



Seventh SICOT/SIROT Annual International Conference

&

SOF Ortopediveckan 2010

Abstracts

Oral Presentations



31 August – 3 September 2010

Swedish Exhibition & Congress Centre

Gothenburg, Sweden

Date: 2010-08-31

Session: Symposium - Joint Preserving Operations & Osteotomies for Adult Hip Diseases

Time: 13:30-15:00

Room: Congress Hall

Abstract number: 26853

POSTERIOR ROTATIONAL OSTEOTOMY IN YOUNG ADULTS AND ADOLESCENTS WITH SEVERE OSTEONECROSIS

Takashi ATSUMI, Satoshi TAMAOKI, Ryosuke NAKANISHI, Eiji KATOH, Minoru WATANABE, Toshihisa KAJIWARA

Department of Orthopaedic Surgery, Showa University Fujigaoka Hospital, Yokohama (JAPAN)

Preservation of joint of femoral head necrosis with extensive lesion and apparent collapse in young adults and adolescents are generally thought to be difficult. The advantages of posterior rotational osteotomy are; The posterior column artery is shifted medially without vascular damage, thus, high degree posterior rotation is possible. The necrotic area is transferred to the postero-medial non-weight bearing portion. Postoperative uncollapsed anterior viable areas are moved to the loaded portion below the acetabular roof in flexed positions. After posterior rotation, congruency can be expected in a flexed position of daily life. 85 hips of 66 young adults (less than 50 years old) with extensive necrosis treated by posterior rotational osteotomy were reviewed with more than 5 year follow up with a mean of 9 years. 13 hips of 12 adolescents with extensive necrosis with apparent collapse treated by posterior rotational osteotomy were also reviewed with a mean of 6.5 years. All hips had extensive lesion on loaded portion preoperatively. Necrotic lesions were extended anteriorly to posteriorly. The mean age was 31 years (18-49) in adults and was 14 years in adolescents. 59 hips were non-traumatic, and 26 were traumatic in adults, 6 were followed SCFE, 3 were traumatic, 3 were after steroids treatment, 1 was Perthes' disease in adolescents. A mean degree of posterior rotation was 121. Recollapse was prevented in 77 hips (91%) of adults, and 13 hips of adolescents on final AP radiographs. Progressive joint narrowing was found in 16 hips of adults. Resphericity of the postoperative transferred medial collapsed femoral head on final AP radiographs was observed on 52 of 58 hips with collapsed area moved medially in adults, and on 10 hips of adolescents. This operation appeared to be effective for remodeling and in delaying the progression of degeneration in young patients with extensive lesions.

Date: 2010-08-31

Session: Symposium - Joint Preserving Operations & Osteotomies for Adult Hip Diseases

Time: 13:30-15:00

Room: Congress Hall

Abstract number: 26843

CURVED INTERTROCHANTERIC VARUS OSTEOTOMY FOR NON-TRAUMATIC OSTEONECROSIS OF THE FEMORAL HEAD

Yukiharu HASEGAWA, Taisuke SEKI

Department of Orthopaedic Surgery, Nagoya University Graduate School of Medicine, Nagoya city (JAPAN)

The purpose of this study is to investigate the clinical and radiographic outcomes of curved intertrochanteric varus osteotomy (CIVO) for non-traumatic osteonecrosis of the femoral head (ONFH) in cases with longer than a 5-year follow-up. A total of 64 patients with 67 hips were investigated. The average age was 39.2 years. The mean postoperative period was 8.3 years (5 to 18). Disease classification of the Japanese Investigation Committee: 5 hips were of Type B, 51 hips were of Type C1, and 11 hips were of Type C2. With regard to the staging: 25 hips were Stage 2, 29 hips were Stage 3A, 10 hips were Stage 3B, and 3 hips were in Stage 4. The indications of CIVO were for cases in which the weight bearing area was classified as Type B upon maximum abduction in image findings from AP radiographs of the hip joint. The mean Harris hip score improved from 69.7 points before surgery and to 85.6 points at final follow-up. The mean varus angulation was 27.1 degrees. The intact ratio was 14.4% before surgery, improving to 45.8% following surgery. Conversion to THA was performed for 4 hips. Collapse had progressed in 11 hips from the preoperative stage. A Kaplan-Meier survivorship analysis showed a 10-year postoperative survivorship of 95.5%, with the end point defined as conversion to THA. With the end point defined as the progression of collapse, the 10-year postoperative survivorship was 80.1%. If the postoperative intact ratio was 35% or higher, a progression of collapse was not significantly observed ($p=0.017$). When 1/3 of the outer part of the femoral head remains intact upon maximum abduction based on the image findings from AP radiographs of the hip joint, then good postoperative results can be expected.

Date: 2010-08-31

Session: Symposium - Joint Preserving Operations & Osteotomies for Adult Hip Diseases

Time: 13:30-15:00

Room: Congress Hall

Abstract number: 26858

TRANSPPOSITION OSTEOTOMY OF THE ACETABULUM FOR THE HIP OSTEOARTHRITIS DUE TO THE ACETABULAR DYSPLASIA

Seiya JINGUSHI

Kyushu Rosai Hospital of Japan Labour Health and Welfare Organization, Kitakyushu (JAPAN)

The patients with hip osteoarthritis in Japan are unique in comparison to those in Caucasians. Most patients are assessed to have acetabular dysplasia as the etiology; the patient distribution thus peaks for middle-aged patients and not elderly patients (1). Poor coverage of the femoral head causes supero-lateral subluxation followed by incongruity and instability of the joint. This causes abnormal shear stress or high pressure on the weight-bearing articular cartilage, and osteoarthritic changes occur. The disease will deteriorate unless such a biomechanical abnormality is corrected. Transposition osteotomy of the acetabulum (TOA), which has been developed by Nishio in 1955 (2), is the first periacetabular osteotomy to be performed in which the acetabulum is transposed with articular cartilage. TOA improves the coverage of the femoral head and restores congruity and stability of the joint to enable improvement of symptoms and prevention of osteoarthritis deterioration. Additionally, this osteotomy causes regeneration of the injured articular cartilage. TOA is a promising treatment option for osteoarthritis hips even at an advanced stage when preoperative radiographs at abduction of the hip show good congruity or containment of the joint (3). References: 1. Jingushi S, et al.: A Multi-institutional Epidemiologic Study Regarding Osteoarthritis of the Hip in Japan. *J Orthop Sci* 2010 (in print). 2. Nishio A. Transposition osteotomy of the acetabulum for the treatment of congenital dislocation of the hip. *Nippon Seikeigekagakkai Zasshi* 1956; 30:482-4 (in Japanese). 3. Matsuo A, Jingushi S, et al.: Transposition Osteotomy of the Acetabulum for Advanced Stage Osteoarthritis of the Hips. *J Orthop Sci* 2009; 14:266-273

Date: 2010-08-31

Session: Symposium - Joint Preserving Operations & Osteotomies for Adult Hip Diseases

Time: 13:30-15:00

Room: Congress Hall

Abstract number: 26814

LONG-TERM OUTCOME OF ROTATIONAL ACETABULAR OSTEOTOMY: 88 HIPs FOLLOWED FOR 15-22 YEARS

Yuji YASUNAGA¹, Mitsuo OCHI²

¹*Department of Artificial Joints & Biomaterials, Hiroshima Univ., Hiroshima (JAPAN),*

²*Department of Orthopaedic Surgery, Hiroshima Univ., Hiroshima (JAPAN)*

BACKGROUND: Satisfactory intermediate and long-term results of periacetabular osteotomy for the treatment of early osteoarthritis secondary to developmental dysplasia of the hip have been reported. The purpose of this study was to examine the long-term results of rotational acetabular osteotomy (RAO) in patients with pre- or early-stage osteoarthritis secondary to developmental dysplasia of the hip. **METHODS:** We performed a retrospective review of the results of RAO in eighty patients (eighty-eight hips). All of the patients had radiographic evidence of pre- or early-stage osteoarthritis according to the staging system of the Japanese Orthopaedic Association. Seventy-three patients were female, and seven were male. The mean age was 35 (13-58) years at the time of surgery, and the mean duration of follow-up was 17.5 (15-22) years. Clinical follow-up was performed with use of the system of Merle d'Aubigné and Postel. The center-edge angle, acetabular roof angle, and head lateralization index were measured on radiographs made preoperatively and postoperatively. Postoperative joint congruency was classified into four grades. **RESULTS:** The mean preoperative Merle d'Aubigné clinical score was 14.3 points, which improved to a mean of 16.2 points at the time of the latest follow-up ($p < 0.0001$). The mean center-edge angle improved from -0.4 degrees preoperatively to 34 degrees ($p < 0.0001$), the mean acetabular roof angle improved from 29 degrees to 2.0 degrees ($p < 0.0001$), the mean head lateralization index improved from 0.65 to 0.60 ($p < 0.01$). Thirteen hips had radiographic evidence of progression of osteoarthritis. Kaplan-Meier survivorship analysis, with radiographic signs of progression of osteoarthritis as the end point, predicted a twenty-year survival rate of 78.0%. **CONCLUSIONS:** The long-term outcome of RAO was satisfactory for a dysplastic hip with pre- or early-stage osteoarthritis.

Date: 2010-08-31
Session: Shoulder / Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 26530

BONY BANKART IS A POSITIVE PREDICTIVE FACTOR AFTER PRIMARY SHOULDER DISLOCATION

Björn SALOMONSSON, Anders VON HEIJNE, Mats DAHLBORN, Hassan ABBASZADEGAN, Susanne AHLSTRÖM, Nils DALÉN, Ulf LILLKRONA
Karolinska Institutet, Stockholm (SWEDEN)

Introduction: It would be a great advantage if it were possible to categorise the patients with first time dislocations to an initial treatment with the most beneficial outcome. MRI could be a useful method for finding lesions after shoulder dislocation. Patients and Methods: Fifty-eight patients with traumatic anterior shoulder dislocation were treated by closed reduction and were examined by MRI after a maximum of 2 weeks. The hemarthrosis or effusion present in the joint after the primary dislocation could be used as a contrast for arthrography to identify the lesions present on MRI. Results: At follow-up more than 8 years later, the MRI findings were compared to the shoulder function, shoulder stability, Rowe score and Western Ontario Shoulder instability Index (WOSI). Besides the age of the patient being above 30, the MRI findings analyzed showed that an isolated fracture of the major tubercle, as well as a bony Bankart lesion are prognostic factors for a good functional result and a stable shoulder after a primary dislocation. The glenoid rim fracture was only detected on plain radiographs in 6 out of 10 findings on MRI. Discussion: MRI findings of a glenoid rim fracture, equal to a bony Bankart lesion, were found to be a prognostic factor for stability and a good functional outcome. This could influence the treatment at the time of the primary dislocation when choosing between between a conservative or active treatment by surgery or immobilisation in external rotation.

Date: 2010-08-31
Session: Shoulder / Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 23092

REHABILITATION OF PATIENTS WITH LOWER EXTREMITIES BONE NON-UNION AND DEFECTS

Guseynali ISMAYLOV
Milad Hospital, Tehran (IRAN)

Introduction: Nowadays one of the most complicating Orthopaedic problems is a patient with lower extremities bone defect and pseudoarthroses. Various surgical methods which done by different bone auto transplantation, artificial materials and application of splits not only may cause negative results but also may conduct to a limb amputation. Material and Methods: Four hundred and eight patients (521 lower extremities) with different etiology have operated since 1996. There was osteomyelitis in 68.4% of them. Ninety percent of above cases had been operated from 2 to 67 times with classic methods we should say some surgeons had used external instruments. All efforts that had been done not only could not solve the problem but also created complications such as hypertrophic scar, paralysis, arteries failure, arthricular disorders, deformity and shortening of leg. For 94 cases amputation had been advised. In 26.7% patients both tibia and femur were involved. Ilizarov instruments made it possible to treat patients in both open and closed surgical ways. Results: According to patient's declaration and our assessment the results were excellent from both Clinical and radiological points of view. The good rehabilitation program during the Ilizarov method treatment may be the main reason for this excellent result. At the same time along with the main problem other accompanying disorders were corrected too. Conclusion: Compression distraction Osteosynthesis by Ilizarov method treated most patients, preserving full function of their lower extremities.

Date: 2010-08-31
Session: Shoulder / Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 26588

THE MORPHOLOGY OF HILL-SACHS LESIONS IN RELATION TO SOFT TISSUE AND BONY BANKART LESIONS ON MRI ARTHROGRAPHY

Nnamdi OBI¹, Rouin AMIRFEYZ¹, Rebecca GRIGGS¹, Partha SARANGI¹, Charles WAKELEY¹, Alan DUNKLEY²

¹*Bristol Royal Infirmary, Bristol (UNITED KINGDOM)*, ²*Taunton & Somerset NHS Trust, Taunton (UNITED KINGDOM)*

Objective: Observational multi-centre study to determine the morphology of Hill-Sachs lesions and their relationship to soft tissue and bony Bankart lesions on MRI Arthrography. Methods: 260 Shoulder MRI Arthrograms at 2 hospitals over a period of 3 years were reviewed on the Picture Archiving and Communications System (PACS). 17 MRI Arthrograms were excluded due to previous stabilisation surgery, failed study or glenoid hypoplasia. A control group of 60 Shoulder MRIs was also reviewed. 12 were excluded due to recent fracture, history of instability or instability surgery, presence of Bankart lesion, and loss to follow-up. Hill-Sachs lesions were identified and characterized by appearance as flat or notched. Soft and Bony Bankart lesions were recorded. Results: There is a significant difference ($p=0.0014$) between bony and soft tissue Bankart lesions in relation to the morphology of Hill-Sachs (i.e. flat vs. notched) with an odds ratio of 8.67 where bony Bankart is more likely to be associated with a flat Hill-Sachs (C.I. 2.12 - 35.36). Conclusion: To our knowledge this study is the first to assess the shape of Hill-Sachs lesion and its relevance with regards to the Bankart's. A flat Hill-Sachs increases the likelihood of anterior glenoid defect and may imply the necessity of open surgical approach with application of a bone block to decrease the rate of recurrence

Date: 2010-08-31
Session: Shoulder / Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 25697

REVISITING THE UK SHOULDER SURGEON'S APPROACH TO TRAUMATIC, ANTERIOR SHOULDER DISLOCATION IN THE YOUNG PATIENT

Akshay MALHOTRA, Matthew FREUDMANN, Stuart HAY

The Robert Jones and Agnes Hunt Orthopaedic Hospital, Oswestry (UNITED KINGDOM)

Aims: To discover how the management of traumatic anterior shoulder dislocation in the young patient (17-25) has changed, if at all, over the past six years. **Methods:** The same postal questionnaire was sent in 2003 and 2009 to 164 shoulder surgeons. **Summary of Results:** Response rate - 92% (2009), 83% (2003): The most likely management of a young traumatic shoulder dislocation: Reduction under sedation in A&E by A&E doctor (80%). Check x-ray (80%) followed by immobilisation for 3 weeks, and then physiotherapy (82%). 68 % consider stabilisation surgery for first time dislocators (especially professional sportsmen) compared to 35% (2003). Out of them nearly 90% perform an arthroscopic stabilization vs. 57.5% (2003). For recurrent dislocators: 75% consider stabilisation after a second dislocation. 85% investigate prior to surgery, choice of investigation being MR arthrogram (52%), compared to 50% (2003). 77% perform arthroscopic stabilisation vs. 18% (2003), commonest procedure-arthroscopic Bankart repair using biodegradable bone anchors (62% 2009 vs. 27% in 2003). Immobilisation for 3 weeks, full range of motion 1-2 months and return to contact sports 6 - 12 months. **Conclusions:** There has been a remarkable change in practice compared to previous survey. A significant proportion of Orthopaedic Surgeons would consider stabilisation in young first time dislocators. Arthroscopic stabilisation is the preferred technique compared to open stabilisation whenever possible. Surgeons are using more investigations prior to listing the patient for surgery namely the MR arthrogram. There is an increased use of bio-degradable anchors as compared to metallic bone anchors in 2003.

Date: 2010-08-31
Session: Shoulder / Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 22984

A LONG TERM FOLLOW UP OUTCOME AFTER ARTHROSCOPIC ROTATOR CUFF REPAIR

Umesh NAGARE¹, W.A. NIEZYWINSKI²

¹*Brighton & Sussex University Hospitals NHS Trust, Brighton (UNITED KINGDOM),*

²*Grantham Hospital, Grantham (UNITED KINGDOM)*

PURPOSE: To follow long term outcome results of patients who underwent rotator cuff repair using all arthroscopic repair techniques. **TYPE OF STUDY:** Retrospective comparative study. **METHODS:** We retrospectively reviewed 80 patients who underwent arthroscopic rotator cuff repair. Follow-up averaged 23 months (range, 3 to 43 months). Surgery is carried out under combination of general anesthesia and an interscalene brachial plexus block, in a supine beach chair position, with traction applied to the axis of the limb abducted at 40 degrees. Standard arthroscopic portals are used. We use the standard single-row technique with re-insertion at the original site. The outcome for the patients was evaluated using the UCLA shoulder rating system, DASH and SST (simple shoulder test). After surgery the limb is immobilized in a shoulder polysling for 6 weeks during which, in accordance with the strength of re-attachment, passive exercise is carried out. Rehabilitation therapy should continue for 6 months at least. **RESULTS:** All patients were fully evaluated. The average post-operative UCLA score was 33.74 points, DASH score was 12.44 points and SST score was 9.28 points. In addition to rotator cuff repair, we performed acromioplasty (28) and acromioclavicular joint resection (2). In two patients we recorded superficial wound infection. They were completely treated. All patients were satisfied with the treatment outcome and expressed willingness to undergo the surgery again, if needed. **CONCLUSIONS:** This study confirms that long-term results for arthroscopic rotator cuff repair are good to excellent and supports continued use of arthroscopic repair techniques.

Date: 2010-08-31
Session: Shoulder / Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 23579

ARTHROSCOPIC REMOVAL OF CALCIUM DEPOSIT IN SHOULDER

Kayvan NOJOOMI

Dubai Health Authority, Dubai (UNITED ARAB EMIRATES)

Aim: To evaluate the result of arthroscopic calcium deposit removal in patients with calcified tendinitis. **Materials and methods:** 13 shoulders (8 right and 5 left) in 12 patients (7 women and 5 men) with shoulder calcific tendinitis due to calcium deposit underwent arthroscopic removal surgery. The preoperative diagnosis was based on the symptoms and physical examination, X-Ray and MRI. Their mean age was 48 years (range 26-75 years), and the average follow-up was 32.3 months (range 6-60 months). No physiotherapy was done for the patients before surgery. 4 patients had the problem in both shoulder. In 1 case operation done bilaterally, in 2 cases observation and in 1 case sub-acromial Depomedrol injection was performed. One patient had rotator cuff tear along with calcium deposit. One patient developed iatrogenic cuff tear in time of removal. **Results:** The Constant and Murley Score improved by a mean of 35 points, from a mean of 34 points (range 21-54) preoperatively to a mean of 87 points (range 53-100) at the time of follow-up. 75% of the patients were satisfied with the procedure. **Conclusion:** Calcified tendinitis is a condition that causes the formation of a small, calcium deposit within the tendons of the rotator cuff. One of the treatments is arthroscopic removal of calcium deposit. Our results suggest that arthroscopic removal of calcium deposit is an excellent treatment for symptomatic patients. Factors that may lead to a negative outcome are size of the lesion, Patients' symptoms, and tendon attenuation after surgery.

Date: 2010-08-31
Session: Shoulder / Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 22983

FUNCTIONAL & CLINICAL OUTCOME AFTER SURGICAL REPAIR OF FULL-THICKNESS ROTATOR CUFF TEAR USING A MINI-OPEN TECHNIQUE

Umesh NAGARE, Mohammad MAQSOOD

Lincoln County Hospital, Lincoln (UNITED KINGDOM)

The mini-open repair was carried out from October 2002 through July 2007 in 56 patients for all types of rotator cuff tears, except massive tears. A total of 56 consecutive patients treated by a single surgeon with mini-open cuff repair. A transacromial skin incision about 3 cm long was made. The rotator cuff tear was repaired. All patients were evaluated at a minimum 12 months postoperatively (mean, 18 months). Patients were evaluated at follow-up with a focused shoulder examination, the disabilities of arm, shoulder and hand score, Oxford shoulder score, Simple shoulder test and the University of California Los Angeles Shoulder Scale. There were 25 male and 31 female patients, with a mean age of 56 years (range, 12-82 years). All patients failed a preoperative course of physical therapy and nonoperative management. The mean UCLA Shoulder Rating Scale for all groups was 33.6/35. Mean SST Shoulder Questionnaire at follow-up was 91%. Mean OSS was 16.2. Mean DASH score was 28. The mean time from surgery to full recovery was 7 months. Patient's subjective satisfaction based on their preinjury level of performance at most recent follow-up was 92.6%. In the open procedure we prefer the mini-open deltoid splitting technique, because it does not require detachment of the deltoid from the acromion. Active forward flexion was significantly greater compare to preoperative flexion on 3 and 6 months after surgery. With mini-open repair, patients seem to be able to return to sports or social activities earlier.

