient had infection and subsequently developed pus discharging sinus over the lateral aspect of lower thigh at 4 weeks postop. At this point various possible options, including removal of nail and external fixator application, as well as continuation with nail, were contemplated. However, a check-up x-rays at 5 weeks postop showed sign of callus formation incorporating the multiple comminuted fragments. Thereafter it was decided that the nail be continued with, with regular clinico-radiological assessment. Regular cleaning and irrigation of infected site with copious amount of normal saline to dilute the infection load was done. Subsequent radiographs showed consolidation of union. At 9 months postop the nail was removed and thorough debridement was done. The last x-ray of the series shows stout bone formation without any sequestrum.

**Date : 2008-08-27**  
**Session : Trauma: tibial fractures 2**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 15997**

**ANTERIOR KNEE PAIN AFTER TIBIAL INTRAMEDULLARY NAILING**

Nikica DARABOS, Marijan CESAREC, Denis GRGUROVIC, Zeljko RUTIC  
*Department of Traumatology, General Hospital Varazdin, Varazdin (CROATIA)*

Anterior knee pain (AKP) is common complication following intramedullary nailing of tibial shaft fracture. Its etiology is often not known. In our retrospective study we have evaluated postoperative outcome results of 94 operated patients with tibial shaft fractures in last 3 years. We identified 50 patients with healed fractures initially treated with intramedullary reamed nails with 2 or 3 interlocking screws on both parts of nail and with use of paratendinous incision for nail entry portal. We have analysed postoperative outcome results and possible relationship between AKP according to the VAS scale, and nail position (NP) marked as distance from tip of nail to tibial plateau and tuberositas tibiae, measured postoperatively on L-L knee X-rays. The symptoms related to AKP had 9 of 50 examined patients. Four of them had AKP only when kneeling and 5 complained of AKP constantly (VAS range 4-6). NP on knee X-rays showed that these patients had nail implanted 10mm or less from tibial plateau and 4mm or less from tuberositas tibiae (Group A). The rest of them had nail implanted 11-32mm from tibial plateau and 5 to 10mm from tuberositas tibiae (Group B). The difference between two groups, concerning the incidence of AKP and NP measurement was statistically significant ( $p < 0.05$ ). We found that insertion point of tibial nail should be medial to patellar tendon and tip of nail should be more than 10mm from tibial plateau and more than 4mm from tuberositas tibiae.



**Date : 2008-08-27**  
**Session : Trauma: tibial fractures 2**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 16061**

**MANAGEMENT OF TIBIAL PLATEAU FRACTURES TYPE II&III BY ELEVATION AND PERCUTANEOUS CANNULATED CANCELLOUS SCREW FIXATION**

Veerappan VEERAI AH

*Mahatma Gandhi medical college&research institute, Pondicherry (INDIA)*

AIM: To study the outcome of tibial plateau fractures type II&III treated by elevation and percutaneous cancellous screw fixation. MATERIALS AND METHODS: We treated 20 patients of type 2 and type 3 tibial condyle fractures with elevation and cancellous screw (6.5mm) fixation with bone graft from 2004 to 2006. Average age of the patients was 45.5 years; 12 males and 8 females. Mean delay in surgery ranged from 2-5 days. Before discharge patient was given hinged knee brace to emphasize range of movement exercises for 6 weeks. At 8 to 12 weeks patient started toe touching and then increase weight bearing by 25lbs every week depending on the level of comminution. RESULTS: We had excellent results in 50%, good in 30%, fair in 15%, one case could not be reduced in closed manner which turned out to be an open procedure with cancellous screw fixation. DISCUSSION: Tibial plateau fractures are anxious problems for both patients and surgeons. We have followed the time tested simple procedure of percutaneous cancellous screw fixation for this study; though we have varieties of Schatzker other groups, we are presenting only the type 2 and type 3. We preferred this over the other methods like buttress plating because of the acceptable morbidity and minimal blood loss. The functional outcome is also good. CONCLUSION: The goal of treatment for any intra-articular fracture is to achieve a stable, aligned, congruous joint with painless restoration of motion and function.

**Date : 2008-08-27**  
**Session : Trauma: tibial fractures 2**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 16743**

**TREATMENT OF COMPLICATED FRACTURES OF LOWER EXTREMITY WITH THE ILIZAROV'S PROCEDURE**

Chuan Mu CHEN

*Dept. of Orthopaedics & Traumatology, Veterans General Hospital, Taipei (TAIWAN)*

The Ilizarov's technique is an important modality of reconstructive surgery for limb deformities. The author reviewed the past twenty years' experience of Ilizarov's procedures with distraction osteogenesis in the lower extremity. **MATERIALS AND METHODS:** Between October 1988 and December 2007, 70 patients with complicated fractures of lower extremity were treated with Ilizarov's apparatus at the Department of Traumatology in Taipei-Veterans General Hospital. The causes of the bone defect were 58 infected cases and 12 non-infected cases. There were 25 cases of the femoral fractures and 45 cases involving the tibia. Length gain averaged 7.0cm (range 4-20 cm). Bone grafting performed at the docking site in all cases. **RESULTS:** Union was achieved in all cases with an average external fixation time of 8 months (range 6-12 months). No recurrent infection. No deformity and leg length discrepancy greater than 1cm. Bone marrow injection to the regenerate site was 15%. **CONCLUSIONS:** The disadvantage of this technique is the lengthy time consuming operative procedure and external fixations, but simultaneous polylocal actions of distraction lessen the healing time. Our results confirm that distraction osteogenesis by Ilizarov's technique is effective for restoration of limb alignment and length under poor biological conditions due to its minimal invasive fixation technique.

**Date : 2008-08-27**  
**Session : Trauma: tibial fractures 2**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 17368**

**ACUTE MANAGEMENT OF OPEN FRACTURES: THE STAGES AT WHICH DELAY OCCURS**

Roger WALTON, Vikas GUPTA, Mani RATHINAM, Andrew PHILLIPSON, James STEVENSON  
*Countess of Chester NHS Trust, Liverpool (UNITED KINGDOM)*

**BACKGROUND:** Open fractures constitute an orthopaedic emergency. Traditionally, gold standard treatment is surgical intervention within 6 hours, supported by current British Orthopaedic Association guidelines. Despite recent contrary evidence suggesting that intervention beyond 6 hours may not produce dismal results, these injuries should continue to be treated promptly. **AIM:** Identification of areas of care where delays commonly occur where modifications could expedite surgery. **METHODS:** This was a retrospective analysis of 103 open fractures managed at a DGH over a three-year period. All long bone fractures were included, excluding feet and hands. Data was obtained by case note review and computer database. Demographics, ASA grade, co-existing injuries, fracture site, mechanism and Gustilo grade were recorded. Time lapse between various points of care from injury to surgery were calculated. **RESULTS:** Major delays occurred between A&E review and referral (mean 29.8 minutes) and between referral and orthopaedic review (mean 40.9 minutes). Time from orthopaedic review to theatre was the most marked delay (mean 770 minutes). Grade of initially reviewing orthopaedic doctor was insignificant. **DISCUSSION:** Past literature revealed one paper on this subject of time delay, involving 30 patients. Time of injury was not recorded in 50% of cases. In our data interestingly, time of injury and all other times were obtained, excluding time of referral, in over 80% of cases. Our study identified 3 prime areas where delay could be avoided. We recommend a protocol to provide seamless open fracture care to promote prompt surgical intervention within regular working hours.

Date : 2008-08-27

Session : Trauma: tibial fractures 2

Time : 1400-1530

Room: 404-405

Abstract number : 17657

**COMPOSITE CARE OF OPEN LOWER LIMB INJURIES INCLUDING SOFT TISSUE COVER BY ORTHOPAEDIC SURGEONS**

Boopalan P.R.J.V.C., Manasseh NITHYANANTH, Titus V.T.K., Vinoo Mathew CHERIAN, Thilak JEPEGANAM  
*Christian Medical College, Department Of Orthopaedics, Vellore (INDIA)*

INTRODUCTION: Optimal care of open, high velocity, lower limb injuries requires surgical skills in debridement, skeletal stabilisation and in providing appropriate soft tissue cover. Timely co-ordination between orthopaedic and plastic surgeons is difficult. In our centre, orthopaedic surgeons provide composite care of these injuries including soft tissue cover. MATERIALS AND METHODS: We retrospectively reviewed the results of the lower limb flaps done for these injuries between January 2005 and December 2006. We studied the injury pattern, indications for flaps and their outcome. RESULTS: There were 106 patients with 120 flaps during this period. Two patients with two flaps were lost to follow-up. The average age was 32 years (range 3-75). There were 89 males and 15 females. 65 patients had Type IIIB Gustilo and Anderson injuries from knee and below. 39 patients had isolated soft tissue injuries. The indications for flaps were exposed bone, tendon and joint in 45, 11 and 12 respectively or a combination in 36 patients. The flaps done were 51 reverse sural artery, 35 gastrocnemius, 25 local fasciocutaneous and 7 foot flaps. The flap dimensions ranged from 2X2cm to 30X15cm. 91 flaps (77%) healed primarily. Among 28 flaps (23%) with necrosis, 18 flaps (15%) required secondary STSG for healing while the other 10 flaps (8%) healed without further surgery. CONCLUSION: Acquiring basic plastic surgery skills should be an essential part of the training programme of all orthopaedic surgeons, so that they will provide independent, composite care of these injuries, especially in developing countries.

**Date : 2008-08-27**  
**Session : Trauma: tibial fractures 2**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 17815**

**FIBULAR GRAFT VERSUS SEGMENT TRANSFER IN TREATMENT OF ACQUIRED INTERCALARY BONE DEFECT BY ILIZAROV EXTERNAL FIXATOR**

Mahmoud FAYED<sup>1</sup>, Yasser ELBATRAWY<sup>2</sup>

<sup>1</sup>*Ain Shams university, Cairo (EGYPT)*, <sup>2</sup>*Azhar university, Cairo (EGYPT)*

Acquired intercalary bone defect may occur following bone loss after high energy trauma or iatrogenic after segment excision of chronic osteomyelitis, bone tumour or dead avascular bone. Bone defect may be complete or partial including only part of the circumference. 17 patients with bone defect were divided into 2 groups. One group (7 cases) was treated with segment transfer in whom the defect was complete. The second group (10 patients) was treated with fibular strut free graft plus Ilizarov external fixator. In the second group the defect was complete in 4 cases and partial wall defect in 6 cases. The average length of the defect, age, and pathology were equalized in 12 cases to elicit the implication of the technique selected on time factor. Filling of bone defect and union were achieved in 13 patients. The second group of patients took shorter time of treatment than the first group by 2-4 months. The incidence of refracture after frame removal is higher than the first group. Fibular graft is more suitable with patients with partial wall defect with shorter time of treatment than with segment transfer. Failures of union and graft fracture were the commonest complications in the second group of patients.

Date : 2008-08-27

Session : Trauma: tibial fractures 2

Time : 1400-1530

Room: 404-405

Abstract number : 17878

**THE CHANGE OF LENGTH OF PATELLA TENDON AFTER REMOVAL OF INTRAMEDULLARY NAIL IN TIBIAL SHAFT FRACTURES**

Jihoon CHANG<sup>1</sup>, Dong-Eun SHIN<sup>2</sup>

<sup>1</sup>NHIC Ilsan Hospital, Koynag (KOREA), <sup>2</sup>Bungdang CHA hospital, Bundang (KOREA)

**PURPOSE:** The purpose is to compare and analyse length change of patella tendon after intramedullary nailing of tibial shaft fracture using transtendinous approach. **MATERIALS AND METHODS:** Forty-three patients with tibial shaft fracture using transtendinous approach were analysed from December, 1999 to December, 2005. Insall Salvati ratios between patella tendon length and patellar bone length were compared. Fracture types were classified along AO classification. Effect of initial trauma on change of length of patellar tendon was evaluated. The duration of nail insertion was assessed to affect the change of length of patellar tendon. The knee function scale was described by Lysholm. **RESULTS:** Shortening of patella tendon was observed in 34 out of 43 cases in which transtendinous approach was used to insert and remove intramedullary nail, which was statistically significant ( $p < 0.0001$ ). The effect of AO type on the decrease of Insall Salvati ratio was not significant, being 0.072, 0.121 and 0.118 respectively for types A, B and C ( $p > 0.05$ ). The duration of nail insertion and the shortening of patella tendon was not significantly correlated either, for the decrease ratio was 0.086 in cases with more than 2 years duration and 0.094 in cases with less than 2 years duration. ( $p = 0.778$ ). Postoperative Lysholom score decreased to 89.5, average. **CONCLUSION:** It would be helpful for decrease shortening of patellar tendon length that avoiding transtendinous approach in intramedullary nailing of tibial shaft fracture.

**Date : 2008-08-27**  
**Session : Trauma: tibial fractures 2**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 17946**

**WOUND COMPLICATION OF MINIMALLY INVASIVE PLATE OSTEOSYNTHESIS IN DISTAL TIBIA FRACTURES**

Chi Fat CHAN, TW LAU, KLF LEUNG

*Queen Mary Hospital, Hong Kong (HONG KONG)*

Nowadays, the use of Minimally Invasive Plate Osteosynthesis (MIPO) in the management of fracture distal tibia is common. The various advantages of the MIPO technique, namely preserving blood supply and better bone healing, had been described extensively in the literature. However, this technique is not without its complication. Among all the complications, infection is one of the commonest. In the last 3 years, we have performed 48 cases of MIPO in treating the distal tibia fractures. Our study was to evaluate the clinical outcome of these cases, with special attention to the infection rate and our experience in managing these infection cases. Our result showed that the average time when the patient started to full weight bear was 9.4 weeks. The average time for bony union was 18.7 weeks. There were 7 cases of late infection among these 48 cases. The rate was 15%. The presence of late infection had no obvious effect of the time of bony union. 25 patients (52%) have the implants removed and the commonest cause was skin impingement by the implant. The clinical presentation and the management of these late infections were discussed. In conclusion, MIPO fixation of the distal tibia fractures using metaphyseal locking plate is safe and efficient. However, complication like late wound infection and impingement are relatively common. The overall clinical outcome is still good despite the presence of these complications.

Date : 2008-08-27

Session : Trauma: tibial fractures 2

Time : 1400-1530

Room: 404-405

Abstract number : 18615

**THE PROXIMALLY BASED SURAL ARTERY FLAP FOR COVERAGE OF SOFT TISSUE DEFECTS AROUND THE KNEE AND ON THE PROXIMAL AND MIDDLE LOWER LEGS**

Sang-Jin CHEON, In-Bo KIM

*Pusan National University Hospital, Pusan (KOREA)*

**PURPOSE:** There are few reports regarding the proximally based sural artery flap which is useful for reconstruction for soft tissue defects around the knee and on the proximal and middle thirds of the lower legs. We report our experience in 10 patients. **PATIENTS:** The defects in the 10 cases were around the knee (4), on the proximal third of the lower leg (4), and on the middle third (2). 8 were fasciocutaneous flaps and 2 were adipofascial flaps. The flap size ranged from 4 to 10cm in length, and from 5 to 8cm in width. The pedicle length ranged from 12 to 20cm. **RESULTS:** All 10 flaps survived. Congestion and tip necrosis occurred in 1 case with a fasciocutaneous flap, which healed without complications. A superficial infection occurred in 1 case of a fasciocutaneous flap, which healed with antibiotic treatment. Necrosis of grafted skin occurred in 2 cases of an adipofascial flap; only one of them, however, required additional surgery. No morbidity of the donor site and no functional deficits were detected in any of the 10 cases. **CONCLUSION:** The proximally based sural artery flap is useful for the reconstruction of soft tissue defects around the knee joint and on the proximal and middle lower legs, and is a relatively easy and reliable procedure.



**Date : 2008-08-27**  
**Session : Trauma: tibial fractures 2**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 18645**

**OUTCOME OF REAMED INTRAMEDULLARY NAILING IN DISTAL TIBIAL FRACTURES**

Devdatta NEOGI, Ashish JAIMAN, Vivek TRIKHA  
*All India Institute of Medical Sciences, New Delhi (INDIA)*

**INTRODUCTION:** The treatment of distal metaphyseal tibial fractures remains controversial. Our aim was to evaluate reamed intramedullary nailing of distal tibial fractures located within 6cm of the ankle joint as a surgical technique by prospective study. **MATERIALS AND METHODS:** 24 patients with average age of 36 years were treated at AIIMS, New Delhi between January 2005 and December 2006 and followed for an average of 25 months. The most common cause of injury was motor vehicle accident, 5 cases associated injury was seen. Additional reduction techniques like fibular plating and poller screws were used in six cases. Fractures with articular extension were initially fixed with lag screws. Eight patients required nail dynamization and five had autologous bone marrow injections. **RESULTS:** The fractures united at an average of 23 (16-30) weeks. Bony union was achieved in every case. No patient had any change in alignment between the immediate postoperative and the final radiographic evaluation. The reduction was anatomically aligned in 86%. Three patients had malalignment defined as varus-valgus angulation or recurvatum of 5 degrees or greater. There was one case of superficial infection and no cases of deep infection. At one-year follow-up some patients did show some functional limitations despite fracture union and maintenance of alignment, but these improved with time. All patients returned to normal daily activities. **CONCLUSION:** Although technically demanding, intramedullary nailing for distal tibial fractures represents a safe and reliable method. Delayed union is often seen and can be prevented with timely secondary interventions.

**Date : 2008-08-27**

**Session : Trauma: tibial fractures 2**

**Time : 1400-1530**

**Room: 404-405**

**Abstract number : 18713**

**MANAGEMENT OF DISTAL TIBIAL FRACTURES**

Wajahat ASHRAF

*Ujala Medical Center, Lucknow (INDIA)*

**INTRODUCTION:** Distal tibial fractures are difficult fractures to treat. Controversies exist regarding different surgical procedures. This study presents a prospective analysis of 40 cases of distal tibial fractures treated with different surgical techniques. **METHODS:** 40 of distal tibial fractures were treated with either (1) Closed reduction internal fixation with interlocking nail with or without the use of poller screws (2) MIS with locking compression plates (3) Multiple screw fixation of the articular surfaces (4) Limited internal fixation augmented with tubular external fixators (5) Joshi's external stabilisation system with limited internal fixation. **RESULTS:** All fractures eventually united. Complications encountered were infection (5%), nonunion (8%) delayed union (13%) ankle stiffness (40%) and persistent swelling (21%). Secondary procedures required following complications were debridement, secondary bone grafting, removal of prominent screws, removal of implant, and arthrodesis. **CONCLUSION:** It is difficult to achieve an anatomical reduction by closed or minimally invasive techniques. However these techniques preserve the blood supply of the fractured fragments. The objective should be to achieve fracture fixation by any technique which assists physiological process of bone healing with minimal surgical trauma.

**Date : 2008-08-27**  
**Session : Trauma: osteoporotic fractures and trauma**  
**Time : 1600-1730**  
**Room: 404-405**

**Abstract number : 15873**  
**FLAPS DONE BY AN ORTHOPAEDIC SURGEON IN DEMANDING TRAUMA SITUATIONS**  
Subbiah VENKATESH BABU  
*Sri Sakthi Hospital, Tirunelveli (INDIA)*

We (India) contribute 10% of world road accidents and our accidents occur mainly in the highway covered by villages. Availability of Plastic surgery team in all our centres would be very difficult. I am presenting cases which needed soft tissue cover in the golden hour was well managed by an orthopaedic surgeon who fixed the bone and also covered the defect with a FLAP.

**Date : 2008-08-27**

**Session : Trauma: osteoporotic fractures and trauma**

**Time : 1600-1730**

**Room: 404-405**

**Abstract number : 15880**

**DO THE LONG TROCHANTERIC NAILS NEED A CHANGE OF THEIR ANTEROPOSTERIOR RADIUS OF CURVATURE?**

Armando PEINADO, Conrad BERTRÁN

*Hospital Sant Joan de Deu, Martorell. Barcelona (SPAIN)*

Most of the available long trochanteric and femoral nails used for the treatment of high or low subtrochanteric fractures have a much longer anteroposterior radius of curvature than that of the average human femur. This mismatch sometimes results in anterior distal femoral cortex penetration, or supracondylar fracture during nailing or postoperatively. We designed a prospective clinical study to know the behaviour of the Long Trochanteric GT Nail - with an anterior bow of 140cm - and a single 9 mm-diameter rotationally unlocked hip screw, in the treatment of 38 consecutive extracapsular and subtrochanteric femoral fractures. In the twenty-eight 31 A-1 and A-2 fractures the femoral bow was intact and the intramedullary nails needed to fully match to it. Three pathologic subtrochanteric fractures and seven subtrochanteric fractures were intramedullary nailed and locked dynamically with a distal screw. In all, but four cases, the GT Nail was manually introduced without reaming. In six cases a 10-mm distal diameter nail was used. 32 patients could be followed up to twelve months. No bone damage was done during nailing, neither during the follow-up period. No patient complains of thigh pain at the nail-tip level. In two cases the distal dynamically locked screw slid upwards more than 10mm. We think that a 140cm of anteroposterior radius of curvature of the trochanteric nails should behave friendly in most of the human femurs. Furthermore, the nails that allow at least 1cm of proximal sliding would help in close contact of the bone fragments and sound healing.

**Date : 2008-08-27**  
**Session : Trauma: osteoporotic fractures and trauma**  
**Time : 1600-1730**  
**Room: 404-405**

**Abstract number : 16541**

**EFFECTS OF NUTRITIONAL STATUS ON WOUND HEALING AFTER HIP FRACTURE IN THE ELDERLY**

Jiong Jiong GUO, Huilin YANG

*Dept Orthopaedics, The First Affiliated Hospital of Soochow University, Suzhou (CHINA)*

**OBJECTIVE:** To evaluate the effects of nutritional status on wound healing after hip fracture in the elderly. **METHODS:** From July 2002 to December 2004, 127 patients with hip fracture who were older than 65 years were treated surgically in our department. Their preoperative nutritional status was reviewed. There were 69 males and 58 females, with an average age of 72.7 years (from 65 to 99 years). 60 cases had femoral neck fractures and 67 cases had intertrochanteric fractures. The parameters indicative of nutritional status (serum albumin, serum transferrin and total lymphocyte count levels) at the time of admission were assessed, along with Rainey McDonald nutritional index and age. Suture removal was performed on postoperative day 14. Results Delayed wound healing complicated 31 of the 127 cases. The preoperative serum transferrin levels were significantly lower in patients who subsequently had delayed wound healing. Only preoperative serum transferrin levels ( $P<0.01$ ) and Rainey McDonald nutritional index ( $P<0.05$ ) showed significant value in predicting which patients would have delayed wound healing. Through prophylactic antibiotics and adherence to strict aseptic precautions, on follow-up, wound healing was normal in all the patients. **CONCLUSIONS:** The malnourishment can influence the surgical outcome of older patients with hip fracture. Preoperative serum transferrin levels and Rainey MacDonal nutritional index show predictive value in wound healing results. Early postoperative exercise has positive on improving the malnourishment of elderly patients with hip fracture.

Date : 2008-08-27

Session : Trauma: osteoporotic fractures and trauma

Time : 1600-1730

Room: 404-405

Abstract number : 16603

**TREATMENT OF PELVIC DISRUPTION - TEMPORARILY EXTERNAL FIXATION WITH OR WITHOUT SACROILIAC SCREW**

Stefan CRISTEA, Noemi RADU, Andrei PRUNDEANU, Florin GROSEANU, Vlad PREDESCU, Tudor ATASIEI

*Clinic for Orthopedics and Trauma, "St. Pantelimon" Clinical Emergency Hospital, Bucharest (ROMANIA)*

OBJECTIVES: We present the results of the use of external fixation, as temporarily external fixation in polytrauma, with pelvic disruption. MATERIALS AND METHODS: From 1993 to 2006, 75 patients with pelvic disruption were treated by external fixation. Assessment of pelvic instability was made by protocol which included: physical examination; radiographic assessment and CT of the pelvis, a complete surgical evaluation. RESULTS: Classification of the pelvic disruption was done according M. Tile. There were 45 patients with type B (B1-31; B2-10; B3-4) and 30 patients with type C (C1-20; C2-8; C3-2) found. Emergency treatment of hemodynamic unstable cases included: initial resuscitation by polytrauma protocol, minimum early diagnostic procedures, temporarily stabilization of pelvis by external fixation. In 15 cases of type C (C1-10; C2-5) we addict a sacroiliac screw to complete the stabilization. This intervention was made in the same session but after the anterior stabilization. Functional outcome results by D'Aubigne-Postel Scoring System were excellent in 36 patients (48%); good in 24 patients (32%); fair in 7 patients (12%); poor in 6 patients (8%). There were complication as a persistent sacroiliac pain in 7 cases; impaired gait in 5 cases; deep infection in 1 patient and pin tract infection in 6 patients. Haemodynamic stability was restored in all patients. CONCLUSION: Temporarily stabilization of pelvic disruption by external fixation should be viewed as part of complex procedure of resuscitation. When is necessary, in type C fractures, the sacroiliac screw assure a stable fixation made by a simple procedure.

**Date : 2008-08-27**  
**Session : Trauma: osteoporotic fractures and trauma**  
**Time : 1600-1730**  
**Room: 404-405**

**Abstract number : 16709**

**SACROILIAC SCREW FIXATION IN PELVIC RING FRACTURES. RESULTS IN 39 PATIENTS**

Syah BAHARI, John MCELWAIN

*Adelaide and Meath Hospital Inc. National Children Hospital, Dublin (IRELAND)*

INTRODUCTION: Percutaneous sacroiliac screw fixation is a recognised technique in the stabilisation of pelvic ring fracture. We reported a consecutive case series of 39 patients with pelvic ring fracture treated with this method. MATERIALS AND METHODS: Patients with unstable pelvic ring fracture treated with percutaneous sacroiliac screw fixation were identified from fracture database. All fractures were classified using the Tile classification system. Demographic data, duration of procedure, procedure cancellation, procedure augmentation with external fixation and complications were recorded. Functional outcome assessed patients' ability to return to work. RESULTS: 42 patients were identified from fracture database but only 39 patients available for follow-up. Mean age was 33 (14-62). Male to female ratio was 1.9:1. Mean follow-up was 20 (6-50) months. 12 patients had Tile B and 27 patients Tile C pelvic fracture. Six cases were deferred due to poor visualisation of S1 vertebral body and nerve foramen on fluoroscopy. One case of foot drop was noted postoperatively, two patients developed nonunion and one had the screw revised. 8 patients had external fixation augmentation. 2 cases of wound infection over the percutaneous screw insertion site were noted. 5% of patients complained of chronic sacroiliac joint pain. CONCLUSIONS: Sacroiliac screw fixation provides satisfactory treatment of unstable pelvic ring fractures. However, this technique is technically demanding with adequate visualisation of S1 vertebral body and nerve foramen being essential prior to performing the procedure.

Date : 2008-08-27

Session : Trauma: osteoporotic fractures and trauma

Time : 1600-1730

Room: 404-405

Abstract number : 16825

**A PRELIMINARY REPORT OF MINIMALLY INVASIVE SURGICAL TECHNIQUE OF INTERNAL FIXATION (DHS) FOR TROCHANTERIC FRACTURES IN THE ELDERLY**

Amitava Narayan MUKHERJEE<sup>1</sup>, Ananda Kisor PAUL<sup>2</sup>

<sup>1</sup>J.N.Roy Hospital, Anandalok Hospital, Kolkata (INDIA), <sup>2</sup>Burdwan Medical College, Kolkata (INDIA)

The Objective was to use a minimal invasive technique of internal fixation of trochanteric fractures for reduction of morbidity in the elderly. 81 patients, age varying 60-98 years (average 82), having 9 undisplaced and 72 displaced trochanteric fractures where satisfactory reduction was achieved by close methods were selected for our study. We used percutaneous insertion of guide wire followed by minimal longitudinal (1.5"-2") skin incision through which reaming, tapping and then DHS screw inserted. The barrel plate introduced keeping its plate portion outside the skin in 60-90 degree overdo position where the plate portion was placed against proximal femoral shaft through the minimal skin incision by rotating the device and retraction of upper edge of skin in two axis (at right angle to the plane of skin incision and away from femoral shaft). Fixation of plate was done by MIPO technique. Wound repaired in three layers, 2-3 skin stitches with suction drain. Average blood loss ½ - 2 soaked mops. Non weight bearing mobilization allowed till the pain subsides as early as 7-10 days after operation. On the basis of clinicoradiological criteria, we assessed the cases for two to 3.5 years (average 2.7). 75 cases showed good, four fair, two poor results due to femoral head cut out by faulty placement of DHS screws resulting in malunion. Overall 75 (92%) cases achieved satisfactory outcome. Therefore indirect reduction and minimal invasive biological osteosynthesis using DHS appears to be a viable option for trochanteric fractures in the elderly.



**Date : 2008-08-27**  
**Session : Trauma: osteoporotic fractures and trauma**  
**Time : 1600-1730**  
**Room: 404-405**

**Abstract number : 16955**

**"THREAD STABLE" IMPLANT FAMILY FOR THE FIXATION OF OSTEOPOROTIC FRACTURES**

László VÁMHIDY, István NAUMOV, József NYÁRÁDY

*Dept. of Traumatology and Hand Surgery, Univ. of Pécs, Pécs (HUNGARY)*

INTRODUCTION: A very useful method for the fixation of osteoporotic metaphyseal fractures are the different types of locking plates. The "thread stable" implant - introduced by the authors - has a very similar fixed angle fixation, but provides a much wider possibility for the screw placement. MATERIALS AND METHOD: Between 01.01.2003 and 12.31.2006, 224 patients were treated with this kind of implant. 145 patients suffered distal radius, 36 dia-supracondyler humerus and 43 proximal humerus fractures. Evaluation was done using the Modified Gartland Werley score for the radius, the Mayo Elbow Performance Index for the elbow and the modified Constant Murley Score for the proximal humerus fractures. RESULTS: There were altogether 3 implant failures - two proximal humerus and one distal humerus fixations. All the fractures healed. The results were better than a similar series treated with conventional plate retrospectively. Compared to the data in the literature, we achieved similar results in the distal radius and proximal humerus group, and slightly better results in the distal humerus group. CONCLUSION: According to our clinical experiences, the "thread stable" implant family is a suitable and cheap method for the treatment of osteoporotic fractures in the aforementioned regions.

**Date : 2008-08-27**  
**Session : Trauma: osteoporotic fractures and trauma**  
**Time : 1600-1730**  
**Room: 404-405**

**Abstract number : 17043**  
**OSTEOPOROTIC PELVIC FRACTURES: DIAGNOSIS AND MANAGEMENT**

Tak Wing LAU, Frankie LEUNG  
*Queen Mary Hospital, Hong Kong (HONG KONG)*

Osteoporotic pelvic fractures are severe injuries that often require a long healing period. There is often a significant impairment of function and an increased risk for considerable morbidity. The majority of these presented as 'pubic rami fractures'. In fact, many of these fall injuries could result in pelvic ring instability. **METHOD:** From December 2006 till November 2007, we recruited patients admitted through the emergency department presented with pubic rami fractures. Patients were examined and sent for CT scans for documentation. The patients that had both radiologically and clinically unstable pelvic ring injuries were operated. Their walking ability was assessed 3 months post injury. **RESULTS:** 40 patients were recruited. 36 of them were female. Average age was 85. After careful examination and CT scans, 25 patients (62.5%) were found to have significant posterior involvement. Mean age was 83. They were either lateral compression I or II injury (Young and Burgess). 9 patients (36%) had the more unstable type II injury. Out of these 25 patients, 10 patients were operated and all of them could return to the premorbid walking state or had a mild deterioration in walking ability in 3 month time. The remaining 30 non-operated patients' results varied in 3 month time. **CONCLUSION:** A simple fall in osteoporotic patients could result in a lateral compression type of pelvic ring injury. Computer tomography is invaluable in detecting occult posterior injuries. Operative treatment could be considered for fracture stabilization and early ambulation and help these patients to return to walking early.

**Date : 2008-08-27**

**Session : Trauma: osteoporotic fractures and trauma**

**Time : 1600-1730**

**Room: 404-405**

**Abstract number : 17237**

**ORIF OF SUBTROCHANTERIC FRACTURES BY PLATE OSTEOSYNTHESIS: COMPARISON OF TWO METHODS OF REDUCTION - ANATOMICAL REDUCTION AIMING FOR MEDIAL BUTRESS VS ANATOMICAL ALIGNMENT BY TRACTION**

Sujit KUMAR<sup>1</sup>, Vinod KATHJU<sup>2</sup>

<sup>1</sup>*The County Hospital, Hereford, Stoke-on-Trent (UNITED KINGDOM)*, <sup>2</sup>*Mahatma Gandhi Hospital, Jodhpur (INDIA)*

Treatment of subtrochanteric fractures deserves special consideration as compared to other femoral fractures because of the difficulties in their management and higher rates of surgical complications. Various methods to reduce and fix these fractures have been described. Ours was a prospective study of 90 cases of subtrochanteric fractures all fixed using plate osteosynthesis over a period of 4 years. The purpose of this study was to evaluate and compare the outcome of open anatomical reduction of these fractures (Group 1) with those cases in which anatomical reduction was not aimed for (Group 2). Instead gentle traction was applied to achieve best possible alignment of the fragments. The average follow-up period was 28 months (range 6-48 months). Seinsheimer's classification was applicable in all the cases and the most common types in the series were type IIIA (31%) and V (24%). The average time to union was 16.3 weeks with no significant difference between the two groups. None of the patients had an unacceptable malalignment or a limb length discrepancy of >1cm. There was one incidence of implant failure in Group 2. **CONCLUSION:** Extensive tissue dissection to get anatomical reduction and a medial buttress in subtrochanteric fractures is most of the time very difficult and time consuming, without achieving any better results when compared to the method of reduction using minimal dissection and just optimal alignment.

Date : 2008-08-27

Session : Trauma: osteoporotic fractures and trauma

Time : 1600-1730

Room: 404-405

Abstract number : 17338

**THE INTRAOPERATIVE MEASUREMENT OF THE FEMUR HEAD CIRCULATION AT NECK FRACTURE**

József NYÁRÁDY, Gábor FARKAS, István NAUMOV, László VÁMHIDY, Andor SEBESTYÉN, Zoltán NYÁRÁDY, Ferenc TÓTH  
*Department of Traumatology and Hand Surgery University, Pécs (HUNGARY)*

INTRODUCTION: The reposed and stabilized femur neck fracture healing depends of the femur head circulation. The femoral head blood supply after neck fracture is unknown. The target of our study was to elaborate an easy and safe method to reveal the femur head circulation after the neck fracture, via direct visualisation. MATERIALS AND METHODS: After the reposition of the fracture under fluoroscopy, a hole is drilled into the femur head. An osteoscope is inserted into this hole and if the blood supply is sufficient, the bleeding appears at the end of the hole. After animal experimentations, this method was applied in 64 cases of human femur neck fracture type Garden III and IV. RESULTS: Based on the amount of the bleeding four groups were established. The groups are as follows: no bleeding: 12 patients, minimal circulation: seven patients, average circulation: 12 patients and excellent circulation: 33 patients. If the circulation was excellent or average the surgical intervention was screw fixation, in the other cases a hemi- prosthesis was implanted. CONCLUSION: According to our experimental and clinical studies, the osteoscopy is a suitable method to determine the circulation in the femur head in cases of neck fracture. Our results support the theory, Garden classification can provide only a rough guide to predict the intraosseal circulation. The aforementioned method can be applicable for visualizing other intraosseal blood circulation disturbances.

**Date : 2008-08-27**  
**Session : Trauma: osteoporotic fractures and trauma**  
**Time : 1600-1730**  
**Room: 404-405**

**Abstract number : 17562**  
**HANDLING A RETAINED MISSILE. 26-YEAR EXPERIENCE**

Thamer HAMDAN  
*Dean, Basrah Medical College, Basrah (IRAQ)*

Retained missile is a perplexing problem frequently faced in military surgery. It creates a lot of medical and medico-legal issues, on short/long term. It may lead to many complications in form of persistent pain, discharging sinuses, anterior venous complications, delayed nerve palsy, many other complications. So it is vital for the Orthopaedics to understand all the complications that may arise from a retained missile and how to behave accordingly. To review a 26-year experience with handling a retained missile of the spine and the extremities and to provide a rationale to guide clinical decision making. Missiles either solid or frequentation, primary or secondary and the secondary can be reclassified into intrinsic and extrinsic. In this article, all vital points related to retained missiles will be clearly discussed which consist of the indication for removal, the local and systemic effect of retention, the chemical natures of same retained missiles, and the relation between retained missile and malignancy. Also the practical technical points required for the safe removal and the proper timing for the extraction will be discussed too. Late complications and the interesting phenomena of migration of a missile need a special consideration. Handling a retained missile should be based on a solid experience. Military Surgeon should be aware of both the early and late complications, in addition to his awareness about the phenomena of migration. Complications may arise even after several years. Only few articles were published about this matter, so basically I shall deliver my experience.

**Date : 2008-08-27**

**Session : CTL - Tumours: Update in Bone Tumour Management**

**Time : 0800-0900**

**Room: 406-407**

**Abstract number : 19183**

**MANAGEMENT OF METASTATIC SPINAL TUMOURS**

Kenneth M.C. CHEUNG<sup>1</sup>, Keith Dip-Kei LUK<sup>1</sup>, John C.Y. LEONG<sup>2</sup>

<sup>1</sup>University of Hong Kong, Queen Mary Hospital, Hong Kong (HONG KONG), <sup>2</sup>The Open University of Hong Kong, Hong Kong (HONG KONG)

Spinal metastases are the most common form of spinal tumours encountered. Yet their management is complex depending on a large number of factors including the overall prognosis, number of lesions, presence of neurology, presence of extraspinal metastases, grade and histological type of tumour, availability of other treatment options, and patient wishes. Moreover, for those that are suitable for surgery, surgical options can vary from a simple laminectomy and stabilization, to combined anterior and posterior excision, and even radical en-bloc spondylectomy. This talk will present our common sense approach to the management of this disorder: how we select patients for surgery, how surgical approach and procedure is selected, and how we deal with consecutive and remote multiple level lesions. Some thoughts on whether one should consider en-bloc spondylectomy for spinal metastases will be presented.

Date : 2008-08-27

Session : Symposium & Free Papers - Basic Science: Cells Biology & Clinical Applications

Time : 0900-1030

Room: 406-407

Abstract number : 15375

**MENISCAL DEGENERATION FOLLOWING ANTERIOR CRUCIATE LIGAMENT TEAR AND THE ROLE OF INTRA-ARTICULAR INJECTION OF SODIUM HYALURONATE. HISTOCHEMICAL AND ELECTRON MICROSCOPIC STUDY IN THE RABBIT KNEE**

Tarek ALY

*Tanta University School of Medicine, Tanta (EGYPT)*

**OBJECTIVE:** The purpose of this study was to demonstrate the histological changes occurring in the synovium and meniscus after transection of the anterior cruciate ligament in rabbits, and to evaluate these changes after intra-articular injection of sodium hyaluronate. **METHODS:** Fifteen rabbits were divided into three groups. The surgery was performed in the left knees only and the right knees served as controls. Group (I) served as sham-operated controls, Group (II) underwent unilateral anterior cruciate ligament transection of the left knees and received no treatment, and Group (III) received intra-articular injections of 0.3ml sodium hyaluronate into the left knee beginning 1 week after surgery, once a week for 5 weeks. All rabbits were killed 8 weeks following surgery for assessment of knee meniscus by histological, histochemical and ultrastructural analyses. **RESULTS:** The histological examination of group II demonstrated the synovium with multilayered synovioblasts, and extensive cellular and matrix deterioration of meniscus in the form of altered cell distribution, decreased cell density, and abnormalities in the collagen arrangement. In groups III, the synovium showed many blood vessels and the cells of menisci apparently increased. Histochemically, safranin-O staining revealed the increased presence of proteoglycan in the sodium hyaluronate treated menisci relative to non-treated one. Ultrastructurally, the chondrocytes of group II showed obvious decrease in their organelles associated with the synthesis and secretions of the matrix with an increase in the number of lysosomes and cytoplasmic vacuoles. In group III, some active chondrocytes containing rER and ribosomes were observed. **CONCLUSIONS:** The results in the present study documented that the treatment with sodium hyaluronate after anterior cruciate ligament transection, induced an improvement of several structural features of both synovial membrane and meniscus. **KEYWORDS:** Meniscus, cruciate ligament tear, sodium hyaluronate.

Date : 2008-08-27

Session : Symposium & Free Papers - Basic Science: Cells Biology & Clinical Applications

Time : 0900-1030

Room: 406-407

Abstract number : 16219

**THE RELATIONSHIP BETWEEN THE IN VIVO MEASURED STIFFNESS AND THE HISTOLOGICAL STAGE OF DEGENERATION OF HUMAN KNEE ARTICULAR CARTILAGE**

Imre SZERB<sup>1</sup>, István PÁNICS<sup>1</sup>, László HANGODY<sup>1</sup>, Ibolya MIKÓ<sup>2</sup>

<sup>1</sup>*Uzsoki Hospital, Dept. of Orthopaedics, Budapest (HUNGARY)*, <sup>2</sup>*National Institute of Rheumatology, Budapest (HUNGARY)*

**PURPOSE:** To determine the relationship between the in vivo indentation stiffness and indices of histopathological degeneration of knee cartilage. **MATERIALS AND METHODS:** Cartilage compressive stiffness was measured in 98 patients during in vivo knee arthroscopies. The age of the patients ranged from 21 to 63 years (mean age 29 years). The measurements were performed at eight standard sites. No chondroarthritic or grade I. chondroarthritic surfaces were measured. An indentation instrument, Artscan 1000, was used for in vivo measurements. Four plugs were harvested from each knee for histological analysis. The stage of cartilage degeneration was assessed according to Mankin histopathology score. 16 measurements were performed after ACL. **RESULTS:** Lateral femoral condyle stiffness (mean + SD; 5.12 ± 1.02N) was greater than all other sites and was significantly greater than mean values obtained for medial femoral condyle (4.8 ± 1.22N); medial and lateral trochlea (4.2 + 0.92, 4.6 + 1.27N), medial (3.1 ± 0.66N) and lateral patella (3.3 ± 1.01N); and medial and lateral tibial condyle for all subjects (2.4 ± 1.17N and 3.2 ± 1.16N). The dynamic modulus of the normal or mildly degenerated cartilage correlated negatively with the Mankin score: r (Spearman) = -0.823, n = 348. Stiffness at the repaired site was similar to normal cartilage at adjacent sites in the knee. **CONCLUSION:** The high negative correlation between stiffness and the Mankin score suggests that the stage of cartilage degeneration can be quantitatively and indirectly assessed with a hand-held instrument during arthroscopy.



Date : 2008-08-27

Session : Symposium & Free Papers - Basic Science: Cells Biology & Clinical Applications

Time : 0900-1030

Room: 406-407

Abstract number : 16506

**EFFECTS OF CDX I, A NATURAL HERBAL AGENT, ON PROLIFERATION AND OSTEOGENIC DIFFERENTIATION OF hMSC-TERT CELLS**

Muwan CHEN<sup>1</sup>, Xuenong ZOU<sup>2</sup>, Lijin ZOU<sup>1</sup>, Wenzhou FENG<sup>3</sup>, Anette BAATRUP<sup>1</sup>, Chungui CHEN<sup>4</sup>, Haisheng LI<sup>1</sup>, Moustapha KASSEM<sup>5</sup>, Hui CAO<sup>4</sup>, Cody BÜNGER<sup>1</sup>

<sup>1</sup>Aarhus University Hospital, Aarhus (DENMARK), <sup>2</sup>The 1st Affiliated Hospital of Sun Yat-Sen University, Guangzhou (CHINA), <sup>3</sup>The 5th Affiliated Hospital of Sun Yat-Sen University, Zhuhai, Guangdong (CHINA), <sup>4</sup>National Engineering Research Center of Modern Tradition Chinese Medicine, Zhuhai, Guangdong (CHINA), <sup>5</sup>University of Southern Denmark, Odense (DENMARK)

**OBJECTIVE:** To investigate the effects of CDX I (a natural agent from plants) on the proliferation and osteogenic differentiation of hMSC-TERT in vitro. **METHODS:** The effects of CDX I on growth of hMSC-TERT cells was assessed by the SYBR green I assay. Osteogenic differentiation of hMSC-TERT cells was assessed by alkaline phosphatase (ALP) activity, ALP histochemical staining, Alizarin Red S staining, and quantification of calcium deposit. **RESULTS:** CDX I (0.78-50µg/ml) promotes the growth of hMSC-TERT cells. Percentages of cell growth in CDX I group (6.25, 12.5 and 25µg/ml) were significantly higher than that in the control group (P=0.023, 0.021 and 0.006). The 50% inhibitory concentration of the cells (IC50) was 122.7µg/ml. The ALP activity in CDX I was higher than that in osteogenic stimulation medium. Similar results were seen by ALP histochemical staining. Alizarin Red S staining and calcium deposit quantification showed that the calcium deposit in osteogenic stimulation medium decreased with the increasing concentration of CDX I, which is consistent with the results of real-time RT-PCR. **CONCLUSION:** CDX I can promote the proliferation of hMSC-TERT cells, increase its ALP activity, but decrease its mineralization. The findings suggest that CDX I can be used to stimulate MSCs during microfracture treatment in the repair focal, full-thickness chondral defect. At the same time, CDX I may inhibit the osteophyte formation, which provides the possibility of a new regimen for OA treatment with little side effects.

Date : 2008-08-27

Session : Symposium & Free Papers - Basic Science: Cells Biology & Clinical Applications

Time : 0900-1030

Room: 406-407

Abstract number : 16652

**HSP90BETA AND P130CAS: NOVEL REGULATORY FACTORS OF MMP-13 EXPRESSION IN HUMAN OSTEOARTHRITIC CHONDROCYTES**

Zhiyong FAN, Johanne MARTEL-PELLETIER

*Osteoarthritis Research Unit, University of Montreal Hospital Centre, Notre-Dame Hospital, Montreal (CANADA)*

AIMS: We previously classified human OA chondrocytes into L (Low)- and H (High)-OA according to MMP-13 basal levels and IL-1beta inducibility. In H-OA chondrocytes, the regulatory proteins p130cas and NMP4 acting on the MMP-13 promoter were identified. To identify regulators of MMP-13 expression/production in human L-OA chondrocytes, determine their effect on the expression of other MMPs and the effect of IL-1beta on these molecules. METHODS: Gel shift assays were done with AGRE-oligonucleotides and L-OA chondrocyte nuclear extracts; the proteins in the specific complex were identified by mass spectrometry. Hsp90beta, p130cas and NMP4 siRNAs were transfected into L-OA chondrocytes and incubated with or without IL-1beta. Gene expression was determined by real-time PCR, MMP-1 and -13 production by ELISA, and MAP kinase activation by Western blotting. RESULTS: Hsp90beta was identified in the gel shift complex. Silencing p130cas and Hsp90beta significantly increased the expression and production of MMP-13; sip130cas affected to a lesser extent MMP-1 expression and production; siNMP4 showed no effect. MMP-2, -3, -9 and -14 expressions were unaffected. Silencing both Hsp90beta and p130cas had a significant additive effect on MMP-13, but not MMP-1 expression, the level of which was similar to that of p130cas alone. IL-1beta decreased p130cas and Hsp90beta expression/production, indicating another pathway by which this cytokine up-regulates MMP expression. The IL-1beta-triggered signalling pathways responsible for MMP up-regulation were unaffected in the silenced cells. CONCLUSION: This study identifies p130cas and Hsp90beta as inhibitors of MMP-13, and p130cas of MMP-1 basal expression/production in L-OA chondrocytes.

**Date : 2008-08-27**

**Session : Symposium & Free Papers - Basic Science: Cells Biology & Clinical Applications**

**Time : 0900-1030**

**Room: 406-407**

**Abstract number : 18121**

**EVALUATION OF IMMORTALIZED HUMAN MESENCHYMAL STEM CELLS AT DIFFERENT POPULATION DOUBLINGS LEVELS**

Emilie GLAVIND, Lea BJERRE, Michael BENDTSEN, Cody BÜNGER

*Orthopaedic Research Laboratory, Aarhus University Hospital, Aarhus C (DENMARK)*

INTRODUCTION: Immortalized cells are often used for in vitro studies, but proliferation and differentiation of the cells may vary considerably at different population doublings levels (PDL). The aim of this study was to characterize differences between early and late PDL. MATERIALS AND METHODS: Telomerase-immortalized hMSCs at PDL 180-189 (early) and PDL 274-283 (late) were cultured in 10%FCS-DMEM (control). Proliferation was determined using SYBR green assay. Cells stimulated by calcitriol were analysed for ALP activity on day 4 and 7. Control medium containing dexamethasone,  $\beta$ -glycerophosphate and ascorbic acid was used to induce osteogenic differentiation, and calcification was assessed using alizarin red staining after 1, 2, and 3 weeks. RESULTS: The proliferation was stronger in late versus in early PDL (PD time 1,5 versus 2,3 days). ALP activity was lower in early PDL at all conditions and time points. Calcitriol supplemented medium induced higher ALP levels than control medium, the ratio calcitriol/control being highest for early PDL. Late PDL increased the ALP during culture independent of calcitriol addition, whereas early PDL only increased upon stimulus. Early PDL responded strongest to the osteogenic stimulus as verified by alizarin red. Results from studies of in vivo ectopic bone formation in mice are pending. CONCLUSION: Differences were observed between the various PDL. Early PDL had a lower proliferation, but higher capacity for osteogenic induction, as compared to late PDL. Therefore, careful consideration regarding PDL is needed when studying immortalized cells.

Date : 2008-08-27

Session : Basic science: cells and tissue engineering

Time : 1100-1215

Room: 406-407

Abstract number : 16513

**HIGH DOSE VITAMIN C SUPPLEMENTATION ACCELERATES THE ACHILLES TENDON HEALING IN HEALTHY RATS**

Suna OMEROGU<sup>1</sup>, Tuncay PEKER<sup>1</sup>, Nurten TURKOZKAN<sup>1</sup>, Hakan OMEROGU<sup>2</sup>

<sup>1</sup>Gazi University Faculty of Medicine, Ankara (TURKEY), <sup>2</sup>Eskisehir Osmangazi University, Faculty of Medicine, Eskisehir (TURKEY)

This experimental study was performed to assess whether or not vitamin C, required during the collagen synthesis, would influence the Achilles tendon healing in a healthy rat model. The right Achilles tendons of 42 healthy female Wistar Albino rats were completely ruptured. The rats were randomly divided into the vitamin C and control groups and both groups included 3rd, 10th and 21st day subgroups. 150 mg (1.5 cc) vitamin C and 1.5 cc % 0.9 NaCl were injected once for every two days for the vitamin C and control groups, respectively. Qualitative and quantitative microscopic comparison of the repair tissues of both groups were made on the mentioned days. Angiogenesis was more evident on the 3rd day in the vitamin C group. There was a significant difference between the control and vitamin C groups regarding the type I collagen production on the 10th day. The structure of the repair tissue was almost in the form of regular dense connective tissue at the end of 21st day in the vitamin C group. Mean collagen fibre diameter was considerably higher and the number of active fibroblasts in the repair tissue slightly elevated in the vitamin C group during the entire healing process. High dose vitamin C supplementation once for every two days has stimulating effects on the Achilles tendon healing because of early angiogenesis and increased collagen synthesis in a healthy rat model.

**Date : 2008-08-27**  
**Session : Basic science: cells and tissue engineering**  
**Time : 1100-1215**  
**Room: 406-407**

**Abstract number : 16687**

**SPONTANEOUS TRANSFORMATION OF CULTURED PORCINE BONE MARROW STROMAL CELLS**

Lijin ZOU<sup>1</sup>, Xuenong ZOU<sup>1</sup>, Ying HE<sup>1</sup>, Haisheng LI<sup>1</sup>, Weimin QIU<sup>2</sup>, Linda HARKNESS<sup>2</sup>, Moustapha KASSEM<sup>2</sup>, Cody BÜNGER<sup>1</sup>  
<sup>1</sup>*Orthopaedic Research Lab, Aarhus (DENMARK)*, <sup>2</sup>*Endocrinology and Metabolism, Odense (DENMARK)*

**INTRODUCTION:** Recently, the possibility that tumours originate from cancer stem cells (CSCs) has been proposed. Stem cells and CSCs share certain features such as self-renewal and differentiation potential. The aim of this study was to evaluate whether bone marrow stromal cells (BMSC) after long-term culture are transformed into malignant cells. **METHODS:** BMSC from 6 pigs were isolated and propagated continuously. Cell morphology was observed. Transformation properties were evaluated by means of serum dependence assay, Ki-67 immunostaining, soft agar colony assay, karyotyping, telomerase activity detection assay and analysis of the expression of p53, Fas and c-Myc genes. Multipotency was investigated by biochemical and histological assays and analysis of gene expression. **RESULTS:** BMSC showed a change in appearance, from the initial spindle shape to a more flattened morphology then to small contact shape. After additional passages, BMSC gradually acquired recovery of proliferating capacity and transformation properties such as anchorage-independent growth, chromosomal abnormality, and abnormal gene expression. The expression of P53 and Fas was decreased, while the expression of c-Myc gene was increased and TGF $\beta$  signaling pathway was upregulated. However, telomerase activity maintained negative during culture. In addition, multilineage differentiation potency was lost except for chondrogenic differentiation. **CONCLUSION:** Porcine BMSC can undergo spontaneous transformation, which provides a useful model to study the mechanisms associated with the tumorigenic potential of adult stem cells.

Date : 2008-08-27

Session : Basic science: cells and tissue engineering

Time : 1100-1215

Room: 406-407

Abstract number : 17069

**INCREASED GENE EXPRESSION OF CHONDROMODULIN I AND ELK 1 IN HUMAN ARTHROTIC CARTILAGE CELLS AFTER TREATMENT WITH 5-AZA-DEOXY-CYTIDINE**

Gerald GRUBER<sup>1</sup>, Florentine FUERST<sup>2</sup>, Heimo CLAR<sup>1</sup>, Martin STRADNER<sup>2</sup>, Norbert KASTNER<sup>1</sup>, Hannes ANGERER<sup>3</sup>, Winfried GRANINGER<sup>2</sup>, Reinhard WINDHAGER<sup>1</sup>

<sup>1</sup>Department of Orthopedics, Medical University, Graz (AUSTRIA), <sup>2</sup>Department of Rheumatology, Medical University, Graz (AUSTRIA),

<sup>3</sup>Department of Rheumatology, Medical University, Graz (AUSTRIA)

**BACKGROUND:** The most common eukaryotic DNA modification is methylation. DNA hypomethylation is associated with gene reactivation and chromosomal instabilities. Hypermethylation in the promoter regions of the genes, on the other hand, is involved in gene repression. In Osteoarthritis the matrix metalloproteinases are important for collagen degradation and are suspects in the development of this disease. The aim of this study was to evaluate the influence of demethylation on the gene expression of Chondromodulin 1 and ELK 1 in macroscopic normal and arthrotic human cartilage cells. **METHODS:** We collected 15 probes of human cartilage before undergoing total knee joint replacement from osteoarthritis patients. Cells from macroscopic "normal" and arthritic areas were harvested. After digestion, the cells were spread out and half of them were treated with 10 uM of demethylation agent 5-AZA-deoxy-cytidine over a period of six days. RNA was extracted using the Trizol method and cDNA was transcribed. Gene expression for chondromodulin 1 and Elk 1 was performed with the Taqman Realtime PCR Assay. **RESULTS:** Interestingly there was a significant increase (4-fold) of the gene expression of chondromodulin 1 and a 1, 5-fold increase Elk 1 gene expression after treatment with 5-Aza-deoxy-cytidine in the human arthrotic cartilage cell cultures compared to the untreated controls. There was no difference between the cells harvested in "normal" and arthritic areas. **CONCLUSION:** Further investigations are needed to show if methylation plays a major role in regulating this pro-arthrotic enzyme. If so, this may lead us to new therapeutic aspects of Osteoarthritis in the future.

**Date : 2008-08-27**  
**Session : Basic science: cells and tissue engineering**  
**Time : 1100-1215**  
**Room: 406-407**

**Abstract number : 17215**

**EFFECTS OF COMMONLY USED EPIDURAL MEDICATIONS ON A HUMAN FIBROBLAST CELL CULTURE**

Christof BIRKENMAIER, Susanne WAGNER, Julia REDEKER, Birte SIEVERS, Volkmar JANSSON  
*Dept. of Orthopedics, University of Munich, Grosshadern Medical Center, Munich (GERMANY)*

**INTRODUCTION:** The Racz epidural catheter procedure, which uses a special drug cocktail, is a popular therapy for spinal pain. However, severe complications have been observed. It is unclear whether these are due to the drug cocktail or to technical errors. We decided to investigate whether these drugs have the potential to damage cells. **METHODS:** Since most epidural tissues are connective tissues, we chose a fibroblast model. Human 015H fibroblasts were cultured for 24 hours, using 104 cells per well in MEM. At 24 hours, cells were changed into medium containing 10% NaCl, 0.5% bupivacaine, 1500 IU hyaluronidase and 40mg triamcinolon-acetonide or a combination. Incubation periods were chosen at 1, 6 and 24 hours. Pure cell culture medium was used as control. **RESULTS:** 10% NaCl or 0.5% bupivacaine as well as the cocktail led to the death of cell cultures at 1 hour. Triamcinolone caused a slowdown in proliferation (3x10<sup>4</sup> cells/well) when compared to control (1.1x10<sup>5</sup> cells/well) at 5 days. Incubation with hyaluronidase was similar to control (2x10<sup>5</sup> cells/well vs. 3x10<sup>5</sup> cells/well on day 6). Dose-effect and time-effect testing showed proliferation-retarding effects with concentrations as low as 2% NaCl and 0.05% bupivacaine. **DISCUSSION:** These experiments indicate that there is a potential for cell damage with steroids, bupivacaine and hypertonic NaCl. While these drugs have traditionally been used for the treatment of spinal pain syndromes, this does not imply that they are risk-free.

Date : 2008-08-27

Session : Basic science: cells and tissue engineering

Time : 1100-1215

Room: 406-407

Abstract number : 17905

#### FATTY ACID FUNCTIONALIZATION STRONTIUM HYDROXYAPATITE NANOROD AND APPLICATION

Wing Moon Raymond LAM<sup>1</sup>, Chi Tak WONG<sup>1</sup>, Zhao Yang LI<sup>1</sup>, Wai Kin CHAN<sup>2</sup>, Dip-Kei Keith LUK<sup>1</sup>, Weijia William LU<sup>1</sup>

<sup>1</sup>Department of Orthopaedics and Traumatology, The University of Hong Kong, Hong Kong (HONG KONG), <sup>2</sup>Department of Chemistry, The University of Hong Kong, Hong Kong (HONG KONG)

Nano strontium hydroxyapatite promotes better osteointegration than micron size counterpart. Rapid strontium release can suppress the growth of fibroblast; in addition, the incompatibility of Polymethyl methacrylate (PMMA) matrix and nano strontium hydroxyapatite (Sr-HA) weakens the cement mantle strength. Fatty acid plays an important role in biological processes. Due to its hydrophobic nature, the functionalized filler is compatible to PMMA matrix. In this study C-18 fatty acids with different degree of un-saturation on strontium hydroxyapatite nanoparticle morphology were investigated, which includes stearic (n=0), oleic (n=1), linoleic (n=2), and linolenic acid (n=3). The functionalized strontium hydroxyapatite nanoparticle was synthesized by Liquid Solid Solution Method. From transmission electron microscopy image, the aspect ratio of linoleic ( $22.00 \pm 11.86$ ) and oleic acid ( $22.47 \pm 6.20$ ) were larger than linolenic ( $4.76 \pm 1.73$ ) and stearic acid ( $6.14 \pm 2.57$ ). From FTIR spectrum, Stearic acid functionalized Sr-HA showed hydrophilic nanorod pattern. Alternatively, linolenic, linoleic and oleic acid showed hydrophobic nanorod pattern. Oleic acid functionalized Sr-HA can be easily dispersed both aqueous and organic solvents. While other functionalized counterpart tended to aggregate in aqueous medium. Oleic acid on the strontium hydroxyapatite surface can be thermal polymerized under hydrothermal condition to form a single layer polymer layer. Based on MTT and BrdU assay on mouse fibroblast (L929), stearic acid functionalized Sr-HA relative growth rate ( $70.54 \pm 15.68$ ) and proliferation rate is slightly lower than nano calcium hydroxyapatite counterpart ( $79.93 \pm 6.10$ ).



Date : 2008-08-27  
Session : Basic science: cells and tissue engineering  
Time : 1100-1215  
Room: 406-407

Abstract number : 18333

**INFLUENCE OF RESVERATROL ON SYNOVIOCYTES OF OSTEOARTHRITIS (OA) AND RHEUMATOID ARTHRITIS (RA) PATIENTS**

Mathias GLEHR<sup>1</sup>, Florentine FUERST<sup>2</sup>, Birgit LOHBERGER<sup>1</sup>, Sonja WALZER<sup>1</sup>, Gerald GRUBER<sup>1</sup>, Winfried GRANINGER<sup>2</sup>, Reinhard WINDHAGER<sup>1</sup>

<sup>1</sup>Department of Orthopaedic Surgery, University Clinic of Graz, Graz (AUSTRIA), <sup>2</sup>Department of Rheumatology, University Clinic of Graz, Graz (AUSTRIA)

**INTRODUCTION:** We investigated the effect of Resveratrol on synovial cells of Osteoarthritis (OA) patients compared to synovial cells from Rheumatoid Arthritis (RA) patients. In animal experiments Resveratrol causes a growth rate decrease in synovial tissue and furthermore an inhibition of pro-inflammatory factors. **MATERIALS AND METHODS:** Random biopsies of synovial membrane were obtained aseptically from joints of OA and of RA patients. After in vitro expansion, cells were cultivated until passage three, seeded in 96 well microtiterplates and treated with 0 $\mu$ M, 50 $\mu$ M, 100 $\mu$ M and 200 $\mu$ M of Resveratrol. After 24 and 48 hours incubation cell proliferation assays were performed. Additionally photographic documentation of resettlement of synovial cells was accomplished. **RESULTS:** The results of cell proliferation assays showed a highly significant reduction of synovial cell proliferation as well in OA and RA cells. In OA cultures 50 $\mu$ M Resveratrol evoked a decrease of 20.3 $\pm$ 2.7%, 100 $\mu$ M 52.2 $\pm$ 2.1% and 200 $\mu$ M 72.3 $\pm$ 1.7%. In RA cultures 50 $\mu$ M Resveratrol evoked a decrease of 28.69 $\pm$ 1.6%, 100 $\mu$ M 58.36 $\pm$ 2.0% and 200 $\mu$ M 77.7 $\pm$ 1.8% (n=20). The results of photographic documentation correlated with cell experiments. **DISCUSSION:** Resveratrol showed a highly significant growth rate decrease in synovial cells. According to literature we expect an inhibition of proinflammatory factors in synovial membrane. As well as in OA and RA the pharmacologic treatment with Resveratrol is a possible therapeutic approach.

**Date : 2008-08-27**

**Session : Basic science: cells and tissue engineering**

**Time : 1100-1215**

**Room: 406-407**

**Abstract number : 18915**

**NANO BIPHASIC CERAMIC ARTIFICIAL BONE'S OSTEOCONDUCTIVITY AND DEGRADABILITY**

Jian-de XIAO, Wei HE

*Dept of Orthopaedics, Shenzhen Second People's Hospital, Shenzhen (CHINA)*

**OBJECTIVE:** To study the nano biphasic ceramic artificial bone's osteoconductivity and degradability. **METHODS:** The animal models were made by the unilateral radius of 36 New Zealand white rabbits, which were divided into three groups (nano biphasic ceramic group and nano hydroxyapatite group and blank group respectively). Every group was evaluated by gross observation, X-ray examination, histopathological observation and SEM detection. **RESULTS:** The degradability of the experimental group is better than that of the control group. The osteoconductivity of the two groups has no difference. **CONCLUSION:** The nano biphasic ceramic artificial bone has fine osteoconductivity and degradability. **KEYWORDS:** Nano; biphasic; artificial bone; osteoconductivity; degradability.

**Date : 2008-08-27**

**Session : Basic science: osteonecrosis and reconstruction**

**Time : 1400-1530**

**Room: 406-407**

**Abstract number : 15619**

**A CLINICAL SIGN TO DIFFERENTIATE BETWEEN POSTERIOR INTEROSSEOUS NERVE AND SUPERFICIAL EXTENSOR MUSCLE INJURY IN PROXIMAL FOREARM LACERATIONS**

Chandrabose REX, Suresh Kumar P.M.

*Rex Ortho Hospital, Coimbatore (INDIA)*

**PURPOSE:** To differentiate between posterior interosseous nerve (PIN) and superficial extensor muscle injury in proximal forearm lacerations. **METHOD:** Five patients presented to us with laceration of the extensor aspect of the proximal (less than 9cm from the lateral epicondyle) forearm. All of them had loss of extension of the medial three fingers, with intact thumb and index finger extension at metacarpophalangeal joint. Surgical exploration revealed an intact PIN in all the five patients. Dissection was done in 20 cadavers which showed that the PIN divides about 9cm distal to the lateral epicondyle of the humerus. The origins of extensor indicis and the extensor pollicis longus were defined and found to arise well distally in the forearm. **RESULT:** Surgical exploration in all the five cases who presented with ulnar three finger drop following a laceration of the proximal forearm over the extensor aspect (less than 9cm from the lateral epicondyle) revealed only superficial extensor muscle injury sparing the PIN. **CONCLUSION:** Presence of thumb and index finger extension with loss of extension of ulnar three digits is a reliable clinical sign to rule out PIN injury. This sign can be used to differentiate superficial extensor muscle injury from the PIN injury in lacerations of the proximal (Less than 9cm from the lateral epicondyle) forearm.

Date : 2008-08-27

Session : Basic science: osteonecrosis and reconstruction

Time : 1400-1530

Room: 406-407

Abstract number : 15833

**ELEVATED LEVELS OF NUMEROUS CYTOKINES IN DRAINAGE FLUID AFTER PRIMARY TOTAL HIP ARTHROPLASTY**

Huub VAN DER HEIDE<sup>1</sup>, Peter VAN DER KRAAN<sup>1</sup>, Willard RIJNBERG<sup>2</sup>, Pieter BUMA<sup>1</sup>, B. Willem SCHREURS<sup>1</sup>

<sup>1</sup>Radboud University Nijmegen Medical Centre, Nijmegen (NETHERLANDS), <sup>2</sup>Rijnstate Hospital, Arnhem (NETHERLANDS)

**INTRODUCTION:** The reason why heterotopic ossification develops after total hip arthroplasty is still not known, but it is assumed that the inflammatory reaction is the major driving force. In literature little is known about the cytokine levels at the site of surgery, most measurements are done in serum. **METHODS:** This study was conducted to investigate if the levels of different pro- en anti-inflammatory cytokines are measurable in drainage fluid and, when measurable, whether we can find a difference in cytokine concentration between one and six hours postoperatively. Samples from the drainage system in 30 consecutive patients undergoing primary total hip replacement were collected at one and six hours after closure of the wound. GM-CSF, G-CSF, IFN- $\gamma$ , TNF- $\alpha$ , MCP-1, IL-1 $\beta$ , IL-2, IL-4, IL-5, IL-6, IL-7, IL-8, IL-10, IL-12, IL-13 and MIP-1 $\beta$ ; levels were measured in the drainage fluids. **RESULTS:** Measurable levels of all cytokines studied were found, except for IL-17. A significant elevation of almost all cytokines was observed between the sample after one hour and six hours postoperatively. The elevation was significant for all cytokines except IL-10 and MIP-1 $\beta$ . We found a strong correlation between the different pro-inflammatory cytokines. Levels are much higher than previously shown levels in serum. Detectable levels of numerous cytokines can be measured in drainage fluid postoperatively. The levels of most cytokines, and especially the pro-inflammatory ones, in drainage fluid are higher in samples taken six hours after surgery as compared to samples taken after one hour, suggesting an inflammatory reaction.

**Date : 2008-08-27**

**Session : Basic science: osteonecrosis and reconstruction**

**Time : 1400-1530**

**Room: 406-407**

**Abstract number : 17943**

**AN INJECTABLE CALCIUM SULFATE - STRONTIUM CONTAINING HYDROXYAPATITE BONE FILLER AS ALTERNATIVE IN RESTORATION OF BONE DEFECTS**

Chi Tak WONG

*The University of Hong Kong, Hong Kong (HONG KONG)*

Calcium sulfate has been used as a substitute for bone graft in filling bone defects. Implantation of calcium sulfate into bone or soft tissue did not result with any foreign-body reaction and, by itself, did not induce bone. In the 1990s the use of calcium sulfate was substituted by calcium phosphates, mainly hydroxyapatite (HA), for bone-grafting. The main reason for this modification was the rapid resorption and low strength of calcium sulfate. An injectable material consisting of calcium sulfate hemihydrate ( $\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$ ) mixed with strontium containing hydroxyapatite (Sr-HA), which was investigated as a possible alternate autograft in the restoration of bone defects. The incorporation of 30%wt Sr-HA allowed improving handling characteristics and strength, while enhancing the osteoconductivity of the material. Results demonstrated that the setting time of  $\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$ -SrHA paste was 20 minutes and the composite showed a higher mechanical strength in both short and long term than the pure calcium sulfate paste. In vitro study showed that the  $\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$ -SrHA paste stimulated osteoblast (SaOS-2) attachment and proliferation, as well as mineralization. The injectable calcium sulfate - strontium containing hydroxyapatite bone substitute could be a potential candidate as alternative in restoration of bone defects.

**Date : 2008-08-27**

**Session : Basic science: osteonecrosis and reconstruction**

**Time : 1400-1530**

**Room: 406-407**

**Abstract number : 18193**

**CORE DECOMPRESSION + GROWTH FACTORS IN THE TREATMENT OF THE OSTEONECROSIS OF THE FEMORAL HEAD**

Jolanda Maria TAGLIORETTI

*CTO\_ICP, Busto Arsizio (ITALY)*

The incidence of osteonecrosis of the femoral head is growing in young people (average 38 years) and, as it is bilateral in 50% and leads to a prosthetic replacement operation in 10%, the goal of the treatment is the preservation of the femoral head which can be performed only in the first stages of the disease (I-II of Ficat) and proportionally to the damage occurred. The core decompression is one of the most common surgical operations of the first stages. The employment of angiogenetic proposals of growth factors, autologous or homologous in case of contraindication to the use of the autologous one (platenetpenia, platenetpathy, neoplastic pathology, coagulopathy, drugs (ASA-FANS-TAO) + concentrated MSCs from drawing on the ilia wing, may raise osteogenesis in the collapsing femoral head. The author reports the experience in 12 cases (8 IIA - 4 IIB) treated with AGF + MSCs in 9 cases, GF from donor + MSCs in 3 cases, with follow-up ranging from 50 to 28 months, and checked at 4-8-12 months and at check with Rx-RNM and with card HHS and VAS pre and postoperative. 7 patients had some excellent results (restitutio ad integrum); 3 patients had good results (low pain while walking but no illness advancement); 2 patients had bad results (1 suffering from AR which was re-operated following the same method; 1 affected with HIV-HCV+). The satisfactory results we obtained, the fact that this lowly invasive operation can be repeated, lead us to suggest this conservative operation even in advanced illness stages.

**Date : 2008-08-27**

**Session : Basic science: osteonecrosis and reconstruction**

**Time : 1400-1530**

**Room: 406-407**

**Abstract number : 18442**

**FUNCTIONAL PERFUSION MRI PREDICTS STEROID-ASSOCIATED OSTEONECROSIS: AN EXPERIMENT STUDY IN RABBITS**

Hui SHENG, Ge ZHANG, Yixiang WANG, David KW YEUNG, James F. GRIFFITH, Kwoksui LEUNG, Xinhui XIE, Ling QIN

*The Chinese University of Hong Kong, Hong Kong (HONG KONG)*

Ischemia is defined pathway leading to steroid-associated-osteonecrosis (ON). Vasculature perfusion function evaluation by perfusion MRI might predict ON occurrence. Lipopolysaccharide and methylprednisolone were injected to induce ON in rabbits. The blood perfusion in proximal femora was evaluated by perfusion MRI at week 0, 1 and 2. T1-weighted and T2-weighted MRI were performed for ON lesions detection. The femora were processed for ON lesions identification, lesion size and marrow fat area measurement. The femora with histopathological ON lesions were defined as ON+ cases and included into ON+ group, those without ON lesions into ON- group. Tissue factor (TF) was detected. The maximum enhancement (ME) in ON+ group were much lower than ON- group at week 1 and 2 ( $p < 0.01$ ). Week 1 ON+ group showed significant decrease in ME and a further decrease in week 2 compared with baseline ( $P < 0.01$ ). 90% (27/30) femora with ME lower than 50% at week 1 subsequently developed into ON+ femora at week 2. The ME showed a strong negative correlation with ON lesion size ( $r = -0.82$ ,  $p < 0.01$ ). Compared with perfusion MRI, 10% (3/30) ON+ femora were detected for abnormal signals at week 1 by conventional MRI. A much larger marrow fat area and stronger positive TF expression of marrow endothelium were found in ON+ femora. This is a first study that confirmed that perfusion MRI could predict ON development. This formed a scientific foundation for clinical validation using perfusion MRI for early prediction or detection of ON.

Date : 2008-08-27

Session : Basic science: osteonecrosis and reconstruction

Time : 1400-1530

Room: 406-407

Abstract number : 18450

**EPIMEDIUM-DERIVED FLAVONOIDS DOSE-DEPENDENTLY INHIBIT BOTH THROMBOSIS AND LIPID-DEPOSITION FOR REDUCING INCIDENCE OF STEROID-ASSOCIATED OSTEONECROSIS NOT VIA THEIR DIRECT ACTION ON TARGETS**

Ge ZHANG, Ling QIN, Hui SHENG, Xinluan WANG, KS LEUNG

*The Chinese University of Hong Kong, Hong Kong (HONG KONG)*

Intravascular-thrombosis and extravascular-lipid-deposit are the two key pathogenic events to interrupt intraosseous blood supply in steroid-associated osteonecrosis (ON). However, there is so far no candidate agents reported simultaneously targeting these two key events. The present study demonstrated that herb Epimedium-derived flavonoids (EF, composed of seven flavonoid compounds with common stem nuclear) exerted dose-dependent effect on inhibition of both thrombosis and lipid-deposition for maintaining integrity of intraosseous vasculature and accordingly reducing incidence of steroid-associated ON in rabbits, which was not via their direct action on pharmacological targets. The underlying mechanism could be explained by counteracting hypercoagulation, hypofibrinolysis, excessive adipogenesis and prominent lipid transport to peripheral tissue. These findings encourage designing clinical trials to investigate potential of EF in prevention of steroid-associated ON.