Date: 2010-08-31
Session: Shoulder / Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 26257

BROKEN SHOULDER PROBE DURING ARTHROSCOPIC SUB-ACROMIAL DECOMPRESSION – REPORT & TECHNICAL TIP

Atanu BHATTACHARJEE, A. YEWLETT, R. KULKARNI
Royal Gwent Hospital, Newport (UNITED KINGDOM)

Background: Instrument breakage during shoulder arthroscopy is a rare complication; we report a case of a shoulder probe breakage during arthroscopic sub-acromial decompression and subsequent migration to axillary pouch. Case Report: A 47- year old man underwent shoulder arthroscopy for a subacromial decompression and removal of calcific deposits from his right shoulder for impingement. He was in beach chair position for shoulder arthroscopy; a Wolf Hook probe© was used to define the calcific deposit. The 5 millimetre probe broke during the procedure and migrated into axillary pouch of the gleno-humeral joint. Irrigation fluid was immediately stopped and toothed arthroscopic grabbing instruments failed to ensure sustained grip to recover the probe because of its circular shape. Direct axillary pressure to displace retained fragment from the axillary pouch failed. Finally the patient's position was changed from beach chair to head down without stopping irrigation fluid. This dislodged the broken probe to the gleno-humeral joint and was successfully recovered with conventional arthroscopic graspers. Discussion: Standard techniques of arthroscopic retrieval are often inadequate during recovery of broken instruments from shoulder joint. Change in position of patient from beach chair to head - down without switching off the irrigation fluid can be used as manoeuvre to aid retrieval. This is important in cases when the broken instrument gets lodged in/near inaccessible inferior part of a relatively stable shoulder joint.

Date: 2010-08-31
Session: Shoulder / Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 25597

LATERAL EPICONDYLITIS OF THE ELBOW – ARE PLATELETS THE ANSWER?

Rahul KAKKAR, Malcolm SCOTT

Northern Deanery, Newcastle (UNITED KINGDOM)

Elbow epicondylar tendinosis is a common problem and an increased trend has emerged in the use of autologous blood products. Platelets release many bioactive proteins responsible for removal of necrotic tissue and enhance tissue regeneration and healing. Based on this principle platelets are introduced to stimulate a supra-physiologic release of growth factors in an attempt to jump start healing in chronic conditions like lateral epicondylitis. 30 patients met the study criteria and were surgical candidates who had failed conservative treatments. All were treated with one Platelet Rich Plasma (GPS III) injection according to manufactures instructions and their scores evaluated pre and post injection by a Quick DASH score as this has recently been validated as a satisfactory measure of outcome in upper limb disorders. The average preinjection quick DASH score was 80. 18 patients (60%) noted improvement according to Quick DASH scores (13.50) at 8 weeks, 21 patients (70%) at 6 months, and 20 (68%) at final follow-up at 12months. These results were statistically significant ($p < 0.05$) for an improvement in outcome. There were minor adverse effects or complications in 3 patients. These results compare favorably with other treatments including surgery for lateral epicondylitis. We believe that Platelet rich Plasma (PRP) injection is certainly is a useful addition to the orthopaedic surgeons' armamentarium. Even if it does not permanently cure lateral epicondylitis it can certainly provide the patient with quality time for the time its effect lasts.

Date: 2010-08-31

Session: Arthroplasty Hip - Acetabular Components

Time: 15:30-17:00

Room: H1

Abstract number: 26834

POLYETHYLENE, CURRENT CLINICAL RESULTS AND FUTURE POTENTIAL

Henrik MALCHAU, Charles BRAGDON

Mass General Hospital, Boston (UNITED STATES)

Highly cross-linked polyethylene is used in total hip arthroplasty to address particle induced periprosthetic osteolysis. Manufacturers have marketed several formulations involving varying doses of ionizing radiation to form cross links to resist wear. Also, methods of annealing, elimination of free radicals by melting or stabilization with additives like vitamin E or Irgonox to prevent long-term oxidative changes to the material, have been developed. These processes affect the wear rates of the material, its mechanical properties, and long-term oxidative stability. Clinical studies at several institutions have been initiated to document the performance of cross-linked polyethylenes. Analysis of retrieved components gives insights into the materials clinical performance and chemical stability. All formulations of highly cross-linked polyethylene have shown reduced wear in the first 5 years of use. Retrieval analysis has shown that annealed polyethylene can oxidize in vivo sometimes faster than in conventional polyethylene. In re-melted polyethylene, no oxidation can be detected in freshly explanted components, but exposure to air begins oxidation ex vivo. An RSA report from Sweden suggests a probable change in femoral head penetration rate after 5 years. To investigate this, we instituted a multi-center radiographic study using the Martell Hip Analysis Suite software. With over 200 patients analyzed, we have not been able to demonstrate any significant difference in the femoral head penetration rate between the early period (up to 5 years), or the late period (5-10 years). The latest formulation of highly cross-linked polyethylene involves the infusion of vitamin E into the cross-linked polyethylene in order to stabilize rather than eliminate the residual free radicals. This allows closer retention of mechanical properties while providing resistance to oxidation. Our institution has initiated a clinical RSA study of this material. Early results indicate significantly less polyethylene creep than is reported for conventional or other formulations of highly cross-linked polyethylene.

Date: 2010-08-31

Session: Arthroplasty Hip - Acetabular Components

Time: 15:30-17:00

Room: H1

Abstract number: 24070

RSA EVALUATION OF WEAR OF VITAMIN E STABILIZED HIGHLY CROSS-LINKED POLYETHYLENE

Henrik MALCHAU, Charles BRAGDON, Meridith GREENE, Harry RUBASH, Andrew FREIBERG

Massachusetts General Hospital, Boston (UNITED STATES)

Introduction: Vitamin E doped highly cross-linked polyethylene is a low wear bearing with improved mechanical properties. This study evaluates the in vivo wear properties of this new material using Radiostereometric analysis (RSA). Methods: 50 patients will be recruited into a 5 year RSA study. Tantalum beads were placed into the pelvic bone, femur, and the vitamin E doped polyethylene liner at surgery. RSA radiographs are scheduled immediately postoperatively, 6 months, 1, 2, 3, and 5 years post-operatively. Results: Currently, 22 patients have been followed for 6 months, 16 for 1 year, and 1 at 2 years. The median superior femoral head penetration at 6 months was 0.01 ± 0.01 mm and at 1 year it was 0.03 ± 0.02 mm. The median acetabular cup migration in the proximal direction was 0.14 ± 0.03 mm at 6 months and at 1 year it was 0.08 ± 0.4 mm. The median femoral stem subsidence was 0.16 ± 0.43 mm at 6 months and at 1 year it was 0.13 ± 0.62 mm. Conclusion: The early femoral head penetration and component stability with the new bearing material are excellent. The small amount of penetration is likely due to creep of the material which is low relative to reports of other forms of polyethylene. Three stems which had substantial subsidence were viewed radiographically to be undersized and may represent a learning curve in the use of this femoral stem system. So far, one has stabilized at 1 year.

Date: 2010-08-31

Session: Arthroplasty Hip - Acetabular Components

Time: 15:30-17:00

Room: H1

Abstract number: 26778

ACETABULAR CUP WITH PRE ASSEMBLED CERAMIC LINER. A PROGRESS TO AVOID CERAMIC LINER BREAKAGE

David DAGRENAT¹, N. MONCADE¹, T. GRADEL², L. DEVUN²

¹*Clinique de l'Orangerie, Strasbourg (FRANCE)*, ²*TURAL, Marignier (FRANCE)*

Ceramic-ceramic bearing in total hip arthroplasty is reliable and recommended for active young patients. In order to limit dislocation the femoral head diameter was increased. To obtain a 36mm head in a 50mm cup, metal-back and ceramic liner thicknesses were reduced thanks to an improvement in ceramic mechanical properties. A new risk of ceramic liner breakage [1] appeared: - The thickness reduction leads to metal-back deformation during impaction: the ceramic liner can be malseated[2], the contact is not a surface but points, inducing local overstresses, leading to ceramic fatigue breakage. - The diameter increase allows higher hip range of motion, introducing risks of impingement between stem and ceramic edge which can result in liner breakage. A new solution concept is proposed: - A press-fit cup with a preassembled ceramic liner, eliminates the liner malseating risk, increases the cup rigidity, and reduces risks of metal-back deformation. - The metal-back presents a rim to prevent any contact between stem and ceramic. A series of 157 acetabular preassembled cups is presented, with 15 to 32 months follow-up: - no ceramic liner breakage, neither dislocation, nor revision, - optimal implant positioning in 97% of patients, - one transient squeaking, - five patients complained after hard activities of groin pain, attributed to psoas conflict. These results are very encouraging, moreover this implant and its quick and simple technique are secure. Long-term results must confirm this evaluation. [1] Fracture-dissociation of Ceramic Liner, Orthopaedics2008 [2] Incidence of Ceramic Liner Malseating in Trident Acetabular Shell, ClinOrthopRelatRes2009

Date: 2010-08-31

Session: Arthroplasty Hip - Acetabular Components

Time: 15:30-17:00

Room: H1

Abstract number: 25562

INFLUENCE OF IMPACTING CERAMIC INSERTS ON PROPER SEATING IN ACETABULAR CUPS FOR HIP IMPLANTS

Thomas PANDORF, Roman PREUSS

CeramTec AG, Plochingen (GERMANY)

The advantage of a modular system is that the surgeon is able to choose the metal cup and insert to adapt the implant system to the individual needs of a patient. Beside the benefits, the surgeon needs to take care of specific requirements, e.g. to apply a slight axial tap using a plastic impactor onto the insert to assure a secure connection. To investigate the importance of this impaction, metal cups embedded in a cast resin have been used in an appropriate adhesion test setup. Ceramic inserts were assembled with the cups by applying three different methods: a. three inserts pressed-in manually; b. three inserts statically pressed-in by use of a 10 kg weight (100 N); c. three inserts impacted manually with a slight axial tap. To apply appropriate adhesion forces, a ball head (diameter 36 mm) is set into the insert calotte which is wetted with 3 ml of a 25% Di-H₂O-new born calf serum solution. It was found that the taper connection of each insert pressed-in manually or pressed-in statically by a mass of 10 kg failed, the inserts were pulled out of their appropriate metal cups. The impaction forces generated by a slight tap have been evaluated as being sufficient so that the ceramic inserts remained in their metal cups. The results show that manual pressing-in of inserts does not lead to sufficient connection strength. Only a slight axial tap using a plastic impactor after inserting the ceramic insert yields sufficient locking strength of the parts.

Date: 2010-08-31

Session: Arthroplasty Hip - Acetabular Components

Time: 15:30-17:00

Room: H1

Abstract number: 23694

REVIEW OF CERAMIC-CERAMIC BEARINGS IN HYDROXYAPATITE CERAMIC COATED HIP IMPLANTS: A CLINICAL AND RADIOLOGICAL EVALUATION WITH UP TO EIGHTEEN YEAR FOLLOW-UP

James BUCHANAN, David FLETCHER, Peter LINSLEY

Sunderland Royal Hospital, Newcastle upon Tyne (UNITED KINGDOM)

Will Hydroxyapatite hip (HA) arthroplasty associated with ceramic bearings produce uncomplicated function in younger, active patients? The incidence of aseptic loosening, dislocation and broken implants has been particularly investigated. Debris disease from plastic debris contributes to aseptic loosening. Hard-Hard bearings should obviate this problem. Metal-metal will release ions which might be deleterious. Ceramic bearings may fracture but otherwise appear free of complications. This is a study extending over 18 years of 634 HA hip arthroplasties with ceramic bearings. Annual review using Harris Hip Score to assess pain and function and X-rays to check osseointegration has been performed. Alumina ceramic was inserted in 467 hips. The newer Zirconia Toughened Alumina (ZTA) has been inserted in 165 hips. There are 169 hips still under review at 10 or more years. Aseptic loosening is unusual (one stem, two acetabulae (3 of 1268 components, 0.24%) Failure from mal-orientation with repeated dislocation occurred in six hips (0.95%). Three alumina heads (0.47%) and two alumina liners (0.32%) broke. There has been no failure of ZTA ceramic. No patients have thigh pain. Osteolysis and debris disease have not arisen. Harris Hip Scores show 88.6% scoring over 90 or 100. Lower scores mostly relate to other joint and medical problems. Assessments confirm that patients remain well. Aseptic loosening of HA hips is rare at 0.24%. Failure from broken alumina components is unusual. Alumina has now been superseded by ZTA for implantation. Ceramic on ceramic is a reliable selection for bearing surfaces.

Date: 2010-08-31

Session: Arthroplasty Hip - Acetabular Components

Time: 15:30-17:00

Room: H1

Abstract number: 24073

A MULTI-CENTER STUDY OF THE MID-TERM FOLLOW-UP RESULTS OF HIGHLY CROSS-LINKED POLYETHYLENE THR COMPONENTS

Henrik MALCHAU¹, Charles BRAGDON¹, John MARTELL², John CLOHISY³, Richard WHITE⁴, Victor GOLDBERG⁵, Craig DELLA VALLE⁶, Daniel BERRY⁷, Bryan JARRETT¹, William HARRIS¹

¹Massachusetts General Hospital, Boston (UNITED STATES), ²University of Chicago Medical Center, Chicago (UNITED STATES), ³Washington University, St. Louis (UNITED STATES), ⁴New Mexico Institution for Joint medicine, Albuquerque (UNITED STATES), ⁵Case Western Reserve University, Cleveland, (UNITED STATES), ⁶Rush University Medical Center, Chicago (UNITED STATES), ⁷Mayo Medical School, Rochester (UNITED STATES)

Introduction: THR using highly cross-linked polyethylene show excellent clinical outcomes, low wear, and minimal lysis at 5 years. However, recent RSA study found that after no detectable wear during years 1-5, a significant increase in penetration occurred between 5 and 7 years. A multi-center study involving U.S. centers has been created to determine whether the RSA observation can be confirmed in a larger study. Methods: Six academic centers contributed patients implanted with Longevity THR liners with a minimum of four radiographs: 1; 2-4.5; 4.5-5.5; and 5.5-9 years. The Hip Analysis Suite™ was used for wear analysis. Linear regressions were computed for the early period (1-5.5 years) and the late period (5.5-9 years). Individual patient's early and late regressions were computed. Results of 165 of 200 hips under analysis are presented. The early period's regression slope (4.9µm/yr, 95%CI: -28µm/yr to 38µm/yr) was not significantly different from the late period's (10.8 µm/yr, 95%CI: -58µm/yr to 80µm/yr) (Zar test p=0.886). Individual regressions showed a trend towards larger penetration rates in the late time period but with no significant difference (paired t-test: p=0.371, Mann-Whitney: p=0.491). Conclusions: Neither the group nor individual analyses showed a significant difference between the penetration rates between the early and late periods. We do not observe the increase in penetration seen in the RSA study after 5 years.

Date: 2010-08-31

Session: Arthroplasty Hip - Acetabular Components

Time: 15:30-17:00

Room: H1

Abstract number: 26380

PREVENTION OF IMPINGEMENT IN TOTAL HIP ARTHROPLASTY BY NECK MODULARITY: DOES IT WORK IN PRACTICE?

Damian GRIFFIN

Warwick Medical School, Coventry (UNITED KINGDOM)

Introduction: Wear and dislocation are associated with component malposition and inter-prosthetic impingement. Modular femoral necks may offer the opportunity to optimise version, valgus and length, and thus reduce the risk of impingement. Methods: We performed a pragmatic randomised controlled trial to compare impingement in normal practice. 100 patients were randomised to receive a cementless stem with either a modular neck or a non-modular neck. We developed a novel system of surgical navigation to observe the exact orientation of the implanted components whilst the surgeon performed the operation using his usual, non-navigated, technique. Virtual models of these real patient implantations were created using computer-aided design (CAD) descriptions and the navigation data. The models were then tested for inter-prosthetic impingement by iterative movement and collision detection. The range of impingement-free movement was represented in three-dimensions, and compared with a target range. Results: We successfully used surgical navigation to precisely observe surgery, avoiding the need for post-operative CT or other measurement modalities. Virtual models generated from combinations of CAD and navigation data were animated and found to move in the expected way, and will be demonstrated in this presentation. There were many examples of patients in whom the model exhibited impingement within the normally required range of movement. In those where non-modular necks had been used, virtual replacement with the best choice of modular neck abolished this impingement. Conclusion: This study is an innovative randomised controlled trial. It demonstrates that neck modularity has the potential to reduce inter-prosthetic impingement in normal practice.

Date: 2010-08-31

Session: Arthroplasty Hip - Acetabular Components

Time: 15:30-17:00

Room: H1

Abstract number: 23322

INFLUENCE OF DESIGN- AND MANUFACTURING-RELATED PARAMETERS TO WEAR IN METAL-ON-METAL HIP JOINT REPLACEMENTS

J. Philippe KRETZER, Eike JAKUBOWITZ, Jörn REINDERS, Robert SONNTAG
Laboratory of Biomechanics and Implant Research, University of Heidelberg, Heidelberg (GERMANY)

Metal-on-metal (MoM) bearings have a long history in total hip replacement. Survivorship of early MoM bearings was limited. Nevertheless, many of them lasted over two decades. Improved manufacturing methods have led to the reintroduction of MoM bearings and growing interest in these implants, especially for young and active patients. Many hip simulator wear tests have been conducted during the past years to identify parameters influencing the wear behaviour of MoM bearings. The aim of this meta-analysis is to summarize and compare the results of multiple hip simulator wear studies and identify the parameters related to design- and manufacturing that influence the wear of MoM bearings. A database search for publications on simulator wear studies of MoM bearings was performed. The results of published studies were normalized; groups with individual parameters were defined and analyzed statistically. 56 different investigations studying a total of 200 implants were included in the analysis. Clearance, head size, carbon content, and manufacturing method were analysed as parameters influencing wear of MoM bearings. This comprehensive analysis of hip simulator wear studies supports the following statements regarding design and manufacturing related parameters and their influence on the wear of MoM bearings: 1) For implants with a diameter of 36mm and above, an increase in head size leads to reduced running-in wear. 2) A smaller clearance reduces running-in wear. 3) The manufacturing method does not affect wear. 4) Heat treatment processes increase wear at least during the steady-state wear phase. 5) The influence of alloy carbon content seems unclear.

Date: 2010-08-31

Session: Arthroplasty Hip - Acetabular Components

Time: 15:30-17:00

Room: H1

Abstract number: 23289

**FROM LFA (LOW FRICTION ARTHROPLASTY) TO MOM (METAL ON METAL)
ARE WE ANY BETTER?**

Maher HALAWA¹, Mahmoud ABDEL KARIM²

¹Peninsula Medical School, Plymouth (UNITED KINGDOM), ²Derriford Hospitals, NHS Trust (teaching), Plymouth (UNITED KINGDOM)

This paper compares the results of low friction arthroplasty published by sir J. Charnley 1986 and metal on metal resurfacing of the hip. A personal series of 326 cases of MOM hip replacement were followed up for 7 years. 25 cases were revised at 4-65 months. Excluding 2 fracture neck of femur, one infection and one recurrent dislocation, 21 cases were revised for persistent pain. 2 cases with click, 2 cases with effusion and the rest for unknown reason. The aspirate of the hip shows no bacterial growth and no raised CRP. There was no increase in bone turnover on radioactive bone scan. On exploration thin serous turbid fluid was found with extensive muscle necrosis. The implants were exchanged to ceramic on ceramic bearing surface on cementless stem. This resulted in complete relief of symptoms. Histopathological examination showed infiltration with plasma cells, lymphocytes and eosinophiles with no bacterial growth on culture as described by Willert as ALVAL. This had been compared with the Swedish joint registry by Peter Herberts.