**Date : 2008-08-27**

**Session : Basic science: bone healing and reconstruction**

**Time : 1600-1730**

**Room: 406-407**

**Abstract number : 16632**

**AUDIT OF USE OF BLOOD TRANSFUSION IN PRIMARY, ELECTIVE, UNILATERAL TOTAL HIP REPLACEMENT**

Sahu AJAY<sup>1</sup>, Nanjundappa HARSHAVARDHANA<sup>2</sup>, Simon MARET<sup>2</sup>, Anubhav DHIR<sup>2</sup>, Maninder SINGH<sup>2</sup>

<sup>1</sup>Stockport Hospitals NHS Foundation Trust, Cheshire (UNITED KINGDOM), <sup>2</sup>Poole Hospitals NHS Trust, Dorset (UNITED KINGDOM)

The aim of this audit was to improve the practice of blood transfusion. We included patients undergoing a primary elective procedure and excluded patients with other causes. We looked into 80 consecutive cases and 14 needed transfusions. Postoperatively, pre-transfusion hemoglobin was tested in 86% (12/14). All of them had hemoglobin less than 8g/dl. 21% (3) received one, 64% (9) received two and 14% (2) received more than 3 units. Of those given more than 2 units, 63% (7/11) had post-transfusion hemoglobin more than 10g/dl. Postoperatively, blood was given if hemoglobin was less than 7g/dl. All asymptomatic patients were not transfused unless hemoglobin was less than 8g/dl, patients more than 65 yrs or with CVS or respiratory disease. 23% (3/14) of the transfused patients audited were ASA III or IV. Patients with hemoglobin less than 7.9 should not be transfused to achieve "normal" hemoglobin i.e. 12. The duration of surgery was 118 minutes (median). Blood loss during surgery was known for 37% (28/80) and after surgery for 88% (71/80). 76% of patients received spinal anaesthesia. We started low molecular weight heparin preoperatively in all 80 patients. Our recommendations were preoperatively anaemia should be corrected. GP's must optimise hemoglobin before referral and there should be a clear cut transfusion policy in the hospital. Single-unit blood may be appropriate in some cases. We found out that a significant amount (10-15%) of transfusions could be avoided.

**Date : 2008-08-27**

**Session : Basic science: bone healing and reconstruction**

**Time : 1600-1730**

**Room: 406-407**

**Abstract number : 16732**

**INCIDENCE OF MUSCULOSKELETAL DISORDER IN COMPUTER USERS AND ITS ERGONOMIC IMPLICATIONS**

Lalit MAINI<sup>1</sup>, E. Debaraju REDDY<sup>2</sup>

<sup>1</sup>Maulana Azad Medical College, Delhi (INDIA), <sup>2</sup>ESI Hospital, Delhi (INDIA)

The rapid development of information technology has entailed extensive and decisive changes in the working life. Despite the fact that information, communication and technology are being used to improve the quality of life, there are associated health hazards with the use of these devices. Musculoskeletal disorder is one of the key health and safety issues of modern IT era. With the computer mounted on everybody's desk, its related musculoskeletal disorders affect millions of computer users in developed and developing nations. Although there are studies done on this, we do not have many published studies on computer related musculoskeletal disorders in India. We conducted a questionnaire based cross sectional study among the IT professionals in India. A standard questionnaire was structured requesting for background information like sex, age, years of computer experience, computer applications commonly used, musculoskeletal problems faced and the knowledge of ergonomics etc. This questionnaire was mailed to different computer users at different centres and forms received back. The data so collected was processed and statistically analysed. The most common problems were those related to neck pain, low backache, and shoulder pain with low back being the most bothering. It is also seen that it is age and work hours dependent with older people being affected more. Those who follow the standards of the working place are less affected. Through this study the importance of ergonomics can be seen and it is suggested that companies involved in this profession educate their employees for proper use.

Date : 2008-08-27  
Session : Basic science: bone healing and reconstruction  
Time : 1600-1730  
Room: 406-407

Abstract number : 17044

**FORMATION OF CAPO<sub>4</sub> AND SUPPRESSION OF NI LEACHING IN NITINOL USING OXYGEN AND SODIUM PLASMA IMMERSION ION IMPLANTATION**

Kelvin YEUNG<sup>1</sup>, YL CHAN<sup>2</sup>, William LU<sup>2</sup>, Keith LUK<sup>2</sup>, Danny CHAN<sup>2</sup>, SL WU<sup>1</sup>, XM LIU<sup>1</sup>, CL CHU<sup>1</sup>, CY CHUNG<sup>1</sup>, Paul CHU<sup>1</sup>, Kenneth CHEUNG<sup>2</sup>

<sup>1</sup>City University of Hong Kong, Hong Kong (HONG KONG), <sup>2</sup>The University of Hong Kong, Pokfulam, Hong Kong (HONG KONG)

Orthopaedic applications of nitinol have been hampered by the high toxic nickel content. Our previous studies demonstrate oxygen plasma immersion ion implantation (PIII) can mitigate nickel leaching and enhance the corrosion resistance. However, the oxygen-implanted layer does not bond well to bones in vivo, thereby leading to potential mechanical failure at bone-implant interface. Sodium PIII may enhance the surface bioactivity of titanium and this study investigates the feasibility of apatite formation and enhancement of corrosion resistance of nitinol using combined Na and O PIII. Nitinol discs are implanted with oxygen plasma and some samples are subsequently treated by sodium plasma. The elemental depth profiles and chemical composition are determined by X-ray photoelectron spectroscopy, and the bioactivity and cytotoxicity are assessed by immersion tests in simulated body fluids and cell cultures respectively. The SEM and EDS spectra indicate the both treated surfaces can attract Ca and P deposition after SBF immersion. The amount of CaPO<sub>4</sub> deposited on the Na-PIII surface is lower than that on the Na&O-PIII sample. The corrosion resistance of Na&O PIII sample increases about 3 folds as compared with the untreated nitinol. The cell attachment tests indicate the cells seeded onto both treated nitinol spread more and the number of osteoblasts attached on the Na&O-PIII sample is significantly higher than the untreated one. In our experiments, energetic Na ions are implanted, thereby changing the chemical composition and surface morphology of the substrate. In summary, it suggests these plasma treatments may contribute to the biological performance.

Date : 2008-08-27

Session : Basic science: bone healing and reconstruction

Time : 1600-1730

Room: 406-407

Abstract number : 17081

**NON-STEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDS), FRIEND OR FOE TO THE ELECTIVE ORTHOPAEDIC PATIENT?**

Aniruddha MITRA, Simon RAJENDRAN, David MULCAHY, Kieran BARRY  
*Cork University Hospital / St Mary's Orthopaedic Hospital, Cork (IRELAND)*

Major orthopaedic surgery may result in significant blood loss and has led to routine pre-emptive blood cross matching for elective surgery. Non-steroidal anti-inflammatory drugs (NSAIDs) provide effective pain relief, however they also increase the risk of bleeding. The aim of our study was to determine the role of NSAIDs in total blood loss and transfusion requirement in elective arthroplasty. METHODS: A prospective randomized trial was undertaken from January 2006 to July 2006. All patients admitted for elective hip and knee arthroplasty (n=232) under two orthopaedic surgeons were enrolled. The patients were divided into two groups. Group 1 patients continued taking regular NSAIDs up to the day of surgery, while Group 2 patients had discontinued NSAIDs or were not on regular NSAIDs. Groups were further subdivided depending on procedure and implant inserted. RESULTS: Two hundred and thirty-two patients were involved in the study. One hundred and eighteen (51%) were on preoperative NSAIDs. Patients on NSAIDs preoperatively had a significantly increased per operative and total blood loss. The total blood loss was 1.27 to 1.40 times greater in Group 1 compared to Group 2 (p value 0.0046 & 0.0061 in the total hip and total knee arthroplasty groups, respectively). Transfusion requirements were 1.5 to 2 times higher in Group 2. There was no significant difference between the various implants in each group. CONCLUSION: This study has shown that discontinuing NSAIDs preoperatively is an effective way of reducing total blood loss and transfusion requirement in elective orthopaedic surgery.

**Date : 2008-08-27**  
**Session : Basic science: bone healing and reconstruction**  
**Time : 1600-1730**  
**Room: 406-407**

**Abstract number : 17538**  
**ESTIMATION OF MUSCLE FATIGUE DEGREE USING TIME-VARYING AUTOREGRESSIVE**

Hongtao LIU, Yong HU  
*The University of Hong Kong, HK (HONG KONG)*

Aiming at investigating the nonstationary character of the EMG signal, time-varying AR model was employed in this study to quickly estimate muscle fatigue by analysing short time surface electromyography. Data from 10 subjects pre- and post-fatigue were analysed by the AR model. A recursive least squares algorithm was then used to extract the time-varying parameters and transformed the time-varying question into time-stable one. The first time-varying parameter shows higher sensitivity to fatigue than that of the traditional median frequency (sensitivities increased from 37.80% to 324.46%). The mean value of the first time-varying parameter could be used as a fast indicator to reflect the fatigue of the muscle, which would promote practical applications in the field of lumbar muscle fatigue diagnosis and rehabilitation. Also it would provide a reliable tool for the study of ergonomics.

**Date : 2008-08-27**

**Session : Basic science: bone healing and reconstruction**

**Time : 1600-1730**

**Room: 406-407**

**Abstract number : 17541**

**FAST EXTRACTION OF SOMATOSENSORY EVOKED POTENTIAL BASED ON SECOND ORDER BLIND IDENTIFICATION**

Hongtao LIU, Yong HU

*The University of Hong Kong, HK (HONG KONG)*

Second order blind identification (SOBI) technique is a promising independent component analysis (ICA) method to extract somatosensory evoked potential (SEP). This simulation study focused on SEP extraction from EEG and power-line noise contaminated SEP signals at signal to noise ratio (SNR) of -10dB and -20dB. The correlation coefficients between template SEP and SOBI extracted SEP showed significant high similarity ( $r>0.76$ ) at -10dB and mild acceptable similarity ( $r>0.6$ ) at -20dB EEG contaminated SEP. However, SOBI extracted SEP showed good performance in power-line noise situation to achieve high correlation coefficients with template SEP ( $r=0.96$ ). The fast extracted SEP showed stable amplitude and latency, which are almost identical with the SEP template. The results suggested that SOBI is an appropriate method to extract SEP from noisy background. Acknowledgment: This work was partially supported by the Research Grants Council of the Hong Kong SAR, China (CERG HKU 7130/06E).

Date : 2008-08-27

Session : Basic science: bone healing and reconstruction

Time : 1600-1730

Room: 406-407

Abstract number : 18518

**ENHANCED OSTEOINTEGRATION OF THE GRADIENT COATING COMPOSED OF BIOACTIVE GLASS AND HYDROXYAPATITE IN RABBITS**

Xinhui XIE<sup>1</sup>, Tingting TANG<sup>2</sup>, Shaoxian ZENG<sup>3</sup>, Ruilin DU<sup>3</sup>, Ge ZHANG<sup>1</sup>, Ling QIN<sup>1</sup>

<sup>1</sup>Department of Orthopaedics and Traumatology, Prince of Wales Hospital, Hong Kong (HONG KONG), <sup>2</sup>Department of Orthopaedics, Shanghai Ninth People's Hospital, Shanghai (CHINA), <sup>3</sup>Institute of Ceramics, Shanghai (CHINA)

We conducted histologic and histomorphometric studies to evaluate the level of osteointegration of gradient coatings composed of bioactive glass and hydroxyapatite (BG-HA) on titanium-alloy orthopaedic implants and surrounding bone tissue in vivo. Titanium-alloy implants with a gradient coating (gradient coating group), uncoated implants (uncoated group), and implants with a plasma-sprayed hydroxyapatite (HA) coating (HA coating group) were randomly implanted in the medial and lateral femoral condyles of 32 male New Zealand rabbits. Both the amount of bone-implant contact and the new bone volume in the notch created for observing bone ingrowth and apposition were greater in the gradient coating group than in both the uncoated group and the HA coating group at 12 and 24 weeks ( $p < 0.05$ ) after implantation for the former value and at 4, 12, and 24 weeks for the latter value ( $p < 0.05$ ). Fluorescence micrographs showed active osteogenesis in the gradient coating group at 4 weeks after implantation. These findings indicate that BG-HA gradient coatings could enhance orthopaedic implant osteointegration.

Date : 2008-08-27  
Session : Spine: spinal stenosis  
Time : 0900-1030  
Room: 408

Abstract number : 15366

**EVIDENCE BASED REVIEW OF BACK PAIN IN ELITE SPORTSMEN AND WOMEN AS A RESULT OF DISC DEGENERATION, SEEN WITH MAGNETIC RESONANCE IMAGING**

Chindu KABIR<sup>1</sup>, Nemendra SANDIFORD<sup>1</sup>, Ritesh SHARMA<sup>2</sup>

<sup>1</sup>The London Hip Unit, London (UNITED KINGDOM), <sup>2</sup>The Royal Surrey County Hospital, Guildford (UNITED KINGDOM)

There is an increased chance of exacerbation of disc degeneration in athletes and sportsmen and women engaged in elite sports. Current training regimes in many sports have not fully assessed the impact of early exposure to top-level sport amongst athletes and specifically the effect on intervertebral disc degeneration, although some investigators have drawn attention to this. Ong et al., Sydney Olympic Games, 2000. 4-week duration. 31 athletes recruited. Loss of disc signal intensity, loss of disc height and presence of disc displacement mainly at L5S1 level. Study cannot be taken as the conclusive evidence for the prevalence of a higher level of disc degeneration in athletes but it does raise many questions regarding the current training methods for athletes and the intensity of these training regimes. Elliot et al. To identify the relationship between lumbar disc degeneration and bowling action in fast bowlers after a 3-year educational intervention. 24 fast bowlers from the Western Australia with mean age 13.4 years and 17 with mean age 13.2 years. Educational intervention on bowling action attending 3 of the 4 yearly testing sessions and 2 of the 3 yearly testing sessions respectively. The yearly coaching made significant improvement in changing the bowling action and subsequent reduction in risk of disc injury. No significant change on the maximum knee joint angle. There was also no change on the ball velocity with the change in action for front-on, side-on and mixed action bowlers. Disc degeneration was more evident for mixed action bowlers.



**Date : 2008-08-27**  
**Session : Spine: spinal stenosis**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 16364**

**LONG-TERM OUTCOMES OF THE REVISION OPEN LUMBAR DISCECTOMY BY FENESTRATION**

Jiong Jiong GUO, Huilin YANG

*Dept of Orthopaedics, The First Affiliated Hospital of Soochow University, Suzhou (CHINA)*

**METHODS:** Fifty-one patients who underwent the second open discectomy by fenestration from Jan 1, 1988 to Dec 31, 1994 were followed for an average of 146.8 months. The long-term follow-up results were evaluated by using the MacNab classification and the JOA scoring system through direct examinations and questionnaires. Radiography also was used in patients who agreed to visit the hospital and findings were compared with those on preoperative radiographs. **RESULTS:** At the final follow-up with the MacNab classification an excellent and good outcome was achieved in 70.6% of the cases; 78.4% were satisfied with their results. The failure rate was 15.7%. Excluding those 8 failed cases that needed another reoperation, the average improvement calculated by JOA scores was  $64.6 \pm 18.2\%$ . The disc height of the operation site significantly decreased after surgery; nevertheless, this did not affect the long-term clinical outcome. Factors that were associated with a fair and bad outcome included smoking, isolated trauma or injury, fibrosis and the length of the remaining or recurrent primary postoperative symptoms history. Psychosociological signs were probably known as negative predictors of lumbar disc surgery outcome. **CONCLUSION:** The long-term outcome of the revision open lumbar discectomy by fenestration in this series was favourable. Because the revision operation is typically associated with a higher complexity, selection of suitable surgical candidates and determination of valid indications for operative treatment are very important. JOA scores have proved to be easy to perform for patients and clinicians and standardize subjective data.

Date : 2008-08-27  
Session : Spine: spinal stenosis  
Time : 0900-1030  
Room: 408

Abstract number : 16388

**POSITRON EMISSION TOMOGRAPHY FOR MONITORING INTERBODY FUSION WITH EQUINE BONE PROTEIN EXTRACT, RHBMP-2 AND AUTOGRAFT**

Casper FOLDAGER<sup>1</sup>, Michael BENDTSEN<sup>1</sup>, Xuenong ZOU<sup>1</sup>, Lijin ZOU<sup>1</sup>, Aage Kristian OLSEN<sup>2</sup>, Ole Lajord MUNK<sup>2</sup>, Cody BÜNGER<sup>1</sup>  
<sup>1</sup>Orthopaedic Research Laboratory, Aarhus University Hospital, Aarhus C (DENMARK), <sup>2</sup>PET-Center, Aarhus University Hospital, Aarhus C (DENMARK)

**INTRODUCTION:** The widespread use of fusion procedures in the management of spinal disorders has led investigators to explore the use of growth and differentiation factors. The assessment of bone regeneration, from equine collagen lyophilisate or rhBMP-2 is important in better understanding of the mechanism of action of these materials currently being developed as bone graft alternatives. The tracer fluoride ion, <sup>18</sup>F, is known to accumulate at sites of osteoblastic activity by exchange with the hydroxyl group of hydroxyapatite crystals. **MATERIAL AND METHODS:** An anterior lumbar interbody fusion was performed on 17 Danish female landrace pigs. A PEEK cage containing autograft, INFUSE (rhBMP-2) dissolved on collagen, or COLLOSS E was inserted in the intervertebral space. They were divided into three groups of 6, 6 and 5 pigs that were observed for 2, 4, and 8 weeks respectively. Before sacrifice, the pigs were scanned by means of PET/CT with <sup>18</sup>F tracer. **RESULTS:** Paired T-test revealed a difference in the activity was found in both the INFUSE and COLLOSS E level compared to autograft ( $P < 0.05$ ) two weeks postoperatively, with no difference between the INFUSE and COLLOSS E ( $P < 0.05$ ), with no difference between the latter two. 8 weeks postoperatively, no significant difference was found. **CONCLUSION:** This non-invasive technique provides important information about the ongoing metabolic status of the osteogenesis in spinal fusion.

Date : 2008-08-27  
Session : Spine: spinal stenosis  
Time : 0900-1030  
Room: 408

Abstract number : 17007

**LUMBAR SPINAL STENOSIS: BASELINE CHARACTERISTICS, SURGICAL MEASURES, AND OUTCOMES IN THE SPINE TANGO REGISTRY**

Markus MELLOH<sup>1</sup>, Thomas ZWEIG<sup>2</sup>, Emin AGHAYEV<sup>2</sup>, Lukas STAUB<sup>2</sup>, Thomas BARZ<sup>3</sup>, Peter RIEGER<sup>3</sup>, Jean-Claude THEIS<sup>1</sup>, Christoph ROEDER<sup>2</sup>

<sup>1</sup>University of Otago, Dunedin (NEW ZEALAND), <sup>2</sup>MEM Research Center/ University of Berne, Berne (SWITZERLAND), <sup>3</sup>Asklepios Klinikum Uckermark, Schwedt/ Oder (GERMANY)

INTRODUCTION: While the first international spine registry SPINE TANGO has now been fully operational for five years, no results of collected data on a defined spinal disease have been shown so far. METHODS: Prospective consecutive study of 1778 patients, who had been treated with posterior lumbar fusion for spinal stenosis between 05/2005 and 10/2007. Surgical complications, work status, medication, physician-based outcome, rehabilitation process, complications, and therapeutic consequences at follow-up were assessed. Descriptive analysis was conducted for demographic, surgical, and follow-up data. RESULTS: Median age was 70 yrs (range 19-97 yrs) with a female to male ratio of 5.3:4.7. Sole decompression, fusion without, and fusion with rigid stabilization were performed in one third of the patients respectively. The rate of surgical complications was 6.7%, thereby dural tears accounted for almost 50%. Only 19.1% of patients resumed work whereby 51.3% were already retired before surgery. The most frequently taken medication were NSAIDs (33.5%) followed by opiates (8.0%). 80.3% of outcomes were rated as "excellent" or "good", 19.7% as "fair" or "poor" by their physicians. Outpatient (31.5%) and home-based rehabilitation (29.1%) were arranged most frequently, inpatient rehabilitation accounted for 7.4%. Complication rate at follow-up was 8.1%, with 14.5% of these patients needing re-intervention. DISCUSSION: The feasibility of data analysis of a defined spinal disease from the international spine registry SPINE TANGO could be demonstrated performing descriptive analysis with an evidence level 2++.

Date : 2008-08-27  
Session : Spine: spinal stenosis  
Time : 0900-1030  
Room: 408

Abstract number : 17042

**YELLOW LIGAMENT FLOATING METHOD FOR LUMBAR SPINAL CANAL STENOSIS: A LESS INVASIVE TECHNIQUE TO NERVE TISSUE**

Takashi YAMAZAKI<sup>1</sup>, Motoaki MURAKAMI<sup>1</sup>, Koh MATSUDAIRA<sup>2</sup>

<sup>1</sup>Musashino Red Cross Hospital, Tokyo (JAPAN), <sup>2</sup>Tokyo University, Tokyo (JAPAN)

We have developed a new decompression technique that preserves the yellow ligament when treating lumbar spinal canal stenosis (LSCS). Floating the yellow ligament is achieved by circumferential removal of the lamina attachment. Decompression of the nerve roots is confirmed by removing bone by the width of the pedicles. The utility of this method is that the epidural vessels and fat are preserved and incidental durotomy is decreased, as almost all of the procedure is performed posterior to the yellow ligament and the dura rarely appears in the surgical field. Our cohort consisted of 20 LSCS cases (mean age 69.3) that had no history of spontaneous leg pain, positive SLR test, or lumbar disc herniation on MRI. Following our procedure, the overall Japanese orthopedic association score improved from 16.0 to 23.9 and the overall Oswestry disability index improved from 40.1% to 15.4% (follow-up period 12-21 months). No incidental durotomy occurred. In another cohort of 102 patients who required disc checks, removal of the yellow ligament was performed after floating the yellow ligament. Incidental durotomy occurred in only one case, thus the overall rate of incidental durotomy was 1/122 or 0.8%, which is better than our previous result of 6.1% (11/179) and results reported in the literature (1% to 16%). Our conclusion is that the yellow ligament floating method is a safer and more useful decompression technique that may reduce the possibility of epidural scar formation.

**Date : 2008-08-27**  
**Session : Spine: spinal stenosis**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 17612**

**CIRCUMSPINAL DECOMPRESSION WITH DEKYPHOSIS STABILIZATION FOR THORACIC MYELOPATHY DUE TO OSSIFICATION OF POSTERIOR LONGITUDINAL LIGAMENT**

Norio KAWAHARA, Katsuro TOMITA, Hideki MURAKAMI, Satoru DEMURA, Tadaki OKAYAMA  
*Department of Orthopaedic Surgery, School of Medicine, Kanazawa University, Kanazawa (JAPAN)*

Anterior decompression is the best for the spinal cord recovery to treat thoracic myelopathy caused by ossification of posterior longitudinal ligament (OPLL) on the concave side of the spinal cord. However, anterior decompression for OPLL is technically demanding. Circumspinal decompression with dekyphosis stabilization was prospectively performed for thoracic myelopathy due to OPLL. **METHODS:** Operative procedure: 1st step: Wide laminectomy is performed. Bilateral gutters along the dural tube are made using a diamond drill into the vertebral body covering the extent of the OPLL to be removed anteriorly. Posterior instrumentation is applied for stabilization of the spine and reducing thoracic kyphosis by approximately 5-10 degrees (dekyphosis stabilization). 2nd step: 4 weeks after the 1st step, anterior decompression is performed with direct vision with the landmark of gutters using an operative microscope, followed by interbody fusion. 15 patients with thoracic OPLL had this operation. **RESULTS:** Kyphosis in the stabilization area reduced from 31 to 25 degrees on average in the 15 patients. All 15 patients neurologically improved from 4.0 points to 9.3 points on average in JOA scores (full score: 11.0 points) at 4.6 years follow-up. In the 1st step, the operative time was 9.20 hours, and the blood loss was 1550ml on average. In the 2nd step, 8.5 hours and 1310ml. **CONCLUSION:** The OPLL plaque in the thoracic spine might be most easily, safely, and completely removed or floated and the spinal cord is circumferentially decompressed through this operation.

Date : 2008-08-27  
Session : Spine: spinal stenosis  
Time : 0900-1030  
Room: 408

Abstract number : 17980

**THE INTERSPINOUS LOCKER FIXATION FOR LUMBAR STENOSIS IN ELDERLY PATIENTS**

Sang-Ho LEE<sup>1</sup>, Dong-Yeob LEE<sup>2</sup>

<sup>1</sup>Seoul Wooidul Hospital, Seoul (KOREA), <sup>2</sup>Chungdam Wooidul Hospital, Seoul (KOREA)

**BACKGROUND:** Degenerative lumbar spinal stenosis is a common condition in elderly patients. Since most of these patients are frequently combined with degenerative instability, fusion procedures have been conventionally proposed in addition. However, performing fusion in this elderly population has its own disadvantages due to co-morbid conditions and health risks of the subjects. The purpose of study is to evaluate the efficacy of the interspinous locker fixation (ILF) after microdecompression as an alternative to the fusion for the treatment of lumbar stenosis with mild degree of instability in the elderly patients. **METHODS:** Forty-one patients with the minimum age of 65 years and symptomatic spinal stenosis who underwent ILF after microdecompression between February 2004 and August 2006 at our institution are followed retrospectively. The male to female ratio was 19:22 with the mean age of 71.7 years (range: 65-81 years). The mean follow-up period was 14.6 months (range: 5-32 months). **RESULTS:** The mean VAS score for leg and back symptom dropped from 5.8 to 2.3 ( $p<.0001$ ) and 5.6 to 3.4, respectively ( $p=.0019$ ). The ODI improved from 56.4% to 31.9% ( $p<.0001$ ). There was one case requiring revision surgery at the affected levels. There was no associated complication such as infection or intraoperative neural injury. **CONCLUSIONS:** Considering its conservative nature, the ILF could be favoured as less invasive yet as effective procedure as fusion operation with comparable clinical outcome to that of fusion operation for elderly patients suffering from lumbar stenosis.

**Date : 2008-08-27**  
**Session : Spine: spinal stenosis**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 18161**

**SOLE PAIN CAUSED BY L5/S EXTRAFORAMINAL STENOSIS SUCCESSFULLY TREATED BY MICROENDOSCOPIC SURGERY**

Motohide SHIBAYAMA<sup>1</sup>, Saori NAGAO<sup>1</sup>, Jun MIZUTANI<sup>2</sup>, Takanobu OTSUKA<sup>2</sup>

<sup>1</sup>*Toyokawa City Hospital, Toyokawa city, Aichi (JAPAN)*, <sup>2</sup>*Nagoya City University, Nagoya (JAPAN)*

**OBJECTIVES:** To describe a new clinical entity of sole pain caused by L5/S extraforaminal stenosis. **PATIENTS AND METHODS:** Two males and two females, aged 60 to 82, had sole pain with over 3-year history in average. One had unilateral and three had bilateral symptoms. Two had tarsal tunnel surgery previously. MRI, selective root graphy and other image studies were performed. JOA score and VAS were used as evaluation. **SURGERY:** L5/S extraforaminal stenosis was decompressed under microendoscope. A third of the caudal transverse process, lateral wall of the L5 body, and the Sacral Ala were resected to unroof L5 root. **RESULTS:** All image studies showed no specific findings. Only selective nerve root block showed pain relief. After surgery, VAS dropped 8.2 to 2.5. JOA score increased 15 to 24. **DISCUSSIONS:** Extraforaminal stenosis or entrapment is most common at L5/S, which involves L5 nerve root. Usual symptom caused by L5 root entrapment is instep pain. But our patients expressed sole pain, which is usually innervated by S1. In surgery, anomaly was found in one patient, but no reasons for mismatch were discovered in others. All showed good clinical recovery by microendoscopic decompression of L5 root. Diagnosis of this entity is difficult, because the innervations are different from regular knowledge. Image studies rarely describe the lesion. And bilateral symptoms from extraforaminal stenosis are usually rare. L5/S extraforaminal region must be checked in case of patients with undiagnosed sole pain.

Date : 2008-08-27  
Session : Spine: spinal stenosis  
Time : 0900-1030  
Room: 408

Abstract number : 18651

**TRANSFACETAL SCREW FIXATION AND FUSION IN DEGENERATIVE SPONDYLOLISTHESIS: A PROSPECTIVE STUDY OF 22 CASES**

Ashok GAVASKAR<sup>1</sup>, Rajamani ACHIMUTHU<sup>2</sup>

<sup>1</sup>Mahatma Gandhi Medical College and Research Institute, Chennai (INDIA), <sup>2</sup>Government Rajaji Hospital, Madurai (INDIA)

22 consecutive female patients with degenerative spondylolisthesis of the lumbar and lumbosacral spine underwent transfacetal screw fixation and fusion at our institution from 2000 to 2002. The indication for fusion in all patients was persistent, resistant intractable low back pain. All patients had degenerative changes with anterolisthesis  $\pm$  pathological disc condition and spondyloarthritis confined to a single level. Patients demonstrating lysis were excluded. All patients demonstrated segmental instability with >5mm translation on dynamic radiographs. Fixation with transfacetal screws was performed in all patients and the local bone obtained during decompression was used for fusion. Nucleotomy were performed in indicated cases. Average follow-up was 4 years and 4 months. All patients showed solid bony fusion in the radiologic follow-up. Loosening or breakage of the screws was not seen in any patient. All patients had postoperative pain relief. All of them returned to their daily activities without major limitations. The results were further analysed according to Stauffer and Coventry with good results in 18 patients and satisfactory results in 4 patients. To conclude transfacetal screw fixation offers an immediate postoperative stability of the lumbar and lumbosacral spine and enhances fusion. In the present series no neurologic complications were noted. It represents a useful and inexpensive technique for short segment fusion in degenerative instability of lumbar and lumbosacral spine.



**Date : 2008-08-27**  
**Session : Spine: spinal stenosis**  
**Time : 0900-1030**  
**Room: 408**

**Abstract number : 18766**

**INTRADISCAL ELEKTROTHERMAL THERAPY - A PROSPECTIVE CLINICAL TRIAL IN PATIENTS WITH CHRONIC DISCOGENIC PAIN SYNDROME**

Andreas VEIHELMANN, C. BIRKENMAIER  
*Hospital Falkenburg/Waldbronn, Bad Herrenalb (GERMANY)*

**INTRODUCTION:** The effect of Intradiscal electrothermal therapy (IDET) is discussed controversially. This study was performed to evaluate whether IDET is effective in patients with chronic low back pain which had an indication for total disc replacement (TDR) or stabilization. **METHODS:** 25 patients were enrolled in this study. All of them had indication for TDR or stabilisation after unsuccessful conservative treatment. Inclusion criteria were positive provocative discography and dehydrated disc with at least 70% height of the adjacent disc. Before, 4 weeks, 3 and 6 months after IDET visual analogue scale (VAS), modified Oswestry Disability Score (ODS), as well as the question "IDET again?" were identified. **RESULTS:** 3 months after IDET VAS was significantly reduced from 7.1 $\pm$ 2.0 to 3.3 $\pm$ 1.7 ( $\pm$  SEM) (6 months after 3.6 $\pm$ 1.6). ODS was significantly ameliorated at all time points. Only 2 out of 25 refused having IDET again. **DISCUSSION:** In a selected group of patients with discogenic pain syndrome IDET seems to be a possible alternative therapy to total disc replacement or stabilisation.

**Date : 2008-08-27**

**Session : Spine: degenerative spine**

**Time : 1100-1215**

**Room: 408**

**Abstract number : 15890**

**INTERSPINOUS LUMBAR EPIDURAL STEROID INJECTION IN LOW BACKACHE WITH RADICULOPATHY WITHOUT FLUOROSCOPIC GUIDANCE**

Premananda DAS, Ranjit Kumar BARUAH

*Assam Medical College & Hospital, Department of Orthopaedics, Dibrugarh (INDIA)*

**INTRODUCTION:** The epidural injection of a combination of a long acting steroid with an epidural anesthetic is an excellent method of symptomatic treatment of back and leg pain from discogenic disease and other sources. **AIMS AND OBJECTIVES:** (I) To evaluate clinical results of epidural steroid in low backache with or without radiculopathy. (II) To evaluate the success rate of the procedure without fluoroscopic guidance. **METHODS:** Total 30 patients both male and female equal in numbers of 20-50 years of age with low backache with radiculopathy were assessed clinically after the procedure on 0, 1, 7 days and then monthly for 3 months by using following improvements of sign and symptoms (1) Back pain (2) Leg pain and (3) SLRT. Needle placement is confirmed by following three confirmatory tests (i) Saline drop out test (ii) Air injection test & (iii) Whash test. **RESULTS:** At three months 26 cases (86.66%) got back pain relief, 19 cases (63.33%) cases got leg pain relief and 28 (93.33%) cases SLRT were negative. **CONCLUSION:** Epidural steroid do offer prolonged pain relief without excessive analgesic intake and easy to give with a very minimum or nil complication. Needle placement success rate is almost the same as fluoroscopic guidance after using the three confirmatory tests without fluoroscopy.

**Date : 2008-08-27**  
**Session : Spine: degenerative spine**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 16023**

**CLINICAL OUTCOME OF SPINE STABILISATION USING SEMI-RIGID (DYNESYS) SYSTEM IN DEGENERATIVE LUMBAR SPINE DISORDERS - STUDY OF 25 CASES**

Manish DESAI, Ganesh NATARAJAN, K.P. MURALIKUTTAN  
*Calderdale Royal Hospital, West Yorkshire (UNITED KINGDOM)*

**METHOD:** Retrospective study. **OBJECTIVES:** Subjective evaluation and patient-oriented clinical outcome of the result; to establish whether Dynamic spine stabilisation system can replace the commonly used rigid systems. **MATERIALS AND METHODS:** 25 patients (male 10: female 15). Clinical evaluation was based on pre and postoperative VAS and ODI, at 6 weeks, 6 months, 1 and 2 years. **RESULTS:** The mean VAS for low back pain was 6.9 and decreased after surgery at 24 months to 3.4. Mean VAS for leg pain was decreased from preoperative 6.2 to 2.1 postoperative. The final ODI score reduced from 54 preoperative to 29. An interesting pattern of improvement in ODI as 43.0, 38, 32.5 and 29 score at 6 weeks, 6 months, 1 year, and 2 years, respectively represents an improvement of 20%, 29%, 40% and 46%. Group A (>50 years), mean ODI improved from 50 (preoperative) to 25 postoperative, suggests >50% improvement. Group B (<50 years) mean ODI improved 62 to 34. This suggests there is no age-related difference in clinical outcome. More than 50% improvement in the mean ODI, from preoperative 49 to 21 postoperative, observed in lumbar spine instability especially spondylolisthesis and Lumbar canal stenosis. **DISCUSSION:** Dynesys system in spondylolisthesis and stenosis gives similar and promising clinical results as seen in established protocols using decompression and fusion with pedicle screws. **CONCLUSION:** Dynesys can be considered as an effective option to rigid stabilisation systems and a successful alternative to disc implant.

Date : 2008-08-27

Session : Spine: degenerative spine

Time : 1100-1215

Room: 408

Abstract number : 17131

**CLINICAL OUTCOME AFTER SEGMENTAL WIRE FIXATION AND BONE GRAFTING FOR REPAIR OF THE DEFECTS IN LUMBAR SPONDYLOLYSIS**

Hiroyasu OGAWA, Katsuji SHIMIZU, Satoshi NOZAWA, Hideo HOSOE, Kei MIYAMOTO, Kenichiro TANAKA  
*Gifu University School of Medicine, Gifu (JAPAN)*

INTRODUCTION: The aim of this study was to assess clinical outcomes after segmental wire fixation and bone grafting for repair of pars defects in lumbar spondylolysis. PATIENTS AND METHODS: Between 1983 and 2004, 30 patients with lumbar spondylolysis (22 men and 8 women, mean age 24.3+/-1.2 years) underwent this surgery. Clinical outcomes were determined by Japanese Orthopaedic Association (JOA) scores and Macnab criteria, and healing of pars defects was evaluated by radiography. RESULTS: The level of spondylolysis was L4, L3+L4, L2+L3+L5, and L3+L4+L5 in one patient, respectively, L5 in 21 patients, and L4+L5 in 5 patients. The mean follow-up period was 43.4+/-4.5 months. The mean JOA score improved from 21.0+/-0.7 before surgery to 27.4+/-0.3 after surgery, and the recovery rate was 77.1+/-4.6%. An "excellent"; was achieved in 23 cases, a "good" in 6 cases and a "fair" in one case according to the Macnab criteria. Radiographs revealed healing of all defects in 27 cases, healing of three out of four defects in 2 cases, and no healing of any defect in one case. There was no severe complication except for wire breakage in 5 patients. CONCLUSION: Pseudoarthrosis seemed related to wire breakage, and patients who did not obtain complete healing were patients who did not fully comply with instructions to wear a lumbar corset or restrict activity postoperatively. This surgery was effective for lumbar spondylolysis.

**Date : 2008-08-27**  
**Session : Spine: degenerative spine**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 18028**

**CORRELATION BETWEEN CLINICAL FEATURES AND PATHOANATOMICAL CHANGES SEEN IN MR IN LUMBAR DISC PROLAPSE**

Janardhana AITHALA, Rajgopal KV  
*Kasturba Medical College, Manipal, Udupi, Karnataka (INDIA)*

**AIM OF THE STUDY:** To determine the association between abnormalities visible in MRI and patient's clinical features. **MATERIALS AND METHODS:** 119 patients with disc prolapse (diagnosed with clinical criteria) were included in the study. Clinical evaluation included pain severity, pain distribution, disability, neurological symptoms and signs. MR evaluation included grades of disc degeneration, type of herniation, neural foramina compromise, nerve root compression and miscellaneous findings. MRI findings were tested for inter and intraobserver variability. Statistical analysis included Kappa coefficient, Odd's ratio, logistic regression analysis and K-W tests. **RESULTS:** There was no significant inter or intra observer variation for most of MRI findings except for disc herniation (0.46). Correlation between clinical and MRI findings showed that clinical level of pain distribution correlated well with MRI level (Kappa 0.8), but not all disc bulges produced symptoms. Central bulges with thecal sac compression were mostly asymptomatic, while Centro lateral protrusion and extrusion with neural foramina compromise were correlated well with dermatomal distribution of pain. Root compression observed in MRI did not produce neurological symptom or deficits in all patients but when deficits were present, correlated well with presence of root compression in MRI. Multiple level disc herniations with foramina compromise were strongly associated with presence of neurological signs. **CONCLUSION:** Clinical findings correlate well with MRI findings, but all MRI abnormalities need not have clinical significance. Presence of Centro lateral protrusion or extrusion with gross foramina compromise is invariably associated with significant pain and disability.

**Date : 2008-08-27**  
**Session : Spine: degenerative spine**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 18054**

**CAUDA EQUINA SYNDROME - A REPORT ON 39 CASES WITH REVIEW OF LITERATURE**

Thamer HAMDAN

*Dean, Basrah Medical College, Basrah (IRAQ)*

Cauda equine syndrome is caused by compression of the lumbosacral nerve roots below the level of the spinal cord, it is rare, usually occurs in adults, the most common cause is herniated intervertebral disc. The author analyses thirty-eight cases of cauda equine in the Basrah University, Department of Orthopaedic Surgery with age range between 19-65 years. 19 cases were diagnosed preoperatively because of herniated disc, six cases were because of canal stenosis, three were following lumbar interathecal tumour, five following bullet injury, in six cases the syndrome was diagnosed in the postoperative period. The outcome was very variable and unpredictable, related partly to the time of surgery and dural tear, follow-up period various between 6 months and 3 years. Extensive review of related articles will be discussed, too.

**Date : 2008-08-27**  
**Session : Spine: degenerative spine**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 18149**

**THE 6-MINUTE WALK TEST: A NEW SIMPLE RELIABLE STANDARD FOR SCREENING AND PROGRESS MONITORING OF SPINAL CLAUDICATION: A PROSPECTIVE STUDY OF 245 PATIENTS**

Ying Kei CHAN

*Department of Orthopaedics & Traumatology, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR (CHINA)*

There is no gold standard to assess severity or treatment effectiveness for spinal claudication. This study validates a simple 6-minute-shuttle-walking test (6MWT) as a reliable screening and monitoring tool. Patients suspicious of spinal claudication were prospectively tested on 30min continuous standing and walking. The time they developed intolerable claudication symptom(s) constituted the tolerance time for comparison. Patients were then tested on the distance (6MWD) they can maximally level-ground-shuttle-walk along 15m-distance within 6-minute and screened for instability. Patients treated operatively were assessed every 3 months. Patients with cardiopulmonary, vascular or joint diseases were excluded. 245 Chinese patients (108 men/137 women) (mean age: 66.8) were studied. The age-matched-6MWD correlated significantly with standing tolerance and Tinetti gait score. The mean 6MWD differed significantly for those with <20 min from >20 min standing tolerance. 39 patients underwent surgery and could stand longer and walk faster. The 6MWD continued to increase significantly for 6 months postoperatively. The 6MWT only requires simple facility and instructions. It is not time-consuming and could be used for screening; the shorter the 6MWD, the more severe is the spinal claudication. Using the statistical receiver-operating-characteristic curve, a 6MWD greater than 320m, 300m and 270m screen out incapacitating claudication of 20 min for age group of 51-60, 61-70 and 71-80 respectively. The 6MWT also provides quantitative data for disease progression and treatment outcome monitoring. This study showed that the significant improvement of postop 6MWD was a reflection of early improvement of pain tolerance and later improvement of stability.

Date : 2008-08-27

Session : Spine: degenerative spine

Time : 1100-1215

Room: 408

Abstract number : 18167

**VOLUME DETERMINATION OF THE ANTERIOR LATERAL EPIDURAL SPACE L5/S1 USING HUMAN SPINE CADAVERS AND IN VIVO DIRECT MEASUREMENTS UNDER ALLOWANCE OF INJECTION TECHNIQUES IN SPINE ROOT COMPRESSION SYNDROMES**

Wolfram TESKE<sup>1</sup>, Jan NOTTENKAEMPER<sup>1</sup>, Juergen KRAEMER<sup>2</sup>, Heinrich KLEINERT<sup>1</sup>, Theodoros THEODORIDIS<sup>2</sup>, Roland WILLBURGER<sup>1</sup>, Stefan ESENWEIN<sup>1</sup>, Frank RUBENTHALER<sup>1</sup>

<sup>1</sup>Ruhr Universitaet Bochum, Bochum (GERMANY), <sup>2</sup>Institut fuer Wirbelsaeulenforschung, Bochum (GERMANY)

**PROBLEM:** Epidural corticosteroid injections are important in the conservative treatment of lumbar nerve compression syndrome. Common epidural injections need a dose of 40-80mg triamcinolone in a volume of 10-20ml. The epidural-perineural interlaminar approach allows an injection in the anterolateral space containing the roots L5/S1. Intention of this project was the volume determination of this space, which was never done. **METHODS:** The segment L5/S1 of 12 human cadaver spines was radiologically determined. Cadavers with obvious diseases were excluded. The preparation of the L5/S1 area was performed without bone cut. The space barriers are cranial the root L5, lateral the facet joint, medial the dura and caudal the sacrum. Dental silicone was filled in the anatomical space. The volume of the easily removed silicone was measured by using the principle of water displacement. In vivo the volume was determined in patients with a herniated vertebral disc L5/S1 at the end of a microscopic procedure with no bleeding (exclusion criteria). **RESULTS:** The volume of the cadaver spine was at least 0.6ml with a maximum of 1.4ml (mean value 1.9ml). The volume in vivo was between 0.6-1.5ml (mean value 0.9ml). **CONCLUSION:** The data show a good correlation. The first-time determination of the volume allows the conclusion that the direct placement of 5-10mg steroids in the anterolateral space is possible with a volume of 1.5-2ml, using the epidural-perineural injection technique under reduction of systemic adverse reaction.



Date : 2008-08-27  
Session : Spine: degenerative spine  
Time : 1100-1215  
Room: 408

Abstract number : 18449

**"SKIPPED" LEVEL DISC DEGENERATION OF THE LUMBAR SPINE: PREVALENCE AND ASSOCIATED RISK FACTORS**

Dino SAMARTZIS<sup>1</sup>, Jaro KARPPINEN<sup>2</sup>, Florence MOK<sup>3</sup>, Daniel Y.T. FONG<sup>4</sup>, Keith D.K. LUK<sup>3</sup>, Kenneth M.C. CHEUNG<sup>3</sup>

<sup>1</sup>*Shriners Hospital for Children, Chicago (UNITED STATES)*, <sup>2</sup>*Department of Physical Medicine and Rehabilitation, University of Oulu, Oulu (FINLAND)*, <sup>3</sup>*Department of Orthopaedics & Traumatology, The University of Hong Kong, Hong Kong (HONG KONG)*, <sup>4</sup>*Department of Nursing Studies, The University of Hong Kong, Hong Kong (HONG KONG)*

Clinical observations suggest that subjects occasionally exhibit a pattern involving non-consecutive ("skipped") levels of lumbar degenerative disc disease (SLDDD). This study aims to address this unpublished issue by examining its prevalence and associated clinical and radiological factors. As part of a large population-based genetic study in Southern Chinese (n=1,989), subjects exhibiting DDD more than two levels (n=838) were grouped into SLDDD (n=174) and non-SLDDD (n=664). SLDDD were classified into five types by the relative location of healthy disc(s) (HD) to DDD levels. Subject demographics and clinical profiles were collected by questionnaire. SLDDD was present in 8.7% and 20.8% of the overall and DDD population, respectively, and more prevalent in males (OR: 1.6; 95% CI: 1.1-2.2; p=0.008). Type 1 (38%; one DDD level above and below HD) and Type 2 (32%; one level above and multi-levels of DDD below HD) were the most common types. SLDDD was significantly associated with the presence of Schmorl's node (p = 0.0001), which also presented in non-DDD levels. Interestingly, disc bulge/extrusion, back injury history and pain profiles were significantly associated with non-SLDDD (p<0.05). Other demographics, MRI findings and clinical profiles did not significantly differ between groups (p>0.05). This study is the first to describe SLDDD. While its etiology remains unknown, altered spinal biomechanics associated with SLDDD might account for less pronounced clinical symptoms. The understanding of SLDDD may shed light on the cause of back pain.

**Date : 2008-08-27**  
**Session : Spine: degenerative spine**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 18635**

**DEGENERATIVE LUMBAR SPINAL STENOSIS - RESULTS OF EXPANSIVE LAMINOPLASTY**

S S SANGWAN

*PGIMS, Rohtak, Rohtak (INDIA)*

**INTRODUCTION:** Expansive laminoplasty, a procedure used more and more often for cervical myelopathy, was carried out in patients with lumbar spinal stenosis in the Department of Orthopaedics, Paraplegia, Physical Medicine and Rehabilitation of our institute. **MATERIALS AND METHODS:** 25 patients with lumbar spinal stenosis who were having neurological deficit, intractable low back pain or claudication not being relieved by conservative means and neglected cases were taken up for the study. After exposing the involved vertebrae the target laminae were cut using a high speed drill with a guard. On the side to be opened, interrupted perforations were made up to inner cortex and laminae were detached completely with an osteotome. While on the hinged side a groove was made using a burr. Laminae were rotated to enlarge the canal and rotated laminae were fixed with a steel wire. **RESULTS:** Using CT, the spinal canal was found to be enlarged to a nearly rectangular shape and the average enlargement was 124%. The visual analogue scale (VAS) was used for subjective pain assessment before and after the surgery. The ultimate outcome was assessed by the Surin et al. criteria (Spine 17:1-8, 1992). **DISCUSSION:** As laminoplasty decompresses the nerve roots while maintaining the spinal stability so it is a very good option for patients with multilevel spinal stenosis. Also there are less chances of recurrence due to formation of laminectomy membrane. Hence lumbar laminoplasty is good treatment option for patients with degenerative lumbar spinal stenosis.

**Date : 2008-08-27**  
**Session : Spine: degenerative spine**  
**Time : 1100-1215**  
**Room: 408**

**Abstract number : 18879**

**A CONTROL STUDY ON SELF-LOCKING POLYETHERETHERKETONE (PEEK) CAGE AND AUTOGENOUS ILIAC CREST GRAFT IN THE TREATMENT OF CERVICAL DEGENERATIVE DISEASES**

jian DONG, Xilei LI, Taolin FANG, Qing XIA

*Department of Orthopaedics, Zhongshan Hospital, Shanghai Fudan University, shanghai (CHINA)*

**OBJECTIVE:** To compare the effect of self-locking PEEK cage and autogenous iliac crest graft in cervical spinal fusion for the treatment of cervical degenerative diseases. **METHODS:** 72 patients with cervical degenerative diseases, who underwent interbody fusion with MC+® cage or autogenous iliac crest graft from June 2005 to December 2007, were reviewed. Patients in Group A (40 patients, 64 segments) had fusion with self-locking PEEK cage, and patients in Group B (32 patients, 51 segments) had fusion with autogenous iliac crest graft. All patients took AP and lateral cervical X-ray examinations before operation, after operation and in the postoperative 3rd and 6th month, and underwent two-dimensional CT reconstruction in 3-6 months after operation. Preoperative and postoperative JOA scores were evaluated. Cervical physiological curvature and intervertebral height were determined preoperatively and postoperatively. Data such as preoperative and postoperative JOA scores, cervical physiological curvature, and intervertebral height were compared. **RESULTS:** All patients were followed up for 6-12 months. The operation time in Group A was much less than in Group B. In the 6th month of follow-up, all patients had complete interbody fusion. Postoperative JOA scores, cervical physiological curvature and intervertebral height in both Group A and Group B were better than the preoperative ones with significant differences, but the improvement rate had no significant differences between Group A and Group B. **CONCLUSION:** Self-locking PEEK cage can effectively restore the cervical physiological curvature and intervertebral height with a satisfactory fusion rate. It is a simple operation and has minor soft tissue injury.

Date : 2008-08-27

Session : Spine: tumours and infections

Time : 1400-1530

Room: 408

Abstract number : 16528

**SINGLE STAGE POSTERIOR ALONE GLOBAL INSTRUMENTED FUSION SURGERY WITH LOCAL BONE GRAFTS IN THE TREATMENT OF INSTABILITY OR DEFORMITY FOLLOWING SPINAL TUBERCULOSIS - REPORT ON INITIAL SIXTEEN CASES**

Vidyadhara S, James GNANADOSS

*MGMC & RI, Pondicherry (INDIA)*

INTRODUCTION: Posterior surgery for tuberculosis of spine has gone to disrepute by virtue of it removing the normal posterior elements leaving behind the diseased anterior column. MATERIAL AND METHODS: We analysed clinicoradiological outcome of single stage posterior alone global instrumented fusion surgery with local bone grafts in the management of sixteen consecutive patients with tuberculosis of the spine for instability or deformity. Twelve patients had neurological deficits (six Frankel C, seven Frankel D, and three Frankel B). Average vertebral body loss was 1.2. Average kyphosis was 44° (range 12°-87°). Surgery time was 112min (range 86-145min). RESULTS: Postoperative kyphosis correction was 76% and there was an average loss of correction by 6° at last follow-up. Average duration of follow-up was 13 months (range 9-16 months). There was neurological recovery in all patients with deficits by at least one grade. One patient developed postoperative worsening of neurology which recovered over the next three weeks but eventually patient died of tuberculous meningitis. At the last follow-up, all patients had healed well and were asymptomatic. CONCLUSION: Single stage posterior alone surgery yields a good opportunity to correct the spinal deformity in addition to global fusion using instrumentation. Posterior elements not being diseased can well be used with or without cages to produce a definitive anterior fusion mass. Posterior approach also facilitates good canal clearance from all sides which is reflected by recovery of all patients with neurological deficits. It is technically demanding and needs good anesthesia set up as significant blood loss can be predicted.

**Date : 2008-08-27**  
**Session : Spine: tumours and infections**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 17008**  
**GRADING OF NEURAL DEFICIT IN PARAPLEGIA WITH TB SPINE**

Anil JAIN, Skand SINHA  
*University College of Medical Sciences, New Delhi (INDIA)*

The neural deficit in TB spine as graded by ASIA score and Tuli's classification are not sensitive to subtle improvement/deterioration in neural deficit. The present study compared the efficacy of the ASIA score and Tuli's classification in Pott's paraplegia/tetraplegia and suggested a suitable classification. 58 cases of TB spine with paraplegia were evaluated serially for severity of neurological deficit by Tuli's classification and ASIA score, during the course of treatment. 207 charts of neurological status were recorded and analysed. Tuli's grading was sensitive for detection of early stage (grade I) of neurological deficit. The rest of the grades (grade II, III, IV) of Tuli's classification have a wide range of sensory-motor deficit and hence are insensitive to early detection or any deterioration/improvement in the neurological status. The ASIA score failed to grade all types of neurological deficit associated with the Pott's spine. The sensory-motor score in ASIA score depends on the level of involvement of the spinal cord. The higher the level of the cord damage, the poorer is the score. **CONCLUSION:** Neither Tuli's grading nor the ASIA scale alone can effectively grade all stages of neurological deficit in tuberculosis of the spine. The neurological deficit in tuberculosis of the spine should be described in stages and each stage should have sensory and motor scoring. A new staging system of Pott's tetraplegia/paraplegia is suggested. The new staging system was validated on 25 patients (96 neural charts).

**Date : 2008-08-27**

**Session : Spine: tumours and infections**

**Time : 1400-1530**

**Room: 408**

**Abstract number : 17075**

**ALGORITHM OF DIAGNOSTICS, BIOPSY AND SURGICAL TECHNOLOGY UNDER SPINE TUMOURS**

Ludmila PASHKEVICH, Andrey BABKIN, Natalia GOLUTVINA

*State Institution Republican Scientific Practical Centre of Traumatology and Orthopedics., Minsk (BELARUS)*

The methods of diagnostics under spine tumours, that is restricted in diagnostic algorithm, which was examined on large clinical material - 456 patients with tumours and tumour-like lesions of spine on different levels - are introduced in the article. Technology and results of biopsy under growth of spine of the 38 patients are taken up in the article. 6 patients were operated on their new growth in the neck section of spine, 14 patients - thoracic, 4 patients - lumbar, 14 patients - sacral spines. The getting of material of biopsy for the morphological investigations from bodies of the cervical vertebrae and the dorsal structures of the thoracic, lumbar and sacral sections does not present any technical difficulties. The open transpaedicular and extrapaedicular biopsy is recommended for the tumours lesions of bodies of the thoracic, lumbar and upper sacral vertebrae. It is safe, non-traumatic and effective, and it does not need any supplemental explicit costs. The analysis of surgical intervention at 266 patients, in whom 284 operations were realised, including the application of constructions and implants, which were developed in Republican centre of spine surgery SI RSPC of traumatology and orthopedics - is carried out in this work. 56 patients with tumours of cervical spine part, 96 patients - thoracic spine part, 71 patients - lumbar spine part, 43 patients - sacral spine part - were operated.

**Date : 2008-08-27**  
**Session : Spine: tumours and infections**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 17117**

**SURGICAL SITE INFECTION IN SPINAL METASTASIS - RISK FACTOR AND COUNTERMEASURE**

Satoru DEMURA, Norio KAWAHARA, Hideki MURAKAMI, Katsuro TOMITA  
*Department of Orthopaedic Surgery, Kanazawa University, Kanazawa (JAPAN)*

**BACKGROUND:** Surgery for spinal metastasis is associated with an increased risk of surgical site infection (SSI). Although previous studies have evaluated risk factors for SSI, such studies lack statistical analysis, including multivariate analysis. A recent study demonstrated the utility of prostaglandin E1 (PGE1) in decreasing SSI in patients with prior irradiation. The role of PGE1 in spine surgery has not been evaluated. **PURPOSES:** The purposes of this study are to identify risk factors of SSI and to evaluate the positive effect of PGE1 administration in patients with spinal metastasis. **METHODS:** 113 surgeries were reviewed from 1993 to 2002 (phase 1). Risk factors were analysed using logistic regression. Between 2003 and 2007, we performed a prospective clinical trial with PGE1 administration in patients with prior irradiation (Phase 2). The infection rate and risk factors identified in phase 1 and 2 were compared. **RESULTS:** The rate of SSI in Phase 1 was 7.1% (8/113 cases). Independent risk factors identified by multivariate logistic regression were diabetes ( $p=0.01$ ), and prior irradiation at surgical site ( $p=0.01$ ). The rate of SSI in phase 2 was 3.1% (3/97 cases). The rate of SSI between phase 1 and 2 in patients who had prior irradiation in phase 2 was significantly different ( $p=0.04$ ). **CONCLUSIONS:** This study identified diabetes and prior irradiation to be independent risk factors for SSI in patients with spinal metastasis. PGE1 administration was found to decrease the incidence of SSI in patients who underwent prior irradiation.

**Date : 2008-08-27**

**Session : Spine: tumours and infections**

**Time : 1400-1530**

**Room: 408**

**Abstract number : 17247**

**LANGERHANS' CELL HISTIOCYTOSIS OF THE SPINE IN CHILDREN WITH SOFT TISSUE EXTENSION AND CHEMOTHERAPY**

Xin Sheng PENG

*The First Affiliated Hospital, Sun Yat-Sen University, Guangzhou (CHINA)*

**OBJECTIVE:** To look into the possible incidence of obvious soft tissue extension from Langerhans' cell histiocytosis (LCH) of spine in children and evaluate the effects of chemotherapy for those patients. **METHODS:** Eighteen patients with histopathologic diagnosis of LCH of the spine in children were reviewed between 2000 and 2006. Nine patients with obvious paravertebral and/or intraspinal soft tissue extension were included in this study. Clinical and radiologic data, diagnostics, treatment and results were collected. **RESULTS:** The soft tissue extension involved in the spinal canal and/or around vertebral body in 8, posterior involvement in 1. 8 patients experienced neurologic symptoms. All patients received chemotherapy. One patient had surgical treatment. The mean follow-up time was 30.3 m. Soft tissue extension disappeared completely in all patients. No clinical evidence of disease such as pain, discomfort or neurologic symptom was observed during the most recent follow-up of all patients. **CONCLUSIONS:** The incidence of LCH of the spine in children with obvious soft tissue extension was up to 50%. Chemotherapy is safe and effective and surgical decompression probably was not necessary to most patients.



**Date : 2008-08-27**  
**Session : Spine: tumours and infections**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 17469**

**INSTRUMENTED STABILIZATION IN TB SPINE**

Anil JAIN<sup>1</sup>, Puneet MISHRA<sup>1</sup>, Ish Kumar DHAMMI<sup>2</sup>, Bhagwat Prasad BHAGWAT<sup>1</sup>

<sup>1</sup>University College of Medical Sciences, New Delhi (INDIA), <sup>2</sup>Guru Teg Bahadur Hospital, New Delhi (INDIA)

The indications of instrumented stabilization in TB spine are not defined, hence this study to analyse data reported and our series (n=50). 124 papers published (n=7524 patients) in the last 20 years are retrieved. The affected region of the spine was not described in 87.8% cases. 70.85% (n=5240) were surgically treated. 4143 (77%) underwent debridement/radical debridement with or without BG. 1097 (21.85%) underwent instrumentation, posterior (n=369) and anterior (n=728). Mean vertebral involvement was described in 191 (18%) with 87 had one vertebral disease. Preoperative, immediate postoperative and final kyphoses were described in only 387/1097 cases. That was 250, 9.10, 2.30 respectively in anterior instrumentation group and 40.00, 18.70 and 19.70 in posterior instrumentation group. 50 cases of TB spine were operated for surgical decompression and instrumented stabilization. The indication of surgery were a) panvertebral lesion (n=10), kyphosis correction (n=32) and long segment disease (n=8). The anterior decompression, posterior instrumentation with or without posterior shortening, anterior bone grafting, posterior bone grafting were done by extrapleural anterolateral approach in a single stage. The mean surgery time was 2.4 hrs and blood loss 850ml. The mean follow-up was 18 months, with mean kyphosis pre-operatively (530) corrected to mean 270. CONCLUSION: The lacunae about indication of surgery and instrumented stabilization, approach and stages of surgery exist in literature. We report a series of anterior decompression and instrumented posterior stabilization by single incision and stage with specified indications.

Date : 2008-08-27

Session : Spine: tumours and infections

Time : 1400-1530

Room: 408

Abstract number : 17561

**SURVIVAL AND COMPLICATIONS FOR ELDERLY PATIENTS WITH SPINAL METASTASES TREATED ACCORDING TO OUR SURGICAL STRATEGY**

Hideki MURAKAMI, Katsuro TOMITA, Norio KAWAHARA, Satoru DEMURA

*Department of Orthopaedic Surgery, Graduate School of Medical Science, Kanazawa University, Kanazawa (JAPAN)*

**PURPOSE:** A rapidly aging population and improved long-term survival has expanded the role of surgical treatment in elderly patients with metastatic spinal disease. The purpose of this study is to evaluate the perioperative complications and the prognosis of elderly patients that underwent a defined surgical strategy for metastatic spinal disease. **MATERIALS AND METHODS:** Twenty-one elderly patients (>70 years) who underwent surgical treatment based on Tomita's surgical strategy for spinal metastasis (Tomita K. et al. Spine 2001) since 1999 were retrospectively reviewed. **RESULTS:** For 3 elderly patients, appropriate surgical choice based on the surgical strategy was not possible due to their preoperative conditions. The mean survival time of the 8 patients with 2-4 points in surgical strategy was 27.3 months. That of the 9 patients with 5-7 points was 19.1 months. That of the 4 patients with 8-10 points was 5.8 months. Perioperative complications encountered in these elderly patients were: respiratory in 19.0%, cardiovascular in 9.5%, and delirium in 19.0%. **CONCLUSIONS:** Even for elderly patients the postoperative prognosis may be predicted by the surgical strategy. The optimal surgical procedure for such patients, however, may deviate from that predicted by the surgical strategy due to their preoperative conditions and an increased risk for perioperative complications. Despite the increased potential for complications, more radical procedures, such as total en bloc spondylectomy, need not be avoided solely due to advanced patient age.

**Date : 2008-08-27**  
**Session : Spine: tumours and infections**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 18342**

**RETROSPECTIVE ANALYSIS OF VERTEBRA TUBERCULOSIS WITHOUT SIGNIFICANT KIFOSIS THAT WE OPERATED BETWEEN 1985 AND 2005**

Temel TACAL, Mehmet Nurullah ERM#304;S, Hüseyin Emre AKDEN#304;Z, Umit TUHANOGLU, Hasan DOGRULOGLU  
*Baltalimani bone disease hospital, istanbul (TURKEY)*

Baltalimani Bone and Joint Disease Hospital had been established in 1944 for patients who had bone and joint tuberculosis. There were a lot of people treated conservatively or surgically. After 1985 our hospital served not only tuberculosis but also other diseases of bone and joint, and we could just reach the documents till 1985. From 1985 to 2005, 205 Pott disease and psoas abscesses were operated in our hospital. 98 (47.8%) patients had thoracal Pott disease. Average age was 35.2. We performed standard costotransversectomy and debridement treatment for all patients. We did not use any instrumentation and we used strut autografts only in 10 (10.2%) patients. 38 (18.5%) patients had lumbar Pott disease. Average age was 37.7. We performed transversectomy and debridement. And we used strut autograft for 15 (39%) patients. These grafts got from tibia in 11 (73.3) patients, fibula in 1 (6.6%) patient and corticocancellous graft from iliac wing in 2 (12.2) patients. We did not use any instrumentation. And we operated 69 (33.6%) psoas tuberculosis abscesses. Surgical drainage had been performed. Before and after surgical treatment all the patients used chemotherapeutic agents. They used four antibiotics (INH, rifampin, pyrazinamide and ethambutol) till surgery. After surgery we advised two drugs (INH and rifampin) till the end of their twelve months of the tuberculous disease.

Date : 2008-08-27

Session : Spine: tumours and infections

Time : 1400-1530

Room: 408

Abstract number : 18411

**EFFECTS ON SPINAL CORD BLOOD FLOW AND NEUROLOGIC FUNCTION SECONDARY TO INTERRUPTION OF BILATERAL SEGMENTAL ARTERIES WHICH SUPPLY THE ARTERY OF ADAMKIEWICZ: AN EXPERIMENTAL STUDY USING A DOG MODEL**

Satoshi KATO, Norio KAWAHARA, Hideki MURAKAMI, Satoru DEMURA, Yoshiyasu FUJIMAKI, Katsuro TOMITA

*Department of Orthopaedic Surgery, School of Medicine, Kanazawa University, Kanazawa (JAPAN)*

**OBJECTIVE:** To examine how many ligations of bilateral segmental arteries including the level of Adamkiewicz artery cause ischemic spinal cord dysfunction using a dog model. **METHODS:** The 25 dogs in which Adamkiewicz artery originated from L5 level were taken in this study. There were 15 dogs divided into 5 groups: sham group, no ligation; group 1, ligation of bilateral segmental arteries at 1 level (L5); group 2, at 2 levels (L4-5); group 3, at 3 levels (L4-6); and group 4, at 4 levels (L3-6). Spinal cord blood flow at the L5 spinal cord segment, and spinal cord-evoked and compound muscle action potentials were measured simultaneously until 10 hours after ligation. Neurologic function was assessed 1 week after operation in 10 other dogs divided into 2 groups: 3 pairs group, ligation at 3 levels (L4-6); 4 pairs group, at 4 levels (L3-6). **RESULTS:** Spinal cord blood flow was 98.2%, 76.1%, 66.6%, 61.4% and 53.5% in the sham group, group 1, 2, 3 and 4 respectively 10 hours after ligation. Abnormal spinal cord-evoked and compound muscle action potentials were observed in 1 out of 3 dogs in group 4. Postoperative neurologic evaluation identified all 5 dogs in 3 pairs group and 4 in 4 pairs group as normal. There was 1 dog in 4 pairs group that had paraparesis. **CONCLUSION:** Interruption of bilateral segmental arteries at  $\geq 4$  consecutive levels including the level of Adamkiewicz artery risks producing ischemic spinal cord dysfunction.

Date : 2008-08-27  
Session : Spine: tumours and infections  
Time : 1400-1530  
Room: 408

Abstract number : 18436

**THE EFFECT OF PREOPERATIVE EMBOLIZATION OF THE BILATERAL SEGMENTAL ARTERIES AT THREE LEVELS ON INTRAOPERATIVE BLOOD LOSS IN TOTAL EN BLOC SPONDYLECTOMY FOR THORACIC SPINAL TUMOURS**

Norio KAWAHARA<sup>1</sup>, Katsuro TOMITA<sup>1</sup>, Hideki MURAKAMI<sup>1</sup>, Satoru DEMURA<sup>1</sup>, Osamu MATSUI<sup>2</sup>, Junichiro SANADA<sup>2</sup>

<sup>1</sup>Department of Orthopaedic Surgery, School of Medicine, Kanazawa University, Kanazawa (JAPAN), <sup>2</sup>Department of Radiology, School of Medicine, Kanazawa University, Kanazawa (JAPAN)

**INTRODUCTION:** The effect of preoperative embolization of bilateral segmental arteries at three levels on intraoperative blood loss during total en bloc spondylectomy (TES) was compared with of preoperative embolization of one segmental artery. **PATIENT SAMPLE:** All patients with thoracic spinal tumours who underwent embolization of the bilateral segmental arteries at three levels (group A, 18 patients) or embolization of corresponding one segmental artery (group B, 18 patients) and subsequent TES were evaluated. **METHODS:** The segmental artery supplying the targeted tumour was embolized with polyvinyl alcohol particles in both groups and adjacent segmental arteries with pieces of gelatin sponge or thrombogenic coils in group A. Surgery was performed within 72 hours of embolization. The operation time, intraoperative blood loss and neurological status were evaluated in both groups. Statistical analysis followed the Mann-Whitney nonparametric test. **RESULTS:** No neurological complications occurred as a result of embolization. The average operation time was 8.8 hours (6.5-10.5 hours) in group A and 9.2 hours (7.5-11.5 hours) in group B. This difference was not statistically significant. The intraoperative blood loss was 1406g (375-2550g) in group A and 2612g (1530-5950g) in group B. There was a significant reduction in the blood loss ( $p < 0.05$ ). No comparable incidents occurred after the surgery. **CONCLUSIONS:** The results of this study suggest that preoperative embolization of the bilateral segmental arteries at three levels for hypervascular spinal tumours can reduce intraoperative blood loss effectively during TES without compromising the spinal cord function.

**Date : 2008-08-27**

**Session : Spine: tumours and infections**

**Time : 1400-1530**

**Room: 408**

**Abstract number : 18700**

**ANTIBIOTIC LOADED ALLOGRAFT LOWERS DEEP WOUND INFECTION RATE IN CP SPINE FUSION**

Freeman MILLER, Battugs BORKHUU, Andrzej BOROWSKI, Kirk DABNEY, Suken SHAH

*Al duPont Hospital for Children, Wilmington (UNITED STATES)*

The concept of using antibiotic-loaded bone graft to provide local antibiotics has been explored in high risk patients, such as those with osteomyelitis or following infected arthroplasties. There have been no reports of using antibiotic-loaded bone graft prophylactically in spine surgery. The goal of this study was to compare the infection rate in children with cerebral palsy after posterior spinal fusion with unit rod instrumentation with or without Gentamicin-impregnated bone allograft. **METHODS:** The records of 220 children with cerebral palsy (CP) who had spinal fusion with unit rod instrumentation for a primary spinal deformity between January 2000 and December 2006 in single institution were retrospectively reviewed. We evaluated the incidence of postoperative wound infection in patients with antibiotic-loaded bone graft (AbBGF) (Gentamycin 10mg/kg) and those without (BGF). **RESULTS:** 154 patients received AbBGF during spinal fusion surgery with 6 patients (3.9%) complicated with a deep wound infection. Ten of the 66 patients (15.2%) without antibiotic-loaded bone graft developed a deep wound infection. The difference between groups was statistically different ( $p=0.003$ ). The mean age at surgery, preoperative Cobb angle, correction rate, operative time, and estimated blood loss were not statistically different between the two groups ( $p>0.05$ ). The length of hospital stay was less in AbBGF group ( $p<0.05$ ). **CONCLUSION:** The incidence of deep wound infection for children with CP undergoing spinal fusion decreased from 15% to 4% with the use of prophylactic antibiotics in the corticocancellous allograft.

**Date : 2008-08-27**  
**Session : Spine: tumours and infections**  
**Time : 1400-1530**  
**Room: 408**

**Abstract number : 18969**

**SURVIVAL AND NEUROLOGICAL IMPROVEMENT AFTER SURGICAL INTERVENTION IN PATIENTS WITH EXTRADURAL OSSEOUS SPINAL METASTASES**

Katrin SCHÄTTIGER, Kristian HØY, Ebbe Stender HANSEN, Bent NIEDERMANN, Haisheng LI, Thomas ANDERSEN, Cody BÜNGER, Peter HELMIG

*Aarhus University Hospital, Aarhus C (DENMARK)*

**INTRODUCTION:** In a prospective observational study of Aarhus Spine Center neurological improvement and survival in patients with spinal metastases undergoing spinal surgery was assessed. **MATERIALS AND METHODS:** 474 patients (1997 till 2008) with histologically confirmed diagnosis of spinal metastases were included. Neurological status pre- and postoperative was evaluated using Frankel-Score. In a subgroup (SG) of 274 patients, survival was measured using Kaplan-Meier-curves. **RESULTS:** Average age was 61 years (27-87 years), M:F ratio 6:4. 20.6% suffered from prostata, 19.6% from breast cancer metastases. Further common primaries: lung (11.8%), kidney (8.4%), myeloma (6.9%). More than 20% had unknown primary cancer at admission, 36.4% patients were paralysed (Frankel A-C). 88% (SG) were unable to work or to carry out normal activities of daily living. According to Aarhus Algorithm, 63% (SG) underwent posterior decompression and instrumentation. After operation 15.5% were still paralysed (Frankel A-C, preop: 36.4%). 38.7% reached Frankel D (preop: 36.3%) and 36.7% Frankel E (preop: 23.4%). Postoperative 45% (SG) were free of pain. 28% (SG) of the patients survived 6 months postoperative, 16% (SG) 12 months and 6% (SG) 24 months, mean survival were 224 days (SG). Related to primary tumour (SG), patients with prostate-cancer survived 186 median days, breast-c 534, lung-c 89, kidney 237 and cancer coli 173 days. **CONCLUSIONS:** Presented data show that the primary tumour displays a strong impact on the days of median survival. Surgical intervention in patients with spinal metastatic tumour results in a remarkable bettering of the neurological function and thus quality of life.

**Date : 2008-08-27**  
**Session : SICOT / Scoliosis Research Society (SRS): Adult Deformity**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 15496**

**ACCURACY OF DETECTING PEDICLE SCREW LOOSENING USING PLAIN X-RAY**

Fras DAKHIL-JEREW, John SHEPPERD  
*Conquest Hospital, Hastings (UNITED KINGDOM)*

**INTRODUCTION:** In this study, we report interobserver reliability of X-ray for the interpretation of pedicle screw osteointegration based on the diagnosis of "Halo zone" surrounding the screw. Dynamic stabilisation system for the spine relies on titanium screw purchase within the pedicle. Decision on osteointegration is important especially when the patient becomes symptomatic following initial good outcome. **METHOD:** Lumbar spine X-ray images of 50 patients in two views (AP and lateral) randomly selected from our cohort of 420 Dynesys patients. The images were deployed in a CD-ROM. Seven observers composed of two expert orthopaedic spine consultant surgeons and one spine expert consultant radiologist and four Specialist Registrars in orthopaedics and radiology were asked to review the images and state whether or not each pedicle screw is loose (total of 258 pedicle screws). Data gathered were distributed and presented in tables in the form of descriptive statistics. The evaluation of interobserver agreement was performed by obtaining a Kappa (K) index. For continuous variables comparison, the t-test was employed, with a significance level of 0.05. **RESULTS:** Kappa index for Pedicle screw loosening among 3 Experts at 95% confidence interval was as low as 0.2198. Similarly KI for all seven assessors it was even less (0.1462). **DISCUSSION AND CONCLUSION:** Kappa Index among expert assessors was 0.2 which means X-ray is unreliable for the assessment of pedicle screw osteointegration. Validity of X-ray is not applicable as it is unreliable.



**Date : 2008-08-27**  
**Session : SICOT / Scoliosis Research Society (SRS): Adult Deformity**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 17005**

**KYPHOSIS CORRECTION IN SPINAL TUBERCULOSIS**

Anil JAIN<sup>1</sup>, Ish DHAMMI<sup>2</sup>

<sup>1</sup>University college of medical sciences - university of Delhi, New Delhi (INDIA), <sup>2</sup>Guru Teg Bahadur Hospital, New Delhi (INDIA)

Late onset paraplegia is avoided by correcting severe kyphosis in the active/healing/healed spinal TB. We present an analysis of a series of TB spine with severe kyphosis, corrected by extrapleural anterolateral approach by single incision and stage. METHODS: 26 patients with dorsal or dorsolumbar spinal TB, fourteen with paraplegia, twelve without paraplegia who underwent kyphus correction. All patients who presented with kyphosis of 60° or more having initial vertebral body loss of 1.5 or children with spine at risk 2 or more were included. Fifteen patients had active, eight partially treated, and three healed disease. The age range was from 3 to 38 years and had a mean kyphosis of 58.50 (range 35-76°). Mean vertebral body involvement on computed tomography was 4.2 (2-9), and mean initial vertebral body loss was 1.76 (1-2.6). The sequential steps for kyphus correction were anterior corpectomy, shortening of the posterior column, posterior instrumentation and anterior gap grafting, and posterior fusion as a single-stage procedure by the extrapleural anterolateral (costotransversectomy) approach. The mean surgical time was 3.2 hrs (2.4-5.5 hrs). The mean blood loss was 1100ml (700-1900 ml). Minimum follow-up was 9 months (range 9-48 months). All but one patient with neural deficit showed complete neural recovery. Mean kyphosis correction was 27.30 (range 9-42°). Mean correction loss on 1 year follow-up was 1.40 (range 0-4°). CONCLUSION: Kyphosis can be corrected by extrapleural anterolateral approach in single stage consistently.