Date: 2010-08-31

Session: Arthroplasty Hip - Acetabular Components

Time: 15:30-17:00

Room: H1

Abstract number: 26503

STABILITY OF UNCEMENTED PRESS FIT CUPS RELATED TO DIFFERENT WEIGHT BEARING REGIMES AFTER SURGERY. A RCT USING RSA IN 32 PATIENTS FOLLOWED FOR 5 YEARS

Olof WOLF, Per MATTSSON, Jan MILBRINK, Sune LARSSON, Hans MALLMIN
Department of Orthopaedics, Uppsala (SWEDEN)

Background and purpose: There is no consensus on the best weight bearing regime after uncemented total hip arthroplasty. Theoretically, bone ingrowth into the implant should benefit from restricted early loading. We investigated whether the degree of postoperative weight bearing influences the stability of press fit acetabular cups. Patients and methods: 32 patients with unilateral osteoarthritis of the hip received a press fit acetabular cup and were randomized to either immediate (I) postoperative weight bearing or to partial (P) weight bearing for 3 months. Compliance to loading during walking was measured with the F Scan system. Implant stability was assessed by radiostereometric analyses (RSA) after surgery and at 1 and 3 months, and 1, 2, and 5 years. Results: Postoperative weight bearing did not influence the translation of the cup. At 1 month, 2 and 5 years there was a difference in inclination of the cups between the groups. At 5 years the inclination of the cups had increased by 1° in the I group, and decreased by 0.7° in the P group. This is just above the precision of the RSA method. Interpretation: There is no clinical relevant difference in stability of the uncemented press fit cups related to weight bearing after surgery. Immediate weight bearing is safe, at least regarding the type of cups evaluated in this study.

Date: 2010-08-31

Session: Arthroplasty Hip - Acetabular Components

Time: 15:30-17:00

Room: H1

Abstract number: 26631

PREVALENCE OF ADVERSE LOCAL TISSUE REACTION IN METAL ON METAL HIP ARTHROPLASTY

Anuj JAISWAL, Karadi Hari SUNIL KUMAR, S. C. BUDITHI, Bernhard TINS, Jan-Herman KUIPER, James B. RICHARDSON

Robert Jones & Agnes Hunt Orthopaedic Hospital, Oswestry (UNITED KINGDOM)

Background: Metal-on-metal (MOM) articulations have rapidly entered clinical practice of hip arthroplasty. Different types of reaction have been termed adverse soft tissue reaction (ALTR). Recent reports have highlighted poor results of revision due to soft tissue necrosis. Comparisons of ALTR in symptomatic and asymptomatic patients have not been reported. Questions/purposes: To assess ALTR in a surgical practice of different types of MOM articulations and analyse effect of risk factors. Patients and Methods: We evaluated a consecutive series of 105 MOM hip arthroplasties in 82 patients. A self-assessed Harris Hip score (HHS) was used to divide patients into Group 1 HHS \geq 70 and Group 2 HHS < 70. Patients had an ultrasound scan (USS) or MRI scan assess soft tissues. Results: Our study observed a 16% prevalence of ALTR around the MOM bearing hip arthroplasty. Prevalence in the Group 1 was 9.5% and in Group 2 was 32%. A total of 5 (16%) hips were revised in group 2 and one (1.3%) in Group 1. Patients with ALTR had significantly lower hip scores. 9.5% patients in Group 1 showed evidence of ALTR. No predictive factors were identified. Conclusions: A significant proportion (9.5%) of ALTR was observed in asymptomatic patients. USS is a cost effective modality to monitor MOM patients and positive findings can be confirmed by MRI scan. Large studies are needed to assess the true prevalence and risk factors associated with ALTR. We advise follow up of all MOM patients with ultrasound scans.

Date: 2010-08-31

Session: Arthroplasty Hip - Acetabular Components

Time: 15:30-17:00

Room: H1

Abstract number: 25721

A PROSPECTIVE OBSERVATIONAL STUDY OF OSTEOARTHRITIS TOTAL HIP REPLACEMENT PATIENTS TREATED WITH AND WITHOUT A METAL SHELL AND A NEW TYPE OF ACETABULAR COMPONENT

Sabine MAI, Burkhard MAI, Werner SIEBERT

Vitos Orthopaedische Klinik Kassel, Kassel (GERMANY)

Prospectively 15 consecutive osteoarthritis total hip patients were treated with a new type of total hip reconstruction (TriboFit® Hip). The acetabular component consisted of a 3 mm soft, pliable polycarbonate-urethane (PCU) polymer that was snap-fit directly into the acetabular bone after minimal reaming of cartilage (6) or into a metal shell (9). The average age was 75 in the no shell group and 72 in the metal shell group. The female/male distribution was 4/2 in the no shell group and 8/1 in the shell group. The left/right distribution was 1/5 in the no shell group and 6/3 in the shell group. Of the 15 total patients, 2 could not be followed--1 patient in the no shell group was unavailable because of a traumatic acetabular fracture shortly after surgery and 1 patient in the shell group died of mesenteric ischemia within a month of surgery. The no shell group average time after surgery is 28 months and the shell group 21 months, giving an average of the two at 24 months. The Harris Hip Score for the no shell group was 54 pre-operatively and 83 at 12 months. In the shell group, the Harris Hip Score was 37 pre-operatively and 89 at 12 months. No patient was revised, became dislocated, or developed an infection. The results to date appear to favor the metal shell group, but a longer term follow-up with more patients is needed.

Date: 2010-08-31
Session: Cartilage
Time: 13:30-15:00
Room: G4

Abstract number: 23805

TREATMENT OF OSTEOARTHRITIS WITH INFRA PATELLAR FAT PAD DERIVED MESENCHYMAL STEM CELLS IN RABBIT

Seifollah DEHGHANI NAZHVANI¹, Abasali GHADERI², Fatemeh Sadat TOGHRAEI³, Ma GHOLIPOOR⁴, Niloofar CHENARI⁵, Simin TORABINEZHAD⁶

¹Department of Veterinary Surgery, Shiraz (IRAN), ²Cancer Research Institute, Shiraz (IRAN), ³School of Veterinary Medicine, Shiraz (IRAN), ⁶Department of Orthopaedics, Shiraz (IRAN)

Scaffold free mesenchymal stem cells obtained from infra patellar fat pad was used in an experimental animal model of Osteoarthritis by direct intra articular injection to observe repair of damaged articular cartilage or to reduce the progression of OA. Mesenchymal stem cells isolated from a 2.8 Kg White New Zealand rabbit. The cells were expanded and grown in vitro. Osteoarthritis was induced in adult rabbits by unilaterally anterior cruciate ligament transection of knee joints. 12 weeks after operation, a single dose of 1 million stem cells suspended in one ml of medium was injected into the injured intra articular space directly. Control group received 1 ml of medium without cells. The knees were examined after sixteen and twenty weeks following the operation. Repairing was monitored radiologically, grossly and histologically using H&E, Safranin-O and Toluidine blue staining. Radiological assessment confirmed development of OA changes after 12 weeks. Rabbits receiving mesenchymal stem cells showed a significantly lower degree of cartilage degeneration, osteophyt formation, and Subchondral sclerosis than control group at 20 week after surgery. The quality of cartilage was significantly better in cell treated group compared with control group after 20 weeks. Infra patellar fat pad derived mesenchymal stem cells could be the promising cell sources for the treatment of OA.

Date: 2010-08-31
Session: Cartilage
Time: 13:30-15:00
Room: G4

Abstract number: 25218

MICROFRACTURE OF THE KNEE: A META-ANALYSIS OF SIXTEEN STUDIES

Lukas L. NEGRIN, Vilmos VÉCSEI

Medical University of Vienna, Department of Trauma Surgery, Vienna (AUSTRIA)

Purpose: As controversial parameters influencing the outcome after microfracturing the knee have been presented by several authors we performed statistical computations to summarize available score values by means of meta-analysis, subgroup analysis and meta-regression. **Methods:** 16 studies (763 patients) which held the necessary information were detected by a comprehensive literature search. We performed regression analysis on the basis of own patients because five clinical scores were used for evaluation in the relevant papers. Furthermore, we reviewed that our results were in line with acknowledged international ones. In consequence of its frequency, the difference of post- and preoperative values of the Lysholm Score was set as effect size. **Results:** A mean treatment effect of 26.48 Lysholm points was calculated ($p < 0.0001$). Of the subgroup analysis, only the study groups with a patient age less respectively more than 35 years on average revealed a significant difference, 19.93 versus 31.70 Lysholm points ($p < 0.0001$) on average. Finally, a multiple regression analysis identified age and etiology as significant determining factors ($p < 0.00001$; $p = 0.0009$). According to an increase of mean patient age by one year the mean treatment effect rose by 1.15 Lysholm points on average. Furthermore, a regression coefficient of 0.21 was calculated between the mean etiology measured in the percentage of trauma evidence and the mean effect size. **Conclusions:** Surprisingly, our statistical findings revealed that microfracture provides higher improvement for older patients, a hypothesis which should be tested by randomized controlled trials.

Date: 2010-08-31
Session: Cartilage
Time: 13:30-15:00
Room: G4

Abstract number: 26542

TREATMENT OF PATELLOFEMORAL ARTICULAR CARTILAGE LESIONS WITH CHONDROCELECT® IN A COMPASSIONATE USE PROGRAMME

Karl Fredrik ALMQVIST¹, Johan VANLAUWE², Daniel SARIS³, Johan BELLEMANS², René VERDONK¹

¹*Dept. Orthopaedic Surgery and Traumatology, Ghent University Hospital, Gent (BELGIUM),* ²*Orthopaedic Surgery, UZ Leuven, Pellenberg (BELGIUM),* ³*AMC Utrecht, Utrecht (NETHERLANDS)*

Introduction: Autologous chondrocyte implantation presents a viable alternative to microfracture in the repair of damaged articular cartilage of the knee; however, outcomes for patellar lesions have been less encouraging. ChondroCelect (CC) is an innovative, advanced cell therapy product consisting of autologous cartilage cells expanded ex vivo through a highly controlled and consistent manufacturing process. Methods: CC was administered to 61 patients with patellar lesions (predominantly secured with a biological membrane; mean lesion size: 3.6 cm²; aged 32.4 years). Efficacy was assessed with validated scales of Clinical Global Impression for Improvement (CGI-I) and Therapeutic Effect (CGI E) and stratified by the postoperative follow-up period (<18 months vs >18 months). Results: CC resulted in therapeutic and clinical improvement in 87% of patients. Long-term follow-up showed a modest shift towards worse CGI-I and CGI-E scores, with the very much improved subgroup (CGI-I) during the first 18 months (38.5%) moderately reduced after 18 months (25.0%); however, the proportion of improved patients remained consistent. The most commonly reported adverse events (knee pain [23%], joint crepitation [13.1%], joint range of motion decreased [13.1%], arthrofibrosis [8.2%] and tendon disorder [8.2%]) were reported at incidences higher than those associated with femoral condyle and trochlea lesions. There were no reports of cartilage hypertrophy. Conclusion: CC was effective in the treatment of patellofemoral lesions, with results comparable to outcomes for femoral condyle and trochlear lesions.

Date: 2010-08-31
Session: Cartilage
Time: 13:30-15:00
Room: G4

Abstract number: 25789

THE COMPARISON OF THE PEDUNCULATED SYNOVIAL GRAFT WITH PERIOSTEAL GRAFT AFTER ARTICULAR CARTILAGE DEFECTS IN THE RABBITS

Ismail TUNCAY, Aytakin KARAMAN, Huseyin DEMIRORS, Rahmi AKGUN, İlhami KURU

Baskent University, Ankara (TURKEY)

The purpose of this experimental study is to compare the repair capacities of pedunculated synovial grafts with commonly used periosteal grafts histopathologically. In our study, we used 32 white rabbits, which were older than 1 year. We divided the rabbits into three groups. In group 1, there were 12 rabbits whose knees were bilaterally transplanted with periosteal grafts. In group 2, there were 12 rabbits whose knees were bilaterally transplanted with pedunculated synovial grafts. In group 3, there were 8 rabbits as the control group with only cartilage defects. At the 6th, 12th and 24th weeks, the rabbits were sacrificed. After sacrifice, all distal femurs were excised from the supracondylar region via the old incision scars. The samples were decalcified by 10% formic acid and embedded into the paraffin. The samples were microtomed into the 4-mm thickness specimens and stained with hematoxylin-eosin, safranin-o-fast green and collagen II stains. The stained specimens were analyzed histologically under microscope and scoring of the cartilage repair was detected by using a standardized grading system. A factorial variance analysis was used to evaluate the results. The results of the cartilage repair were found significantly different between three study groups. In the pedunculated synovial transplant group, the cartilage repair at the 6th, 12th and 24th weeks was all found significantly better than the other two groups ($P < 0.05$). As a conclusion, the pedunculated synovial grafts had a superior effect on cartilage repair compared with periosteal grafts ($P < 0.05$).

Date: 2010-08-31
Session: Cartilage
Time: 13:30-15:00
Room: G4

Abstract number: 25042

PROGENITOR/CELLULAR MIGRATION AND MATRIX INTERACTIONS IN RESPECT TO STEM CELL NICHES WITHIN THE MAMMAL INTERVERTEBRAL DISC REGION. A STUDY IN THREE SPECIES

Helena BRISBY¹, Helena BARRETO HENRIKSSON², Emilia SVALA², Eva SKIÖLDEBRAND², Katarina JUNEVIK², Anders LINDAHL²

¹*Dept of Orthopaedics, Inst. of Clinical Sciences, University of Gothenburg, Gothenburg (SWEDEN),* ²*Dept. of Clinical Chemistry and Transfusion Medicine, Gothenburg (SWEDEN)*

Introduction: Disc degeneration is believed to play a major role in chronic lumbar pain patients. Regeneration processes within the intervertebral disc (IVD) have been sparsely described. Recently, stem cell niches in the IVD region were identified. The present study investigates cell migration routes (MR) of cartilage progenitor cells in the IVD to gain knowledge about disc regeneration patterns. Methods: In vivo labelling with 5-bromo-2-deoxyuridine; BrdU in 18 rabbits, visualized by immunohistochemistry (IHC) after 4 to 56 days provided cell proliferation pattern and slow-cycling cells in the disc. Human degenerated (n=3), normal porcine (n=2) and lapine (n=4) IVD tissue were investigated by IHC for: Growth-and-differentiation-factor-5 (GDF5) (progenitor), Bone-morphogenic-protein-receptor-1B (BMPR1B) (GDF5-receptor), SNAILhomolog-1 (Snai1), SNAILhomolog-2 (SLUG) (migration) and 1-INTEGRIN (cellular adhesion), MMP9 and MMP13 (matrix degradation). Real-time PCR was performed on lapine / human IVD for the same markers. Results: BrdU+ cells were observed at early time points predominantly in the IVD niche, adjacent to the growth plate, at later time points mainly in the outer region of the annulus fibrosus (AF), indicating a gradual migration of cells. All investigated markers were found on protein level in comparable regions. Gene expression of GDF5, BMPR1B, SLUG, SNAI1 and B1-INTEGRIN supporting the results was detected in IVD tissue (lapine, human). Discussion: The results suggest a cellular migration route from the IVD stem cell niche towards the AF and the IVD inner parts. These findings may be of importance for understanding of regenerative and growth mechanisms in IVD and development of biological treatment strategies.

Date: 2010-08-31
Session: Cartilage
Time: 13:30-15:00
Room: G4

Abstract number: 26231

TRANSPLANTATION OF MESENCHYMAL STEM CELLS IN A COMPOSITE SCAFFOLD BASED ON COLLAGEN I WITH CHITOSAN MICRO- AND NANOFIBRES INTO ARTICULAR CARTILAGE DEFECTS

Ladislav PLANKA¹, Robert SRNEC², Jiri KLIMA³, Jana HLUCILOVA³, David STARY¹, Leos KREN¹, Lucie VOJTOVA⁴, Josef JANCAR⁴, Petr GAL¹, Alois NECAS², Michal CRHA⁵, Evzen AMLER⁶

¹*Faculty Hospital Brno, Brno (CZECH REPUBLIC)*, ²*University of Veterinary and Pharmaceutical Sciences Brno, Brno (CZECH REPUBLIC)*, ³*Institute Animal Physiology and Genetics AS CR, Libechov (CZECH REPUBLIC)*, ⁴*Faculty of Chemistry Brno University of Technology, Brno (CZECH REPUBLIC)*, ⁶*Institute of Experimental Medicine, Academy of Sciences of the Czech Republic, Prague (CZECH REPUBLIC)*

The aim of this study was to evaluate the quality of newly formed tissue in iatrogenic defects of femoral condylar articular cartilage in miniature pigs treated with microfractures in comparison with the transplantation of a composite scaffold and mesenchymal stem cells (MSCs), or the composite scaffold without MSCs. The results of histological and immunohistochemical examinations using the modified scoring system according to O'Driscoll were as follows: 14.7 ± 3.82 points after transplantation of the scaffold and MSCs (Group A); 5.3 ± 2.88 points after transplantation of the scaffold without MSCs (Group B); and 5.2 ± 0.64 points after treatment using microfractures (Group C). The O'Driscoll score in Group A was significantly higher than in Group B ($p = 0.0004016$), as well as in Group C ($p=0.0004208$). No significant difference was found in the O'Driscoll score between groups B and C. The treatment of iatrogenic lesions using transplantation of MSCs in the composite scaffold led to the filling of defects by a tissue of the appearance of hyaline cartilage. Lesions treated using implantation of the scaffold without stem cells, or using microfractures, were filled with fibrous cartilage with lower O'Driscoll score. The results were published by authors in *Physiological research*, November 2009 (Epub ahead of print). This work was supported by the Ministry of Education, Youth and Sports of the Czech Republic (NPV II 2B06130) and by the Grant Agency IGA Ministry of Health of the Czech Republic (NS9896-3/2008).

Date: 2010-08-31
Session: Arthroplasty Shoulder / Elbow
Time: 15:30-17:00
Room: F2

Abstract number: 26584

REVERSED SHOULDER ARTHROPLASTY. IT IS WORKING! SHORT TO MEDIUM TERM RESULTS OF 43 ARTHROPLASTIES PERFORMED AT A DISTRICT GENERAL HOSPITAL.

Avadhoot KANTAK, Surendra PATNAIK, Praveen PANOSE, T.P SELVAN
East Surrey Hospital, Redhill (UNITED KINGDOM)

Purpose: The purpose of this study was to evaluate the outcome after reversed shoulder prosthesis in the short to medium term. **Methods:** Between May 2003 and June 2009, 33 women and 10 men aged 53 to 85 (mean, 76) years underwent total shoulder replacement using the Delta III reverse prosthesis. Patient diagnoses were massive rotator cuff tear (n=33), disabling squeal of proximal humeral fractures (n=6), and failure of a hemiarthroplasty or total shoulder arthroplasty (n=4). Clinical and functional results were assessed using the abbreviated Constant scale. Active range of motion (ROM) was measured and radiographs were examined. Patient satisfaction of the treatment was evaluated by a direct interview. **Results:** 43 patients with a minimum follow up of 6 months were followed up for 6 to 76 (mean, 32.4) months. Mean abbreviated constant score pre-operatively was 10 and improved post-operatively to 46. 35 patients (81%) were extremely satisfied, 5 were partially satisfied and 3 unsatisfied. Two patients had late infection, whilst one underwent two stage revision surgeries; the other patient had removal of prosthesis. There were one instances of postoperative dislocation which settled after closed manipulation. Four patients had grade 1 and two patients grade 2 scapular notching but none have had inferior clinical results. Only active elevation improved significantly after surgery, as did their Constant scores. There was minimal restoration of rotations. **Conclusion:** Reversed arthroplasty provides a substantial improvement of shoulder function. The incidence of notching remains a concern.

Date: 2010-08-31
Session: Arthroplasty Shoulder / Elbow
Time: 15:30-17:00
Room: F2

Abstract number: 23837

INADEQUATE INSERTION OF TOTAL ELBOW REPLACEMENTS

Steven BORLAND, Mohan RAO, John FRASER

South Tyneside Hospital, South Shields (UNITED KINGDOM)

Background: Total elbow replacement is a technically demanding procedure, particularly in patients diagnosed with juvenile rheumatoid arthritis (JRA). Results: A 33 year old woman with a history of JRA presented to our clinic some ten years after undergoing a left total elbow replacement. Since the time of surgery her movement was limited, but as her pain was controlled, she had not complained. However she now presented with a protrusion in the left biceps. Through examination and investigation, we found that the humeral component of the implant was protruding through the anterior humeral cortex and biceps muscle. The position of the implant was not conducive to movement. We used a diamond tipped burr to remove the protruding section of implant. After surgery, she noticed both a reduction in the pain and swelling in the arm, but also increased movement at the elbow joint. Conclusions: The technique of total elbow arthroplasty has been well described. It has also been noted that it is often a difficult procedure in those who have been diagnosed with juvenile rheumatoid arthritis as they often have severe osseous atrophy, deformity and soft tissue contractures that need special consideration. Actual insertion of the implant can often be difficult, but care should be taken to avoid situations like this. We believe that in this case the humeral section of the implant was initially inserted roughly and fractured the anterior cortex.