**Date : 2008-08-27**

**Session : SICOT / Scoliosis Research Society (SRS): Adult Deformity**

**Time : 0800-1215**

**Room: 603-604**

**Abstract number : 17041**

**SURGICAL TREATMENT OF VARIOUS FORMS OF SCOLIOSIS BY THE LAMELLAR ENDOCORRECTOR «LSZ»**

Nikolai ZAGORODNII, Aleksandr LAKA, Muhamad SAMPIEV, Medet ABAKIROV

*Russian People Friendship University, Moscow (RUSSIAN FEDERATION)*

Surgical treatment of various forms of scoliosis by the lamellar endocorrector "LSZ". Between 2004 and 2007 Moscow's based Russian People Friendship University's department of traumatology and orthopedics developed a number of new constructions, which made it possible to approach each patient individually. We named this system LSZ (Laka, Sampiev, Zagorodniy). It includes the versions of the dynamic endocorrectors of high, low and super low profile. Dynamic endocorrectors of a complete profile for adolescents with the preservation of the possibility of spine growth and stable constructions for patients with the complete growth. A construction is used on patients when the purpose of an operation is not only the correction of a deformation, but also the stabilisation of spine prevents consequences and complications of scoliosis disease. An increase in the quantity of plates a three to four makes it possible to increase the strength applied for the correction. The use of rods with a round or oval profile excludes such possibilities. The analysis of 1508 cases of the surgical treatment of idiopathic (dysplastic) scoliosis with the use for the correction of the deformation of laminar endocorrectors is represented in this work. The majority number of operations were aged between 11 and 18 (median age is 15 years), including men - 211 (13.98%) and women - 1297 (86.02%). By treating by this method we achieved correction up to: 100% for I degree, 90-95% for II degree, 80-85% for III degree, 65-70% for IV degree.

**Date : 2008-08-27**  
**Session : SICOT / Scoliosis Research Society (SRS): Adult Deformity**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 17609**

**OPERATIVE TREATMENT OF HIGH-GRADE SPONDYLOLISTHESIS IN CHILDREN**

Gilbert CHAN, David SPIEGEL, John DORMANS, Kristen D'ANDREA  
*The Children's Hospital of Philadelphia, Philadelphia (UNITED STATES)*

**PURPOSE:** Controversy exists regarding treatment for children with high grade spondylolisthesis. This study compares outcomes and describes our treatment protocol and experience in the treatment of children with high grade spondylolisthesis comparing reduction and fusion with in-situ fusion. **METHODS:** A review of surgically treated cases of spondylolisthesis was reviewed from 1991 to 2006. A total of 28 cases diagnosed with high grade spondylolisthesis were reviewed with 17 cases having adequate follow-up. Eight were treated with a reduction and fusion of the slip (group 1), 9 cases were treated with fusion in situ (group 2). Radiographic parameters, clinical outcomes and complications were reviewed. **RESULTS:** On radiographic evaluation, correction of the slip angle and grade of the slip was superior in group 1. The correction was well maintained over time. The correction of lumbar lordosis was similar for both groups. Seven cases (87.5%) in group 1 were asymptomatic on follow-up, 3 cases developed post-operative neurologic deficits (37.5%), two resolved without problems; one case had persistent footdrop, two cases had documented pre-operative neurologic deficits. In group 2, 4 cases (44%) had pain with activity on follow-up. Two cases (22%) were noted to have a pseudoarthrosis and required revision surgery. Two cases (22%) were seen to have progression of deformity. **CONCLUSIONS:** Better correction of sagittal balance was seen in the reduction group. This correction was well maintained over time. High grade spondylolisthesis can be treated safely with a reduction and fusion with relatively low complication rates.

**Date : 2008-08-27**  
**Session : SICOT / Scoliosis Research Society (SRS): Adult Deformity**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 17729**

**THE ROLE OF POSTERIOR SPINAL FUSION IN HEALED POST-TUBERCULAR KYPHOSIS IN CHILDREN**

Vikas TRIVEDI

*Subharti Medical College, Meerut (INDIA)*

**INTRODUCTION:** Tubercular kyphosis in children is cosmetically and functionally disabling with a fear of late onset paraplegia. Correction of deformity is difficult and hazardous. We propose posterior-fusion done in highly selective kyphosis resulting in self-correction or prevention of progression, avoiding later surgeries and complications. **CLINICAL METHODS:** A prospective study of 20 patients over 5 yrs. Selection criteria: a) healed tuberculous kyphosis; b) progression of kyphosis at serial follow-up;c) No >2 spine-at-risk signs present. Posterior fusion in situ without instrumentation was done. Kyphosis correction assessed by clinical and radiological improvement in K angle of deformity. **RESULTS:** 12 dorsal, 6 dorso-lumbar and 2 lumbar cases. 16 patients had no spine-at-risk signs, 4 had <2 spine-at-risk signs. 19 patients had a progressive increase in angle pre-op. Mean follow-up: 4 yrs. Following fusion, 75 percent patients showed a self-correction and clinical improvement. 20% had static angle. Worsening was in 1 patient. **DISCUSSION:** Kyphosis can pose later a risk of cardio-respiratory embarrassment and late-onset paraplegia. 39% children show worsening kyphus (Type IBgroup; Rajsekaran). Posterior fusion with autogenous cancellous chips along with allograft was done in all. Self-correction is achieved by continued growth of anterior vertebral epiphyseal end-plates causing selective anterior-column growth. The pivot is the posteriorly fused mass and moment of the superior and inferior vertebral arms gives correction. With destruction of end-plates, the posterior-fusion gives complementary global fusion and halts the progression. **CONCLUSION:** Posterior Spinal Fusion is simple, safe, acceptable and less morbid with good results, changing long-term disability of patients.

**Date : 2008-08-27**  
**Session : SICOT / Scoliosis Research Society (SRS): Adult Deformity**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 18346**

**PEDICLE SUBTRACTION OSTEOTOMIES FOR SAGITTAL IMBALANCE**

Mohammad SHARKAWI, Esam EL-SHERIF  
*Assiut University Medical School, Assiut (EGYPT)*

**OBJECTIVE:** To report our early results at a minimum of 6 months after pedicle subtraction osteotomy for fixed sagittal imbalance.  
**METHOD:** Fourteen consecutive patients with sagittal imbalance (5 females/9 males, average age at surgery, 33.4 years) treated with pedicle subtraction osteotomies (1 at D11, 2 at D12, 5 at L1, 4 at L2, and 2 at L3) were analysed (average follow-up, 9 months; range 6-31 months). The etiology for imbalance was post-traumatic (8), Scheuermann disease (2), congenital (3), and postlaminectomy (1). Radiographic and clinical outcomes analysis was performed. **RESULTS:** The mean correction of the kyphotic angle at the osteotomy site was  $32.3\pm 5.0^\circ$ . The mean estimated blood loss was  $1,319\pm 1,416\text{mL}$ . Patients reported very good satisfaction (88%) and good function (78%) at ultimate follow-up. Complications included pseudarthrosis (1) that was revised 9 months postoperatively, pulling out of screws (1) and recurrence of deformity requiring revision and longer fixation, transient lower limb paraesthesia (2), and superficial infection (1). Progressive junctional kyphosis occurred in a patient with Scheuermann disease and required another PSO 6 months later. **CONCLUSION:** PSO can provide satisfactory clinical and radiographic outcomes with acceptable risk and morbidity.

**Date : 2008-08-27**  
**Session : SICOT / Scoliosis Research Society (SRS): Adult Deformity**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19167**

**ADULT SCOLIOSIS: CLASSIFICATION AND NATURAL HISTORY AND SELECTION OF FUSION LEVELS**

Oheneba BOACHIE-ADJEI

*Hospital for Special Surgery, Briarcliff Manor, NY (UNITED STATES)*

The incidence of adult scoliosis is estimated to be between 4% to 8% and can be the consequence of a process that began before skeletal maturity or the scoliosis can arise, "de novo", in adult life secondary to osteoporosis, osteomalacia or iatrogenic causes. Patients with thoracic curves of 50° to 75° were at the highest risk of progression. Thoracolumbar curves. The most common complaint in patients with scoliosis is pain and symptoms related to compression of the neural elements especially in patients with degenerative scoliosis. A recent radiographic adult deformity classification system categorizes curves in Single Thoracic, double Thoracic, double Major, Tripple Major, Thoracolumbar/ Lumbar curves. Primary Sagittal deformity. Regional Sagittal, Degenerative and global modifies (coronal and Sagittal) has also been proposed to aid in the selection of fusion levels. Patients <40 years of age with thoracic or thoracolumbar deformity without degenerative changes of the lumbar and lumbosacral spine, fusion levels are similar to those for the adolescent patient. Sagittal profile should also be as near normal and physiologic as possible. For the older adult with extensive degenerative changes, consider modification of the fusion levels. CT myelography or MRI scan will determine the integrity of the distal lumbar discs and the facet joints. Levels to be included are Painful segments, Translational changes and levels requiring decompression for spinal stenosis. Patients that have Sagittal and/or coronal imbalance require additional anterior release and fusion. Structural allograft or spacers with autograft can help improve sagittal balance. When long fusions are performed to the sacrum, pelvic fixation and anterior strut graft at the lumbosacral junction at L4-5, L5-S1 improves the fusion rate and also reduce the biomechanical stress on the sacral pedicle screws.

**Date : 2008-08-27**  
**Session : SICOT / Scoliosis Research Society (SRS): Adult Deformity**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19168**

**COMPLICATIONS OF ADULT SCOLIOSIS SURGERY: HOW TO AVOID AND MANAGE THEM**

Oheneba BOACHIE-ADJEI

*Hospital for Special Surgery, Briarcliff Manor, NY (UNITED STATES)*

Surgical treatment of adult scoliosis is generally fraught with higher complications than adolescent patients. Documented complication rates include residual pain (30%), paralysis (< 2%), and instrument failure (10%), Pseudarthrosis (5%-30%), infection (5%), pulmonary (10%), mortality (2%), and variable rate of Sagittal decompensation depending on the distal extent of the fusion. With a reported overall complication rate as high as 80%, it is imperative that the treating physician not only be aware of the risks and benefits of adult scoliosis surgery but fully discuss them with the patients and family. Factors significantly affecting the major complication rate in older adults include ASA grade >1 and compromised pulmonary function. Specific problems and how to avoid them: PSEUDARTHROSIS: 1. Use autologous bone graft; 2. Consider anterior fusion for decompensated adult T/L, lumbosacral deformity, Kyphosis, Charcot, pseudo repair and infected non-unions. ADJACENT SEGMENT DEGENERATION: Avoid distraction in the lumbar spine and do not fuse to degenerative levels: May require extension of fusion and instrumentation to affected levels to obtain spine balance. NEUROLOGIC DEFICIT: Direct Neural Injury; Avoid high profile implants; detect preoperative Intraspinous anomalies; Avoid Cord Elongation with spinal column shortening procedures; Use drains to avoid Epidural Hematoma and perform immediate evacuation. THROMBOEMBOLIC DISEASE: History of DVT- Consider aggressive prophylaxis and also in patients undergoing combined anterior posterior procedures especially the right sided approach. Lessons to adhere to in avoiding complications: 1. Prevent decompensation and be aware of overcorrection of primary deformity. 2. Choose the correct index procedure and fusion levels. 3. Appreciate factors that can affect surgical outcome: Medical co-morbidities, Procedure type and staging, Nutritional status, Previous surgery, and Surgeon expertise. Despite the high complication rate in adult patients a significant number still report improvements in appearance and overall satisfaction.

**Date : 2008-08-27**

**Session : Session 1: Adult Idiopathic Scoliosis**

**Time : 0800-1215**

**Room: 603-604**

**Abstract number : 19170**

**ADULT SCOLIOSIS: INDICATIONS FOR SACRAL PELVIC FIXATION AND THE ROLE OF FUSIONS TO L5**

Oheneba BOACHIE-ADJEI

*Hospital for Special Surgery, Briarcliff Manor, NY (UNITED STATES)*

Indications for fusion to the pelvis include degeneration of the lumbosacral spine, and Sagittal and coronal imbalance. Anterior strut grafting of L4-5 and L5-S1 improves the biomechanical strain on the instrumentation and may improve the fusion rate. Extension of the instrumentation distally to S2, intrasacral rods or pelvic instrumentation with iliac screws or Galveston fixation is beneficial. Instrumentation across the sacral iliac joint without fusing the sacral iliac joint is not without its problems. The Galveston extension or iliac extension sometimes has to be removed due to its prominence and pain. The more recent segmental instrumentation systems provide a selective long anterior and short posterior instrumentation for thoracolumbar/Lumbar curves and obviates the need for pelvic fixation. Moreover for long constructs extending the instrumentation into the pelvis and sacrum with multiple rods have improved our ability to place instrumentation in a more user friendly and timely manner. Multiple rods make these long constructs even easier to place and allow fine tuning of the alignment when all the rods are in place. Long x-ray cassettes to check intraoperative alignment of the long constructs to the pelvis is essential in avoiding unrecognized decompensation. Anterior fusion to L5/S1 is technically challenging when performing a multi-level release and fusion for adult scoliosis. A review by a multicenter study reported equal pseudarthrosis rates of 13% between patients fused to the sacrum with and without anterior L5-S1 fusion. A recent review of adult scoliosis patients fused from the thoracic spine to L5 Showed subsequent L5-S1 DDD developed in 66% of patients after long adult fusions to L5. A relative but not absolute protection against progressive DDD is provided by a deep-seated L5.



**Date : 2008-08-27**  
**Session : SICOT / Scoliosis Research Society (SRS): Adult Deformity**  
**Time : 0800-1215**  
**Room: 603-604**

**Abstract number : 19189**  
**POST SURGICAL SAGITTAL IMBALANCE**  
Kamal IBRAHIM  
*Loyola University Chicago, Chicago (UNITED STATES)*

**DEFINITION:**Surgical Sagittal Imbalance (Flat back syndrome) is a rigid loss of lumbar lordosis with sagittal axis anterior to L5-S1, associated with significant back pain and poor posture  
**Etiology:** - Iatrogenic 2ry to distraction instruments in lumbar spine (Harrington system, most common) or fusion in malalignment.- Pseudoarthrosis with loss of lumbar lordosis or decompensation beyond a fusion segment  
**Normal sagittal alignment of the spine:-** Normal thoracic kyphosis range 20-50 degrees- Normal lumbar lordosis range 20-65 degrees- Most of the lordosis occur between L3 and S1- Sagittal vertical axis from center of C7 body should fall through S1 body  
**PREVENTION:** proper evaluation of the global sagittal alignment, proper rod bending for lumbar instrumentation, pedicle screws, proper positioning on the table, adequate extension of the fusion and instrumentation. **SURGICAL CORRECTION:-** Preoperative planning to restore a vertical axis which intersect posterior end of S1- Lumbar Osteotomies: at the site of maximal deformity  
o Smith Petersen osteotomy: limited correction but safer  
o Pedicle subtraction osteotomy (partial vertebral decancellation, egg shell procedure) three-column posterior wedge osteotomy: technically demanding but achieves significant correction and no pseudoarthrosis.  
o Combination osteotomies of the above: utilized in severe deformity, either multiple Smith Peterson or pedicle subtraction at one level and Smith Peterson at another level.  
o Vertebral column resection: for severe rigid sagittal and coronal deformities and imbalance-  
**Expected results:** average correction 16-30 degrees, standing and walking straight without bend knees, marked improvement of pain, But complication rate range from 20% to 60%  
**CONCLUSION:** flat back syndrome is a preventable condition. With the current knowledge and modern instrumentation with pedicle screws fixation, iatrogenic flat back should no longer occur

**Date : 2008-08-27**

**Session : SICOT / Scoliosis Research Society (SRS): Adult Deformity**

**Time : 0800-1215**

**Room: 603-604**

**Abstract number : 19212**

**POST TRAUMATIC ADULT DEFORMITY SURGICAL TECHNIQUES**

S. RAJASEKARAN

*Ganga Med. Centre & Hosp. PVT, COIMBATORE (INDIA)*

Post traumatic deformities can be disabling due to chronic pain of progressive deformity or ensuing neurological deficit. The methods to identify patients at risk for progressive deformity and some of the surgical procedures with good results in the correction of such deformities will be discussed. While traditionally both anterior and posterior surgeries are considered important in such procedures, newer surgical approaches and techniques have made it possible to achieve good results with posterior only approach.

**Date : 2008-08-27**

**Session : AOSpine: Current Controversies in the Treatment of Spinal Disorders**

**Time : 1400-1530**

**Room: 603-604**

**Abstract number : 19153**

**THE EVIDENCE FOR LUMBAR FUSION FOR DEG DISK DISEASE**

Yat Wa WONG

*Department of Orthopaedics and Traumatology, the University of Hong Kong, Queen Mary Hospital, Hong Kong (HONG KONG)*

Degenerative lumbar disc disease is common and can have different clinical presentations. While most patients are asymptomatic, some patients get back pain, referred pain to buttock or posterior thigh, or sciatica. Occasionally patients can also present with spinal claudication. Nevertheless, the predominant symptom is pain and it is very difficult to assess pain objectively. Psychosocial factor may play an important role as well. As a result, there are no uniform patient selection criteria and outcome measures. Direct comparison of clinical studies has to be careful. Many surgical techniques have been developed for lumbar fusion. They can be anterior, posterior or combined fusion, with or without instrumentation. The techniques can be traditional or minimally invasive. In addition, there is no good way to assess the craftsmanship of surgeons that may also affect the clinical outcome. The criticism of lumbar fusion includes adjacent level degeneration and limitation of lumbar movement. The former can be a result of natural development, increased stress after adjacent level fusion, intraoperative injury during the prior operation or pre-existing degeneration. We don't know whether MRI can adequately reflect the lumbar disc degeneration. Radiological measurement of individual disc movement is easy but it is certainly not the normal range of movement for most of the patients during activities of daily living. In order to evaluate the evidence base of fusion surgery for the lumbar degenerative disease, we need to understand the natural history of disc degeneration, with and without adjacent level fusion. In comparing studies, special attention has to be taken in patient selection, outcome measures, surgical indications and fusion techniques.

**Date : 2008-08-27**

**Session : AOSpine: Current Controversies in the Treatment of Spinal Disorders**

**Time : 1400-1530**

**Room: 603-604**

**Abstract number : 19158**

**THE EVIDENCE FOR STANDARD DECOMPRESSION AND FUSION -GRADE I DEGENERATIVE SPONDYLOLISTHESIS WITH STENOSIS-**

Manabu ITO

*Department of Orthopaedic Surgery, Hokkaido University Graduate School of Medicine, Sapporo (JAPAN)*

There has been a long debate whether or not spinal fusion should be performed besides decompression procedure for lumbar degenerative spondylolisthesis with stenosis. There have been many scientific reports suggesting that clinical results of patients with both decompression and fusion are superior to those of patients with decompression alone. Based on these favorable results to spinal fusion, increasing number of spine surgeons are converting decompression alone to decompression combined with spinal fusion. However, since spinal fusion is more invasive to decompression alone, care must be taken especially to elderly patients with multiple comorbid medical problems. Some other reports concluded that clinical benefits of spinal fusion do not necessarily outweigh risks or complications related to surgery in those vulnerable patients. Though the use of spinal instrumentation has been proven to make higher fusion rate than non-instrumentation surgery does, the real benefits of spinal instrumentation to provide patients with better QOL are not fully answered. There are a lot of unanswered questions whether spinal instrumentation is safe in patients with severe osteoporosis, how often adjacent disc degeneration will occur for a long-term, or whether instrumented fusion is really cost-effective from a medico-social perspective. In this lecture, through a review of numerous previous reports, pros and cons of spinal decompression with or without fusion for treatment of degenerative spondylolisthesis will be discussed.

**Date : 2008-08-27**

**Session : AOSpine: Current Controversies in the Treatment of Spinal Disorders**

**Time : 1600-1730**

**Room: 603-604**

**Abstract number : 19156**

**GROWTH FACTORS FOR SPINAL FUSION**

Jeffrey C. WANG

*UCLA Comprehensive Spine Center, Santa Monica (UNITED STATES)*

The Use of Biologics for Spinal Fusion: This talk will discuss the origins of biologic factors for spinal fusion and how they were developed and brought into practice for spine surgery. The development and the studies demonstrating their efficacy, as well as the biologics substrates that are used that do not have significant evidence to support their efficacy will be discussed and described. The state of the art current treatment options and the appropriate usage will also be discussed for lumbar, thoracic, and cervical applications. The problems and complications associated with their usage and how to minimize their adverse effects will also be discussed. Cases demonstrating complications and bone resorption according to the high dosages will also be explored. The use of biologics in the near future will also be discussed with the expiration of patents and the potential for significant decreases in the costs associated with their development and production will also be discussed.

Date : 2008-08-27

Session : AOSpine: Current Controversies in the Treatment of Spinal Disorders

Time : 1600-1730

Room: 603-604

Abstract number : 19266

**THE EVIDENCE FOR INTERSPINOUS SPACERS (IS) FOR GRADE 1 DEGENERATIVE SPONDYLOLISTHESIS WITH STENOSIS (DSS)**

Ahmet ALANAY

*Hacettepe University Faculty of Medicine, Sıhhiye Ankara (TURKEY)*

DSS is a common cause for low back pain, neurogenic claudication and radiculopathy in elderly patients. Recently, IS has been suggested as an alternative procedure for the treatment of grade 1 DSS while it was declared to be contraindicated for patients with higher slips. One prospective randomized study by Anderson et al. investigating the clinical effects of IS in patients with grade 1 DSS reported 42 patients treated by IS compared to 33 patients treated with non-operative treatment. An overall clinical success rate of 63.4% was reported in the IS treated patients compared to 12.9% in the non-operative patients after 2 year follow-up. Secondary surgery was required in 5 (11.9%) of the patients in the IS group compared to 4 (12.1%) in the control group (Level II). A recent retrospective study by Verhoof et al. investigated a cohort of 12 consecutive patients with symptomatic grade 1 DSS who were treated with the IS. Postoperatively, eight patients had a complete relieve of symptoms while 4 had no change in symptoms. Recurrence of pain, neurogenic claudication and worsening of neurological symptoms was observed in 3 patients within 24 months. Finally, secondary surgical treatment by decompression with posterolateral fusion was performed in seven (58%) of patients within 24 months. The authors concluded that IS showed an extremely high failure rate and can not be recommended for the management of patients with DSS. (Level IV).IS may be an alternative treatment for carefully selected patients with grade I DSS. The stability status of the slip, the condition (enlarged facet joint spaces with cysts, osteophytes) and the orientation of the facet joints may be the other important factors to be taken into account in addition to grade of the slip.

**Date : 2008-08-27**

**Session : Shoulder and elbow: fractures and lesions of shoulder and humerus**

**Time : 0900-1030**

**Room: 605**

**Abstract number : 15676**

**CORRECTION OF POST-TRAUMATIC CUBITUS VARUS BY DOME OSTEOTOMY: A CLINICAL OUTCOME STUDY**

Amite PANKAJ<sup>1</sup>, Rajesh MALHOTRA<sup>2</sup>, Surya BHAN<sup>2</sup>

<sup>1</sup>UCMS and GTB Hospital, Delhi (INDIA), <sup>2</sup>AIIMS, New Delhi (INDIA)

The indication for surgery in the majority of children with post-traumatic cubitus varus is the presence of an unsightly deformity. Lateral closing wedge supracondylar osteotomy, although a widely used corrective procedure, has a tendency to produce lateral condylar prominence thus jeopardizing the cosmetic outcome. We employed the dome supracondylar osteotomy as the corrective procedure for cubitus varus in 12 consecutive children. The average follow-up was for 2.3 years (range: one year to four years). The objective evaluation was done by one of the authors by measuring the pre and postoperative lateral condylar prominence index, carrying angle and the range of movements at the elbow. The patients and parents were also asked to self-assess the cosmetic outcome. There were seven excellent and five good results. None of the children showed prominence of lateral humeral condyle. Hypertrophic scar formation and ulnar neuropraxia were seen in one patient each. Our results were comparable to the published results of lateral closing wedge osteotomy in terms of correction of carrying angle and preservation of elbow motion, and were superior to those of the lateral closing wedge osteotomy as regards the prominence of lateral humeral condyle, acceptability of the scar and cosmesis. We offer independent verification of the observation that the technique of dome osteotomy as described by Tien et al. for the correction of the post-traumatic cubitus varus is a simple, safe and technically sound procedure that prevents the lateral condyle from becoming prominent and yields excellent cosmetic outcome.

Date : 2008-08-27

Session : Shoulder and elbow: fractures and lesions of shoulder and humerus

Time : 0900-1030

Room: 605

Abstract number : 16268

**SURGICAL TREATMENT OF COMMUNED FRACTURES OF THE GLENOID OF THE SHOULDER**

Gershon VOLPIN<sup>1</sup>, Genadi KIRSHNER<sup>1</sup>, Victor KAMILOVSKI<sup>2</sup>, Slobodan VOCHCOV<sup>2</sup>, Jordan SAVESKI<sup>2</sup>  
<sup>1</sup>Western Galilee Hospital, Nahariya (ISRAEL), <sup>2</sup>City Hospital, Skopje (MACEDONIA)

INTRODUCTION: Fractures of the glenoid are rare injuries, usually caused by high-energy trauma. Most fractures are minimally displaced but some are displaced with glenohumeral subluxation. We present our experience with this pathology. PATIENTS: There were 37 Pts. from Israel and Macedonia (30M, 7F, 18-74Y old, mean 43.5Y) followed for 2-6 years (mean 3.5Y). Fractures were classified according to Idelberg. 29/37 Pts. had minimally displaced fractures treated conservatively. 8/37 had comminuted fractures of the glenoid and some degrees of shoulder subluxation and were treated surgically by ORIF by plates (3) or by screws alone (5). One of them, a 73Y old female, had also a comminuted fracture of the proximal humerus, treated by ORIF of the glenoid with 2 screws and shoulder hemiarthroplasty. All patients were evaluated by the Constant's Shoulder Score and radiographs. RESULTS: Overall results were excellent and good in 30/37 Pts. (81%). They were almost free of pain and most of them had almost complete ROM of the affected shoulder. 24/29 Pts. treated conservatively had satisfactory results. 6/8 Pts. treated surgically (75%) had excellent and good results, with some better results in less comminuted fractures. The remaining 2/8 Pts. had fair results. CONCLUSIONS: Most fractures of the glenoid with minimal displacement can be treated conservatively. Patients with displaced glenoid fractures of more than 5mms or with shoulder instability should be treated by open reduction and internal fixation by screws or by plates, followed by intensive physiotherapy.



**Date : 2008-08-27**

**Session : Shoulder and elbow: fractures and lesions of shoulder and humerus**

**Time : 0900-1030**

**Room: 605**

**Abstract number : 16277**

**THE ANAESTHETIC BURN**

Hesham AL-KHATEEB, Tim PECKHAM

*Basildon University Hospital, LONDON (UNITED KINGDOM)*

Peri-incisional numbness is a common finding in both open and arthroscopic procedures and is a recognised complication in open shoulder procedures and is usually self-limiting. We present a case where 3 patients underwent open shoulder surgery, 2 open shoulder decompressions and acromioplasty and 1 shoulder stabilisation, and, after applying hot compresses, postoperatively developed a full thickness burn over the incision. The burn was attributed to the fact that there was a localised area of peri-incisional numbness present; the patient was therefore unaware of the burn caused by the hot compresses applied. All burns were treated conservatively and healed completely with no adverse effects on the index procedures. Surgeons should be aware of this commonly occurring complication and alert patients of the potential risks. To our knowledge, full thickness burns occurring secondary to peri-incisional numbness post shoulder surgery have not been previously reported.

**Date : 2008-08-27**

**Session : Shoulder and elbow: fractures and lesions of shoulder and humerus**

**Time : 0900-1030**

**Room: 605**

**Abstract number : 16650**

**FUNCTIONAL OUTCOME AND IMAGING IN GREATER TUBEROSITY FRACTURES OF THE SHOULDER**

Simon JOHNSON, Paul JENKINS, John DAVEY, Nicholas OHLY, Kash KHAN, Martin MITCHELL, Michael ROBINSON  
*Royal Infirmary of Edinburgh, Edinburgh (UNITED KINGDOM)*

**INTRODUCTION:** There has been little research looking at the complications and functional outcome following greater tuberosity fractures. The purpose of this study is to describe fracture characteristics on MRI imaging and relate these to functional outcomes after greater tuberosity fractures. **METHODS:** This study was performed by the Shoulder Injury Clinic, Edinburgh Orthopaedic Trauma Unit. 101 patients were recruited into the study and underwent MRI imaging within 2 weeks of injury. Patients were followed-up after 6 weeks, 3 months and 6 months. Shoulder function was assessed using DASH score and by measuring range of movement. **RESULTS:** Patients were generally younger than patients with other proximal humeral fractures. DASH score peaked at 6 weeks but was still significantly higher at 6 months than the pre-injury score. Axillary nerve dysfunction was a common complication and an important predictor of poor functional outcome. MRI showed displacement in 69% of cases and was more sensitive in detecting displacement compared to plain radiograph. Humeral head bone bruising and osteochondral defects were commonly seen on MRI as were rotator cuff abnormalities, which were present in a quarter of patients. However, displacement and rotator cuff abnormalities were the only characteristics on MRI related to poorer functional outcome. Displacement over 3mm was an important predictor of DASH and displacement over 10mm caused reduced range of movement. **CONCLUSION:** Greater tuberosity fractures involve a long recovery period and may require follow-up to at least 6 months. MRI is useful in evaluation of injury and in treatment planning.

**Date : 2008-08-27**

**Session : Shoulder and elbow: fractures and lesions of shoulder and humerus**

**Time : 0900-1030**

**Room: 605**

**Abstract number : 16713**

**NAILING OR PLATING IN HUMERUS SHAFT FRACTURES. A SURGICAL DILEMMA**

Kiran Kumar SINGISETTI

*Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM)*

**BACKGROUND:** Treatment of fractures of humeral shaft continues to evolve as advances are made in both nonoperative and operative management. **MATERIALS AND METHODS:** A prospective study of management of fractures of diaphysis of humerus by interlocking nail fixation and dynamic compression plating (DCP) was undertaken over a period of 3 years. 45 patients with humerus fracture were treated with either interlocking nailing or plating. **RESULTS:** The maximum number of patients is in age group 21-40 years. Fractures in males represented about 78% and mode of injury was mostly road traffic accident (86%). Fractures with unacceptable alignment were the most common indication (53%). While only 50% of the interlocking group had healed by 16 weeks, 75% of the plating group had united by this time. Overall results (Rodriguez-Merchan) show 65% excellent and good results in interlocking group and almost 93% similar results in the plating group. Postoperative radial nerve palsy was seen in none of the interlocking group but was noted in 6.25% of the plating group. All of them recovered uneventfully with time. **CONCLUSION:** The controversy over procedure of choice is still ongoing for surgical treatment of closed fractures. Plating is generally considered gold standard and seems to have more predictable results. Interlocking nailing is particularly preferable in comminuted, segmental and pathological fractures. Use of interlocking nails in humeral fractures is technically demanding and has a steep learning curve.

**Date : 2008-08-27**

**Session : Shoulder and elbow: fractures and lesions of shoulder and humerus**

**Time : 0900-1030**

**Room: 605**

**Abstract number : 16890**

**ARTHROSCOPIC FINDINGS IN SHOULDER AFTER TRAUMATIC DISLOCATION**

Ivica MEDENICA, Stasa MUNITLAK, Milan LUKOVIC

*Military Medical Academy, Belgrad (SERBIA)*

The aim of this study was to verify patho-anatomic lesion after traumatic dislocation leading to chronic instability of the shoulder. During the period January, 1st 2004 - November, 31st 2007 we performed 145 arthroscopies of the shoulder. All patients have experienced at least one dislocation, 62 had 1 to 3, and 83 had more than 3 dislocations. Gender structure was 112 males and 32 females, with mean age of 32.3 years. There were 62% of right and 38% of left shoulder dislocations. Time passed from the first dislocation till the arthroscopy was 15 days to 8 years, and the time passed from the last dislocation varied from 15 days to 5 years. Sport injuries participated with 77.2%, injuries at work with 14.5%, car accidents with 8.3%. The arthroscopic findings were as follows: 137 (94.4%) had lesion of anterior capsule and ligament complex (Bankart lesion), 118 (81.4%) had anterior capsule laxity, 131 (90.3%) had Hill Sachs lesion, 109 (75.2%) had lesion of inferior glenohumeral ligament, 21 (14.5%) had complex rotator cuff lesion, 8 (5.5%) had partial rotator cuff lesion, 12 (8.3%) had posterior labrum lesion, and 31 (21.4%) had SLAP lesion.

**Date : 2008-08-27**

**Session : Shoulder and elbow: fractures and lesions of shoulder and humerus**

**Time : 0900-1030**

**Room: 605**

**Abstract number : 17837**

**NEW TECHNIQUE OF SECURE REDUCTION AND FIXATION OF ACJ DISLOCATION**

Yasser ELBATRAWY<sup>1</sup>, Mahmoud FAYED<sup>2</sup>

<sup>1</sup>*Azhar university, Cairo (EGYPT)*, <sup>2</sup>*Ain Shams university, Cairo (EGYPT)*

Is there a safe and secure method of fixation for the Acromio-Clavicular joint dislocation? The currently used methods are either crossing the AC joint by smooth k-wires, threaded screws, threaded pins and/or kuntcher nail. Or by Coraco-clavicular fixation by a screw or wire cerclage. Many postop. complications were reported during using all previous methods. These include mechanical failure, CC ossification, AC arthritis, osteolysis of the distal end of the clavicle, osteomyelitis, fracture in implant hole or holes, pins or wires migration and recurrent of the deformity. In our study, we used a new method for both reduction and secure fixation without crossing the AC joint by metals. We combined open surgical primary repair of the AC ligament to the original Russian method of Reduction and fixation of AC joint complete dislocation using Ilizarov arch and crossing wires in a special technique for tensioning the wires to reduce the dislocation then fix it externally. We are showing the results in 4 patients. All of them have long-term results. We have none of the previously mentioned common complications associated when using the other methods of fixation. In addition we have excellent functions of the shoulder joint complex in our 4 patients. We believe that this new method is an excellent method for reduction and fixation of that injury and may become a popular one for trauma surgeon in future.

**Date : 2008-08-27**

**Session : Shoulder and elbow: fractures and lesions of shoulder and humerus**

**Time : 0900-1030**

**Room: 605**

**Abstract number : 18101**

**DISPLACED THREE PART PROXIMAL HUMERAL FRACTURES TREATED BY RETROGRADE HALDER HUMERAL NAIL**

Jim NEWMAN, Prajwal DAS, J A CHAPMAN, S C HALDER

*Calderdale and Huddersfield NHS Trust, HALIFAX (UNITED KINGDOM)*

AIM: The aim of this study was to analyse the results of the displaced three part fractures of the proximal humerus treated by retrograde nailing +/- cannulated screws for fixation of greater tuberosity. MATERIAL AND METHODS: Displaced three part fractures of the humerus are unstable and difficult to fix. Different methods of operative treatment available for this type of fractures are Kirschner wires, tension band wiring, hemiarthroplasty and most commonly used procedure open reduction and internal fixation with plate and screws. The Halder Humeral nail was introduced through the olecranon fossa into head of humerus, to stabilise the neck of humerus fracture. Displaced greater tuberosity was reduced with minimal stab incision and fixed with cannulated screws. Compared to other open procedures very minimal proximal exposure was required to fix Greater Tuberosity. Since January 1995, we have operated 107 patients with displaced three part proximal humerus fractures. 81 patients were treated with proximal screws and 26 (24.29%) patients were treated without proximal screw fixation. Total females were 62 and males 15. Average age was 67.68 years. RESULTS: Early passive movements were encouraged in the shoulder. The pain was relieved in almost all patients. In 87 fractures united well. 15 patients had malunion, 3 had head collapse and 2 had AVN humeral head. CONCLUSION: In our experience, displaced three part proximal humeral fractures can be treated with this nail in retrograde method which avoids any major exposure in the shoulder region.

**Date : 2008-08-27**

**Session : Shoulder and elbow: fractures and lesions of shoulder and humerus**

**Time : 0900-1030**

**Room: 605**

**Abstract number : 18134**

**TREATMENT OF NONUNION OF THE HUMERAL SHAFT - COMPARISON OF LOCKED AND UNLOCKED IMPLANTS**

Noureddine BAHRI, Christian QUEITSCH, Martin WURM, Klaus SEIDE, Christian JUERGENS

*Bg Trauma Center, Hamburg (GERMANY)*

Diaphyseal nonunion is not unusual after treatment of fractures of the humeral shaft. In a retrospective study 43 patients with delayed or nonunion of the humeral diaphysis between January 1995 and January 2003 were examined. In 14 patients the treatment involved a 4.5-mm low-contact dynamic compression plate and autologous bone grafting (LCDCP group); 29 patients were each treated by insertion of an internal fixator with locked screws and autologous bone grafting. The mean lapse of time between the initial treatment and the operative treatment for delayed union or non-union was 18.3 months (4-58 months). On average, patients had undergone 1.5 (0-4) previous operations before the final treatment. Primary nerve palsy was documented in 7 cases. Consolidation was achieved in all patients. In the LCDCP group two revisions were necessary; both in patients with osteoporosis, while in the internal fixator group one re-osteosynthesis was required after a plate failure. The range of movement in shoulder and elbow increased rapidly after treatment of the patients' pseudarthroses.

**Date : 2008-08-27**

**Session : Shoulder and elbow: fractures and lesions of shoulder and humerus**

**Time : 0900-1030**

**Room: 605**

**Abstract number : 18319**

**ANGULAR STABLE FIXATION OF PROXIMAL HUMERAL FRACTURES**

Gerhild THALHAMMER, Patrick PLATZER, Gerhard OBERLEITNER, Manfred GREITBAUER, Christian FIALKA, Vilmos VÉCSEI  
*Medical University of Vienna, Department of Trauma Surgery, Vienne (AUSTRIA)*

**OBJECTIVES:** The purpose of this study was to assess the clinical and radiographic long-term results after angular stable plate fixation of proximal humeral fractures. **MATERIAL AND METHODS:** We retrospectively analysed functional and radiographic results of 42 patients after angular stable plate fixation of proximal humeral fractures at an average time of 3.2 (+/- 0.8) years after trauma. Functional results were defined by the Constant score (CS) and the individual Constant score (CS<sub>indiv</sub>). Radiographic results were assessed by a three-view trauma series. Two different angular stable implants were used. Twenty-seven patients were stabilised by a HOFER plate, fifteen patients by a Locking Proximal Humerus Plate (LPHP). **RESULTS:** Clinical results revealed an average CS of 74.0 points and an average CS<sub>indiv</sub> of 79.2%. Fourteen patients had an excellent functional outcome, eight patients a good outcome and fourteen patients had moderate functional results. Six patients (14%) had a poor outcome with less than 55% on CS<sub>indiv</sub>. We had an overall union rate of 95%. Failures of reduction and fixation occurred in fourteen patients (33%), in nine patients (21%) we had signs of a humeral head necrosis. **CONCLUSION:** With regard to fracture healing and functional outcome of the patients, we had a satisfactory outcome after angular stable plate fixation of proximal humeral fractures. However, we experienced a notably high rate of technical failures and partial humeral head necrosis. Advanced surgical skills and experiences seem to be necessary to reduce the risk of these treatment-related complications.



**Date : 2008-08-27**

**Session : Shoulder and elbow: elbow fractures in the child**

**Time : 1100-1215**

**Room: 605**

**Abstract number : 16420**

**RESULTS OF OPEN REDUCTION AND INTERNAL FIXATION OF FRACTURE CLAVICLE WITH RECONSTRUCTION PLATE**

Osama FARAG

*Saudi German Hospital, AlMadinah AlMonourah (SAUDI ARABIA)*

**OBJECTIVES:** To study the results of open reduction and internal fixation of fracture clavicle with reconstruction plate on the early return to functional activity and union rate. **MATERIAL AND METHOD:** 75 patients with fracture clavicle were studied between January 2004 and June 2007, with a follow-up period ranged from 8 months to 2 years. The study was carried out at Saudi German Hospitals KSA. Ages range from 20 to 49 years, male:female 53:22. 51 patients were polytrauma patients with more than one fracture or other system affection, 15 cases presented as solo fracture clavicle and 5 cases malunion of clavicular fracture and 4 cases nonunion fracture clavicle. **RESULTS:** The patients were assessed mainly according to Hill criteria with clinical, functional and radiological assessment. Excellent results in 68 patients with union of fracture between 8-12 weeks, full range of motion of shoulder and return to sedentary non forceful activities of shoulder within two weeks. 2 cases developed implant failure which necessitated refixation and grafting, one case developed infection with MRSA, 3 cases delayed union which needed bone graft and one case developed limited range of motion of shoulder which was associated with comminuted fracture glenoid. **CONCLUSION:** Open reduction and internal fixation of clavicular fracture is a good choice especially in polytraumatized patients which can be an alternative to conservative treatment to decrease the period of inactivity of shoulder in arm sling and malunion or nonunion of the fracture.

Date : 2008-08-27

Session : Shoulder and elbow: elbow fractures in the child

Time : 1100-1215

Room: 605

Abstract number : 17667

**A STUDY OF FUNCTIONAL OUTCOME OF TREATMENT OF GARTLAND'S TYPE III SUPRACONDYLAR FRACTURE OF HUMERUS IN CHILDREN WITH CLOSED REDUCTION AND CROSSED KIRSCHNER WIRES FIXATION**

Pradeep REDDY, Raghav Sunil KAMMA, Ashish SINGH, Sharukh DOTIVALA

*Sancheti Institute, Hyderabad, Andhra Pradesh (INDIA)*

This was a prospective study which was carried out at the Sancheti Institute for Orthopaedics and Rehabilitation, Shivajinagar, Pune during 2005-2007. 25 cases of closed Gartland's type III displaced supracondylar fracture of humerus in children. These cases were studied on the basis of mechanism of injury, classification and their surgical and functional outcome with or without residual complications. Manipulative closed reduction was achieved by Traction-Countertraction method, and then the crossed Kirschner wires were passed taking all due precautions not to injure the ulnar nerve while passing the medial pin and final checking under the image intensifier was done to assess the position of the Kirschner wires. In a few cases with metaphyseal comminution were fixed with 3 Kirschner wires (1 to 1.5mm size) commonly one each through medial and lateral epicondyles. The range of movement and the carrying angle were noted clinically and were compared with the normal side. Loss of movement and loss of carrying angle were noted. The total follow-up duration was up to 1 year. The observations were tabulated and results were graded accordingly. Closed anatomical reduction and internal fixation with crossed Kirschner wires is extremely safe after confirming the reduction under image intensifier and taking due precautions not to damage the ulnar nerve while placing the medial pin. We have had 84% of excellent results in our series comprising 25 patients.

**Date : 2008-08-27**

**Session : Shoulder and elbow: elbow fractures in the child**

**Time : 1100-1215**

**Room: 605**

**Abstract number : 17902**

**EARLY RECOVERY IN FRACTURE CLAVICLE WITH ASSOCIATED FRACTURE**

Sanjib Kumar BEHERA, Raghu Babu MEKA, Amar Choudary L.

*Yashoda Hospital Secunderabad, Hyderabad (INDIA)*

AIM: Early compliance with pain and faster (quicker) recovery of clavicle fracture with associated injury. Treatment of displaced mid shaft clavicle fracture is still controversial, though non operative treatment is favoured with good results. Operative treatment is advocated in our cases only in favour to suggest immediate relief from pain and ensure minimum discontinuity in one professional work. Thus, for those having associated fracture multiple ribs, scapula and humerus and head injuries (unconscious and irritable). 64 subjects of clavicle fracture with associated ribs, scapular, humerus and other injuries of ipsilateral shoulder injuries. During the year 2001-2007 May, 64 cases were treated with open reduction and internal fixation with plate and screws. All of them had immediate relief from pain and better in activities of daily life during the convalescence period and had early return to work. None had nonunion, one had repeated implant failure and one had fracture of implant. 44 cases of clavicle fracture with 2 or more than 2 rib fractures. 04 cases of clavicle fracture with isolated 2nd rib fracture. 04 cases clavicle fracture associated with scapula and single rib fracture. 02 cases of clavicle fracture associated with scapula fracture only. 06 cases of clavicle of fracture associated with scapula fracture with head injury without any other injuries. 2 cases of clavicle fracture with humeral shaft fracture. 2 cases of isolated clavicle fractures brachial plexus neuropraxia.

Date : 2008-08-27

Session : Shoulder and elbow: elbow fractures in the child

Time : 1100-1215

Room: 605

Abstract number : 18690

**FRACTURE OF THE HUMERAL SHAFT AND ASSOCIATED WITH IPSILATERAL FRACTURE DISLOCATION OF THE SHOULDER**

Selahattin OZYUREK<sup>1</sup>, Feridun CILLI<sup>2</sup>, Mahir MAHIROĞULLAR<sup>1,2</sup>, Ahmet KARAL<sup>2</sup>, Bahadır SEYHAN<sup>1</sup>  
<sup>1</sup>Diyarbakir Military Hospital, Dept.Orthopaedics and Traumatology, Diyarbakir (TURKEY), <sup>2</sup>Department of Orthopaedics and Traumatology, GATA Haydarpasa Training Hospital, Istanbul (TURKEY)

**INTRODUCTION:** Dislocations associated with fractures of the adjacent long bones, usually resulting from severe trauma, are among the most uncommon and functionally serious injuries. **OBJECTIVE:** We present a rare a case of simultaneous dislocation of the shoulder and fracture of the ipsilateral humeral shaft and greater tuberosity fracture. **MATERIALS AND METHODS:** A 79-year-old patient presented to our department with pain and inability to move right shoulder due to trauma. There was deformity and painful swelling of the right shoulder and arm. No neurovascular deficit was found and all other clinical findings were normal. Initial radiographs revealed a fracture of the middle-lower third of the right humerus and greater tuberosity together with an ipsilateral anterior glenohumeral dislocation. Under general anaesthesia, closed reduction of the dislocation was performed successfully and the humeral shaft fracture was treated by open reduction and internal fixation with a dynamic compression plate and screws. Greater tuberosity fracture was also treated by Kirschner wires. There were no surgical complications after operation and the affected limb was immobilised with a sling. The patient was instructed to start active movement of the glenohumeral joint 3 weeks after operation. **RESULTS:** After twelve weeks, bony union was demonstrated radiographically. Aggressive muscle strength exercises were then commenced. At six-month follow-up, she had returned to her normal occupation. **CONCLUSION:** We have experienced a case of dislocation of the shoulder joint with ipsilateral humeral shaft fracture and greater tuberosity fracture. We report early-term result of our treatment. Good clinical results were demonstrated.

**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 1**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 15956**

**SUBACROMIAL IMPINGEMENT SYNDROM-RESULTS AFTER BURSECTOMY AND ACROMIOPLASTY**

Adrian Radu RADULESCU, Adrian Emilian BADILA, Octavian NUTIU, Cristian NITA, Robert MANOLESCU  
*Bucharest University Hospital, Bucharest (ROMANIA)*

GOAL: Effectiveness of open subacromial decompression and acromioplasty (on anterior approach) for subacromial impingement syndrome. MATERIALS AND METHODS: The study group is composed of 62 patients, 32 women and 30 men, with a mean age of 56.2 years (extremes 39-71) who, between 2002 and 2006, underwent open acromioplasty using transdeltoidian anterior approach, accompanied by previous complete section of coracoacromial ligament and partial subacromial bursectomy for subacromial impingement syndrome; all patients had no lesions of the rotator cuff. A local anesthetic/steroid subacromial injection was administered to all patients with a clinical diagnosis of subacromial impingement syndrome. Among these, 51 patients had a positive injection test but the symptoms came back in less than one year and other 11 patients had a negative injection test but the diagnosis was sustained on MRI (they all together represent the "surgical" group). The results were evaluated according to Constant score at the onset of the disease, after the local anesthetic/steroid subacromial injection and postoperative at 6 weeks, 3 months and 6 months after surgery. RESULTS: The preoperative mean Constant score was 43 points (extremes 19-66), after subacromial injection 74 (extremes 49-89) and postoperative at 6 weeks 63 (extremes 31-81), at 3 months 76 (extremes 44-93), at 6 months 81 (extremes 48-98). CONCLUSIONS: The local anesthetic/steroid subacromial injection is an effective method of diagnosis and treatment of inflammatory arthropathy. Section of coracoacromial ligament, subacromial bursectomy and acromioplasty represent a good option in patients who do not respond to conservative treatment.

Date : 2008-08-27

Session : Shoulder and elbow: reconstruction 1

Time : 1400-1530

Room: 605

Abstract number : 16237

**POSTOPERATIVE PAIN IN ARTHROSCOPIC SUBACROMIAL DECOMPRESSION. THE USE OF BIPOLAR VS MONOPOLAR RADIOFREQUENCY**

Mohammed DIAB<sup>1</sup>, Antonella ARDOLINO<sup>2</sup>

<sup>1</sup>Dorset County Hospital, Dorchester (UNITED KINGDOM), <sup>2</sup>Poole Hospitals NHS Trust, Dorset (UNITED KINGDOM)

**OBJECTIVE:** Arthroscopic Subacromial Decompression (ASD) is a well accepted and successful technique for the treatment of chronic impingement syndrome of the shoulder. Since the introduction of the bipolar arthroscopic radiofrequency (RF) wand, it started to replace the classic Bovie monopolar probe on the assumption that the new technology replaces the cellular pyrolysis and thermal cutting of standard monopolar electro-surgery with cool ablative process that produces little collateral soft tissue damage. Because the current does not pass directly through the tissue with the use of bipolar RF wand, tissue heating is minimal. The surface tissue temperature when using the bipolar device is usually between 40-70°C compared to the standard electrocautery device which could reach >400°C. Theoretically, this should produce less postoperative pain and encourage faster postoperative recovery. **MATERIALS AND METHODS:** In order to test this hypothesis we set a prospective randomized comparative study. 40 patients underwent arthroscopic subacromial decompression, randomized into 2 groups. The degree of postoperative pain was tested in the first 24hrs and the next 10 postoperative days using visual analogue scale (VAS). All patients had the same perioperative pain regime. **RESULTS:** There was no statistically significant difference in the degree of postoperative pain between the group of patients treated with the bipolar RF and the one treated with the classic monopolar RF. **CONCLUSION:** The biophysical advantage of new bipolar RF ablation device over the classic monopolar RF could not be translated into better postoperative pain control and subsequently faster shoulder recovery.

**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 1**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 16256**

**IS THERE STILL A PLACE TODAY FOR NEER'S CAPSULAR SHIFT REPAIR IN ATHLETS WITH RECURRENT ANTERIOR SHOULDER DISLOCATION?**

Gershon VOLPIN, Leonid LICHTENSTEIN, Alexander KAUSHANSKI, Haim SHTARKER  
*Western Galilee Hospital, Nahariya (ISRAEL)*

INTRODUCTION: Various surgical methods have been described to manage the problem of recurrent anterior dislocation of the shoulder. Treatment is directed now towards restoration of normal function with full ROM, based mainly on arthroscopic stabilization or on "open" Neer's capsular shift procedures. During the last few years, there are more and more papers dealing with a surprising unexpected high number of patients with shoulder instability following arthroscopic repair. This study reviews the long-term results of "open" Neer's capsular shift procedure. MATERIALS: This is a presentation of 87 consecutive patients, 19-47 year-old (mean 23Y) with a follow-up of 4-15Y (mean 6Y). 45 Pts had episodes of traumatic recurrent anterior dislocation. 42 Pts had multidirectional instability with proved dislocations. All patients were treated by modified Neer's capsular shift procedure. RESULTS: 82/87 Pts had a stable shoulder without recurrent dislocation. 5 patients had an episode of traumatic shoulder dislocation within 2-4 months following operation. One patient developed partial brachial plexus injury, most probably due to traction of the affected limb following operation. 78/87 had normal shoulder function with full ROM and the 9 remaining Pts had only a slight limitation in shoulder ROM. CONCLUSIONS: It is suggested that capsular shift procedure is an excellent method for repair of recurrent anterior shoulder dislocation which allows restoration of shoulder stability with better functional results. This is suitable mainly for patients with structural hyperlaxity and multidirectional instability, whereas arthroscopic stabilization might be used in patients with true traumatic instability.

Date : 2008-08-27

Session : Shoulder and elbow: reconstruction 1

Time : 1400-1530

Room: 605

Abstract number : 16285

### THIRD GENERATION BAKSI SLOPPY HINGE ELBOW ARTHROPLASTY - MID-TERM RESULTS

Debadyuti BAKSI<sup>1</sup>, Durgapada BAKSI<sup>2</sup>, Ananda Kisor PAL<sup>3</sup>

<sup>1</sup>Tort Centre, Ninewells Hospital, University of Dundee, Kolkata (INDIA), <sup>2</sup>Kothari Medical Centre, Kolkata (INDIA), <sup>3</sup>Burdwan Medical College, Kolkata (INDIA)

**INTRODUCTION:** The Baksi sloppy hinge elbow (Baksi, 1998, JBJS (Br.), 80B, 614-619) having 70-100 side-to-side laxity to divert the stresses to the surrounding soft tissues was modified to third generation, adding flanges on either side of shank of humeral stem to get anchored to the lower end of humerus to act as a single assembly against the rotational torque to reduce the loosening around the humeral stem. Results of its use in a series of irreversibly damaged elbows from January 2004 to December 2007 will be presented. **MATERIALS AND METHODS:** Thirty-one elbows (five post-traumatic bony ankylosis, 11 - recent stage IV, four malunited, eight ununited intercondylar fracture humerus, two old neglected dislocations of elbows and one G.C.T. lower end of humerus) were replaced. Ages varied from 31 to 68 years (average 38.5), nineteen were males and twelve females. **RESULTS:** During F.U. period of 12 to 48 months (average 28 months) following a criteria 29 were good, two fair and none was poor. All patients had arc of elbow flexion 200±100 to 1200±200. No radiolucent line around the prosthetic stems was noted in any, except the occurrence of bony erosions around the flanges of the humeral stem in two. Four had postoperative ulnar neuropraxia recovered spontaneously. **DISCUSSION:** Prosthetic replacement of the elbows exhibited satisfactory painless stable elbow motions in majority, though they were advised to avoid its strenuous use permanently.



**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 1**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 17211**  
**MANAGEMENT OF OLD MONTAGIA FRACTURES IN CHILDREN**  
Aly MOHAMEDEIN  
*Assiut university hospitals, Assiut (EGYPT)*

This is a report on a prospective study evaluating Management of old montagia fractures in children using the technique of osteotomy of the malunited ulna, open reduction of the head of radius with the use of periosteal flap to keep the reduction of the head of radius in 9 patients - 2 males and 7 females, 3 were right and 6 left, with lack of full flexion with minimum follow-up period of 6 months. All osteotomised ulnae were united, all heads of radius were reduced with full flexion of all elbows at the end of follow-up. The operative technique used, the perioperative complications, the clinical as well as the radiological outcome will be presented.

Date : 2008-08-27

Session : Shoulder and elbow: reconstruction 1

Time : 1400-1530

Room: 605

Abstract number : 17318

**LONG-TERM RESULTS OF TREATMENT OF ANTERIOR HABITUAL SHOULDER DISLOCATION WITH HILL-SACKS LESION USING ROTATIONAL OSTEOTOMY OF THE HUMERUS**

Alexey MASLOV<sup>1</sup>, Alexander BELETSKY<sup>2</sup>, Alexander MASLOV<sup>1</sup>

<sup>1</sup>Minsk Regional Clinic, Minsk (BELARUS), <sup>2</sup>State Scientific and Practical Centre of Traumatology and Orthopaedics, Minsk (BELARUS)

We have studied the results of surgical technique of strengthening of anterior wall of shoulder joint according to Boychev-I in treatment of 56 patients with an anterior habitual shoulder dislocation (average term of supervision - 7 years). Insufficiency of applied technique almost at each third patient is determined. The unsatisfactory result of treatment (redislocation) is found in 4 cases (7.1%), satisfactory (the moderate and expressed functional deficiency) - in 12 (21.4%). Since 1995, with the introduction of shoulder joint arthroscopy in clinical practice at 99 patients with massive bone-cartilage lesion of back surface of humeral head, we have applied rotational osteotomy of the humerus with subscapularis tendon transposition (male/female ratio - 3:1, middle age - 34.6 years). Average duration of disease before the operation was 4.2 years (from 1.2 years to 24 years). In each clinical case the quantity of shoulder dislocations exceeded 6. Long-term result of treatment is studied at 55 patients. Good and excellent clinical results have been reached at 48 patients (87.2%). The moderate functional disorders are revealed at 6 patients (10.9 %) There was one case of redislocation after repeated trauma. There were no cases of nonunion, evident contracture or avascular necrosis of humeral head. Rotational osteotomy of a humerus with subscapularis tendon transposition is an effective operation with rather simple postoperative conducting and low frequency of complications. This operation can be recommended in cases of pronounced Hill-Sacks lesion with severe instability of humeral joint, after failed plastic procedures on the soft tissues.

**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 1**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 17389**

**HOW TIGHT IS ENOUGH IN ROTATOR CUFF REPAIRS? STRESS-RELAXATION MAY BE A CAUSE OF EXCESSIVE GAP FORMATION**

Mark HABER<sup>1</sup>, David BELL<sup>2</sup>, Daniel BIGGS<sup>3</sup>, William WALSH<sup>2</sup>

<sup>1</sup>University of Wollongong, Graduate School of Medicine, Sydney (AUSTRALIA), <sup>2</sup>Surgical & Orthopaedic Research Laboratories, University of New South Wales, Sydney (AUSTRALIA), <sup>3</sup>Central West Orthopaedics & Sports Injuries, Sydney (AUSTRALIA)

**INTRODUCTION:** Restoration of the rotator cuff footprint without gap formation is thought to be a critical factor in the healing of rotator cuff tears. The ideal tension applied to the repair for optimum healing has yet to be documented. We used an electronic pressure sensor (Tekscan) to measure changes over time in footprint area following tensioning for two different double-row repair configurations. We hypothesized that significant stress-relaxation of the repair would occur. **MATERIALS AND METHODS:** Rotator cuff tears were created in the subscapularis tendon of 10 pig shoulders and repaired with the AutoCuff system using one of two different "transosseous-equivalent" techniques: 1) Double-Row-Loop (DRL); 2) Double-Row Cross-Over (DRCO). The sensor was placed between the tendon and bone to measure the footprint area and measured for 300 seconds. **RESULTS:** The initial contact area (ICA) of the DRL was 84mm<sup>2</sup> and this reduced by 70%. The DRCO ICA was 121mm<sup>2</sup>, which decreased by only 30%. **DISCUSSION:** Stress relaxation of rotator cuff repairs causes loss of contact between the tendon and bone over time which may contribute to gap formation. There was significant greater contact area with the DRCO compared with DRL technique. Both techniques undergo significant stress-relaxation with the DRCO demonstrating significantly less relaxation (30%) in the first 5 minutes than the DRL repair (70%). This has significant clinical relevance; stress relaxation occurs, especially within the first 30 seconds. The repair should be checked before the suture is locked, which is possible when using the AutoCuff system.

Date : 2008-08-27

Session : Shoulder and elbow: reconstruction 2

Time : 1600-1730

Room: 605

Abstract number : 15953

**ARTHROSCOPIC REPAIR OF MASSIVE ROTATOR CUFF TEARS: CORRELATION OF FUNCTIONAL RESULTS WITH INTEGRITY OF THE CUFF IN A PROSPECTIVE, MRI CONTROLLED STUDY**

Dorian HAUKE<sup>1</sup>, Sven LICHTENBERG<sup>2</sup>, Dennis LIEM<sup>2</sup>, Petra MAGOSCH<sup>2</sup>, Peter HABERMEYER<sup>2</sup>

<sup>1</sup>University Hospital of Basel, Orthopaedic Department, Basel (SWITZERLAND), <sup>2</sup>ATOS-Clinic, Heidelberg (GERMANY)

**BACKGROUND:** Over the last decades there has been an impressive progress in the treatment of massive rotator cuff tears. The arthroscopic repair of rotator cuff tears from today shows good clinical results and a high patients' satisfaction. To our knowledge there were no studies, which have specifically assessed cuff integrity and their influence on the clinical outcome after arthroscopic repair of posterosuperior rotator cuff tears. **METHODS:** We evaluated twenty consecutive patients (average age 58.8 years) with massive posterosuperior rotator cuff tear. In all patients we performed an arthroscopic rotator cuff repair. After an average follow-up of 34.9 months, all patients were evaluated by a physical examination and a strength testing, which were graded to the Constant Score. Furthermore all patients underwent a standardized MRI-examination. Evaluation criteria was cuff integrity, the findings were correlated to the clinical result. **RESULTS:** The overall Constant Score improved significantly from preoperative 47.93 to postoperative 78.16 points after arthroscopic repair ( $p=0.001$ ). The retear rate was 40% (eight patients). In the retear group there were also a significant clinical improvement from pre- to postoperative ( $p=0.012$ ). Comparing the postoperative results of the intact and return tendon group there were no significant differences ( $p=0.09$ ). **CONCLUSION:** Arthroscopic repair of massive posterosuperior rotator cuff tears gives good clinical results and high patients' satisfaction. Our clinical results and retear rate are comparable to open or mini-open techniques. Therefore it can be recommended as a good treatment option for this entity.

**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 16047**

**MID-TERM CLINICAL EXPERIENCE OF A NEWLY DESIGNED SHOULDER HEMIPROSTHESIS**

Amitava Narayan MUKHERJEE

*Anandalok, Charnock and J N Roy Hospital, Kolkata (INDIA)*

The objective was to evaluate the clinicoradiological outcome of a newly designed shoulder hemiprosthetic replacement for fracture/fracture-dislocations or pathology of proximal humerus. 51 patients were selected for study of which 45 had 3 or 4 part fracture/fracture dislocations, 3 head split fracture and 3 cases of GCT of proximal humerus. Most patients were elderly with mean age 54.3 years comprising 21 male and 30 female, sidewise right 28 and left 23. A newly designed, patented shoulder hemiprosthesi (212115, India) for Asian patients was used for replacement hemiarthroplasty with cement fixation in 46 and uncemented in 5 patients. Myoosseous anchorages were restored with S.S. wire and sutures using its lateral and medial offset with or without bone grafts for osseointegration. Cases were evaluated from August 2001 to November 2007 with mean follow-up period of 5.6 years. Clinical evaluation was done on the basis of pain, stability, range of motions, functional outcome/ADLS of the replaced shoulder and patient satisfaction. Static and dynamic roentgenogram was also performed. 46 cases regained painless average 95 degree abduction, with patient satisfaction of 92.3% functional activity. Unsatisfactory functions were due to muscle weakness in rheumatoid arthritis and wide excision of GCT of humeral head. In complications, Extrusion of prosthetic stem, radiolucency around uncemented stem, superior migration of greater tuberosity and subluxation/dislocation each occurred in one case. This newly designed shoulder hemiprosthesi may be a viable option for replacement in fracture/fracture-dislocation/pathologies of proximal humerus for the Asian patients.

Date : 2008-08-27

Session : Shoulder and elbow: reconstruction 2

Time : 1600-1730

Room: 605

Abstract number : 17257

**BIOMECHANICAL BASIS FOR POSTOPERATIVE REHABILITATION FOLLOWING ROTATOR CUFF REPAIR: SINGLE VS. DOUBLE LAYER**

Mark HABER<sup>1</sup>, David BELL<sup>2</sup>, William WALSH<sup>2</sup>, Daniel BIGGS<sup>3</sup>

<sup>1</sup>University of Wollongong, Graduate School of Medicine, Wollongong (AUSTRALIA), <sup>2</sup>Surgical & Orthopaedic Research Laboratories, University of New South Wales, Sydney (AUSTRALIA), <sup>3</sup>Central West Orthopaedics & Sports Injuries, Blacktown (AUSTRALIA)

INTRODUCTION: Failures of rotator cuff repairs have been attributed in part to inappropriate postoperative rehabilitation (POR). Despite this, there is very little research on which to base modern protocols. We used an electronic pressure sensor to look at tendon-to-bone contact properties following RCR in a cadaver when the arm is moved, simulating early POR following surgery. MATERIALS AND METHODS: Single row repairs (SRR), followed by double row repairs using a novel technique (PerfectPrint) were performed in supraspinatus tendons of six fresh cadaveric human shoulders using the Opus Magnum system. A Tekscan was placed between the supraspinatus tendon and bone. The arm was then taken through a range-of-motion from 0-90 degrees abduction. The contact areas at 0.45 and 90 degrees were recorded. RESULTS: There was a 63% decrease in contact area from 0-90 degrees following the SRR. There was no significant difference in mean contact area with the PerfectPrint technique. DISCUSSION: Sound tendon-to-bone contact following RCR during the healing phase is thought to be vital. The extent of the tear and the means of repair require a flexible POR. We showed a 63% decrease in contact area with SRR when the arm is abducted to 90 degrees, compared to the PerfectPrint repair which remains unaltered. This is an important consideration when determining POR following RCR. This finding justifies the need for a very conservative rehabilitation, discouraging passive abduction with SRR until some healing has occurred. On the other hand, using PerfectPrint technique, it appears safe to commence early passive motion.

Date : 2008-08-27  
Session : Shoulder and elbow: reconstruction 1  
Time : 1600-1730  
Room: 605

Abstract number : 17543

**OPTIMUM SETTINGS TO ACHIEVE RADIOFREQUENCY STABILIZATION OF ARTHROSCOPIC KNOTS. RADIOFREQUENCY HEAT VS LOW TEMPERATURE COBLATION. NOT ALL DEVICES ARE THE SAME**

Mark HABER<sup>1</sup>, Stephen VAN DUIN<sup>2</sup>, Eran DOLEV<sup>3</sup>, Daniel BIGGS<sup>4</sup>

<sup>1</sup>University of Wollongong, Wollongong (AUSTRALIA), <sup>2</sup>Faculty of Engineering, University of Wollongong, Wollongong (AUSTRALIA),

<sup>3</sup>Southern Orthopaedics, Wollongong (AUSTRALIA), <sup>4</sup>Central West Orthopaedics & Sports Injuries, Sydney (AUSTRALIA)

INTRODUCTION: Knot slippage in arthroscopic surgery continues to be a major concern. Newer sutures while demonstrating improved strength has a greater tendency to slip compared to Ethibond. Williams et al. have recently presented "heat treatment of arthroscopic knots" utilizing Radiofrequency (RF) demonstrating improved knot security. This study attempts to expand on this concept using the ArthroCare Coblation system. MATERIALS AND METHODS: Arthroscopic knots were subjected to 3 different time intervals, 2, 5 or 10 seconds of RF using the ArthroCare system. The loops were tested using Instron Tensometer. Each loop was subjected to 10N preload before cyclically loading between 10 and 45 N for 200 cycles. Maximum elongation was then measured. 2 groups of 6 samples were utilized, 1) Orthocord tied using a locking SMC knots. 2) Magnum Wire tied using a sliding Nicky's knot. RESULTS: Failure with defined as >3mm of slippage. Of the SMC knots, one sample (5 seconds RF) showed early slippage which stabilized. Of the Nicky's knots, all failed. However the ones exposed to longer periods of RF slipped less. DISCUSSION: Stabilization of the knot depends on thermal energy. We failed to achieve the predicted results because Heat, not coblation, is required to stabilize the knots. Coblation RF energy is designed to achieve low temperature plasma to remove tissue. Ironically, the higher the voltage is, the lower the temperature. Further studies are currently underway to explore the optimum settings to obtain thermal damage to the suture to stabilize the knot.

**Date : 2008-08-27**

**Session : Shoulder and elbow: reconstruction 2**

**Time : 1600-1730**

**Room: 605**

**Abstract number : 17722**

**OUR EXPERIENCE IN TREATMENT OF MULTIFRAGMENTAL FRACTURES OF THE ADULT DISTAL HUMERUS**

M. GERASIMENKO<sup>1</sup>, N. GIHAR<sup>2</sup>, V. GURKO<sup>2</sup>

<sup>1</sup>Belarussian State Medical University, Minsk (BELARUS), <sup>2</sup>Minsk Clinical Hospital #6, Minsk (BELARUS)

We performed 62 operations in 62 patients from 2001 till 2007 on distal end of humerus in cases of multifragmental fractures (AO classification type C1, C2, C3). Left elbow - 27, right - 35. The age of patients was from 18 to 83 (middle 43.5). According to usual method with osteotomy of olecranon were performed 39 operations, with osteotomy of olecranon with mobilization and decompression - 20, according to original modification (without osteotomy of olecranon through the longitudinal approach with mobilization and decompression - 3). Follow-up results were observed in all patients from 4 months to 6 years. Good results were achieved in 47 cases (76%), satisfactory - 12 (19%), bad - 3 (5%).



**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 1**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 17930**

**ROLE OF MRI ARTHROGRAM IN SHOULDER SLAP LESION MANAGEMENT**

Kiran Kumar SINGISETTI, Deepu BHASKAR  
*Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM)*

MRI arthrogram of shoulder is a routinely done investigation to evaluate and plan the management of SLAP (superior labrum anterior and posterior) lesions. But the only definite way to diagnose it is an open or arthroscopic procedure. MRI arthrogram of shoulder was performed at our hospital in 54 patients with clinically suspected SLAP lesions over a period of 20 months and reported by a single experienced radiologist. SLAP was reported to be present in 12 cases. SLAP was reported not to be present in 42 patients. Shoulder arthroscopy was performed by a single surgeon in 18 patients (out of the 54) who were willing to undergo an operative intervention, with 10 cases of SLAP lesion being diagnosed and repaired while no SLAP was identified in the rest 8 cases. The positive predictive value of MRI arthrogram was 100%, negative predictive value was 57.14%, sensitivity was 40% and specificity was 100%. Thus we conclude that MRI arthrogram of shoulder should be used judiciously only in certain situations where an appropriate clinical diagnosis cannot be reached and not as a routine before shoulder arthroscopy. It is further important to understand the rationale and limitations of the MRI arthrogram in such situations as it involves injection of a contrast and has cost implications.

Date : 2008-08-27

Session : Shoulder and elbow: reconstruction 1

Time : 1600-1730

Room: 605

Abstract number : 18035

**SHARING EXPERIENCES OF MANAGING RADIAL HEAD FRACTURES WITH ARTHROPLASTY**

Jagan Mohana Reddy VELPULA<sup>1</sup>, A. LATIF<sup>1</sup>, M. WASEEM<sup>1</sup>, L. SANZ<sup>1</sup>, Akshay MALHOTRA<sup>2</sup>

<sup>1</sup>Macclesfield hospitals, Macclesfield (UNITED KINGDOM), <sup>2</sup>Dewsbury and District General Hospital, Dewsbury (UNITED KINGDOM)

Radial head arthroplasty is commonly indicated for comminuted radial head fractures that cannot be managed by fixation. We treated 18 patients who had post-traumatic radial head fractures with prosthetic radial head replacement. The prosthesis used was modular bipolar. Approaches used - the standard lateral (Kocher) and the Wrightington approach. We achieved similar results with both approaches. Mobilisation was commenced on the first postoperative day. Follow-ups were arranged at 6 weeks, 3 months, 6 months and 12 months. Thereafter yearly follow-ups were arranged. Both clinical and radiological follow-ups were done. RESULTS: Mean follow-up time was 16 months, average flexion achieved was 130 degrees, supination and pronation was 80 degrees. No valgus or varus instability noted on examination. Mean mayo elbow performance score was 92. Average visual analogue score was 9 out of 10. Radiological follow-up showed no implant migration, subluxation of distal radio ulnar joint or loosening of prosthesis. DISCUSSION: Our early results are encouraging, indicating that radial head fractures can be treated with prosthetic replacement with good functional outcome and high patient satisfaction.

**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 18062**

**AN ACCURATE DESCRIPTION OF THE KINEMATICS IN NORMAL AND TRAUMATICALLY UNSTABLE SHOULDERS**

Kris DAZELL, Khalid MOHAMMED, Andrew BROOKSBANK  
*Department of Orthopaedics, Hamilton (NEW ZEALAND)*

We recorded data with a Polhemus magnetic tracking device (Kaiser Aerospace and Electronics Co., Vermont). Receivers were taped on landmarks over the sternum, scapula and humerus. Movements studied in normal shoulders were sagittal plane elevation and abduction in the plane of the scapula. 52 shoulders were studied in males aged 20-30 years with no previous shoulder instability. The ratio of glenohumeral to scapulothoracic (GH/ST) movement was established. Dynamic repositioning was measured in the group (six patients) with unilateral traumatic instability. Repositioning was measured during five movements: forward elevation (FEL), external rotation with the arm by the side (ERS), external and internal rotation with arm at ninety degrees abduction (ERN, IRN) and crossbody abduction (CBA). Measurements were made at both midrange and close to end range. The subjects' unaffected shoulder served as a comparison. Scapulothoracic and glenohumeral joints contribute to shoulder movement throughout the ranges studied. During Abduction and adduction the ratio of GH/ST increases from 1:1 during the first few degrees of movement to 3.5:1 at the end of range in an approximately linear fashion. Flexion and extension ratios produce slightly less steep curves and a mean ratio of 2-3:1 throughout the range. Reproducibility analysis reveals small variance from the mean. Repositioning errors were found to occur on the affected side at end range during CBA, ERS, ERN, IRN and mid range FEL. We have developed an accurate method to examine shoulder kinematics. Subjects without traumatic shoulder instability demonstrate a comparable characteristic shoulder kinematics.

**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 18064**

**LONG-TERM RESULTS OF THE BANKART OPERATION: REVIEW OF 50 CASES WITH MEAN 26-YEAR FOLLOW-UP**

Alain DURANDEAU

*CHR Pellegrin, Bordeaux cedex (FRANCE)*

**PURPOSE OF THE STUDY:** The purpose was to assess at more than twenty years follow-up, the results achieved with the Bankart operation. **MATERIAL AND METHODS:** This retrospective analysis reviewed clinically and radiographically patients who underwent shoulder surgery for instability between 1971 and 1986. The clinical assessment used the Duplay and Rowe scores. The Pietro and Samilson radiographic score (four stages) was noted. **RESULTS:** Mean follow-up was 26 years for 49 patients (50 shoulders). There were 3 women and 46 men, mean age 25 years at surgery. Eighty percent practiced a contact sport. The time from the first dislocation to surgery was four years on average. The rate of recurrence was 16%. All recurrences were provoked by a violent accident. 94% of patients returned to sports activities. 80% at the same level; 86% of patients were satisfied. Mean Duplay and Rowe scores were 81.3 and 82.2 respectively. Average deficiency of external rotation was 9°. Normal radiographs were noted for 13 shoulders (26%). The Prieto and Samilson classification was: stage I (n=18), stage II (n=5), stage III (N=5) and stage IV (n=1). **DISCUSSION:** In this cohort with 80% competition sports athletes and 94% return to sports activities after surgery, the Bankart operation demonstrated its efficacy for contact sports. The rate of osteoarthritis after this operation is comparable with that observed with other types of bone blocks, but the follow-up here was twice as long. The deficit in external rotation was not greater.

**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 18156**

**BRACHIAL PLEXUS INJURIES - DIAGNOSIS, TREATMENT AND NEUROTIZATION**

Harilaos SAKELLARIDES

*Boston University School of Medicine, Boston, MA (UNITED STATES)*

PURPOSE: To demonstrate that brachial plexus injuries, if treated properly, can give satisfactory results. METHODS: Of 45 patients, 40 involved the C5-C6 nerve roots, three involved the C5-C6-C7, and two cases with total paralysis. All patients had exploration of the brachial plexus with insertion of nerve grafting from the nerve roots to the peripheral nerves. Two patients had neurotization, namely using five intercostal nerves, and through nerve grafting neurotization was performed. SUMMARY: Excellent 25%; Good 48%; Fair 37%. CONCLUSION: If the operation is not delayed for more than three months, a very devastating condition can be markedly improved.

**Date : 2008-08-27**

**Session : Shoulder and elbow: reconstruction 2**

**Time : 1600-1730**

**Room: 605**

**Abstract number : 18195**

**RECONSTRUCTION OF POSTEROLATERAL INSTABILITY OF THE ELBOW WITH FCR GRAFT - A PROSPECTIVE STUDY**

Jagan Mohana Reddy VELPULA, A. MALHOTRA, L. SANZ, M. MADHU, J. SINGH, A. LATIF, M. WASEEM  
*Macclesfield District General Hospital, Macclesfield (UNITED KINGDOM)*

We are presenting early results repair of posterolateral instability of elbow using flexor carpi radialis as an autograft. **BACKGROUND:** Posterolateral instability is caused by insufficiency of the lateral collateral ligament complex. Various methods and techniques have been described in the literature. One of which is reconstruction. A variety of grafts can be used for reconstruction ranging from autograft to synthetic graft. Literature review has shown good results with autograft. Palmaris longus, Tendo Achilles, Plantaris, Extensor carpi ulnars and Semitendinosus are some of the described autografts used. In our study we have used flexor carpi radialis autograft for reconstruction. **METHODS AND PATIENTS:** In our study we managed 14 patients with clinically posterolateral instability of the elbow, all due to trauma. All patients were investigated with MRI scan. We have managed with the above technique. Post of special from brace was given, allowing limited mobilisation between 60-90 degrees, for six weeks. Lateral protective mobilisation for next 6 weeks. Regular follow-up at 2/52, 6 /52, 12/52, 6 months and 12 months. Average follow-up was 9 months. All patients are back to there occupation, vas 9/10, high patients satisfaction, mean post operative mayo score was 90. Our early results are encouraging, FCR autograft will give good reconstruction, high patients satisfaction, back to there occupation.

**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 18212**

**MODULAR TUMOUR PROSTHESES FOR RECONSTRUCTION OF BONY DEFECTS OF THE HUMERUS IN ELBOW ARTHRITIS**

Philipp FUNOVICS, Reini SCHUH, Jochen HOFSTAETTER, Martin DOMINKUS, Rainer KOTZ  
*Medical University of Vienna Department of Orthopaedics, Vienna (AUSTRIA)*

**BACKGROUND:** Post-traumatic, septic and degenerative changes of the elbow can cause defects of the distal humerus, requiring complex reconstruction, for which standard implants may be insufficient. **PATIENTS:** Since June 1992, 13 patients were treated by use of a modular tumour prosthesis of the elbow for other than oncological conditions. Defects of the distal humerus were caused by pseudarthrosis (6), failed prosthesis (4), trauma (2) and osteomyelitis (1) in 4 men and 9 women with an average age of 56.0 years (30.8-78.3). Average follow-up was 32.4 months (1.0-187.8). **RESULTS:** 6 patients showed satisfactory healing. There were 2 cases of infection: one in a patient with prosthetic infection in his history, requiring removal of the prostheses leaving a flail-joint. The other was successfully treated by one-stage revision. 2 patients underwent a cemented refixation of the prosthetic stem after additional traumatic periprosthetic fracture. Aseptic loosening was observed in 3 patients due to osteoporotic bone structure (2) and radio-ulnar synostosis (1) and required revision with change of the cementless stem to a cemented fixation. There were no persisting neural deficits. The functional results at latest follow-up showed an average Inglis/Pellici Score of 76.3 (54.0-91.0) with 3 excellent, 4 good, 1 fair, 3 poor results and 1 failure. The average Morrey Score was 80.8 (45.0-100.0). **CONCLUSION:** Endoprosthetic replacement of the distal humerus provides a less complex alternative in the treatment of failed operative procedures around the elbow with satisfactory functional results.

**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 18305**

**FIRST RESULTS USING NEW TYPE OF GLENOSPHERE IN REVERSE SHOULDER ARTHROPLASTY**

Hans Rudolf BLOCH, Adriana GHIDELLI

*Ars Ortopedica, Ars Medica Clinic, Gravesano - Lugano (SWITZERLAND)*

**BACKGROUND:** One possibility for the surgical treatment of disabling shoulder arthropathy where anatomical total shoulder arthroplasty is limited is Reverse Total Shoulder Arthroplasty. First evaluation in our own patients so as in the whole literature by short and midterm results of arthroplasty with the use of reverse prosthesis confirmed new, unusual complications (notching), not known by previous conventional shoulder arthroplasty. Clinical outcome is analysed evaluating short-term results with new type of glenosphere. **METHODS:** 117 patients (2005 and 2006) undergoing surgery were investigated retrospectively (clinical exam, X-ray, shoulder score); we report the result after Reverse Shoulder Arthroplasty with the 36mm concentric glenosphere in comparison with the 36mm eccentric and the 44mm glenosphere in short-term outcome (average follow-up 14 months). **RESULTS:** From the 36mm concentric group, 36% showed in the follow-up radiological changes with bony erosion on the scapular neck, corresponding to inferior scapula notching. Compared with the 36mm eccentric and the 44mm glenosphere group in patients with equal diagnosis they produced lower results in the outcome findings. **CONCLUSIONS:** We attribute better clinical outcome in the first short-term results after Reverse Shoulder Arthroplasty to the lowering of the centre of rotation preserving the good bone stock in the middle of the glenoid for fixation of the glenoid component, eviting inferior notching by the 36mm eccentric glenosphere and the enlargement of the glenosphere 44mm. Major mobility, joint stability and patient's satisfaction is documented.



**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 18316**

**IS IT THE STEROID OR THE PRESERVATIVE PART OF THE DRUG THAT IS RESPONSIBLE FOR STEROID FLARE FOLLOWING PERIARTICULAR INJECTION THERAPY?**

Philip BRADY, Daragh HYNES  
*Cappagh National Orthopaedic Hospital, Dublin (IRELAND)*

This was a prospective double-blind randomised controlled study. The objective of this study was to determine the cause of post-injection pain after periarticular steroid injection. Approval for this study was granted by the hospital's Ethics Committee. Selection criteria included all patients undergoing a periarticular injection therapy of the shoulder under the care of the senior author. Patients who elected to be in this study gave their consent following a detailed explanation of the study and provision of a patient information leaflet. The enrolled patients were randomised into one of two groups. Group A received a standard triamcinolone acetonide injection mixed with bupivacaine. Group B patients received triamcinolone acetonide without the preservative part of the drug and bupivacaine. Both the patient and surgeon were unaware which group the patient was selected to be in. Patients' scores were recorded using visual analogue scales and pain severity scores prior to injection and 4 days following injection. Inflammatory signs were also recorded at 4 days post-procedure. A total of 52 patients were enrolled. Pain scores reduced by 46% in group A and 43% in group B. Inflammatory signs occurred in 26% less cases when group B was compared with group A, however this was not statistically significant.

**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 1**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 18382**  
**MISSED TRICEPS TENDON AVULSION INJURIES**  
Vikas SHARMA  
*Lincoln County Hospital, Lincoln (UNITED KINGDOM)*

The study demonstrates the radiological findings in 5 cases where complete avulsion of the Triceps tendon was missed at the initial presentation in A&E. Between November 2005 and August 2006, 5 patients were seen in fracture clinic who were referred from A&E with a diagnosis of avulsion fracture at the tip of Olecranon. An above elbow back slab with elbow in 90 degrees of flexion was applied in A&E. No mention of Triceps tendon injury was made in A&E notes. Examination of these patients in fracture clinic revealed palpable gap just proximal to the tip of Olecranon and absent active extension of elbow against gravity. Surgical exploration was carried out in all patients with a working diagnosis of avulsion of Triceps tendon from the tip of Olecranon. All cases showed a complete avulsion of Triceps tendon on exploration. The repair was carried out using anchoring intra-osseous sutures. Preop pictures of the operative findings were obtained in one case. The elbow was immobilised in an above elbow cast for 6 weeks in all the cases. All patients were followed up for 6 months following surgery. Full pain-free range of movement with normal elbow function was noted at the final follow-up in all patients. The study illustrates that the avulsion fracture at the tip of Olecranon is a pathognomic feature of complete Triceps tendon avulsion injury. An early diagnosis and surgical repair leads to normal return of function.

**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 18534**

**CAN LATISSIMUS DORSI TRANSFER COMBINED WITH REVERSE SHOULDER ARTHROPLASTY AS A ONE STEP PROCEDURE IMPROVE EXTERNAL ROTATION?**

Michael GOEBEL, Ludwig SEEBAUER

*Zentrum für Orthopädie, Unfallchirurgie und Sportmedizin, München (GERMANY)*

**AIM:** In patients with cuff tear arthropathy and pseudoparalysis reverse shoulder arthroplasty can reliably restore active abduction and flexion of the shoulder, unlike to active external rotation. However, Latissimus dorsi Transfer in posterior-superior massive rotator cuff tears is considered as reliable procedure to restore active external rotation. Can both treatments as a one step procedure in cuff tear arthropathy improve active external rotation compared to solitary reverse shoulder arthroplasty? **METHODS:** 10 shoulders in 10 patients with pseudoparalysis of the shoulder and positive Hornblower and ER lag sign were treated between 1/07 and 8/07 in a single step surgery with reverse arthroplasty latest generation and modified Latissimus dorsi Transfer in L'Episcopo technique. All patients showed fatty infiltration of Infraspinatus and Teres minor grade II or greater in preoperative MRIs and were seen clinically (Constant Murley Score, VAS, Simple Shoulder Test) and radiologically (true ap, y-view, axial) preoperative and 6 weeks, 6 months and 12 months postoperative. **RESULTS:** At latest follow-up (average follow-up 12 months) active flexion, abduction and strength in Constant Score improved significantly. Active external rotation was improved as well, but not significantly. SST and pain release according to VAS could be improved considerably. **CONCLUSION:** In cases of cuff tear arthropathy with pseudoparalysis of the arm and accompanying external rotation lag signs the single step procedure of reversed arthroplasty and modified Latissimus dorsi Transfer can improve external rotation compared to solitary reverse arthroplasty leading to a better functional result after 12-month follow-up.

**Date : 2008-08-27**

**Session : Shoulder and elbow: reconstruction 1**

**Time : 1600-1730**

**Room: 605**

**Abstract number : 18568**

**THE ELBOW DISLOCATION**

Karim EL HACHIMI, Fayçal BENNANI, Mohamed MOUJTAHID, Mohamed OUARAB

*Service de traumatologie et d'orthopedie, aile 4 , CHU Ibn Rochd, Casablanca (MOROCCO)*

The elbow joint is superficial and mobile thanks to a complex anatomical and biomechanical structure. The purpose of this study is to make our contribution to the debate on the biomechanics of dislocations of the elbow based on a recent literature review and thereafter respond to a variety of questions: which treatment?, time of immobilisation?, time of re-education?, by comparing our results to the literature. Our work consists of a retrospective study of 45 dislocations elbow collected between 2000 and 2006 in our department. Our patients are 34 men and 11 women, whose average age is 27 years. Our series is comparable to the other concerning frequency among young men in a fall, or in a sport accident, the posterior dislocation is the most frequent. The non surgical reduction was done in all cases. All of our patients have benefited from a plaster cast immobilisation for a period of 2 to 3 weeks, and an early mobilisation was then started.

**Date : 2008-08-27**  
**Session : Shoulder and elbow: reconstruction 2**  
**Time : 1600-1730**  
**Room: 605**

**Abstract number : 19088**

**OUTCOME ANALYSIS OF MUSCLE TRANSFER FOR SHOULDER RECONSTRUCTION IN OBPP &#65533; ANALYSIS OF 150 CASES IN 10 YRS**

Rujuta MEHTA, Mukund THATTE  
*Bai Jerbai Wadia Hospital for Children, Mumbai (INDIA)*

We performed 150 muscle transfers for shoulder reconstruction in 150 OBPP sequelae, studied prospectively since 1999. Group 1 includes late presentations 90 cases (60%). Groups 2 -60 cases (40%) includes children with primary nerve surgery (neurolysis / nerve reconstruction / nerve transfers) or were followed up since infancy. Analysis also includes upper plexus (73 cases) and mixed lesions with predominantly upper plexus component of post ganglionic nature (58 cases). 19 cases presented with a mixed pre-ganglionic nature of which 12 had the advantage of primary nerve resection anastomosis. RESULTS: Mallet Scores were used for outcome evaluation. 82 cases (54.66%) had excellent Mallet scores for abduction and external rotation, while 39 cases (26%) had excellent Mallet scores for shoulder abduction but poor scores for external rotation. Additional surgery in the form of internal contracture release and derotation osteotomy was required in 23 cases (15.33%) . 7 cases required release of internal rotation contracture release with transfer for abduction only. Gleno-humeral deformity has been studied only in 17 cases hence this aspect is not included. CONCLUSION: Isolated muscle transfer shows good results for shoulder abduction (80.66%), but requires additional surgery to restore external rotation of shoulder in severe and late cases. KEYWORDS: Shoulder Muscle Transfer, Sequelae OBPP, Outcome

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 1: Basic Science

Time : 0900-1215

Room: 606-607

Abstract number : 17010

**PODOGRAM AND FOOT BIMALLEOLAR ANGLE IN THE EVALUATION OF CLUBFOOT**

Anil JAIN<sup>1</sup>, sudhir KUMAR<sup>2</sup>, Zulfiqar AM<sup>3</sup>

<sup>1</sup>University College of Medical Sciences, New Delhi (INDIA), <sup>2</sup>University College of Medical Sciences, New Delhi (INDIA), <sup>3</sup>University College of Medical Sciences, New Delhi (INDIA)

The objectivity of Podogram in clubfoot is lacking. We calculated foot bimalleolar (FBM) angle on podogram in normal infants and correlated with CTEV. Foot tracings with level of both malleoli of 182 feet (91 normal infants) were recorded. The anteromedial angle between the long axis of foot and the bimalleolar plane is the FBM angle. The FBM angle in normal infants was 82.50. Eighty-four CTEV (51 patients) were clinically classified as grade I (n=5; FBM angle; 73.20). Grade II (n=21 feet; FBM angle, 66.60), and grade III (n=58; FBM angle, 54.70). 31 feet (22 patients) prospectively followed after conservative (n=17; grade I, three feet; grade II, three; grade III, n=11) and surgical release all grade III, 14 feet). All feet with grade I and grade II and 44% (11 feet) with grade III deformity were amenable to gentle graduated manipulations and cast application, whereas 56% (14 feet) with grade III deformity underwent soft tissue release. After nonsurgical treatment, the mean FBM angle was 82.30. Of surgically treated feet, those with excellent (11 feet) and good correction (3 feet) had a mean FBM angle of 79.90 and 74.30, respectively. The clinical severity of foot deformity and treatment outcome correlated well with the FBM angle. Foot tracing with the FBM angle is a simple, objective, and reproducible clinical criterion to classify the severity of foot deformity and evaluate the outcome. It's correlation with Pirani score is underway.

**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 1: Basic Science**

**Time : 0900-1215**

**Room: 606-607**

**Abstract number : 17651**

**A PROSPECTIVE EPIDEMIOLOGICAL STUDY OF CONGENITAL TALIPES EQUINOVARUS**

Wahab YINUSA, Jerry GRANGE, O.O ODUNUBI

*National Orthopaedic Hospital, Lagos (NIGERIA)*

**INTRODUCTION:** Several studies have documented the epidemiological features of congenital clubfoot. In most of these studies, it is difficult to determine whether the talipes equinovarus was primary or secondary to some other conditions. Besides, the number of patients might be too small to make valid conclusion. **AIM:** The aim of this study is to present the distribution of various parameters associated with Congenital Talipes Equinovarus (CTEV). **METHODOLOGY:** In the Clubfoot Clinic of the National Orthopaedic Hospital, Igbobi, Lagos all congenital extremity musculoskeletal malformations are being seen on a weekly basis since 1979. A proforma was designed to record relevant history and the physical findings at presentation. **RESULTS:** 2,895 cases of congenital extremity malformations were seen between April 1979 and March 2004; 2,415 (83%) of which were CTEV. There were 1,516 males and 899 females giving a M:F ratio of 1.7:1.0. The deformity affected the right side in 730 cases, the left side in 595 cases while it is bilateral in 1,086 (45%) cases. The mean maternal and paternal ages were 28.3 yr and 37.2 yr respectively. Family history, observed in 155 (6.5%) cases, suggests a polygenic mode of inheritance. Associated peripheral deformities were present in 3.5% of cases, the commonest being overriding of the digits and constriction band. **CONCLUSION:** This study shows that CTEV is the commonest congenital musculoskeletal malformation in Nigeria. It confirms the often reported male sex and right side preponderance in CTEV.

**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 1: Basic Science**

**Time : 0900-1215**

**Room: 606-607**

**Abstract number : 18702**

**ULTRASOUND ASSESSMENT OF CLUBFOOT IN INFANTS**

Guy GRIMARD, Marie-Claude MIRON, Benoit MORIN, Marie-Andrée CANTIN, Morris DUHAIME

*Hopital Sainte-Justine, Montreal (CANADA)*

**PURPOSE:** Clubfoot is a relatively common musculoskeletal disorder. It is characterised by equinus and varus of the hindfoot, adduction of the forefoot, supinatus plus or less cavus. The purpose of this study was to establish the usefulness of US in clinical practice. To determine the value of the different US items analysed and to compare the talo-calcaneal angle measured by US and plain films. **MATERIAL AND METHODS:** Using a linear high frequency transducer, the US was performed along medial, dorsal, posterior and lateral borders of the foot. The talo-navicular relationship was established and quantified from medial and dorsal approaches. Measurement of the distance between the navicular and the medial malleolus was evaluated. The talo-calcaneal divergence was assessed in order to correlate with angle obtained on plain films. The tibio-talo-calcaneal axis in dorsiflexion of the foot was evaluated by a posterior approach. The relationship between the cuboid and the calcaneus was established and quantified with examination of the lateral border of the foot. **RESULTS:** 110 patients with idiopathic clubfoot were assessed by US (73% male; mean age at first exam 11.5 weeks; 66% bilateral involvement). Patients with neuro-muscular disorders or other syndromes were excluded. Morphological changes of the talo-navicular joint, the distance between the medial malleolus and the navicular, and the talo-calcaneal relationship are good indicators of the clinical severity. There is good agreement between US and plain films measurement of the talo-calcaneal angle. **CONCLUSION:** US is an effective technique to assess and quantify the deformity in clubfoot.



Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 1: Basic Science

Time : 0900-1215

Room: 606-607

Abstract number : 19219

**ARE TALIPES EQUINOVARUS AND CONGENITAL FIBULAR DYSPLASIA DIFFERENT MANIFESTATIONS OF ABERRENT VASCULOGENESIS?**

David R. HOOTNICK<sup>1</sup>, Matthew DOBBS<sup>2</sup>, Russell J. CRIDER<sup>3</sup>

<sup>1</sup>The State University of New York, New York (UNITED STATES), <sup>2</sup>Washington University School of Medicine, Saint Louis (UNITED STATES), <sup>3</sup>New York University School of Medicine, New York (UNITED STATES)

**OBJECTIVE:** Recorded anomalies of the anterior tibial artery (ATA) are found in approximately 5-7% in otherwise normal adult limbs, in 89% of preoperative clubfeet (TEV) (n=63/71), and in 100% of limbs with congenital fibular dysplasia (CFD) (n=3). TEV and CFD occur independently with a frequency of approximately 1/1000 births. The expected association of these two independent deformities should be 0.001/1000. The incidence of TEV in limbs with CFD appears at a rate of about 150/1000. This paper is an attempt to reconcile the disparity between the expected and actual frequencies of limbs with CFD and TEV and explicate their mutually associated arterial anomalies. **METHODS:** We reviewed the results of arteriography of our index patient with CFD and TEV and compared the findings of that study (JBJS 1980) with a report of five limbs with CFD and TEV studies via MR arteriography (MRA). **FINDINGS:** Our index patient exhibited not only absence of the ATA but also preservation of four persistent primitive arteries: the embryonic interosseous (axis), tibial posterior superficialis, peronea posterior superficialis and ramus communicans inferior arteries. The MRA study of five limbs with CFD and TEV reported absence of the ATA in two of the five limbs with no radiographic images. **CONCLUSIONS:** Arteriography is second only to dissection in obtaining a correct interpretation of aberrant, primitive arteries, which require a precise anatomic identification not currently available with MRA in CFD. TEV is part of a spectrum of congenitally dysplastic lower limbs with persistent aberrant vasculogenesis. Any insult to the six-week embryonic limb bud during rapid vasculogenesis and osteogenesis provides a commonality among the development of TEV, CFD, and the aforementioned arteries. Therefore, these morphologically disparate clinical entities may all be different manifestations of the same processes. **Level of Evidence:** Retrospective level III study.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 1: Basic Science

Time : 0900-1215

Room: 606-607

Abstract number : 19220

**POLYGENIC THRESHOLD MODEL WITH GENDER DIMORPHISM IN CLUBFOOT INHERITANCE: THE CARTER EFFECT**

Matthew DOBBS, Lisa M. KRUSEL, Christina GURNETT

*Washington University School of Medicine, Saint Louis (UNITED STATES)*

**PURPOSE:** Idiopathic clubfoot is approximately twice as common in males as in females. The reason for this gender discrepancy is unclear but may represent an inherent difference in the susceptibility to the deformity. If this difference is due to genetic factors, it is predicted that females with clubfoot would need to inherit a greater number of susceptibility genes than males. Females would also be more likely to transmit the disease to their children and have siblings with clubfoot. This phenomenon is known as the Carter effect, and the presence of such an effect supports a multifactorial threshold model of inheritance. **METHODS:** Ninety-seven multiplex families with greater than one individual with idiopathic clubfoot were studied. This included 1093 individuals: 291 with clubfoot, and 802 unaffected relatives. Transmission rates were calculated from the 37 affected fathers and 26 affected mothers, and incidence among siblings was determined in the nuclear families of affected persons. **RESULTS:** Within these multiplex families, the incidence of clubfoot was lowest in daughters of affected males (8/24), and highest in sons of affected mothers (11/13). Affected mothers transmitted clubfoot to 59% (19/32) of all children compared to affected fathers who transmitted idiopathic clubfoot to 37% (26/70) of all children ( $p=0.04$ ). Siblings of affected females also had a significantly higher incidence of clubfoot compared to siblings of an affected male: 46% (54/117) versus 34% (67/197) ( $p=0.03$ ). **CONCLUSIONS:** This study demonstrates the presence of the Carter effect in idiopathic clubfoot. This can be explained by a polygenic inheritance of clubfoot with a greater genetic load required for females to be affected.

**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 1: Basic Science**

**Time : 0900-1215**

**Room: 606-607**

**Abstract number : 19223**

**MOTOR PROBLEMS IN CHILDREN TREATED FOR IDIOPATHIC CLUBFOOT- A PILOT STUDY**

Hanneke ANDRIESSE, L. WESTBOM, G. HÄGGLUND

*Lund University Hospital, Lund (SWEDEN)*

**PURPOSE:** To study the prevalence of motor problems in children previously treated for idiopathic clubfoot. **METHODS:** Twenty children (mean age 7.5 years, SD 3.2 months) from a consecutively born cohort were assessed with both the Movement Assessment Battery for Children (MABC) and the Clubfoot Assessment Protocol (CAP). **RESULTS:** There was an increased prevalence of motor problems both regarding the total score for MABC ( $p < 0.05$ ) and for the subtest ABC-Ball skills ( $p < 0.05$ ). No relation was found between the child's orthopedic foot status and motor ability. The CAP item one-leg stand was the only single variable that correlated significantly with the MABC ( $r_s = 0.53, p = 0.02$ ). The extent of surgery was not related to MABC outcome. **CONCLUSION:** Children with idiopathic clubfoot appear to have an increased risk for motor impairments, that is not related to their foot status. We suggest that children with clubfoot and obvious problems with balance should be offered a thorough neurodevelopmental assessment in addition to their orthopedic follow-up.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 1: Basic Science

Time : 0900-1215

Room: 606-607

Abstract number : 19222

**MICROVASCULATURE IN CLUBFOOT TALI BASED ON MICRO-CT**

Gunther WINDISCH<sup>1</sup>, Friedrich ANDERHUBER<sup>1</sup>, Dietmar EXNER<sup>2</sup>, Ulrich GERHARD<sup>3</sup>, Verena HALDI-BRÄNDLE<sup>3</sup>

<sup>1</sup>Medical University Graz, Graz (AUSTRIA), <sup>2</sup>Upper Austria University of Applied Science, Graz (AUSTRIA), <sup>3</sup>Universitätsklinik Balgrist, Balgrist (SWITZERLAND)

**PURPOSE:** The aim of the study was to elucidate the microvasculature in clubfoot tali by the use of a 3D-Micro-Computed Tomography system. **MATERIAL:** Gross dissections on seven idiopathic clubfeet of fetuses aborted between the 25th and 37th week of gestation were carried out and compared to two normal feet (27th and 36th week of gestation). **METHODS:** The 3D-Micro-Computed Tomography system generated series of X-ray attenuation measurements, which were used to produce computed reconstructed 3D data sets of each of the separated bones. The 3D reconstruction showed precisely the course of the cartilage canals to the ossification center. **RESULTS:** The talar body, neck and head of the normal fetal foot was supplied by four to five main branches originating from the tarsal sinus and the tarsal canal. Tiny branches were also penetrating from the dorsal part of the neck and the posterior process of talus to reach the ossification center. In clubfoot tali the ossification center was only nourished by vessels entering the talus at the level of the posterior process. Vessels branching from the tarsal sinus, tarsal canal and even from the dorsal part of the neck were not found. **CONCLUSION:** The reduction of the vascularisation disturbs the normal development of the talus which leads to misshaped bones and cartilages.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 1: Basic Science

Time : 0900-1215

Room: 606-607

Abstract number : 19224

**REVIEW OF ISCHEMIC NECROSIS FOLLOWING CLUBFOOT SURGERY WITH CASE OF RETAINED PRIMITIVE ARTERIAL RETE**

David HOOTNICK<sup>1</sup>, Matthew DOBBS<sup>2</sup>, Russell J. CRIDER<sup>3</sup>

<sup>1</sup>The State University of New York, Liverpool (UNITED STATES), <sup>2</sup>Washington University School of Medicine, St Louis (UNITED STATES), <sup>3</sup>New York University School of Medicine, New York (UNITED STATES)

**OBJECTIVE/PURPOSE:** Ischemic necrosis following clubfoot surgery is a rare but catastrophic complication. Deficiencies of the anterior tibial (ATA) and dorsalis pedis arteries (DPA) appear to predispose some postoperative clubfeet to the risk of such necrosis. Impaired oxygen delivery was termed "The Purple Hallux Sign"; in our review of fourteen limbs in thirteen affected patients. Arteriography of a limb with a clubfoot deformity with postoperative necrosis, obtained prior to amputation, revealed a previously unknown arterial variation in another patient (#15). This case had led us to attempt to provide an estimate of the incidence of ischemic necrosis after clubfoot surgery and its relationship to aberrant vasculature. **METHOD:** Arteriographic evaluation of the affected thrice-operated limb of patient #15 was reviewed. Our previous cases had undergone surgery over a 30-year period out of an estimated cohort of 2000 operative clubfoot cases per year in the USA. **RESULTS:** Arteriography of the affected limb in patient #15 revealed preservation of the primitive arterial rete. **CONCLUSIONS:** Deficiency of the DPA in clubfeet that required surgery (54%), compared with those that did not (20%), suggests to us that an ATA/DPA deficiency may be more prevalent among clubfeet with more severe deformity. Further, this case finding suggests that limbs with more severe arterial dysplasia may be stiffer and more likely to fail conservative measures. The "atypical" TEV may manifest a higher incidence and severity of both arterial and bony dysplasia. Postoperative ischemic necrosis in clubfoot appears to occur infrequently (less than 1/1000). The risk of litigation after an event of ischemic necrosis is high. The risk of ischemic necrosis should not deter necessary surgical intervention after failure of more conservative measures. **Level of Evidence:** Retrospective level III study

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 1: Basic Science

Time : 0900-1215

Room: 606-607

Abstract number : 19225

**DO TALIPES EQUINOVARUS (TEV) AND CONGENITAL VERTICAL TALUS (CVT) HAVE A COMMON ETIOLOGY**

Russell CRIDER<sup>1</sup>, David HOOTNICK<sup>2</sup>, Matthew DOBBS<sup>3</sup>, Leonard Philip SEIMON<sup>4</sup>

<sup>1</sup>New York University School of Medicine, New York (UNITED STATES), <sup>2</sup>The State University of New York, New York (UNITED STATES), <sup>3</sup>Washington University School of Medicine, St Louis (UNITED STATES), <sup>4</sup>Montefiore Medical School, New York (UNITED STATES)

A comparison of the radiographic deformities seen in untreated idiopathic clubfoot (TEV) and congenital vertical talus (CVT) with the rocker bottom deformity (RBD) of over-vigorous non-operative treatment of TEV reveals several common radiological features. Prof. Wicart (2007) reviewed 36 feet in children with club feet who developed RBD after vigorous closed treatment. The calcaneo-tibial angle was 95 degrees prior to treatment, improving to only 87 degrees with further nonoperative treatment. Ritsila (1969) produced both TEV and CVT in newborn rabbits by inducing a severe equinus deformity by tethering the calcaneus posteriorly to the tibia, or by placing the feet in casts in severe equinus. TEV was produced by transecting the peroneal and the extensor digitorum tendons. CVT was created with the same calcaneal contracture plus the resection of the transverse crural ligament and /or the resection of the extensor digitorum longus and anterior tibial tendons. The equinus of the calcaneus was identical in both TEV and CVT. Thus the different forces that were applied to the foot distal to the mid-tarsal joints produced the TEV or CVT. In view of the arterial dysplasia in TEV (usually absence of the Anterior Tibial Artery) and as well as in CVT (usually absence of the Posterior Tibial Artery), arterial disruptions in utero are possibly contributory by causing prenatal tethering of the calcaneus in equinus and the induction of other muscle imbalances about the foot and ankle. In conclusion CVT in humans is most likely caused by an extreme equinus contracture of the calcaneus in utero (as is TEV), but have other forces acting to dorsiflex the forefoot and distal midfoot. These forces could be muscular in origin, or possibly other intrauterine forces that are mechanical in nature. The similarities between CVT and RBD indicate that they have similar etiologies.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 1: Basic Science

Time : 0900-1215

Room: 606-607

Abstract number : 19226

**CORRELATION OF RADIOGRAPHS TO PEDOBAROGRAPHS IN NONOPERATIVELY TREATED IDIOPATHIC CLUBFEET**

Lori KAROL, Joshua MEIER, Kelly JEANS

*Texas Scottish Rite Hosp. for Children, Dallas (UNITED STATES)*

PURPOSE: Determine if radiographic measures correlate with pedobarograph pressure in the assessment of non-operatively treated clubfeet. METHODS: 156 idiopathic clubfeet treated by French physical therapy program (n=72) or Ponseti casting (n=84) without surgery were included. Standing lateral foot radiographs were obtained 18 months of age. Gait analysis, including pedobarograph pressure mapping, was performed at 2 yrs of age. The tibio-calcaneal angle was measured (normal=70-90 degrees). Higher values represented equinus. The talo-calcaneal angle was also measured (normal = 40 degrees). Lower values represent hindfoot varus. Each patient underwent gait analysis, and kinematics were obtained using the Vicon system. Sagittal plane ankle kinematics were analyzed and equinus and calcaneus patterns identified. Pedobarographs were obtained with the Emed system. Pearson correlation coefficients were calculated to compare pedobarographic and radiographic measurements. RESULTS: The relationship between an increased lateral talo-calcaneal angle, signifying hindfoot valgus, and increased mean force in the medial midfoot revealed a correlation coefficient of  $r=0.07$  ( $p=0.34$ ), i.e. there was poor correlation. A very good correlation was found between decreased talo-calcaneal angles, or radiographic varus, and increased pressure in the lateral midfoot ( $r=-0.33$ ,  $p<0.0001$ ). In 9 patients who had kinematic ankle equinus, analysis of the relationship between hindfoot and midfoot pressure and tibio-calcaneal angle was performed. While there was no correlation with decreased medial or lateral heel pressure ( $r=-0.24$ ,  $p=0.53$ ), there was a trend towards increased lateral midfoot pressure ( $r=0.60$ ,  $p=0.09$ ). In 11 patients with calcaneus, defined as  $<3$  degrees of plantar flexion at terminal stance, there was no statistical relationship between a decreased tibio-calcaneal angle and increased contact time in the medial or lateral hindfoot. CONCLUSION: In young children, standing radiographs do not correlate with foot function as measured by pedobarograph, except for residual varus.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 2: Evaluation and Ponseti Method

Time : 1100-1215

Room: 606-607

Abstract number : 18233

**EARLY RESULTS WITH PONSETI METHOD OF MANIPULATION AND CASTING IN PATIENTS WITH CLUBFOOT AND EFFECTS OF VARIABLES (AGE AT STARTING, SEVERITY AT PRESENTATION, COMPLIANCE WITH BRACE) ON THE RESULT**

Manish PRUTHI<sup>1</sup>, ramesh SEN<sup>2</sup>

<sup>1</sup>university college of medical sciences, delhi (INDIA), <sup>2</sup>PGIMER, chandigarh (INDIA)

**BACKGROUND:** The Ponseti technique is reported to have a high success rate in the treatment of idiopathic clubfoot. The aim of this study is to evaluate Ponseti method of manipulation and casting in patients with clubfoot and effects of variables (age at starting, severity at presentation, compliance with brace) on the result by using two established clubfoot scoring systems. **MATERIAL AND METHODS:** 21 patients (32 feet) were treated in the present study. Patients were evaluated by Dimeglio-Bensahel and Catterall-Pirani scoring at every cast change and at follow-up. **RESULTS:** All patients had good results at the end of casting and at 3-month follow-up. At 6-month follow-up (19 patients), two patients developed recurrence. Positive correlation was found between severity at presentation and need for Achilles tenotomy and compliance with brace and relapses, and there was a trend towards higher number of casts with increasing severity of deformity at presentation. **CONCLUSION:** Ponseti casting technique provides excellent early results, Achilles tenotomy is required in significant number of cases and can be predicted by severity at presentation, and recurrence is associated with noncompliance with bracing protocol. **KEYWORDS:** Clubfoot, Ponseti technique.



**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 2: Evaluation and Ponseti Method**

**Time : 1100-1215**

**Room: 606-607**

**Abstract number : 18670**

**EARLY RESULTS OF MODIFIED PONSETI CLUBFOOT TREATMENT**

Bobby K. W. NG, K. L. LIU, Jack C.Y. CHENG, T. P. LAM

*Department of Orthopaedics & Traumatology, Prince of Wales Hospital, The Chinese University of Hong Kong, Shatin, N.T. (HONG KONG)*

INTRODUCTION: Ponseti clubfoot treatment has been shown to be effective in the management of clubfoot. We review the outcome with a modified technique since its introduction in 1999 to 2007. METHODS: 29 cases were treated. The corrective maneuver and corrective sequence followed Ponseti except that the casting was replaced with synthetic cast. RESULT: The average age at follow-up is 4.2 years (0.34-8.7). Age at first cast average 23 days (2-150). 9 female and 20 male patients. 11 right, 6 left and 12 bilateral cases. The rigidity according to Dimeglio classification was 14.1 (10-16) for right foot and 13.88 (10-16). The number of casts changes averaged 4.62(0-10). 13 patients had PETA performed and the number was increasing in the later part of the study. There were 23 idiopathic and 6 syndromic cases. 10 patients eventually required conventional open surgery. These were earlier and syndromic cases. The age at first cast was also higher for this group at 48 days (2-150). The number of casts change averaged 5.2 (3-10). PETA were performed in 3cases. The rigidity for this group was also higher at 15.5 for right and 15.1 for left foot. All patients completed treatment with 3 cases of superficial plaster cutter burn during removal of casts. All patients were satisfied with the outcome of treatment. DISCUSSION: The Ponseti clubfoot treatment has a learning curve. Later results showed open procedure were almost avoided. It can be successful in some syndromic cases.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 2: Evaluation and Ponseti Method

Time : 1100-1215

Room: 606-607

Abstract number : 19227

**IMPORTANCE AND LIMITATION OF INITIAL CLUBFOOT-CLASSIFICATION**

Verena HALDI-BRÄNDLE<sup>1</sup>, Ulrich EXNER<sup>2</sup>

<sup>1</sup>-, Wallisellen (SWITZERLAND), <sup>2</sup>Uniklinik Balgrist, Zürich (SWITZERLAND)

PURPOSE: Each clubfoot is different and there are different ways of treatment in different cultures. To be able to evaluate which method in whose hands may have the best results, it is necessary to use an objective classification. For these reasons, initial classification prior to treatment in the first days of life is needed. METHOD: Before initiation of the dynamic-functional (French) treatment all our patients are scored with the Bensahel/Dimeglio-classification. Scores of the main components of equinus, varus, adductus and tarsus-derotation may be up to 4; additional 4 points for cavus, calf-atrophy, creases over the calcaneus and Chopart joint may result into a maximum of 20 points. RESULT: Individual scores given for three feet with a same total of points before initiation of the dynamic-functional treatment of clubfeet. Scores of the different components may vary significantly. Case 1 Case 2 Case 3 Equinus 3 4 3 Varus 3 3 3 Derotation block 3 3 4 Adductus 3 2 2 Cavus 1 1 1 Atrophy 1 1 1 Posterior crease 1 1 1 Medial crease 1 1 1 16 16 16 Results No operation No operation Peritalar Release (11 mths) Conclusion: The Bensahel/Dimeglio classification is clear and simple with a high inter-observer reproducibility. The outcome of feet with the same initial total scores may vary greatly. The first subjective clinical impression of how short and thick a foot presents, is a strong prognostic factor which cannot yet be assessed objectively. Pooling of data may also hide important differences: no information about the prognostic meaning of each component. The initial classification is important for clear separation of mild clubfeet (1 &#65533; 5 points) and moderate ones (6 &#65533; 10 points), which traditionally give excellent results with most treatment strategies, from more severe cases, to allow for critical comparison.

**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 2: Evaluation and Ponseti Method**

**Time : 1100-1215**

**Room: 606-607**

**Abstract number : 19228**

**CLINICAL AND PHYSIOLOGICAL EXAMINATIONS OF CONGENITAL CLUBFOOT (PRINCIPLES AND RESULTS)**

Irina J. KLYCHKOVA

*Turner's Pediatric Orthopedic Institute, St.Petersburg (RUSSIAN FEDERATION)*

**INTRODUCTION:** There are only few articles devoted to the problem of neuromuscular /Thomson G.L. et al, 1982, Levis Mark et al. 1999, Vavilov M.A., 2007/ and vascular systems examination / Vavilov M.A., 2007/ of newborns and infants with clubfoot. **MATERIALS and METHODS:** 56 patients with congenital clubfoot passed through the complex examination at the age of 7 days- 1 year, what included: neurological, ultrasonic, electromyographic and Doppler's examinations. **RESULTS:** Neurological symptoms were present in 70% of the patients with congenital clubfoot, such as - movements disturbance syndrome with the clinical signs of dystonia and high muscle tone or muscle hypotonia; hydrocephalus etc. Electromyographic examination revealed low amplitude electrogenesis values /of the shank's muscles/ in 85% of the patients /30-50% lower than age values /. Doppler's examination revealed significant disturbances of blood circulation values on the level of the surface and deep femoral arteries and popliteal artery, - in the deformed limb /including cases with bilateral clubfoot/. The most significant disturbances were revealed in the distal vessels of the lower extremities. The lower speed values of artery bloodstream more than 30%; hypoplasia of the vessels in 20% of the patients - were diagnosed. Ultrasonic examination of the foot revealed - the anomaly insertion of tibialis anterior muscle tendon - in 65% of examined patients and lateralisation of the distal articular surface of the first cuneiform bone - in 65%. **CONCLUSION:** Treatment of congenital clubfoot must be complex - with the use of vessel therapy; muscle tissue activity stimulation; neurological treatment. In cases where the anomaly of bone development and joint apparatus are presented - prolonged conservative treatment is not recommended; the better time for surgical treatment at the age of 4-5 months is better to obtain good results.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 2: Evaluation and Ponseti Method

Time : 1100-1215

Room: 606-607

Abstract number : 19229

**NATURAL HISTORY RELAPSES AFTER CORRECTION IN IDIOPATHIC CLUBFOOT**

Jose MORCUENDE, Matthew E. LOVELL, Lori DOLANI

*University of Iowa Hospitals and Clinics, Iowa City (UNITED STATES)*

**BACKGROUND:** This study evaluates the natural history of idiopathic clubfoot relapses after successful correction with the Ponseti method and the effects of foot maximum abduction on relapse prevention. **METHODS:** Consecutive case-series from 1948 through December 2000. A total of 320 patients (502 clubfeet) were evaluated. All patients were treated by serial manipulation and casting as described by Ponseti. Two groups were analyzed based on the degree of abduction in the last cast and brace. Group I: clubfeet treated between 1948 and 1984 whom did not receive maximum abduction (n=291); and Group II: clubfeet treated between 1991 and 2000 with maximum abduction (n=211). Main outcomes included surgical releases, relapses, and anterior tibialis transfers. **RESULTS:** There were no differences between groups with respect to gender, family history of clubfoot, and bilaterality. Thirty-three percent (95/288) of group I had previous conservative treatment at outside institutions versus 77% (163/211) of group II (p< 0.05). Casting and tenotomy corrected 286/291 (98%) of group I and 209/211 (99%) of group II. Relapses occurred in 170 patients (58%) in group I compared to 59 (28%) in group II (p<0.0001). Overall, 91% of relapses occurred before six years of age. Relapses were related to non-compliance with the brace (65% in group I and 61% in group II) in both groups (p=0.001). Surgical releases decreased from 11% in group I to 4% in group II (p=0.004), and anterior tibialis transfer from 51% to 15% (p<0.0001). **CONCLUSIONS:** Most idiopathic clubfeet will not relapse after six years of age, but the tendency to relapse may persist until 11 years of age. Maximum abduction of the last cast and brace has significantly reduced relapses and the need for extensive corrective surgery and anterior tibialis transfers.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 2: Evaluation and Ponseti Method

Time : 1100-1215

Room: 606-607

Abstract number : 19230

**ULTRASONOGRAPHIC ASSESSMENT OF THE ACHILLES TENDON HEALING AFTER PERCUTANEOUS SECTION WITH A NEEDLE FOR CORRECTION OF THE RESIDUAL EQUINUS OF CLUBFOOT**

José Batista VOLPON<sup>1</sup>, D.A.C. MARANHO<sup>2</sup>, D.M. LEAL<sup>1</sup>, M.H. NOGUEIRA-BARBOSA<sup>1</sup>, M.N. SIMAO<sup>2</sup>

<sup>1</sup>University Hospital, Ribeirao Preto School of Medicine, RIBEIRAO PRETO (BRAZIL), <sup>2</sup>University Hospital-Ribeirao Preto School of Medicine, RIBEIRAO PRETO (BRAZIL)

**OBJECTIVE:** To follow-up the Achilles tendon healing after sectioning of the tendon with a needle introduced percutaneously for treatment of residual equinus of clubfoot.**METHODS:** Thirty one tenotomies were prospectively analyzed in 26 patients with clubfoot treated by the Ponseti technique. The tenotomy was performed percutaneously, under local anesthetic, with a 16 gauge needle and ultrasonography was done immediately to assure that a complete section was achieved and to measure the gap between the two tendon stumps. The repairing process was followed up with ultrasound exams performed at three weeks, six months and one year after the tenotomy.**RESULTS:** The ultrasonography performed immediately after the tenotomy showed that section of the tendon was clinically achieved in all cases, but in 30% of them there was still persistence of intact residual filaments bridging the divided segment. This tendon bridging was divided soon afterwards under ultrasound view. The mean stump gap (retraction) was 5.5 mm (2.3 a 10.5 mm). Two cases showed unusual bleeding that was controlled with local pressure. Three weeks after tenotomy, the ultrasound showed that the gap was filled with hypochoic tissue with transmission of movements from the heel to the muscle belly. Six months after tenotomy, the ultrasound showed that the healing tissue displayed a fibrillary aspect and the echogenicity was similar to the normal tendon and tendon thickening was similar to the normal tendon. One year after tenotomy, the ultrasound examination was unable to distinguish the regenerated from the non-divided tendon.**CONCLUSION:** The percutaneous section of the Achilles tendon with a needle proved to be an effective method, with no major complications, but ultrasound examination may be important to assure that the tenotomy is fully achieved. There was complete repair of the lengthened tendon with normal tissue by six months.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 2: Evaluation and Ponseti Method

Time : 1100-1215

Room: 606-607

Abstract number : 19231

**PONSETI METHOD FOR THE TREATMENT OF CLUBFOOT: RIYADH EXPERIENCE**

Ayman JAWADI

*King Fahad National Guard Hospital, Riyadh (SAUDI ARABIA)*

**PURPOSE:** The aim of this study was to evaluate the efficacy of Ponseti method for the treatment of clubfoot in Saudi patients. **METHODS:** We report the results of using Ponseti method in 125 children with a mean age of 7.3 weeks (range, 1 - 48 weeks) from September 2002 to September 2007 retrospectively at the one of the main hospitals at Riyadh, Saudi Arabia. A total of 194 clubfeet (134 patients) were treated by the author, using Ponseti method. The patients were followed for 22 months in average (range, 6 m- 5yr 2 m). Pirani score was used to evaluate the patients' pre and post casting. **RESULTS:** there were 134 patients with 194 clubfeet treated with Ponseti method. There were 85 male (63.4%) and 49 female (36.6%). Bilateral clubfeet were seen in 60 patients (44.8%), left side in 44 patients (32.8%), and right side in 30 patients (22.4%). The average casts used were 5.6 cast (range, 3 - 8 casts). 185 feet (95.4%) had percutaneous tenotomy, while 20 feet (10.8%) required 2nd tenotomy because of noncompliance to the brace. Five feet (2.6%) had failed Ponseti method which required surgical intervention (3 feet with Arthrogyposis, and 1 foot had talo-clacaneal coalition). 189 feet (97.4%) had full correction. 25 feet (13.2%) had recurrence because of noncompliance to the brace. No major complications were occurred. **CONCLUSIONS:** In children with clubfeet, Ponseti method showed very encouraging results with our patients, with success rate of 97.4%. Braces compliance is a big challenge especially at night time. Long term FU is recommended to evaluate the relapse.

**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 2: Evaluation and Ponseti Method**

**Time : 1100-1215**

**Room: 606-607**

**Abstract number : 19232**

**THE EXPERIENCE OF THE TREATMENT OF CLUBFOOT BY PONSETI MANAGEMENT**

Jun SUN, Zhilin ZHOU

*AnHui Children's Hospital, Hefei (CHINA)*

PURPOSE: Review the experience of clubfoot with Ponseti management in our hospital.METHOD: There were 45 cases 68 feet with clubfoot, were treated by Ponseti management, male 39, female 6. The youngest was 1 day. The eldest was 3 months.Average age was 28 days. They were treated by classic Ponseti management.RESULT: 60 feet in 45 cases (68 feet) were satisfactorily. 8 feet were operated by anteriortibialis transfer.CONCLUSION: We think that the clubfoot should treat early, more early more better. ThePonseti management is a good choice in the treatment of clubfoot, especially in theyoung patients. The patients younger than 3 months is the best treatment age.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 2: Evaluation and Ponseti Method

Time : 1100-1215

Room: 606-607

Abstract number : 19278

**RESULTS OF USING PONSETI METHOD FOR CLUBFOOT CORRECTION IN ELZAHRA UNIVERSITY HOSPITAL IN CAIRO SINCE 2001**

Yasser ELBATRAWY

*Azhar University, Zahraa University Hospital, Cairo (EGYPT)*

INTRODUCTION: As from 2005 the ponseti method started to be the golden standard for the treatment of clubfoot problem in Egypt, after it was first introduced in the University Hospital in Cairo, 2001. METHODS: We used ponseti method in all infants presented by club foot or feet under the age of 16 months. 84 feet treated with Ponseti method were analyzed. 6 babies were older than 10 months. Four of them had a failed conservative (non ponseti) in another hospital and the last had a failed ponseti method in another hospital. All of them were bilateral cases. We evaluate all patients during treatment using PIRANI SCORING SYSTEM. RESULTS: Success rate is 97.6 % which meets with others excellent results ranging between 92 to 100 %. Only two babies needed a surgery of postero medial release later on. The pre-procedure Pirani score average was 5.2. Final evaluation using Pirani score average was only 0.43. Average number of casts was: 5.3 times. 72 feet from total 84 had percutaneous tendo-achilis tenotomy (85.7 %). From these 72, second tenotomy was done in 12 feet (14.2 %) from the total and third tenotomy was done in 6 (7.1 %) from the total. All 18 feet we did re-tenotomy, the families of these babies mentioned some kind of negligence or reliance in continuing wearing the Dennis Brown splint after full correction was achieved. The timing of second tenotomy average was 6.6 months and for the third tenotomy average age was 10.3 months. Four out of the 6 feet we did the third time tenotomy needed later on for tibialis anterior tendon transfer. Average follow up period for our study was 22.4 months ranging between 8 to 42 months. The ponseti method successfully corrected the CTEV deformity in 82 feet out of 84 with a 97.6 % success rate. DISCUSSION & CONCLUSION: Ponseti method is strongly recommended to correct clubfoot deformity and the Dennis Brown splint and Orthosis is essential to prevent relapse. Re-tenotomy may be needed when the hind foot pirani score starts to be more than 1 again. Pirani scoring system is helpful in evaluation and follow up.



**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method**

**Time : 1350-1730**

**Room: 606-607**

**Abstract number : 17671**

**MANAGEMENT OF NEGLECTED CLUBFOOT BY PONSETI METHOD - ARE WE JOKING?**

Shah Alam KHAN, Ashok KUMAR, Manish VARSHNEY

*All India Institute of Medical Sciences, New Delhi (INDIA)*

INTRODUCTION: Role of Ponseti's technique in the management of clubfoot in newborns is well-known. Correcting a neglected clubfoot by the method is not reported in the world literature. MATERIALS AND METHODS: We prospectively evaluated the results of Ponseti's method of treatment in 17 children (21 feet) having neglected clubfeet (no treatment for first three years of age). Patients were evaluated by Demeglio system. Sequential correction of cavus, adduction, varus and equinus was done. TA lengthening was done in all. RESULTS: The average age at the time of treatment was 5.3 years. Average follow-up was 4.6 years. Demeglio criteria - 13 feet had grade II (score 5-10), 7 grade III (score 10-15) and 2 had grade IV (score 15-20) deformities at the beginning of treatment. Average Demeglio score at the start of the treatment was 9.9 and was 7.8 at the end of four years. Sixteen feet (76.2%) had full correction and five feet (23.8%) had recurrence. Out of five, 3 needed posterior release with, one required lateral transfer of tibialis anterior tendon for persistent dynamic supination of the forefoot and one required a complete subtalar release. One patient had superficial plaster sore. CONCLUSION: Although we recommend that Ponseti's method should be the preferred initial treatment modality for neglected clubfeet and remaining residual deformity can be dealt with surgical intervention as and when deemed necessary. Randomised control study with greater number of neglected clubfeet is required to become a universally acceptable standard initial treatment.

**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method**

**Time : 1350-1730**

**Room: 606-607**

**Abstract number : 17789**

**RESULTS OF IDIOPATHIC CONGENITAL CLUBFOOT CONSERVATIVE TREATMENT WITH FUNCTIONAL METHOD**

Philippe WICART, Virginie RAMPAL, Raphael SERINGE

*Saint-Vincent de Paul Hospital, Paris Cedex (FRANCE)*

**INTRODUCTION:** The goal of this article was to analyse the results of the functional conservative technique in the treatment of idiopathic clubfoot. **MATERIAL AND METHODS:** The basis of the study was a consecutive series of 83 feet (59 patients), treated between 1988 and 1990. The functional method included daily physiotherapy and splints with a progressive stopover through childhood. Average age at first caring was 22 days (0 days to 8 months). Mean age at follow-up was 14 years old (7.6 to 19.2). **RESULTS:** Thirty-eight feet (45%) underwent a surgery at mean age of 3.5 years old, with a complete or selective soft tissue release in respectively 15% and 30% of cases. At last follow-up, 71 (85.5%), 10 (12%) and 2 (2.5%) feet were rated respectively excellent, good or fair results. The most frequent abnormality was a sub-talar joint stiffness often associated with a lack of dorsal flexion of the ankle. The results of non-operated were excellent (44) or good (1). The most frequent flaws were a flattened talar dome and a lack of ankle dorsal flexion. On the whole series, the results were lower if the feet had undergone surgery. **DISCUSSION:** This historical series shows the interest and the limits of functional treatment, which provides excellent or good results without surgery in more than half of the feet. Surgery gives lower results in terms of function. The introduction of Achilles tenotomy may decrease the frequency of surgery and improve the results.

**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method**

**Time : 1350-1730**

**Room: 606-607**

**Abstract number : 18349**

**ROCKER BOTTOM DEFORMITY: A COMPLICATION OF IDIOPATHIC CONGENITAL CLUBFOOT CONSERVATIVE TREATMENT**

Philippe WICART, Georgios KOUREAS, Raphael SERINGE

*Saint-Vincent de Paul Hospital, Paris Cedex (FRANCE)*

INTRODUCTION: Rocker bottom deformity (RBD) is a complication of idiopathic congenital clubfoot conservative treatment. The goals of this study are to describe the pathoanatomy of RBD, to analyse its evolution during conservative treatment, to identify early diagnostic indicators and propose preventive measures and curative treatments. METHODS: Among 1120 clubfeet treated conservatively between 1975 and 1996, 36 feet (3.2%) in 23 patients who developed a rocker bottom deformity were analysed. RESULTS: Average follow-up period was  $15.4 \pm 3.7$  years. Thirty feet (83%) reached skeletal maturity. At first examination, all the feet were belonging to most severe categories (groups Dimeglio C and D). Radiological patho-anatomy was characterized by a plantar convexity appearing at 3-6 months of age. Hindfoot equinus was constant. The convexity concerned initially the medial column (talo-metatarsal1 angle) and secondarily the lateral one (calcaneo-metatarsal5 angle). The apex of the deformity was the Chopart's joint with a dorsal calcaneo-cuboid subluxation. A conservative treatment was applied in 8% of the feet. Structural RBD (92% of the feet) required an adequate soft tissue release with or without osseous procedures provided satisfactory corrections at average age of  $12 \pm 6.8$  months. DISCUSSION: Ideal treatment of RBD is preventive with adequate manipulations/splinting and Achilles' percutaneous tenotomy as soon as plantar convexity appears or for resisting hindfoot equinus. In case of severe RBD, surgery provides satisfactory corrections. However, RBD is often combined with three-dimensional deformity leading to extensive and complex procedures. This highlights the advantage of RBD prevention and early radiological diagnosis.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method

Time : 1350-1730

Room: 606-607

Abstract number : 19233

**NEW HOME STRETCHING PROGRAM TO PREVENT RECURRENCE OF CLUBFOOT DEFORMITY AFTER TREATMENT WITH PONSETI TECHNIQUE**

Pariyut CHIARAPATTANAKOM, Charoenchai PAKPIANPAIROJ, Prasert LIUPOLVANISH

*Lerdsin General Hospital, Bangkok (THAILAND)*

**PURPOSE:** Ponseti technique is reported to have a high success rate in the treatment of idiopathic clubfoot. Recurrence after correction is not uncommon. Foot abduction orthosis is an important factor in maintaining the achieved correction but convincing a patient to wear the orthosis for 3-4 years is difficult. Thai parents usually massage their babies' legs and feet due to their beliefs that this massage will help correct the babies' physiologic bow legs. The purpose of this study was to evaluate the effectiveness of a new home stretching program to parents of our patients with a view to reducing the recurrent rate and avoiding the orthosis.

**METHOD:** Forty-nine idiopathic clubfeet treated by Ponseti technique and followed for at least 3 years were included in this study. All of the patients achieved initial correction by casting alone or casting and tendo achilles tenotomy. Home stretching scheme adapted from Ponseti manipulation technique was introduced to parents after the last cast was removed.

**RESULT:** Forty-seven of the 49 feet complied with the home stretching scheme. Seventy-four percent of the recurrent cases occurred within 4 months after the last cast. No recurrence found after 8 months from the last cast. The oldest age at which recurrence occurred was 1 year and 2 months old. No recurrence found after these patients started walking. Of the 19 recurrent feet, three feet were successfully treated by recasting only, twelve feet by recasting and percutaneous tendo achilles tenotomy, two feet by recasting and percutaneous tendo achilles lengthening. Two feet needed more extensive surgeries, one foot had open tendo achilles lengthening and posterior release, and one foot had posterior-medial release.

**CONCLUSION:** This new home stretching program after initial correction of idiopathic clubfoot achieved high rate of compliance and avoided further extensive surgeries in most cases.

**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method**

**Time : 1350-1730**

**Room: 606-607**

**Abstract number : 19234**

**RESULTS OF TREATMENT OF CLUBFOOT RELAPSES AFTER AGE 4 USING THE PONSETI METHOD**

Jose MORCUENDE, Ignacio V. PONSETI, Lori DOLAN, Scott D. MCKAY

*University of Iowa, Iowa City (UNITED STATES)*

**BACKGROUND:** Early relapses of idiopathic clubfoot are easily treated by repeated manipulation and casting. However, late relapses are a challenge. We report rationale and results of treatment of 22 patients initially well corrected using the Ponseti method, who were treated for relapse after their fifth birthday. **METHODS:** Retrospective review of patients treated from 1948 - 2000 by senior author (IVP). 33 patients (52 feet) were identified. 22 patients (34 feet) met inclusion criteria. A matched comparison group was randomly selected from the same treatment era to detect differences in initial corrective treatment. Initial treatment, brace compliance, age at relapse, relapse treatment, and latest follow-up was recorded. Paired t-test analysis was performed. **RESULTS:** Number of casts needed to achieve initial correction was not statistically different ( $p = .27$ ) between the late relapse group and the controls. Treatment of late relapse followed one of four courses: 1) Anterior tibialis transfer to either 3rd cuneiform or cuboid (ATT), with or without TAL (9 patients/15 feet), 2) ATT +/- TAL with a series of preoperative casts (4 patients/6 feet); 3) casting and continued bracing (4 patients/5 feet), 4) trial of repeat bracing (6 patients/8 feet). 59% of patients had further surgery (13/22) after the above treatment. Average age at follow-up was 24.5 years (range 7.5-43.6), for an average follow-up from late relapse of 18.1 years (range 2.1-35.2 years). Shoe wear, pain, and function were generally not a problem. 19 patients wore normal shoes. Ten patients were pain free. Despite this, only 5 patients acknowledged their feet limited their activities. **CONCLUSIONS:** Clubfoot recurs late in a small percentage of cases and responds very well to manipulation and casting followed by ATT transfer. Functional feet can be expected using this technique, despite mild residual deformity.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method

Time : 1350-1730

Room: 606-607

Abstract number : 19235

**USE OF THE PONSETI METHOD FOR RECURRENT CLUBFOOT FOLLOWING POSTEROMEDIAL RELEASE**

Matthew DOBBS, Sumeet GARG

*Washington University School of Medicine, St Louis (UNITED STATES)*

**PURPOSE:** Frequently a child with recurrent or incompletely corrected clubfoot after previous extensive soft tissue release is treated with revision surgery. This leads to further scarring, pain, and limitations in range of motion. We have utilized the Ponseti method of manipulation and casting and when indicated, tibialis anterior tendon transfer, instead of revision surgery for these cases. **METHODS:** A retrospective review of all children treated since 2002 (n=11) at our institution for recurrent or incompletely corrected clubfoot after previous extensive soft tissue release done elsewhere. Clinical and operative records were reviewed to determine procedure performed. Ponseti manipulation and casting were done until the clubfoot deformity was passively corrected. Based on the residual equinus and dynamic deformity, heel cord lengthening or tenotomy and tibialis anterior transfer were then done. Clinical outcomes regarding pain, function, and activity were reviewed. **RESULTS:** Eleven children (17 feet) with ages ranging from 1.1 to 8.4 years were treated with this protocol. All were correctable with the Ponseti method with 1-8 casts. Casts were applied until the only deformities remaining were either or both hindfoot equinus and dynamic supination. Nine feet required a heel cord procedure for equinus and fifteen required tibialis anterior transfer for dynamic supination. Seven children have follow-up greater than one year (average 27.1 months) and have had excellent results. Two patients had persistent hindfoot valgus which were required hemiepiphysodesis of the distal medial tibia. **CONCLUSION:** The Ponseti method, followed by tibialis anterior transfer and / or heel cord procedure when indicated, can be successfully used to correct recurrent clubfoot deformity in children treated with previous extensive soft tissue release. Early follow-up has shown correction without revision surgery. This treatment protocol prevents complications of stiffness, pain, and difficulty ambulating associated with multiple soft tissue releases for clubfeet.

**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method**

**Time : 1350-1730**

**Room: 606-607**

**Abstract number : 19236**

**COMPARISON OF SERIAL CASTING VERSUS STRETCHING TECHNIQUE IN CHILDREN WITH CONGENITAL IDIOPATHIC CLUBFOOT. EVALUATION OF A NEW ASSESSMENT SYSTEM**

Hanneke ANDRIESSE, G. HåGGLUND

*Lund University Hospital, Lund (SWEDEN)*

**PURPOSE:** The outcome of clubfoot treatment is the result of several factors such as severity, type of treatment, and measurement instruments. We compared two intervention groups with two assessment procedures. **METHODS:** 16 children were treated consecutively with intensive stretching according to the Copenhagen method and 16 children consecutively with casting according to the Ponseti technique, during their first 2 months of age. The need for surgery was then assessed. At 4 months of age, all children used a dynamic Knee Ankle Foot Orthosis. The Clubfoot Assessment Protocol (CAP) and the Dimeglio Classification System (DCS) were used and compared during treatment and at 2 years of age. **RESULTS:** According to the CAP (but not the DCS) the casting technique was superior in clubfoot correction, apparent as better mobility and better quality of motion at 2 years of age. These children also required less surgery. The orthotics management functioned well in both groups, with high compliance and maintenance or slight improvement of the clinical status except for morphology. DCS score changed over time but not between the groups. Because of its multidimensional and narrower scoring interval construct, the CAP enabled us to elucidate and evaluate different clinical functions. **CONCLUSION:** The casting technique according to Ponseti seems to be the better of the two for clubfoot correction, regarding mobility and quality of motion. The Clubfoot Assessment Protocol (but not the Dimeglio Classification System) was able to reveal differences between the Copenhagen and Ponseti treatment methods.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method

Time : 1350-1730

Room: 606-607

Abstract number : 19237

**NONOPERATIVE CLUBFOOT TREATMENT 2008: A COMPARISON BETWEEN THE PONSETI METHOD AND THE FRENCH PHYSIOTHERAPY METHOD**

Benjamin Stephens RICHARDS<sup>1</sup>, Shawne FAULKES<sup>1</sup>, Karl E. RATHJEN<sup>1</sup>, Lori KAROL<sup>2</sup>, John G. BIRCH<sup>1</sup>, Charles E. JOHNSTON<sup>1</sup>, John A. HERRING<sup>1</sup>, Daniel J. SUCATO<sup>1</sup>

<sup>1</sup>Texas Scottish Rite Hospital for Children, Dallas (UNITED STATES), <sup>2</sup>Texas Scottish Rite Hosp. for Children, Dallas (UNITED STATES)

**PURPOSE:** The Ponseti and French physiotherapy methods for clubfoot correction have been reported to be successful in reducing the need for surgical releases. The purpose of this prospective study was to compare results of these two methods at one institution in patients having a minimum 24 months followup. **METHODS:** Beginning in 2001, patients under 3 months of age with previously untreated idiopathic clubfeet were enrolled. Parents selected the method of treatment. Ponseti and Dimeglio's treatment protocols were strictly adhered to. Before treatment, each foot was rated for severity using Dimeglio's numeric scoring system and grouping (moderate, severe, very severe). Outcomes were assessed for 1) initial correction, 2) relapses, and 3) results after 24 month followup at which time they were graded as good (plantigrade foot +/- TAL), fair (limited posterior release or tib ant transfer), or poor (complete PMR). **RESULTS:** Followup averaged 51.4 months (range 24-79 mos). The average pre-treatment Dimeglio severity scores were similar (Ponseti 12.1, French 12.8) [p=NS]. Initial correction to a plantigrade foot was similar (Ponseti 94.4%, French 95.0%). Relapse occurred in 37% Ponseti and 29% French. The outcomes at 24 month minimum FU are shown in the table below. **Overall Outcomes:** Ponseti (267 feet) PT (119 feet) Good 193 feet (72%) 80 feet (67%) Fair 32 feet (12%) 42 feet (16%) 20 feet (17%) 19 feet (16%) **CONCLUSIONS:** At 4 years average followup, both methods demonstrate great success in reducing the need for extensive surgical correction. Overall, the outcomes for both groups were similar. When necessary, cross-over treatment between methods may result in further improvement in outcomes.



**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method**

**Time : 1350-1730**

**Room: 606-607**

**Abstract number : 19238**

**ARMENIA: DYNAMIC-FUNCTIONAL TREATMENT AND TREATMENT WITH CASTS IN A RESOURCE\_DEPRIVED COUNTRY**

Verena HALDI-BRÄNDLE

*Uniklinik Balgrist, Zürich (SWITZERLAND)*

**PURPOSE:** In most resource-deprived countries, clubfeet are treated by casting, although cast supply is often a problem. If casting is not available, normally children with clubfeet get an operation at a few months of age, with no other treatment. For these reasons, dynamic functional treatment is an excellent option. **METHOD:** In Yerevan, Armenia, over 18 months, 20 patients with 35 clubfeet were treated in two different groups; one with dynamic-functional treatment, the other with casts. Physiotherapists were taught the dynamic treatment method with initial repositioning of the bones in the tarsus, while the doctors learned casting according to the anatomical studies for dynamic treatment. When alignment and neutral position of dorsiflexion was gained, children of both groups were supplied with very light splints. **RESULTS:** Analysis of results was flawed by the subjective choice of patients for rigid casting or dynamic-functional treatment, and by poor collection and transmission of data. Nonetheless, except for the one foot that required an operation, the dynamic group showed excellent results in function and form. **Number of patients** **Number of Clubfeet** **Operations** **CASTING** **10** **17** **3** **Feet**, **17.5%** **DYNAMIC-FUNCTIONAL** **10** **18** **1** **Foot**, **5.5%** **CONCLUSION:** It is most difficult to analyze data collected in a resource-deprived country. Cast materials are scarce, too expensive, of poor quality, and not storable if the climate is hot and humid. Casting training may not be widely available and although it is called Ponseti, casts are frequently not done in classic Ponseti way. The form of a foot seems more important than the function. Dynamic functional treatment has advantages due to the fact that it does not require a doctor, is normally performed by physiotherapists, it is less expensive than traditional treatment and is not dependent on quality casting materials being available. The results are excellent.

**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method**

**Time : 1350-1730**

**Room: 606-607**

**Abstract number : 19239**

**EXTRA SPACE CAST CORRECTION TECHNIQUE IN CLUBFOOT: 20 YEARS OF EXPERIENCE**

Nikolai J. RUMYANTSEV, A.G. BAINDURASHVILI, N.J. OMAROV

*Turner's Pediatric Orthopedic Institute, St. Petersburg (RUSSIAN FEDERATION)*

**INTRODUCTION:** For the first time this method was described by Furlong M.W. and Lawn G.W. in USA in 1960. **MATERIALS AND METHODS:** We use extra space cast correction technique since 1987 for conservative clubfoot correction, and in postoperative management for early ankle motion. The cast application (with reserve space) was performed as follows: a special elastic pad was placed on the dorsolateral aspect of the foot before the procedure and fixed with a cotton bandage. The plaster cast was applied. After the cast was set, the elastic pad was removed, leaving a reserve space on the dorsolateral aspect of the foot. Total number of cast applications according to this technique was more 7000. **RESULTS:** The advantages of reserve space technique are: (1) possibility of manipulation into dorsiflexion (i.e. passive dorsiflexion), (2) possibility of active foot dorsiflexion by patient himself, (3) spontaneous foot growth into the side of correction and (4) extra space is a reservoir for swelling after surgery or after active manipulations. **CONCLUSIONS:** Extra space cast application provides good results of primary clubfoot correction in short period of time. This technique is optimal to early ankle motion in postoperative period.

**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method**

**Time : 1350-1730**

**Room: 606-607**

**Abstract number : 19240**

**ADDUCTION IN CLUBFOOT**

Henri BENSANEL<sup>1</sup>, Pasqual JEHANNO<sup>1</sup>, Azriel BENAROYA<sup>2</sup>

<sup>1</sup>*Robert Debre Hospital, Paris (FRANCE)*, <sup>2</sup>*Elmhurst Hospital, New York (UNITED STATES)*

**PURPOSE:** Revisiting Forefoot Adduction for a better comprehensive treatment.**Functional Anatomy:** At birth, in clubfoot, it is known that the forefoot is deviated towards medial plan. Two issues are to be studied regarding such deformity. :-is it truly an Adduction?-is the anatomic forefoot the site of such deformity?The midtarsal joint plays a major role in the pathophysiology of clubfoot. Its dislocation allows the talus to become unstable. Due to it, the whole os calcis is deviated towardsequinus and varus. Thus, the soft tissues of hindfoot become tightened, together with acontracture of the triceps surae. This is making worse the deformity into equinus andvarus deformity.Due to the strength of the tibialis posterior, the talo-navicular joint turns towardssupination: mid and forefoot follow this deviation. Such appear the so-called forefootadduction.Thus, we note that, at birth, the whole forefoot deformity has its onset in the Chopart joint.Later on, as the child starts walking, the natural history of clubfoot induces a trueadduction of the forefoot. In the same way, after an uncompleted treatment, an adductionof the forefoot can be developed.**CONCLUSION:** We may consider 2 stages in the forefoot deformity of clubfoot : At birthand in baby , the supination of midtarsal joint is its origin. After walking, a true forefootadduction may happen from various causes.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method

Time : 1350-1730

Room: 606-607

Abstract number : 19241

**CLUBFOOT CLINICAL OUTCOMES RESOURCE AND EDUCATION GUIDE DEVELOPED BY THE SHRINERS HOSPITALS FOR CHILDREN -CLUBFOOT WORK GROUP**

Norman Y. OTSUKA

*Shriners Hospitals for Children, Los Angeles, CA (UNITED STATES)*

The Orthopaedic Outcomes Advisory Group has identified clubfoot, as a clinical area in pediatric orthopaedic surgery, with high volume, high variation in clinical practice and variable cost in treatment. As a result, the Clubfoot Outcomes Task Force has been formed to develop a Clinical Practice Resource Guide. This guide will present the most recent literature (evidence) as a clinician reference. In the absence of literature, expert opinion from SHC has been included in the guide. The Clubfoot Clinical Resource Guide is part of the Club Foot Clinical Outcomes Resource and Education Tool Kit (Clubfoot CORE), which includes an algorithm of evidence based treatment options, optional order sets, patient education materials and other resources that can be reproduced or edited for use across the SHC system. Measurement of outcomes and costs related to clubfoot treatment and the generation of research proposals to enhance the evidence used for decision-making, are the anticipated end products related to the use of the Clubfoot CORE products. This guide can then be used to compare current practice patterns within SHC to better understand variations in treatment and improve outcomes with cost efficiency. This resource should not be construed as a standard of care, but rather should be used as a source of information for clinicians and patients. The use of the Clubfoot CORE will, however, enhance: 1. Clinical care; 2. Research; 3. Management reporting; and 4. Performance improvement.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method

Time : 1350-1730

Room: 606-607

Abstract number : 19242

**CLASSIFICATION OF CLUBFEET BEFORE TREATMENT AND EVALUATION AT OUTCOME**

Verena HALDI-BRÄNDLE<sup>1</sup>, G. Ulrich EXNER<sup>2</sup>

<sup>1</sup>-, Wallisellen (SWITZERLAND), <sup>2</sup>Uniklinik Balgrist, Zürich (SWITZERLAND)

**PURPOSE:** Treatment of clubfeet should start early after birth. To allow for a correct evaluation of the treatment it is mandatory to assess the feet before treatment and follow them, optimally until growth is finished with a minimal f/u at walking age. Only this will allow for a continuous improvement of our strategies and achievement of results that are as normal as possible. In order to take into account the functionality of the feet at outcome, different scoring systems are used for the two evaluations. **METHOD:** A group of 45 newborns were classified with the Bensahel/Dimeglio-classification (max. 20 points) before treatment in the first days of life. All infants had severe and very severe clubfeet with 11 &#65533; 20 points, groups III and IV. The feet were treated with dynamic-functional (French) method by one single physiotherapist. After walking freely for at least three months, they were again evaluated on a scale of 0-60 points using the rating system developed by the Clubfoot Study Group. **RESULT:** With the initial classification of severe and very severe clubfeet (11 &#65533; 20 points) treated with the dynamic-functional method, the average score at outcome was 2 points out of 60 on the Clubfoot Study Group scale, with a maximum of 6 points. All feet &#65533; even those that required an additional eventual operation &#65533; had excellent results. **CONCLUSION:** Feet must be classified before and after treatment with two different systems. Initially there are newborn feet, at outcome functionally different, weight-bearing feet. Although the analyzed group is small, it is clear, that global pooling of data can conceal very important facts. All scoring systems have drawbacks in that there is no final validation of performance and quality of life. However it is mandatory to evaluate results of different methods in order to find the best solution for each culture and the individual patient.

**Date : 2008-08-27**

**Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method**

**Time : 1350-1730**

**Room: 606-607**

**Abstract number : 19243**

**SPLINT AND CLUBFOOT**

Henri BENSACHEL<sup>1</sup>, Pasqual JEHANNO<sup>1</sup>, Azriel BENAROYA<sup>2</sup>

<sup>1</sup>Robert Debre Hospital, Paris (FRANCE), <sup>2</sup>Elmhurst Hospital, New York (UNITED STATES)

**PURPOSE:** To assess the usefulness of the splint in clubfoot according to its property. **TECHNICAL NOTE:** Whatever is its treatment, a splint is needful for stabilizing the result. It is much more valuable in the steps of the conservative treatment. As the treatment of clubfoot includes immobilisation, the plaster casts control the progression of the reduction of the foot. As the proposed treatment is the functional method, it proceeds the manipulations. It is an active splint as it is the other components of the treatment. As the child reaches to upright position, the splint is modified to help the foot to achieve its status: it is the ski-splint. It is often missed in the statement of the functional method. It is as useful as the previous parts of treatment. **CONCLUSIONS:** In the field of the Functional Method, the manipulations are the major factor of the treatment. Its splint is also much useful during babyhood as for the onset of walking stage. Also, splint helps the alignment of the foot with regard to bimalleolar axis and the whole lower limb.