Date: 2010-08-31
Session: Arthroplasty Shoulder / Elbow
Time: 15:30-17:00
Room: F2

Abstract number: 23307

MOTION ANALYSIS OF THE SHOULDER AFTER A REVERSE SHOULDER PROSTHESIS

T.D.W. ALTA¹, J.M.H BERGMANN², T.W.J JANSSEN³, H.E.J VEEGER⁴, B.J BURGER⁵, W.J WILLEMS¹

¹*Onze Lieve Vrouwe Gasthuis, Amsterdam (NETHERLANDS)*, ²*Division of Applied Biomedical Research, King's College London, London (UNITED KINGDOM)*, ³*Duyvensz-Nagel Research Laboratory, Rehabilitation Centre Amsterdam, Amsterdam (NETHERLANDS)*, ⁴*Research Institute MOVE, Faculty of Human Movement Sciences, VU University, Amsterdam (NETHERLANDS)*, ⁵*Medical Centre Alkmaar, Alkmaar (NETHERLANDS)*

INTRODUCTION: Clinical outcomes of reverse shoulder prosthesis are satisfying. However, ROM is often compromised. Aim of this study: investigate how the reverse prosthesis contributes to movements of the arm and determine if patients can utilize it fully. **METHODS:** Motion patterns of 31 patients (35 shoulders) with a reverse prosthesis (19 primary and 16 revisions) were measured during active and passive ROM tasks. Non-invasive, six degree-of-freedom electromagnetic tracking device (Flock of Birds method) was used to accurately record 3D kinematics. **RESULTS:** Maximum thoracohumeral elevation angles were significantly ($p < 0.001$) larger during passive ($108^\circ \pm 24^\circ$ and $103^\circ \pm 26^\circ$) than during active forward flexion and elevation in the scapular plane, respectively ($89^\circ \pm 25^\circ$ and $88^\circ \pm 26^\circ$). Maximum glenohumeral elevation angles showed these differences ($p < 0.001$) also (sagittal plane: $79^\circ \pm 20^\circ$ and $65^\circ \pm 21^\circ$, scapular plane: $69^\circ \pm 22^\circ$ and $58^\circ \pm 20^\circ$). Maximum axial rotations in the scapular plane showed differences for external rotation ($p < 0.001$) ($49^\circ \pm 27^\circ$ (passive), $27^\circ \pm 25^\circ$ (active)) and internal rotation ($p = 0.021$) ($33^\circ \pm 32^\circ$ and $23^\circ \pm 22^\circ$). Mean ratio between active glenohumeral and thoracohumeral motion was $1:1.6 \pm 0.3$ in the scapular and $1:1.4 \pm 0.4$ in the sagittal plane. **CONCLUSION:** ROM of a reverse prosthesis is acceptable, but not optimal. The differences between passive and active shoulder function show that patients aren't using the full potential of the prosthesis. Ratios between glenohumeral and thoracohumeral motion of a shoulder with a reverse prosthesis are comparable to those of a normal shoulder.

Date: 2010-08-31
Session: Arthroplasty Shoulder / Elbow
Time: 15:30-17:00
Room: F2

Abstract number: 25840

OBJECTIVE AND SUBJECTIVE RESULTS OF REVERSE TOTAL SHOULDER REPLACEMENT. SHOULD IT BE RESERVED TO PATIENTS OLDER THAN 75 ONLY?

Konrad Sebastian WRONKA¹, Amit SINHA²

¹*Poole Hospital NHS Trust, Poole (UNITED KINGDOM)*, ²*Glan Clwyd Hospital, North Wales, Rhyl (UNITED KINGDOM)*

Background: Delta III Total Shoulder Replacement is a reversed, semi-constrained prosthesis. It was initially advised to use it in patients older than 75. In our study we evaluated results of reverse shoulder arthroplasty performed by single surgeon. Methods: We reviewed patients who had reverse shoulder replacement performed between 2001 and 2008 by Mr A Sinha. Patients were evaluated clinically and radiologically. Functional outcome was measured using Constant-Murley score. Oxford Shoulder score was used to measure patients' subjective outcome. X-rays were assessed by 2 independent surgeons. Results: We reviewed 29 out of 36 reverse shoulder replacements identified. Mean time from operation to follow up was 33 months (range 6-82 months). Average patients' age at time of surgery was 73 years (range: 44-90). There were neither failures nor infections in our group. Mean Shoulder Oxford score improved from 20.8 (range 2-36) pre-operatively to 36.7 (range 20-48) at time of follow up. Post operative average Constant Score was 65.5 (out of 100). All patients but one declared overall improvement. 6 patients who were 65 years old or younger at time of surgery improved their shoulder function (Mean Shoulder Oxford score improved from 15 to 32). Discussion: In our experience reverse shoulder replacement is a good solution for rotator cuff arthropathy. Mid-term results are satisfactory in younger and more demanding population. The complications are rare and overall patients' satisfaction is high. More research is necessary to assess long term results, especially in younger population.

Date: 2010-08-31

Session: Arthroplasty Shoulder / Elbow

Time: 15:30-17:00

Room: F2

Abstract number: 24297

EARLY RESULTS OF VERSO® INVERSE POLARITY SHOULDER REPLACEMENT FOR ROTATOR CUFF ARTHROPATHY

Paraskumar MOHANLAL, Amit TOLAT

Medway Maritime Hospital, Medway (UNITED KINGDOM)

INTRODUCTION: Rotator cuff arthropathy results in weak and painful shoulder and can be very disabling to patients. Reverse shoulder replacement was designed to help these patients get a better quality of life. Historically poor results have been reported, but with improvement in the prosthetic design and surgical technique, we are now able to achieve better functional results. We present the early results of Verso® reverse shoulder replacement. **MATERIAL AND METHODS:** Eight patients with rotator cuff arthropathy underwent reverse shoulder replacement using Verso® prosthesis. The average age was 76.1 years and females predominated in the study. Right shoulder was replaced in 5 and left in 3 patients. The procedure was done with the patient in deck chair position using Neviasser-Mckenzie approach. **RESULTS:** With an average follow up of 12(5-18) months, the patients were evaluated for improvement in the range of shoulder movements and functional outcome using Oxford shoulder scores. The mean lateral abduction improved from 50° pre-op to 125° post-op, external rotation from 27.5° to 45.6° and forward flexion from 54° to 128°. The Oxford shoulder scores improved from mean 19.1(13-26) to 39.6(24-48). There were no complications but one patient developed chronic regional pain syndrome due to previous attempts at cuff repair. **CONCLUSION:** Reverse shoulder replacement appears to be a viable option for patients with rotator cuff arthropathy providing improved functional outcome and range of movements. However careful patient selection is necessary and long term follow-up studies needed.

Date: 2010-08-31
Session: Arthroplasty Shoulder / Elbow
Time: 15:30-17:00
Room: F2

Abstract number: 26195

1 TO 7.5 YEARS FOLLOW UP OF RESURFACING HUMERAL HEAD IMPLANTS

Eric PETROFF¹, Stephane AUDEBERT²

¹*Clinique de Flandre, Coudekerque-Branche (FRANCE)*, ²*Clinique du Cambraisi, Cambrai (FRANCE)*

We present the results of Cementless Surface Replacement Arthroplasty (CSRA) of the shoulder in the treatment of advanced glenohumeral destruction of the shoulder which have an intact rotator cuff. Between November 2005 and December 2008, 70 CSRA (32 Copeland, Biomet and 38 SMRR, Lima) were implanted in 67 patients. A deltopectoral approach was used in 34 cases, an anterosuperior approach in 36 cases. The mean follow up was 3.4 years (range 1 to 7.5 years). Patients were assessed with use of the constant score, a patient satisfaction score and a detailed radiographic analysis. The average Constant score preoperatively was 17.6 points (range 2 -55) which increase to an average postoperative score of 66,1 points (range 13-91). The score for pain improved from 1.13 points (range 0-6) to 12.3 points (range 3-15). The forward flexion and the external rotation improved from 71° (range 20-140) and 0° (range -40-+45) to 143° (range 60-180) and 34.4° (range -20-+60) respectively. Complications included: 1 subscapularis detachment, 5 secondary rotator cuff tear, 1 sepsis, 3 shoulder stiffness. No shift in position of the CSRA occurred. 11 humeral components developed radiolucencies at the prosthesis-bone interface. The Deltopectoral approach is the procedure of choice, compared to the anterosuperior approach, patients with deltopectoral approach had significantly better outcomes with regard to anterior elevation and external rotation. We have analyzed the effect of valgus/varus placement of the CSRA. The Age-sex-adjusted Constant score was correlated to the valgus/varus position of the cup.

Date: 2010-08-31
Session: Arthroplasty Shoulder / Elbow
Time: 15:30-17:00
Room: F2

Abstract number: 25167

MANAGEMENT OF ROTATOR CUFF ARTHROPATHY WITH SHOULDER RESURFACING AND SUBSCAPULARIS Z-PLASTY

Sitaram GIRI, Shiv Asish JAIN, Ashvin PIMPALNERKAR
Good Hope Hospital, Sutton Coldfield (UNITED KINGDOM)

Introduction: Glenohumeral arthritis secondary to chronic cuff deficiency not only leads to serious compromise in shoulder function but also poses a surgical challenge with no consensus regarding management. We present our experience using a shoulder resurfacing and subscapularis Z-plasty. Patient and Methods: This study was conducted on 30-patients with rotator cuff arthropathy operated by a single surgeon. There were 21 female and 9 male patients with mean age 73 years (range 62-85 years). The average duration of symptoms prior to treatment was 5.45 years (range 2-15 years). Twenty patients had uncemented while ten patients had cemented resurfacing. The mean follow-up was 21 months (range 36-18 months). The patients were assessed at 3 months, 6 months, 12 months and 24 months postoperatively with European Society for shoulder and Elbow Surgery Score (ESSES) and radiograph at each visit. Results: The ESSES score significantly improved from a mean of 47.5 preoperatively to 77.5 postoperatively, with most improvement being in subjective scoring (pain and ADL) followed by improvement in external rotation and forward flexion. The VAS score for pain improved from average 7.4 to 0.9 at 6 months. On subjective scoring most patients reported good to excellent result at 6 months. There was no difference in outcome scores between cemented and uncemented groups. Our early results with shoulder resurfacing in management of rotator cuff arthropathy are encouraging. This bone conserving surgery may serve as an alternative to major procedures like reverse shoulder arthroplasty in selected group of patients.

Date: 2010-08-31
Session: Arthroplasty Shoulder / Elbow
Time: 15:30-17:00
Room: F2

Abstract number: 24313

MEASUREMENT OF MIGRATION OF A HUMERAL HEAD RESURFACING PROSTHESIS USING RADIOSTEREOMETRY WITHOUT IMPLANT MARKING. AN EXPERIMENTAL STUDY

Magnus ÖDQUIST, Olof SKÖLDENBERG

Karolinska Institutet, Department of Clinical Sciences at Danderyd Hospital, Stockholm (SWEDEN)

Introduction: Standard radiostereometric analysis of prosthetic migration requires that tantalum beads are inserted into the implant. For manufacturing reasons this is not possible for humeral head resurfacing implants. We therefore used marker free radiostereometry, developed for metal-backed acetabular cups, on a dummy model to validate the method for a humeral head resurfacing prosthesis. Material and methods: Three hemispherical resurfacing prosthesis of different sizes were marked with tantalum beads and mounted in a sawbone. Standard and marker free radiostereometry was then done repeatedly with gradual shifts of position of the prosthesis between each analysis. The marker free algorithm was then compared to the standard to determine the accuracy. Results: The accuracy for marker free radiostereometry was 0.16 - 0.21 mm when measuring translations. Significantly wider confidence intervals were found for rotations. Interpretation: Based on our results, marker free radiostereometry can be used to measure migration of humeral head resurfacing prosthesis. This indicates that implant marking is not required when doing radiostereometry on humeral head resurfacing in clinical trials.

Date: 2010-08-31
Session: Arthroplasty Shoulder / Elbow
Time: 15:30-17:00
Room: F2

Abstract number: 24129

SHOULDER PROSTHESIS WITH OR WITHOUT STEM 59 CONSECUTIVE SHOULDER REPLACEMENTS USING THE TESS IMPLANT

Arkan SAYED-NOOR, Göran SJÖDÉN, Nader MAFI, Sigge NORBERG, Bakir KADUM

¹*Departemnt of Orthopaedics, Sundsvall (SWEDEN)*

Fifty-eight patients (59 shoulders) with TESS Biomet shoulder prosthesis (*) consecutively implanted at Sundsvall Hospital from October 2007 until December 2009 are reported. There were 39 women and 19 men aged 43 to 89 years (median 71 years). The indications were glenohumeral arthritis (n=22), fractures (19), rheumatoid arthritis (4), prosthetic revisions (9), cuff tear arthropathy (3) or humeral head necrosis (2) In twenty-two shoulders reversed design was used and in 37 anatomical components (16 hemi and 21 total arthroplasties). In reversed shoulders 7 were without stems and 15 with stems. For anatomic replacements 24 were without stem while 13 were stemmed. Complications were 2 dislocations, 1 dissociation of the stem, 1 mal-positioning and 1 infection. The patients experienced better quality of life and performance at follow-up 13 months (5-23months): EQ-5D rose from 0.27 preop to 0.63 postop and quickDASH improved from 57 preop to 34 postop, low values being better. No implant showed evidence of loosening. Shoulder replacement using TESS reversed and anatomic components show good short-term results comparable to others. If the bone quality is adequate and perioperative fixation is good, the humeral component can be fixed without a stem also when reversed prostheses are being used. Bryan Wall et al: Reverse Total Shoulder Arthroplasty: A Review of Results According to Etiology JBJS (A) Jul 2007; 89: 1476 - 1485.* Huguet D et al: Prothèse humérale sans tige: résultats préliminaires à plus de deux ans de recul. Rev Chir Orthop Traumatol 2009; 95S: S97-S100

Date: 2010-08-31
Session: Arthroplasty Shoulder / Elbow
Time: 15:30-17:00
Room: F2

Abstract number: 24060

PROSTHETIC OVERHANG MOST EFFECTIVE WAY TO PREVENT SCAPULAR CONFLICT IN REVERSE TOTAL SHOULDER PROSTHESIS

Pieter BEEKMAN¹, Lieven DE WILDE¹, Didier PONCET², Anders EKELUND³

¹Department of Orthopaedic Surgery and Traumatology, Ghent (BELGIUM), ²DePuy France, Chaumont (FRANCE), ³Dep. of Orthopaedics, Stockholm (SWEDEN)

Despite good clinical results of the reverse total shoulder arthroplasty inferior scapular notching remains a concern. The aim of this study was to evaluate the effect of 6 different parameters on notching. An average shape A-P view 2-D computer model of scapula was created, using data from 200 scapulae, so that the position of the glenoid and humeral component could be changed, as well as design features such as depth of the polyethylene insert, size of glenosphere and centre of rotation. The model calculates the maximum adduction (notch angle). To prevent an inferior scapular conflict in reverse total shoulder arthroplasty the change in neck-shaft angle or depth of the polyethylene insert had a modest gain in notch angle. The effect of lateralization of the centre of rotation and putting the glenosphere in more varus was completely eliminated by adding a small inferior overhang. The main effect of increasing the size of the glenosphere was if it created a prosthetic overhang. Of all 6 tested parameters the prosthetic overhang resulted in the biggest gain in notch angle and this should be considered when designing the reverse arthroplasty and defining optimal surgical technique.

Date: 2010-08-31
Session: Trauma - Multitrauma
Time: 13:30-15:00
Room: F4

Abstract number: 26864

26 YEARS EXPERIENCE WITH MISSILE INJURIES OF THE LIMBS

Thamer A. HAMDAN

Basrah Medical College, Basrah (IRAQ)

Our experience in handling war wounded for the last twenty-six years will be discussed in comparison with the experience of the others. A new style of wound grading, casualty sorting out and disabilities were developed. The author thinks that the staged conventional debridement is the cornerstone in the treatment of war wounded. Skin graft using the open method was very successful even over a dirty wound. Temporary internal splint for fixing the upper limb fractures and external skeletal fixation for fixing the lower limb fractures were very useful not only for fixing bones but also for accelerating soft tissue healing. We feel the best time for removing retained shell is at the time of initial wound excision, if possible wound infections were the most common complications, and it was higher than other recorded incidence, this was related to delayed presentation and incomplete wound excision. Ligamentous injury was recorded because of shock wave rather than direct injury. Limb salvage attitude was carried out initially, but with experience we moved to limb sacrificing attitude after facing complications and even failure. The outcome of spinal cord injury was very unpredictable, and carries almost always bad prognosis. Some interesting rare problems will be presented too.

Date: 2010-08-31
Session: Trauma-Multitrauma
Time: 13:30-15:00
Room: F4

Abstract number: 26576

THE RELATIONSHIP BETWEEN TIME TO SURGICAL DEBRIDEMENT AND INCIDENCE OF INFECTION IN GRADE III OPEN FRACTURES

Jagwant SINGH, Z. HASHIM, S. MARWAH, R. RAMAN, H. K. SHARMA
Hull Royal Infirmary, Hull (UNITED KINGDOM)

Aim: Urgent debridement of open fractures has been considered in the past to be of paramount importance in preventing infections. Recent literature does not support the urgency in debridement for open fractures. The purpose of this study was to determine the association between time to definite surgical management and rates of infection in exclusively high energy (Grade III A, B and C) open fractures. **Methods:** We retrospectively reviewed 65 high energy open fractures (26 IIIA, 37 IIIB and 2 IIIC) that presented to our trauma centre or were referred from other centres. Treatment included aggressive debridement, antibiotic prophylaxis, fracture stabilization and timely soft tissue coverage. The time from injury to admission and operative debridement as well as patient and treatment characteristics were studied. **Results:** Eight patients (12%) in this study developed infection which required treatment with antibiotics. Seven patients (10%) had delayed unions whereas one patient had infective non union and one was diagnosed with chronic osteomyelitis. The average time to treatment was not significantly different between the infected versus non infected group. There was no increase in infection rate in those treated after 6 hours compared to those treated within 6 hours. **Conclusion:** The risk of developing an infection was not increased if the primary surgical management was delayed more than 6 hours after injury, provided intravenous antibiotics were administered on presentation to the emergency department.

Date: 2010-08-31
Session: Trauma-Multitrauma
Time: 13:30-15:00
Room: F4

Abstract number: 25447

NEW INJURY SEVERITY SCORE: A MORE RELIABLE ASSESSMENT TOOL IN PREDICTING MORBIDITY AND MORTALITY IN MUSCULOSKELETAL INJURIES COMPARED TO INJURY SEVERITY SCORE?

Raj NIRMAL¹, Vel Rajan SHAKTHI², Vijay GONI²

¹*Chennai Medical College Hospital and Research Centre, Trichy (INDIA)*, ²*Post Graduate Institute of Medical Education and Research, Chandigarh (INDIA)*

The Injury Severity Score (ISS) has been the gold standard for anatomical severity scoring since it was introduced in 1974. The ISS sums the severity score for the three most severe injuries, but it only considers one injury per body region. Therefore, one can suspect that the ISS underscores the severity in trauma victims with multiple injuries confined to one body region. To improve the accuracy, Osler et al, introduced in 1997, a modification of the ISS and named it the New Severity Injury Score (NISS). The NISS sums the severity score for the three most severe injuries, regardless of body region. Values of NISS higher than the ISS indicate multiple injuries in at least one body region. Osler claimed that NISS predicted short-term mortality significantly better than did the ISS. Osler's recommendation was supported by Balogh et al and Brenneman et al. So it was considered worthwhile to look for the differences in outcome analysis in isolated musculoskeletal trauma using both ISS and NISS. Data collection from two level 1 trauma centres both retrospectively as well as prospectively. A total of 1000 patients included in the study. Scoring carried out and mortality and morbidity profile noted down. NISS was found to outperform ISS in predicting mortality and morbidity in patients with multiple skeletal injuries. To conclude NISS is found to perform better in scenario of multiple musculoskeletal injuries than ISS.

Date: 2010-08-31
Session: Trauma-Multitrauma
Time: 13:30-15:00
Room: F4

Abstract number: 24603

COMPARISON OF CLINICAL RESULTS OF OPERATIVE INTERNAL FIXATION AND CONSERVATIVE RESPIRATORY TREATMENT FOR FLAIL CHEST WITH MULTIPLE FRACTURES OF THE RIBS

Takaaki KURODA¹, Masanari AONO¹, Kenichi KAZUKI¹, Atsushi OKANO¹, Toshinori MIYAICHI², Tetushi KUBOTA², Akihiro FUKE²

¹*Department of Orthopaedic Surgery, Osaka City General Hospital, Osaka (JAPAN),*

²*Emergency and Critical Care Medical Center, Osaka City General Hospital, Osaka (JAPAN)*

Background: Surgical treatment for flail chest is controversial. However, we investigated the efficacy of the current surgical treatment (treatment used since 2007) for flail chest with multiple rib fractures. **Methods:** We retrospectively analyzed 8 patients with flail chest who were treated at our emergency service facility between 2005 and 2009. Five patients (age range, 40-78 years; average age, 53 years) had undergone operative internal fixation with locking plates for multiple rib fractures, and 3 patients (age range, 40-53 years; average age, 47 years) had undergone conservative respiratory treatment for flail chest. We evaluated the periods of follow-up intubation and complication rates. **Results:** Surgery was performed in the patients who presented with flail chest and multiple rib fractures (fractures at more than 2 sites in more than 3 adjacent ribs). Posttreatment improvement in most of the patients who underwent surgery was more rapid (duration range, 0-11 days; average duration, 6.6 ± 4.5 days) than the improvement in the patients who underwent conservative treatment (duration range, 3-18 days; average duration, 11 days). The incidence of respiratory complications in the conservative treatment group (100%) was higher than that in the surgical treatment group (56%). One patient developed trivial pneumothorax after the surgery. **Conclusion:** Surgical treatment is effective for the treatment of flail chest with multiple rib fractures, and it reduces the duration of and complications associated with artificial respiration. Surgical intervention by using locking plates is one of the approaches for the treatment of multiple rib fractures.

Date: 2010-08-31
Session: Trauma-Multitrauma
Time: 13:30-15:00
Room: F4

Abstract number: 25154

QUALITY OF LIFE CHANGES DURING TWO YEARS AFTER PELVIC AND ACETABULAR FRACTURE SURGERY

Tomas BORG, Sune LARSSON

Uppsala University Dept of surgical science Orthopaedics, Uppsala (SWEDEN)

Pelvic and acetabular fracture patients surgically treated in a three year period were prospectively included in a study of quality of life (QoL) outcome. Our aim was to study SF-36 changes in these two fracture groups during the first 2 years following injury. All 155 patients (110 male, 45 female, age 16-83) with pelvic and acetabular fractures surgically treated Sept 2004-April 2007 were followed at 6, 12 and 24 months with SF-36. There were 51 pelvic and 104 acetabular fracture patients. 124 patients answered the questionnaire (80%), and were compared to an age-and-gender matched reference population. SF-36 mean scores were within 1 SD from normative for the 6 domains Bodily Pain, General Health, Vitality, Social Function, Role Emotional and Mental Health at all time points for both fracture groups. Pelvic fracture patients mean scores for physical function (PF) were 59-66-74, and for role physical (RP) 28-47-62 at the three time-points. This was below 1 SD from normative at 6 months but not at 12 and 24 months. Acetabular fracture patients mean scores for PF were 51-56-61 and for RP 19-32-45 at the three time points. This was below 1 SD from normative both at 6 and 12 months but not at 24 months. We found continuous improvement in QoL physical domains for both pelvic and acetabular fracture patients following surgery.

Date: 2010-08-31
Session: Trauma-Multitrauma
Time: 13:30-15:00
Room: F4

Abstract number: 25506

DAMAGE CONTROL ORTHOPAEDIC SURGERY FOR FEMORAL FRACTURES IN POLYTRAUMA PATIENTS

Olivera LUPESCU¹, Mihail NAGEA², Gheorghe Ion POPESCU¹, Cristina PATRU², Cornelia VASILACHE², Doriana LUPESCU¹

¹*University of Medicine and Pharmacy, Emergency Hospital, Bucharest (ROMANIA),*

²*Emergency Hospital, Bucharest (ROMANIA)*

Introduction: Treatment of femoral fractures in polytrauma patients represents a very actual debate, since both the fracture and its treatment have a significant influence upon these patients. The time and the type of surgery for femoral fractures in polytrauma has not been concluded, yet, but everybody agrees that the 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 unreamed 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 120 polytrauma patients with femoral fractures, treated between 1.01.2001-1.01.2007, 55 by intramedullary nailing (IMN), 65 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: 2010-08-31
Session: Trauma-Multitrauma
Time: 13:30-15:00
Room: F4

Abstract number: 25136

ROLE OF INTRAVENOUS STEROIDS IN THE PROPHYLAXIS OF POST TRAUMATIC HYPOXEMIA AND FAT EMBOLISM SYNDROME IN HIGH RISK PATIENTS

Vibhu Krishnan VISWANATHAN, Ramesh Kumar SEN, Sakthivel Rajan RAJARAM MANOHARAN

Postgraduate Institute of Medical Education and Research, Chandigarh (INDIA)

A randomized prospective study was conducted over a period of 18 months in the emergency orthopaedic services of PGIMER, Chandigarh. A total of 30 patients belonging to the age group 16-65 yrs after sustaining multiple fractures (without any significant non-Orthopaedic injury) with a NISS (new injury severity score) >18 and serum lactate >22mg/dl (both of which were considered as high risk factors for the development of fat embolism syndrome) at admission were divided into two groups A and B: the cases (group A) were given a low dose steroid prophylaxis (6 mg/kg body weight of methyl prednisolone sodium succinate in 6 divided doses) and the control group (B) was not given any prophylaxis. The two groups were then followed over the next 72 hours for the development of fat embolism, defined as per the Schonfeld criteria. Out of the 30 patients studied, clinical fat embolism syndrome (Schonfeld criteria >5) developed in 3 patients in the control group and 1 patient among the cases. However, there was no difference in the occurrence of subclinical fat embolism (Schonfeld criteria 3-5) in our patients (4 patients in each group). We, thus, observed that the administration of steroids at the dose of 6mg/kg body weight though safe, was not effective enough to significantly reduce the incidence of clinical or subclinical forms of fat embolism in our patients.

Date: 2010-08-31
Session: Trauma-Multitrauma
Time: 13:30-15:00
Room: F4

Abstract number: 24552

OPERATIVE TREATMENT OF UNSTABLE PELVIC INJURIES

Alexey SMIRNOV, Michail MAKURIN

Nizhniy Novgorod Research Institute of Traumatology and Orthopaedics, Nizhniy Novgorod (RUSSIA)

INTRODUCTION: The study is based on the analysis of the results of surgery on 87 patients with unstable injuries of the pelvis at the age of 15 to 68 operated on the period 2000 - 2008. **METHODS:** Patients were distributed according to AO-ASIF classification, based on the principles of assessment of stability in posterior parts of the pelvis. Type B injuries were observed in 63 cases (70%), type C in 24 patients (30%). The following three methods of operative treatment were applied: internal fixation (plates, screws), external fixation with a pin apparatus and combined osteosynthesis. **RESULTS:** In the group of patients with rotationally unstable injuries the apparatus of external fixation as an independent and definitive method of treatment was applied in 19 patients, open reduction and internal fixation - in 30 cases, combination of the methods - in 14 patients. Follow-up long term results were estimated by Majeed scale. In rotationally unstable group of patients excellent results were achieved in 47 (74%) patients, good results in 9 (14%), satisfactory results - in 7 (12%) patients. In the group of patients with vertically unstable injuries excellent results were achieved in 12 (50%) cases, good - in 6 (25%), satisfactory - in 6 (25%) patients. **CONCLUSION:** Thus, a variety of pelvic injuries accounts for development of combined osteosynthesis method which allows to reduce traumaticity of surgical intervention, to achieve adequate reduction, stable fixation and to receive excellent and good results of treatment in the majority of patients.

Date: 2010-08-31
Session: Symposium - Cartilage
Time: 15:30-17:00
Room: F4

Abstract number: 26369

**ARTICULAR CARTILAGE REPAIR USING COLLAGEN TYPE I HYDROGELS
– CLINICAL RESULTS**

Ulrich NÖTH, Lars RACKWITZ, Sebastian SIEBENLIST, Florian FENSKY, Thomas BARTHEL, Jochen EULERT¹, Maximilian RUDERT

Orthopädische Klinik, König-Ludwig-Haus, Universität Würzburg, Würzburg (GERMANY),

Different scaffold materials are available for matrix-based autologous chondrocyte implantation (ACI). Over 1500 patients have been treated with a collagen type I hydrogel (CaReS® technology) in Europe so far. We performed a prospective multicenter study in 9 centres including 116 patients to test the outcome of this technology. The International knee documentation score (IKDC), as well as the patient and doctor satisfaction have been investigated before, 3, 6, 12, 24, 36, 48, and 60 months after surgery. The mean follow-up was 30.7 months with an IKDC of 70.5. Patients with osteochondral defects had an IKDC of 80.4, patients with chondral lesions only an IKDC of 68.2. Patients with defect sizes more than 4 cm² had an IKDC of 72.8, while patients with defects smaller than 4 cm² showed an IKDC of 69.6. For the defect site, best results were found at the condyles (IKDC 66.7) compared to defects of the patella (IKDC 61.7). The patient and doctor satisfaction showed in 79.4% and 85.3% very good and good results. In conclusion, patients with osteochondral lesion showed the best results. In general, the results are comparable with other clinical studies using the classical ACI technique or different scaffold materials.

Date: 2010-09-01

Session: Symposium - Trauma - Proximal femoral fractures

Time: 08:00-09:30

Room: Congress Hall

Abstract number: 26805

PROSTHETIC REPLACEMENT AFTER FEMORAL NECK FRACTURE – TOTAL OR HEMIARTHROPLASTY?

James WADDELL

University of Toronto, Toronto (CANADA)

There is increasing interest in the role of hip arthroplasty as the primary treatment of displaced femoral neck fractures. A number of papers have been published comparing arthroplasty with reduction and fixation in this patient group. While early complication rates appear slightly higher in the arthroplasty group longitudinal follow-up suggests that arthroplasty may be the superior option in terms of patient satisfaction, level of patient function and rates of re-operation. Initially these studies were done comparing fixation to various forms of hemiarthroplasty and the results were confounded by the types of arthroplasty chosen. More recent studies involving more sophisticated forms of hemiarthroplasty have reinforced the impression that arthroplasty is a superior form of treatment as compared to reduction and fixation in appropriately selected patients. Recognizing the clinically superior outcome of total hip replacement to hemiarthroplasty in the treatment of hip arthritis there has been increasing interest in total hip replacement as the primary treatment for displaced femoral neck fractures in appropriately selected patients. Direct comparisons between total hip replacement and hemiarthroplasty are relatively uncommon particularly the level one evidence available from randomized clinical trials. However, those studies that are available suggest that the quality of outcome in hip fracture patients may not be as clearly defined as that seen in hip arthritis patients and that complication rates in total hip replacement, particularly dislocation, are substantially higher than seen in hemiarthroplasty. In summary, the issue is not which operation is best for all patients with displaced femoral neck fractures but rather which surgical option is best for the particular patient for whom it is being proposed.

Date: 2010-09-01

Session: Plenary Lecture - International collaboration beyond the culture gap

Time: 10:15-10:45

Room: Congress Hall

Abstract number: 26869

PLENARY LECTURE - INTERNATIONAL COLLABORATION BEYOND THE CULTURE GAP

Shin-ichi KIKUCHI

Fukushima Medical University (JAPAN)

Japanese civilization is very different from others, so it is difficult for Japanese to communicate with other people in other civilization. But it is very important to cross national borders beyond the culture gap. When I was a resident in Japan, I was deeply impressed by the papers of Dr. Macnab and I visited him. He kindly taught me the way of scientific research and clinical work, as well as the way of living. He took me to the ISSLS in 1978, where I met many famous researchers and I found the importance of international exchange. I started to send my young colleagues to the Orthopaedic Department of Gothenburg University soon after I became the professor and chairman of Fukushima Medical University. Our collaboration has brought much success and it is still continuing. Then I created The Study Group for Nerve and Spine with my Japanese and foreign friends in order to give an opportunity for international exchange for Japanese young doctors. International collaboration research projects started to increase in the 1970's and greatly increased in the 1990's. This tendency can be seen in the presentations at the ISSLS and also in Nobel Prize winners. Great scientists influence one another beyond national borders and create greater achievements. Furthermore, we cannot develop scientific research, if we study only in our own limited field. Multidisciplinary approach is essential. The profession and nationalities of the members of ISSLS have been expanded these 30 years. The charter members were only from three fields, and from 11 countries. At the 37nd meeting in 2010, the members were from 16 fields and 27 countries. We should study in collaboration, crossing interdisciplinary and national borders. It is the best way of developing scientific research. Competition is important, but collaboration is more important

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 10:45-12:15
Room: Congress Hall

Abstract number: 25876

CHARNLEY LOW-FRICTIONAL TORQUE ARTHROPLASTY. SURVIVORSHIP PATTERNS: 1962 - 2009

Michael WROBLEWSKI, Paul SINEY, Patricia FLEMING

The John Charnley Research Institute, Wigan (UNITED KINGDOM)

We studied the survivorship after Charnley low-frictional torque arthroplasty with revision as the end point. Between November 1962 and June 2005, 22,066 primary operations had been carried out at Wrightington Hospital by over 330 surgeons. At the time of analysis in March 2006, 1490 patients (2662 hips, 12%) have died and 1001 (4.5%) hips have been revised. Survivorship at 31 years, with revision as the end point was: Infection 95%, dislocation 98%, fractured stem 88.6%, loose stem 72.5%, loose cup 53.7%. Wear and loosening of the ultra high molecular weight polyethylene cup is the main long-term problem. Our principle of regular follow-up and early revisions, if need be for radiographic changes alone, is an integral part of informed consent for the operation. The frequency, judged from the revision patterns, would suggest that every two years would not be unreasonable. Since clinical results do not reflect the mechanical state of the arthroplasty to delay inevitable revisions will lead to progressive loss of bone stock, more complex technical problems, and a loss of opportunity of a better outcome. Recording of all operative findings at revision is essential. In our review the difference between the number of LFAs revised and the operative findings was 17.8%. In other hip registers the rate of combined clinical and radiographic failure was at least twice as high as the register presents in survivorship analysis.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 10:45-12:15
Room: Congress Hall

Abstract number: 23691

REVIEW ON METAL ON METAL HIP RESURFACING ARTHROPLASTY

Hari KOVILAZHIKATHU SUGATHAN, Rudra MAITRA, Nezar TUMIA
Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM)

Aims: 1. To assess the early and mid term functional and radiological results of metal on metal hip resurfacing arthroplasty. 2. To assess the revision rate and causes.
Materials and method: Retrospective case notes and X-ray review of 93 hip resurfacing arthroplasty with a mean follow up duration of 2.7 years (6 months to 6.5 yrs)
Results: There were 46 males and 38 females with 9 bilateral hips. Mean Age was 54 years (29 to 64). 94% cases were primary OA. Early post operative Complications included wound leaking, haematoma, transient foot drop, PE, spontaneous neck of femur fracture and cellulitis. 6 patients (6.4%) had revision hip arthroplasty. Among the revision cases, 2 patients had infection and one patient had metastatic periprosthetic pathological fracture. Revision rate at 2.7y follow up excluding infection and metastatic fracture was 3.2% (3/93). The 3 revision cases included one case of ALVAL and two cases of neck of femur fractures. The final outcome was satisfactory in 79 (85%). 4 patients had on going hip pain with no treatable cause. Radiological review has identified a mean Stem Shaft Angle (SSA) of 134° (range 102 to 160) and mean Cup Inclination of 44.5° (range 23 to 73). Both neck of femur fractures had SSA of 125. The ALVAL case had Cup Inclination of 56.
Conclusions: Our revision rate is higher than the rates quoted by other independent centres. More precise implant positioning could have reduced the revision rate

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 10:45-12:15
Room: Congress Hall

Abstract number: 26800

METAL ON METAL HIP RESURFACING; THE MECHANISM OF FAILURE

Michael WROBLEWSKI, Paul SINEY, Patricia FLEMING

The John Charnley Research Institute, Wigan (UNITED KINGDOM)

It is generally considered that tissue reaction to ultra high molecular weight polyethylene causes osteolysis and component loosening. Metal on metal resurfacing was introduced as a less invasive procedure for young active patients. Problems emerged: neck erosion, nerve irritation and palsy, tissue masses, necrosis and pseudotumours. Attention focused on the orientation of components as the cause of high wear and lymphocyte mediated vasculitis. The results of total hip arthroplasty are better understood when the construct is considered as a neuropathic spacer functioning within a foreign body bursa hence freedom from pain but, clinical results do not reflect the mechanical state of the arthroplasty. Separation of the articular surfaces, during activity, has been documented. The volume of bursal fluid entering will depend on the dimensions of the components and the separation distance. On relocation the high pressure jet, together with the wear particles, will result in tissue damage. This mechanism applies to all total hip arthroplasties. Metal on metal resurfacing introduced new elements: large components and abrasive metal particles. A 50mm set of components at 0.5mm circumferential separation will result in 4.97mm linear separation and 7.55mls pf bursal fluid entering the articulation. During the final stages of relocation under load the peak pressure generated may reach 34200Nm² equivalent to 256mm Hg well above systolic blood pressure. High pressure water jet, recurring with activity over 1,000,000 times a year together with the abrasive metal particles are the mechanical causes of the reported complications. Metal on metal hip resurfacing cannot function without fluid film lubrication paradoxically fluid film is the cause of its failure.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 10:45-12:15
Room: Congress Hall

Abstract number: 23723

REVIEW OF HYDROXYAPATITE CERAMIC COATED HIP IMPLANTS USED IN REVISIONAL SURGERY: A CLINICAL AND RADIOLOGICAL EVALUATION WITH MAXIMUM FOLLOW-UP OF TWENTY YEARS

James BUCHANAN, David FLETCHER, Peter LINSLEY
Sunderland Royal Hospital, Newcastle upon Tyne (UNITED KINGDOM)

Hydroxyapatite coated hip (HAC) arthroplasty should perform satisfactorily in revisional cases. Will an uncemented HA coated implant bond to the host bone in revision surgery? Methods: This study extends over 20 years. Revision of 167 cemented hip replacements to HAC arthroplasty have been evaluated. Annual review using Harris Hip Score to assess pain and function and X-rays to check osseointegration has been performed. There are 42 hips still under review at 10 or more years. Results: Failure of bonding occurred in eight acetabulae and six stems out of a total of 334 components. All the bonded implants remained secure and there has been no case of further aseptic loosening. Failed bonding was noted in some earlier cases. To obtain osseointegration meticulous removal of cement was required followed by firm seating of the new, HA coated implant. This was probably only a three point contact. Serial X-rays over a two to three year period demonstrated the development of new cancellous bone filling the spaces around the implant. No patients with bonded implants have thigh pain. Similarly, osteolysis and debris disease have not developed subsequent to osseointegration. Harris Hip Scores show 120 hips scoring 80 to 100 (71.9%). 35 hips scored less than 80 (20.9%) with just 12 hips (7.2%) scoring less than 60. Conclusions: Patients with bonded implants remain well. Removal of cement and granulation tissue is mandatory. The HA coated implant will integrate and the bony architecture will be restored. HAC implants are recommended for revision cases.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 10:45-12:15
Room: Congress Hall

Abstract number: 25464

INTRODUCTION OF TOTAL HIP ARTHROPLASTY IN LITHUANIA RESULTS FROM THE FIRST 10 YEARS

Sarunas TARASEVICIUS¹, Uldis KESTERIS², Otto ROBERTSSON², Alfredas SMAILYŠ¹, Hans WINGSTRAND²

¹*Kaunas Medical University Clinics, Kaunas (LITHUANIA)*, ²*Lund University Hospital, Lund (SWEDEN)*

Background: Hip replacement as a routine procedure was introduced in Lithuania in 1991. At Klaipeda Hospital, one of the 2 hospitals at which this was begun, the arthroplasties were followed prospectively from the start. This study concerns the 10-year results from a country with no previous experience of hip replacement. The results are compared with those from a hospital with considerable experience of total hip replacement. Methods: We compared the revision rate for the first 658 primary ScanHip arthroplasties inserted at Klaipeda to that for the first 939 ScanHip primary arthroplasties inserted at Lund University Hospital, Sweden. Only patients with osteoarthritis were included, and the endpoint was revision for aseptic loosening with exchange of one or both components. Results: We found that patients operated at Klaipeda Hospital had a significantly higher risk of revision (12%) than those operated in Lund (6%). Interpretation: Although we could not identify any specific reason for the Swedish results being better than the Lithuanian results, it is probable that previous surgical inexperience of hip replacement in Lithuania played a role. We believe that the findings will stimulate surgeons in Lithuania to analyze their failures and improve the results.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 10:45-12:15
Room: Congress Hall

Abstract number: 24434

25 YEAR SURVIVAL OF THE LORD TOTAL HIP PROSTHESES

Roland ZÜGNER, Roy TRANBERG, Johan KÄRRHOLM
Institute of Clinical Sciences, Göteborg (SWEDEN)