Date : 2008-08-27

Session : SICOT/ 5th International Clubfoot Congress- Session 3: Ponseti Method and Functional Method

Time : 1350-1730

Room: 606-607

Abstract number : 19244

**IMPROVED BRACE WEAR COMPLIANCE IN CHILDREN WITH CLUBFEET TREATED WITH THE PONSETI METHOD USING A DYNAMIC ORTHOSIS**

Matthew DOBBS, Sumeet GARG, Kristina PORTER, Melissa KIRCHOFFER

*Washington University School of Medicine, St Louis (UNITED STATES)*

**PURPOSE:** Brace wear noncompliance in children with clubfeet treated with Ponseti method is the leading risk factor for recurrence. A dynamic foot abduction orthosis developed at our institution is believed to result in improved compliance, fewer skin complications, and fewer recurrences. A case-control trial was conducted to test this hypothesis. **METHODS:** A prospective cohort of children with idiopathic clubfoot using the dynamic brace was compared to an equal size group most recently treated with a standard orthosis. Compliance, skin complications, recurrence, and need for surgical soft tissue release were compared between groups at equivalent length of follow-up. **RESULT:** The dynamic and standard brace groups are equivalent in age (1.9 months vs 2.9 months), number of affected feet (97 versus 92), and severity (average of 4 casts required for correction in each group). Fifty-seven children were followed in each group for an average of two years. All were corrected initially with the Ponseti method. Compliance is higher using the dynamic brace (47/57, 81%) compared to the standard brace (21/57, 47%) ( $p < 0.001$ ). Recurrence rate is lower using the dynamic brace (11/57, 19%) compared to the standard brace (22/57, 39%) ( $p < 0.02$ ). Skin complications are fewer in the dynamic brace (2/57, 3%) compared to the standard brace (11/57, 19%) ( $p < 0.008$ ). Most importantly, five children using the standard brace underwent posteromedial release within two years of treatment, as compared to none in the dynamic brace. **CONCLUSION:** The dynamic brace results in improved compliance, fewer recurrences, fewer skin complications, and reduced rates of surgery in idiopathic clubfoot than the traditional brace.

**Date : 2008-08-27**

**Session : Trauma: acetabular and proximal femoral fracture**

**Time : 1100-1215**

**Room: 608**

**Abstract number : 15310**

**MARGINAL IMPACTION FRACTURES OF THE ACETABULUM**

Maheer HALAWA<sup>1</sup>, Fouad SADEK<sup>2</sup>

<sup>1</sup>Derriford hospital, Plymouth (UNITED KINGDOM), <sup>2</sup>Cairo University Hospital, Cairo (EGYPT)

Different factors associated with an adverse functional outcome of acetabular fractures involving the posterior wall have been well documented. Among these is marginal impaction. From 1998 until mid 2006, 105 cases were prospectively reviewed to assess the functional and radiological results of simple and complex acetabular fractures associated with a posterior wall component, with special reference to the marginal impaction. Associated posterior wall components associated with marginal impaction were compared to the pattern of fractures without marginal impaction. The exclusion criteria were non-anatomic reductions i.e. >2mm displacement, avascular necrosis, deep infection, heterotopic ossification grade III, IV, chondrolysis and nerve injuries. All marginal impaction fractures were identified on the preoperative CT scan. They were openly reduced, elevated and autografted from the greater trochanter, followed by rigid internal fixation for early postoperative mobilisation i.e. CPM use. Results were assessed clinically by the modified Merle D'Aubigne and Postel score and radiologically by Kellgren and Laurence method of grading of osteoarthritis. 40 cases were excluded for the reasons above. This left us with 27 cases of marginal impaction and 38 cases of control. The average period of follow up was 35.7 months. The functional results of the marginal impaction grafting group revealed 13 (48.1%) excellent, 7 (25.9%) very good, 6 (22.2%) good and one (3.8%) fair, while the control group showed 18 (47.4%) excellent, 10 (26.3%) very good, 8 (21%) good, one (2.6%) fair and one (2.6%) poor result. The functional and radiological outcome of the posterior wall component fractures associated with marginal impaction has shown very satisfactory results in comparison with a control group in the short and mid-term period. An integral part of this is careful recognition of this injury pattern and its management as part of the open reduction and fixation.



**Date : 2008-08-27**

**Session : Trauma: acetabular and proximal femoral fracture**

**Time : 1100-1215**

**Room: 608**

**Abstract number : 17045**

**MINIMALLY INVASIVE SURGERY IN OS CALCIS FRACTURE: INDICATIONS AND RESULTS**

Tak Wing LAU, Frankie LEUNG

*Queen Mary Hospital, Hong Kong (HONG KONG)*

INTRODUCTION: Os calcis fractures are among one of the most difficult fractures to treat. Many of these fractures are the result of high energy trauma in heavy manual workers. Many of them could not go back to their original work because of various degrees of pain and stiffness. METHODS: From January 2007 till December 2007, Sanders II os calcis fractures were selected for operation with percutaneous screws fixation. After the operation, the patients were allowed to have free ankle mobilization exercise. 6-12 weeks of protected weight bearing walking was allowed followed by full weight bearing walking. Their x-rays, ankle range of movement and walking ability were assessed in regular interval. RESULTS: We have operated 14 os calcis fractures using percutaneous screws fixation in 12 patients. Their age ranged from 17 to 86. 8 were male and the other 4 were female. 4 patients had bilateral os calcis fractures. All fractures healed radiologically within 3 months. Some minor loss of initial reduction was seen. There were no major complications reported. Patients returning to heavy manual work were seen and the time needed could be as short as 3 months post-op. CONCLUSIONS: We concluded that percutaneous screws fixation was an excellent option for treating selected cases of os calcis fractures.

**Date : 2008-08-27**

**Session : Trauma: acetabular and proximal femoral fracture**

**Time : 1100-1215**

**Room: 608**

**Abstract number : 17202**

**STAGING/CLASSIFICATION OF NEGLECTED NECK FRACTURE BASED ON THE CHANGES IN THE PROXIMAL FRAGMENT**

Hardas SANDHU, Parvinder SANDHU

*HSS Orthopaedic Hospital, Amritsar (INDIA)*

**BACKGROUND:** Neglected femoral neck fracture (of more than 3-week duration) is a management problem in young patients below the age of 50. There are many operative procedures aimed at preserving the hip joint with unpredictable results. A classification/staging is needed to help in the choice of suitable operative procedure. **METHOD:** 200 skiagram of neglected femoral neck fracture were given to 3 different individuals (totally blind to any previous categorization, operative procedure and its results) of the status of senior residents and asked to place the fracture in one of the three stages I, II, III on the basis of characteristic of proximal fragment a) condition of the fracture surface b) length of the fragment and c) any sign of avascular necrosis in the femoral head. There were 97% of inter observer agreement and when this was compared with the observation with additional information of MRI or CT Scan. The accuracy was 96%. When this staging was applied to the results obtain by osteosynthesis with cancellous screw and free fibular graft it appeared to be relevant. **CONCLUSION:** Classification staging of neglected femoral neck fracture based on the characteristics of proximal fragment is quite dependable in predicting its outcome of any operative procedure.

Date : 2008-08-27

Session : Trauma: acetabular and proximal femoral fracture

Time : 1100-1215

Room: 608

Abstract number : 17412

**USE OF CELL SAVER IN ACETABULAR FRACTURE SURGERY: DOES INTRAOPERATIVE RED BLOOD-CELL SALVAGE AND AUTOTRANSFUSION REDUCE THE NEED FOR BLOOD TRANSFUSION?**

James KELLAM, Brian SCANNELL, Brian LOEFFLER, Mochael BOSSE, Stephen SIMS, James NORTON  
*Carolinas Medical Center, Charlotte NC (UNITED STATES)*

**PURPOSE:** The purposes of this study were to determine if use of red blood salvage with a cell saver (CS) reduced the amount of allogeneic blood transfused both intra- and post-operatively and decreased the patient's blood-related charges. **METHODS:** A retrospective review of 187 operatively treated acetabular fractures in 186 patients was performed. The decision to use a (CS) was at the surgeon's discretion. The volume of auto-transfused blood, allogeneic transfused blood and charges for these were determined. **RESULTS:** CS was used in 20 out of 104 simple fracture patterns (19%) and in 40 out of 83 cases (48%) for associated fracture patterns. The average volume of blood auto-transfused was 345 mLs. Both groups were similar in age, gender, or body mass index (BMI). There were no differences in rates of transfusion between the CS and non-CS groups (58.3% vs. 48.0%,  $p=0.1883$ ), and no significant differences in mean volumes of transfusion intra- (507 vs. 306,  $p=.0533$ ) or post-operatively (263 vs. 212 mLs,  $p=0.9537$ ). Separate analyses based on fracture pattern, extent of surgical approach, ISS, and estimated blood loss showed no differences in transfusion rates or volumes. Overall, total blood-related charges in the CS group were significantly higher than the non-CS group (\$1,958 vs. \$694,  $p<0.0001$ ). **CONCLUSION:** There was no demonstrable reduction in the volume or rate of allogeneic blood transfused intra- or post-operatively, while hospital blood-related charges were significantly increased when using CS.

Date : 2008-08-27

Session : Trauma: acetabular and proximal femoral fracture

Time : 1100-1215

Room: 608

Abstract number : 17508

**CEMENTLESS MODULAR HIP ARTHROPLASTY AS A SALVAGE OPERATION FOR FAILED INTERNAL FIXATION OF TROCHANTERIC FRACTURES IN ELDERLY PATIENTS**

Jean-Michel LAFFOSSE, François MOLINIER, Jean-Louis TRICOIRE, Philippe CHIRON, Jean PUGET  
*Service d'Orthopédie et de Traumatologie, CHU Rangueil, Toulouse (FRANCE)*

**PURPOSE OF THE STUDY:** Failure of trochanteric fractures osteosynthesis must be revised to avoid bedridden risks. Our study analysed the results of a modular cementless revision stem as a salvage procedure for early mechanical failure in elderly patients. **MATERIAL AND METHODS:** Our retrospective study included 29 patients with a mean age of 81.1 years (range 70-91). Trochanteric-diaphyseal fractures, pathological fractures and infections were excluded. All patients received the same modular femoral implant (cementless stem, quadrangular in section for metaphyso-diaphyseal anchorage). Twenty-two patients underwent hemiarthroplasty and 7 total hip arthroplasty. **RESULTS:** Four patients died and two were lost to follow-up. The 23 patients had an average 20-month follow-up (6-89). Twenty walked with no support (9 cases) or with (11 cases) crutches, 3 patients were bedridden. We noted no perioperative or postoperative femoral fracture. All the patients reported a significant pain relief and functional improvement compared with preoperative profound functional disability and pain. Subsidence of the stem greater than 5mm was noted in three cases, without clinical consequences. None of the stems had to be revised for loosening. **CONCLUSION:** The cementless modular femoral stem used in this study appeared as a reliable implant. It successfully prevented possible complications due to absence of calcar support. The long stem allows bypassing cortical defect left at the site of failed fixation device or of the screw-holes. There was no perioperative fracture or other serious orthopaedic complication. For very selected patients primary prosthetic replacement with this type of implant could be discussed.

Date : 2008-08-27

Session : Trauma: acetabular and proximal femoral fracture

Time : 1100-1215

Room: 608

Abstract number : 18040

**ANALYSIS OF THE OUTCOMES INVOLVED IN THE WALKING ABILITY OF PERITROCHANTERIC FRACTURE OF THE FEMUR TREATED WITH THE INTRAMEDULLARY HIP SCREW SYSTEM**

Ryoichi MURASHIGE<sup>1</sup>, Hiromoto ITO<sup>2</sup>, Kazufumi MINAMI<sup>1</sup>, Hiroshi HASHIGUCHI<sup>1</sup>, Takao NAKAJIMA<sup>1</sup>, Yoshinaga EGAWA<sup>1</sup>

<sup>1</sup>Department of Orthopaedic Surgery, Nippon Medical School, Chiba Hokusoh Hospital, Chiba (JAPAN), <sup>2</sup>Department of orthopaedic surgery, Nippon Medical School, Tokyo (JAPAN)

**OBJECTIVES:** The objective of this study was to analyse postoperative walking ability of peritrochanteric fracture of the femur treated with the intramedullary hip screw system. **METHODS:** 415 patients consisted of 109 males and 306 females, whose mean age was 81.2 years, were the subjects. To identify factors that influenced the walking ability, various factors including age, waiting time to surgery, type of fracture, operating time, radiographic findings of the intra- and postoperative reduction in fixation and complications were analysed statistically. **RESULTS:** Operating time was 43.9 minutes and intraoperative blood loss was 66.5g in average. Bone union was observed in 409 patients excluding patients with death and transfer. As intra- and postoperative reduction in fixation, greater trochanteric fracture, infraction at the locking screw, femoral neck or diaphysis fracture, varus deformity, jamming and cut-out were seen in 29 patients. Identified factors correlated to postoperative walking ability were age, operating time, pulmonary disease, heart disease and cerebral vascular impairment. There was no correlation between postoperative walking ability and waiting time to surgery, type of fracture, radiographic findings of the intra- and postoperative reduction in fixation. **DISCUSSION:** There are some evidences that early surgery reduces systemic complications and mortality, but it does not mean to maintain walking ability. Age and previous illness were inevitable factors influenced postoperative walking ability. Prevention of postoperative complication such as pulmonary infarction, and shortened operating time was important to obtain satisfactory walking ability postoperatively in patients with peritrochanteric fracture of the femur.

Date : 2008-08-27

Session : Trauma: acetabular and proximal femoral fracture

Time : 1100-1215

Room: 608

Abstract number : 18104

**DHS AND SUPPLEMENTARY CANCELLOUS SCREW WITH PRIMARY AUTOGENOUS BONE GRAFTING FOR MANAGEMENT OF FRACTURE NECK OF FEMUR IN MIDDLE TO ELDERLY AGE GROUP**

A. VERMA, R. AHIRE, S.K. MUKHERJEE

*Pt J N M Medical College & Dr B R Ambedkar Hospital, Raipur, CG, Sagar (INDIA)*

INTRODUCTION: Fracture neck of femur is one of the commonest injuries causing morbidity and mortality in patients of middle to elderly age group. Majority of these fractures occur following trivial trauma in bones weakened by osteoporosis, and its incidence increases with increasing age, doubling for each decade beyond 50 years of age. In this study we aim to preserve the head of femur through internal fixation in physiologically active and elderly patients, and to facilitate union through autogenous iliac bone grafting. MATERIALS AND METHOD: From May 2005 to May 2007 a prospective study of 29 consecutive patients with fracture intra capsular neck of femur, Garden type II and III, between 55-85 years of age was undertaken. All fractures were reduced under image intensifier control on a fracture table and were internally fixed using DHS and a supplementary cancellous screw after placing autogenous cancellous bone grafts at the fracture site. Follow-up assessment was done using radiographic evaluation (Union, implant position and maintenance of reduction) and the Oxford Hip Score. RESULTS: 18 patients (64%) had excellent result, 5 patients (17%) had good result, and 2 patients (7%) had poor result. Failure occurred in 3 patients (10%). One patient died a month after surgery due to pre-existing medical problems. CONCLUSION: Preliminary results of treatment of fracture neck of femur in middle and elderly age group patients by DHS and supplementary cancellous screw fixation with autogenous bone grafting are satisfactory in preserving the head and neck of femur.

**Date : 2008-08-27**

**Session : Trauma: acetabular and proximal femoral fracture**

**Time : 1100-1215**

**Room: 608**

**Abstract number : 18326**

**ANAESTHESIA FOR HIP FRACTURE PATIENTS**

Deepu BHASKAR<sup>1</sup>, Purnima AGGARWAL<sup>2</sup>, Ajay GULATI<sup>2</sup>, Kieran SINGISETTI<sup>1</sup>, Martyn PARKER<sup>2</sup>

<sup>1</sup>Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM), <sup>2</sup>Peterborough District Hospital, Peterborough (UNITED KINGDOM)

Continuing controversy exists with regard to the preferred method of anaesthesia for emergency hip surgery. The Cochrane review of all randomised trials on hip fracture patients comparing general versus spinal anaesthesia summarised the results for 2,500 patients. Whilst there was a tendency to a slightly lower mortality at 30 days after surgery for those allocated to spinal anaesthesia, there were no long term differences in mortality and no notable differences in morbidity. We have audited the results for 4,723 consecutive patients admitted to one institution between 13/01/1989 and 19/04/2005 and see if any outcome measures differed between the different forms of anaesthesia. 2,548 patients had General Anaesthesia and 1,541 had spinal Anaesthesia. The choice of Anaesthesia was at the discretion of the Anaesthetist. 30 day mortality for general and spinal anaesthesia groups respectively were 6.2% versus 8.4%. The one year mortality was 27.4% versus 29.7%. The difference at one year was statistically significant ( $p=0.009$ ). Postoperative complications, the incidence of pneumonia was 3.8% versus 5.0%, myocardial infarction 0.3% versus 0.3%, congestive cardiac failure 1.8% versus 2.3%, pulmonary embolism 1.0% versus 0.6%, DVT 1.6% versus 1.6% and confusion 5.4% versus 4.0%. The complications of confusion and pulmonary embolism were of borderline statistical significance ( $p=0.05$ ). We have further analysed our results in matching ASA grades. Our outcomes show significant benefit of spinal in ASA matched groups.

Date : 2008-08-27

Session : Trauma: acetabular and proximal femoral fracture

Time : 1100-1215

Room: 608

Abstract number : 18405

**SUPINE WITH FLEXED HIP POSITION FOR ANTEGRADE FEMORAL NAILING: AN ALTERNATIVE POSITION FOR OBESE PATIENTS OR PROXIMAL FEMORAL FRACTURES**

Banchong MAHAISAVARIYA, Panupan SONGCHAROEN

*Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok (THAILAND)*

INTRODUCTION: Access to the entry point for antegrade femoral nailing may be difficult in obese patients or patients with proximal femoral fractures. The authors present an alternative method of positioning the patient to minimise the difficulty. METHODS: The method includes the position of the patient in supine position on a fracture table with the traction applied via foot piece; the post for foot piece is raised higher with extra-piece of connecting support to make the patient's hip being in 25-35 degrees hip flexion position with 5 degree adduction. The contralateral leg is placed in hemi-lithotomy position with special support. The table is tilted to raise the patient trunk up rise to 10 to 15 degree to accommodate the hip flexed position of the affected thigh for the operation. RESULTS: This method have been applied in 50 cases of which the ordinary supine position may have difficulty. Of these, 27 were male and 23 were female whose ages ranged from 25 to 89 years (average 64 years). Closed antegrade locked nailing was applied in all cases included. Operation time ranged from 30 to 60 minutes with an average of 44.2 minutes. With this method, the average hip flexion was 28 degree (range 25-35 degree). CONCLUSION: The method was found easier for the access to the entry point in obese patients. The method was also found easier in high subtrochanteric fracture in term of the access to the entry point and the reduction of the fracture.



**Date : 2008-08-27**

**Session : Trauma: acetabular and proximal femoral fracture**

**Time : 1100-1215**

**Room: 608**

**Abstract number : 19187**

**SPS FREE BLOCK 3.5 - MINIMALLY INVASIVE TECHNIQUE FOR FEMORAL FRACTURES**

Marcos MUSAFIR, João GASPAR

*Sociedade Brasileira de Ortopedia e Traumatologia, Sao Paulo (BRAZIL)*

Rio de Janeiro has a significant number of polytraumatized patients related to its population of 18 million inhabitants, the traffic jam, the growing construction industry and other high energy situation, are the cause of many femoral fractures. Understanding the problem and the costs of the femoral shaft surgical treatment, Bio Mecanica, a Brazilian and International well credited implants manufacturer built this system to help the surgeons to offer a costly option for the surgical femoral fracture treatment in adults. The concept of the implant include the possibility of block the screw at the low contact plate with free angulations option, because the screw has a locking ring , values that improve the stability, reduce the Loosening Index, and the risks of fracture after plate removal. The kits were submitted to biomechanical tests including Flexion, Fatigue and Pull-Out-Test, with good results that will be shown. The indications are the femoral shaft fractures, high energy trauma, open fractures grade 1, and after the stabilization using damage control orthopedics for the patient. The surgical technique, cases and images will be shown, concluding that this is a safe implant, with good and excellent results in 88% of the cases.

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 1**

**Time : 1400-1530**

**Room: 608**

**Abstract number : 15827**

**SURGICAL EXPERIENCE AND FUNCTIONAL OUTCOME IN TREATMENT OF PROXIMAL TIBIA FRACTURES USING THE LISS PLATING**

Umesh NAGARE, Mohammad MAQSOOD

*Lincoln County Hospital, Lincoln (UNITED KINGDOM)*

**OBJECTIVE:** To summarize the surgical experience and clinical results of the first 78 fractures of the proximal tibia treated with the Less Invasive Stabilization System. **DESIGN:** Retrospective analysis of prospectively enrolled patients into a database. **SUBJECTS/PARTICIPANTS:** Seventy-two consecutive patients with 78 proximal tibia fractures (AO/OTA type 41 and proximal type 42 fractures) treated by 2 surgeons. Seventy patients with 72 fractures were followed until union. The mean follow-up was 16 months (range: 3-30 months). There were 67 closed fractures and 5 open fractures. **INTERVENTION:** Surgical reduction and fixation of fractures, followed by rehabilitation. **MAIN OUTCOME MEASUREMENTS:** Perioperative and postoperative complications, postoperative alignment, loss of fixation, time to full weight bearing, radiographic union, and range of motion. **RESULTS:** Seventy of 72 fractures healed without major complications (96%). There were 2 nonunions. Other complications included a superficial wound infection. The mean time for allowance of full weight bearing was 15 weeks (range: 12-21 weeks), and the mean range of final knee motion was 1 degrees to 122 degrees. **CONCLUSIONS:** The LISS provides stable fixation and early mobilisation (97%), a high rate of union (97%), and a low (2%) rate of infection for proximal tibial fractures. The technique requires the successful use of new and unfamiliar surgical principles to effect an accurate reduction and acceptable rate of malalignment.

**Date : 2008-08-27**  
**Session : Trauma: fractures around the knee 1**  
**Time : 1400-1530**  
**Room: 608**

**Abstract number : 16096**  
**HYBRID ILIZAROV. A SOLUTION FOR DIFFICULT NONUNIONS OF FEMUR**  
Ranjit Kumar BARUAH  
*Assam Medical College, Dibrugarh (INDIA)*

**INTRODUCTION:** Long standing nonunions are difficult to treat being associated with varieties of problems. Ilizarov offers the best solution to global problems of difficult nonunions. We aim at evaluating the results of Hybrid Ilizarov in difficult nonunions of femur between 1994 and 2005. **MATERIALS:** 24 males and 6 females, aged 3-65 years, were included. Patients were divided into two Groups. Group A - Infected nonunion having 24 cases. Causes of infection were Open fractures following RTA in 18 cases, Infected osteosynthesis in 6 cases. Group B - Non infected nonunions having 6 cases with gross comminution, displacement following fall. **METHODS:** Group A cases were treated by radical debridement and finally as Atrophic Aseptic nonunion with bone defect (ASAMI) with Bifocal osteosynthesis. Group B cases were treated by bifocal osteosynthesis with appropriate corticotomy to align limb for rotation, angulation and shortening. 5mm Half pins with short threads to give radial preload were inserted following Stewart Green protocol, in splaying placement manner in Proximal and shaft and "A mounting" in distal third. **RESULTS:** Results were evaluated with 18 months to 6-year follow-up. Infection eradication and Union was 100%. Complications like Interposition of soft tissue [4%], Grade III Pin Tract Infection [2%], Hyporegenerate [11%] were seen. **DISCUSSION AND CONCLUSION:** Ilizarov has shown predictable result in difficult nonunions of Femur in terms of union and eradication of infection offering one stage solution to global problems associated with such cases, allowing early weight bearing during treatment. It produces regenerate without bone graft.

Date : 2008-08-27

Session : Trauma: fractures around the knee 1

Time : 1400-1530

Room: 608

Abstract number : 16172

**ARE INCREASING NAILING NUMBERS A SIGNIFICANT TREND IN AN INDUSTRIALISING SOCIETY? A 10-YEAR AUDIT OF TRAUMA OPERATIONS FROM A CALCUTTA HOSPITAL**

Arindam BANERJEE<sup>1</sup>, Rajiv CHATTERJEE<sup>2</sup>, Arindam GANGULY<sup>2</sup>

<sup>1</sup>Westbank and BP Poddar Hospitals, Calcutta (INDIA), <sup>2</sup>Westbank Hospital, Calcutta (INDIA)

We looked at 3000 operations performed for trauma from a Calcutta hospital over a 10-year period (1998-2007) and analysed the change in the operative mix. Long bone diaphyseal fractures are naturally on the rise in an industrialising country. Increasing number of nailings relative to plating or closed manipulations is also an obvious trend. Nailing requires more physical infrastructure, skilled manpower and financial resources than either plating or closed manipulation. Our first nailing was in 2000 and since then over 300 have been performed. Previously nailing was mainly femoral, tibial or humeral but usage of TENS, PFN and DFN are increasing. Our audit of the nails performed shows that males between 20 and 60 years comprised nearly 60% of patients. Nearly 40% involved the tibia and 80% procedures were done under regional anaesthesia. Males predominated 3:1, and the right side 3:2. Around 20% had other ORIF and 6% had more than one nail inserted. 12% patients were involved in polytrauma while 16% had significant soft tissue injuries needing plastic surgery. Complications include infection (3%), metal failure (3%) and nonunion needing exchange nailing 2%. 1 patient died after postoperative ARDS. Most complications involved humeral nails and TENS. The rise in nailing numbers signifies the increasing high speed accidents in India as well as the availability of better medical infrastructure allowing it to cope. This change happened in the West in the late eighties. The pendulum may however swing back worldwide if locking plates and MIPPO become more popular.

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 1**

**Time : 1400-1530**

**Room: 608**

**Abstract number : 16361**

**MINIMALLY INVASIVE PLATE OSTEOSYNTHESIS OF SUBTROCHANTERIC FEMUR FRACTURES WITH A LOCKING PLATE**

Chang-Wug OH<sup>1</sup>, Jong-Keon OH<sup>2</sup>, Joon-Woo KIM<sup>1</sup>, Byung-Chul PARK<sup>1</sup>

<sup>1</sup>*Kyungpook National University Hospital, Daegu (KOREA),* <sup>2</sup>*Korea University Guro Hospital, Seoul (KOREA)*

Subtrochanteric femur fracture is a challenging injury to treat. This is a series of 16 patients with subtrochanteric fractures, who were treated by the minimally invasive plate osteosynthesis (MIPO) technique using LCP-DF (locking compression plate-distal femur) in reverse. There were two type A, 8 type B, and 6 Type C fractures, according to the AO-OTA classification. There were 11 men and five women with a mean age of 49.6 years. Union occurred without bone graft in all cases, at an average of 20.4 weeks (16 to 28). The mean follow-up was 22 months (13 to 42). There were no major complications such as nonunion, metal failures, or infection. An acceptable alignment was achieved in all patients, except two of minor deformity of internal rotation less than 10°. There was a femoral shortening of 1cm in comminuted fracture. All patient showed good or excellent functional results with the median Merle d'Aubigne score of 17.3 (15 to 18). Locking plate provides an alternative method of MIPO technique for subtrochanteric femur fractures. It provides a stable fixation, with a high union rate and a minimal complication rate.

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee I**

**Time : 1400-1530**

**Room: 608**

**Abstract number : 16608**

**THE Y-NAIL AS THE ENDOPROSTHESIS OF THE FEMUR**

Sergey SERGEEV<sup>1</sup>, Oleg GRISHANIN<sup>2</sup>, Vladimir MATVEEV<sup>2</sup>, Andrey FUTRIK<sup>2</sup>

<sup>1</sup>*Russian Friendship University, Moscow (RUSSIAN FEDERATION)*, <sup>2</sup>*Hospital 20, Moscow (RUSSIAN FEDERATION)*

The osteosynthesis of the femur fractures is the most difficult task for making a decision: when after trauma, how? Now we are writing about isolated fractures and especially in the proximal part of the femur. It is clear that the proximal part is the multiple biomechanical structure, demanding the restoration of anatomy and decreasing strain forces. We consider that the advantages of Y-nail osteosynthesis are in its stress sharing capability. The short (trochanteric) and long version of the Y-nails recover all indications for osteosynthesis of the femur fractures: per- and subtrochanteric, ipsilateral and multifragmental types. In addition, the pathological fractures and osteoporotic fractures with low quality of the bone are the absolute indications for this osteosynthesis. Our surgery tactic was based on the experience of 150 operations. We used the short Y-nail as the endoprosthesis in A1-2 cases, when the long version is an implant of choice for subtrochanteric, ipsilateral and pathological types of fractures. The complication rate is low. Only one patient had septic wound, one nonunion and one cut-out of the lag-screw. The closed technique and full fit placement of the nail are the advantages in the rehabilitation of the patients.

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 1**

**Time : 1400-1530**

**Room: 608**

**Abstract number : 17190**

**EXTREME COMPLICATIONS OF FIXION NAIL IN TREATMENT OF LONG BONE**

Hayati OZTURK<sup>1</sup>, Tansel UNSALDI<sup>1</sup>, Zekeriya OZTEMUR<sup>1</sup>, Okay BULUT<sup>1</sup>, Murat KORKMAZ<sup>2</sup>, Hüseyin DEMIREL<sup>3</sup>

<sup>1</sup>*Cumhuriyet University School of Medicine, Department of Orthopaedics and Traumatology, Sivas (TURKEY)*, <sup>2</sup>*Cevdet Aykan Government Hospital, Tokat (TURKEY)*, <sup>3</sup>*Susehri Government Hospital, Sivas (TURKEY)*

The long bones with application of the Fixion expansion intramedullary nail in a total of 48 surgeries. We have encountered six (12.5%) extreme complications in the management of fractures of 3 humeral, 2 tibial, and 1 femoral bones during its application procedure and postoperative follow-up. Of six cases, two with humeral and tibial fractures developed nonunion and rotational instability because of failure of inflation of the Fixion nail. One of the Fixion nail in humerus was broken spontaneously, and one of the Fixion nail deflated at the follow-up and pseudoarthrosis developed in this patient. In a patient with osteogenesis imperfecta, during the inflation of the nail for the treatment of femur fracture, a new longitudinal fracture occurred and conventional non-locking intramedullary nail was inserted. In a patient with a tibia fracture that was treated with the Fixion nail, new fracture occurred due to its bending after weight bearing in the postoperative period. The Fixion nail application is a new technique for the intramedullar fixation of long bones. It is considered as an effective method for the selective fracture types of long bones. Application may need special training. Since the Fixion has not got rotational stability and rigidity as conventional nailing systems, bending and breaking of the nail may occur during postoperative period in patients with over obesity and peractivity. In patients with osteogenesis imperfecta, it may not be the first choice as a nailing system.

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 1**

**Time : 1400-1530**

**Room: 608**

**Abstract number : 17384**

**THE TREATMENT OF TIBIAL PLATEAU WITH MINIMAL INCISION**

Andrei PRUNDEANU, Sabian POPA, Mihai GAVRILA, Stefan CRISTEA

*Emergency Hospital St Pantelimon, Bucharest (ROMANIA)*

**INTRODUCTION:** The fractures of the tibial plateau necessitate a perfect alignment because they have joint trajectory. It is difficult to treat these fractures, especially type 5 and type 6 Schatzker. Beside the standard treatment with one or two plates and screws, we used the reduction of the fracture's fragment with K wire under RX control and we fixed the fragments with K wire and screws. **MATERIAL AND METHOD:** We used this technique for the treatment of 160 tibial plateau fractures. We used Schatzker classification for their identification. For this technique we used different kind of materials: K wire, screws, external fixation, cast, fluoroscope, and arthroscopy. **DISCUSSION AND RESULTS:** First of all it is important to establish the fracture's type. It is essential in the preoperative diagnosis the laboratory investigation; radiological, and CT scan. The preoperative planning is necessary. The advantages of this method are: minimal blood loss, small infection rate, good mobilisation of the knee without pain. We used a single dose of antibiotics during surgery, and anticoagulant. **CONCLUSION:** This kind of fracture has a joint trajectory and requires perfect alignment of fracture's fragments. We consider this technique useful for the treatment of this kind of fracture and in most cases we have good outcome.



**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 1**

**Time : 1400-1530**

**Room: 608**

**Abstract number : 17752**

**PROBLEMS CONCERNING THE DIAGNOSIS AND TREATMENT OF TIBIAL PLATEAU FRACTURES**

Mihail NAGEA<sup>1</sup>, Olivera LUPESCU<sup>2</sup>, Cornelia VASILACHE<sup>1</sup>, Dorian LUPESCU<sup>3</sup>

<sup>1</sup>*Emergency Hospital, Bucharest (ROMANIA)*, <sup>2</sup>*University of Medicine and Pharmacy, Emergency Hospital, Bucharest (ROMANIA)*,

<sup>3</sup>*University of Medicine and Pharmacy, Bucharest (ROMANIA)*

**PURPOSE:** The tibial plateau fractures are difficult to treat due to their aspect, which is often comminuted and due to the impact on the function of the knee. Surgery has to restore local anatomy and to allow early rehabilitation, meaning proper evaluation and stabilization of the fracture. **MATERIAL AND METHOD:** 26 cases, operated between 01.01.2000-01.06.2005 (mean age 27-58 yrs) with tibial plateau fractures, were analysed. Pre-operative planning using CT scan was used. The fractures were stabilized with plates and screws, and additional suspension of articular surface using 2-3 Kirschner wires was used. Cancellous bone graft was used in 2 cases. The patients were monitored at 1, 2, 6, 12 and 24 months post-operatively, concerning: bone healing, restoring of the axis of the knee, joint mobility. **RESULTS:** The axis of the knee was completely restored in all cases. Bone healing appeared in all patients (starting from 2 months - 8 cases, at 3 months in the rest of the fracture) depending on the initial aspect of the fracture. Flexion of the knee was limited in 9 cases (35% of patients) and extension was affected in 4 patients, depending, also, on the initial characteristics of the fracture. **CONCLUSIONS:** Results after surgery for tibial plateau fractures depend on the initial aspect of the fracture, but also on the results of surgery. The method proposed by the authors, which allows the suspension of the articular surface, is valuable especially when the fracture is comminuted and has small fragments.

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 1**

**Time : 1400-1530**

**Room: 608**

**Abstract number : 17756**

**LONG-TERM RESULTS AFTER PARACORTICAL OSTEOSYNTHESIS FOR DISTAL FEMORAL FRACTURES**

Gheorghe Ion POPESCU, Olivera LUPESCU, Mihail NAGEA, Cristina PATRU

*Emergency Hospital, Bucharest (ROMANIA)*

**PURPOSE:** The authors analyse long-term results after surgery for distal femoral fractures and identify the factors influencing their prognosis. **MATERIAL and METHOD:** 75 patients operated between 1.01.2002-1.01.2005 were included in this retrospective study and organised according to AO criteria: - group 1 - extra-articular - type 33A- 25 cases; - group 2 - partial articular - type 33B - 15 cases; - group 3 - total articular - type 33C - 35 cases. Surgery consisted of open reduction and osteosynthesis using plates and screws, 95 degrees angled blades, retrograde nails and DCS. A 24-month follow-up was performed, in order to identify the incidence of: knee stiffness and osteoarthritis, deviations of mechanical axis, pseudarthrosis and septic complications. **RESULTS:** The frequency of the complications is different between groups, increasing from fractures type 33A to fractures type 33C. When different methods were used inside the same group, the results did not depend on the type of synthesis. **CONCLUSIONS:** Late results after surgical treatment for distal femoral fractures depend on the type of the fracture; these results are worse for compound and articular fractures. Surgical treatment of these fractures is difficult, as a stable osteosynthesis must be achieved, respecting local biological resources.

Date : 2008-08-27

Session : Trauma: fractures around the knee 1

Time : 1400-1530

Room: 608

Abstract number : 17958

**HOW DOES THE CONDYLAR SCREW CONFIGURATION AFFECT THE STABILITY IN THE USE OF LCP-DF?: A BIOMECHANICAL STUDY**

Jong-Keon OH<sup>1</sup>, Kyung-Je KWON<sup>2</sup>, Jin-Ho WHANG<sup>3</sup>, Sung-Jae LEE<sup>4</sup>

<sup>1</sup>Department of OS, Guro Hospital, Korea University, Seoul (KOREA), <sup>2</sup>Dept. of Biomedical Engineering, Inje University, Gimhae (KOREA), <sup>3</sup>Department of Orthopedic Surgery, Guro Hospital, Korea University, Seoul (KOREA), <sup>4</sup>Dept. of Biomedical Engineering, Inje University, Gimhae (KOREA)

LCP-DF has six locking holes on its distal head. But in some 33 A3 fractures, the authors could not place all six screws due to collision between lag screws used for articular reconstruction and the locking screws. Little is known how much decrease we should expect when we miss some holes for the fixation of articular block. The purpose of this biomechanical study is to identify the change in stiffness according to the articular screw configuration in the use of LCP-DF. We have developed the validated finite element (FEM) model. We simulated 33 A3 unstable fracture model with 4cm defect over the supracondylar level. We applied combined eccentric compressive load of 1,610 N and 7Nm of torsional force simultaneously over the femoral head to simulate the loading condition in slow walking. For the shaft fixation three locking screws were placed. For the articular fixation we have simulated 4 groups. In Group 1 all six holes are fixed with screws. Group II simulates the situation where only one locking hole is not filled with a locking screw. There are 6 subgroups in Group II depending on the location of missing hole. In Group III four screws are fixed and 15 subgroups were simulated. In Group IV only three screws are placed and 20 subgroups were simulated. There was 1.8% decrease in stiffness in Group II, 4.5% in Group III, 8.8% in Group IV respectively. These data can be used for the development of the necessity of dual plating. This study was supported by a grant of the Korea Health 21 R&D Project, Ministry of Health and Welfare, Republic of Korea. (A060465)

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 1**

**Time : 1400-1530**

**Room: 608**

**Abstract number : 18039**

**HYBRID FIXATION OF SCHATZKER'S TYPE V & VI TIBIAL PLATEAU FRACTURES: A 10-YEAR STUDY**

S K MUKHERJEE, A VERMA

*Pt JNM Medical College & Dr B R Ambedkar Hospital, Raipur (INDIA)*

**INTRODUCTION:** Despite many advances in the care of intra-articular fractures, tibial plateau fractures continue to be a difficult surgical problem. Recently, more attention has been paid to the condition of soft tissue envelope before surgical intervention. Soft tissue friendly approaches, delayed internal fixation and minimally invasive techniques have all recently improved outcomes following these injuries. **METHODS:** From October 1997 to December 2007, 101 patients (95 males, 6 females with mean age of 34 years) of tibial plateau fractures were operated out of which 23 were Type V (22 males, 1 female) and 21 (all males) were Type VI fractures. All patients were operated by closed reduction, percutaneous cannulated cancellous screw fixation of articular fragments and supplementary tubular type external fixator application under image intensifier control on a fracture table. Follow-up was based on radiographic evaluation (union, implant position & maintenance of reduction) and Rasmussens' Knee score. **RESULT:** With acceptable post op. complications and no case requiring a re-operation, we report an 80% excellent or good outcome using this modality. **CONCLUSION:** Percutaneous cannulated cancellous screw fixation supplemented by external fixation entails minimal soft tissue dissection and provides the ability to alter frame stiffness and thus control compression across fracture fragments. This proves invaluable in cases of delayed or nonunion in the metaphyseal region. This modality allows a short hospital stay, reduced period of recumbency, early joint mobilisation and thus reduces the morbidity in these patients while achieving fracture healing with excellent functional outcome.

**Date : 2008-08-27**  
**Session : Trauma: fractures around the knee 2**  
**Time : 1600-1730**  
**Room: 608**

**Abstract number : 15825**

**MIPPO TECHNIQUE FOR MANAGEMENT OF PROXIMAL TIBIAL FRACTURES - RESULTS OF SINGLE CENTRE STUDY**

Umesh NAGARE, Aroop SEN, Mohammad MAQSOOD, Vikas SHARMA  
*Lincoln County Hospital, Lincoln (UNITED KINGDOM)*

MIPPO (minimally invasive percutaneous plate osteosynthesis) was described for metaphyseal or combined metaphyseal-articular fractures of the proximal tibia. Surgical management is often complicated by the initial soft tissue damage, malalignment, remaining instability, or infection. In this prospective study, we describe the importance of diagnostic procedures for preoperative planning. These include plain radiographs and CT scans in case of articular fracture components. The techniques for temporary stabilization and definitive fracture care using LCP, and LISS (Less Invasive Stabilization System) by limited medial incisions are described in a stepwise protocol. From 2003 to 2007, thirty-six fractures in thirty-six patients were studied. According to the AO classification, there were different types of fractures. All patients had an intact medial soft tissue coverage for surgical approach. A LISS was used in twenty-eight patients. The average time to healing was between 12 and 20 weeks postoperatively. There was no delayed healing, pseudarthrosis, recurrent fracture or late infection. None of the cases needed bone grafting. At the most recent follow-up, all patients were bearing full weight without walking aids. All cases achieved a neutral alignment and satisfactory range of movement. After this study we would like to propagate a single lateral approach and minimally invasive osteosynthesis as a sufficient and subtle technique for stabilization of these complicated fractures.

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 2**

**Time : 1600-1730**

**Room: 608**

**Abstract number : 16063**

**MANAGEMENT OF PEDIATRIC FEMORAL SHAFT FRACTURES BY TITANIUM ELASTIC NAILING**

Veerappan VEERIAH, Krishnagopal RAMAMOORTHY

*Mahatma Gandhi Medical College & Research institute, Pondicherry (INDIA)*

AIM: To study the outcome of paediatric femoral shaft fractures treated with titanium elastic nails. MATERIALS AND METHODS: Fifteen cases of paediatric femoral shaft fractures were taken up for study. The period taken up for study is from September 2005 to August 2007. Among the 15 children, 11 were males and 4 were females. The age ranged from 5 to 12 years. The radiological picture was transverse in 9 cases, oblique in 4 cases and spiral in 2 cases. The mid shaft was involved in 11 cases, upper shaft in 2 cases, and lower 3rd shaft in 2 cases. Duration between injury and surgery ranged from 2 to 8 days. RESULTS: Out of the 15 cases, 8 were excellent, 5 were good, one was fair and one was poor. DISCUSSION: According to John M.Flynn Division of Orthopaedics, Childrens Hospital of Pennsylvania, Philadelphia, 83 were enrolled over a period of three years. Among titanium treated groups, 8 had nail entry irritation; among these 6 were minor and 2 had major involvement but none had developed deep infection. 89.83% were excellent, 6.5% were fair and 4.16% were poor. In our study we had 86.6% excellent, 6.6% were fair and 6.6% were poor. CONCLUSION: Titanium elastic nailing is currently the most popular method for treating fractures of the shaft of the femur in children of school age. Though the sample size is less, our study has confirmed that the outcome after treatment is excellent in most patients.

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 2**

**Time : 1600-1730**

**Room: 608**

**Abstract number : 16066**

**HEMIARTHROPLASTY USING A STANDARD CEMENTLESS PROSTHESIS IN ELDERLY DEBILITATED PATIENTS WITH AN UNSTABLE FEMORAL FRACTURE IN THE TROCHANTERIC REGION**

Ioannis PSYCHARIS, Georgios KECHAGIAS, Georios KOLOBOS, Gabriel PPADAKOS

*General Hospital of Kalamata, Kalamata (GREECE)*

**INTRODUCTION:** To evaluate the results of patients with an unstable fracture in the trochanteric region, who were treated by this type of hemiarthroplasty. **METHODS:** During a 3-year period 130 patients - 98 female and 32 male - with an average age of 82 years, who had an AO type A2 trochanteric fracture and severe osteoporosis (Singh 1-3) were treated in our hospital. A standard cementless unipolar or bipolar rectangular tapered shape endoprosthesis was inserted. Non ambulated patients were precluded. **RESULTS:** The mean operative time was 30 (20-40 min) and the mean hospital stay 7 (6-9) days. Six patients were missed to follow-up, while 122 patients were followed for a minimum of three months. Ninety-nine patients (81%) achieved immediate full weight-bearing mobilisation. Six patients (5%) never walked again. Seventeen patients died within the first six postoperative months. **DISCUSSION/CONCLUSION:** It is concluded that for elderly and debilitated patients with an unstable trochanteric fracture, hemiarthroplasty with a standard prosthesis without cement is an alternative to osteosynthesis or calcar replacement hemiarthroplasty, decreasing operative time, blood loss, implant failure, re-operations, morbidity rates and the overall cost of treatment.

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 2**

**Time : 1600-1730**

**Room: 608**

**Abstract number : 16095**

**CAN EXTERNAL FIXATOR BE AN ALTERNATIVE SOLUTION FOR DIAPHYSEAL FRACTURE OF FEMUR IN CHILDREN OF 5-12 YEARS OF AGE?**

Ranjit Kumar BARUAH

*Assam Medical College, Dibrugarh (INDIA)*

**INTRODUCTION:** Higher complication rate after conservative treatment encouraged surgical treatment to be popular in diaphyseal fracture of femur in 5 to 12 years children. External Fixator used in such fractures yielded mixed results. We report our results of external fixator in such cases from 2002 to 2005. **MATERIALS:** 21 male and 9 female children, aged between 5 and 12 years, were included in the study. 17 had fall and 13 RTA. 8 were oblique, 13 transverse and 9 comminuted. All cases were closed and 5 had abrasions. **METHODS:** Cases were operated under General anesthesia and X-ray control. 4.5mm Schanz screws, 2 in each fragment, were inserted following the protocol of Stewart Green. Unaided weight bearing started at 3 weeks. Meticulous postoperative Pin tract care was taken. Average hospital stay was 4 days. Fixator removed after clinical and radiological healing. **RESULTS:** All cases united at about 8.5 weeks (average). 2 cases had PTI. There was no malunion and significant shortening. Restrictions of ROM at hip and knee joint, evident initially, had full recovery after 1 year. One case had refracture 3 weeks after fixator removal. **DISCUSSION AND CONCLUSION:** The major concern with external fixator, Pin tract infection, can be reduced with strict protocol. Fracture through pin sites and peri fixator fractures that have made the fixator to fall out of favour in this type of fracture were not seen. We conclude that external fixator yields satisfactory result in diaphyseal fractures of femur in 5-12. It is minimally invasive and entails less radio exposure.



**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 2**

**Time : 1600-1730**

**Room: 608**

**Abstract number : 16433**

**RESULTS OF UNILATERAL LOCKED SCREW PLATING OF BICONDYLAR TIBIAL PLATEAU FRACTURES**

Umesh NAGARE, Mohammad MAQSOOD, Vikas SHARMA

*Lincoln County Hospital, Lincoln (UNITED KINGDOM)*

We retrospectively followed a case series of 66 patients with 60 AO/ASIF 41-C-type fractures treated with the Less Invasive Stabilization System for the proximal lateral tibia. We assessed malreduction, secondary loss of reduction and infection rates in patients with a locked screw plate for unilateral fixation of bicondylar fractures. A case series of patients with AO/ASIF 41-C type fractures treated with the less invasive stabilization system for the proximal lateral tibia (LISS PLT) were prospectively followed-up until 12-15 months after surgery. Malreduction and malalignment were defined as an intra-articular step-off of 2mm or more or as a malalignment in the frontal or sagittal plane of more than 5 degrees. Seventy-five (93%) patients returned for final follow-up. Malreduction and malalignment were defined as an intra-articular step-off of 2mm or greater, or as a malalignment in the frontal or sagittal plane greater than 5 degrees. All injuries were closed. Primary bone grafting was done in 10 patients. Unilateral locked screw plating is a good alternative for treatment of problematic fractures of the tibial plateau that are associated with soft tissue damage and metaphyseal comminution. The reduction technique for exact alignment is demanding.

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 2**

**Time : 1600-1730**

**Room: 608**

**Abstract number : 16520**

**TREATMENT OF TIBIAL PLAFOND FRACTURES USING ILIZAROV EXTERNAL FIXATOR**

Mohamed FADEL<sup>1</sup>, Gamal HOSNY<sup>2</sup>

<sup>1</sup>*El-Minia University Hospital, Cairo (EGYPT)*, <sup>2</sup>*Benha University, Cairo (EGYPT)*

**INTRODUCTION:** Fractures of the tibial plafond represent 10% of all lower extremity fracture. It is a challenging condition and their treatment remains controversial. **AIM OF THE WORK:** In this study we evaluate the use of Ilizarov external fixator in tibial plafond fractures. **PATIENTS AND METHODS:** Thirty tibial plafond fractures fractures with a mean age of 36.5 years (range 20:72) were treated between March, 1996 and 2005. Eighteen patients were associated with other bony fractures. The patients were assessed clinically and radiologically and the bone fixed with Ilizarov external fixator. In open fractures the wound was explored, copiously irrigated, debrided, before application of the fixator. Healing in all fractures was obtained and the mean duration of Ilizarov fixation was 15.7 weeks ranging from 8 to 38 weeks. The mean follow-up period was 28.5 months (range 30:60). Bone grafting was needed in 3 patients at the same time of the operation. Pin tract infections occurred in all cases. They were treated with short course of local and or systemic antibiotics, skin release in 4 (under local anaesthesia), removal of 3 (without anaesthesia), and replacement of 5 (under general anaesthesia). **RESULTS:** The results of the 30 patients were 7 excellent, 15 good, 5 fair and 3 poor. **CONCLUSION:** In this study, we conclude that the use of Ilizarov external fixator provides immediate fracture stability and early weight-bearing and rehabilitation, with fewer complications.

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 2**

**Time : 1600-1730**

**Room: 608**

**Abstract number : 16750**

**PREOPERATIVE ESTIMATION OF INTRAMEDULLARY NAIL LENGTH USING INDIRECT MEASUREMENTS**

Lalit MAINI, Harpreet SINGH, P YUVARAJAN, VK GAUTAM

*Maulana Azad Medical College, Delhi (INDIA)*

**INTRODUCTION:** Preoperative estimation of intramedullary nail length is required to have a correct range of nail lengths available in the operation theatre. Most methods of estimating nail length require intact contralateral limb and are not useful for bilateral fractures, opposite side amputation or grossly comminuted fractures (for on table estimation). In the literature, method for estimation of tibial nail length using forearm references has been described for European population. Tibial and femoral length to height ratio is different in different races. This study tries to assess a simple method of estimating femoral and tibial nail lengths preoperatively using forearm measurements or height in Indian population. **METHODS:** Length of lower limb, forearm and recumbent height of 100 patients of Lok Nayak Hospital were taken. In all five such measurements of each patient were taken and were correlated with one another using linear regression. **RESULTS:** Femoral and tibial lengths showed high degree of correlation with forearm measurements, height and with one another but the correlation factor is different from that described in literature for the European population. **DISCUSSION:** The results suggest that forearm measurements and height can be used to preoperatively estimate femoral and tibial nail lengths in Indian population too, but the correlation factor is different from that of the European population. As the forearm bony points are more easily palpable than their lower limb counterparts, therefore, the forearm references are easier to measure and are more accurate.

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 2**

**Time : 1600-1730**

**Room: 608**

**Abstract number : 16753**

**MEDIAL WEDGE OSTEOTOMY IN MALUNITED DEPRESSED TIBIAL PLATEAU FRACTURES: A NEW TECHNIQUE**

Lalit MAINI, P YUVARAJAN, VK GAUTAM

*Maulana Azad Medical College, Delhi (INDIA)*

Tibial Plateau fractures are one of the common injuries around knee following road traffic accidents. Most of these injuries are high velocity injuries with extensive soft tissue and bony disruption. The knee being a very sensitive joint demands a very high level of expertise and management to have a good functional outcome. Many times even in expert hands this may not be achieved. Also soft tissues conditions may not allow surgeons for operative interventions, thus resulting in malunion of the fracture leading to valgus and varus instability and deformity. Hereby we present a series of 5 cases of malunited tibial plateau fracture with medial condyle depression at initial treatment. All patients had functional disability with varus instability. All these patients were managed with open osteotomy of the medial condyle with iliac crest graft. Postoperatively, patients were put on a long leg cast for 3 weeks, followed by non weight bearing mobilisation for 4-5 weeks. At two months patients were put to partial weight bearing. At 4-month follow-up all patients showed radiological union of the osteotomy. The radiological evaluation showed correction of the full depression in 3 cases and residual depression of 2mm in 2 cases. All patients had a good range of motion at the end of treatment with improved function at the knee joint. The aim of this presentation is to highlight this simple technique of managing this complex problem which can be undertaken by every orthopaedic surgeon.

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 2**

**Time : 1600-1730**

**Room: 608**

**Abstract number : 17344**

**FISH HOOK TECHNIQUE OF EXTRACTING BROKEN INTRAMEDULLARY NAILS**

Asef ALANI, Mehool ACHARYA, Clare WILDIN

*Leicester Royal Infirmary, Leicester (UNITED KINGDOM)*

It is sometimes very difficult to remove the distal portion of a broken intramedullary fixation device. Various methods have been described ranging from modified Kuntscher reaming guides to screws or guide wires wedged into the nail cavity. In our hospital we have devised a simple, safe and cheap method for extracting the broken distal portion of femoral intramedullary nails. Once distal locking screws are removed a 2mm guide wire is fashioned to form a "fish-hook" using standard wire benders. The "fish hook" is then introduced via the greater trochanter into the intramedullary canal. The fish hook can then be passed either intramedullary & intraprosthetic or intramedullary & extraprosthetic. The fish hook is then engaged into the tip of the distal portion of the nail and pulled out in a retrograde manner. The distal portion of the broken femoral nail is removed together with the fish hook guide wire. The femoral canal can then be over reamed if necessary and a larger diameter nail inserted as required. Our Fish-Hook technique is simple, safe, cheap, and does not require specialist instrumentation. In both cases the extraction was performed with ease and the average operating time was 60 minutes. Fracture union occurred within 6-8 months in both cases we used it without any complications. The technique could be extended to include most hollow nails.

**Date : 2008-08-27**

**Session : Trauma: fractures around the knee 2**

**Time : 1600-1730**

**Room: 608**

**Abstract number : 17658**

**TO STUDY THE ROLE OF DYNAMIZATION IN TREATMENT OF DIAPHYSEAL FRACTURES OF FEMUR TREATED WITH STATIC MODE INTERLOCKING NAIL**

Sharukh DOTIVALA, Ashish SINGH, Raghav Sunil KAMMA, Pradeep REDDY, Sachin KAD

*Sancheti Institute, Mumbai, Maharashtra (INDIA)*

A retrospective study was to done to study the effects of dynamizing a static interlocking nail to promote femoral fracture healing and the adverse effects of dynamization. Twenty-two static interlocking femoral nails were dynamized at an average of two to five months (median 3 months 2 days) because of poor fracture healing. The clinical and roentgenographic healing was recorded. Significant complications were treated and studied. Twenty-two patients were followed up for at least 10 months (range 10 to 21 months). Fourteen patients (63.64%) achieved solid union with an average union period of 6 months (range 4 to 9 months). Eighteen percent (4 out of 22) had more than a 2cm femoral shortening, three of which were in cases of nonunions. The eight cases of nonunion were treated with additional surgical procedures like bone grafting and/or refixation. Dynamization is a method that can be tried to improve fracture healing in femoral fractures that show delayed union after static interlocking nailing. In our series, however, not all cases achieve union after dynamization. Patients must be examined regularly to look for significant shortening. Earlier dynamization has better results than delayed one.

Date : 2008-08-27  
Session : Joint: thromboprophylaxis  
Time : 1400-1530  
Room: Theater 1

Abstract number : 18757

**A PHASE III STUDY OF ONCE-DAILY RIVAROXABAN - AN ORAL, DIRECT FACTOR XA INHIBITOR - COMPARED WITH SUBCUTANEOUS ENOXAPARIN FOR THROMBOPROPHYLAXIS AFTER TOTAL KNEE REPLACEMENT: RECORD3**

Michael R. LASSEN<sup>1</sup>, Walter AGENO<sup>2</sup>, Tiemo J. BANDEL<sup>3</sup>, Lars C. BORRIS<sup>4</sup>, Jay R. LIEBERMAN<sup>5</sup>, Frank MISSELWITZ<sup>3</sup>, Nadia ROSENCHER<sup>6</sup>, Alexander G.G. TURPIE<sup>7</sup>

<sup>1</sup>Nordsjællands Hospital, Hoersholm (DENMARK), <sup>2</sup>University of Insubria, Varese (ITALY), <sup>3</sup>Bayer HealthCare AG, Elberfeld (GERMANY), <sup>4</sup>Aarhus University Hospital, Aarhus (DENMARK), <sup>5</sup>University of Connecticut Health Center, Farmington (UNITED STATES), <sup>6</sup>Hôpital Cochin, Paris (FRANCE), <sup>7</sup>McMaster University, Hamilton, Ontario (CANADA)

INTRODUCTION: RECORD3, a multicentre phase III study, was designed to investigate the efficacy and safety of once-daily rivaroxaban compared with subcutaneous enoxaparin for thromboprophylaxis in patients undergoing total knee replacement (TKR). METHODS: Patients scheduled to undergo TKR (N=2531) were randomised to received either rivaroxaban 10mg once daily (od; initiated 6-8 hours after surgery) or enoxaparin 40mg od (initiated the evening before surgery, then given 6-8 hours after surgery), and daily thereafter for 10-14 days. RESULTS: Rivaroxaban significantly reduced the incidence of the primary efficacy outcome (the composite of any deep vein thrombosis [DVT: symptomatic or asymptomatic detected by mandatory, bilateral venography], non-fatal pulmonary embolism [PE] and all-cause mortality), compared with enoxaparin: 9.6% and 18.9%, respectively;  $p < 0.001$ ; relative risk reduction (RRR) 49%. The incidence of major VTE (the composite of proximal DVT, PE and VTE-related death) was also significantly reduced in the rivaroxaban group, compared with the enoxaparin group ( $p = 0.016$ ; RRR 62%), as was the incidence of symptomatic VTE ( $p = 0.005$ ). The incidence of bleeding events were similar in both groups (major bleeding: 0.6% rivaroxaban and 0.5% enoxaparin; on-treatment bleeding: 4.9% and 4.8%, respectively; haemorrhagic wound complications [the composite of excessive wound haematoma and surgical-site bleeding]: 2.1% and 1.9%, respectively). No deaths or PEs occurred in the rivaroxaban group during the active study period, and two deaths and four PEs occurred in the enoxaparin group. CONCLUSION: Rivaroxaban was significantly more effective than enoxaparin for the prevention of VTE after TKR, with a similar, low rate of bleeding.

Date : 2008-08-27

Session : Joint: osteotomies around the knee + misc

Time : 1600-1730

Room: Theater 1

Abstract number : 16173

**INCIDENCE AND RISK FACTORS OF FIBULAR COMPLICATIONS AFTER CLOSE WEDGE TIBIAL VALGIZATION OSTEOTOMY (TVO)**

Mira RAMANOUDJAME

*Hopital Européen Georges Pompidou, Paris (FRANCE)*

BACKGROUND: The debate on the most suitable TVO's technique still exists: close or open wedge. Each technique has its own advantages and complications. The aim of this series is the specific study of the fibular complications after close wedge TVO associated with fibular osteotomy. MATERIALS AND METHODS: 120 patients underwent a close wedge TVO with fibular osteotomy between 1990 and 2004. We did not perform any fibular osteotomy around the fibular neck. The preoperative varus mean was  $7^{\circ} \pm 4^{\circ}$ . Patients were prospectively followed up (average follow-up: 33 months). The apparition of nervous complications or fibular pseudarthrosis was then indexed. The presence or absence of fibular pseudarthrosis was studied according to: preoperative variables, the procedure and postoperative variables and statistically analysed by SPSS 10.0.5 software. RESULTS: 15 fibular pseudarthrosis were indexed (12.5%) and required surgical recovery. 3 lesions of the musculocutaneous nerve, one of the tibial nerve and two of the common fibular nerve were also noted. Three variables were statistically significantly correlated to the apparition of pseudarthrosis: low obliqueness of the osteotomy, a low postoperative fragmentary contact and a high preoperative BMI. DISCUSSION: The rate of pseudarthrosis after close wedge TVO associated with a fibular osteotomy is high. CONCLUSION: The complications of a close wedge TVO can be avoided on condition that the fibular osteotomy is performed far from the neck, oblique, and a good postoperative fragmentary contact (more than 50%) is maintained in a patient who has reduced a possible ponderal overload.



**Date : 2008-08-27**  
**Session : Joint: thromboprophylaxis**  
**Time : 1600-1730**  
**Room: Theater 1**

**Abstract number : 16193**

**PREVALENCE OF THROMBOEMBOLIC EVENTS AFTER SURGICAL TREATMENT OF PROXIMAL HUMERUS FRACTURES**

Joseph ABBOUD, Rocco BASSORA

*University of Pennsylvania Health System, Philadelphia (UNITED STATES)*

**BACKGROUND:** The objective of this prospective study was to determine the incidence of deep vein thrombosis (DVT) and pulmonary embolism (PE) following the operative treatment of patients with displaced proximal humerus fractures. We hypothesized that patients with operative proximal humerus fractures treated with aspirin thromboprophylaxis would have a low rate (<1%) of deep venous thrombosis and pulmonary embolism. **METHODS:** Sixty patients, average age 68.8 years (range 29-92), with proximal humerus fractures underwent fixation with osteosynthesis or hemiarthroplasty by one surgeon. Strict inclusion and exclusion criteria were used. Patients were prospectively followed and chemoprophylaxed with aspirin (325 mg twice a day) for 6 weeks after surgery. Duplex ultrasound of the affected arm as well as both lower extremities were performed postoperatively (range 7-21 days) to evaluate for DVT. Patients underwent a standardized physical therapy protocol and were clinically monitored for the development of any symptomatic DVT or PE for one year postoperatively. **RESULTS:** Of the 60 patients with operative proximal humerus fractures, 50 patients underwent fixation with plate osteosynthesis and ten patients underwent hemiarthroplasty. Five patients did not meet our inclusion criteria and were excluded from the study. The remaining 55 patients were treated for 6 weeks with aspirin thromboprophylaxis and underwent ultrasound monitoring for DVT. None of these patients developed a postoperative DVT or PE. Two patients excluded from the study developed a thrombus: one patient with an underlying history of malignancy developed a PE and one patient with operatively treated bilateral proximal humerus fractures developed a DVT.

**Date : 2008-08-27**

**Session : Joint: osteotomies around the knee + misc**

**Time : 1600-1730**

**Room: Theater 1**

**Abstract number : 16254**

**3 DIMENSIONAL FINITE ELEMENT MODELING OF RETROACETABULAR PATHOLOGY**

Jacob MUNRO, Vicki SHIM, Iain ANDERSON, Rocco PITTO

*Bioengineering Institute, Auckland (NEW ZEALAND)*

Total hip arthroplasty is a successful procedure performed worldwide. While long-term survival for many implants has improved over the last 40 years, the pursuit of increased implant longevity continues. Loosening of the acetabular component secondary to osteolysis remains the leading cause for revision. Biomechanical data for the pelvis in pathologic situations remains scarce. We present a unique 3D finite element model based on patient specific retro-acetabular pathology. Patients with cystic disease of the pelvis associated with THJR were identified by CT scan. Accurate 3D models of these patients were constructed and exposed to forces found in normal ambulation. Stress strain data were collected for the cancellous and cortical regions of the pelvis. Data show that, while the cortical margin remains intact, the pelvis transmits force from the lateral to medial wall in a normal manner, regardless of cancellous bone loss. When a medial wall defect occurs, there are significant decreases in cortical stress. This persists despite the degree of cancellous bone loss. Theory of bone resorption would indicate that this could lead to ongoing cortical loss. Our data suggests that the loss of medial cortical wall is more important biomechanically than retroacetabular cancellous bone loss. This may be additional information for surgeons making decisions about revision arthroplasty in the setting of retroacetabular osteolysis.

**Date : 2008-08-27**  
**Session : Joint: osteotomies around the knee + misc**  
**Time : 1600-1730**  
**Room: Theater 1**

**Abstract number : 16296**

**TAPPING TEST IN PATIENTS WITH PAINFUL BONE MARROW EDEMA OF THE KNEE**

Nicolas AIGNER<sup>1</sup>, Roland MEIZER<sup>1</sup>, Elisabeth MEIZER<sup>2</sup>, Christian RADDI<sup>1</sup>, Franz LANDSIEDL<sup>1</sup>

<sup>1</sup>Orthopaedic Hospital Vienna-Speising, Vienna (AUSTRIA), <sup>2</sup>Medical University of Vienna, Vienna (AUSTRIA)

**BACKGROUND:** Although bone marrow edema (BME) of the knee is a common phenomenon, physical tests to diagnose this condition have not been investigated so far. We hypothesized that a mallet test would be useful as a diagnostic aid as well as a screening tool. **METHODS:** 70 patients (36 female, 34 male) were investigated in this controlled study. Group 1 consisted of patients with painful BME in the knee and group 2 of patients with a painful knee without BME. Pain provoked by a reflex mallet was assessed for each quadrant on a visual analog scale (VAS). **RESULTS:** The VAS score was 3.7 ( $\pm 2.1$ cm) for quadrants affected by BME (group 1), 1.59 ( $\pm 1.44$ ) in non-affected quadrants of the knee affected by BME (group 1) and 0.85 ( $\pm 0.85$ ) in painful knees without BME (group 2). Pain on the tapping test was significantly correlated with the presence of BME in the affected knee ( $p < 0.0001$ ) as well as with the affected quadrant ( $p < 0.0001$  for the medial femoral condyle and the medial femoral plateau). Implicating a threshold value of VAS 2.0 for a tapping test to be positive in the distinction of BME affected quadrants of group 1 and all quadrants of group 2 sensitivity was 90.4%, specificity 83.7%, positive predictive value 73.4% and negative predictive value 94.6%. **CONCLUSION:** The tapping test is a good screening instrument to diagnose BME in the knee.

Date : 2008-08-27

Session : Joint: osteotomies around the knee + misc

Time : 1600-1730

Room: Theater 1

Abstract number : 16581

**SATISFACTION OF PATIENTS WHO UNDERWENT CONSECUTIVE HIGH TIBIAL OSTEOTOMY OPERATIONS FOR BOTH LIMBS, WITH DIFFERENT TECHNIQUES**

Kerem AYDIN, Sarper GURSU, Bilal DEMIR, Timur YILDIRIM, Vedat SAHIN

*Baltalimani Metin Sabanci Bone and Joint Diseases Education and Research Hospital, Istanbul (TURKEY)*

AIM: In this study we aimed to evaluate the results of High Tibial Osteotomy (HTO) operations of patients who had Open Wedge Osteotomy (OWO) on one side and Tibial Dome Osteotomy (TDO) on the other side. METHODS: In our hospital 296 consecutive patients (327 knees) underwent HTO operation between January 2002 and January 2007. Among these patients, 31 were operated on both sides. 5 of these patients had TDO on one side and OWO on the other side. One of them was male and 4 were females. The mean age at the time of surgery was 53.7 (41-61). Anatomical axis was used to determine the degree of the preoperative varus deformity and the valgus produced postoperatively. The mean preoperative femorotibial angle was 4.4 degrees of varus in the TDO group and 4.4 also in the OWO group. RESULTS: The mean valgus alignment angle produced postoperatively was 8.8 in the TDO group and 5.6 in the OWO group. After a mean follow-up of 3.2 years all the patients were asked to say the side with better function and less pain. 4 of them did not have any problems with the TDO side but had slight pain on the OWO side. Only one patient was satisfied with both sides. The first 4 patients stated that they would ask for the TDO procedure for their contralateral knees if they had a chance. CONCLUSION: TDO procedure provides more satisfactory results for patients when compared to OWO technique.

**Date : 2008-08-27**  
**Session : Joint: osteotomies around the knee + misc**  
**Time : 1600-1730**  
**Room: Theater 1**

**Abstract number : 17251**

**INTRA-ARTICULAR/PERIARTICULAR CYSTIC LESIONS OF THE KNEE**

Mandeep DHILLON, Akshay GOEL, Sharad PRABHAKAR

*Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh (INDIA)*

Periarticular cystic lesions of the knee are mostly associated with meniscus tears, bursitis or popliteal fossa swellings. Completely intra-articular cysts/ganglia are rare, and may be incidental discoveries on MRI. They have been found in various locations such as on the anterior or posterior cruciate ligaments, in the infrapatellar fat pad, on the posterior wall of the posteromedial compartment and (very rarely) in connection to the menisci. **MATERIALS:** We analysed 3500 consecutive arthroscopies, and found a significant incidence of cystic lesions. There were 7 patients with intra-articular cysts/ganglia in relation to cruciates, 28 cystic swellings associated with menisci, and 1 large calcified popliteal cyst. ACL cysts were commonly attached to the anterior aspect, with extension either into the fat pad or in relation to intermeniscal ligament; in 2 patients cysts were located between the ACL and PCL. The clinical presentation of intra-articular ganglion cysts varied according to its location in the joint. The MR appearance of intra-articular ganglion cyst was characteristic, with low T1-weighted signal intensity and high T2-weighted signal intensity. **DISCUSSION:** In purely intra-articular cysts minor additional pathology was found in the knee, while meniscal periphery cysts always had a degenerative or traumatic meniscal tear. The cysts related to ACL were most commonly seen in sportspersons with high impact activity. Intra-articular cysts/knee ganglia can themselves be symptomatic, and good outcomes can be expected after cyst decompression and removal.

**Date : 2008-08-27**

**Session : Joint: osteotomies around the knee + misc**

**Time : 1600-1730**

**Room: Theater 1**

**Abstract number : 17253**

**AN INNOVATIVE FIXATOR-CUM-DISTRACTOR/COMPRESSOR - ITS CLINICAL APPLICATIONS**

Zile Singh KUNDU

*PGIMS, Rohtak, Rohtak (INDIA)*

**INTRODUCTION:** We have innovated a T-shaped fixator-cum-distractor/compressor in our orthopaedics workshop. This apparatus has been utilised for the principle of "Distraction osteogenesis". **METHOD:** The apparatus consists of three portions. One is T-shaped end piece, the other is straight end piece and a central turn-buckle. The apparatus can be used distractor as well as compressor as per need. It has been utilised for: limb lengthening by epiphyseal plate distraction i.e. chondrodiastasis; and by callotasis (callous distraction); for high tibial osteotomy (HTO), gradual open wedge type for O.A. knee; for correction of bony deformities around knee joint, for arthrodesis of knee and ankle. It has been utilised in more 250 patients. **RESULTS:** The apparatus is quite useful and effective in majority of the cases for the purpose of distraction, stabilization of osteotomy; and for compression in cases of arthrodesis. **DISCUSSION:** The apparatus is very cost-effective (cost only 7 \$) and very easy to apply and can be well utilised even in peripheral hospitals. For HTO, limb lengthening and deformity correction it has served as good distractor and for arthrodesis a good compressor. Its simplicity makes it a versatile tool.

**Date : 2008-08-27**

**Session : Joint: osteotomies around the knee + misc**

**Time : 1600-1730**

**Room: Theater 1**

**Abstract number : 17467**

**KNEE JOINT DEFORMITIES AND THEIR CORRECTION**

Vladimir SHEVTSOV<sup>1</sup>, Natalia SAZONOVA<sup>2</sup>

<sup>1</sup>*Russian Ilizarov Scientific Center, Kurgan (RUSSIAN FEDERATION)*, <sup>2</sup>*Russian Ilizarov Scientific Center "Restorative Traumatology and Orthopaedics", Kurgan (RUSSIAN FEDERATION)*

INTRODUCTION: Knee joint deformity is a rather frequent pathology; its development is connected with anatomic variations of bone and cartilage tissues, injuries of bone growth zones and ligamentous apparatus. MATERIAL AND METHODS: We have an experience of 715 patients' treatment with knee joint deformities. At 63.4% of patients deformities were congenital, and at 36.6% - they developed after trauma and diseases. In examination of patients we used clinical, X-ray, dynamometric, biological and other methods of examination. RESULTS: In results of examinations we found out: - Deviation of the center of knee joint from biomechanical extremity axis; - In congenital deformities varus type prevails, in acquired - valgus; - In congenital etiology the deformity top is situated out of knee joint, in admitted - deformity has intra-articular localisation; - To correct deformity we use two- three-point or lever sets of Ilizarov frame; - Correction rate of deformity is 1.4-2.2° per day; - Internal constructions of Ilizarov frame install perpendicularly to longitudinal axis of segment. DISCUSSION: Osteosynthesis by Ilizarov frame helps to do correction of all types of knee joint deformities. In this case bone fragments displace on defined trajectory. In correction process necessary movement amplitude in joint is kept, that helps to combine treatment process with rehabilitation.

**Date : 2008-08-27**

**Session : Joint: osteotomies around the knee + misc**

**Time : 1600-1730**

**Room: Theater 1**

**Abstract number : 18246**

**ROCKING CLOSED-WEDGE HIGH TIBIAL OSTEOTOMY**

Alain DURANDEAU, Cédric BELIN, Sylvain DEMAILLY, Clément TOURNIER, Thierry FABRE  
*Pellegrin University Hospital Center, Bordeaux cedex (FRANCE)*

**BACKGROUND:** High tibial osteotomy (HTO) use in young patients with medial gonarthrosis before TKA (Total Knee Arthroplasty) is now well established. This study evaluates the outcomes of a modified closing wedge HTO called rocking closed-wedge HTO. 50 cases were reviewed and the mean follow-up was 6.5 years. **MATERIALS AND METHODS:** 47 patients (50 knees) were operated on between 1996 and 2005. The mean age was 53 +/- 7 years; the mean body mass index was 27.9 +/- 7. The surgical technique consisted in a combined lateral closing and medial opening wedge osteotomy. **RESULTS:** The results were assessed pre and postoperatively by means of the hospital for special surgery (HSS) score. This score increased from 68.5 to 82.1 at the last follow-up with good and excellent results in 62% of cases. The survival rate was 80% at 7 years with a complication rate of 6% and no pseudarthrosis. The mean HKA (Hip Knee Ankle) angle declined from 187 +/- 4.7° preoperatively to 181 +/-4.5° at the revision. Neither the patellar height nor the posterior tibial slope were modified. Our HTO's epiphyseal translation of the tibia induced no malunion. **DISCUSSION:** This new surgical approach confirms the benefits of HTO in young patients as attested by their good long-term results. Even if the adverse effects of HTO have to be taken into account in case of expectable upcoming TKA, their frequency in our series appeared to be diminished.



Date : 2008-08-27  
Session : Joint: thromboprophylaxis  
Time : 1600-1730  
Room: Theater 1

Abstract number : 18755

**A PHASE III STUDY OF EXTENDED THROMBOPROPHYLAXIS WITH ORAL RIVAROXABAN VERSUS SHORT-TERM SUBCUTANEOUS ENOXAPARIN AFTER TOTAL HIP REPLACEMENT: RECORD2**

Ajay K. KAKKAR<sup>1</sup>, Benjamin BRENNER<sup>2</sup>, Ola E. DAHL<sup>1</sup>, Bengt I. ERIKSSON<sup>3</sup>, Patrick MOURET<sup>4</sup>, Tiemo J. BANDEL<sup>5</sup>, Andrea G. SOGLIAN<sup>5</sup>, Jim MUNTZ<sup>6</sup>, Sylvia HAAS<sup>7</sup>

<sup>1</sup>Thrombosis Research Institute, London (UNITED KINGDOM), <sup>2</sup>Rambam Medical Center, Haifa (ISRAEL), <sup>3</sup>Sahlgrenska University Hospital/Östra, Göteborg (SWEDEN), <sup>4</sup>Frankfurt-Höchst Clinic, Frankfurt (GERMANY), <sup>5</sup>Bayer HealthCare, Elberfeld (GERMANY), <sup>6</sup>Methodist and St. Luke's Hospitals, Houston (UNITED STATES), <sup>7</sup>Institut Rechts der Isar, Munich (GERMANY)

**INTRODUCTION:** Following total hip replacement (THR), pharmacological thromboprophylaxis is recommended for at least 10 days and up to 35 days. RECORD2 was designed to evaluate the potential benefits of extended thromboprophylaxis after THR. **METHODS:** Patients undergoing THR (N=2509) received either subcutaneous enoxaparin 40mg once daily (od), started the evening before surgery and continued for 10-14 days, followed by placebo until day 35±4 (short-term prophylaxis), or oral rivaroxaban 10mg od, started 6-8 hours after surgery and continuing for 35±4 days (extended prophylaxis). The primary efficacy outcome was total VTE (the composite of any deep vein thrombosis [DVT; symptomatic or detected by mandatory, bilateral venography after extended thromboprophylaxis if asymptomatic], non-fatal pulmonary embolism [PE], and all-cause mortality up to day 36±6). **RESULTS:** Extended thromboprophylaxis with rivaroxaban significantly reduced the primary efficacy outcome compared with enoxaparin/placebo (2.0% versus 9.3%, respectively; p<0.001; relative risk reduction [RRR] 79%). The incidence of major VTE (the composite of proximal DVT, non-fatal PE and VTE-related death) (p<0.001; RRR 88%) and symptomatic VTE (p=0.009; RRR 80%) were also significantly reduced. The incidence of major bleeding was 0.1% in both groups. Non-major bleeding occurred in 6.5% and 5.5% of the rivaroxaban and enoxaparin/placebo groups, respectively. Haemorrhagic wound complications (the composite of excessive wound haematoma and reported surgical-site bleeding) occurred in 1.6% of the rivaroxaban group and 1.7% of the enoxaparin/placebo group. **CONCLUSION:** Extended thromboprophylaxis provides substantial benefits to patients undergoing THR. Rivaroxaban is a safe and effective option for extended thromboprophylaxis in this setting.

Date : 2008-08-27  
Session : Joint: thromboprophylaxis  
Time : 1600-1730  
Room: Theater 1

Abstract number : 18756

**A PHASE III STUDY OF RIVAROXABAN - AN ORAL, DIRECT FACTOR Xa INHIBITOR - COMPARED WITH SUBCUTANEOUS ENOXAPARIN FOR THROMBOPROPHYLAXIS AFTER TOTAL HIP REPLACEMENT: RECORD1**

Bengt I. ERIKSSON<sup>1</sup>, Lars C. BORRIS<sup>2</sup>, Richard J. FRIEDMAN<sup>3</sup>, Sylvia HAAS<sup>4</sup>, Menno V. HUISMAN<sup>5</sup>, Ajay K. KAKKAR<sup>6</sup>, William GEERTS<sup>7</sup>, Tiemo J. BANDEL<sup>8</sup>, Eva MUEHLHOFER<sup>8</sup>, Frank MISSELWITZ<sup>8</sup>

<sup>1</sup>Sahlgrenska University Hospital/Östra, Göteborg (SWEDEN), <sup>2</sup>Aarhus University Hospital, Aarhus (DENMARK), <sup>3</sup>Medical University of South Carolina, Charleston (UNITED STATES), <sup>4</sup>Institut Rechts der Isar, Munich (GERMANY), <sup>5</sup>Leiden University Medical Center, RC Leiden (NETHERLANDS), <sup>6</sup>Thrombosis Research Institute, London (UNITED KINGDOM), <sup>7</sup>University of Toronto, Toronto/Ontario (CANADA), <sup>8</sup>Bayer HealthCare AG, Elberfeld (GERMANY)

**INTRODUCTION:** Thromboprophylaxis is recommended for 10-35 days after total hip replacement (THR), but no convenient, oral anticoagulant is currently available. RECORD1 was designed to investigate the efficacy and safety of extended thromboprophylaxis with rivaroxaban - a novel, oral, once-daily, direct Factor Xa inhibitor - compared with subcutaneous enoxaparin following THR. **METHODS:** Patients (N=4541) were randomised to receive oral rivaroxaban 10mg (6-8 hours after surgery and once daily thereafter) or subcutaneous enoxaparin 40mg (administered the evening before surgery, 6-8 hours after surgery, and once daily thereafter) for 35±4 days. The primary efficacy outcome was the composite of deep vein thrombosis (DVT: symptomatic or detected by mandatory, bilateral venography if asymptomatic), non-fatal pulmonary embolism (PE), and all-cause mortality up to day 36±6. Major venous thromboembolism (VTE), the composite of any DVT, non-fatal PE and VTE-related death, was a secondary outcome. Safety endpoints included major and non-major bleeding on study medication. **RESULTS:** Rivaroxaban significantly reduced the incidence of the primary efficacy outcome compared with enoxaparin (1.1% vs. 3.7%, respectively; p<0.001; relative risk reduction [RRR] 70%). Rivaroxaban also significantly reduced the incidence of major VTE compared with enoxaparin (0.2% vs. 2.0%, respectively; p<0.001; RRR 88%). There were no significant differences in the incidence of major bleeding (0.3% vs. 0.1%; p=0.178) or non-major bleeding (5.8% vs. 5.8%; p=1.000) between groups. There was no evidence of liver safety issues associated with rivaroxaban. **CONCLUSION:** Thromboprophylaxis with once-daily, oral rivaroxaban was significantly more effective than subcutaneous enoxaparin following THR without an increased risk of bleeding.

**Date : 2008-08-27**  
**Session : Joint: osteonecrosis**  
**Time : 1400-1530**  
**Room: Theater 2**

**Abstract number : 16279**

**SUBCUTANEOUS ADDUCTOR TENOTOMY, CHEILECTOMY, DRILLING AND TENSOR FASCIA LATA (TFL) MUSCLE PEDICLE BONE GRAFTING (MPBG) FOR ADVANCED STAGES OF OSTEONECROSIS OF FEMORAL HEADS - LONG-TERM RESULTS**

Durgapada BAKSI<sup>1</sup>, N.D CHATTERJEE<sup>2</sup>, Ananda Kisor PAL<sup>3</sup>, Debadyuti BAKSI<sup>4</sup>

<sup>1</sup>*Kothari Medical Centre, Kolkata (INDIA)*, <sup>2</sup>*I.PG.M.E&R Hospital, Kolkata (INDIA)*, <sup>3</sup>*Burdwan Medical College, Kolkata (INDIA)*, <sup>4</sup>*Tort Centre, Ninewells Hospital, University of Dundee, Kolkata (INDIA)*

**INTRODUCTION:** Femoral head preserving operation is desirable in osteonecrotic femoral heads in young. **MATERIALS:** 123 patients with 151 osteonecrotic femoral heads (72 idiopathic, 46 corticosteroid induced, 28 post-traumatic and 5 alcoholic) were treated. According to stages of Ficat Arlet (1980), 101 were stage III and 50 stage IV necrosis. Collapse (5 m.m. or more) of femoral heads were excluded. Presence of good range of at least single movement was an important criterion for this operation. Average age was 35.5 years. **METHODS:** Through anterior approach to the hip, clearance of marginal adhesions, cheilectomy, multiple drilling and TFL MPBG to the femoral head and subcutaneous adductor tenotomy (Baksi, 1991, J.B.J.S. (Br.) 73B, 241-245) were done. **RESULTS:** Mean follow-up period was 16.5 years (10 to 21.5). Radiological improvement was noted in 70.1% of stage III and 56.1% of stage IV patients. Following HSS score of Salvati & Wilson (1973), combined excellent and good results (score above 25) were obtained in 80.4% in Stage III and 61% in stage IV patients. Their survivorship using Kaplan Meier estimator (1958) was 82% in stage III and 74% in stage IV patients. **DISCUSSION:** Pain relief was regularly achieved due to decompression and repair of necrotic areas by the TFL-MPBG which improved vascularity. Movements of hip improved due to relief of pain, capsulotomy, cheilectomy and adductor tenotomy. Even in advanced stages, this method can give symptomatic relief and delay the need for THR.

Date : 2008-08-27  
Session : Joint: osteonecrosis  
Time : 1400-1530  
Room: Theater 2

Abstract number : 17515

**RESULTS OF PERCUTANEOUS DRILLING AND ILIAC CANCELLOUS AUTOGRAFT FOR THE TREATMENT OF NON-TRAUMATIC OSTEONECROSIS OF THE FEMORAL HEAD: 66 CASES**

Francois Loic PAUMIER, Jean-Michel LAFFOSSE, Philippe CHIRON, François MOLINIER, Jean PUGET  
*Service d'Orthopédie et de Traumatologie, CHU Rangueil, Toulouse (FRANCE)*

**MATERIAL AND METHODS:** Sixty-six hips (46 patients with a mean age of 46 years (22-68) were included in this study. ARCO classification was: 8 stage IIA, 21 stage IIB, 15 stage IIC, 7 stage IIIB, 13 stage IIIC and 2 stage IV. The technique combined percutaneous drilling with a cancellous iliac bone graft harvested percutaneously homolaterally. Minimum follow-up was two years. The main outcome was rate of THR conversion at 2 years. **RESULTS:** Considering all stages, 38 hips did not have a THR at two years (58% success) with a follow-up of 40 months (25-65). Twenty-eight hips had total prosthesis at 2 years (42% failure). Mean survival was 29 months (3-65) with stabilisation of the initial lesions in 50% of hips. For stage II hips, rate success was 64%. The success rate for stages IIA and IIB was 70% with mean follow-up of 29 months (19-65). For stage III hips success was achieved in nine (45%), with 30% for stage IIIB and 54% for stage IIIC at 21 months (12-45). **DISCUSSION:** Subchondral fracture and necrosis volume >30% appear to be unfavourable factors for outcome. This technique is simple and very attractive. On the one hand, it combines the advantages of the decompression-effect for the local vascularization with the bone inducer effect of the marrow auto-graft. On the other hand, it is a non-invasive and conservative procedure which does not modify the morphology of the proximal femur and does not jeopardize a future THR. The best indication remains stage IIA and IIB.

**Date : 2008-08-27**  
**Session : Joint: osteonecrosis**  
**Time : 1400-1530**  
**Room: Theater 2**

**Abstract number : 17555**

**THE MECHANICAL STABILITY OF RESURFACING ARTHROPLASTY IN EXTENSIVE OSTEONECROSIS OF FEMORAL HEAD - BIOMECHANICAL STUDY**

Yoon Je CHO

*Department of Orthopedic Surgery, College of Medicine, Kyung Hee University, Seoul (KOREA)*

There are many concerns about mechanical stability of resurfaced femoral head in extensive osteonecrosis because of severe bone defect. This study was designed to clarify the mechanical stability of the resurfaced head in extensive osteonecrosis of head. The 10 pairs of femora obtained from 10 dead bodies were used. 10 right femora were determined to experimental group and 10 left femora were controlled. We removed almost 50% of bone from anterosuperior part of the 10 right heads to make an extensive osteonecrosis. Placement of resurfacing heads was performed using bone cement. Neck-shaft angle was 135° and there was no notching in the superior neck in any cases. Each femur with resurfaced head was mounted on a mechanical testing machine and sinusoidal cyclic loading was applied from 60 to 300Kg (5 times of body weight) under 2Hz up to 15,000 cycles. Load-displacement measurements were performed at a sampling rate of 20Hz and the percentage of a decrease of stiffness was calculated using initial stiffness (1~5000 cycles) and final stiffness (10000~15000 cycles). Each group's result was compared by T-test. The mean of the percentage of a decrease of stiffness was 57% in experimental group, 53% in control group. The difference between both groups was approximately less than 4%, and there was no statistically significant difference. Comparing control and experimental group, there was no statistically significant difference in mechanical strength. Resurfacing arthroplasty in extensive osteonecrosis of femoral head could be justified as a safe procedure in regard to the mechanical stability.

**Date : 2008-08-27**  
**Session : Joint: osteonecrosis**  
**Time : 1400-1530**  
**Room: Theater 2**

**Abstract number : 17769**

**NEW TRENDS FOR THE TREATMENT OF A.V.N: FORAGE RECONSTRUCTION WITH AUTOGRAFTS, OSTEOINDUCTIVE FACTORS, ROD SUPPORT**

Francesco Saverio SANTORI, Nicola SANTORI  
*S. Pietro Hospital, ROME (ITALY)*

The non invasive treatment of AVN is frequently a failure so there is the need of doing some type of treatment. According to the Steinberg classification we treat Steinberg 1 lesions with PEMF. In Steinberg stages 2-3-4 we modified core decompression technique and began since 1993 a new conservative surgical approach and technique (2-3cm skin incision). After performing a core technique, some more necrotic bone of the head is taken away with a special instrumentation. The proximal void is filled with autologous bone chips drawn from the metaphyseal part of the decompression and, recently, osteoinductive factors. This for two reasons: to give a biological and a mechanical support. We report the clinical and rdx results of 177 cases mean follow-up 8Y (15-2y). More recently (2001), to improve the the mechanical support of the head and avoid collapse we adopted the so called "two-step technique" which is the result of a long experimental work: in the first step a support rod is inserted. In case of failure of the procedure, after 5 or more months (time necessary to have a good osteointegration), half of the damaged head is removed and the rod is transformed in a very conservative prosthesis. The results of both techniques are presented.

**Date : 2008-08-27**  
**Session : Joint: osteonecrosis**  
**Time : 1400-1530**  
**Room: Theater 2**

**Abstract number : 17862**

**RESULTS OF CORE DECOMPRESSION FOR IDIOPATHIC AND STEROID-INDUCED OSTEONECROSIS OF THE FEMORAL HEAD**

Sokichi MANIWA<sup>1</sup>, Hidetoshi YAMAGUCHI<sup>2</sup>, Hideaki SANADA<sup>2</sup>, Taku TADENUMA<sup>1</sup>, Yuji UCHIO<sup>2</sup>

<sup>1</sup>Department of Rehabilitation, Shimane University School of Medicine, Izumo (JAPAN), <sup>2</sup>Department of Orthopaedic Surgery, Shimane University School of Medicine, Izumo (JAPAN)

**PURPOSE:** To evaluate the long-term results of core decompression (CD) for idiopathic and steroid-induced osteonecrosis of the femoral head (ION and SON, respectively). **PATIENTS AND METHODS:** Thirteen consecutive patients (4 men and 9 women), with an average age of 47 (21-68) years, were included in this study. Six patients (7 hips) were ION and 7 patients (13 hips) were SON. All patients were diagnosed using X-rays and MRI, classified according to the 2001 revised criteria of the Japanese Ministry of Health, Labor and Welfare, and staged with ARCO staging system. All patients were stage 1 or 2. Mean follow-up period was 14 years. **RESULTS:** Seven hips (53.8%) received THA in SON group, whereas only 1 hip (14.3%) had THA in ION group. THA was performed at an average of 2 years after CD. Type B never needed THA. While 40% of the type C1 lesions required THA, up to 83.3% of the C2 lesions did ( $p=0.046$ ). Seventy-two percent of patients who could avoid THA developed osteoarthritic change. **DISCUSSION AND CONCLUSION:** While CD improved the collapse ratio of the hips with C1 lesions (83.3%) slightly, comparing to the natural course of ON (94%, Ohzono, 1991), 60% of the patients with C1 did not need THA at an average of 14 years in our series. This study demonstrated that CD is an effective alternative for the hips with C1 lesion in the patients with ION rather than SON.

**Date : 2008-08-27**  
**Session : Joint: osteonecrosis**  
**Time : 1400-1530**  
**Room: Theater 2**

**Abstract number : 17947**

**DIABETIC OSTEOLYSIS - A REPORT ON TEN CASES WITH REVIEW OF LITERATURE**

Thamer HAMDAN

*Dean, Basrah Medical College, Basrah (IRAQ)*

It is not unusual to meet diabetic patients in the Orthopaedic clinic. They usually present because of foot problems, frozen shoulder or neuropathy. On very rare occasions they present with Osteolysis, which is usually discovered accidentally because it is a silent process, radiological findings, rather than clinical findings, usually diagnosed by exclusion, it should be differentiated from Osteomyelitis in the foot and bone secondaries in the spine. The author analysed severe cases in the foot and three cases in the spine. The objective is to shed light on this rare and forgotten complication of diabetes.



**Date : 2008-08-27**  
**Session : Joint: osteonecrosis**  
**Time : 1400-1530**  
**Room: Theater 2**

**Abstract number : 17981**

**HEAD-PRESERVING OPERATION FOR POST-TRAUMATIC OSTEONECROSIS OF FEMORAL HEAD**

Taek-Rim YOON, Eun-Kyoo SONG, Sang-Jin PARK, Azlina Amir ABBAS, Ki-Hyeoung KIM  
*Chonnam Nat. Univ. Hwasun Hosp., Jeonnam (KOREA)*

The aim of this study was to evaluate the results of head-preserving treatment for post-traumatic osteonecrosis of femoral head. Twenty-four hips with post-traumatic osteonecrosis of femoral head treated with transtrochanteric rotational osteotomy (TRO) and/or muscle-pedicled iliac bone graft (MPBG) were reviewed. The mean age at operation was 30.4 years, and mean follow-up period was 26.8 months. The causes of fracture were motor vehicle accident in 11 hips, domestic falls in 7, and falls from height in 6. The sites of fracture were femoral neck in 19 hips, intertrochanter in 3, and femoral head in 2. Time from injury to osteonecrosis was mean 25.6 months. The mean HHS improved from 58.2 points to 88.5 points. Thirteen of the 24 patients were treated with MPBG. Eleven of these (84.5%) had good result at mean follow-up of 36.2 months. Seven patients were treated with TRO. All had good results at mean follow-up of 12.6 months. Four patients were treated with TRO and MPBG. Three of these (75%) had good result at mean follow-up of 20.9 months. After 26.8 months follow-up, twenty-one (87.5%) of 24 patients were successful. The remaining three patients underwent conversion to THR. The results of this study indicate that TRO and/or MPBG are useful head-preserving treatments for post-traumatic osteonecrosis of femoral head. Transtrochanteric rotational osteotomy and/or gluteus medius muscle-pedicled iliac bone grafting is a recommendable option for post-traumatic osteonecrosis of the femoral head.

**Date : 2008-08-27**  
**Session : Joint: osteonecrosis**  
**Time : 1400-1530**  
**Room: Theater 2**

**Abstract number : 17986**

**BILATERAL SIMULTANEOUS TWO-INCISION MI THR FOR AVASCULAR NECROSIS OF FEMORAL HEAD**

Taek-Rim YOON, Eun-Kyoo SONG, Sang-Jin PARK, Sanket R. DIWANJI, Azlina Amir ABBAS  
*Chonnam Nat. Univ. Hwasun Hosp., Jeonnam (KOREA)*

Benefits of single stage bilateral THR include shorter hospitalization, faster rehabilitation and lowered cost. It is shown to be as safe and effective as unilateral THR or bilateral staged procedures. Fifty-two patients with bilateral femoral head AVN (ARCO 3 or 4) operated by modified 2-MI-THR were followed for average 29.3 months. The average age was 44.35 years. The acetabular component was inserted through a part of Watson Jones approach, whereas femoral component was inserted through the interval between piriformis and gluteus medius tendon. Patients were evaluated using Harris Hip Score, WOMAC score and radiologically. Factors assessed were blood loss, surgical time, complications, and rehabilitation. The average surgical duration was 178.4 minutes and average perioperative blood loss was 900ml. Complications include postoperative periprosthetic fractures in two, and delayed infection in one. The average HHS improved from 42.18 to 94.97. WOMAC score improved from average 63.88 to 5.0. Within 3 months, 48 patients could walk without support, 47 could walk unlimited distance and 45 could climb stairs without a railing. At last follow-up, all patients could squat and sit crossed-leg on floor. The average lateral acetabular opening angle was 43° and anteversion angle was 12°. All femoral components were implanted in neutral to 5° valgus. Bilateral simultaneous 2-MI-THR in patients with femoral head AVN gives satisfactory clinical and radiological results. It is safe when performed by technically experienced surgeons, without additional risk of complications. It shortens the rehabilitation period and provides excellent patient satisfaction.

**Date : 2008-08-27**  
**Session : Joint: osteonecrosis**  
**Time : 1400-1530**  
**Room: Theater 2**

**Abstract number : 18001**

**A MODIFIED TRANSTROCHANTERIC ROTATIONAL OSTEOTOMY FOR THE OSTEONECROSIS OF THE FEMORAL HEAD**

Taek-Rim YOON, Eun-Kyoo SONG, Azlina Amir ABBAS, Young-Jin KIM, Ki-Hyeoung KIM  
*Chonnam Nat. Univ. Hwasun Hosp., Jeonnam (KOREA)*

Osteonecrosis of the femoral head is a disabling condition affecting young patients. Treatments of osteonecrosis in these patients are variable. We retrospectively reviewed 39 patients (43 hips) in whom a modified transtrochanteric rotational osteotomy was performed for osteonecrosis. The average follow-up period was 36.6 months and the mean patient age was 34.3 years. Based on the ARCO classification, 17 hips were classified as Stage 2 and 26 as Stage 3. We performed rotational osteotomy alone in 15 cases, in combination with simple bone grafting in three, and in combination with muscle-pedicle-bone grafting in 25. There was further collapse of the femoral head in three hips. The overall success rate was 93%. Of the remaining 40 hips, the Harris Hip Score improved from 69.9 to 92.1. Modified transtrochanteric rotational osteotomy is an effective method for delaying the progression of collapse in the treatment of selected cases of osteonecrosis of the femoral head.

**Date : 2008-08-27**  
**Session : CTL - Spine: Cervical Degeneration**  
**Time : 0800-0900**  
**Room: Theatre 1**

**Abstract number : 18458**

**NON-SPECIFIC NECK PAIN: ITS SYMPTOMATOLOGY AND LOCAL ANESTHETIC BLOCK**

Shoichi KOKUBUN

*Research Center for Spine and Spinal Cord Disorders, NHO Nishitaga Hospital, Sendai (JAPAN)*

Pain in the neck and arm is a common complaint seen at the outpatient department. It presents alone as 1) nape pain or 2) suprascapular pain or is frequently accompanied by 3) Barre syndrome consisting of headache, eyeball ache, dizziness, tinnitus, difficulty in concentration and so on, 4) interscapular pain, 5) brachialgia or 6) numbness of hand. In addition, it is caused even by whiplash injuries. Most patients have a combination of the following signs: 1) a tender point (named as K point) near the insertion of the cleido-occipital head of the sternocleidomastoid (SCM) muscle to the skull, 2) a squeeze pain of the cleido-occipital head, 3) tenderness on the coracoid process, 4) tenderness on the diaphysis of the second metacarpal, and 5) limited extension and contralateral rotation of the cervical spine to the pain side. These symptoms and signs can be diminished or cleared up by a local anesthetic block on K point. Therefore, the symptom complex is thought to be caused by irritation of the aponeurosis near its insertion to the occiput. However, the possible mechanism for the diverse symptom presentation is unknown.

**Date : 2008-08-27**  
**Session : CTL - Spine: Cervical Degeneration**  
**Time : 0800-0900**  
**Room: Theatre 1**

**Abstract number : 19139**  
**CURRENT TRENDS OF CERVICAL LAMINOPLASTY**

Manabu ITO

*Department of Orthopaedic Surgery, Hokkaido University Graduate School of Medicine, Sapporo (JAPAN)*

Posterior decompression surgery of the cervical spine is commonly used for cervical spondylotic myelopathy or ossification of posterior longitudinal ligament. Since surgical result of laminectomy was not sufficient due to the thick scar formation over the dural sac, numerous types of cervical laminoplasty had been developed by Japanese spine surgeons since early 1970s. The surgical aims of the cervical laminoplasty are to expand the spinal canal, to secure spinal stability and to preserve the mobility of the cervical spine. Cervical laminoplasties were roughly classified into three types, which are Z-plasty type, unilateral hinge type, and bilateral hinge type. Several supplementary procedures, such as reattachment of muscles to the spinous process and preservation of the spinous process ligament muscle complex, have been added to these original procedures in order to decrease postoperative cervical axial pain by preserving static stabilizer and dynamic stabilizer of the cervical spine. The recent minimally invasive procedures are slip laminectomy, muscle preserving interlaminar decompression (MILD), and muscle preserving double-door laminoplasty (TEMPL) developed by Shiraiishi. Currently many surgeons are seeking less invasive procedures to the soft tissues to pursue better functional outcomes. Laminoplasty is not effective in patients with a certain amount of cervical kyphotic deformity. For patients with local kyphosis exceeding 13 degrees, laminoplasty combined with correction of kyphosis using posterior instrumentation is recommended.

Date : 2008-08-27  
Session : Joint: thromboprophylaxis  
Time : 1400-1530  
Room: Theatre 1

Abstract number : 18758

**A PHASE III STUDY COMPARING RIVAROXABAN - AN ORAL, DIRECT FACTOR XA INHIBITOR - WITH ENOXAPARIN FOR THROMBOPROPHYLAXIS AFTER TOTAL KNEE REPLACEMENT: RECORD4**

Alexander G.G. TURPIE<sup>1</sup>, Kenneth A. BAUER<sup>2</sup>, Bruce L. DAVIDSON<sup>3</sup>, Michael GENT<sup>1</sup>, Louis M. KWONG<sup>4</sup>, Michael R. LASSEN<sup>5</sup>, Fred D. CUSHNER<sup>6</sup>, Paul A. LOTKE<sup>7</sup>, Tiemo J. BANDEL<sup>8</sup>, Frank MISSELWITZ<sup>8</sup>, William D. FISHER<sup>9</sup>

<sup>1</sup>McMaster University, Hamilton, Ontario (CANADA), <sup>2</sup>Beth Israel Deaconess Medical Center, Boston (UNITED STATES), <sup>3</sup>Univ of Washington School of Medicine, Seattle (UNITED STATES), <sup>4</sup>Harbor-UCLA Medical Center, Beverly Hills (UNITED STATES), <sup>5</sup>Nordsjællands Hospital, Hoersholm (DENMARK), <sup>6</sup>Insall, Scott and Kelly Clinic, New York (UNITED STATES), <sup>7</sup>Hospital of the University of Pennsylvania, Philadelphia (UNITED STATES), <sup>8</sup>Bayer HealthCare AG, Elberfeld (GERMANY), <sup>9</sup>Royal Victoria Hospital, Westmount (UNITED STATES)

**INTRODUCTION:** The risk of venous thromboembolism (VTE) is increased following major orthopaedic surgery. Adherence to guidelines for VTE prevention could be improved by the introduction of convenient, safe and effective oral anti-thrombotics. The safety and efficacy of once-daily rivaroxaban - an oral, direct Factor Xa inhibitor - has been evaluated for thromboprophylaxis after major orthopaedic surgery in four international phase III trials: RECORD1 and RECORD2 in hip, and RECORD3 and RECORD4 in total knee replacement surgery (TKR). In RECORD3, rivaroxaban was significantly more effective than enoxaparin 40mg once daily with a 49% risk reduction in the composite of VTE and all-cause mortality. RECORD4 compared rivaroxaban 10mg once daily with enoxaparin 30mg every 12 hours for thromboprophylaxis following TKR. **METHODS:** RECORD4 was a worldwide, prospective, double-blind trial. Patients (N=3149) received either oral rivaroxaban 10mg (starting 6-8 hours after surgery and continued once daily), or subcutaneous enoxaparin 30mg (given every 12 hours, starting 12-24 hours after surgery). Study medication was given for 10-14 days, with mandatory bilateral venography undertaken the following day. The primary efficacy outcome was the composite of deep vein thrombosis (DVT), non-fatal pulmonary embolism (PE), and all-cause mortality. The major secondary efficacy outcome was major VTE (composite of proximal DVT, PE and VTE-related death). The primary safety outcome was major bleeding. **RESULTS:** The final results of this trial will be presented. **CONCLUSIONS:** The results of this trial will provide valuable data concerning the use of rivaroxaban for thromboprophylaxis after TKR in the North American setting.

**Date : 2008-08-27**  
**Session : CTL - Joint: Total Hip Arthroplasty**  
**Time : 0800-0900**  
**Room: Theatre 2**

**Abstract number : 19110**

**IS DISTAL STEM FIXATION NECESSARY FOR SUCCESSFUL PERFORMANCE OF CEMENTLESS TOTAL HIP ARTHROPLASTIES?**

Young-Hoo KIM

*Ewha Womans University School of Medicine, Seoul (KOREA)*

Background: Architectural changes in occurring in the proximal femur (resorption) after total hip arthroplasty (due to stress shielding) continues to be a problem. In an attempt to reduce these bony changes the concept of short and femoral neck sparing stem designs have been advocated. The purpose of this study was to evaluate the early clinical and radiological results, especially stem fixation and bone remodeling of proximal femur after total hip arthroplasty. Methods: A total of forty-five patients (fifty-four hips) were included in the study. There were twenty men and twenty-five women. The mean age at the time of operation was 53.9 years (range, twenty-six to seventy-five years). Clinical and radiological evaluation were performed at each follow-up. Bone densitometry was carried out on all patients one week after operation and at the final follow-up examination. The mean follow-up was 1.3 years (range, one to two years). Results: The mean preoperative Harris hip score was 45 points (range, 15 to 48 points), which improved to a mean of 96 points (range, 85 to 100 points) at the final follow-up. No patient complained of thigh pain at any stage. No acetabular or femoral osteolysis was observed and no hip required revision for aseptic loosening of either component. One hip (2%) required open reduction and fixation with a cable for calcar femorale fracture. Bone mineral densitometry revealed a minimal bone remodeling in the acetabulum and proximal femur. Conclusions: The geometry of this ultra-short anatomic neck sparing cementless femoral stem has proved to provide effective initial stability even without the diaphyseal portion of the stem. We believe that femoral neck preservation and lateral flare of the stem provide an axial and torsional stability and more natural loading of the proximal femur.

**Date : 2008-08-27**  
**Session : Joint: infections**  
**Time : 0900-1030**  
**Room: Theatre 2**

**Abstract number : 16383**

**COMPUTER NAVIGATED ARTICULATED CEMENT SPACERS (IGS PROSTALAC) FOR INFECTED TOTAL KNEE REPLACEMENT**

WP YAU, KY CHIU, Margaret FOK

*The University of Hong Kong, Hong Kong (HONG KONG)*

**INTRODUCTION:** Two-stage revision total knee replacement with an interim articulated cement spacer is now the standard treatment for infected total knee replacement. However, this is a technically demanding operation because of potential significant issues with bone defects, lack of instruments for aligning the prosthesis and the limited range of sizes in the prostheses available. **METHODS:** We describe a technique for performing articulated functional spacer insertion under computer navigation by a modification of the workflow of a commercially available navigation system. Two cases are presented to illustrate the principle of the technique. The alignment of the implanted PROSTALACs in the postoperative long film of the lower limb was reported. **RESULT:** The application of computer navigation technique in PROSTALAC Total Knee Replacement significantly reduced the technical difficulty in correct implantation of the cement spacers. The alignment of the implanted articulated spacers were considered to be satisfactory as no outlier of more than 3 degrees were observed. **CONCLUSION:** A computer navigation technique which can be employed in performing implantation of an articulated cement spacer is described. The aims are to facilitate optimal implantation of the tibial functional spacer and to achieve the appropriate balance between the flexion and extension gap.



**Date : 2008-08-27**  
**Session : Joint: infections**  
**Time : 0900-1030**  
**Room: Theatre 2**

**Abstract number : 16572**

**ARTHROSCOPIC LAVAGE FOR SUSPECTED SEPTIC ARTHRITIS OF KNEE JOINTS - ARE WE OVERDOING IT?**

Dip CHAKRABARTI, Rajesh Gopichand KAKWANI

*Good Hope Hospital, Heart of England NHS Trust, Sutton Coldfield, West Midlands (UNITED KINGDOM)*

**INTRODUCTION:** Hot swollen knee joints are a common presentation in clinical practice. It has wide differential diagnoses, the most serious being septic arthritis. Delayed or inadequate treatment leads to joint damage. Arthroscopic lavage is a useful adjunct in treatment of this condition. It should be planned appropriately after proper clinical assessment and investigation. Other differential diagnoses like crystal arthritis, reactive arthritis, monoarticular inflammatory arthritis should be considered. **PATIENTS AND METHODS:** This retrospective audit involved 44 patients who had arthroscopic knee lavage for suspected septic arthritis from January 2005 to May 2007. Analysis included the aspects of adequate backup supportive evidence for the procedure, the time from diagnosis to operation and postoperative antibiotic regime. **RESULTS:** There were 29 males and 15 females with age group ranging from 11 to 91 yrs. Fever was present in 15 patients (34%), preoperative joint aspiration done in 22 (50%), perioperatively pus found in 11 (25%). 13 patients (29.5%) had procedure done within 6 hrs, causal organism identified in 25%. Follow-up ranged up to 12 months without persistence or reactivation. **DISCUSSION:** Arthroscopic lavage is a useful adjunct in the treatment of septic arthritis of knees but proper patient selection with systematic approach considering other possible differential diagnoses is important for avoiding unnecessary operations. **KEYWORDS:** Arthroscopy, lavage, septic knee, differential diagnosis.

Date : 2008-08-27  
Session : Joint: infections  
Time : 0900-1030  
Room: Theatre 2

Abstract number : 16792

**THE IMPACT OF C. DIFFICILE INFECTION AFTER ELECTIVE PRIMARY HIP/KNEE ARTHROPLASTY**

Kakwani RAJESHKUMAR, Dip CHAKRABARTI, Krishnaiah KATAM  
*Good Hope Hospital NHS Trust, Birmingham (UNITED KINGDOM)*

INTRODUCTION: Clostridium difficile associated diarrhoea has emerged as a healthcare associated infection of great clinical and economic significance. The type "027" strains are multi-resistant and cause severe morbidity and mortality. METHODS: All patients diagnosed with C. Difficile after primary elective joint arthroplasties performed at our institute during the three-year study period from April 2004 till March 2007 were included in the present study. All patients received the routine perioperative antibiotic prophylaxis of three doses of intra-venous cefuroxime. Data collected included age, sex, duration between operation and the onset of diarrhoea, length of stay and associated mortality. RESULTS: A total of 1430 patients underwent primary hip or knee arthroplasties during the three years of study period. A total of 32 patients suffered from C. Difficile diarrhoea (2.2%) after the arthroplasty procedure, and within this cohort, 5 patients died during the same admission to the hospital (0.35%). The average length of stay for an elective hip/knee arthroplasty was increased from 10 to 43 days in patients affected with C. Difficile diarrhoea. DISCUSSION: The C. difficile infection does not accentuate the morbidity, but also significantly increases the mortality rate after elective joint replacement. The broad-spectrum perioperative antibiotics used to prevent infection after a joint replacement generally render the patient vulnerable to this highly lethal hospital bug. Introduction of simple hygiene measure (hand washing) and change of perioperative antibiotic protocol lead to a statistically significant reduction in the incidence of C. difficile infections after elective joint replacement surgery without compromising arthroplasty results.

**Date : 2008-08-27**  
**Session : Joint: infections**  
**Time : 0900-1030**  
**Room: Theatre 2**

**Abstract number : 17147**

**TOTAL HIP REPLACEMENT IN ACTIVE TUBERCULOSIS - A MYTH OR A REALITY**

Devdatta NEOGI, Chandra Shekhar YADAV, Shah Alam KHAN  
*All India Institute of Medical Sciences, New Delhi (INDIA)*

**INTRODUCTION:** There has been a reversal of the decline in incidence rates of tuberculosis worldwide. Osteoarticular tuberculosis in the hip and other joints is on a rise and population in India commonly presents with advanced stages of joint destruction. **MATERIALS AND METHODS:** This study is being carried out at All India Institute of Medical Sciences Hospital, India and includes 14 patients with an average age of 44 years. All cases had advanced stages of hip destruction clinically and radiologically. Diagnosis in all cases was confirmed by histopathology and culture. All patients were treated with primary total hip replacement and given peri-operative antituberculous medication and continued for 12 months postoperatively. **RESULTS:** Average follow-up period is 38 months. No reactivation was seen in 13 cases and had excellent to good Harris Hip scores. One case with secondary drug resistance developed superimposed infection through non healing sinus tract and underwent component removal and girdlestone arthroplasty. **CONCLUSIONS:** We believe that when the infected tissue can be debrided completely and adequate anti tubercular therapy is instituted, the outcome of joint replacement may not be adversely affected. Total hip arthroplasty in the tuberculous hip is a safe procedure and produces superior functional results compared with resection arthroplasty or arthrodesis.

Date : 2008-08-27  
Session : Joint: infections  
Time : 0900-1030  
Room: Theatre 2

Abstract number : 17800

**LONG-TERM RESULTS IN CASE OF INFECTION AFTER ALLOARTHROPLASTY OF THE HIP JOINT**

Stefan A ESENWEIN<sup>1</sup>, Klaus M ROBERT<sup>2</sup>, Friedrich KUTSCHA-LISSBERG<sup>3</sup>, Philipp SINGER<sup>3</sup>, Gert MUHR<sup>4</sup>

<sup>1</sup>St. Josef-Hospital Bochum - University Hospital, Bochum (GERMANY), <sup>2</sup>Biberach General Hospital, Biberach a. d. Riss (GERMANY), <sup>3</sup>Knappschaft Hospital Bergmannsheil Buer, Gelsenkirchen (GERMANY), <sup>4</sup>BG Trauma Center Bergmannsheil Bochum, Bochum (GERMANY)

INTRODUCTION: Worldwide approximately 3 million hip endoprotheses are implanted annually and infection rates of 0.2%-2.3% of all treated cases are reported. Due to the high number of implantations every year, a high number of patients are concerned. The objective of this study was to find out which clinical results can be expected in case of deep infections after alloarthroplasty of the hip. METHODS: 48 patients were included in this study. All of them underwent revision surgery due to deep infection of the hip joint after primary implantation of an endoprosthesis. The mean clinical follow-up was 7.8 years. Analysis of the results was done regarding eradication of infection, patient's opinion and assessment of Merle d'Aubigné' score. RESULTS: In 37 out of 48 cases two stage revisions were performed. Due to persisting or recurrent hip joint infection in 16 out of 48 cases a Girdlestone procedure was performed. In most of these cases Pseudomonas, group D Streptococcus, methicillin-resistant Staphylococcus aureus, Proteus or Escherichia coli were detected. Evaluation using the Merle d'Aubigné' score showed a mean of 12.1 points. 83 percent of all patients (n=40) were satisfied with the functional results obtained, 9 of them after resection arthroplasty. CONCLUSIONS: Generally, the concept of two-stage revision showed good results. Girdlestone procedure is still a salvage procedure in case of failed re-implantation. This has to be considered in cases of multidrug-resistant strains of bacteria, which contaminate the joint prosthesis' surface and form biofilms.

**Date : 2008-08-27**  
**Session : Joint: infections**  
**Time : 0900-1030**  
**Room: Theatre 2**

**Abstract number : 17879**

**THE DOSE OF ANTIBIOTICS IN CEMENT HAS POSITIVE EFFECTS ON TREATING INFECTED TKA**

Hwa-Chang LIU<sup>1</sup>, Wen-Chi TSAI<sup>2</sup>, Tzil-Shang Thomas LIU<sup>3</sup>, Shier-Chieh HWANG<sup>2</sup>, Pokai TSENG<sup>2</sup>

<sup>1</sup>*Department of Orthopaedic Surgery, National Taiwan University Hospital, Taipei (TAIWAN)*, <sup>2</sup>*National Taiwan University Hospital, Taipei (TAIWAN)*, <sup>3</sup>*Department of Orthopaedic Surgery, Pittsburgh University Medical Center, Taipei (TAIWAN)*

Among 279 patients admitted to university medical center for treatment of infected total knee arthroplasty (TKA), from October 1993 to September 2006, 50 patients were treated with removal of the prosthesis, debridement, filling the space with cement beads loaded with different doses of antibiotics, replacement with a new set of prosthesis which was fixed with cement loaded with different doses of antibiotics and followed-up for more than 1 year. The present study is aimed to investigate the effects of the different doses of antibiotics loaded in cement on (1) the time needed to obtain normalization of c-reactive protein level (CRP) and (2) on the recurrence after revision of the infected TKA. The etiology of primary surgery were osteoarthritis (44 patients), rheumatoid arthritis (4 patients), and post-traumatic arthritis (2 patients). Definition of infection were positive cultures, or negative culture but with increased level of CRP plus clinical signs of sinus discharge, or swelling, redness, local heat and pain and positive x-ray findings. Follow-up studies included physical examinations, CRP measurement, and x-ray study. It is found that the higher the dose of antibiotics loaded in cement, the shorter the time was to normalize CRP level after debridement. The higher dose of antibiotics loaded in cement also reduced more the recurrences of infection after revision TKA.

**Date : 2008-08-27**  
**Session : Joint: infections**  
**Time : 0900-1030**  
**Room: Theatre 2**

**Abstract number : 17959**

**CEMENTLESS TOTAL HIP ARTHROPLASTY USING CONE PROSTHESIS FOR SEQUELAE OF CHILDHOOD HIP INFECTION**

Taek-Rim YOON, Eun-Kyoo SONG, Sang-Jin PARK, Young-Jin KIM  
*Chonnam Nat. Univ. Hwasun Hosp., Jeonnam (KOREA)*

**INTRODUCTION:** Total hip arthroplasty in patients with a history of hip infections is a technical challenge because of the longstanding anatomical abnormalities of the bone and soft tissues. The aim of this study was to review the results of total hip arthroplasty using the Cone Prosthesis in patients with dysplastic hip due to a childhood hip infection. **METHODS:** Thirty-seven patients (37 hips) were retrospectively reviewed. The mean patient age was 44 years (range, 22-66), and the mean follow-up duration was 51 months (range, 24-117). The joint articulations were metal-on-metal in 30 hips and ceramic-on-ceramic in 7. **RESULTS:** The mean Harris Hip Score improved from 45 points to 90 points at the final follow-up. No patients complained of thigh pain. The mean leg length discrepancy decreased from 3.1cm to 0.7cm. Femoral offset increased from 22.6mm to 31.0mm. Subsidence of the femoral stem of more than 5mm was encountered in only one hip with subsequent osteointegration. Two hips were infected at 6 and 9 months postoperatively and the implants were removed. One dislodged acetabular socket was revised at 53 months postoperatively. A radiolucent line of more than 2mm around the stem was observed in one without any evidence of loosening. **DISCUSSION AND CONCLUSION:** This study showed that a cementless Cone Prosthesis used to treat the sequelae of a childhood hip infection had excellent clinical outcomes. **SUMMARY:** Wagner Cone Prosthesis is a recommendable option for dysplastic hip due to a childhood hip infection.

**Date : 2008-08-27**  
**Session : Joint: infections**  
**Time : 0900-1030**  
**Room: Theatre 2**

**Abstract number : 17972**

**CEMENTLESS TOTAL HIP ARTHROPLASTY IN FEMORAL HEAD NECROSIS IN RENAL TRANSPLANT RECIPIENTS**

Taek-Rim YOON, Eun-Kyoo SONG, Sang-Jin PARK, Ki-Hyeong KIM  
*Chonnam Nat. Univ. Hwasun Hosp., Jeonnam (KOREA)*

**INTRODUCTION:** The aim of this study was to analyse the clinical results of cementless total hip arthroplasties (THA) as the treatment of osteonecrosis of the femoral head in renal transplant recipients. **METHODS:** Fifteen cementless THA were performed in 12 renal transplantation recipients with advanced osteonecrosis of the hip. The average interval from transplant to arthroplasty was 52 months (range: 7-116 months). The mean age at the time of arthroplasty was 37 years old (range: 25-58 years). The average preoperative Harris hip score was 39 points (range: 31-55 points). The mean follow-up period was 51 months (range: 24-101 months). The articulations were metal-on-polyethylene bearing in 1 case, metal-on-metal in 6 cases, and ceramic-on ceramic in 8 cases. **RESULTS:** The average postoperative Harris hip score was 90 points (range: 82-94 points), and there were no problems such as wound healing or infection despite immunosuppressed state. Radiographically, there was one case of femoral and acetabular osteolysis which had used metal on polyethylene articulation in postoperative 80 months and there was neither aseptic loosening nor dislocation after average 51 months. Heterotopic ossification was detected in 1 case and was under closed observation. **DISCUSSION AND CONCLUSION:** The early results of a cementless THA in this young group of renal transplant recipients appeared encouraging. **SUMMARY:** The early results of a cementless THA in this young group of renal transplant recipients appeared encouraging.

**Date : 2008-08-27**  
**Session : Joint: infections**  
**Time : 0900-1030**  
**Room: Theatre 2**

**Abstract number : 17995**

**ADVANCED ACTIVE TUBERCULOUS OF THE HIP TREATED WITH UNCEMENTED TOTAL HIP ARTHROPLASTY**

Taek-Rim YOON, Azlina Amir ABBAS, Young-Jin KIM, Ki-Hyeoung KIM  
*Chonnam Nat. Univ. Hwasun Hosp., Jeonnam (KOREA)*

**INTRODUCTION:** Treatment methods for tuberculosis of the hip with considerable bone destruction are resection arthroplasty, arthrodesis, or arthroplasty. Resection arthroplasty or arthrodesis may relieve pain and control infection, but has unsatisfactory hip function. This study evaluates the results of 15 cases of advanced active tuberculosis of the hip treated by THA. **MATERIAL AND METHODS:** Fifteen patients with advanced active tuberculous infection were treated using THA. Five patients had associated pulmonary tuberculosis, and one patient had spine tuberculosis. Average follow-up duration was 55 months. Culture or histological examination demonstrated tuberculosis in all cases. **RESULTS:** Four patients were treated with resection arthroplasty, curettage and debridement, and antituberculous medication for 1 year, followed by THA. Postoperatively, ESR normalized within 4 months and CRP within 3.3 months. The average interval from the resection arthroplasty to THA was 14.5 months. The preoperative Harris Hip Score (HHS) was 25, and improved to 89 at last follow-up. Eleven patients were managed with primary THA and one year-postoperative antituberculous medication. Postoperatively, ESR normalized by 4.2 months and the CRP by 3.4 months. The preoperative HHS was 36.7 and improved to 91.6 at last follow-up. In all fifteen cases, reactivation of the infection did not develop. Based on the HHS, the result was excellent in 10 patients, and good in 5. **CONCLUSION:** THA in an advanced active tuberculous hip is a safe procedure. It provides symptomatic relief and improved function irrespective of whether it was performed primarily or following a Girdlestone procedure.



**Date : 2008-08-27**  
**Session : Joint: infections**  
**Time : 0900-1030**  
**Room: Theatre 2**

**Abstract number : 17997**

**TWO-STAGE RECONSTRUCTION OF INFECTED HIP JOINTS**

Taek-Rim YOON, Sanket R. DIWANJI, Azlina Amir ABBAS, Ki-Hyeong KIM  
*Chonnam Nat. Univ. Hwasun Hosp., Jeonnam (KOREA)*

The purpose of this study was to assess clinical results of using antibiotic-loaded cement-spacer for two-stage reconstruction of primary hip joint infections. Nine patients with infected hip joints were treated using this technique. Three had a primary hip infection, and six developed infection following surgery of the affected hip. Average follow-up duration was 42 months. First-stage surgery consisted of debridement and insertion of antibiotic-loaded cement-spacer. Antibiotic choice depended on results of preoperative bacterial cultures. Second-stage surgery was performed after infection eradication, healing of wounds and normalization of ESR and CRP. Assessments with radiographs and Harris Hip scores (HHS) were performed at every follow-up. Eight of nine hips had successful THR conversion after average 24 weeks. One patient required spacer reinsertion and another experienced re-infection after THR. ESR normalised within 60 days, and CRP within 67 days after spacer insertion. After first operation, all patients could non-weight-bear crutch walk, had minimum 101° total range of motion and average shortening of 2.5mm. All intraoperative cultures were negative at time of second surgery. No patient had a limb length discrepancy of more than 1cm at final follow-up. Average HHS improved from 38.37 preoperatively to 57.62 between surgical stages to 97.83 at final follow-up. Two-stage reconstruction using antibiotic-loaded cement-spacer gave satisfactory results in treating hip infections of various etiologies. This technique cures infection by delivering high concentration of antibiotics locally, saves the patient from agony and complications of prolonged recumbency, and the surgeon from complicated revision surgery.

**Date : 2008-08-27**  
**Session : Joint: infections**  
**Time : 0900-1030**  
**Room: Theatre 2**

**Abstract number : 18253**

**EFFECT OF PREOPERATIVE MRSA SCREENING ON DEEP PERIPROSTHETIC INFECTION**

Murali Krishna SAYANA<sup>1</sup>, Kayode ODUWOLE<sup>2</sup>, Yudash CHETTY<sup>1</sup>, Tom MC CARTHY<sup>2</sup>, Darragh HYNES<sup>1</sup>

<sup>1</sup>*Cappagh National Orthopaedic Hospital, Dublin (IRELAND)*, <sup>2</sup>*Cappagh national orthopaedic hospital, Dublin (IRELAND)*

**AIM:** To present the current incidence of MRSA colonisations and infections of the year 2006, in an exclusive ring-fenced elective orthopaedic hospital and compare the incidence with year 1999. **METHODS:** All the MRSA positive cultures from the years 1999 and 2006 were identified from the microbiology laboratory database. **RESULTS:** In 1999, 31 patients out of 3,200 in-patients and day cases tested were positive for MRSA (incidence of 0.96%). (12 cases of nasal colonisation (0.37%), 3 cases of wound infections, 5 cases of deep prosthetic infections needing revisions (0.15%), other sites - 5 cases). Four of the new staff screened +ve for nasal colonisation. In 2006, 58 subjects tested positive for MRSA (incidence 1.75%). These included 28 of 3,299 in-patients and day cases (incidence of 0.84%) and 25 of 1,800 out-patients attending the preop assessment and MRSA screening for major joint/spinal surgery (incidence of 1.27%). Forty-seven subjects had nasal colonisation (0.92), 4 cases of wound infections which included 2 deep prosthetic infections needing revisions (incidence of 0.12%), and other sites - 7 cases. Five of the new staff screened +ve for nasal colonisation. **DISCUSSION:** Although the incidence of MRSA +ve cultures has increased from 0.96% in 1999 to 1.75% in 2006, the policy of preoperative out-patient MRSA screening has helped to cut down the number of deep peri-prosthetic infections in our hospital from 0.15% to 0.12%.

**Date : 2008-08-27**  
**Session : Joint: infections**  
**Time : 0900-1030**  
**Room: Theatre 2**

**Abstract number : 18348**

**MRSA SURGICAL SITE INFECTION FOLLOWING PRIMARY TOTAL HIP ARTHROPLASTY: CLINICAL OUTCOMES AND MANAGEMENT CONSIDERATIONS**

Raymond WALLS, Simon ROCHE, John MCCABE  
*Merlin Park University Hospital, Galway (IRELAND)*

Methicillin-resistant *Staphylococcus aureus* (MRSA) rates in Ireland are among the highest in Europe. Preventative measures are reported, however little data are available on specific management of MRSA surgical site infection (SSI). We analysed outcomes of MRSA SSI following primary hip arthroplasty (THA) to formulate a management algorithm. Consecutive cases of MRSA infection after primary THA between 1999 and 2003 were prospectively identified, recording clinical management and outcomes. Infections were classified temporally and pathologically. MRSA SSI incidence was 1% with 16 SSI's in 15 patients: 6 superficial, 2 deep and 8 implant. Four patients with MRSA on preoperative screening were from the community while only 1 patient (7%) resided in a nursing home; regular steroid intake was documented in 5 cases (33%). Superficial SSI resolved with antibiotic therapy (mean; 9.8 days). Deep SSI required several debridements and a mean of 8.5 weeks antimicrobial therapy to eradicate MRSA. Most implant SSI presented early (62.5%) with attempted retention successful in only 20%. Delayed exchange arthroplasty was successfully performed in 4 cases. Overall, 3 hips have necessitated excision arthroplasties (43%). Our results suggest an increasing prevalence of MRSA in the community and steroid therapy a potential individual risk factor for MRSA SSI after hip arthroplasty. Superficial SSI typically resolves within 14 days; if symptoms are present beyond this a deep SSI may be present. Our protocol cautions against implant salvage procedures given our low success rate and suggests delayed exchange arthroplasty as definitive surgery for implant SSI from the outset.

Date : 2008-08-27

Session : Symposium - Joint: Primary Total Hip Arthroplasty

Time : 1600-1730

Room: Theatre 2

Abstract number : 19111

**RESULTS OF TOTAL HIP ARTHROPLASTIES IN THE PATIENTS WITH HIGH DISLOCATION OF HIP AFTER CHILDHOOD PYOGENIC ARTHRITIS**

Young-Hoo KIM

*Ewha Womans University School of Medicine, Seoul (KOREA)*

Background: Patients with high-riding hypo-dysplastic hips secondary to childhood infection pose surgical challenges for total hip arthroplasty because of long standing anatomic abnormalities of bone and soft tissues and the possibility of reinfection. We determined; 1) whether cementless total hip arthroplasty would improve pain and functional scores postoperatively; 2) whether the radiographic results would be similar to reported results of standard total hip arthroplasty; 3) what is the definition of adequate support of the acetabular component by host bone; 4) whether complication rates in these patients would be high; and 5) whether or not total hip arthroplasty should be attempted in a hip that had a previous bacterial infection? Methods: We prospectively analyzed sixty-two hips with high dislocation in patients who had had infection of the hip during childhood. The age of patients at the time that the infection was contracted was an average of 5.8 years (range, one to nine years). The mean age of the patients at the time of the index total hip arthroplasty was 47.5 years (range, twenty-two to sixty-six years). The interval between active infection and total hip arthroplasty was 32.8 years (range, eleven to forty-one years). All but one hip had a quiescent period of infection of more than ten years. Clinical examination using Harris hip score and radiographic evaluations were performed at each follow-up. The mean duration of follow-up was 10.2 years (range, eight to twelve years). Results: Pain and functional scores were improved significantly ( $p < 0.05$ ) at the latest follow-up. Also, the deformity and range of motion was improved significantly ( $p < 0.05$ ). Radiographic results were similar to reported those of standard total hip arthroplasty. The rate of penetration of the acetabular polyethylene liner was an average of 0.30 mm per year. Osteolysis was identified in 61% (thirty-eight of sixty-two hips). One acetabular component (1.6%) which was covered less than 60% by host bone had aseptic loosening. One patient with a quiescent period of eight years had recurrence of the infection. Kaplan Meire survivorship analysis with revision as the end point for failure, revealed a ten-year rate of survival of the acetabular and femoral components was 95% (95% confidence interval, 0.91 to 1.00). Conclusions: Improved surgical technique and design of the cementless acetabular and femoral components provided favorable results in these young and active patients with technically difficult arthroplasties. There was no recurrence of infection after total hip arthroplasty in the patients in whom infection had been quiescent for more than ten years.

**Date : 2008-08-28**  
**Session : Symposium- General Orthopaedics: Orthopaedic War Injuries**  
**Time : 1100-1215**  
**Room: 403**

**Abstract number : 18876**

**HOSPITAL UNDER FIRE; THE EXPERIENCE OF THE ISRAELI WESTERN GALILEE HOSPITAL DURING THE LEBANON WAR 2006**

Gershon VOLPIN

*Dept. of Orthopedic Surgery and Traumatology, Western Galilee Hospital, Nahariya (ISRAEL)*

The Western Galilee Hospital of Nahariya is located in northern Israel, about 10 kilometres from the border with Lebanon. Four years ago we constructed a new Surgery Building, and underneath it, an underground hospital for emergency situations, with a capacity of 450 beds, including an underground network of roads that enables ambulances to access all underground hospital facilities. Israel's war in Lebanon began on 12/7/06, when Hezbollah terrorists occupying south Lebanon fired rockets on the northern Israeli civilian population. Within 3 hours all patients were evacuated to the underground hospital. During the month-long war 800 rockets fell on our city alone. One of the most frightening experiences was travelling to and from the hospital daily, never knowing when and where the rockets will land. On July 28 one of the rockets hit the hospital destroying patients' rooms and medical equipment. The damage was estimated at about \$200,000. Very luckily, there were no bodily injuries since all patients and medical staff had been evacuated to the underground hospital from the beginning of the war. 1858 patients with various types of war injuries were treated during the month-long war. 947 Pts had symptoms of psychological post-traumatic stress. 839 had mild shrapnel injuries of the body, 45 of them with closed or open simple fractures of limbs; 42 had moderated injuries as open comminuted fractures of limbs, extended soft tissue injuries, or amputation of limbs; 18 had multiple injuries including either chest and abdominal injuries, vascular injuries, or head injuries, with associated compound fractures of limbs. 12 patients died of katyusha rocket injuries. Despite the constant sirens and katyusha attacks, and together with taking care of wounded patients, we managed to continue with routine medical and surgical care, including hemodialysis, elective and urgent operations, underground delivery room births and even 21 corneal transplantations. All together about 2,600 patients were treated in our hospital during that month.

**Date : 2008-08-28**  
**Session : CTL - Trauma: Distal Radius Fractures**  
**Time : 0800-0900**  
**Room: 404-405**

**Abstract number : 19077**  
**PLATE FIXATION OF INTRA-ARTICULAR DISTAL RADIUS FRACTURES**  
Frankie LEUNG  
*The University of Hong Kong, Pokfulam (HONG KONG)*

Distal radius fractures occur as a result of either a low-energy injury or a high-energy trauma with possible impairment to the function of the upper extremity. Normally, the articular surface of distal radius has a radial tilt of 20 degrees and a palmar tilt of 10degrees. Radial shortening, dorsal and volar displacements, residual articular step or gap are possible after a fracture. Such mal-reduction may result in a painful, stiff and dysfunctional wrist. Carpal instability may also be caused by such displacement. For better functionIntra-articular distal radial fractures have always been challenging to surgeons. Post-traumatic arthritis can occur if the articular reconstruction is not anatomical. Two generally accepted methods of fixation, external fixation, and open reduction and plate fixation, are performed to fix these fractures at present. In the face of crushed cancellous bone and depressed articular fragments, internal fixation with bone graft is a better choice. With new designs of implant and new surgical techniques, plating of distal radius fractures can be achieved with reconstruction of individual &#65533;columns&#65533;. For better formIn the past, elderly fragility fractures of the distal radius are often treated with manipulation and casting, despite the fact that most will heal with significant shortening and malalignment. The generally accepted concept is that the compromise in function would not be too significant in such patients with low demand. However, with the introduction of locking screws and implants, a good alignment can often be achieved and maintained by a volar plating, which is technically easier than dorsal plating. Whether the pursuit of an anatomical alignment is necessary is still debatable. It is however, envisaged that an increasing number of osteoporotic wrist fractures will be treated with surgery in future.

**Date : 2008-08-28**  
**Session : CTL - Trauma: Distal Radius Fractures**  
**Time : 0800-0900**  
**Room: 404-405**

**Abstract number : 19160**

**NON-BRIDGING EXTERNAL FIXATOR FOR COMMUNATED FRACTURE OF THE DISTAL RADIUS**

Masahiro TOBE, Kazuhiro MIZUTANI  
*Ohashi Medical Center, Toho University, Tokyo (JAPAN)*

**BACKGROUND:** Management for comminuted fracture of the distal radius is challenging. Many kinds of method have been performed for a long time. Bridging external fixator has been a one of surgical procedure in the treatment for comminuted fracture of the distal radius. But it fixes the wrist joint before its removal. A main concept of non-bridging external fixator and its knack and pit fall will be presented. **MATERIALS AND METHOD:** Between 2002 and 2008, 52 wrists in 50 patients were treated in non-bridging external fixator. Among the non-bridging external fixators, the Flexible-Wrist system which can catch the crushed fragments through the radial styloid was used. It doesn't prevent wrist motion. According to the AO classification, there were 12 in C1, 22 in C2 and 16 in C3. When there was a bone defect, calcium phosphate bone cement was filled into the space with limited exposure. Clinical evaluation included Mayo wrist score, range of motion, X-ray measurement and complications. **RESULTS:** In Mayo wrist score, excellent was 85% on six months after surgery. In range of motion, prompt recovery was provided. In X-ray measurement, radial shortening was shown but it was no significant complication. On the other hand, there was no correction loss in step-off and gap. Complication included nerve disorder at the superficial branch of the radial nerve in four, pin tract infection in two, and a leakage of calcium phosphate cement in one. However, these complications improved eventually. **CONCLUSIONS:** Non-bridging external fixator is better than bridging external fixator for comminuted fractures in clinical. In case of metaphysical comminution of the radius or severe osteoporosis, additional volar plate is recommended.

**Date : 2008-08-28**  
**Session : CTL - Trauma: Distal Radius Fractures**  
**Time : 0800-0900**  
**Room: 404-405**

**Abstract number : 19161**

**PERCUTANEOUS PINNING FOR DISTAL RADIUS FRACTURES**

Masahiro TOBE, Kazuhiro MIZUTANI

*Ohashi Medical Center, Toho University, Tokyo (JAPAN)*

**PURPOSE:** Percutaneous pinning for distal radius fractures has been done now and before. However, a detailed verification of the evidence is not done. In this study, we reviewed and introduce percutaneous pinning for distal radius fractures in Japan. **MATERIAL AND METHODS:** From 1997 to 2007, there are 22 trials about percutaneous pinning for distal radius fractures in Journal of JSSH. The trials included modified Kapandji procedure in eight, intramedullary pinning in five, transulnar pinning in two, cross pinning in one, Demanet procedure in one, transstyroid pinning in one, and unknown in one. **RESULTS:**760 cases were investigated. The age at the time of injury ranged from 5 to 93 years-old. A type of fracture classified eight in Saito's classification, five in Frykman, four in AO, five in unknown. Clinical evaluation was shown in only 486 cases in 760 cases, included 14 in Saito's criteria, three in Sarmient, one in Gartland & M, one in Mayo wrist score and four in only X-ray evaluation. There were 235 in excellent, 150 in good, 25 in poor and 1 in fair. **CONCLUSIONS:** Percutaneous pinning can be easily done everywhere only with the image and K-wire. It is simple procedure without expensive implant. Especially it is good indication for children and young adults with simply fractures. Otherwise, it is impossible to maintain restore position for the elderly with osteoporosis.



**Date : 2008-08-28**  
**Session : Symposium - Trauma: Distal Radius Fractures**  
**Time : 0900-1030**  
**Room: 404-405**

**Abstract number : 19085**  
**RESULTS OF RADIOGRAPHIC VERSUS CLINICAL OUTCOME**

Tak Wing LAU, Frankie LEUNG  
*Queen Mary Hospital, Hong Kong (HONG KONG)*

**Introduction:**Intra-articular distal radius fractures are difficult to treat and are prone to poor functional outcome and early degeneration. Our study is to investigate the correlation between the residual deformity and articular incongruity with the functional outcome as well as the grading of osteoarthritis. The result of this study will guide surgeons in making more precise evaluation of post-operative x-ray, and thus in turn giving a more accurate and realistic expectation regarding the prognosis and outcome of these fractures.  
**Materials and Method:**This was a multi-centre prospective study. Intra-articular distal radius fractures (AO type C) fracture pattern were recruited from 3 different centers located in Hong Kong, Taiwan and Singapore. These fractures were operated by plate fixation or external fixation and percutaneous pinning. The criteria for acceptable reduction in both groups included dorsal tilt  $\leq 10$  degree, radial tilt  $\leq 20$  degree, articular step and gap  $\leq 2$ mm, radial tilt present and radial shortening  $\leq 5$ mm. All these fractures were followed regularly at 3 months, 6 months, 1 year and 2 years. Radiological parameters including deformity and articular incongruity were evaluated on all radiographs by two surgeons post-operatively. The anatomical parameters measured included radial height, radial shortening, radial tilt, radial shift, palmar tilt and dorsal/palmar shift. The articular deformity parameters measured included articular gap, articular step and central depression. The functional outcome was assessed by the modified clinical score of Green and O'Brien, and also the Gartland and Werley Point System. The grading of arthritis was assessed with a modification of Knirk and Jupiter grading. For discrete variables we used counts and percentages, for continuous variables we used means and standard deviations. Statistically significant differences between treatment groups in terms of patient characteristics and outcome measures were analyzed using non-parametric tests. Spearman rank correlations were calculated between the radiological measurements and the functional scores and grading of arthritis.  
**Results:**A total of 139 distal radius fractures with complete documentation with a follow up of 2 years were assessed. Among all parameters measured, the radial height ( $r=0.38$ ,  $p<0.01$ ), radial shortening ( $r=-0.26$ ,  $p=0.02$ ), radial tilt ( $r=0.26$ ,  $p=0.02$ ) and palmar tilt ( $r=-0.25$ ,  $p=0.03$ ) were all shown to be significantly related to poor functional outcome. Moreover, the articular incongruity, especially the articular step ( $r=-0.23$ ,  $p=0.05$ ) and gap ( $r=0.32$ ,  $p=0.01$ ) in both PA and lateral views all correlated significantly to poor functional outcome. Central depression was also significantly related to poor function ( $r=-0.42$ ,  $p<0.01$ ). Regarding the correlation between the articular incongruity and the degree of osteoarthritis, it is also statistically significant ( $p<0.05$ ).  
**Conclusion:**Anatomical results can predict outcome of intra-articular fractures and the accuracy of articular reconstruction can predict both clinical outcome and post-traumatic arthritis.

**Date : 2008-08-28**  
**Session : Trauma: organisation**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 15874**

**IMPROVEMENT OF PRE HOSPITAL TRAUMA CARE IN THE SOUTHERN TAMILNADU STATE, INDIA**

Subbiah VENKATESH BABU

*Sri Sakthi Hospital, Tirunelveli (INDIA)*

We (India) contribute 10% of world accidents and mainly our accidents occur in the early hours of the day and in the highways covered by villages. We had very high mortality rate due to accidents in our district in yester years. We formulated and implicated Highway Trauma care centres with ambulances with drivers whom we gave first aid training .The trauma victims are given first aid in the golden hour and seriously injured been shifted with Oxygen and cervical spine control to the nearest Hospital. While comparing the mortality rate due to road accidents in the year 2000 with recent years there is significant reduction in the mortality rate due to accidents in our Tirunelveli District. We are proudly presenting our work and explaining how the work was carried out.

**Date : 2008-08-28**  
**Session : Trauma: organisation**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 16634**

**ORTHOPAEDIC TRAUMA SERVICE UTILISATION - IS THERE MORE THAN WHAT THE EYE MEETS?**

Ulfin RETHNAM, Balasundaram RAMESH, Nigel CLAY  
*Glan Clwyd Hospital, Rhyl (UNITED KINGDOM)*

**BACKGROUND:** Proper utilisation of trauma services can have a significant impact on patient outcome. Delays leading to postponement of trauma surgeries can result in poor outcome especially in the elderly. We analyse the factors influencing poor trauma service utilisation and its impact. **METHODS:** This retrospective study included all Orthopaedic trauma patients who required surgical intervention over a 4-week period. Data was collated on time scale for the trauma patient through their journey from the ward to the trauma theatre. Any delays and subsequent postponements were assessed and reasons analysed. **RESULTS:** There were 192 admissions relating to trauma during the study period with 158 proposed surgical procedures. There was a delayed start to the trauma theatre list by >30min in 53.6% of days. A surgeon was available to start the list on time in 75% of days. The mean delays were as follows: ward delay - 20.12 min (Range 7-86 min), Theatre reception - 12.1 min (Range 0-50 min), Anaesthesia - 20.6 min (Range 1-75 min) and delay between consecutive patients - 5.3 min (Range 0-95 min). Most delays were in the ward due to re-shuffling of list, pending investigations, patients not kept ready and lack of communication between the medical personnel. The delays resulted in postponement of 55 surgical procedures. **CONCLUSION:** Trauma services should be managed appropriately to improve patient care. Our study identified a deficiency in the utilisation of available trauma services. Thorough planning with good communication between members of the trauma team would improve the quality of trauma care.

Date : 2008-08-28  
Session : Trauma: organisation  
Time : 1400-1530  
Room: 404-405

Abstract number : 16706

**PREDICTING THE NEED FOR BLOOD TRANSFUSION IN ORTHOPAEDICS TRAUMA PATIENTS. FACTORS IN DECISION MAKING**

Syah BAHARI, John MCELWAIN

*Adelaide and Meath Hospital Inc. National Children Hospital, Dublin (IRELAND)*

INTRODUCTION: Shortage of blood for transfusion due to reduce blood donation and stricter regulations on blood donation screening has created more awareness on the decision for blood transfusion. Blood wastage occurred due to unused cross matching. The purpose of the study is to analyse the factors useful in predicting transfusion requirement in a cohort of trauma patients. MATERIALS AND METHODS: Patients admitted for orthopaedic trauma procedures requiring blood transfusion were assessed prospectively over one year. Demographic data, ASA score, POSSUM score, co morbidities, type of procedures, number of unit transfused, reason for transfusion, time of transfusion, pre and post transfusion haemoglobin were recorded. Polytrauma patients with abdominal or thoracic injury requiring surgical intervention were excluded from the study. RESULTS: 162 patients were identified. Mean age was 72.7 (45-89). Male to female ratio was 1:3. Mean ASA and POSSUM score was 2.6 and 62.3%. The most common procedure requiring transfusion was cemented bipolar hemiarthroplasty. The mean unit transfused was 2.6 (1-4). 80% of patients were transfused with haemoglobin less than 7g. Mean pre and post transfusion haemoglobin were 7.2(5.9-8.3)g/dL and 10.5(8.9-11.6)g/dL. 90% of patients were transfused post operatively. 26 patients required more than one episode. CONCLUSIONS: Profiling the type of patients, identifying the commonest procedure and when transfusion most likely to occur can minimise unnecessary cross matching thus reducing blood wastage.

**Date : 2008-08-28**  
**Session : Trauma: organisation**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 16914**

**AVAILABILITY OF ARTERIAL EMBOLIZATION IN HEMODYNAMICALLY UNSTABLE PELVIC FRACTURE**

Hyung Ku YOON, Soo Hong HAN, Byung Ho YOON, Tae Keun AHN

*Department of Orthopaedic Surgery, Bundang CHA Hospital, College of Medicine, Pochon CHA University, Seongnam (KOREA)*

**PURPOSE:** The purpose of this study is to assess availability and the appropriate time of arterial embolization by angiography in patients who sustained hemodynamically unstable pelvic bone fracture. **MATERIALS AND METHODS:** 19 cases of angiography and arterial embolization among 287 cases of pelvic bone fracture admitted from May 2002 to February 2007 were reviewed retrospectively regarding blood pressure, pulse rate, hemoglobin, prothrombin time, partial thromboplastin time, platelet at 3 time sequences immediately after arrival at emergency room, and before embolization and after embolization by repeated measures analysis of variance as a means of statistical analysis. **RESULTS:** The blood pressure of post embolization showed significant difference from that of pre embolization. Hemoglobin and prothrombin time checked at the arrival in showed statistically significant difference from those checked immediately before and after the embolization, respectively. The partial thromboplastin time and platelet checked immediately after arrival at ER showed significant difference from those checked before the embolization. **CONCLUSION:** In the hemodynamically unstable pelvic bone fracture with rapid change of hemoglobin, prothrombin time, partial thromboplastin time and platelet with little response to fluid and transfusion resuscitation, interventional angiography and embolization can be one effective treatment modality.

**Date : 2008-08-28**  
**Session : Trauma: organisation**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 17206**

**AWARENESS ABOUT COMPARTMENT SYNDROME AMONG TRAUMA NURSES**

Ashok MARUDANAYAGAM, Mohammad YAQOOB, Ravi NIDUMOLU  
*Withybush General Hospital, Haverfordwest (UNITED KINGDOM)*

AIM: To assess the level of awareness of trauma ward nurses about compartment syndrome. MATERIALS AND METHODS: A questionnaire was distributed to all the registered nurses who manage trauma patients in the ward. Seventy-five completed questionnaires were analysed. RESULTS: The answers were analysed for each question in the proforma. Only sixty percent of the nurses understood what compartment syndrome is. One third of them identified tibial and elbow fractures being the common causes of compartment syndrome. Only more than 50% felt that pain out of proportion to that of injury is a useful symptom in diagnosing this condition. Around one third of the nurses found that passive stretch pain is the diagnostic sign, while very few identified tense compartment as a reliable sign. Majority of them opted for calling the SHO as their immediate response on diagnosing this condition. More than 80% of them answered limb loss as the potential dreaded complication. CONCLUSION: The level of awareness of compartment syndrome in trauma nurses was suboptimal. ACTION TAKEN: Regular education sessions for trauma nurses started. Flow chart showing the action plan in a suspected compartment syndrome was prepared and put up in wards where trauma patients get admitted. SIGNIFICANCE OF OUR WORK: We had a relatively higher incidence of compartment syndrome and the long-term sequelae over a year's time before the study was performed. The incidence of long-term complications of compartment syndrome significantly reduced after the action we took following this study.

**Date : 2008-08-28**  
**Session : Trauma: organisation**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 17724**

**APPROPRIATENESS OF TRAUMA CLINIC REFERRALS**

Kakwani RAJESHKUMAR, Apurva SINHA, Paresh SONSALE  
*Good Hope Hospital NHS Trust, Birmingham (UNITED KINGDOM)*

AIM: A prospective audit to evaluate the appropriateness of referral to the Consultant led New Trauma Clinic at the Primary referral unit. The Minor Injuries unit is run by experienced and trained nurse practitioners. The patients needing expert opinion are then referred onto the weekly New Trauma clinic run by the senior author (PS). METHODS AND MATERIALS: Over the 5-month study period, 269 patients were referred to the Trauma Clinic. 43 patients failed to attend the clinic appointment (15.9%). 93/269 patients needed a Consultant opinion/intervention (34.6%). Whereas 133/269 patients did not need a Consultant opinion/intervention (49%). RESULTS: Only 23% of patients with certain hand fractures needed an Orthopaedic Consultant input (undisplaced metacarpal, metatarsal and phalangeal fracture). 66% of soft tissues injuries sent to the Trauma Clinic were minor and could have been followed up at the GP practice. 63% of distal radius fractures were undisplaced and needed just one further assessment at 4 weeks to assess fracture union. This section if filtered would account to 53% reduction in the Trauma Clinic workload and the resources saved could then be redirected for better utilisation. The good sensitivity of this clinic was denoted by the fact that only 6 out of the 269 patients (2.3%) referred to the clinic needed admission, of whom 3 patients needed surgical intervention. CONCLUSION: Simple guidelines regarding undisplaced metacarpal, metatarsal and phalangeal fractures could lead to a significant saving by reducing inappropriate referrals.

**Date : 2008-08-28**  
**Session : Trauma: organisation**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 17797**

**PATTERN OF TRAUMA-RELATED EMERGENCY ROOM DEATHS IN A WEST AFRICAN TERTIARY HOSPITAL**

Cosmas IHEZIE

*Federal Medical Centre, Department Of Orthopaedic Surgery, Owerri (NIGERIA)*

**INTRODUCTION:** Trauma remains a leading cause of preventable and untimely death world over. A great percentage of trauma-related deaths occur in the emergency room. **OBJECTIVE:** To review the incidence, pattern and determinants of trauma-related emergency room deaths and recommend ways of reducing the burden in our subregion. **CASES AND METHODS:** A seven-year retrospective review of records of trauma-related deaths in our emergency department from 2001 to 2007 was done. Collated data were statistically analysed. **RESULTS:** A total of 1041 deaths were recorded. Three hundred and seventy-nine (36.4%) of these were due to trauma. Male: Female ratio was 4:1, with age range between 1 and 85 years, modal age being between 21 and 30 years. Road traffic accident caused 76% of injuries while isolated head injury was by far the most common injury 45.6% leading to death followed by polytrauma (27.4%). We noticed a progressive annual incidence of trauma-related deaths. Most deaths occurred during the evening and night shifts and about 45% of deaths occurred within the first hour of reaching the hospital, 25% occurring within 30 minutes. **CONCLUSION:** The pattern of trauma-related deaths in our subregion is similar to other African studies. Injury and violence prevention strategies remain pivotal to the hope of curbing the incidence of trauma-linked deaths.