Most early designs of uncemented hip implants turned out to be failures mainly because the prerequisites for durable implant fixation were unknown. One exception was the stem of the Lord prosthesis (Benoist Girard, France). We studied the clinical and radiographic results of 107 hips (58 females, 40 males; mean age of 47 years (25-67) operated between 1979 and 1986. At the last follow-up 5 stems and 54 cups had been revised or extracted including all reasons for revision corresponding to stem and cup survival rates of 92 ± 3 and 45 ± 5 % at 25 years. The majority of the cup revisions and only 1 of the stem revisions were due to loosening. 66 hips with remaining Lord stem were available for clinical follow up with a median follow up of 26 24-29 years. The mean total Harris hip and pain score in this group was 81 range 46-100 (SD 14) and 41 range 30-44 (SD 5). No stem was loose according to radiographs, whereas the majority of the cups showed signs of insufficient fixation. More or less pronounced osteolysis was observed in Gruen regions 1 and 7 in almost half of the cases. Bone resorption was mainly seen in regions 1, 6 and 7. The Lord screw ring has turned out as a large scale failure due to poor fixation whereas only 1 stem loosened. Most cases had comparatively good function after 26 years despite that more than half of them had been revised 1 or 2 times.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 10:45-12:15
Room: Congress Hall

Abstract number: 26070

A DECENNIAL EXPERIENCE IN TOTAL HIP REPLACEMENT USING ALTIMED IMPLANTS

Ivan MINAKOUSKI, Alexandre BELETSKY, Andrej VORONOVICH, Pavel SKAKUN
*Belarus Republic Scientific and Practical center for Traumatology and Orthopaedics,
Minsk (BELARUS)*

From 200 to 2009 we performed 1916 total hip replacements using various designs of implants from ALTIMED manufacturer (Belarus), including SLPS non-cemented implants with screw cups (851 cases), non-cemented implants with press-fit cups (218 cases), cemented implants (137 cases), hybrid systems (cemented cup with non-cemented stem) in 355 cases, systems with Muller rings (113 cases). The indications for operation were: primary coxarthrosis (32%), dysplastic coxarthrosis (42%), avascular necrosis of the femoral head (7%), rheumatoid arthritis (5%), posttraumatic coxarthrosis (5%), femoral neck fractures (4%), and other hip joint lesions (5%). The average age of the patients was 52 years old (from 18 to 82), 67% female and 33% male. The five-year survival rate for the screw cups was 83%, the two-tear survival rate for the press-fit cups was 99.1%, the five-year survival rate was 94% for the noncemented stems, 97% for the cemented cups, 94% for the cemented stems, the two-tear survival rate for the strengthening rings was 99.3%. The functional outcomes were evaluated according to the Merle d'Aubigne scale. They improved from 7.6 points before the operation to 16.2 after the operation. Medium-term postoperative supervision gives encouraging results. Thus, the study of the long-term results of the surgery is necessary.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 10:45-12:15
Room: Congress Hall

Abstract number: 22981

**LONG TERM 15 YEAR FOLLOW UP RESULTS OF JRI (FURLONG) TOTAL HIP
ARTHROPLASTY USING HYDROXYAPATITE-COATED THREADED
ACETABULAR CUPS**

Umesh NAGARE, Jonathan WILKINSON

Lincoln County Hospital, Lincoln (UNITED KINGDOM)

We present the clinical and radiographic outcome of 88 consecutive primary total hip replacements performed in 78 patients using a hydroxyapatite-coated femoral component and threaded cup with a modular ceramic head (JRI-Furlong). The mean follow-up was for 11 years (13 to 18). Patients were assessed clinically, using the median Harris and Merle d'Aubigné and Postel score. Radiographs were evaluated using DeLee and Charnley zones for the cup. Cup angle, migration and radiolucency were used to assess loosening of the cup. The criteria for failure were revision, or impending revision because of pain or loosening. We reviewed 72 (92%) hips at a median follow-up of 8 years (5 to 13.8) after implantation; Three (4%) were lost to follow-up. At review there had been two (6%) revisions but only one for aseptic loosening (acetabulum). Radiographic review of the remaining hips did not identify any evidence of femoral or acetabular loosening. The median Harris and Merle d'Aubigné and Postel hip scores were 94 (42.7 to 100) and 17 (3 to 18) respectively. The JRI-Furlong acetabular threaded cups give promising functional and radiographic results in the medium term.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 10:45-12:15
Room: Congress Hall

Abstract number: 26188

HIP RESURFACING ARTHROPLASTY IN THE NORDIC ARTHROPLASTY REGISTER ASSOCIATION (NARA) DATABASE

Per-Erik JOHANSON¹, Anne Marie FENSTAD², Ove FURNES², Göran GARELLICK³, Leif HAVELIN², Sören OVERGAARD⁴, Alma PEDERSEN⁴, Johan KÄRRHOLM³

¹Department of Orthopaedics, Gothenburg (SWEDEN), ²The Norwegian Arthroplasty Register, Bergen (NORWAY), ³The Swedish Hip Arthroplasty Register, Gothenburg (SWEDEN), ⁴The Danish Hip Arthroplasty Register and Department of Orthopaedic Surgery, Clinical Institute, Aarhus (DENMARK)

Background: There is considerable variability in reported outcomes of hip resurfacing arthroplasty (HRA). We therefore analysed the outcome of this procedure in the NARA data base common for all three countries. Patients and methods: The risk of non-septic revision within two years was analysed in 1 638 HRA and compared to 172 554 conventional total hip arthroplasties (conTHA), using Cox regression models. We calculated relative risk (RR) for revision and 95% confidence interval (95% CI). Results: HRA had an almost threefold increased revision risk compared to conTHA (RR=2.87; 95% CI: 2.09-3.92). In the subgroup of men below 50 years of age this difference disappeared, but increased for women of the same age group, HRA vs. conTHA RR=4.65 (95% CI: 2.59-8.33). Within the HRA group, risk for non-septic revision was reduced by male gender, RR=0.46 (95% CI: 0.25-0.86), in hospitals performing ≥ 70 HRA (RR=0.26, 95% CI: 0.11-0.60) and with use of BHR (Birmingham Hip Resurfacing) compared to all other designs (RR=0.27, 95% CI: 0.12-0.61). The femoral head diameter had no significant influence on the early revision rate. Interpretation: HRA might become an alternative for young men, but our follow up is too short to determine if this indication remains in the longer perspective.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 10:45-12:15
Room: Congress Hall

Abstract number: 25172

**TWO RESURFACING HIP REPLACEMENTS COMPARISON: BHR VS. ASR
– SINGLE SURGEON SERIES**

Shanmugasundaram RAJKUMAR, Shawn TAVARES
Royal Berkshire Hospital, Reading (UNITED KINGDOM)

Introduction: We report our comparable results of BHR Vs ASR hip resurfacing replacements. Method and materials: 152 BHRs (137 patients, 15 bilateral) Vs. 120 ASRs (107 patients, 13 bilateral). The two groups were comparable with regards to age, gender and other demographics. The mean follow-up for BHR group was 53.49 months (range: 15-89 months) and that of ASR group was 26.57 months (range: 10-52 months). Results: The mean pre-op OHS for BHR group was 38.48 (range: 23-50), which improved to a mean post-op OHS of 16.20 (range: 12-40) while the mean pre-op OHS for ASR group was 40.44 (range: 27-55)($p < 0.05$), which improved to a mean post-op OHS of 21.58 (range: 12 - 40)($p < 0.05$). Complications for BHR group: neck fracture in 2, notching in 1, HO in 3, LLD in 2, nerve palsy in 3, superficial wound infection -1, bursitis- 2, psoas tendonitis -2, ALVAL -2, , impingement -1. Complications in ASR group: superficial wound infection in 2 patients, notching of neck in 2, PE -1, bursitis -3, LLD -1, impingement -1, ALVAL - 1, fracture-1, HO-1. Revisions: BHR group: 6 patients had revision surgery with a revision rate: 3.94% at a mean of 4.5 years. ASR group: 3 patients had revisions with a revision rate: 2.5% at a mean of 2 years. Conclusion: Both types of resurfacing hip replacements had similar results in this single surgeon independent series.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 10:45-12:15
Room: Congress Hall

Abstract number: 23844

**OSTEONECROSIS OF THE FEMORAL HEAD FOLLOWING RESURFACING THA.
A CLINICAL PET STUDY**

Gösta ULLMARK¹, Jens SÖRENSEN², Jan MILBRINK³, Olle NILSSON³, Kent SUNDGREN¹

¹*Ortopedic Clinic, Gävle (SWEDEN)*, ²*Dept of Nuclear Med Uppsala Akademiska Hospital, Uppsala (SWEDEN)*, ³*Ortop Dept UAS, Uppsala (SWEDEN)*

Background: Since the historical reintroduction of resurfacing arthroplasty, the concept has spread widely. A number of questions like metal ions, pseudo tumor, long time results and viability of bone in femoral head remain to be answered. Aim: In our original prospective PET study of resurfacing THA (Ref 1), four of 14 patients had developed an asymptomatic osteonecrosis of the remaining part of the femoral head one year after surgery. Methods: In the present study those 4 cases were further analyzed again by F-PET-scans and radiography two years after surgery. The area of low fluoride uptake seen in prosthetic components, cement and non viable bone was analyzed. Results: In one case the area had diminished in three it had enlarged. No signs of osteo necrosis were seen on radiography and no patient had pain or discomfort from the hip. Discussion: Fluoride-PET is a sensitive tool to study dynamic processes of bone metabolism in vivo and none invasively. Metabolically damaged bone areas 1-2 years after resurfacing THA may diminish or enlarge. Clinical consequences of the present results are unclear. We recommend the resurfacing THA method to be used with restrictiveness until further research is presented. Ref 1: Osteonecrosis following resurfacing arthroplasty. A clinical positron emission tomography study of 14 cases. Ullmark G, Sundgren K, Milbrink J, Nilsson O and Sörensen J. Acta Orthop 2009; 80: 670-4.

Date: 2010-09-01

Session: Injury Prevention – A Focus on Cross-Border Interventions

Time: 16:00-17:45

Room: Congress Hall

Abstract number: 26880

CAPABILITIES OF DRIVER ASSISTANCE SYSTEMS IN ACCIDENT SCENARIOS. AN INTERDISCIPLINARY INTERCONNECTION ANALYSIS BASED ON REAL ACCIDENT DATA USED AS AN APPROACH FOR THE POTENTIAL EVALUATION OF DRIVER ASSISTANCE SYSTEMS.

Stefanie WEBER¹, Ulrich CHIPELLINO¹, Thomas WINKLE², Birgit GRAAB², Eckart DONNER², Antonio ERNSTBERGER³, Michael NERLICH³

¹Regensburg University Clinical Center, Audi Accident Research Unit, Regensburg (GERMANY), ²AUDI AG, Ingolstadt (GERMANY), ³Regensburg University Clinical Center, Department of Trauma Surgery, Regensburg (GERMANY)

The Audi Accident Research Unit (AARU) is an interdisciplinary cooperation between the AUDI AG and the Regensburg University Clinical Center. The AARU is supported by the Bavarian Department of the Interior and collaborates with the Bavarian police. Its objective is to promptly investigate road traffic accidents in an interdisciplinary analysis technical, medical and psychological. To enhance general road safety and thus also the safety of all road users the ambition of vehicle manufacturers is to develop passive as well as active safety systems. In this context, the emphasis lies on the development of driver assistance systems. Therefore, the AARU is gathering psychological data via standardized interviews with the drivers in order to get detailed information regarding the pre-crash phase. With this knowledge the AARU is able to identify the cause of the accident using the 5-step method and to judge whether driver assistance systems could have prevented the accident. The study shows that driver assistance systems which are already available for vehicles could significantly contribute to the enhancement of road safety. For the study accidents out of the AARU database were matched with the data from the official Bavarian statistic on road traffic accidents. Subsequently, a sample of 100 accidents was analyzed with the AARU's interdisciplinary approach. The results show that driver assistance systems that already exist in the market would have prevented the accident in 25 out of the 100 examined accidents. Consequently, the number of people injured would have been significantly reduced as well. In addition, AARU's interdisciplinary method of analyzing road accidents is also able to evaluate the effectivity (decrease of injury severity) of an increasing spread of driver assistance systems.

Date: 2010-09-01

Session: Injury Prevention – A Focus on Cross-Border Interventions

Time: 16:00-17:45

Room: Congress Hall

Abstract number: 26857

BICYCLE HELMETS – DO WE NEED A EUROPEAN LEGISLATION? A HEALTH ECONOMIC PERSPECTIVE

Christian JUHRA¹, Udo WEISS², Marcus MESSERSCHMIDT³, Britta WIESKÖTTER¹, Michael J RASCHKE¹

¹*Klinik und Poliklinik für Unfall-, Hand- und Wiederherstellungschirurgie, Münster (GERMANY)*, ²*Polizeipräsidium Münster, Münster (GERMANY)*, ³*Direktion Verkehr, Münster (GERMANY)*

The need for a legislation enforcing bicycle helmet use has been discussed controversially in the EU member states and beyond. Bicycling is one the most non-polluting and healthiest means of transportation. Using the Health Economic Assessment Tool provided by the WHO, the present value of the mean annual benefit of bicycle use in Münster was 77.063.000 Euro. Yet each year around 85.000 bicyclists are injured or killed. Using costs associated with accidents as provided by the German Road Agency (BASt), a total burden to society summing up to 28.349.749 was caused by bicycle accidents in a year in the city of Münster. Among these, 1 death and 39 hospital admissions were caused by traumatic brain injury alone, summing up to a total cost to society of 4.565.376. While several studies clearly show the use of bicycle helmet in the prevention of traumatic brain injury, evidence exists that the introduction of laws enforcing helmet wear lead to a decrease in bicycle use. Assuming that bicycle helmet laws could prevent all brain injuries and would at the same time lead to a 10% decrease in bicycle usage, the cost for society would be 3.140.924. Thus prevention methods need to be identified that do not decrease the use of bicycles. Experiences in other countries where the infrastructure for bicycles is very good (like the Netherlands) have shown that an improvement of bicycle roadways etc. can also lead to a decrease in bicycle accidents. Member states can learn from success and failure of projects performed in other states. Since the circumstances in each member state differ, the needed measures will also differ. A joined EU effort is necessary to promote safe cycling and should not focus alone on bicycle helmet use, but include other factors (e.g. alcohol and cycling) as well.

Date: 2010-09-01
Session: Trauma Shoulder - Elbow
Time: 08:00-09:30
Room: H1

Abstract number: 25608

PROXIMAL HUMERAL FRACTURE FIXATION – DOES THE IMPLANT MATTER?

Rahul KAKKAR, R. KAKWANI

Northern Deanery, Newcastle (UNITED KINGDOM)

Various operative treatments have been proposed for proximal humeral fractures. The purpose of our study was to compare complications of plate versus nail for these proximal humeral fractures and to determine whether it is the implant or fracture and surgeon related factors which result in complications. We had 74 patients operated from March 2006 till June 2008 for displaced 3 (49pts) or 4 (25pts) part proximal humeral fractures. 43 had plating (PHILOS) and 31 had a humeral nail inserted. 57 patients were over 60 years at presentation while 17 were younger than 60. The functional outcomes were assessed by Quick DASH score and were comparable in both groups at 1 year postoperatively. 18 of the 43 patients in the Plating group had a radiological complication with 9 cases of screw cutout, 5 fractures maluniting and 1 nonunion. There was no case of osteonecrosis. In the nailing group, 13 patients had radiological complications, with 8 patients having varus malunion, 3 having proximal screw loosening and 1 having osteonecrosis apart from the clinical complications of impingement and rotator cuff problems. Given the similar complication rate and functional outcome achieved by both these techniques it is hard to determine if any one in particular is better. The key determining factors might actually be patient and surgeon related. It is important to achieve medial continuity and good initial reduction in these fractures to prevent them from collapsing into varus, especially with the nails. Also, age, osteoporosis and functional demand are factors determining success.

Date: 2010-09-01
Session: Trauma Shoulder - Elbow
Time: 08:00-09:30
Room: H1

Abstract number: 23183

**THE USE OF LOCKING PLATES IN PROXIMAL HUMERAL FRACTURES:
COMPARISON OF OUTCOME BY PATIENT AGE AND FRACTURE PATTERN**

Uthman ALAO, Michael LEONARD, Aaron GLYNN, Mark DOLAN, Pat FLEMING
Cork University Hospital, Cork (IRELAND)

Background - Proximal humeral fractures are challenging. The anatomy is complex, the blood supply precarious and the bone quality often poor. Objectives - This study was undertaken to evaluate the efficacy of a proximal humeral locking plate (PHILOS), and to specifically study the effect of patient age and fracture type on outcome. Patients and Methods - The radiographs and hospital notes of 31 patients who underwent fixation with a PHILOS plate between 2003 and 2007 were reviewed. Fractures were classified with the AO/ASIF system. A Quick DASH questionnaire was sent to each patient. Minimum follow up was 18 months. Results - Average scores per AO/ASIF fracture type was 25.3 for type A, 21.4 for type B and 22.7 for type C. There was no statistically significant difference between these groups. The mean DASH score for patients less than 65 years of age was 21.5 and 27.5 for patients over 65 years of age. This was significant ($p=0.03$). At final radiologic review (mean 12 months post-op) 30 of the patients had united (96%). The mean time to union was 12 weeks. Seven patients (22.5%) required a second surgical procedure. Conclusion - The PHILOS plate is a useful addition to the armamentarium of the trauma surgeon; however we experienced a high number of complications and re-operations with its use. Inferior results may be expected in patients over 65 years.

Date: 2010-09-01
Session: Trauma Shoulder - Elbow
Time: 08:00-09:30
Room: H1

Abstract number: 26317

**SURGICAL TREATMENT FOR NON-UNION OF THE MID-SHAFT CLAVICLE:
ANALYSIS OF THE LONG-TERM RESULTS**

Teng-Le HUANG¹, Horng-Chaung HSU¹, Ching Chieh YANG², Jiunn-Jer WU³, Hsiu-Chen LIN¹, Hong-Wen WU¹

¹*China Medical University and University Hospital, Taichung (TAIWAN)*, ²*Youngfore Hospital, Taipei (TAIWAN)*, ³*Chung Shan Hospital, Taipei (TAIWAN)*

A retrospective study was performed to evaluate the effect of AO reconstruction plate in the open reduction and internal fixation for nonunion of the mid-shaft clavicle. In this study, we examined the relationship between the position of the scapula and the final functional results. From January 1998 to January 2005, 21 patients with symptomatic nonunion of the mid-shaft clavicle were collected. Seventeen nonunions were atrophic and four were hypertrophic. Nineteen patients were initially treated conservatively with a figure-of-eight bandage and two patients underwent primary cerclage wire fixation. The follow-up period was 65.7 (24-108) months. Outcome analyses included standard clinical follow-up, plain radiographs, the Constant and Murley score and subjective assessment. All nonunions united well with the union time of 13.6 (11-27) weeks. All patients were satisfied with their surgical results. Moreover, older age and longer period of nonunion result in a larger amount of scapular malposition that is related to poor functional results. In this study, we found that older age and longer period of nonunion resulted in a larger amount of scapular malposition that related to poor results. Furthermore, meticulously open reduction and rigid internal fixation with AO reconstruction plate is very useful and effective in the surgical treatment of nonunion of mid-shaft clavicle.

Date: 2010-09-01
Session: Trauma Shoulder - Elbow
Time: 08:00-09:30
Room: H1

Abstract number: 23490
CLAVICLE NAILING – A STUDY OF 40 CASES
Amit AGARWAL
S.N. Medical College, Agra (INDIA)

Clavicle fractures are common and commonest site is mid third. By conservative methods chances of delayed healing is 10-30% it is more common in high speed injuries, females, older patients, smokers. Disadvantages are unfavourable humping and poor shoulder function. Plates have there own disadvantages of becoming prominent and superficial and at the edges of the plate presenting a fracture risk. To overcome these disadvantages clavicular nailing is preferred over conservative methods and plating. The only indication in which clavicular nailing is less useful is comminuted fracture. A study of 40 cases of clavicle nailing was done with the help of 2.0 / 2.5mm thick titanium elastic nail. The results were documented at an 1,3 & 6 months. The advantages of intramedullary nailing were minimal trauma to soft tissues, safer approach, better chances of union, no deformity and fast recovery.