**Date : 2008-08-28**  
**Session : Trauma: organisation**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 18061**

**PACS - DOES IT AID THE MANAGEMENT OF ORTHOPAEDIC TRAUMA?**

Jagan Mohana Reddy VELPULA, V. GUPTA, K. BARNES, M. WASEEM  
*Macclesfield Hospitals, Macclesfield (UNITED KINGDOM)*

Picture Archiving and Communications System, more commonly known as PACS, enables images such as x-rays, CT and MRI scans to be stored electronically and to be viewed on LCD monitors. This allows health care professionals access to images at the touch of a button. NHS hospitals through out the country are introducing PACS in a phased manner. We performed a prospective study to assess how effective the use of PACS. We devised a questionnaire relating to the use of PACS. This was given to all on-call orthopaedic junior doctors for a period of 3 weeks. Data collected from the questionnaire were then analysed. Overall we found that PACS was beneficial in the management of orthopaedic patients. The orthopaedic registrars are non resident when on call. PACS allowed electronic transfer of images ranging from simple to more complex cases. This ensured senior review of all films and aided the SHO in getting a quick decision from the on call registrar. This helps in achieving the four hour target time for A&E, reducing unnecessary admissions and reducing incidence of missed fractures by more junior doctor. PACS can also be regarded as an advanced teaching tool. Images are easily located and can be displaced on almost any computer in the hospital. A&E doctors can also send images to other parts of the hospital especially at night so that opinions can be gathered with regards to management. However PACS should be an aid and not a substitute for clinical examination.

**Date : 2008-08-28**  
**Session : Trauma: organisation**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 18335**

**NEW RADIOLOGICAL ALIGNMENT JIG FOR INSERTING DISTAL LOCKING SCREWS IN INTRAMEDULLARY NAILS**

Alan J JOHNSTONE, Saravana Vail KARUPPIAH

*NHS Grampian University Hospitals Trust, Aberdeen (UNITED KINGDOM)*

**INTRODUCTION:** The current techniques used for locking the distal end of intramedullary nails with cross screws remain a technical operative challenge. The surgeon uses his experience to locate the distal holes in the intramedullary nail with two dimensional intraoperative X-ray images (fluoroscopy). As a result, a large number of X-ray images are frequently required, significantly increasing the radiation exposure to both the patient and the operative team with increase in the operating time. **AIM:** We aimed to develop a simple new radiological alignment jig that would allow the accurate placement of distal locking cross screws in an intramedullary nailing, with minimal radiation exposure, without having to visualise the distal screw holes. **MATERIALS AND METHODS:** Laboratory tests were conducted using plastic femora (Sawbones Limited) fixed with intramedullary nails. Tests were performed three times using each of the different femoral intramedullary nails (Russell-Taylor) investigating whether the length or diameter of the nail had any influence upon the accuracy of distal screw insertion. A limited clinical study was conducted using the new alignment jig to insert distal locking screws in patients. **RESULTS:** Both the bench tests and limited clinical study were 100% successful and permitted the clinician to identify the distal holes correctly without needing to visualise the distal screw holes radiologically. **CONCLUSION:** Our initial bench tests and clinical study show that the new alignment jig allows simple and accurate insertion of the distal locking screws with minimal radiological guidance with an overall decrease in operating time.

**Date : 2008-08-28**  
**Session : Symposium - Trauma: Updates in Hip Fracture Management**  
**Time : 1400-1530**  
**Room: 404-405**

**Abstract number : 19086**  
**CLINICAL PATHWAY OF HIP FRACTURE MANAGEMENT**

Tak Wing LAU, Frankie LEUNG  
*Queen Mary Hospital, Hong Kong (HONG KONG)*

The team started work in August 2006. With active participation and involvement of multidisciplinary members, the clinical pathway appropriate to the Hong Kong situation from acute to convalescent phases was mapped out. As the service scope covers 3 hospitals in our region: Queen Mary Hospital (QMH), Fung Yiu King Hospital (FYKH) and MacLehose Medical Rehabilitation Centre (MMRC), with the concerted effort of team members from all three hospitals, the clinical pathway was then worked spanning across 3 hospitals so that patients could be assured of the quality and continuity of care. The pathway was finalized in Jan 2007 and pilot run in February 2007. MAJOR ACHIEVEMENTS

1. Reduce Length of Stay (LOS) The team has identified room for improvement in the 4 days average pre-operation length of stay. With the support from anesthetists and fellow trauma surgeons, the average pre-operation length of stay was reduced to 2 days in 2007. The total length of stay has also been reduced from 12 days to 7 days (- 34%) over the last one year. Detailed result and comparison with Hospital Authority (HA) average through cluster wide collaboration between acute hospital (QMH), and 2 convalescence hospitals (FYKH/MMRC) achieved are listed as follows: Pre-op LOS <=2 days: 2006: HA: 34%; QMH: 15% 2007 (Jan-Aug): HA: 40%; QMH: 48% 2007 (Sep): HA 53%; QMH: 70% 2007 (Nov): HA 58%; QMH: 82% Total LOS: 2006: 12.07 days 2007 (Feb &#65533; May): 9.77 days 2007 (Jun &#65533; Aug): 8.14 days 2007 (Sep &#65533; Dec): 7.27 days LOS (convalescence): 2006: 40 days 2007 (Feb &#65533; May): 34 days 2007 (Jun &#65533; Aug): 33 days 2007 (Sep-Dec): 26 days
2. Better Quality Care to patients With the structured clinical pathway, the expected length of stay, details of the rehabilitation program and general expected outcome of recovery after hip fractures can be communicated to the patient, their family/ care provider at the early stage of the admission. &#65533; Fall Prevention Program &#65533; has been added to the standard care process to enable patients and families to improve their self care ability. Osteoporosis management program was also incorporated into the hip fracture pathway to prevent future osteoporotic induced problems.
3. Teamwork & Common Vision The clinical pathway established by the team has its uniqueness in that it starts from acute hospital and continues at convalescence hospital till patient discharge. Flow of information and continuity of patient management between acute and convalescence hospitals are strengthened through enhanced multidisciplinary and intra cluster collaboration and communication.
4. Resource Management The team has mobilized every resource available within the hospitals and in the community. Apart from appointing a part time nurse as case manager, volunteer service group was recruited for extending the service. WAYS FORWARD: The team has achieved the objective of enhancing quality care to fracture hip patients through effective collaboration between different disciplines and hospitals. It will not be a success without the commitment, teamwork, mutual understanding and common vision for better patient care from all the team members.

Date : 2008-08-28

Session : Symposium - Spine: Spondylolisthesis

Time : 1400-1530

Room: 406-407

Abstract number : 19162

**PRINCIPLE OF MANAGEMENT OF SPONDYLOLISTHESIS**

Keith Dip-Kei LUK

*University of Hong Kong, Hong Kong (HONG KONG)*

- Degenerative spondylolisthesis: Pathoanatomy: - Reduction of disc height; - Reduction of intervertebral foramen; - Subluxation of facet joints; - Infolding of ligamentum flavum; - Bulging or herniated disc. - Degenerative spondylolisthesis: Pathomechanics: - Reduction of anterior column support; - Slackening of paravertebral ligaments; - Decrease in segmental stiffness in all planes. - Assessment: - Neurology; - Stability; - Deformity. - Causes of neurological deficit: - Spinal stenosis: - central, - root canal; - Bulging discs / osteophytes; - Facet hypertrophy; - Ligamentum flavum hypertrophy; -Foraminal stenosis; - Olisthesis; - Stretching of cauda equina. Static measurement of instability. Dynamic measurement of instability. Flexion/extension radiographs. - Suspension radiograph: Friberg, Spine 1987. - Traction radiographs: 50% body weight traction; supine traction radiograph (ST); prone traction radiograph (PT). - Prone traction radiograph - Maximum: - reduction of olisthesis; - restoration of lordosis; - restoration of disc height/area. - Instability in Spondylolisthesis: Loss of anterior column support. - Treatment strategy: - Nerve decompression; - Stabilization; - Correction of deformity (if necessary). - When to fuse?: - Back pain; - Dynamic neurological deficit; - Instability on traction radiograph; - Young patients (<65); - Iatrogenic instability. - When NOT to fuse?: - Old/debilitated patients; - Claudication without back pain; - No demonstrable instability; - Uneventful medial facetectomy. - Reduce or Not reduce: - Majority do not require reduction; - Risk of neurologic complication. - Reduction of spondylolisthesis: - Facilitates nerve decompression; - Facilitates fusion; - Improves body posture. - Principle of surgical treatment:Reconstruct anterior column. - Interbody Fusion (graft/spacer): - Decompresses; - Stabilizes; - Reduces deformity. - The value of pedicular screw fixation in single level spondylolisthesis is not proven.

**Date : 2008-08-28**  
**Session : Symposium- Spine: Spondylolisthesis**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 19178**  
**SPINAL STENOSIS IN SPONDYLOLYTIC SPONDYLOLISTHESIS**

Kan Hing MAK  
*Kwong Wah Hospital, HONG KONG (HONG KONG)*

**OBJECTIVE:** To review the pathology, the causes of symptom and surgical management in patients with spondylolytic spondylolisthesis.**MATERIALS and METHODS:**The surgical findings and post-operation results in 12 patients with spondylolytic spondylolisthesis, aged 20 to 76, were reviewed with a minimum follow up of 3 years, male to female ratio of 1:2. Duration of symptoms before surgery was from 2 to 5 years. Indications of surgery were: 1. patients with persistent decreasing in walking distance (typically under 10 minutes) due to calf pain and weakness on walking and standing, with or without localized radiculopathy, accompanied by 2. genuine back pain on change in posture, getting up in bed or on flexion and extension, or on rotation of the spine, with 3. radiological evidences of spondylolytic spondylolisthesis, flattened inter-vertebral disc and/or hypertrophic ligamentum flava.**RESULTS:**Causes of symptoms in patients with spondylolytic spondylolisthesis found at the time of surgery included: 1. Pseudo-arthrosis in the spinous processes with ruptures of the supra and inter spinous ligaments. 2. Central canal stenosis with retropulsion of the flattened inter-vertebral disc. 3. Lateral canal stenosis due to hypertrophic ligamentum flava and hypertrophic pseudo-arthrosis of the pars defect. 4. Vertical segmental instability, with translation in the sagittal and coronal plane. All patients were benefited with improved paraesthesia and increased lower limb activities. There was no neurological deterioration in all patients. Complications of surgery included: one case of pedicle screw protrusion, one case of breakage of screw and one case of superficial infection. Degeneration of the adjacent levels was occasionally seen.**CONCLUSIONS:** In spondylolytic spondylolisthesis, if the patients had significant back pain related to instability in the presence of spinal claudication, removal of the pseudo-arthrosis in the pars defect and interbody lumbar fusion should be considered after decompressive laminectomy.

**Date : 2008-08-28**  
**Session : Symposium- Spine: Spondylolisthesis**  
**Time : 1400-1530**  
**Room: 406-407**

**Abstract number : 19204**  
**MANAGEMENT OF SPONDYLOLYSIS**

Ahmet ALANAY  
*Hacettepe University Faculty of Medicine, Sıhhiye Ankara (TURKEY)*

Spondylolysis refers to a defect of the vertebral pars interarticularis. It should be considered in the differential diagnosis of children presenting with low back pain. Typical presentation is characterized by a history of activity-related low back pain and the presence of painful spinal mobility and hamstring tightness without radiculopathy. Plain radiography, computed tomography, and single-photon emission computed tomography are useful for establishing the diagnosis. Spondylolysis is best treated with immobilization of the spine and activity restriction. It often responds to brief periods of activity restriction, immobilization, and physiotherapy. The growing child may need to be followed clinically and radiographically through skeletal maturity for early detection of potential slips. Surgical intervention should be considered when pain persists despite nonsurgical interventions and when progressive vertebral displacement occurs. Repair of pars defects can be performed for patients younger than 20 years, with slip no more than grade 1 and with healthy interbody discs. Several techniques of pars repair techniques with satisfactory results have been described. The most important determinant for the success of any technique seems to be the proper patient selection among many others. Posterior fusion is the standart approach for those who do not fit to the criteria of pars repair. Decompression may be necessary for those patients with radicular symptoms due to the compression of fibrous tissue at the side of pars fracture. There is controversy about the best method of fusion. It is the surgeon's preference for the selection of most efficient technique. There are many studies in the literature reporting satisfactory and similar results with fusion without instrumentation, with posterior instrumentation as well as posterior instrumentation + interbody fusion (ALIF vs. TLIF vs. PLIF)

**Date : 2008-08-28**

**Session : Basic science: articular cartilage, imaging and reconstructions**

**Time : 0900-1030**

**Room: 603-604**

**Abstract number : 16757**

**HISTOLOGICAL ASSESSMENT OF DEGENERATION OF CRUCIATE LIGAMENTS IN OSTEOARTHROTIC KNEES AND THEIR ASSOCIATION WITH CLINICAL AND FUNCTIONAL STATUS OF THE KNEE JOINT**

Akshay GOEL, Aditya AGGARWAL, Bishan Das RADOTRA, S.S GILL

*PostGraduate Institute of Medical Education and Research (PGI-MER), Chandigarh (INDIA)*

OBJECTIVE: Studies have demonstrated that degeneration occurs in cruciate ligaments in osteoarthritis, but not much literature is available regarding their association with clinical status of knee. We studied osteoarthrotic changes in cruciate ligaments and their correlation with the deformities in arthrotic knee and its functional status. MATERIAL AND METHODS: Study included 30 osteoarthrotic knees undergoing TKA. Cases were assessed preoperatively using Knee Society Score. Cruciate ligaments were studied macroscopically and degenerative changes classified histologically depending on the number of microscopic fields involved. The changes were then compared with the knee score, function score, and deformities. RESULTS: The gross appearance of ACL was normal in 8, abnormal or ruptured in 22. In all cases PCL appeared to be normal. On microscopy, 4 ACL specimens had no changes while 19 had moderate-severe changes. Amongst PCL 4 were normal, while 11 had moderate-severe degenerative changes. Predominant changes were presence of loose fibrous tissue and cystic degeneration. Arthrotic changes in cruciate ligaments correlated with the Knee score and the presence of anteroposterior instability ( $p < 0.05$ ), but had no significant correlation with other deformities or function score. CONCLUSION: Knee score was reliably predictive of degenerative changes in anterior and posterior cruciate ligaments while the function scores were not, possibly, because knee score is more objective. Although PCL appeared normal during TKA, in majority it showed some degree of histological degenerative changes. Patients with poor knee scores and anteroposterior instability have more severely degenerated PCL and are perhaps candidates for PCL substituting TKA implants.

Date : 2008-08-28

Session : Basic science: articular cartilage, imaging and reconstructions

Time : 0900-1030

Room: 603-604

Abstract number : 18262

**3.0T MRI IN FOLLOW-UP AFTER MICROFRACTURING - DO RELATIVE T2 VALUES IN REPAIR TISSUES CORRELATE WITH THE KOOS SCORE?**

Florian KUTSCHA-LISSBERG<sup>1</sup>, Lukas NEGRIN<sup>2</sup>, Stephan DOMAYER<sup>3</sup>, Christian GÄBLER<sup>1</sup>, Vilmos VÉCSEI<sup>1</sup>

<sup>1</sup>Dept. for Trauma surgery- Medical University of Vienna, Vienna (AUSTRIA), <sup>2</sup>Medical University of Vienna, Vienna (AUSTRIA),

<sup>3</sup>Orthopedic Department - Medical University of Vienna, Vienna (AUSTRIA)

INTRODUCTION: Presently three different techniques to directly visualize the molecular structure of cartilage are considered to be of promise: delayed gadolinium-enhanced MRI of cartilage (dGEMRIC), T1rho and T2 mapping. T2 mapping provides information on collagen network organization and concentration. As 3.0 T units become more and more established in clinical routine, the integration of T2 mapping in monitoring of cartilage repair may be useful. METHODS: 20 Patients have been radiologically scored by 3.0T MRI and T2 Mapping, clinically by the KOOS Score at least one year postoperatively. Microfracturing was performed according to Steadman's guidelines. We compared T2 values of repairs sites and native cartilage (paired, double tailed t-test). The Spearman correlation coefficient (rs) and unpaired, double tailed t-tests were calculated. P<0.05 was defined as significantly different. RESULTS: Global T2 values of repair sites differed significantly from T2 values of native articular cartilage (P=0.001). We found statistically significant correlation between the KOOS Score and the global T2 values. (Sport: 0.477 p=0.034, Quality of life: 0.518 p=0.019, Symptoms 0.536 p=0.015, Pain 0.529 p=0.016, Activities of daily living 0.607 p=0.005). DISCUSSION: Although microfracturing cannot provide the generation of articular hyaline cartilage, the evaluation of global T2 values appears to be a valuable measurement for the follow-up after microfracturing. As these are preliminary results, the evaluation of a larger population size is necessary for the corroboration of these results.



Date : 2008-08-28

Session : Basic science: articular cartilage, imaging and reconstructions

Time : 0900-1030

Room: 603-604

Abstract number : 17757

**REGIONAL CHANGES OF T1 AND T2 RELAXATION OF ENZYMATICALLY DEGRADED PORCINE PATELLAR CARTILAGES IN VITRO**

Zhiyang ZHOU<sup>1</sup>, Xuenong ZOU<sup>2</sup>, Steffen RINGGAARD<sup>3</sup>, Hai-sheng LI<sup>4</sup>, Li-Jin ZOU<sup>1</sup>, Michael BENDTSEN<sup>4</sup>, Casper FOLDAGER<sup>4</sup>, Hans STODKILDE-JORGENSEN<sup>5</sup>, Cody BÜNGER<sup>4</sup>

<sup>1</sup>Orthopaedic Research Laboratory and MR Research Center, Aarhus University Hospital, The University of Aarhus, Aarhus C (DENMARK), <sup>2</sup>Department of Orthopaedics, The First Affiliated Hospital of Sun Yet-Sen University, Guangdong (DENMARK), <sup>3</sup>MR Research Center, Aarhus University Hospital, The University of Aarhus, Aarhus (DENMARK), <sup>4</sup>Orthopaedic Research Laboratory, Aarhus University Hospital, The University of Aarhus, Aarhus C (DENMARK), <sup>5</sup>MR Center, Institute of Experimental Clinical Research, Aarhus University Hospital, Skejby Sygehus, Aarhus N (DENMARK)

**OBJECTIVE:** To investigate signal changes in spin-lattice relaxation in the rotating frame (T1) and transverse relaxation (T2) from porcine articular cartilages after the trypsin digestion in vitro. **METHODS:** T1 and T2 relaxation times were measured from porcine patellar cartilage. The samples (n=20) were assigned to 2 groups. A group of right patellar samples (n=10) were bathed in PBS to serve as self-control group. The left patellar samples (n=10) were bathed in PBS with trypsin for 4 hours as treated groups. T1 and T2-images were collected with a spin-echo sequence pre-encoded with a spin-lock pulse cluster and a spin-echo sequence on a 7.0T scanner. Using a home-built analysis programme, T1 and T2-maps were obtained and the cartilage from each sample was manually segmented by drawing regions-of-interest. This segmentation separated the patellar cartilage into four layers (superficial, middle, deep and calcified) to investigate regional differences of T1 and T2 in patellar cartilage. **RESULTS:** T1 and T2 relaxation in superficial (P<0.01) and total (P<0.05) layers increased significantly in samples after 4 hours trypsin digestion. However, T1 and T2 relaxation showed no difference on both layers in the control groups. **CONCLUSION:** This study demonstrates that T1 and T2 relaxation changes at the cartilage with a hyperintense lamina are sensitive to trypsin digestion, which could correlate to PG loss. Thus, T1 and T2 measurements may be used as non-invasive early evaluation method for cartilage disease.

Date : 2008-08-28

Session : Basic science: articular cartilage, imaging and reconstructions

Time : 0900-1030

Room: 603-604

Abstract number : 17891

**OPTIMAL LOCAL DOSAGE OF HOUSEKEEPING ANTIBIOTICS TO INHIBIT S. AUREUS WITHOUT INDUCING OSTEOBLAST NECROSIS: IN VITRO STUDY**

Kit Ying LEUNG<sup>1</sup>, Kelvin Wai Kwok YEUNG<sup>1</sup>, Richard KAO<sup>1</sup>, Paul CHU<sup>2</sup>, Kenneth CHEUNG<sup>1</sup>

<sup>1</sup>The University of Hong Kong, Hong Kong (HONG KONG), <sup>2</sup>The City University Of Hong Kong, Hong Kong (HONG KONG)

Staphylococcus aureus is commonly seen in orthopaedic implant related infections. A high local concentration of antibiotics is toxic to osteoblasts, thereby inhibiting bone formation. Account has to be taken while designing antibiotic coated implants and delivering antibiotics locally. Cefazolin, vancomycin and gentamicin are usually used. However, the correlations between such antibiotics and osteoblast activity have not been well studied in the optimal dosage to inhibit that bacterium without inducing cytotoxic effect. This study aims to investigate the tolerance of osteoblasts against such antibiotics in-vitro. Osteoblasts (SaOs2) were cultured in antibiotic free medium and then exposed to concentrations of each antibiotics between 10,000ug/ml and 0.001ug/ml. Viable cells at 24 hours were counted using Thiazolyl Blue Tetrazolium Bromide (MTT) assay. By using the same concentration gradient, minimal inhibition concentration of such antibiotics to S. aureus was studied. In cytotoxicity test, osteoblasts die as the concentration of antibiotics increases to 10,000ug/ml, whereas all the cells can survive as the concentration reduces to 1000ug/ml or below. In minimal inhibition concentration testing, it suggests 0.625ug/ml of gentamicin and/or vancomycin is able to inhibit S. aureus activity. For cefazolin the concentration even reduces to 0.15625ug/ml. According to guideline, the recommended daily dosages of cefazolin, gentamicin and vancomycin are 35.7ug/ml, 3.75ug/ml and 17.86ug/ml, respectively. By using the in-vitro results, these clinical dosages do not induce any toxic effect to osteoblasts and are also capable to inhibit S. aureus activity.

Date : 2008-08-28

Session : Basic science: articular cartilage, imaging and reconstructions

Time : 0900-1030

Room: 603-604

Abstract number : 17914

**AN ANTI-BACTERIAL COATING IN DENTAL IMPLANT USED IN ORTHOPAEDICS/ FEASIBILITY STUDY OF ANTI-BACTERIAL COATING IN DENTAL IMPLANT FOR ORTHOPAEDIC USE**

Kit Ying LEUNG<sup>1</sup>, Kelvin Wai Kwok YEUNG<sup>2</sup>, Richard KAO<sup>1</sup>, Paul CHU<sup>2</sup>, Kenneth CHEUNG<sup>1</sup>

<sup>1</sup>The University of Hong Kong, Hong Kong (HONG KONG), <sup>2</sup>City University Of Hong Kong, Hong Kong (HONG KONG)

Bacterial adhesion becomes an important event in the pathogenesis of bacterial infection. Plasma surface modification, with nitrogen layer, to resist bacterial activity has successfully been implemented to dental implants [1]. We hypothesize that same surface modification can be applied to orthopedic and suppress bacterial attachment. This study aims to investigate the feasibility of antibacterial ability of medical grade titanium alloy treated with nitrogen plasma immersion ion implantation (PIII). Surface roughness and depth profile of N-PIII samples are determined by atomic force microscopy and X-ray photoelectron spectroscopy. Since *S. aureus* is found in orthopedic post-op infection, an overnight culture of this bacterium in 1X10<sup>8</sup>/ml CFU is prepared for colony forming unit counting. In surface roughness measurement, N-PIII modified sample seems to be rougher than the control. The surface morphology is changed after PIII. XPS results reveal the thickness of nitrogen-rich layer ranges from 19.88nm to 99.4nm. Therefore, nitrogen plasma is successfully implanted into the substrate. In CFU counting, the numbers of attached bacteria of N-PIII samples are about 3 folds higher than the control. It therefore suggests N-PIII Ti surface does not have an ability to reduce *S. aureus* adhesion. It should understand the bacteria in oral are different from *S. aureus*. Nitrogen plasma treated sample can suppress the adhesion of oral bacteria and salivary protein, but not to that bacterium. Therefore, a concern must be taken if this surface coating is used as antibacterial layer in orthopedic implants. [1] J. Oral Implant Vol.XXIX No.2.2003.

**Date : 2008-08-28**  
**Session : Basic science: articular cartilage, imaging and reconstructions**  
**Time : 0900-1030**  
**Room: 603-604**

**Abstract number : 17953**

**AN IN VITRO GENTAMYCIN RELEASE STUDY ON STRONTIUM CONTAINING HYDROXYAPATITE (SR-HA) BIOACTIVE BONE CEMENT COMPARED WITH POLYMETHYLMETHACRYLATE (PMMA)**

Wai Ching LIU, Chi Tak WONG, William Weijia LU, Richard KAO  
*The University of Hong Kong, Hong Kong (HONG KONG)*

Osteomyelitis is a complication of bacterial infections in the bone usually occurred after implantation. Clearance of bacteria at the osteomyelitic site is usually achieved by local antibiotic release after incorporated into the bone cement. PMMA has been the most widely used bone cement, but concerns over this material have been arisen to its very high setting temperature and lack of osteoconductivity. Our group has developed Sr-HA bone cement which was proved to be osteoconductive and have lower setting temperature. As a result, we hypothesized that Sr-HA bone cement would be feasible to deliver antibiotics at the osteomyelitic site like PMMA. Sr-HA bone cement was impregnated with gentamycin to compare with commercially available PMMA bone cement loaded with the same antibiotic. Quantitative measurement of the gentamycin released was done by fluoremetric method. Efficacy of the bacteria clearance by released gentamycin from the specimens was studied with *Staphylococcus aureus*. A burst release pattern was found at the first few days in this antibiotic impregnated Sr-HA cement to achieve maximum bacteria removal as expected. The antibiotic release kinetics of this Sr-HA bone cement was reported to be comparable to PMMA cement with the potential in treating osteomyelitis.

Date : 2008-08-28

Session : Basic science: articular cartilage, imaging and reconstructions

Time : 0900-1030

Room: 603-604

Abstract number : 18071

**3D-T1&#961; IMAGING AND QUANTITATION OF ARTICULAR CARTILAGE AT 7.0T**

Xuenong ZOU<sup>1</sup>, Zhiyang ZHOU<sup>1</sup>, Steffen RINGGAARD<sup>2</sup>, Hai-sheng LI<sup>1</sup>, Li-jin ZOU<sup>1</sup>, Hans STØDKILDE-JØRGENSEN,<sup>2</sup> Cody BÜNGER<sup>1</sup>  
<sup>1</sup>Orthopaedic Research Laboratory and MRI Research Center, Aarhus University Hospital, Aarhus C (DENMARK), <sup>2</sup>MRI Research Center, Aarhus University Hospital, Aarhus C (DENMARK)

OBJECTIVE: To demonstrate the feasibility of three-dimensional (3D) T1&#961;-weighted imaging of porcine patellar cartilage in vitro at 7.0T and the measurement of T1&#961; values on agarose phantom and patellar cartilage. METHODS: All the MR Imaging experiments were performed using 3D SE sequence with a self-compensating spin-lock pulse cluster. TSL was from 0 to 50 ms with an interval of 10ms. 3D-T1&#961; imaging was done triplicate for 6 phantoms (1% to 6%) at different days, as well as once for 8 porcine patellar cartilages. SNR was measured on the acquired images of both phantoms and patellar cartilages. T1&#961; values were calculated on T1&#961; maps. RESULTS: T1&#961;-weighted images with a shorter TSL had a higher SNR value, which measured between 40 and 100 in the global cartilage. Cartilage images had a higher SNR (TSL<30ms) compared to agarose phantoms and only a lower SNR (TSL>30ms) compared to 1% agarose phantom. T1&#961; relaxation times in agarose phantoms increased from 26ms to 147ms as agarose concentrations decreased in global regions (P<0.05). T1&#961; in the superficial and deep layers was statistically significantly higher than in the transitional, calcified layer and global cartilage (P<0.05). CONCLUSION: The present study demonstrates T1&#961; mapping can be used to quantify the laminar appearance in 3D-T1&#961;-weighted images of articular cartilage.

**Date : 2008-08-28**

**Session : Basic science: articular cartilage, imaging and reconstructions**

**Time : 0900-1030**

**Room: 603-604**

**Abstract number : 18100**

**COMPARISON OF THERAPEUTIC EFFECT OF ENZYMATIC HYDROLYZED COLLAGEN AND GLYCOSAMIN**

Tomas TRC

*2nd Medical School, Charles University, Prague (CZECH REPUBLIC)*

100 volunteers suffering from OA gr.II and III have been treated with enzymatic hydrolyzed collagen or glycosamin. Quadruple VAS, Womac, SF 36 were controlled during 6-month regular controls. Better results have the group of patients treated with enzymatic hydrolyzed collagen. No adverse events or complications have been registered. Patients' satisfaction was higher in collagen group. No other studies were made with nutraceuticals and the results are surprising.

**Date : 2008-08-28**

**Session : Basic science: articular cartilage, imaging and reconstructions**

**Time : 0900-1030**

**Room: 603-604**

**Abstract number : 18471**

**ISOLATED UNICOMPARTMENTAL OSTEOARTHRITIS OF THE KNEE: DIFFERENCE IN DISTRIBUTION OF ARTHRITIC LESIONS**

A GULATI, R CHAU, RICHIE GILL, C A F DODD, D W MURRAY, A J PRICE, D J BEARD, H G PANDIT

*Nuffield Orthopaedic Centre, Oxford (UNITED KINGDOM)*

INTRODUCTION: Osteoarthritis (OA) of the knee usually starts as unicompartmental disease. The aim of this study was to compare the site of lesions in isolated medial and lateral unicompartmental osteoarthritis (OA) of the knee. METHODS: 40 patients with medial and 20 with lateral osteoarthritis (OA) of knee were prospectively studied to determine the difference in distribution of full-thickness lesions. The distance between the margins of the lesion and reference lines was measured and lateral radiographs were used to determine the relationship between the lesion site and knee flexion angle (KFA). RESULTS: The midpoints were significantly different ( $p < 0.001$ ) in lateral OA (femur lesion: 24mm, SD: 9.8 posterior to reference line) compared to medial OA (10mm, SD: 9.3). In lateral OA, the midpoint of femoral lesions was on an average at 40° flexion (SD: 2.9°). The sites of smaller lesions were variable and the lesion expanded both anteriorly and posteriorly. In medial OA, the midpoint of the femoral lesion was at an average of 10.0° (SD: 3.7°) and smaller femoral lesions occurred in full extension and extended further posteriorly with disease progression. CONCLUSION: Medial OA begins near full extension, progresses in a predictable manner and is perhaps initiated by events occurring at heel strike. Lateral OA begins in flexion in a less predictable manner, at KFA above that seen during the gait cycle. The different lesion sites in medial and lateral OA suggest different aetiology and pathophysiology. Therefore, prevention and treatment strategies should be different.

**Date : 2008-08-28**  
**Session : Tumours**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 15295**

**SOFT TISSUE RECURRENCE OF GIANT CELL TUMOUR**

Krishnakumar RAMACHANDRAN NAIR, Gopakumar T.S.  
*Medical College, Trivandrum, Kerala (INDIA)*

Giant cell tumour of bone is characterized radiographically by a well delineated, eccentric, purely lytic, epiphyseal lesion with absence of reactive sclerosis and periosteal new bone formation abutting the articular surface. Giant cell tumour of the bone accounts for 4-5% of primary bone tumours and 18.2% of benign bone tumours. CASE REPORT: A 35-year-old man was presented to our institution because of a gradually enlarging soft-tissue mass in the anterolateral aspect of the proximal part of the right leg for the past six months. Twenty-four months previously, the patient had been treated by curettage and packing with polymethylmethacrylate cement for a giant-cell tumour of the proximal aspect of the right tibia. Physical examination revealed a nontender soft-tissue mass, seven by four centimeters in size, mobile, variable in consistency from bony hard to soft cystic; that was palpable in the anterolateral aspect of the proximal part of the leg. Plain radiographs showed a soft-tissue mass with more central ossification and trabeculations. Magnetic resonance imaging studies showed a lobulated well-defined hyperintense mass intending the proximal substance and origin of the peroneus longus and peroneus brevis with loss of intervening fat planes - possibly infiltrating the peroneus brevis on T2-weighted and STIR images. Histological analysis demonstrated a recurrent GCT. Peripheral rim of ossification around a soft-tissue recurrence of giant-cell tumour is thought to be almost pathognomonic of recurrence. But in this case, central ossification was seen and, to the best of our knowledge, this is second such case reported in the literature.



**Date : 2008-08-28**  
**Session : Tumours**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 16538**

**GIANT CHONDROBLASTOMA OF BONES: REPORT OF THREE CASES AND REVIEW OF LITERATURE**

Vidyadhara S<sup>1</sup>, Pandian S<sup>2</sup>, James GNANADOSS<sup>1</sup>

<sup>1</sup>*MGMC & RI, Pondicherry (INDIA),* <sup>2</sup>*Abiraami Hospital, Cuddalore (INDIA)*

Chondroblastoma is the commonest epiphyseal tumour in children and adolescents with an indolent course. There are not many reported cases of Chondroblastoma of alarmingly large size so as to produce cortical break or pathological fractures. We encountered three adult patients with giant chondroblastomas breaching the cortices and relatively rapid growth. All three patients were successfully treated using extended curettage with hydrogen peroxide and reconstruction of the tumour cavity with structural autografts like fibula and/or iliac crest. They had good functional outcome without recurrence at the last follow-up. The case of giant Chondroblastoma of acromion reported by us to the best of our knowledge is the first of its kinds reported in the literature so far.

**Date : 2008-08-28**  
**Session : Tumours**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 16566**

**OUR EXPERIENCE OF BONE CYSTS TREATMENT**

Ludmila PASHKEVICH, Ihar SHPILEUSKI, Natalia GOLUTVINA

*Belarusian Research Centre of Traumatology and Orthopaedic Surgery, Minsk (BELARUS)*

We have studied the details of treatment and its results at 73 patients; the average age was 10.2 (4-16 years). Aneurysmal bone cysts were in 17 cases, active form of simple cysts in 22. The clinical picture of bone cysts was classical, in 12 cases cyst leads to pathological fracture. The dominant bone cyst localizations were the proximal pars of humerus (34) and in the trochanteric pars of femur (20). The segmentary resection was performed in two cases; defect was filled by massive bone allograft. The sectoral resection and excochleation were performed in 43 cases; post-resection defect was filled by crushed cortical (12) and spongy (31) allografts. Bone cyst transfer from adjacent growth plate (USSR patent '681595) was performed at 12 patients. Intra-cyst steroid injections were used at 24 patients. The incomplete healing (bone structure condensation) was observed in all cases; the partial (17 cases) or full (4) relapse came in 1-3 years. Our experience show that the best results may be received after bone cyst excision - segmentary, sectoral bone resection or excochleation - there were not any relapses, consequence shortening of the affected segment was registered in six cases. Bone cyst transfer is indicated only at younger children, since the intra-operative damaging of growth plate may lead to significant shortening of the segment. Intra-cyst steroid injection may be used only as a preliminary stage before the bone resection - steroid therapy allows to reduce the size of resection and to delay the term of its execution for 1-3 years.

**Date : 2008-08-28**  
**Session : Tumours**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 17255**

**BENIGN AGGRESSIVE AND MALIGNANT OSSEUS TUMOURS AROUND KNEE: OUR EXPERIENCE OF VARIOUS MODALITIES OF TREATMENT**

Zile Singh KUNDU, S S SANGWAN  
*PGIMS, Rohtak, Rohtak (INDIA)*

INTRODUCTION: The commonest site of the osseous malignant and aggressive benign lesions is around the knee. The common benign lesions are giant cell tumours, chondromyxoid-fibroma, chondroblastoma and the malignant are osteosarcoma, malignant fibrous histiocytoma and chondrosarcomas. MATERIAL AND METHODS: Sixty-two such lesions (between 2004-2006) were managed by various methods like extended curettage alone, extended curettage + sandwich method, wide excision and arthrodesis, rotation-plasty and wide excision and limb shortening procedure etc. RESULTS: We could achieve very good results of more than 2-year follow-up. In benign lesions it was the quality and extent of curettage; and for malignant cases, response of chemotherapy and the margins of excision which matters the results. DISCUSSION: From these modalities of treatment we could draw some conclusions that majority of benign lesions of grade I and II can be managed by thorough extended curettage, however, the grade III benign and the malignant lesions need wide excision. Our experience of rotation-plasty, arthrodesis and other innovative method will be presented.

**Date : 2008-08-28**  
**Session : Tumours**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 17533**

**A CASE OF SOLITARY FIBROUS TUMOUR DEVELOPING AT THE NAIL BED OF THE INDEX FINGER**

Haruhisa MARUYAMA<sup>1</sup>, Hiromoto ITO<sup>2</sup>, Hideki NISHIKAWA<sup>3</sup>

<sup>1</sup>*Shinmatudo Central General Hospital, Department of Orthopaedic Surg., Matsudo (JAPAN),* <sup>2</sup>*Nippon Medical School Hospital, Department of Orthopaedic Surg., Tokyo (JAPAN),* <sup>3</sup>*Nishikawa Orthopaedic Clinic, Sagamihara (JAPAN)*

We herein report a case of recurrent fibrous tumour with nail plate prominence of the index finger whose diagnosis was histopathologically difficult. CASE: A 59-year-old male patient. He developed marginal nail prominence of the left index finger and nail deformation with no trigger and underwent partial onychectomy in 2000. He experienced the recurrence and was referred to our department for radical treatment in 2006. A tumour was present under the nail of the left index finger and nail plate deformation and redness of the periungual skin were observed. The X-ray showed the shadow of tumour without bone destruction. For removal of the tumour, radical resection and the defect area was covered with an artery flap. The tumour was elastic hard, grayish white, and solid. The histopathological findings showed that it was a crude fibrous tumour consisting of the spindle cells arranged in cords with a storiform pattern in the lesion. Since the immunostaining showed that CD-34 was positive and  $\alpha$ -SMA and S-100 protein were negative, solitary fibrous tumour (SFT) was diagnosed. DISCUSSION: SFT is considered to be a tumour originating from the undifferentiated mesenchymal cells, characterized by the perivascular fibroblasts. Given that the biological aspect is still unclear, we consider that treatment of SFT or similar fibrous tumours requires extensive resection of the affected site with a small area of unaffected site and close follow-ups of the patients, as it is recognized as a low-grade malignant tumour.

**Date : 2008-08-28**  
**Session : Tumours**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 17539**

**TUMOURS OF BONES AMONG TANZANIANS**

Christina Anthony LYIMU<sup>1</sup>, Alfred C. T. KANGOLLE<sup>2</sup>, Steven MAHENDEKA<sup>1</sup>

<sup>1</sup>*The ARK Consultancy Firm, Dar es Salaam (TANZANIA)*, <sup>2</sup>*Ocean Road Cancer Institute (ORCI), The ARK Consultancy Firm, Dar es Salaam (TANZANIA)*

INTRODUCTION: Less attention is being paid to bone and joints tumours. These tumours are occurring and need consideration in aspect of prevention and treatment. OBJECTIVE: To determine the proportion of patient with bone and joints tumours among new patients treated at Ocean Road Cancer Institute (ORCI), Dar es Salaam. To determine the distribution by sex of bone and joints tumours among new patients treated at ORCI, Dar es Salaam. METHODOLOGY: Review of ORCI new patients' records for the year January-December 2007 was done. The data were analysed using STATA version 8. Findings: For the period January-December 2007, ORCI received a total of 2738 patients, 67% (1833) were females and 33% (905) were males. Among females 0.38%, 0.11%, and 0.11% had Ewing's tumour/osteosarcoma/osteofibroma, chondrosarcoma and synovial sarcoma respectively and for males this was 1.66%, 0.22% and 0.11% respectively. For all sexes this was 0.8, 0.15%, and 0.11%. Generally 0.65%, 1.995 and 1.1% of females, males and all sexes respectively had these cancers. DISCUSSION: The tumours of bones and joints are common, a 2% of males and 1.1% of all sex new patients at ORCI is enough proportion that needs attention and consideration for prevention and treatment.

**Date : 2008-08-28**  
**Session : Tumours**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 17553**

**THE TRENDS OF TUMOURS OF BONE AND JOINTS IN EARLY 2000s AT OCEAN ROAD CANCER INSTITUTE**

Alfred C. T. KANGOLLE<sup>1</sup>, Steven MAHENDEKA<sup>2</sup>, Christina Anthony LYIMU<sup>2</sup>

<sup>1</sup>*Ocean Road Cancer Institute (ORCI), The ARK Consultancy Firm, Dar es Salaam (TANZANIA),* <sup>2</sup>*The ARK Consultancy Firm, Dar es Salaam (TANZANIA)*

INTRODUCTION: Epidemiological observation of routine data is crucial in determining and change that may have passed unnoted. Tumours of bones and joints need similar consideration to know if there is any change over time. OBJECTIVES: To determine the proportion of bone and joints tumours among new patients at Ocean Road Cancer Institute (ORCI) in early 2000s. METHODOLOGY: Record review of ORCI new patients for 2000, 2001 and 2002 was done. Data were entered and analysed using EPI info. RESULTS: In 2000, 0.4% of 1698 new patients at ORCI had tumours of bone and joints. This proportion was 0.6% and 0.5% of 1842 and 1893 for 2001 and 2002 respectively. DISCUSSION: In the period of three years, 2000-2002, there was an overall increase of new patients with a slight increase of patients with tumours of bone and joints. Tumours of bone and joints need to be investigated further to know the reasons of their increase in Tanzania.

**Date : 2008-08-28**  
**Session : Tumours**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 17581**

**TUMOURS OF BONES AND JOINTS AMONG TANZANIANS: A COMPARISON BETWEEN EARLY AND MID 2000s**

Alfred C. T. KANGOLLE<sup>1</sup>, Christina Anthony LYIMU<sup>2</sup>, Steven MAHENDEKA<sup>2</sup>

<sup>1</sup>*Ocean Road Cancer Institute (ORCI), The ARK Consultancy Firm, Dar es Salaam (TANZANIA),* <sup>2</sup>*The ARK Consultancy Firm, Dar es Salaam (TANZANIA)*

**INTRODUCTION:** Observing disease trends using routine data work as disease surveillance. This is important in determining any change. Tumours of bones and joints need similar consideration to know if there is any change over time that may call for attention. **OBJECTIVES:** To determine and compare the proportions of bone and joints tumours among new patients at Ocean Road Cancer Institute (ORCI) between early and mid 2000s. **METHODOLOGY:** The two periods' record review of ORCI's new patients for early (2000, 2001, 2002) and mid 2000s (2005, 2006 and 2007) was done. Data were entered and analysed using EPI info. **RESULTS:** During the two periods the findings show that 2000, 0.4% of 1698 new patients at ORCI had tumours of bone and joints for the early 2000s. This proportion was 0.6% and 0.5% of 1842 and 1893 for 2001 and 2002 respectively. For the mid 2000s this was: in 2005, 0.8% of 2465 new patients at ORCI had tumors of bone and joints. This proportion was 1.1% and 1.99% of 2512 and 2738 for 2006 and 2007 respectively. **DISCUSSION:** There was a four times increase of new patients with tumours of bones and joints from 0.5% in 2000 to 2% of all new patients in 2007. Tumours of bone and joints need to be investigated further to know the reasons of their increase in Tanzania. There is a possibility that there may be a cause of these changes that has not been looked for.

Date : 2008-08-28  
Session : Tumours  
Time : 0900-1030  
Room: 605

Abstract number : 18038

**PROXIMAL TIBIAL EWING'S SARCOMA IN 4-YEAR-OLD - MULTIDISCIPLINARY APPROACH WITH 6-YEAR FOLLOW-UP**

Murali Krishna SAYANA<sup>1</sup>, Marie NOONAN<sup>1</sup>, Ingrid RADOVINOVIC<sup>1</sup>, Patrick KIELY<sup>1</sup>, Brian HURSON<sup>2</sup>, David MOORE<sup>1</sup>  
<sup>1</sup>*Our Lady's Hospital for Sick Children, Dublin (IRELAND)*, <sup>2</sup>*CNOH, Dublin (IRELAND)*

**INTRODUCTION:** With an increase in the 5-year survival rate of Ewing's tumour patient, the focus is now on maximising the function of the patient after excision of the tumour. **CASE REPORT:** We present a 6-year follow-up of a boy who presented at 4 years of age with a Ewing's tumour of his proximal tibia with involvement of the physis. He was staged as stage IV with pulmonary metastasis. Management included chemotherapy (Euro Ewing 99 - pulmonary met protocol), application of a ring frame, wide excision of proximal tibia followed by osteotomy of tibial diaphysis and bone transport 10 months after the start of chemotherapy. He underwent whole lung radiation for the lung mets after completion of chemotherapy. Eight months after the start of bone transport, the nonunion at the docking site of the proximal tibia was excised and acutely shortened. The docking site was solid 7 months after the nonunion excision and shortening. He developed cellulites and an abscess in the middle and distal thigh 20 months after the index procedure. Twenty-four months after the index procedure he was out of frame, mobilising with minimal limp. Over the next four years, his leg length discrepancy has increased to 2cm. He is still being followed-up by oncology, psychology and limb reconstruction teams. **CONCLUSION:** Despite the prolonged treatment, we succeeded in salvaging patient's own limb, gave him best possible function and avoided an implant or an amputation and their accompanying complications.



**Date : 2008-08-28**  
**Session : Tumours**  
**Time : 0900-1030**  
**Room: 605**

**Abstract number : 18760**

**INTRASOSEOUS LIPOMA PROXIMAL TIBIA IN A RHEUMATOID PATIENT**

Ala El-Din ABBAS, Enrique SAAVEDRA, Susana WYLES  
*Ealing Hospital, London (UNITED KINGDOM)*

A 55-year-old patient referred from the rheumatology clinic with a painful left knee and an abnormal X-ray. CT scan was requested in the orthopaedic clinic, and this showed bone tumour. The patient then had excisional biopsy and an impaction bone graft. The histopathology confirmed a rare intraosseous lipoma.

Date : 2008-08-28

Session : Tumours: primary tumour and limb salvage

Time : 1100-1215

Room: 605

Abstract number : 16100

**PATHOLOGICAL FRACTURES OF THE PROXIMAL FEMUR - A CONTRAINDICATION FOR LIMB SALVAGE SURGERY WITH MEGAPROSTHESIS?**

Saravanan ARUMUGAM<sup>1</sup>, Viktor VOLOSHIN<sup>1</sup>, Vladimir SOKOLOVSKII<sup>2</sup>, Vladimir ZUBIKOV<sup>1</sup>, Mammed ALIEV<sup>2</sup>

<sup>1</sup>Moscow Regional Clinical Research Institute, Moscow (RUSSIAN FEDERATION), <sup>2</sup>N.N. Blokhin Russian Cancer Research Center, Moscow (RUSSIAN FEDERATION)

INTRODUCTION: Presence of pathological fracture is considered a contraindication to limb salvage surgery (LSS) for two reasons: 1. the fracture results in a local hematoma with dissemination of tumour cells into adjacent tissues and adjacent joints, and 2. damage to the microcirculation may facilitate metastases. The supporting factors are the followings: the efficacy of neo-adjuvant chemotherapy, healing of the fracture during the preoperative chemotherapy, thus facilitating manipulation during surgery, and the use of modern reconstructive modalities. PATIENTS AND METHODS: Our study included 25 patients (12 men and 13 women) with an average age of 48.4 years (range 18 to 80 years). Histological diagnoses were: Osteosarcoma - 3, Ewing's tumour, Malignant fibrous histiocytoma, Giant cell tumour each 2, Multiple myeloma - 1, Metastases from kidney - 6, Metastases from breast - 5, and Metastases from Unknown origin - 4. All patients had pathological fracture at their presentation to the clinic. All the tumours were staged according to the Enneking et al. staging system (majority belonged to stage II B). Out of 25, 14 patients received neo-adjuvant chemotherapy. All patients were treated by LSS. RESULTS: Postoperative complications included were: dislocation of endoprosthesis - 2, periprosthetic infection - 1, instability of the endoprosthesis components - 1, and local recurrence - 1. Six patients died. All the other patients have functionally good extremities. The 5-year survival of the patient was 79.8%. CONCLUSION: In our view, LSS is typically indicated for reconstruction of large destructive lesions and proximal periarticular fractures not amenable to internal fixation.

**Date : 2008-08-28**  
**Session : Tumours: primary tumour and limb salvage**  
**Time : 1100-1215**  
**Room: 605**

**Abstract number : 16675**

**TREATMENT OF MALIGN TUMOURS OF THE PROXIMAL FEMUR WITH REVISION PROSTHESIS**

Catalin CIRSTOIU, Dan POPESCU, Razvan ENE, George CIRCOTA, Corina BADICEANU  
*Orthopedic - Traumatology Clinic of the University Hospital, Bucharest (ROMANIA)*

**PURPOSE:** To maintain the life quality in the case of the patient suffering of proximal femur extremity malign tumour, using within the oncological limits the resection, as well as by replacing the proximal femur with a reconstruction prosthesis. **MATERIALS AND METHODS:** At the Traumatology Clinic of SUUB, we made between 2004 and 2007, 12 surgery interventions regarding the resection-reconstruction of the proximal femur with the revision prosthesis, after primary and secondary malign tumours at this level. There were 3 cases - osteosarcom, 3 cases - condrosarcom and 6 cases - single bone metastases. All resections were done within the oncological limits, having the anatomopathological extemporaneous check of the resection limit. Also, for all the cases were used for the reconstruction revision prosthesis with long tail and with the possibility of distal locking. Periodical medical checks of 6 weeks, 3, 6, 12 and 18 months post-operator. **RESULTS:** All patients included in the study had a positive development, without any local recidives of secondary distance effects. They followed a medical recovery programme identical to the one followed by the patients with primary hip arthroplasty, with mobilisation every 48 hours post-operator, using the mobile tool, having normal support on the operated pelvian member. The patients started to walk, without sticks 8-10 weeks after operation. **CONCLUSIONS:** The reconstruction after the proximal femur resection using artroplasty with revision prosthesis provides a superior life standard to the patient, with the possibility to get back to a normal life standard after 8-10 weeks from surgery.

**Date : 2008-08-28**  
**Session : Tumours: primary tumour and limb salvage**  
**Time : 1100-1215**  
**Room: 605**

**Abstract number : 16774**

**DIAGNOSTICS AND LIMB SALVAGE OPERATIONS AT TUMOURS OF A KNEE JOINT**

Ludmila PASHKEVICH, Iosif VORONOVICH, Natalia GOLUTVINA

*Belarusian Research Centre of Traumatology and Orthopaedic Surgery, Minsk (BELARUS)*

We have studied the details of complex diagnostics and surgical treatment of 518 patients with tumours of a knee joint (benign - 446, primarily malignant - 72). The clinico-radiological and pathomorphological comparisons have allowed us to define early symptoms of aggressive growth and malignant transformation at 6.5% of patients with osteochondromas and at 8.7% - with chondromas; in 12.8% cases of giant cell tumour the sites of its active growth were revealed. Based on our research, the indications for the most rational methods of surgical treatment, depending on clinico-radiological findings, pathomorphological structure and extent of tumour lesion, were developed. The original surgical techniques of resection and bone grafting in cases of femur and tibiae condyles tumorous lesions were developed. These techniques allow us to preserve the function of a knee joint. Auto- and allografting of bone segment at aggressive and malignant neoplasm allow us to preserve the support ability of extremity.

**Date : 2008-08-28**  
**Session : Tumours: primary tumour and limb salvage**  
**Time : 1100-1215**  
**Room: 605**

**Abstract number : 17579**

**DIFFERENT SURGICAL TREATMENT METHODS FOR METASTATIC FRACTURES OF THE FEMUR**

Manfred GREITBAUER, Kambiz SARAHUDI, Vilmos VECSEI  
*Medical University of Vienna, Dept. of Traumatology, Wien (AUSTRIA)*

**BACKGROUND:** Metastatic fractures of long bones are common complications of malignant tumours. However, the influence of the primary tumour, the stage of metastatic disease, different surgical techniques, and the patients mobility on the postoperative survival have not been clearly defined. The aim of this study was to evaluate the outcome after surgical treatment of metastatic femoral fractures with respect to the primary tumour. **PATIENTS AND METHODS:** A consecutive series of 142 patients with metastatic fractures of the femur were retrospectively studied. Breast carcinoma was the most common primary tumour (n:66), followed by carcinoma of the bronchus (n:14), prostate (n:11), kidney (n:7), multiple myeloma (n:7), and others (n:38). Surgical treatment was based on intramedullary stabilisation without local tumour resection (n:94), marginal resection and extramedullary fixation (n:25), and complete resection and prosthetic replacement (n:23). **RESULTS:** The survival rate after one year was 17% and after two years 6%. The rate was higher in patients with fractures due to breast carcinoma than in patients with other primary tumours. The total rate of complications was 3.2% in patients with intramedullary stabilisation, 20% in patients with extramedullary fixation, and 8.6% in patients with prosthetic replacement. **CONCLUSION:** Although many studies describe prosthetic replacement as the safer method, our data demonstrate that intramedullary stabilisation has many advantages with respect to the patients' postoperative quality of life. In conclusion, this method can be considered as an equivalent treatment alternative especially for patients with advanced metastatic disease.

Date : 2008-08-28

Session : Tumours: primary tumour and limb salvage

Time : 1100-1215

Room: 605

Abstract number : 17843

**UNIPOLAR HIP REPLACEMENT IN PROXIMAL FEMORAL ENDOPROSTHETIC REPLACEMENTS - NOT GOOD FOR YOUNG PATIENTS?**

C R CHANDRASEKAR

*Royal Orthopaedic Hospital, birmingham (UNITED KINGDOM)*

BACKGROUND AND AIMS: The aim of the study was to assess the outcomes following proximal femoral endoprosthesis replacement with unipolar femoral head component without acetabular resurfacing. METHOD: 126 patients who underwent proximal femoral endoprosthesis replacement with unipolar femoral head components without acetabular resurfacing were followed for a mean period of 27 months [range 1 to 180]. The indications were primary bone tumours - 50, secondary bone tumours 66, haematological malignancies 8 and non-oncological diagnosis 2. Their age range was from 4 to 85. 75 patients died with the prosthesis in situ, 6 patients had amputations and 45 patients are alive. 9 patients underwent revision to include acetabular resurfacing and 3 patients await revision for symptoms secondary to acetabular erosion/subluxation. The rate of revision for primary bone tumours was 20% and the rate of revision for secondary bone tumours was 3%. The mean duration from index surgery to revision was 50 months. 45% of the patients who were less than 25 years at the time of the proximal femoral endoprosthesis replacement needed revision surgery compared with 3% of those older than 25 years ( $p=0.008$ ). CONCLUSIONS: Our study showed that 9.5% of patients needed revision to resurface the acetabulum. This procedure was more common for primary bone tumours when the surgery is usually performed as a curative procedure in young patients. Proximal femoral endoprosthesis replacement with monopolar femoral head component is useful for primary and secondary bone tumours when the life expectancy is less than 4 years.

**Date : 2008-08-28**  
**Session : Tumours: primary tumour and limb salvage**  
**Time : 1100-1215**  
**Room: 605**

**Abstract number : 17846**  
**REVIEW OF MONOPOLAR PROXIMAL FEMORAL ENDOPROSTHESES**  
C R CHANDRASEKAR  
*Royal Orthopaedic Hospital, birmingham (UNITED KINGDOM)*

**BACKGROUND AND AIMS:** The aim of the study was to assess the outcomes following proximal femoral endoprosthetic replacement with unipolar femoral head component without acetabular resurfacing. **METHOD:** 131 patients who underwent proximal femoral endoprosthetic replacement with unipolar femoral head components without acetabular resurfacing were followed for a mean period of 27 months [range 1 to 180]. The indications were primary bone tumours - 55, secondary bone tumours 66, haematological malignancies 8 and non-oncological diagnosis 2. Their age range was from 4 to 85. 75 patients died with the prosthesis in situ, 6 patients had amputations and 50 patients are alive. 9 patients underwent revision to include acetabular resurfacing and 3 patients await revision for symptoms secondary to acetabular erosion/subluxation. The rate of revision for primary bone tumours was 20% and the rate of revision for secondary bone tumours was 3%. The mean duration from index surgery to revision was 50 months. 45% of the patients who were less than 25 years at the time of the proximal femoral endoprosthetic replacement needed revision surgery compared with 3% of those older than 25 years ( $p=0.008$ ). **CONCLUSIONS:** Our study showed that 9.5% of the patients needed revision to resurface the acetabulum. This procedure was more common for primary bone tumours when the surgery is usually performed as a curative procedure in young patients. Proximal femoral endoprosthetic replacement with monopolar femoral head component is useful for primary and secondary bone tumours when the life expectancy is less than 4 years.

**Date : 2008-08-28**  
**Session : Tumours: primary tumour and limb salvage**  
**Time : 1100-1215**  
**Room: 605**

**Abstract number : 18157**

**MODULAR PROSTHETIC RECONSTRUCTION AFTER TUMOUR RESECTION OF THE DISTAL HUMERUS**

Philipp FUNOVICS, Reini SCHUH, Jochen HOFSTAETTER, Martin DOMINKUS, Rainer KOTZ  
*Medical University of Vienna Department of Orthopaedics, Vienna (AUSTRIA)*

**BACKGROUND:** Methods of reconstruction of bony defects in the distal humerus are limited. Modular tumour prostheses offer a solution not only in cancer but also in bone loss due to infection, trauma or failed primary elbow arthroplasty. **PATIENTS:** 48 patients underwent reconstruction of the elbow due to post-traumatic joint degeneration (13) or after resection of a bone tumour (35) by use of a modular humerus and elbow prosthesis at our institution since June 1989. There were 22 cases of metastatic disease and 13 primary tumours in 21 men and 14 women with an average age of 53.9 years (5.5 to 90.3). 29 patients received the prosthesis as therapy of first choice, 6 after failure of other reconstructions. There were 11 total and 24 distal humeral implants. Average follow-up was 43.9 months (1 to 250). **RESULTS:** 19 patients died of their oncological disease. 6 patients required revision for infection including one-stage (3) and two-stage (1) revision, explantation leaving a flail joint (1) and amputation (1). 2 patients with metastatic disease underwent partial resection of the scapula and amputation, respectively, due to recurrent tumours. 2 patients complained about joint instability, all other patients showed stable movement. At latest follow-up average range of motion was 95.3° (40 to 155) in flexion. Flexion contracture was the most common limitation of motion. **CONCLUSION:** Modular tumour prostheses of the distal humerus provide a stable reconstruction of the elbow with satisfactory function. Infection remains the major complication especially in total humeral implants.



**Date : 2008-08-28**  
**Session : Tumours: primary tumour and limb salvage**  
**Time : 1100-1215**  
**Room: 605**

**Abstract number : 18691**

**PROSTHETIC RECONSTRUCTION IN LIMB SALVAGE SURGERY OF THE LOWER LIMB: PRELIMINARY RESULTS OF A NEW MODULAR SYSTEM**

Rodolfo CAPANNA, Domenico Andrea CAMPANACCI, Leonardo LATELLA, Pietro DE BIASE, Giovanni BELTRAMI, Guido SCOCCIANTI, Marco MUGNAINI

*Department of Orthopaedic Oncology, Azienda Ospedaliera Universitaria Careggi, Firenze (ITALY)*

In 2001, a new modular prosthetic system was introduced for reconstruction of the lower limb. The system was designed to replace the proximal femur, the distal femur, the total femur and the proximal tibia and for intercalary reconstructions of the femur and arthrodesis of the knee. The same modular system allowed the assembling of an allograft as allograft-prosthesis composite in proximal femur and proximal tibia replacements. The authors present a review of 225 consecutive cases of prosthetic reconstruction performed during the last six years with the new modular system. Between June 2001 and December 2007, 225 patients underwent prosthetic reconstruction of the lower limb with the new modular system. The diagnosis was a primary malignant bone tumour in 89 cases, a bone metastasis in 86 and aggressive benign bone tumour in 16. In 34 cases the prosthesis was implanted as revision of failed periarticular osteosynthesis and traumatic bone loss or of a failed prosthesis. The most frequent complication was infection observed in 16 cases (7%). Mechanical failure of the morse taper occurred in 8 cases (3.5%). Aseptic loosening was seen in 2 cases (0.8%) and prosthetic dislocation in 4 (1.7%). At final follow-up, 75% of the evaluable patients presented a satisfactory functional result (excellent or good following MSTS-ISOLS classification). In conclusion, the new modular prosthetic system may be successfully employed for prosthetic reconstruction or for allograft-prosthesis composite assembling. Preliminary data showed satisfactory functional results which need to be confirmed by a long-term follow-up.

Date : 2008-08-28

Session : Tumours: outcome after primary tumour resection

Time : 1400-1530

Room: 605

Abstract number : 15445

**EXPERIMENTAL MRSA OSTEOMYELITIS TREATMENT BY A BIODEGRADABLE POLYLACTIDE SYSTEM RELEASING LINEZOLID**

Nicolas EFSTATHOPOULOS<sup>1</sup>, Vassilios NIKOLAOU<sup>1</sup>, Panagiotis TSIOLIS<sup>1</sup>, Ioannis LAZARETTOS<sup>1</sup>, Thomas TSAGANOS<sup>2</sup>, Pantelis KOUTOUKAS<sup>2</sup>, Konstatntina FRANGIA<sup>3</sup>, Evangellos GIAMARELLOS-BOURBOULIS<sup>2</sup>

<sup>1</sup>2nd Department of Orthopaedics - Athens University, Athens (GREECE), <sup>2</sup>4th Department of Internal Medicine, Athens University, Athens (GREECE), <sup>3</sup>Department of Pathology, Sotiria Hospital, Athens (GREECE)

**INTRODUCTION:** The effectiveness of a new system from polymerized dilactide (PLA) with incorporated linezolid has been investigated in a rabbit model for treating osteomyelitis by methicillin-resistant Staphylococcus Aureus. **METHODS:** The PLA-Linezolid system was made after thorough stirring 2gr of polymer with 100mg of linezolid. Experimental osteomyelitis was established in 40 rabbits by a modification of the Norden model. MRSA was applied as the test isolate. After drilling a hole in the upper right femur, the isolate was inoculated along with a thin needle working as a foreign body. After three weeks the needle was removed and cultured and PLA-Linezolid system was implanted in half of the animals. Animals were sacrificed at regular time intervals and tissue around the site of implantation was sent for histologic examination and quantitative cultures. **RESULTS:** At 2-4-6-8-10 weeks time after removal of the needle results (mean values) were as follows (Controls/PLA-Linezolid): Log<sub>10</sub> (cfu/g) at infection site: 2.99/5.68-3.44/3.20-3.22/2.39-1.00/1.27-1.00/1.00 respectively and  $\log_{10}$  (cfu/g) compared to start: -0.05/-3.23-0.23/0.13-0.05/0.93-1.34/1.09-3.31/3.34 respectively. Histology confirmed the previous mentioned results, showing an early decrease following by late recurrence of the infectious reaction at the animals that PLA-Linezolid system was used. **CONCLUSIONS:** It is concluded that the applied system achieved an early decrease of the tissue bacterial load which was not maintained until late on follow-up. This might be explained by the bacteriostatic mode of action of linezolid.

**Date : 2008-08-28**

**Session : Tumours: outcome after primary tumour resection**

**Time : 1400-1530**

**Room: 605**

**Abstract number : 15643**

**ROLE OF THE FIXION NAIL IN PATHOLOGICAL HUMERAL SHAFT FRACTURES**

Anil KHANNA<sup>1</sup>, Arun KHANNA<sup>1</sup>, Angus WALLACE<sup>1</sup>, Ravi INDLURU<sup>2</sup>

<sup>1</sup>Nottingham City Hospital, Nottingham (UNITED KINGDOM), <sup>2</sup>Peterborough District Hospital, Peterborough (UNITED KINGDOM)

**INTRODUCTION:** Treatment of patients with pathological fractures is a challenge in itself. The goal of treatment is to provide pain relief, preserve function, union if possible in this challenging environment and most important to make the patient comfortable. Several forms of treatment options are available. We undertook this study to evaluate the role of FIXION Nail in management of pathological fracture shaft of humerus at our hospital. **MATERIAL AND METHOD:** A retrospective analysis of seven patients with pathological fracture shaft of humerus (not prophylactic) treated with the FIXION NAIL was undertaken. As most of the patients had died at the time of study (six out of seven), case notes and X-rays were used to assess the degree of postoperative pain relief and union progression. **RESULTS:** Patient with fracture at the junction of proximal 2/3rd and distal 1/3rd of humerus did not had significant pain relief (5 out of seven). While patient with deposits at the middle 1/3rd were symptomatically much better. Radiological evidence of union was either delayed or not seen at all in these patients. **CONCLUSION:** The FIXION Nails did not prove to be useful in patients with pathological fracture shaft of humerus especially in lower 1/3rd fractures. This we feel is due to lack of stability provide by this implant in distal fractures as distal locking is not promoted in these nails and also the shape of humerus changes at this level, preventing a snug fit by this nail.

Date : 2008-08-28

Session : Tumours: outcome after primary tumour resection

Time : 1400-1530

Room: 605

Abstract number : 16344

**A COMPARATIVE STUDY OF EFFICACY OF CURETTAGE AND BONE GRAFTING WITH ENBLOCK RESECTION AND RECONSTRUCTION IN GIANT CELL TUMOUR OF BONE**

Dariush GOURAN SAVADKOOHI<sup>1</sup>, Mohammad GOURAN SAVADKOOHI<sup>2</sup>, Ali Reza AMIN JAVAHERI<sup>1</sup>, Mostafa SHAREZAI<sup>1</sup>

<sup>1</sup>Sina Hospital, Tehran University of Medical Sciences, Tehran (IRAN), <sup>2</sup>Shaheed Beheshti University of Medical science, Tehran (IRAN)

**INTRODUCTION:** Giant Cell Tumours (GCT) are neoplasms of mesenchymal stromal cells with varied manifestations. There is no uniform accepted treatment protocol for these tumours; our study evaluates the possibility of Managing GCT with an enblock Resection with Reconstruction instead of an extended Curettage with Bone Graft to reduce Recurrence. **MATERIALS AND METHODS:** Twenty-one patients with giant cell bone tumour were treated between August 1990 and May 2001. The average of follow up was 16/7 months (range 3-78 months). We analyzed the difference in local recurrence rates, functional results and complications between enblock resection & reconstruction and curettage with corticocancellous bone auto graft. The patients were evaluated clinically, radiologically and by histology. Campanacci grading and Enneking Staging was used in the study. **RESULTS:** Eleven patients underwent the curettage & bone grafting. In the curettage group, two patients had local recurrences and one patient had fracture complications. None of the ten patients with enblock resection had local recurrence at the time of their most recent follow-up examination. Enneking functional score with intralesional curettage (25.41) was better than enblock excision (23.21). **CONCLUSION:** Despite the higher rate of recurrence in curettage and Bone Graft group, intralesional therapy has a better functional outcome than enblock resection. **KEYWORDS:** Enblock resection, giant cell tumour, extended curettage.

**Date : 2008-08-28**

**Session : Tumours: outcome after primary tumour resection**

**Time : 1400-1530**

**Room: 605**

**Abstract number : 16517**

**EVALUATION OF FINAL OUTCOMES OF PATIENTS WITH OSTEOSARCOMA AFTER SURGICAL TREATMENT**

Turgay ER, Sarper GURSU, Kerem AYDIN, Timur YILDIRIM, Bilal DEMIR, Vedat SAHIN

*Baltalimani Metin Sabanci Bone and Joint Diseases Education and Research Hospital, Istanbul (TURKEY)*

Osteosarcoma is a rather rare malignancy mostly seen in the younger age groups but can be seen at any age. The most commonly affected site for this tumour are the distal femur and the proximal tibia. Between 1989 and 2006, we have seen 40 patients with osteosarcoma in our institute. 24 of these patients were treated surgically. Among these patients 15 were males whilst 9 were females. The affected bone was distal femur in 8 cases, proximal femur in 1 case, proximal tibia in 5 cases, distal radius in 3 cases, proximal humerus in 2 cases, proximal ulna in 1 case, crista iliaca in 1 case and proximal fibula in 1 case. The mean age was 18.9 (11-64) years at the time of presentation. Resection was made for 15 cases, amputation for 8 cases and intralesioner treatment for 1 case. Arthroplasty was performed for 6 patients. Appropriate chemotherapy regiments were administrated to all patients. 9 of these patients are still alive with a mean life time of 5.2 (1-23) years after surgery. We have lost the remaining 15 patients in a mean of 14 months after surgery. In the recent years intensive chemotherapy treatment combined with appropriate surgical treatment led to an increase in the life expectancy of patients with osteosarcoma. Recurrences of osteosarcoma most commonly occurs in the first 3 years but can also occur much later as well. This is why a long-term follow-up of each case treated is necessary.

Date : 2008-08-28

Session : Tumours: outcome after primary tumour resection

Time : 1400-1530

Room: 605

Abstract number : 17062

**WHAT INFLUENCES THE OUTCOME AFTER PERIACETABULAR TUMOUR RESECTION?**

Parag JAISWAL<sup>1</sup>, Will ASTON<sup>1</sup>, Grimer ROB<sup>2</sup>, Saket TIBREWAL<sup>1</sup>, A. ABUDU<sup>2</sup>, Simon CARTER<sup>2</sup>, Gordon BLUNN<sup>3</sup>, Tim BRIGGS<sup>1</sup>, Steve CANNON<sup>1</sup>

<sup>1</sup>Royal National Orthopaedic Hospital, Stanmore (UNITED KINGDOM), <sup>2</sup>Royal Orthopaedic Hospital, Birmingham (UNITED KINGDOM),

<sup>3</sup>Institute of Orthopaedics & Musculoskeletal Sciences, Stanmore (UNITED KINGDOM)

We performed a retrospective review of 98 patients with malignant tumours of the periacetabular region. These were treated by resection and endoprosthesis reconstruction between 1971 and 2005 at the Royal National Orthopaedic Hospital, Stanmore and The Royal Orthopaedic Hospital, Birmingham. The mean age of the patients was 43.6 years (10 to 76). 53 out of 98 patients were male. The age distribution shows a bimodal pattern with peaks in the 2nd and 6th decade. The mean follow-up was 65 months (6 to 405) and 5 patients were lost to follow-up. The overall 10 year survival rate was 56% (as determined by the Kaplan-Meier method). Fifty-four patients (58.1%) experienced complications. Infection was the most common (30%). Dislocation occurred in 19 patients (20%). All dislocations were recurrent with a mean of 2.9 (2 to 6) episodes. Operations performed before 1994 were associated with a dislocation rate of 40.5% and after 1996 the rate was only 3.9% ( $p < 0.001$ ). Men experienced higher rates of death, infection and revision than women ( $p < 0.05$ ). The local recurrence rate was 31% with high grade tumours associated with higher recurrence rates ( $p < 0.05$ ). Tumour resection in the ilium is associated with higher rates of infection than tumours located in the periacetabular region alone ( $p < 0.05$ ). This method of reconstruction is still associated with high morbidity. The improved dislocation rate is probably the result of improved surgical technique and the use of larger femoral heads.

**Date : 2008-08-28**

**Session : Tumours: outcome after primary tumour resection**

**Time : 1400-1530**

**Room: 605**

**Abstract number : 17522**

**PELVIC RECONSTRUCTION AFTER RESECTION OF PERIACETABULAR TUMOURS WITH PUGET'S TECHNIC**

Aurélien POURCEL, Jean-Michel LAFFOSSE, Jean-Louis TRICOIRE, François MOLINIER, Philippe CHIRON, Jean PUGET  
*Service d'Orthopédie et de Traumatologie, CHU Rangueil, Toulouse (FRANCE)*

**INTRODUCTION:** Bony reconstruction after tumorectomy in an around the acetabular joint area is a difficult problem. Several solutions have been described, like massive allografts, autografts and THA, hemipelvis prosthesis designed by CAO or Saddle prosthesis. None of these different methods gave us good results, with added a high level of morbidity. **TECHNIC:** We use the Puget's technic to fill up the tumorectomy area. We perform an osteotomy of the upper part of the homolateral femur (10-12cm). This graft is well-shaped in the defect and fixed on the remaining pelvis. A modular prosthesis is implanted to restore the femoral defect. **MATERIAL AND METHOD:** We performed a retrospective analysis of the cases operated in our Department between 1987 and 2006: we studied a series of 18 cases with a mean age of 56 years at the day of surgery. Every tumour included the acetabulum. We noted every surgical complication and used the MSTS functional score. **RESULTS:** At the revision, 13 patients were dead of tumours complications. Mean time review was 2.5 years. We noted infections, local recidives of the primary tumour, dislocations and sciatic palsies. Mean MSTS score was 15.5 and mean PMA score was 11. **DISCUSSION:** This technic was performed on patients with a quite short life expectancy. They are very concerned with life quality. Functional results are hopeful with early weight bearing, and pain is improving. Complications seem to be less important than the benefits our patients owned on the quality of life.

**Date : 2008-08-28**

**Session : Tumours: outcome after primary tumour resection**

**Time : 1400-1530**

**Room: 605**

**Abstract number : 18652**

**RADIO-HYPERTHERMO-CHEMOTHERAPY FOR SOFT TISSUE SARCOMAS**

Yasushi MATSUSHITA, Satoshi YAMADA, Otani MASAHUMI, Takanobu OTSUKA  
*Nagoya City University, Nagoya (JAPAN)*

**PURPOSE:** We performed radio-hyperthermo-chemotherapy (RHC) as a new neoadjuvant therapy for 25 patients with high-grade malignant soft tissue sarcomas of the limbs between 2002 and 2005. We report here the effectiveness of RHC for high grade soft tissue sarcomas. **PATIENTS AND METHODS:** Radiotherapy involved the delivery of radiation at a dose of 2 Gy once daily on 16 days to give a total dose of 32 Gy. Hyperthermia was conducted locally once a week, with a total of 5 sessions. The temperature was measured by inserting a hyperthermia needle into the tumour and inserting a thermocouple thermometer into the space. The objective of treatment was to achieve a temperature of 42.5 Celsius or more for 60 minutes. Chemotherapy was performed by implanting a reservoir and administering cisplatin (90 mg/M) 3 times and Pinorubin (25mg/M) twice by intra-arterial infusion at weekly intervals. We divided the patients into three groups; 1) complete hyperthermia: intratumoral temperature was more than 42.5 Celsius 2) mild hyperthermia; intratumoral temperature was between 40 and 42.5 Celsius 3) poor hyperthermia; intratumoral temperature was less than 40 Celsius and we evaluated the effectiveness of RHC for those three groups. **RESULTS:** The ten patients of complete hyperthermia were all CDF and the histological evaluation was also excellent. Among the poor hyperthermia group, round cell sarcomas such as soft tissue Ewing's sarcoma showed good response histologically. **DISCUSSION:** RHC is currently the most potent and relatively safe treatment method for high-grade soft tissue sarcomas.