Date: 2010-09-01
Session: Trauma Shoulder - Elbow
Time: 08:00-09:30
Room: H1

Abstract number: 25193

CORACOCLAVICULAR SUTURE ANCHOR FIXATION FOR ACUTE ACROMIOCLAVICULAR JOINT INJURY AND LATERAL END CLAVICLE FRACTURES- OUR EXPERIENCE IN 23 PATIENTS

Sitaram GIRI, K. KATAM, Paresh SONSALE

Good Hope Hospital, Sutton Coldfield (UNITED KINGDOM)

Introduction: Multiple options exist for treating acute acromioclavicular injuries and fractures of lateral end of clavicle. There is not much evidence to suggest the superiority of one method over the other. We present our experience in 23 consecutive patients using coracoclavicular fixation using Arthrex Tightrope fixation device. Patients and Methods: 23 consecutive patients with acute acromioclavicular injury(>Grade 3) and type 1 lateral clavicular fractures were included. There were 19 males and 4 females with average age of 35 years (range 17-59 years). 20 had AC joint injury and 3 had lateral end clavicle fracture. All were operated by single surgeon at mean of 6.5 days after injury (range 2-20 days). Coracoclavicular fixation using Arthrex tightrope device was used in all cases. All patients were reviewed at 2 weeks, 6 weeks and 6 months. Shoulder ROM, Oxford Shoulder score, radiological assessment and subjective scoring were recorded at 6 weeks and 6 months. Results: 19 patients had full return of shoulder movement and 22 patients had >90% return of shoulder movements at last follow up. The mean Oxford shoulder score was 52.2 at 6 months (range 40-59). All patients were pain free and had returned to preinjury activity level at last follow up. There was no case of implant failure. On subjective scoring most patients reported good to excellent results. Our results using the coracoclavicular suture anchor fixation for acute acromioclavicular suggest this as a reliable option with the added advantage of not needing a second operation for hardware removal

Date: 2010-09-01
Session: Trauma Shoulder - Elbow
Time: 08:00-09:30
Room: H1

Abstract number: 23388

EXTERNAL ROTATION SPLINT TO PREVENT RECURRENCE IN YOUNG ANTERIOR SHOULDER DISLOCATORS

Santosh VENKATACHALAM, Roland PRATT

North Tyneside General Hospital, North Tyneside (UNITED KINGDOM)

Bankart lesion occurs in 84% of patients with anterior traumatic shoulder dislocation. The tension of the subscapularis, which increases in external rotation, may also prevent separation of the site of the lesion from the glenoid. Recurrence rate varies from 50-94% in literature in young patients. This is a prospective study over one year that looked at recurrence rate in young shoulder dislocators treated with this splint. All patients <40 years with first time anterior traumatic shoulder dislocation with external rotation splint for 4 weeks were included. Recurrent dislocators and associated fractures in glenohumeral joint were excluded. Out of 36 patients (32) males, 16: < 20 years, 10: 21-30 years, and 10: 31-40 years. Problem with compliance was mainly during the night. Patients were followed up at one year to check for any evidence of instability, operations on the shoulder and return to work/activities. At one year from initial dislocation, 5 had recurrent dislocations due to Bankarts lesion and were operated with anterior stabilisation. In this group, 3 were compliant and the two in non compliant group were both < 20 years. The stable group had returned to work and also sports/overhaed activities by 3 months following the initial episode. Recurrence rate in our study was around 16% and in patients less than 20 years was 20%. The initial results of using this splint are promising. Compliance is a major issue especially wearing during the night- patients need to be well motivated and understand its importance in preventing recurrence.

Date: 2010-09-01
Session: Trauma Shoulder - Elbow
Time: 08:00-09:30
Room: H1

Abstract number: 25694

MINOR SHOULDER INSTABILITY COMBINED WITH SUBACROMIAL IMPINGEMENT. INTRA-ARTICULAR PATHOLOGY PRESENTING EXTRA-ARTICULAR SYMPTOMS

Ulf NORDENSON¹, Raffaele GAROFALO², Marco CONTI², Jennie CLASSON³, Linger EVA⁴, Karlsson JON⁵, Alex CASTAGNA²

¹OrthoCenter, Göteborg (SWEDEN), ²Shoulder and Elbow Unit, Rozzano, Milan (ITALY), ³Department of Physiotherapy, Mölndal (SWEDEN), ⁴IFK Rehab, Göteborg (SWEDEN), ⁵Department of Orthopaedic Surgery, Mölndal (SWEDEN)

20 patients with minor shoulder instability combined with subacromial impingement had surgery with plication of the shoulder joint capsule. All patients underwent preoperative assessment by one independent physiotherapist, using Constant and WOSI scores, Castagna test on both the affected and non-affected sides. Hawkins test and subacromial pain in 90 degrees abduction and internal rotation were evaluated too. All patients followed the same rehabilitation protocol by a second physiotherapist. All patients were followed at 6, 12 and 24 months postoperatively by the same independent physiotherapist. Results: At 24 months, the Constant score had improved from 73.5 preoperatively to 89.5. WOSI had improved from 49.4 preoperatively to 82.3. 19/20 patients had a positive Hawkins sign at >20 degrees preoperatively and 4/19 had a positive Hawkins sign at the 24 months follow-up ($p < 0.0001$). 16/19 had pain during internal rotation in 90 degrees of abduction at >45 degrees preoperatively; 1/19 had pain during this manoeuvre at the 24 months follow-up ($p < 0.0001$). 19/19 had a positive Castagna test preoperatively, 1/19 had a positive Castagna test at the 24 months follow-up. 7/19 had a positive Castagna test on the contralateral side preoperatively while 3/19 was positive on this side at the 24 months follow-up ($p = 0.2$). Conclusion: We conclude that minor shoulder instability is an intra-articular pathology presenting extra-articular symptoms. By treating the intra-articular pathology the extra-articular symptoms can be relieved in the vast majority of patients.

Date: 2010-09-01
Session: Trauma Shoulder - Elbow
Time: 08:00-09:30
Room: H1

Abstract number: 23624

A RANDOMISED CONTROLLED TRIAL COMPARING A LOCKING PLATE WITH NON-OPERATIVE TREATMENT IN ELDERLY PATIENTS WITH A DISPLACED 3-PART PROXIMAL HUMERAL FRACTURE

Per OLERUD¹, Leif AHRENGART¹, Sari PONZER¹, Jenny SAVING¹, Jan TIDERMARK²

¹*Karolinska Institutet, Södersjukhuset, Stockholm (SWEDEN)*, ²*Karolinska Institutet, Capio S:t Görans sjukhus, Stockholm (SWEDEN)*

Background: The aim of the study was to report the 1-year outcome after a displaced 3-part fracture of the proximal humerus in elderly patients randomised to treatment with a locking plate or non-operative treatment. **Patients and Methods:** We included 60 patients, mean age 74 (56 to 92) years, 80% being women. Follow-up examinations were done at 4 and 12 months. The main outcome measures were the Constant and DASH scores and quality of life according to the EQ-5D. **Results:** In the locking plate group the reduction was judged to be good in 86% of the patients. 3 patients (10%) underwent reoperations (1 non-union and 2 deep infection). In the non-operative group all but 1 fracture healed and none of these patients were operated upon during the study period. At the final follow-up the mean EQ-5D index score was 0.74 in the locking plate group, compared to 0.65 in the non-operative group ($p = 0.34$) The corresponding values for the Constant score were 61 versus 57 ($p = 0.18$), flexion 114° versus 108° ($p = 0.25$) and , for the DASH score, 29 versus 35 ($p = 0.32$). **Conclusion:** The results of our study indicate an advantage in functional outcome and quality of life in favour of the locking plate over the non-operative approach in the treatment of elderly patients with a displaced 3-part fracture of the proximal humerus. Although the study was not entirely conclusive, our data can be used in future meta-analyses.

Date: 2010-09-01
Session: Trauma - Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 26820

THE USE OF NERVE STIMULATION DURING PERCUTANEOUS PINNING OF SUPRACONDYLAR FRACTURES IN CHILDREN

Haim SHTARKER, Riad DAKWAR, Alexander GUREVICH, Gershon VOLPIN
Western Galilee Hospital, Nahariya (ISRAEL)

Injury to the ulnar nerve from the medial pin is the major concern during percutaneous pinning for supracondylar fractures. The incidence is estimated to be 2% to 3%. Fixation of supracondylar fractures by 2 lateral pins doesn't provide enough stability. Soft tissue edema or excessive mobility of ulnar nerve may be predisposing factors for iatrogenic injury. During last five years 224 children with supracondylar fractures were operated. In all cases we used nerve stimulator permanently connected to pin during all time of wire insertion. In order to produce permanent monitoring of ulnar nerve during fixation, changes in setting of stimulator were made. There were 201 children with extension type of supracondylar fracture and 23 with flexion type. Average age of the patients was 5.3 years (range 3-9 years). Open supracondylar fractures and children with brachial artery compromise weren't included in this study. Closed reduction and percutaneous KW fixation by 2 or 3 pins were performed in 206 fractures, in 18 cases open reduction of fracture KW fixation was done. In 7 cases no stimulation from ulnar nerve was observed prior to reduction. In those cases exploration on ulnar nerve was performed before reduction. No rupture of nerve was found, but in 3 cases was noted crush of ulnar nerve which was caused by sharp bone end. In all cases anatomic reduction was achieved. No cases of nerve or vascular injury were observed, except two cases with postoperative neuropraxy of ulnar nerve (less than 0.5%) despite achieved and controlled stimulation. No cases of secondary fracture displacement were noted. Absence of stimulation from ulnar nerve prior to reduction is reliable predictor for nerve injury and nerve exploration should be performed. The monitoring of ulnar nerve by nerve stimulator is reliable and makes insertion of wires secure.

Date: 2010-09-01
Session: Trauma - Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 26440

HEMIARTHROPLASTY FOR COMMUNUTED DISTAL HUMERUS FRACTURES OF THE ELDERLY

Klaus BURKHART¹, Stefaan NIJS², Stefan MATTYASOVSKY³, Dominik GRUSZKA¹, Pol ROMMENS¹, Lars MÜLLER¹

¹*Department for Trauma Surgery of the Center for Musculoskeletal Surgery, University Mainz, Germany, Mainz (GERMANY),* ²*Department for Trauma Surgery, University Hospital of the Catholic University of Leuven, Leuven (BELGIUM),* ³*Department for Trauma Surgery of the Center for Musculoskeletal Surgery, Johannes Gutenberg-University Mainz, Mainz (GERMANY)*

Purpose: The Purpose of our study was to evaluate the objective and subjective as well as radiographic results after distal humerus hemiarthroplasty for comminuted distal humerus fractures of the elderly. **Methods:** Ten female patients were treated with distal humerus arthroplasty due to eight fresh osteoporotic distal humerus fractures and two early failed osteosyntheses of distal humerus fractures. Mean follow-up was 12.1 months (6-23). Mean age was 75.2 years (62-88). All patients were reexamined using the Mayo Elbow Performance Score (MEPS) and Disabilities of the Arm, Shoulder and Hand score (DASH) as well as ap and lateral radiographs of the injured elbow. **Results:** According to the MEPS eight patients achieved an excellent, one a good, and one a fair result. The mean DASH was 11.49 (0-44). Flexion averaged 124.5° (95-140°), the extension deficit was 17.5° (5-30°), pronation 80.5° (60-90°) and supination 79.5° (50-90°). The following complications were seen: one triceps insufficiency, one ulnar nerve irritation, one wound infection and two cases of heterotopic ossifications. The wound infection could be managed with debridement. No explantation or further surgery was performed. No evidence of loosening, radiolucencies or proximal bone resorption could be detected, whereas one patient developed progressive osteoarthritis of the proximal ulna and radius. **Conclusions:** Distal humerus hemiarthroplasty can lead to excellent short-term results in elderly patients. Complications found were minor and reoperation rate was low.

Date: 2010-09-01
Session: Trauma - Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 26566

TOTAL ELBOW ARTHROPLASTY AS A TREATMENT OPTION IN COMPLEX INJURIES OF THE ELBOW IN ELDERLY PATIENTS

Lars BECKER, Kay SCHMIDT-HORLOHÉ, Andreas BONK, Reinhart HOFFMANN
Berufsgenossenschaftliche Unfallklinik, Frankfurt (GERMANY)

Between March 2005 and September 2009 we implanted 25 Coonrad-Morrey prosthesis in 24 patients (15 female, 9 male) with a mean age of 67. 8 patients had AO type C fractures and were treated with primary implantation. 16 patients received a secondary implantation including 7 posttraumatic arthrosis, 3 nonunions, 3 failed osteosynthesis, 3 chronic luxations and 1 reimplantation after deep prosthetic infection. The mean follow up was 12 ± 8 months. The functional outcome was measured by using the Mayo Elbow Performance Score. All patients achieved very good results based on the used score with a postoperative mean of 97 points (range 90 to 100 points) with a maximum performance of 100 points. The mean range of motion concerning extension and flexion was 92 degrees (55 to 115 degrees), concerning pronation and supination 144 degrees (100 to 160 degrees). The mean flexion deformity was 19 degrees (10 to 50 degrees), the mean maximum flexion was 112 degrees (90 to 130 degrees). We had two partial ruptures of the triceps tendon, one treated operatively, one temporary lesion of the ulnar nerve and one postoperative hematoma which needed surgical treatment. One patient needed revision surgery and resection arthroplasty due to a deep infection, but received a new prosthesis after two months. We recorded no radiographic loosening or other mechanical problems so far. Our findings indicate that total elbow arthroplasty should be considered as an additional treatment alternative. Patients with a lower functional demand and of higher age benefit most from a prosthesis.

Date: 2010-09-01
Session: Trauma - Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 26558

THE VALIDATION OF RADIO-CAPITELLUM RATIO (RCR) MEASUREMENT ON HUMAN ELBOWS

Fanny CANET¹, Dominique ROULEAU¹, Emilie SANDMAN², Georges-Yves LAFLAMME¹, George ATHWAL³, Yvan PETIT⁴

¹*Hopital du Sacre-Coeur, Montreal (CANADA)*, ²*Universite de Montreal, Montreal (CANADA)*, ³*Hand and Upper Limb Clinic, London (CANADA)*, ⁴*École de Technologie Supérieure, Montreal (CANADA)*

Purpose: The purpose of this study was to develop and validate a method to measure the radiocapitellar joint translations in patients elbow. This measure has been already validated on sawbone model. **Methods:** A radiological study on 50 lateral elbow x-rays from 25 normal patients (right and left side) was performed in order to quantify radial head translations: the Radio-capitellum ratio (RCR) in percentage. The displacement of the radial head was obtained by measuring the distance between the radial axis and the center of the capitellum with sliceOmatic, Tomovision, Magog, QC, Canada. The ratio of the radial displacement to the diameter of the capitellum was done to eliminate effect of magnification. A result over 100% means a complete dislocation ie the offset of the axis of the radius is equal or greater than the capitellum diameter. RCR was measured two times by two independent evaluators to test inter-observer agreement and intra-observer consistency. **Results:** Mean translation was of -4% (SD 5%: -30% to 24%). A 4% RCR in a 28 mm capitellum diameter means 1.12 mm of translation. Negative values signify posterior translation. Intra-observer reliability was very good for the RCR (ICC over 0.9) and good for inter-observer reliability (ICC over 0.5). **Conclusion:** This study showed that RCR measurement in normal patient is not 0%, cause by a 5% measurement error or by a normal joint laxity of the elbow. The proposed measurement of radial head translation about the capitellum: RCR has good reliability when using our measurement method.

Date: 2010-09-01
Session: Trauma - Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 26554

IS NORMAL FUNCTIONAL OUTCOME POSSIBLE IN TYPE C INTERCONDYLAR DISTAL HUMERAL FRACTURES?

Aditya AGGARWAL, Tarun GOYAL

Post graduate Institute of medical Education & Research, Chandigarh (INDIA)

Intercondylar distal humeral fractures are uncommon with unsatisfactory results. Surgical treatment poses a therapeutic dilemma due to complex anatomy, limited bone stock, accompanying comminution and osteoporosis. Objective of this study was to analyze the ultimate functional outcome in type C Intercondylar distal humeral fractures. Study was carried out prospectively in 80 patients managed by Open reduction and internal fixation. Posterior approach with Olecranon osteotomy was used. Bicolumnar fixation was done in 61 and single plate in 19 patients. Internal fixation was done with reconstruction plates only and/or with LCDCP. Anterior transposition of ulnar nerve was done in all cases. Active mobilization of the joint was started at the first wound inspection. Functional outcome was evaluated using Jupiter's rating system. Mean age was 35.6 years (range 15-65). Mean time between injury and surgery was 14 days (range: 1-88). Majority were type C3 injuries (67). Mean follow up was 100.6 months (range 7-134 months). Excellent to good results were seen in 66 (n=80; 82.5% patients). 9 (11.3%) had fair and 5 (6.2%) poor results. Mean flexion-extension was 87o (36o-123o). Mean time for union was 3.8 months. 5 cases had superficial infection. Ulnar nerve neuropraxia was seen in 3 cases with complete recovery. Heterotopic ossification occurred in 3 patients. Anatomical reduction with Perfect congruity of intraarticular fragments and stable internal fixation with early postoperative mobilization may restore range of motion as close to normal as possible with good to excellent functional outcome.

Date: 2010-09-01
Session: Trauma - Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 25559

TENSION BAND WIRING FOR OLECRANON FRACTURE. SHOULD WE ROUTINELY REMOVE THE METALWORK?

Syah BAHARI, Mugtaba AMIN, Seamus MORRIS, Joseph SPARKES
Department of Trauma and Reconstructive Surgery, Dublin (IRELAND)

Introduction: Tension band wiring for olecranon fracture can be complicated by pain, metal prominence, ulceration and infection. No good evidence exists to support early removal of metal to reduce the incidence of these complications. This study was designed to investigate whether routine removal of metal should be a part of the treatment algorithm allowing the patient to be informed of the definite necessity for a second procedure and planning for same, or if patients should be managed symptomatically on a case by case basis, and what effect retained metalwork had on elbow function. Patients and Methods: Patients were identified from the fracture database and followed up for clinical and radiological outcome. Demographic data, date of procedure, metalwork removal and complications were collected. The Mayo elbow performance score was used to assess clinical outcome. Results: 56 patients were identified and 48 were followed up. 19 patients had removal of metalwork due to metal prominence while (3) removed due to infection. The mean score in metalwork removed patients was 93.89(90-100) compared to 86.2(70-90). Complications noted were pain (19) infection (5), metal prominence (20), wires sticking out through the skin (2), stiffness (3) and non union (1). Conclusion: 40% of the studied population has symptomatic metal prominence, which requires metalwork removal. A significant improvement in Mayo elbow performance score ($p < 0.05$) was seen in the metalwork removed group compared to none removed. We recommend offering early removal of metalwork to prevent complications and improving clinical outcome.

Date: 2010-09-01
Session: Trauma - Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 25093
SIDE SWEEP INJURIES AROUND ELBOW
Mrinal SHARMA
Indraprastha Apollo Hospital, New Delhi (INDIA)

High-energy trauma may result open injuries around the elbow joint. The management of these injuries can be difficult. Methods: A total of 34 cases of side sweep injuries were seen between 2002-2007 of which 22 were complex grade 111 injuries and 12 were bony injuries with major skin problems. 94% were adult males and rest were females with age group 8-48 years (mean age 30 years). 98% sustained injury while their limbs were protruding outside the vehicles. Major soft tissue loss was seen in 22 patients, radial nerve injury in 10, vascular injury in 6 and primary bone loss in 4 patients. Management includes debridement after vascular repair, fracture stabilisation (external or internal fixation), nerve repair and soft tissue coverage. Relook debridement if needed. Tendon transfers were required in 6 patients. Soft tissue coverage was achieved by skin graft in 10, muscle transposition in 2, latissimus dorsi myocutaneous flap in 6 and free tissue transfer in 4. Complications were infection in 2, blowout of repaired artery in 2, VIC in 2, non-union in 8 and ankylosis in 2 cases. Functional range of motion was achieved in 20 patients. 6 had restricted ROM and 6 had poor functional results. 2 were lost to followup. Conclusion: side sweep injuries can be prevented by keeping limbs inside the vehicle. A multispeciality approach is needed.