**Date : 2008-08-28**  
**Session : Tumours: outcome after primary tumour resection**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 18656**

**SURGICAL OUTCOME OF GIANT CELL TUMOUR OF BONE**

Takatoshi OHNO<sup>1</sup>, Koji OSHIMA<sup>1</sup>, Katsuji SHIMIZU<sup>1</sup>, Yutaka NISHIMOTO<sup>2</sup>

<sup>1</sup>*Department of Orthopaedic Surgery, Gifu University School of Medicine, Gifu (JAPAN),* <sup>2</sup>*Department of Adult and Gerontological Nursing, Gifu University School of Medicine, Gifu City (JAPAN)*

**AIMS:** Giant-cell tumour of bone (GCT) is a rare benign lesion that represents 5% of all primary bone tumours in adults. We present the results of a retrospective study. **METHODS:** Between 1997 and 2006 we treated 24 patients, 10 women and 14 men, for a GCT of bone. The average age of the patients was 38.6 (range 17-68) years. The median follow-up time was 45 months. The tumour sites were distal femur in 12 cases, proximal tibia in 3, proximal humerus in 3 and others in 6. Three of these patients (12.5%) had a pathological fracture. According to the classification of Campanacci, 1 patients (4.2%) were diagnosed in grade I, 15 (62.5%) in grade II, and 8 (33.3%) in grade III. **Surgical procedures** were intralesional curettage with bone and/or bone substitute-grafting in 22, and bone lengthening in 1. In one case we performed a wide resection. In 13 cases cryotherapy by spraying technique using liquid nitrogen were employed as an adjuvant therapy. **RESULTS:** Local recurrence was observed in 4 patients (16.7%) after a median of 10.2 (5-12) months. There was a trend toward lower recurrence rate in the cryotherapy group (7.7%) compared to that in the non-cryotherapy group (27.3%). Overall function of the cases with extremity tumours was good to excellent in 18 cases (81.8%), moderate in 4 (18.2%). **CONCLUSION:** To reduce the risk of local recurrence we recommend cryotherapy as an adjuvant to curettage for GCT.

**Date : 2008-08-28**  
**Session : Tumours: outcome after primary tumour resection**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 18661**

**SOFT TISSUE SARCOMAS - RESULTS OF WIDE EXCISION AND ROLE ADJUVANT THERAPY**

Zile Singh KUNDU, S S SANGWAN  
*PGIMS, Rohtak, Rohtak (INDIA)*

**INTRODUCTION:** Soft tissue sarcomas are relatively uncommon tumours. These are a highly heterogeneous group of tumours that are classified on a histogenetic basis. They amount to less than 1% of the overall human burden of malignant tumours but they are life threatening and may pose a significant diagnostic and therapeutic challenge. Wide excision and wherever indicated the adjuvants like radiotherapy (RT) and chemotherapy (CT) are the treatment modality for these tumours. **MATERIAL AND METHODS:** In the last 8 years we have treated 51 sarcomas by performing wide surgical resection and local postoperative radiotherapy and chemotherapy using adriamycin and ifosfamide as per indication. The patients were monitored for the postoperative problems in view of the side effects of RT and CT. The margins were confirmed by the histopathology. **RESULTS:** The results were evaluated in view of the local recurrence, the metastasis and the survival of the patients. It was observed that the local recurrence decreased with RT and there was significant control on the metastasis after chemotherapy in the cases where it was the part of the treatment. **DISCUSSION:** Wide excision is the treatment of the choice for the soft tissue sarcomas. The adjuvants in the form of the local RT and the CT are important for the local control and for the metastasis. The overall survival does improve with these adjuvants.

**Date : 2008-08-28**  
**Session : Tumours: outcome after primary tumour resection**  
**Time : 1400-1530**  
**Room: 605**

**Abstract number : 18714**  
**GIANT CELL TUMOURS - A CLINICAL STUDY**

Aftab IRAQI<sup>1</sup>, Wajahat ASHRAF<sup>2</sup>  
<sup>1</sup>JN Medical College, Aligarh (INDIA), <sup>2</sup>Ujala Medical Center, Lucknow (INDIA)

**AIMS:** Giant cell lesions of the bone are uncommon lesions constituting 5% of total bone tumours. They remain a difficult management problem because there are no absolute clinical, radiological, and histological parameters that can accurately predict the likelihood of recurrence. Our study was aimed at determining the clinical aspects and treatment of giant cell tumours. **MATERIALS AND METHODS:** Between 2000 and 2006, 54 cases with GCT underwent surgical treatment. Various surgical procedures were employed. Simple curettage and cancellous bone grafting was done in 31 cases, segmental resection and limb salvage by fibular grafting in 20 cases and segmental resection in 3 cases. For evaluation we used Enneking's radiographic grades and surgical stages, which represent the latent, active and aggressive presentation. **RESULTS:** In our study we observed that the recurrence rate of GCT is highest after simple curettage, 9 cases (16%). The best functional long time results were achieved in cases treated with segmental resection and fibular grafting with no cases of recurrence. **CONCLUSION:** The comparative failure of curettage arises because of indiscriminate use of this technique without proper assessment of the stage of the lesion. Resection and fibular grafting in suitable cases gives good functional results. Because of the complex management problems of GCT, the use of staging system is recommended.

Date : 2008-08-28  
Session : SICOT/ 5th International Clubfoot Congress  
Time : 0900-1030  
Room: 606-607

Abstract number : 18055

**OUTCOME AFTER REPEATED SOFT TISSUE RELEASE IN POSTOPERATIVE RECURRENCE OF IDIOPATHIC CONGENITAL TALIPES EQUINOVARUS**

Mahtab MEHRAFESHAN, Philippe WICART, Raphael SERINGE  
*Saint-Vincent de Paul University Hospital, Paris (FRANCE)*

**PURPOSE OF THE STUDY:** The aim of this study is to evaluate the results of the repeated soft tissue release for recurrent postoperative idiopathic congenital talipes equinovarus. **PATIENTS AND METHODS:** Fifty-nine patients (78 feet) underwent revision surgery between 1974 and 2001. Mean age at the time of revision was 6 years. Complete release was performed in 54 feet, partial release in 24, subtalar release in 21, and distal calcaneal osteotomy in 51. The clinical and radiological outcome was assessed using the Ghanem and Seringe scores. **RESULTS:** Mean follow-up was 10.5 years (4-25.5 years). Complications included overcorrection in valgus (8 feet) and recurrence (5 feet). The anatomical correction was highly significant. Dorsoplantar X-rays show the improvement of mean talus-first metatarsal angle ( $25^{\circ}$  to  $2.5^{\circ}$ ), and calcaneus-fifth metatarsal angle ( $17^{\circ}$  to  $1.5^{\circ}$ ). The average of tibiocalcaneal angle in lateral view increased from  $2.5^{\circ}$  to  $11^{\circ}$  and of calcaneal incidence from  $7^{\circ}$  to  $10^{\circ}$ . At follow-up, outcome was considered as "very good" and "good" in 80% of the cases. We had "fair" results in 11 feet because of poor functional results in two thirds and anatomical defects in one third. Five feet had "poor" results due to significant anatomical defects. Triple arthrodesis was needed in three feet. **DISCUSSION AND CONCLUSION:** Repeated soft tissue release provides an effective means for correcting anatomical anomalies caused by recurrent club foot. The mid-term results are however affected by functional limitations characterised by decreased range of motion, joint pain and triceps muscle weakness.

Date : 2008-08-28  
Session : SICOT/ 5th International Clubfoot Congress  
Time : 0900-1030  
Room: 606-607

Abstract number : 19245

**EXTENSIVE SOFT TISSUE RELEASE IN IDIOPATHIC CONGENITAL CLUBFOOT. CORRELATION BETWEEN RADIOLOGICAL AND FUNCTIONAL OUTCOMES**

In Ho CHOI<sup>1</sup>, Won Joon YOO<sup>1</sup>, Young Kyun LEE<sup>1</sup>, Tae-Joon CHO<sup>2</sup>, Chin Youb CHUNG<sup>2</sup>, Wan Lim KIM<sup>2</sup>, Duk Yong LEE<sup>2</sup>  
<sup>1</sup>Seoul National University Children's Hospital, Seoul (KOREA), <sup>2</sup>National University Children's Hospital, Seoul (KOREA)

**PURPOSE:** To evaluate correlation between radiological and functional outcomes of extensive soft tissue release (ESTR) in patients with idiopathic congenital clubfoot. **METHODS:** We retrospectively reviewed medical records of 48 clubfoot patients (71 feet) who underwent ESTR during their infancy. The follow-up period averaged 11 years (9 to 19.3). Radiological outcomes were evaluated using the indices of tarsal bone deformation, joint degeneration and foot alignment. Deformation of tarsal bones at postoperative 5 years was compared with that of a comparative group treated by Ponseti method (32 feet in 22 patients). Functional results were assessed using the criteria proposed by Laaveg and Ponseti in 27 patients (39 feet) with long-term followup of ESTR. **RESULTS:** Flattening of talar head (66%, 47 feet) and dome (44%, 31 feet) deformed talus to a triangular shape on lateral radiographs. Other deformation of tarsal bones included flattening of the subtalar facets of calcaneus (23%, 16 feet), wedge-shaped navicular (25%, 18 feet), and blunting of the anterior part of distal tibia (20%, 14 feet). Joint irregularity was observed in talonavicular (42%, 30 feet), calcaneocuboid (14%, 10 feet) and talocalcaneal (11%, 8 feet) joints. Talonavicular subluxation was observed in 16% (11 feet). Radiographic indices revealed marked improvement of foot alignment except some residual forefoot adduction. Functional results were assessed as excellent to good in 36%, fair in 28% and poor in 36% of the operated feet, which correlated with severity of the initial deformity (Dimeglio grading). Final functional outcomes could not be predicted by any of radiological parameters. **CONCLUSION:** ESTR resulted in considerable deformation of tarsal bones and joint degeneration in association with high rate of unsatisfactory function. This study strongly suggests that ESTR should be a last resort to restore foot alignment and joint orientation after failed primary treatment that minimizes soft tissue damage and scar formation.

Date : 2008-08-28  
Session : SICOT/ 5th International Clubfoot Congress  
Time : 0900-1030  
Room: 606-607

Abstract number : 19246

**MODIFIED POSTEROMEDIAL RELEASE IN INFANTS CLUBFOOT SURGERY: PERSONAL EXPERIENCE IN 142 CASES**

Irina KLYCHKOVA

*Turner's Pediatric Orthopedic Institute, St. Petersburg (RUSSIAN FEDERATION)*

INTRODUCTION: Statistics of recurrent congenital clubfoot (according to the scientific literature) is about from 30% to 60 % of forefoot adduction remain in 85% of the patients. MATERIALS AND METHODS: 100 patients were performed at the age of 3 months - 3 years with congenital clubfoot, which were not treated at all before or treated not enough. All these children were previously examined clinically, neurologically, by electromyography, dopplerography, X-ray and ultrasound to evaluate the condition of bone-joint and ligament apparatus of the foot. We treated patients with the method, based on combination of posteromedial release and bone-joint apparatus reconstruction / original method/. Medialisation of first cuneiform and first metatarsal, replacement of the point of attachment of the tibialis anterior tendon to the second cuneiform bone were performed, also we made derotation of the talus in the ankle mortise, elimination of medial subluxation of talo-cuneiform joint with pin fixation. RESULTS: Remote results were studied for the period of 3-9 years. Recurrent clubfoot were observed in two patients with initial deformation of the talus; in one child - the secondary valgus deformation developed, which haven't been corrected surgically. Recurrent forefoot abduction was not observed. During control examination - proper of correlation in the foot's joints; the improvements of muscle function and blood circulation in the operated foot were revealed and the absence of degenerative and dystrophic lesions of bone was evident. CONCLUSION: Surgical treatment of the clubfoot, if serial plaster casts bring no results, must be started from the age of 4 months. We recommend the complete foot reconstruction operation with subluxation reposition of forefoot, midfoot and hindfoot joints, which must have been done after posteromedial release.

**Date : 2008-08-28**  
**Session : SICOT/ 5th International Clubfoot Congress**  
**Time : 0900-1030**  
**Room: 606-607**

**Abstract number : 19247**

**RELEASING SOFT TISSUE FOR CONGENITAL CLUBFOOT IN CHILDREN UNDER 24 MONTHS OF AGE**

Ngoc Hung NGUYEN

*National Hospital for Pediatrics, Ho Chi Minh City (VIET NAM)*

**OBJECTIVE:** To evaluate the clinical and functional results of a technical procedure insurgical treatment of congenital clubfoot in children under 24 months of age.**Material and methods:** A retrospective study had been undertaken from January 1990to December 2002. Congenital clubfoot was classified for four grades according toDimeglio. All patients were were treated by soft tissue release medial and lateral portionof the foot (lengthening Achilles tendon, tibialis posterior tendon or including lengthingof the tendons flexor digitorum longus and flexor hallucis longus, talonavicular jointcapsulotomy, release of the medial aspect of the subtalar joint). After surgery, foot wasimmobilized by cast for five months. The results of treatment were grade according to thesystem of Laaveg and Ponseti.**Results:** There were 59 boys and 35 girls in this study and 126 feet in 94 patients withcongenital clubfoot. The average age at surgery was thirteen months of age (range 4months to 24 months). There were two groups were operated: (1) grade II: 39 feets(30.9%); and (2) grade III & IV: 87 feets (69.1%). The average follow-up was 6 years andtwo months (range 4 years and three months to 10 years and five months). In overall,Exellent results in 24 foets (19.1%), Good results in 65 foets (51.6%). Fair results in 28foets (22.2%), and Poor results in 9 foets (7.1%).**CONCLUSION:** These patients were early application of surgery yields better results withseverely deformed proceduces a good funtion outcome in the majority of feet.**Key Words:** Congenital clubfoot, foot deformity, Anterior tibia tendon transfer, Clubfootcomplication, Equinovarus foot.

Date : 2008-08-28  
Session : SICOT/ 5th International Clubfoot Congress  
Time : 0900-1030  
Room: 606-607

Abstract number : 19248

**THE ATHLETIC ABILITY IN CONGENITAL CLUBFOOT PATIENTS AT SCHOOL AGE**

Tomonori KENMOKU<sup>1</sup>, Makoto KAMEGAYA<sup>2</sup>, Takashi SAISU<sup>2</sup>, Kazuhisa TAKAHASHI<sup>1</sup>

<sup>1</sup>Graduate School of Medicine, Chiba University, Chiba (JAPAN), <sup>2</sup>Chiba Children's Hospital, Chiba (JAPAN)

**PURPOSE:** Assessing the athletic ability of the patients with congenital clubfoot through their records of physical test. **MATERIALS and METHODS:** Between 1989 and 2006, we treated 434 clubfoot patients. Forty-six clubfeet of thirty patients (eighteen boys and twelve girls) without any congenital neuromuscular disorders were subjected for this study. Sixteen patients were bilaterally affected, and fourteen were unilaterally affected. Nine patients were treated conservatively, eight patients underwent percutaneous tenotomy of Achilles tendon, and thirteen patients underwent extensive soft-tissue release. The average age at this investigation was 8.8 years old. The mean follow-up term was 8.3 years. We collected their records of physical test held in elementary schools. These tests consisted of following 5 events: 50 meters race, standing long jump, softball arm throw, agility test, and shuttle run. We referred to the standard record of each event in normal group published by the ministry of education, and made a comparison of those scores between clubfoot and normal. The correlation between the scores and the radiological measurements were also examined. **RESULTS:** The mean scores of all patients were 46.8 in 50 meters race, 48.5 in standing long jump, 51.0 in softball arm throw, 52.2 in agility test and 47.5 in shuttle run. Of all 148 records, 143 were over -2SD. In every event, there was no significant difference in score between unilateral and bilateral club feet (Mann-Whitney's U test,  $p > 0.05$ ) and among treatment methods (ANOVA,  $p > 0.05$ ). The lateral talo-calcaneal angle, the lateral first-fifth metatarsals angle, and the antero-posterior calcaneus-fifth metatarsal angle had significant correlations with the scores in some events. Especially, the antero-posterior calcaneus-fifth metatarsal angle was significantly correlated with scores of agility test, shuttle run, and long jump (Spearman's RANK,  $p < 0.05$ ). **CONCLUSION:** Treated clubfeet did not result in decline of athletic ability in this study.



**Date : 2008-08-28**  
**Session : SICOT/ 5th International Clubfoot Congress**  
**Time : 0900-1030**  
**Room: 606-607**

**Abstract number : 19249**

**SELECTIVE SOFT TISSUE RELEASE FOR RESIDUAL DEFORMITY AFTER CONSERVATIVE TREATMENT OF IDIOPATHIC CLUBFOOT**

Soo-Sung PARK, Bong-Sung JUNG, Ji-Yong AHN, Ho-Seung LEE  
*University of Ulsan College of Medicine, Seoul (KOREA)*

**PURPOSE:** The Ponseti method has gained widespread popularity in recent years and known to be the standard initial method of conservative care. However relapsed or residual deformity can be a problem after the Ponseti method. The purpose of this study was to evaluate the surgical outcomes of selective soft tissue release for the relapsed or residual deformity cases of idiopathic clubfoot after Ponseti method in the intermediate term. **MATERIALS and METHODS:** Out of 28 patients with 50 clubfoot deformities who had been treated with the Ponseti method, 13 patients with 19 residual clubfeet who had relapsed or residual deformities after Ponseti method underwent selective soft tissue release between 2000 and 2005. The mean age at operation was 30.3 months (6 ~ 62 months). The mean follow-up was 30.5 months (13 ~ 69 months). Cases with equinus deformity of hindfoot were treated by Vulpius type tendoachilles lengthening, varus deformities of the hindfoot with fractional lengthening of tibialis posterior tendon, adduction deformities of the forefoot with fractional lengthening of abductor hallucis tendon and medial joint capsulotomy. The modified Pirani score was used for clinical assessment. Parental satisfaction with the results was assessed during interviews with the patients with the questions regarding the cosmetic appearance and complaints such as pain and difficulty in walking. The Talo-calcaneal angle, talo-1st metatarsal angle and tibio-calcaneal angle on standing AP and dorsiflexion lateral views were used for radiographic parameters. **RESULTS:** At last follow up, all cases achieved parental satisfaction with the results. The mean modified Pirani score improved from 4.8 (2.5~5.5) to 2.5 (1.5~4.5). The tibio-calcaneal angle improved from 91 degrees (60~118 degrees) preoperatively to 69 degrees (52~84 degrees) at final follow up. **CONCLUSIONS:** Selective soft tissue release is thought to be an effective method for treatment of the residual or relapsed clubfoot deformity after conservative treatment of idiopathic clubfoot.

Date : 2008-08-28  
Session : SICOT/ 5th International Clubfoot Congress  
Time : 0900-1030  
Room: 606-607

Abstract number : 19250

**GAIT ANALYSIS OF CHILDREN TREATED NON-OPERATIVELY FOR CLUBFOOT: PHYSICAL THERAPY VS PONSETI CASTING**

Lori KAROL, Ron EL-HAWARY, Kelly JEANS

*Texas Scottish Rite Hosp. for Children, Dallas (UNITED STATES)*

**BACKGROUND:** The purpose of this study was to compare the gait of children treated with these two techniques. **METHODS:** A review was made of 182 patients with idiopathic clubfoot (273 feet). Seventy-seven patients were excluded because of lack of adherence to the treatment protocol or because surgery was required. Gait analysis was performed at 2 years of age. Temporal and kinematic data were classified as abnormal if they fell outside one standard deviation from age-matched normal values. **RESULTS:** 105 patients (56 Cast and 49 PT) with 154 clubfeet (79 Cast and 75 PT), were tested at an average age of 2 yrs and 3 months. Initial Dimeglio scores ranged between 10 and 17. No statistical differences for cadence parameters were found. 67% of feet treated with physical therapy had normal ankle sagittal plane kinematics versus 47% treated with Ponseti casting. When kinematic deviations were present, children treated with PT were more likely to walk with knee hyperextension (37%)\*, equinus (15%)\*, and foot-drop (17%)\*; whereas one casted patient walked in equinus and only three demonstrated foot-drop. In contrast, the casted group demonstrated excessive stance phase ankle dorsiflexion (48%)\* and calcaneus (10%). More PT feet had an internal foot progression angle (45% PT vs. 24% Ponseti)\* [\*p<0.05] **CONCLUSION:** Children treated non-operatively for clubfoot by either method had a higher proportion of normal sagittal-plane ankle motion than a similar group of surgical patients previously published. Less than 15% in each group demonstrated calcaneus or equinus. The increased incidence of equinus in the physical therapy group is due to the intact Achilles tendon, while increased ankle dorsiflexion in the Ponseti group was linked to tenotomy. Intoeing is less likely following Ponseti casting, probably due to long-term external rotation nighttime orthoses.

Date : 2008-08-28  
Session : SICOT/ 5th International Clubfoot Congress  
Time : 0900-1030  
Room: 606-607

Abstract number : 19251

**EVALUATION OF DYNAMIC FOOT PRESSURES AND FOOT AND ANKLE KINEMATICS TWENTY-ONE YEARS FOLLOWING OPERATIVELY TREATED CLUBFOOT**

Peter Alan SMITH<sup>1</sup>, A. GRAFT<sup>2</sup>, S. HASSANI<sup>2</sup>, A. FLANAGAN<sup>2</sup>, A. CAUDILL<sup>2</sup>, J. KRZAK<sup>2</sup>, J. LONG<sup>2</sup>, Ken KUO<sup>2</sup>, G. HARRIS<sup>2</sup>

<sup>1</sup>*Shriners Hospital for Children-Chicago, Chicago (UNITED STATES)*, <sup>2</sup>*Shriners Hospitals for Children, Chicago (UNITED STATES)*

**PURPOSE:** To investigate foot pressures and multi-segment foot and ankle kinematics during gait in young adults with surgically treated clubfeet as infants. **Methods:** This study included sixteen subjects (Clubfoot Group, 13M, 3F, mean age 21+/-1.6 years) who underwent comprehensive soft-tissue release for clubfoot deformity by one surgeon between 1982 \_ 1987 (mean age at surgery 8 months; mean follow-up 21 years). Twenty-one age matched controls (Control Group, 12M, 9F; 21.9 +/- 2.9 years) were also evaluated. Foot kinematic analysis was performed using a multi-segmental foot and ankle model and dynamic foot pressures were measured. Nine selected segments within the foot were analyzed identifying peak pressures, maximum force, total contact area and pressure time integral. Each subject completed the midfoot and hindfoot American Orthopedic Foot and Ankle Society (AOFAS) outcome measure. **RESULTS:** Differences in kinematics of the hindfoot and hallux were noted between the two groups. Findings in the Clubfoot group included reduced hindfoot range of motion in the sagittal plane throughout the stride and in the coronal plane during stance phase. Reduced ROM was also noted in the hallux in the sagittal plane. Plantar pressure analysis found the largest differences between groups in the hindfoot, including maximum force measurements over 2.5 times those of the Control group. The forefoot also demonstrated multiple differences from the Control group; in general, excessive measurements in the hindfoot were associated with decreased measurements in the forefoot. **CONCLUSION:** The Clubfoot Group demonstrated significant deviations in forefoot and hindfoot motion during gait, increased peak pressures at the hindfoot and midfoot with decreased pressure at the forefoot, and significantly lower scores on the midfoot and hindfoot AOFAS. These results demonstrate measurable differences from normal subjects at 21 years relative to foot structure and dynamic range of motion of the foot during gait.

Date : 2008-08-28  
Session : SICOT/ 5th International Clubfoot Congress  
Time : 0900-1030  
Room: 606-607

Abstract number : 19252

**A TWENTY-ONE YEAR FOLLOW-UP OF ADULTS AFTER COMPREHENSIVE SOFT-TISSUE RELEASE FOR CLUBFOOT DEFORMITY**

Ken KUO, G.F. HARRIS, J. LONG, J. KRZAK, A. CAUDILL, A. FLANAGAN, A. GRAF, S. HASSANI  
*Shriners Hospitals for Children, Chicago (UNITED STATES)*

**PURPOSE:** To evaluate long-term outcomes of young adults who underwent comprehensive clubfoot release as an infant compared to age matched controls. **METHODS:** This is a study of 16 subjects (Clubfoot Group, 13M, 3F, mean age 21 +/-1.6years; 9 bilateral) who underwent comprehensive soft-tissue release for clubfoot deformity by one surgeon between 1982 and 1987 (mean age at surgery 8 months; mean follow-up 21 y). The Control Group (12M, 9F; 21.9 +/- 2.9 years) consisted of 21 age-match controls. Evaluation consisted of: gait analysis, physical examination measuring ankle range-of motion (ROM), heel rise test, and isokinetic strength testing of ankle plantarflexion, dorsiflexion, inversion, and eversion. The Clubfoot Group completed the Disease Specific Instrument (DSI), Short-Form 36 (SF-36), and Foot Function Index (FFI). Turco, International Clubfoot Study Group (ICFGS) and American Orthopaedic Foot and Ankle Society (AOFAS) midfoot and hindfoot scores were calculated. Significance was set at  $p < 0.05$ . **RESULTS:** Clubfoot Group heel-rise score was 3.6 +/-1.4, Turco score 1.96 +/-0.6, ICFGS score 14.9 +/-6.9, FFI 0.17, and DSI 26.7%. SF-36 scores were significantly lower for physical function and bodily pain subscales. Compared to the Control Group, the Clubfoot Group demonstrated significant differences in the hindfoot and midfoot AOFAS scores, lower values for strength testing of all parameters except ankle dorsiflexion, and decreased ROM for all ankle motions. The Clubfoot Group demonstrated diminished stride length (87% Control), walking speed (82% Control), and increased stance phase duration (104% Control). Reduced sagittal plane ROM and internal moment demand during stance were also noted. **CONCLUSION:** The Clubfoot Group demonstrated more pain with activity, reduced walking speed, and significant ankle weakness except for ankle dorsiflexion compared to the Control Group. Operatively treated clubfeet have measurable deficiencies from normal controls at twenty-one years out, but the relationships of these findings to quality of life is still unknown.

**Date : 2008-08-28**  
**Session : SICOT/ 5th International Clubfoot Congress**  
**Time : 0900-1030**  
**Room: 606-607**

**Abstract number : 19253**

**FUNCTIONAL OUTCOME OF CLUBFOOT TREATED BY SURGICAL RELEASE**

Kai Tsun Michael TO, Y.H. LI, Wang CHOW  
*Queen Mary Hospital, Hong Kong (HONG KONG)*

**INTRODUCTION:**Majority of the patients with clubfeet are treated with a period of manipulations or serial taping. Surgeries are required if adequate correction cannot be achieved. Ponsetis method is increasingly popular and much of the attention in the recent literatures is focused on Ponsetis method. The purpose of the study is to review the functional outcome of the patients treated by surgical release for the clubfoot deformities.**MATERIALS & METHODS:**This is a retrospective review of all surgically treated clubfeet using McKays or a la cart approach in the Duchess of Kent Childrens Hospital between 1988 and 2004. All the clubfeet must be idiopathic in nature and had failed conservative treatment without prior surgical treatment. The functional outcome of all feet was evaluated both radiologically and clinically using the Lehman functional rating system.**RESULTS:**39 patients including total of 53 feet were reviewed. The average age of operation was 19 months and the average follow-up was 75.5 months. 83% of the feet achieved either excellent or good results. There was no significant difference in the functional outcome when comparing among patients treated before 1 year old, 1-3 years old and older than 3 years old. 2 feet developed recurrence and 1 foot developed calcaneal deformity due to overlengthening of the Tendo Achilles.**DISCUSSION & CONCLUSION:**Surgical release of clubfoot can achieve reasonable functional results without much complication. Despite increasing popularity of Ponsetis method, surgical release should not be considered as an inferior treatment option.

Date : 2008-08-28  
Session : SICOT / 5th International Clubfoot Congress  
Time : 0900-1030  
Room: 606-607

Abstract number : 19271

**INITIAL MANAGEMENT OF CONGENITAL CLUBFOOT: FROM THE REGIMEN OF AN INDIVIDUAL SURGEON TO THE CAMPAIGN OF PUBLIC HEALTHCARE IN MAINLAND CHINA**

Li ZHAO<sup>1</sup>, Rui-xue MA<sup>1</sup>, Qing DU<sup>1</sup>, Shao-chuan PAN<sup>2</sup>, Shi-jun JI<sup>2</sup>, Jian-ping YANG<sup>2</sup>, Jose MORCUENDE<sup>3</sup>, Matthew DOBBS<sup>4</sup>, Xin-le WU<sup>2</sup>, Zhen-ting LIU<sup>2</sup>, Yan-zhou WANG<sup>2</sup>, Zhen-sheng MA<sup>2</sup>

<sup>1</sup>Xin-Hua Hospital affiliated to Shanghai Jiao Tong University School of Medicine, Shanghai (CHINA), <sup>2</sup>-, Beijing (CHINA), <sup>3</sup>University of Iowa, Iowa City (UNITED STATES), <sup>4</sup>Washington University School of Medicine, Saint Louis (UNITED STATES)

**INTRODUCTION** Neglected clubfoot is a major problem in Mainland China. We, as pediatric orthopaedic surgeons, are trying to make a difference by launching a campaign for preventing neglected clubfoot with use of the Ponseti method as the initial management across Mainland China. **MATERIALS & METHODS** For the last few decades, the most common approach in Mainland China for the treatment of congenital clubfoot has been a surgical release. The Ponseti method has been applied in a few medical centers since the beginning of this decade, with encouraging early results. It was proposed that the task force at the national level should be established for disseminating the knowledge and skills necessary to be successful with the Ponseti method. With the sponsorships and endowments from Chinese governmental agencies and NGOs as well as from the international organizations, China Clubfoot Project has been launched with the campaign entitled "Healthy Walk". **RESULTS** Six courses or symposiums were organized in various locations jointly with the teams from Ponseti International Association. These activities included well-designed practice sessions. The Ponseti method has been accepted for the initial treatment during the neonatal period in many hospitals. **CONCLUSION** The Ponseti method is good for the initial management of congenital clubfoot. It is expected that we, as pediatric orthopaedic surgeons, will make a difference for clubfoot children by decreasing the amount of surgical intervention and/or delayed management, by using Ponseti method and changing from the regimen of an individual surgeon to the campaign of public healthcare in Mainland China.

**Date : 2008-08-28**  
**Session : SICOT/ 5th International Clubfoot Congress**  
**Time : 1100-1215**  
**Room: 606-607**

**Abstract number : 17198**  
**SPLIT TIBIALIS ANTERIOR TRANSFER IN RELAPSED CLUBFOOT**

Hardas SANDHU, Parvinder SANDHU  
*HSS Orthopaedic Hospital, Amritsar (INDIA)*

**BACKGROUND:** Relapse of clubfoot deformity after conservative or operative treatment is very common. Muscle imbalance is one of the many factors responsible for this. Restoration of muscle balance by suitable tendon transfer is desirable in such cases. **MATERIAL AND METHOD:** During the period 1974-2001 split tibialis anterior transfer has been carried out in 181 patients of clubfoot in whom deformity had recurred either after conservative treatment (52 patients) or after operative treatment (129 patients). There were 117 male and 54 female patients. Average age at operation was 3 years 4 months (range 1 year 6 months to 6 years). In addition to this transfer 168 patients required further soft tissue release. Postoperative management was above knee POP cast for 8-12 weeks and talipes shoes for a further period of 1-2 years. **RESULTS:** The deformity remained corrected and no further treatment was needed in 118 (65%) patients. There was recurrence of deformity in 48 (26.2%) necessitating further operative procedure (JESS in 25, Triple arthrodesis in 11, astraglectomy in 2). Ten patients were operated in other hospitals. In 15 (8%) patients transplant was overacting producing tendency to calcaneovalgus deformity requiring tenotomy of transplanted tendon. **CONCLUSION:** Split tibialis anterior transfer is a useful procedure in selected cases of relapsed clubfoot. It should be carried out, where peronei remained weak. Other factors responsible for relapse should also be tackled. Follow-up for at least 5 years is essential to detect and correct any overacting transplant in time.

Date : 2008-08-28  
Session : SICOT/ 5th International Clubfoot Congress  
Time : 1100-1215  
Room: 606-607

Abstract number : 19256

**LONG-TERM RESULTS OF ANTERIOR TIBIALIS TRANSFER IN IDIOPATHIC CLUBFEET: A FIFTY-YEAR FOLLOW UP STUDY**

Jose MORCUENDE, David E. OJI, Matthew LOVELL, Lori DOLAN, John YACK, Smita RAO  
*University of Iowa, Iowa City (UNITED STATES)*

**BACKGROUND:** Relapses of idiopathic clubfoot after walking age can be effectively treated with an anterior tibialis tendon transfer (ATT). However, a long term assessment of its results has not been documented. This study was designed to evaluate the long term results of this procedure. **MATERIALS and METHODS:** Thirty-five patients treated for idiopathic clubfoot between 1950 and 1967 participated in the study. Fourteen were treated with ATT for relapses at an average age at surgery of 5 years old. They were compared to the remaining 21 non-ATT patients. Patients were evaluated using the AAOS Foot and Ankle Baseline Questionnaire with the SF-36, Laaveg & Ponseti Clubfoot Questionnaire, Foot Function Index, musculoskeletal examination, radiographic analysis, gait analysis, and surface EMG. **RESULTS:** Quality of life surveys demonstrated no statistical difference between the groups. None of the patients had further relapses or required other surgeries associated with their clubfeet. Mean ankle dorsiflexion was 3.4 degrees and motor strengths were similar in both groups. ATT patients were able to complete more toe-ups compared to non-ATT group. Radiographic analysis showed no significant difference between the groups except for a smaller AP talocalcaneal angle and slightly more talar flattening in the ATT group. Peak pressures and total force distribution were not statistically significantly different. Surface EMG demonstrated no difference in the firing pattern of the anterior tibialis muscle when compared to non-ATT and normal individuals. **CONCLUSIONS:** Long term follow-up of ATT demonstrated that the procedure effectively treats relapses and lead to a long-term functional foot.



Date : 2008-08-28  
Session : SICOT/ 5th International Clubfoot Congress  
Time : 1100-1215  
Room: 606-607

Abstract number : 19257

**THE PROGNOSTIC VALUE OF THE NAVICULAR IN FAILED SURGICAL MANAGEMENT OF CLUBFOOT DEFORMITY**

Norman OTSUKA<sup>1</sup>, Tae Y. YANG<sup>2</sup>, Anna V. CUOMO<sup>2</sup>, Alaaeldin A. AHMAD<sup>2</sup>

<sup>1</sup>Shriners Hospitals for Children, Los Angeles, CA (UNITED STATES), <sup>2</sup>David Geffen School of Medicine, UCLA, Los Angeles, CA (UNITED STATES)

**PURPOSE:** Surgical treatment of congenital clubfoot can be complicated by residual deformity. Further surgical intervention may be avoided if at risk factors are identified and treated appropriately during early treatment. Therefore, the purpose of this study was to correlate early post-operative findings with initial surgical treatment failure. **METHODS:** We reviewed the charts and radiographs of 41 patients with clubfoot without associated congenital or neuromuscular disorders who underwent surgical posteromedial subtalar release and percutaneous talonavicular pin fixation as a primary treatment for their deformity. The incidence of post-operative infection and residual deformity (hindfoot varus, metatarsus adductus) were recorded. Standard weight-bearing anterior-posterior and lateral views were evaluated post-operatively to assess the navicular ossific nucleus, talocalcaneal angles, and talo-first metatarsal angles. Failure of treatment was defined as residual clubfoot deformity necessitating further surgical intervention. **RESULTS:** The patients were divided into two groups: successful and failed initial surgical management (see Table 1). **Table 1. Patient demographics and post-operative clinical and radiographic findings.**

Parameter	Successful (n=34)	Failed (n=7)
Mean age (range) at surgery	1.2 (0.5-6.5) years	1.5 (0.8-1.6) years
Mean age (range) at last follow-up	6.1 (2.0-17.5) years	6.2 (2.2-14.3) years
Incidence of post-operative infection	2 (6%)	3 (43%)
Incidence of metatarsus adductus	11 (32%)	5 (71%)
Average talus-first metatarsal angle	9 degrees	17 degrees
Average talocalcaneal angle (lateral)	33 degrees	26 degrees
Incidence of navicular dorsal subluxation	34 (26%)	6 (86%)
Incidence of navicular avascular necrosis	14 (41%)	3 (43%)

**CONCLUSIONS:** Failed initial surgical management was associated with clinical and radiographic findings of recurrent deformity (increased incidence of metatarsus adductus and elevated talus-first metatarsal angle). Importantly, dorsal subluxation of the navicular was highly predictive of failed initial treatment. Early post-operative infection was also associated with treatment failure, which may be associated with loss of initial correction of the navicular position from early talonavicular pin removal.

Date : 2008-08-28  
Session : SICOT/ 5th International Clubfoot Congress  
Time : 1100-1215  
Room: 606-607

Abstract number : 19258

**THE ROLE OF METATARSAL OSTEOTOMIES FOR CLUBFOOT TREATMENT OF THE OLDER CHILD**

Azriel BENAROYA<sup>1</sup>, Robert FRIDMAN<sup>2</sup>, Ram PRABHOO<sup>3</sup>, Rajesh ROHIRA<sup>4</sup>, Henri BENSACHEL<sup>5</sup>

<sup>1</sup>Elmhurst Hospital Center, New York (UNITED STATES), <sup>2</sup>Columbia University Medical Center, New York (UNITED STATES), <sup>3</sup>V.N. Desai Hospital, Mumbai (INDIA), <sup>4</sup>JESS Research & Development Society, Mumbai (INDIA), <sup>5</sup>Robert Debre Hospital, PARIS (FRANCE)

Differential Distraction has demonstrated to be an effective, minimally invasive procedure for treatment of clubfoot. Long-term follow-up (over 5 years) have demonstrated that patients, 5 years and older, treated with this method have residual/ recurrent forefoot adductus. Incorporating M1 osteotomy and lengthening within the DD protocol in this age group of patients has eliminated the residual/ recurrent adductus deformity of the foot. We present a series of six cases treated with DD, M1 osteotomy and lengthening, all patients were over 5 years of age. Two patients had neglected and four had recurrent clubfoot deformity. M: F ratio was 2:1. The treatment with DD extended between 6 & 8 weeks. M1 osteotomy was carried out at the proximal 1/3 of the bone, subperiosteally, four weeks after beginning of the DD. Rate of distraction after the osteotomy was 3:1 for 2 weeks. Slowing the distraction rate allowed the regenerate to consolidate as distracted. M1 was lengthened in average ~8 mm and the distal fragment laterally translated. The regenerate bone healed in all cases. DD was continued until correction of all components of the clubfoot was completed. During follow-up, there was no recurrence of deformity in any of the cases. Complications: The first two cases had MPJ subluxation that was addressed by stabilizing the MPJ with pinning or an aluminum sling in all other patients. CONCLUSION: M1 osteotomy combined with DD has shown to be an effective procedure that eliminates residual forefoot adductus after clubfoot treatment in the older child.

**Date : 2008-08-28**  
**Session : SICOT/ 5th International Clubfoot Congress**  
**Time : 1100-1215**  
**Room: 606-607**

**Abstract number : 19259**

**CORRECTION OF STIFF CLUB FOOT DEFORMITY WITHOUT OSTEOTOMY OR SOFT TISSUE RELEASE USING ILIZAROV EXTERNAL FIXATOR**

Aik SAW

*University Malaya Medical Centre, Kuala Lumpur (MALAYSIA)*

Club foot deformity which recurred after surgery is generally stiff and difficult to treat. Ilizarov external fixator allows gradual stretching of the tight soft tissues and provides a minimally invasive method to deal with the problem. We treated 13 children with 20 stiff club feet that failed surgical correction with simultaneous gradual correction of all deformity components without osteotomy or soft tissue releases. A standard frame configuration that varies in the diameter of the half rings was used. Fixation was achieved with 2 smooth wires for the metatarsus, 2 smooth wires for the calcaneum (two cases had additional half pin fixation the calcaneum) and 2 smooth wires / one half pin for the tibia. On frame removal the corrected feet were applied with below knee POP cast for 4 weeks before converted into AFO splint. The mean duration of frame application was 3.35 months. In all cases equinus and adduction deformities were over-corrected beyond neutral position. In 4 feet the hindfoot were not over corrected (only to neutral or slight varus). Over a mean follow up of 1 to 7 years 4 feet required repeat Ilizarov correction. They were treated with the exact method and all achieve satisfactory correction. In one older child we evaluated a preoperative / postoperative MRI and demonstrated partial lateralization of navicular bone over the talar head. There was also articular and bone bruises over lateral aspect of the talar dome corresponding to antero-lateral ankle pain on walking. While syndesmotomy release was being considered, the pain resolved and the patient was able to walk with near normal gait. A standard frame configuration that is constructed before operation significantly reduces the operating time. The procedure is also simpler and few components are required to be sterilized. Incidence of frame adjustment during gradual correction was minimal and there was no additional procedures requiring anaesthesia. Longer follow up will be required to evaluate the functional outcome. Special imaging is also required to evaluate the anatomical outcome of the procedure.

Date : 2008-08-28  
Session : SICOT/ 5th International Clubfoot Congress  
Time : 1100-1215  
Room: 606-607

Abstract number : 19260

**COMPLICATIONS IN CLUBFOOT TREATED WITH JESS DIFFERENTIAL DISTRACTION**

Azriel BENAROYA<sup>1</sup>, Robert FRIDMAN<sup>2</sup>, Ram PRABHOO<sup>3</sup>, Rajesh ROHIRA<sup>4</sup>, Henri BENSACHEL<sup>5</sup>

<sup>1</sup>Elmhurst Hospital Center, New York (UNITED STATES), <sup>2</sup>Columbia University Medical Center, New York (UNITED STATES), <sup>3</sup>V.N. Desai Hospital, Santacruz (E), Mumbai (INDIA), <sup>4</sup>JESS Research & Development Society, Mumbai (INDIA), <sup>5</sup>Robert Debre Hospital, Paris (FRANCE)

Residual deformity in clubfoot after traditional casting and open treatment are challenging problems. The most common of these recurrent deformities are adductus, cavovarus and rocker bottom deformities of the foot, with the most challenging being calcaneus's foot deformity. Multiple surgeries are commonly employed, which render the foot stiff, and eventually require fusion. We present a series of cases of complications following prior clubfoot treatment (casting and/or surgery) that were managed with the JESS Differential Distraction (DD) method, physical therapy and long-term bracing. Twelve feet (four, with cavovarus deformity; seven, with rocker-bottom foot and two feet with calcaneus's deformity) were treated with this protocol. The average patient age was 8 years, (range 4 yrs -14 yrs), male: female ratio was 2:1. The treatment with DD extended between 4 - 8 weeks. Follow-up after DD treatment was between 3-5 years (average: 4.2 years). In all cases of rocker bottom foot, after overcorrection was achieved, the distractors were replaced with curved rods during the static phase to maintain the arch. During follow-up period, there was no recurrence of deformity in any of the cases. No serious complications were observed in this series. CONCLUSION: Residual and iatrogenic foot deformities are serious complications resulting from clubfoot treatment. Differential Distraction (DD), physical therapy and long-term bracing is a viable, minimally invasive option for treatment of these serious conditions, restoring shape, and improving foot mobility and function.

**Date : 2008-08-28**  
**Session : SICOT/ 5th International Clubfoot Congress**  
**Time : 1100-1215**  
**Room: 606-607**

**Abstract number : 19261**

**MANAGEMENT OF NEGLECTED CLUBFOOT BY ILIZAROV TECHNIQUE BASED ON PONSETI PRINCIPLES**

Ramavtar AGRAWAL

*Agrawal orthopaedic hospital, MUMBAI (INDIA)*

**PURPOSE:**In all developing countries, few neonates with clubfoot are brought for management; rather neglected clubfoot is encountered more frequently. Repeated surgeries on the soft tissue in neglected clubfoot causes increased stiffness of the foot while bony procedures make a foot which is usually already small, even smaller. An alternative is there to use the Ilizarov technique. The purpose of this study was to use the well established Ponseti principles of correction of clubfoot in Ilizarov technique for correction of neglected clubfoot in 33 patients. **METHOD:** Between 1999 and 2004, 22 boys and 11 girls with idiopathic clubfeet were treated by Ilizarov technique using Ponseti principles. Mean age was 7.4 yrs. First the plantar fasciotomy was performed followed by correction of forefoot pronation by gradual distraction between forefoot and midfoot rings followed by supination of forefoot ring. After this adduction was corrected followed by T.A. tenotomy. By changing the frame configuration finally equinus was corrected gradually. **RESULTS:** Results were analyzed using a scoring system based on degree of correction achieved. **DISCUSSION:** The aim of treatment of neglected clubfoot is to obtain a fully corrected and mobile foot at maturity rather an absolute anatomical but stiff foot. Ilizarov technique achieves correction by distraction of foot allowing realignment. **CONCLUSION:** Ilizarov technique based on Ponseti principles is a safe and effective method of treatment of neglected clubfoot, it radically decreases the need for extensive open surgery.

Date : 2008-08-28  
Session : SICOT/ 5th International Clubfoot Congress  
Time : 1100-1215  
Room: 606-607

Abstract number : 19262  
**EXTERNAL MINI-FRAME FOR CONGENITAL TALIPES EQUINOVARUS IN INFANT**  
Hanlin WANG  
*The Third Hospital of Hebei Medical University, Shijiazhuang (CHINA)*

Objective: A new 3-dimension external mini-frame for congenital talipes equinovarus infants was designed and applied, and its therapeutical mechanism and effects were observed. Methods: From 2004.1 to 2006.1, 58 infants (70 feet) with congenital talipes equinovarus were treated using the mini-frame in our department. 41 male and 17 female; age 0.5-3 years with the average age 1.5 years. 43 left foot and 27 right foot, both feet 20 cases and single foot 30 cases; 44 cases were given orthosis or cast treatment; 5 cases were operated in other hospitals, the other cases were not given any treatment. According to the age, the degree of deformity, being operated or not and the pathological change of the foot, we apply different treatment method. 1. Correction and fixation of the club foot directly with the mini-frame. 2. Limited soft tissue release, then correction and fixation of the club foot with the mini-frame. 3. Correction and fixation of the club foot with the mini-frame after extensive soft tissue release of interior posterior of the foot. 4. Correction and fixation of the club foot with the mini-frame after soft tissue release, tendon transfer and restore of muscle force balance. The time of external fixation is about 3 months after the operation. Results: All cases were followed up in 1-3 years with the average 2.2 years. The results were evaluated as excellent, good, effective and ineffective, according to the correction of foot deformities, plantigrade foot in walking, and the range of joint motion of the foot. Excellent: the foot looks near normal, the calcaneus is erect, with plantigrade foot in walking, the range of the joint motion in foot is near normal. Good: the foot deformity improved obviously, but a light adduction has remained in the forefoot, with plantigrade foot in walking, the range of joint motion in foot is good. Effective: The forefoot adducted slightly, with lightly calcaneus varus, the motion of foot is limited partly. Ineffective: the deformity isn't improved or is recurred. Second operation is needed. In all the cases, excellent: 46 cases (52 feet), Good: 10 cases (16 feet), Effective: 2 cases (2 feet), ineffective: no case. CONCLUSIONS: For the congenital talipes equinovarus in infant, the treatment with the new 3D external mini-frame is more simple, safe, and reliable than traditional cast technique after surgery, its medical value is equal to that of Ilizarov external frame for adult's foot deformities which is not suitable to treat infant's foot deformities.

**Date : 2008-08-28**  
**Session : Joint: revision hip arthroplasty**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 15973**

**9-YEAR RESULT OF INTERFACE BIOACTIVE BONE CEMENT (IBBC) IN REVISION THA**

Hiroshi FUJITA<sup>1</sup>, Hironobu OONISHI<sup>2</sup>, Shigeru ITO<sup>2</sup>, Seok KIM<sup>2</sup>, Hirofumi DOUKAWA<sup>2</sup>

<sup>1</sup>*Institute for Joint Replacement, Department of Orthopedic Surgery, Kyoto Katsura Hospital, Kyoto (JAPAN),* <sup>2</sup>*Hironobu Oonishi Memorial Joint Replacement Institute, Osaka (JAPAN)*

**PURPOSE:** 30 cases whose femoral side was operated with interface bioactive bone cement (IBBC) technique which includes smearing hydroxyapatite granules just before cementing in revision THA for aseptic loosening were evaluated. **METHOD:** The present study includes 2 men and 28 women with average age at operation of 60 years old (ranging 35 to 81). Evaluation of preoperative radiograph showed Grade 1, 2, 3, and 4 of Endo Klinik classification of 4, 13, 12, and 1, respectively. **RESULTS:** Re-revision of acetabular component and radiological loosening were found in 1 case each. However, re-revision of femoral component was not found. Radiolucent line at bone cement interface was not observed in 17 cases, but in 13 cases less than 1 mm width radiolucent line was observed at 1, 2, 3, 6, and 7 zone of Gruen for 6, 3, 3, 3, and 10 cases respectively. Osteolysis was not observed in 25 cases, but in 5 cases it was observed at 1, 2, and 7 zones of Gruen for 4, 1, and 3 cases respectively. Possible loosening was observed in 1 case by criteria of Harris. Among 21 cases whose cementing grade was assessed as B or C in postoperative X-ray, radiolucent line at bone cement interface has been disappeared before last follow-up in 11 cases. **CONCLUSION:** As femoral endosteal surface after loosening is generally smooth, microinterlocking is difficult to obtain, which leads to poor outcome. The present study revealed good result was obtained by IBBC technique for reconstruction of aseptic femoral loosening.

**Date : 2008-08-28**

**Session : Joint: revision hip arthroplasty**

**Time : 0900-1030**

**Room: Theater 2**

**Abstract number : 16788**

**REVISION THR: RADIAL IMPACTION BONE GRAFTING AND COLLARED LONG STEM PROSTHESIS FOR PAPROSKY TYPE II AND III FEMORAL DEFECTS**

Rajeshkumar KAKWANI, Shankar KASHYAP, Saqib M.

*Queen Elizabeth Hospital, Gateshead, Birmingham (UNITED KINGDOM)*

**INTRODUCTION:** Massive bone loss has been a challenging feature of Revision hip arthroplasty. Subsidence of collarless stems with impaction allografting is a known feature. **MATERIALS:** All 107 patients who underwent radial impaction allografting during Revision THR in our unit between 1997 and 2005 were included in the present study. 3 patients had died due to unrelated causes and 3 patients were lost to follow-up at the final review. Average duration between the primary and revision surgery was 9.4 years (range 6-23 years). The indication for radial impaction bone grafting was type II, III A and B defects in the femur (Paprosky classification). All follow-up patients were assessed using Oxford hip score and Harris hip score, along with plain radiographs. **RESULTS:** The average follow-up duration was 68.8 months. The survival of the femoral stem was 93.8%, using revision for any cause as the end-point. Three patients underwent revision for periprosthetic fracture and four patients for infection. There were no revisions for aseptic loosening. All cases with surviving implants showed improvement in both Oxford Scores (mean: 41.2 to 19.2) and Harris scores (mean: 40.8 to 83.4) compared to preoperative status. **DISCUSSION:** The use of collared stem with radial impaction allografting technique in our study reduced the problem of subsidence. Graft strength assessment is essential to provide the initial stability of the prosthesis. Bypassing the tip of the existing cement mantle by at least two femoral diameters using long stem prosthesis reduces the risk of peri-prosthetic fractures.



**Date : 2008-08-28**  
**Session : Joint: revision hip arthroplasty**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 17037**

**CEMENTLESS ACETABULAR REVISION USING THE DURALOC "JUMBO" CUP. A 5-YEAR EXPERIENCE**

Farshid MALEKI, Ruth DELANEY, Aniruddha MITRA, Philip BRADY, David MULCAHY, Aniruddha MITRA  
*Cork University Hospital, Department of Orthopaedic Trauma Surgery, Cork (IRELAND)*

**BACKGROUND:** Acetabular revision in the presence of bone loss is a challenging task. Larger, porous-coated, cementless acetabular cups are being used increasingly. The so-called "jumbo cups" have been in use in our institute since 2002. **AIMS:** The aim of this study was to assess the intermediate-term survival using this implant. **METHODS:** Patients who had revision surgery between January 2002 and December 2006 performed by a single surgeon (D.M.) were reviewed. Jumbo cup was defined as a diameter of >66mm in males, >62mm in females. The Harris hip score was used to assess clinical outcome. Radiolucency, osteolysis and cup migration were assessed using postoperative radiographs. **RESULTS:** 61 jumbo cups were used for revision of the acetabular component in 60 patients at a mean age of 72.4 years using the Duraloc 1200 cup. The indications for revision hip surgery were: 1) Aseptic loosening of acetabular components 13; 2) Aseptic loosening of both components 36; 3) Recurrent dislocation 2; 4) Septic loosening 5; 5) Periprosthetic fracture 5. Average Harris hip score preoperatively was 43.75. At the latest follow-up this improved to 91.83. There were 3 failures (5%), 2 due to infection (revision was for infected primary THR in one case) and one due to instability secondary to excessive retroversion of the cup. There was no case of aseptic loosening. The major complications included one intraoperative femoral fracture. **CONCLUSION:** The intermediate-term results of acetabular revision using large cups are encouraging, with good functional and radiographic outcomes in the majority of patients.

Date : 2008-08-28

Session : Joint: revision hip arthroplasty

Time : 0900-1030

Room: Theater 2

Abstract number : 17410

**1413 EXETER STEM REVISIONS WITH IMPACTION BONE GRAFTING AND CEMENT. A SWEDISH MULTICENTER STUDY**

Ewald ORNSTEIN<sup>1</sup>, Ragnar JOHNSON<sup>1</sup>, Stefan LEWOLD<sup>1</sup>, Lars LINDER<sup>1</sup>, Jonas RANSTAM<sup>2</sup>, Maria TORPER<sup>1</sup>

<sup>1</sup>Department of orthopaedics, Håssleholm (SWEDEN), <sup>2</sup>University Hospital, Lund (SWEDEN)

11 of 1368 unilateral hip revisions (0.5%) were re-revised because of aseptic loosening of in total 71 (5.2%) re-revisions followed up to 15 years. INTRODUCTION: Stem revision with impaction bone grafting and cement (IBGC) has been questioned. The re-revision rate using the Exeter stem was studied. METHODS: 1413 stem revisions performed with this technique were identified. 1368 (97%) were followed for up to 15 years (mean 7.9 years). The mean age was 72 years. The revisions were performed because of aseptic loosening in 1189 hips, infection in 97, other reasons in 59 and not specified in 23 hips. Cumulative re-revision rate (CRRR) was calculated using Kaplan-Meier technique. The effect of learning was tested using a log-rank test for trend over number of revisions per department in 5 categories. All calculations were performed using STATA v10.0. RESULTS: 71 of the 1368 hip revisions were re-revised, the majority early after revision. The causes of re-revision were femoral fracture in 21 hips, infection in 16, subsidence in 13, aseptic loosening in 11, other reasons in 4 and not specified in 6 hips. At 15-year follow-up the overall CRRR for loosening was 5.6% (95% confidence interval: 4.4%-7.1%). Departments having performed fewer than 25 revisions with the technique had 3.3 times ( $p=0.020$ ) higher re-revision risk than departments having performed 100 or more. DISCUSSION: Most re-revisions were performed early. The CRRR for aseptic loosening was low. Increased surgical experience decreases the risk of re-revision.

**Date : 2008-08-28**  
**Session : Joint: revision hip arthroplasty**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 17779**

**HIP REVISION SURGERY: CEMENTED AND CEMENTLESS IMPACTION GRAFTING IN SEVERE FEMORAL BONE LOSS**

Francesco Saverio SANTORI, Nicola SANTORI  
*S. Pietro Hospital, ROME (ITALY)*

In hip revision surgery frequently a huge femoral bone loss is present. The bone loss reconstruction can be realized in several ways. One possible way is the "impaction grafting" technique. This procedure has been developed in England (Leeds) by Ling et al., and was utilised by the conventional technique only with cemented implants applied after the bone chip pressurization. In our experience, this technique is very helpful in cases of osteolysis and in osteoporotic bone. The bone remodeling, in the long-term results, is really amazing. In patients with severe proximal bone loss but good distal cortical bone we adopted this procedure impacting the bone chips around a cementless long-stem prosthesis utilising different kinds of implant. This technique is particularly utilised in younger patients. The distal fixation of the stem associated with the bone chips pressurization allows also in these cases a very good bone remodelling. We report the results of 217 cases (126 cementless, 91 cemented) performed between 1990 and 2006, with a mean follow-up of 8.5 years.

Date : 2008-08-28

Session : Joint: revision hip arthroplasty

Time : 0900-1030

Room: Theater 2

Abstract number : 18076

**OVERALL SHORT-TERM RESULT OF CEMENTED ACETABULAR RECONSTRUCTION WITH IMPACTED ALLOGRAFT OVER A WIRE MESH FOR SEVERE ACETABULAR BONE DEFECT**

Kee Hyung RHYU<sup>1</sup>, Myung Chul YOO<sup>1</sup>, Yoon Je CHO<sup>2</sup>, Kang Il KIM<sup>1</sup>, Young Soo CHUN<sup>1</sup>

<sup>1</sup>Center for Joint Disease, Kyung Hee University East-West Neo Medical Center, Seoul (KOREA), <sup>2</sup>Department of Orthopaedic Surgery, Kyung Hee Medical Center, Seoul (KOREA)

We evaluated the clinical and radiographic results of cemented acetabular reconstruction with impacted morselized allograft over a wire mesh in revision total hip arthroplasty. A total of 21 cases of acetabular revisions with this method were available for complete analysis. The mean follow-up period was 63 months. Clinically, the Harris hip score and the complications were evaluated. We observed radiographic changes including the incorporation of an allograft, change in cup inclination, cup migration, radiolucent line around the cup and the component loosening. The mean Harris hip score improved significantly. Radiological incorporation between the host bone and the allograft was observed at an average of 11.4 months after the surgery. The mean change in cup inclination was 1.9 degrees, and the mean medial and superior migration was 3.93mm and 4.41mm respectively. The majority of these radiological changes occurred within 6 months after the surgery. A case of mild heterotopic ossification and a case of radiological cup loosening was observed but there was no re-revision or complications, such as infection and dislocation. In a severe acetabular bone stock deficiency that cannot be reconstructed with a cementless acetabular cup, cemented acetabular reconstruction with an impacted morselized allograft over a wire mesh showed good results in this short-term follow-up study.

**Date : 2008-08-28**  
**Session : Joint: revision hip arthroplasty**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 18320**

**MODES OF FAILURE OF CONSTRAINED IMPLANTS**

Olivier GUYEN<sup>1</sup>, Miguel CABANELA<sup>2</sup>, David LEWALLEN<sup>2</sup>

<sup>1</sup>*Edouard Herriot Hospital, LYON (FRANCE),* <sup>2</sup>*Mayo Clinic, Rochester (UNITED STATES)*

**INTRODUCTION:** Constrained implants have become the most commonly used option to manage hip instability. However, reports on mechanical failures begin to emerge. This study analyses the modes of failure of a single design of constrained device. **MATERIALS AND METHODS:** 43 Osteonics constrained tripolar implants were revised for failure between 1995 and 2004 at our institution. These devices had been inserted during revision procedures using seven methods of implantation: either impacted (into a new acetabular shell, into a well-fixed uncemented shell, into a shell which was cemented into a cage) or cemented (into the acetabulum, into a well-fixed shell, into a new trabecular metal shell, and into a cage). Operative reports and radiographs were reviewed to identify the modes of failure. **RESULTS:** The average time to failure was 28.4 months. Five modes of failure were witnessed: failure at the bone-implant interface (type I), failure at the mechanisms holding the constrained liner to the metal shell (type II), bipolar retaining mechanism failure (type III), dislocation at the inner bipolar bearing (type IV), and infection (type V). Infection was the most common mode of failure (12 cases), followed by type I failures (11 cases), type III failures (10 cases), type II failures (6 cases), and type IV failures (3 cases). The mode of failure remained unknown in one case. **CONCLUSION:** Failure of the constrained device can occur at all of its interfaces. This study points out limitations of such devices and the need to restrict their use to salvage situations.

Date : 2008-08-28  
Session : Joint: revision hip arthroplasty  
Time : 0900-1030  
Room: Theater 2

Abstract number : 18404

**FUNCTIONAL OUTCOME FOLLOWING HIP RESURFACING: THE IMPORTANCE OF COMPONENT SIZE AND ACETABULAR ORIENTATION**

Simon JAMESON, David LANGTON, Antoni NARGOL  
*University Hospital of North Tees, Stockton (UNITED KINGDOM)*

Optimal cup orientation for metal-on-metal hip resurfacing has yet to be established. Guidance is based on hip replacement data and in vitro studies. We sought to determine the influence of component size and positioning on early clinical outcome. This study comprises a consecutive series of 200 hip resurfacings. All had Harris Hip Scores (HHS) at one-year review. Acetabular inclination angles were measured on preoperative radiographs, and cup inclination/anteversion angles on 3-month postoperative films using EBRA. "Restoration" of anatomy was defined as placement of the cup within  $\pm 5^\circ$  of preoperative inclination. The difference between preoperative acetabular and postoperative cup inclination was termed "cup-angle difference" (CAD). HHS inversely correlated with CAD ( $P=0.023$ ) and anteversion ( $P=0.003$ ), and directly correlated with femoral head size ( $P<0.001$ ). In patients with restoration of inclination anatomy mean HHS at one year was significantly higher at 98.7 compared with cups placed outside the normal anatomy "restoration" limits (93.8,  $P=0.003$ ). Patients with anteversion  $\geq 20^\circ$  had a significantly lower HHS ( $P=0.010$ ) compared with cups anteverted  $<20^\circ$ . 96% of patients with HHS  $<90$  had malaligned cups. Restoring preoperative cup inclination, anteverting the cup  $<20^\circ$  and using large femoral heads improves early clinical outcome.

**Date : 2008-08-28**  
**Session : Joint: revision hip arthroplasty**  
**Time : 0900-1030**  
**Room: Theater 2**

**Abstract number : 18426**

**FEMORAL REVISION USING LONG HYDROXYAPATITE-COATED INTERLOCKING STEM**

Rajesh MALHOTRA, Aman DUA, Vijay KUMAR  
*All India Institute of Medical Sciences, NEW DELHI (INDIA)*

**INTRODUCTION:** The IOTA interlocking femoral stem is a hydroxyapatite coated stem with the option of interlocking the stem distally. **MATERIALS AND METHODS:** We retrospectively reviewed the results of 18 total hip arthroplasties in 17 patients using the IOTA interlocking stem. The bone deficiency was classified based on the AAOS classification. Radiographs at the final follow-up were evaluated by the criteria described by Engh et al. **RESULTS:** Average age at the time of revision was fifty-seven years. Preoperatively 5 femora showed type I deficiency, type II deficiency was seen in 3, Type III in 9 and Type IV deficiency in one femur. In 5 hips the calcar replacing prosthesis was implanted and in one hip allograft was used to reconstruct the calcar. One patient sustained intraoperative fracture of the shaft of the femur while implanting the trial prosthesis and one patient had a perforation of the posterior cortex of femur while trying to remove the cement. The mean follow-up period was 33.5 months. The mean preoperative Harris Hip Score was 36, which improved to 77 at the time of final follow-up. None of the stems required revision and at minimum 27-month follow-up, bony ingrowth was noted in 83.33% of the stems. **CONCLUSION:** IOTA interlocking stem provides initial axial and rotational stability and consistent bony in growth owing to hydroxyapatite coating. The calcar replacing option of the stem is useful in patients with deficient calcar as a substitute for the allograft.

**Date : 2008-08-28**  
**Session : CTL - Spine: Spinal Infection**  
**Time : 0800-0900**  
**Room: Theatre 1**

**Abstract number : 19144**

**CURRENT TRENDS IN TREATMENT OF SPINAL INFECTION**

Manabu ITO

*Department of Orthopaedic Surgery, Hokkaido University Graduate School of Medicine, Sapporo (JAPAN)*

The number of spinal infections has been increasing in the past few decades, as the population of elderly people with comorbid medical problems increases. As contemporary medical treatment for serious systematic diseases prolongs the life of the patients, the opportunities for these patients to suffer from spinal infections are getting more frequent. The patients suffering from spinal infection are getting older and drug resistant organisms such as MRSA or MRSE are getting more frequent in recent years. Favorable results have been reported with regard to anterior debridement and fusion using autografts in patients with major bone destruction or neurological impairment. Although spinal instrumentation has been reported safe and effective in patients with TB infection, use of spinal instrumentation in those with pyogenic infection is still controversial. Some studies showed that there were significant complication rates in association with spinal reconstruction surgery using metal implants in patients with pyogenic spinal infection. Since the patients suffering from pyogenic spinal infections had serious comorbid conditions, the success rates of major spinal surgery in these patients are not promising. There have been several attempts to treat spinal infections using minimally invasive surgical techniques, such as percutaneous suction and irrigation, or posterolateral endoscopic debridement and irrigation. By accurate detection of spinal infection in the early phase with MR images, many patients with spinal infections can be treated successfully by these minimally invasive surgical techniques.



**Date : 2008-08-28**  
**Session : CTL- Spine: Spinal Infection**  
**Time : 0800-0900**  
**Room: Theatre 1**

**Abstract number : 19190**  
**PYOGENIC SPONDYLITIS: FROM ASPIRATION TO INSTRUMENTATION**

Kan Hing MAK  
*Kwong Wah Hospital, Hong Kong (HONG KONG)*

From September 1997 to August 2007, 62 patients with infective spondylitis required surgical treatment because of failure in conservative treatment. 51 of them were pyogenic. Mean age of patients was 58.0 years. Pain, neurological compromise and fever were the predominant complaints. The mean duration of symptoms before presentation was 11.3 weeks. While patients with significant para-spinal and epidural abscesses required mandatory posterior drainage, there were: 1. 30 patients operated via anterior approach alone. 2. 4 patients were just drained through a posterior approach. 3. 12 patients required decompression and posterior instrumentation. 4. 4 required combined anterior debridement, anterior strut graft and posterior instrumentation. 5. One had thoracoscopic drainage alone. Use of instrumentation had been hazardous in the presence of pyogenic infection and may be contraindicated. 16 cases had been instrumented for the support of involved spinal segments because of genuine segmental instability or chance of neurological embarrassment after debridement. On follow up more than one year after surgery, 71.4% of patients had either improvement of neurological function or maintenance of intact neurological status. The average correction of kyphosis in early post-operative period was 9.0° while the final angle of correction dropped to 2.0°. The average correction for patients with instrumentation was 14.8° compared to 6.3° for those without. The final correction was 9.1° for the instrumented group compared to -1.9° for those without. There was no evidence of recurrence of infection related to presence of implant. **CONCLUSION:** For spinal infections that had failed to respond with conservative therapy, surgical debridement and stabilization offered a good chance of neurological recovery and clearance of infection focus. Judicious use of spinal instrumentation was able to restore spinal stability and alignment destroyed in pyogenic spondylitis, and had not demonstrated increase risk in eradicating the infection.

**Date : 2008-08-28**  
**Session : CTL- Spine: Spinal Infection**  
**Time : 0800-0900**  
**Room: Theatre 1**

**Abstract number : 19214**

**SPINAL INFECTIONS EVOLUTION AND TREATMENT OF SEVERE KYPHOTIC DEFORMITIES IN SPINAL TUBERCULOSIS**

S. RAJASEKARAN

*Ganga Med. Centre & Hosp. PVT, COIMBATORE (INDIA)*

Uncomplicated spinal tuberculosis is now mainly a medical disease. However, many children end up with severe kyphotic deformities following conservative therapy. Established kyphotic deformities are very difficult to correct and are associated with serious complications. It is important to identify children who are at risk for severe deformity so that prophylactic spinal stabilisation could be performed before collapse of the spine. The patterns of progress in deformity, the method to identify children at risk and the various surgical options to correct the deformities will be discussed.

**Date : 2008-08-28**

**Session : Symposium- Spine: Low Back Pain & Disc Degeneration**

**Time : 0900-1030**

**Room: Theatre 1**

**Abstract number : 18063**

**LONG-TERM OUTCOME OF LUMBAR DISCECTOMY - A HOMOGENOUS SERIES OF 376 CASES**

Thami BENZAKOUR, Abderrazak HEFTI, Mohamed LEMSEFFER, Ahmed BENZAKOUR

*Zerktouni Orthopaedic Clinic, Casablanca (MOROCCO)*

We present a homogenous series of 376 cases of lumboradiculalgia on herniated discs treated by mini open discectomy during the period 1980-2005. MATERIAL: - The average age was 37.2 years (255 males and 121 females). There have been 223 radiculalgia cases, 115 hyperalgetic forms and 38 paralytic forms.- Classification of the hernia is made according to the seat and the size.- Surgical decision requires three technical requirements of discectomy. RESULTS: - Pain: 63% of the patients have a total disappearance of the pain.- Recovery of the achyleen reflex: 25%- Duration of work absence: 12 weeks- Reoperations: 9 for hernia among 23 recurrences. Global results: good and very good: 81.9%, fair: 10.1% and failures: 8%.After 5 years follow-up, we had 92% of good and very good results, but after 13.2 years we have only 81.9 % which is a decrease of 10.1%. DISCUSSION:After medical treatment failure, surgery could be indicated if conflict image agrees with clinical aspects. A question is then raised: is surgery recommended? - In recent common radiculalgia, the answer is: no- In hyperalgetic sciatica: maybe- In evolving paralysis: yes- In resistant sciatica: yes, but#8230; CONCLUSIONS: Initial good results decrease slightly with time after 5 years. The mini open discectomy remains a reliable treatment provided we respect the surgical indications and requirements (purpose, selection, technique and target). We operate only on sciatica that resists to a good medical treatment for at least three months.

**Date : 2008-08-28**

**Session : Symposium - Spine: Low Back Pain & Disc Degeneration**

**Time : 0900-1030**

**Room: Theatre 1**

**Abstract number : 19135**

**BORDERLINE INDICATION FOR DYNAMIC STABILIZATION**

Andre J. KAELIN

*Children's Hospital, HUG, GENEVA 14 (SWITZERLAND)*

Dynamic stabilization of the degenerative spine is growing concept in the field of surgical possibilities for back pain. The goal of dynamic neutralization is to re-align and re-stabilize one or two vertebral segments to a position close to normal in order to restore physiological movement and provide disk healing in the best cases. The usual indications are mainly early stage of disk degeneration. We present in our series borderline indications: long segments, degenerative scoliosis, spondylolisthesis with long term results. Dynamic neutralization technique can be used with PLIF or TLIF on specific segments in order to preserve lumbar lordosis. Dynamic stabilization in older patient allows quicker functional recovery. In selected cases the long term results are good to excellent.

**Date : 2008-08-28**

**Session : Symposium - Spine: Low Back Pain & Disc Degeneration**

**Time : 0900-1030**

**Room: Theatre 1**

**Abstract number : 19181**

**HOW HAS GENETICS CHANGED OUR UNDERSTANDING OF DISC DEGENERATION?**

Kenneth M.C. CHEUNG<sup>1</sup>, Jaro KARPPINEN<sup>2</sup>, Danny CHAN<sup>3</sup>, BJ FAN<sup>3</sup>, Daniel HO<sup>3</sup>, Patrick KAO<sup>3</sup>, You Qiang SONG<sup>3</sup>, Pak SHAM<sup>3</sup>, Kathryn S.E. CHEAH<sup>3</sup>, John C.Y. LEONG<sup>3</sup>, Keith Dip-Kei LUK<sup>3</sup>

<sup>1</sup>University of Hong Kong, Queen Mary Hospital, Hong Kong (HONG KONG), <sup>2</sup>University of Oulu, Oulu (FINLAND), <sup>3</sup>University of Hong Kong, Hong Kong (HONG KONG)

Intervertebral disc degeneration has traditionally been thought to be related to overloading, smoking and ageing. Yet recent work on epidemiological factors and gene mutation detection has demonstrated a high genetic predisposition. Since 2001, the author has recruited some 2500 volunteers from the local population, between 18 and 55 years, and carried out MRI examinations of their lumbar spine. Blood were taken for DNA extraction, and predisposing genes were screened using case-association, genome-wide and family approaches. A number of new genes have been identified, including genes that predispose to osteoarthritis and genes that are either structural components or involved in the regulation of the extracellular matrix. They can result in a 2 to 6 times increased risk of developing disease. Through the discovery of new genes and the understanding of their relative contribution to the etiology of disc degeneration and back pain, a new understanding of this condition is beginning to emerge. This talk will explain some of these concepts for the general orthopaedic surgeon, and discuss how they may be relevant to our clinical practice.

**Date : 2008-08-28**  
**Session : Symposium- Sports Medicine: Controversies in Meniscal Surgery**  
**Time : 1400-1530**  
**Room: Theatre 1**

**Abstract number : 19200**  
**RATIONALE FOR REPAIRING THE MENISCUS**

Wilson LI  
*Queen Elizabeth Hospital, Hong Kong (HONG KONG)*

Young patients injure their meniscus mainly from trauma in sports, mostly due to a rotational grinding force such as a sudden twisting at the knee at flexion; while older individuals injure theirs after even minor trauma. Menisci have limited blood supply. Studies showed that vascularity was limited to the peripheral region of menisci only (the peripheral 10-30% ) while the inner 65-70% is avascular. Though early works by Smilie suggested that total meniscectomy might result in regrowth of meniscus type structure, later research ( Fairbank and others ) all supported that total meniscectomy invariably led to arthritis, while more conservative, or partial meniscectomy, could delay, but not eliminate the risk of degenerative joint disease. While meniscal resection is associated with less recovery time and restriction in motion, meniscal repair is associated with more favorable prognosis in the long run. Annandale first reported repair of the semilunar cartilage as early as 1885, while Henning introduced the modern concept of meniscus repair, used rasping and inside out sutures. Rasping is indicated for incomplete and stable tears, using the shaver meniscal rasp to roughen the tear and the adjacent parameniscal synovial tissues, adding trephination with a coring device in order to stimulate vascularity for meniscal healing if necessary. For complete and unstable tears, various methods of arthroscopic meniscal repairs evolved over the past 30 years or so. Arthroscopic outside-in , inside-out, and all inside techniques are widely practiced, with high success rates reported. Different biological and synthetic adjuncts for repair were also described. Potential complications and factors that decrease healing rate will be outlined. Latest experimental methods for repairs and methods for assessing the repair will be discussed too.

**Date : 2008-08-28**  
**Session : Symposium - Trauma: Updates in Hip Fracture Management**  
**Time : 1400-1530**  
**Room: Theatre 2**

**Abstract number : 19105**  
**DYNAMIC HELICAL BLADE PLATE FIXATION OF INTERTROCHANTERIC FRACTURES**

Frankie LEUNG  
*the University of Hong Kong, Pokfulam (HONG KONG)*

Proximal femoral fractures are commonly encountered in our daily practice. However, significant complications still occur and most fractures heal with significant collapse, resulting in limb shortening and limping gait. The fixation over the femoral head region is still not satisfactory and lag screw cut-out occurs 6-19%. The helical blade plate fixation was devised as an attempt to improve the fixation of the femoral head. The theoretical advantage includes an increased cross section area to resist cut-out and a decreased amount of bone removed from the femoral head during insertion. An anti-rotation mechanism was also devised, which potentially decreased the amount of rotational displacement during fracture collapse. A total of 104 dynamic helical blade plate fixations were performed in Queen Mary Hospital, Hong Kong. The average age was 82. The indications include AO/OTA 31 A1 and A2 fractures. Cut-out of the helical blade occurred in two patients (1.9%). All other fractures united with different degrees of shortening. The theoretical advantages of the helical blade fixation of the osteoporotic femoral head appear to be valid. However, the fracture of the lateral wall of the proximal femoral shaft can still occur and may compromise the result of this method of fixation. Larger randomized studies are needed to further evaluate the usefulness of this method of fixation.