Date: 2010-09-01
Session: Trauma - Elbow
Time: 13:30-15:00
Room: H1

Abstract number: 25797

MANAGEMENT OF ADULT PROXIMAL ULNAR FRACTURE WITH DIFFERENT METHODS OF PLATE FIXATION ALONG WITH A DESCRIPTION OF BADO I AND II COMMUNUTED FRACTURE PATTERNS

Sudiptomohan MUKHOPADHYAY, A. GUHA, K. MOHANTY
University Hospital of Wales, Newport (UNITED KINGDOM)

INTRODUCTION: Locking plate system has revolutionised management of difficult fracture patterns. Our study aims to reviews the results of management of proximal ulnar fractures with locking plate against DCP or LCDCP systems. **PATIENTS AND METHODS:** Between 2005 and 2009, thirty-five patients were selected and sub-grouped retrospectively with proximal ulnar fractures. Group 1 patients were treated with locking compression plate or locking reconstruction plate (n-21). In group 2 (n-14) proximal ulna fractures were treated with AO DCP or reconstruction plates. **RESULTS:** In group one, 95% patients had adequate radiological healing. Majority (16/21) had good clinical outcome MEP score 75-100. In group two thirteen (93 %) patients had good radiological healing at the end of follow up. Eleven patients had good clinical outcome (MEP score-85-100). In group 1 there was a larger number of patients with comminution significantly greater ($p<0.05$) than the patients in group 2. This resulted in a relatively better MEP scores in group 2 patients ($P= 0.07$). We have also described a Bado equivalent type of fractures with marginal fractures or impacted fractures of the radial head or neck. **CONCLUSION:** For more complex adult Monteggia fracture-dislocations with comminution locking plates appears to provide wider range of solution than AO DCP or reconstruction plate although clinical outcome may not be significantly different. It appears that equivalent injuries to Bado type II fractures require similar surgical management with use of locking system.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 16:00-17:45
Room: H1

Abstract number: 25755

BEHAVIOR OF ISOELASTIC FEMORAL STEMS – LONG-TERM FOLLOW-UP RESULTS

Gennady KUROPATKIN

Samara Regional Clinical Hospital, Samara (RUSSIA)

Preventing of the stress shielding remains one of the main goals in hip replacement. One of possibility solve this problem is produce stem from isoelastic materials. The aim of our work was clinical progress observation and retrospective analysis after implanting old and new generations of isoelastic femoral stem prosthesis. Materials and methods. From 1996 to 2001 three groups patients after uncemented stem implantation were marked out - first (39 pat) with old generation RM stem, second group with new generation Physiologic stem (composite prosthesis consisting of a titanium core sheathed in implantable PEEK polymer and additionally coated with a titanium layer). In control group (142 pat) standard Spotorno stems were used. Follow-up period was 8-12 years (average 9,5). Clinical and functional results were evaluated by Harris Hip Score. Bone density in Gruen's zones was measured by densitometer. Postoperatively, the patients were evaluated at three, six months, one year, and then each year. Results. In first group revision rate was very high - 23% (9 pat.), and in 15,4 % (6 pat.) proximal part of femur was destroyed totally. In second group revision rate was considerably low - 6,9 % (4 pat.), but in control group revision rate was only 1,4 %. Isoelastic stems, especially old generation, often provoked hip pain. The results of our study don't let us make absolute statements yet, but we decidedly don't recommend old RM stem generation. The behavior of the Physiologic stems is more attractive, but still worse than classic uncemented stems.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 16:00-17:45
Room: H1

Abstract number: 25315

A PROSPECTIVE COMPARISON OF FEMORAL PERIPROSTHETIC STRESS-SHIELDING IN PATIENTS IMPLANTED WITH 4/5TH AND 1/3RD POROUS COATED CEMENTLESS FEMORAL STEMS

Vijay KUMAR, Rajesh MALHOTRA

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

Aims & Objectives: This study aims to analyse and compare prospectively the femoral periprosthetic stress-shielding around 4/5th and 1/3rd porous coated cementless femoral stems in patients undergoing unilateral cementless total hip replacement done using DEXA scan by quantifying the changes in bone mineral density around femoral component. **Material & Method:** Femoral periprosthetic bone mineral density was measured in the seven Gruen Zones with DEXA scan at 2 weeks, 1 years and 2 years 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 stems and other 30 patients with 1/3rd porous coated 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 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 stems. Increased bone loss was seen in patients who had larger diameter stem (> 13.0 mm) and in patients with low bone mineral density in the unoperated hip. **Conclusion:** Bone loss as a result of stress-shielding is more pronounced in 4/5th porous coated stems as compared to 1/3rd porous coated stems.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 16:00-17:45
Room: H1

Abstract number: 25871

THE IMPORTANCE OF ADEQUATE STEM ANTEVERSION FOR ROTATIONAL STABILITY IN THA. AN RSA STUDY WITH 10 YEARS FOLLOW UP

Sverrir KIERNAN, Leif RYD, Gunnar FLIVIK
Dept of Orthopaedics, Lund (SWEDEN)

Progressive retroversion of the stem within the femur has been suggested to be an important initial mode of hip prosthesis failure. In 60 cemented THAs we have assessed the relationship between direct postoperative stem anteversion angle, measured with 3-D CT, and the rotational stability as measured with repeated RSA examinations during 10 years follow up. The patients were divided into three groups depending on the measured anteversion angle: $\leq 10^\circ$, 11° - 25° and $\geq 25^\circ$. At 10 years, all except one stem had rotated into a more retroverted position. There was a strong correlation between postoperative anteversion angle and later stem rotation towards retroversion. The group with $\leq 10^\circ$ of stem anteversion rotated significantly more towards retroversion, seen as early as 3 months and continuously significant for the whole follow up period. At 10 years the $\leq 10^\circ$ group had a mean retroversion of $13,5^\circ$ compared to $5,1^\circ$ in the 11° - 25° group and $5,2^\circ$ in the $\geq 25^\circ$ group. The distal stem migration were accordant with significantly more subsidence at 10 years for the $\leq 10^\circ$ group (2,4 mm compared to 0.5 and 0.4 mm respectively). Within 10 years 4 of the 13 stems in the $\leq 10^\circ$ group have been revised because of aseptic loosening. Our results strongly suggest that the initial rotational position of the femoral component during surgery is decisive for the degree of later retroversion, subsidence and eventual loosening. The degree of retroversion may be prosthesis design sensitive but less than 10° of anteversion appears deleterious.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 16:00-17:45
Room: H1

Abstract number: 25602

REVISION TOTAL HIP ARTHROPLASTY: A CEMENTLESS MODULAR STEM COMPARED WITH CEMENTED LONG-STEM PROSTHESES. A POPULATION-BASED STUDY FROM THE SWEDISH HIP ARTHROPLASTY REGISTER.

Rüdiger WEISS¹, André STARK¹, Johan KÄRRHOLM²

¹*Department of Molecular Medicine and Surgery, Section of Orthopaedics and Sports Medicine, Karolinska Institutet, Karolinska University Hospital, Stockholm (SWEDEN),* ²*Department of Orthopaedics, Sahlgrenska University Hospital, Gothenburg (SWEDEN)*

Background: We evaluated survival and risk-factors for revision of the cementless MP-Link stem in the Swedish Hip Arthroplasty Register. The results of conventional cemented long-stem (>15cm) hip revision arthroplasties were studied for comparison. **Methods:** 812 consecutive revisions with the MP-stem and a control group of 1,073 cemented long-stems operated between 1999-2007 were included. Kaplan-Meier-analysis was used to construct survival with reoperation and revision as the endpoint. The Cox regression-model was used to study risk-factors for reoperation/revision related to the patient and to the surgical technique. **Results:** The mean age at surgery with the MP-stem was 72 (SD 11) years. Most hips were revised due to aseptic loosening of the prostheses (57%), followed by periprosthetic fractures (26%). The cemented stems had a better survival for reoperation and revision at 1 and 3 years. However, at 5 and 7 years, both groups had a similar survival (MP-stem at 7 years: reoperation = 86% [95% CI 82-89], revision = 93% [91-96]). Multiple previous reoperations/revisions prior to the index operation increased the risk of further surgery for both the cementless and cemented cohort. Compared to the standard proximal part of the MP-prosthesis the shorter version showed an increased risk of reoperation (OR 2.4 [1.1-5.2]). **Conclusion:** Hip revision with a long cemented stem turned out to provide lower risk of reoperation/revision up to 3 years after the index operation. Thereafter the relative risk of revision of the uncemented modular stem decreased and equalized both at 5 and 7 years.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 16:00-17:45
Room: H1

Abstract number: 25833

BONE REMODELING AROUND SLPS (SELF LOCKING POROUS SYSTEM) CEMENTLESS HIP JOINT ENDOPROSTHESIS WITH PROXIMAL POROUS TITANIUM INSERTS

Aliaksei MASLAU¹, Alexander RUTSKY², Oleg NAVRAS¹

¹*Minsk Regional Clinic, Minsk (BELARUS)*, ²*Belarussian Medical Academy for Advanced Training of Doctors, Minsk (BELARUS)*

Bone resorption at the femoral stem due to stress shielding has been particularly observed secondary to cementless hip replacement. In order to increase proximal fixation of the stem, two porous titanium inserts - thickness 2-5 mm connected with apertures are used in the press-fit stems. The specified inserts provide deep throughout growing of the bone tissue and strong fixation of an implant. From 1997 to 2008, we used SLPS hip replacements in a series of 1444 primary total hip arthroplasties. We evaluated plain radiographs and clinical results of 198 hips for remodeling changes over time (extent and location of trabecular bonding, its condensation, cortical hypertrophy, cortical porosis). The mean follow-up period was 7,5 years. The average age of patients was 57,6 years (from 21 to 84). The 28 porous inserts taken from 14 removed implants and its break surface passed the microphotography with light microscope, SEM with chemical analysis system with special emphasizes the spread and mineral contents. The pores were filled with biological tissue with bone tissue indicative microelements on the depth of 4000 µm, which is equal to the insert width. Proximal augmentation of biologic fixation of the stems allowed reduce the distal cortical hypertrophy associated with tip fixation and proximal stress shielding and provides good clinical and radiographic results in 96% cases.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 16:00-17:45
Room: H1

Abstract number: 25660

RESULTS OF CEMENTLESS TOTAL HIP REPLACEMENT FOR BONY ANKYLOSIS IN PATIENTS WITH ANKYLOSING SPONDYLITIS

Rajesh MALHOTRA, Krishna Kiran EACHEMPATI, Vijay KUMAR
All India Institute of Medical Sciences, New Delhi (INDIA)

Introduction: The current study is an endeavor 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, which envisages assessment of the pain, function, deformities and range of motion 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 post operatively. Post operatively 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%. 13 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. Discussion: Cementless THA in osseous ankylosis in ankylosing spondylitis is a worthwhile surgical intervention in bony ankylosis.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 16:00-17:45
Room: H1

Abstract number: 24768

BONE REMODELING IN CEMENTLESS HA COATED THA STEMS AFTER 20 YEARS

Jens BOLDT

Orthopaedic Clinic Siloah, Muri (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 remodeling 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: 2010-09-01
Session: Arthroplasty Hip
Time: 16:00-17:45
Room: H1

Abstract number: 26521

SIMULTANEOUS BILATERAL CEMENTLESS TOTAL HIP REPLACEMENT

Zoran POPOVIC, Radoslav BARJAKTAROVIC, Dragan RADOICIC

Military Medical Academy, Clinic for Orthopaedic Surgery and Traumatology, Belgrade (SERBIA)

Simultaneous vs staged bilateral total hip arthroplasty (THA) continues to provoke controversies, with peri/postoperative complications representing the most significant issue. Main advantages of simultaneous bilateral THA are shorter hospital stay, lower expenses and lower postoperative risk of common complications. This study compares 81 consecutive patients who underwent simultaneous bilateral cementless THA, to 156 patients with two staged bilateral THA in the same period. All operations were performed with standard surgical technique in lateral decubitus position using a single cementless prosthesis design, antibiotic and antithrombotic prophylaxis. The operations were followed by a single rehabilitation period within one hospital stay. There was no significantly more inpatient complications and adverse events in patients who underwent simultaneous bilateral THA. Rate for the most common complications (infection, DVT, pulmonary embolism, instability and loosening) was similar in both groups, but we noted that 12% of patients in bilateral THA group had higher transfusion requirement, and 14% of patients failed to reach physical therapy goals during admission. Need for subsequent hip surgery was not significantly higher in simultaneous bilateral patients. Simultaneous bilateral total hip arthroplasty has advantages where both hips are symptomatic and has less risk in younger patients with understanding of the increased risk of pulmonary complications.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 16:00-17:45
Room: H1

Abstract number: 23958

PERIPROSTHETIC BONE MINERAL DENSITY CHANGES AROUND STEMLESS AND STEMMED CEMENTLESS ANATOMIC FEMORAL COMPONENTS

Young-Hoo KIM, Yoowang CHOI, Jun-Shik KIM

Ewha Womans University School of Medicine, Seoul (KOREA)

Stress shielding bone resorption in the proximal femur after total hip arthroplasty (THA) continues to be a problem. We asked whether stress shielding bone resorption, Harris hip scores, thigh pain, radiographic results, and complication rate would be better in the patients with a stemless femoral component than those with a stemmed femoral component. Fifty patients (60 hips) in each group were matched prospectively for age, gender, weight, height, body mass index, diagnosis, bone type, and activity level. One group received a stemless femoral component and another group received a stemmed femoral component. The mean follow-up was 3.35 years (range, three to four years) in both groups. Grade 1 or 2 stress shielding bone resorption of calcar femorale in stemless femoral component group and grade 3 or 4 stress shielding bone resorption of proximal femur in a stemmed femoral component group was observed. The BMD was significantly increased in the femoral zone 1, but it was slightly decreased in the zone 7 in the stemless femoral component group. In the stemmed femoral group, the BMD was markedly decreased in the both zones 1 and 7. Harris hip scores, radiographic results, and complication rate were similar between the two groups. Five patients (10%) only in the stemmed femoral component group complained of thigh pain. No hip in either group required revision of the component. Stemless femoral component gave markedly less stress shielding bone resorption than stemmed femoral component. The patients with a stemless femoral component had no thigh pain.

Date: 2010-09-01
Session: Arthroplasty Hip
Time: 16:00-17:45
Room: H1

Abstract number: 23888

5 YEARS FOLLOW-UP RESULTS OF BONE MINERAL DENSITY AFTER IMPLANTATION OF A FEMORAL NECK HIP PROSTHESIS. A PROSPECTIVE ANALYSIS.

Wolfram STEENS¹, Philipp MÜLLER², Ulrich SIMON², Ralf DECKING³

¹*Paracelsus- Klinik, Marl (GERMANY)*, ²*St. Franziskus Hospital, Münster (GERMANY)*, ³*Orthopädische Universitätsklinik, Ulm (GERMANY)*

BACKGROUND: Stress shielding in the proximal part of the femur is a well known problem noticed in a number of conventional cementless stems. Femoral-neck implants are designed to avoid such a phenomenon by claiming less interference with biomechanics of the proximal femur. Aim of our study was to analyze changes in bone density in the proximal femur and the clinical outcome after implantation of a femoral-neck prosthesis. **METHODS:** We prospectively assessed clinical outcome and changes of bone density of the proximal femur up to 5 years after implantation of a short femoral neck prosthesis in 20 patients with a mean age of 54 years (range 21 to 73). Clinical parameters were measured using the Harris Hip Score. For relevant outcome the WOMAC was used. Using dual energy x-ray absorptiometry bone density prospectively was measured preoperatively, 10 days, 3 months and 60 months after surgery on both sides, the operated leg and the contralateral side. **RESULTS:** The Harris Hip Score improved from an average preoperative score of 46 to a postoperative score at 60 months of 95 points. The WOMAC score changed from 5,3 preoperatively to 0,6 at 60 months postoperatively. In comparison to conventional stems, the DEXA-scans overall revealed a non significant impairment of bone mineral density in the proximal femur in the 60 months following the implantation. **CONCLUSION:** The short femoral neck stem leads to a distinct bone reaction. This is significantly different when compared to changes in bone mineral density reported after implantation of conventional implants.

Date: 2010-09-01
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: G4

Abstract number: 25168

MEDIUM TERM RESULTS OF PATELLOFEMORAL JOINT REPLACEMENT

Anupkumar SHETTY, Praveen SHARDA, S. MAHESWARAN

University Hospital of Northtees, Stockton-On-Tees (UNITED KINGDOM)

Patellofemoral joint replacement surgery was commenced at our institute in 2002 using the Avon design, pioneered at the Avon Orthopaedic centre, Southmead, Bristol, UK. This is a retrospective analysis of 60 consecutive Patellofemoral replacements done in 55 patients between 2002 and March 2007, 55 patients were available for review. They were all assessed clinically and radiologically till the last follow up. Melbourne scoring system (Bartlett et al) and Knee Function score was used to score the knee status. Results: On Melbourne scoring system, the preoperative average score was 10, (range from 5 to 21). Preoperative Knee functional score was average 57, (range 23-95). The average range of movement was 0-116, with flexion ranging from 100 to 140 degrees. Postoperatively, the Average Melbourne knee score improved to 25 (range 11-30), while the Knee function score was 85(range 28-100). 87% of patients rated the result as good or excellent, while 11% rated as fair. 2% (1 patient) thought the result was poor and the knee felt worse than before. Discussion: The commonest complaint was clicking at various degrees of flexion (8 patients), most commonly around 40. 2 of these patients had a nodule at the insertion of quadriceps tendon causing patellar clunk syndrome which was arthroscopically resected. In our experience this is a successful operation for carefully selected group of patients, with fairly predictable results. However, progression of the tibiofemoral arthritis is unpredictable and we need longer follow up to determine the success rate.

Date: 2010-09-01
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: G4

Abstract number: 23770

**PATELLAR RETENTION VERSUS PATELLAR RESURFACING DURING TKR
– A PROSPECTIVE, RANDOMIZED STUDY**

Stefan CRISTEA, Vlad PREDESCU, Andrei PRUNDEANU, Florin GROSEANU,
Tudor ATASIEI, Vlad GEORGEANU, Gheorghe PANAIT

*Clinic of Orthopaedic and Trauma Surgery, St. Pantelimon Hospital, Bucharest,
(ROMANIA)*

Introduction: Existing data in the literature is supporting either patellar retention or patellar resurfacing during primary TKA. There is no clear answer for the question in which cases the patella should be retained or resurfaced during primary TKA. Materials and Methods: In this prospective study 2 groups of patients with a mean follow up of 34 months after TKA were compared. 83 patients (98 TKA) were implanted with a TKA with patellar retention (group 1) while 93 TKA (86 patients) were done including a patellar resurfacing (group 2). The patients were randomized according to the year of birth. The Scorpio Stryker was implanted. A dome shaped patellar prosthesis with 3 pegs was used for patellar resurfacing. Clinical Outcomes were based on the knee society score parameters, anterior knee pain, patient satisfaction, feeling of instability, step test while component position and limb alignment were measured by standard radiographs. Results: No statistical differences between both groups with regard to post-operative anterior knee pain and knee society score were found. We found no preoperative predictor factors for the development of post-operative anterior knee pain for each group and both together. Patellar mal-tracking was worse in group 2 than in the patellar retention group (3 cases with patellar subluxation in group 1 versus 2 cases in group 2). Conclusion: According to the not significant differences for the clinical outcomes between group 1 and 2 we routinely retain the patella. Patellar resurfacing is done only in selective cases.

Date: 2010-09-01
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: G4

Abstract number: 24940

**ROLE OF PATELLAR REPLACEMENT IN TOTAL KNEE ARTHROPLASTY
– A RETROSPECTIVE STUDY**

Manuel RIBEIRO DA SILVA, Paulo OLIVEIRA, Nuno NEVES, Pedro RODRIGUES,
Rui RIBEIRO, Carlos SIMOES, Vitor VIDINHA, Rui PINTO, Abel TRIGO CABRAL
São João Hospital-Orthopaedics Departement, Porto (PORTUGAL)

Patellar replacement in total knee arthroplasty remains a controversial. The authors present the clinical results of a retrospective study between two groups of individuals that underwent knee arthroplasty with and without patellar replacement. 46 patients who underwent total knee arthroplasty, 23 with patellar replacement and 23 without, randomized for age, sex, axial deviation, pre operative radiologic evaluation and post operative follow up time. For each group was described Knee Society Score (KSS) pre and post operatively, Knee anterior pain and pain while climbing up stairs (VAS), Radiographic evaluation, patellar tilt, Insall-Salvatti ratio and TKARESS (The Knee Society Total Knee Arthroplasty Roentgenographic Evaluation and Scoring System). 35 women and 11 men, mean age of 66 years (53-79), follow up for a mean of 39 months. There is a statistical significant improvement in favour of patellar replacement for KSS (score ($p=0,008$)) and function ($p=0,006$)), as it is for anterior knee pain ($p<0,05$). There are no differences in the Insall-Salvatti ratio. In all patients TKARESS was <4 . It was verified a lesser number of revision procedures in patients with patellar replacement (0 vs 5). Patients with patellar replacement present better clinical results that than the ones that don't. They also present less procedures of revision. The study doesn't present enough time of follow up to analyse the complications that could be related with patellar replacement. The option for patellar replacement isn't consensual, but this study presents some evidence favouring the replacement of the patella.

Date: 2010-09-01
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: G4

Abstract number: 26624

HYBRID COMPONENT FIXATION IN TOTAL KNEE ARTHROPLASTY; 10-27 YEARS FOLLOW UP

Taik-Sun KIM, Jung-Ro YOON, Jae-Hyuk YANG, Hyuk JEGAL, Jun-Ho LEE, Mi-Nyeo YOON

Seoul Veterans Hospital, Seoul (KOREA)

Although many cementless designs have demonstrated inferior outcomes, hybrid fixation has not been studied in detail. We retrospectively reviewed 355 hybrid total knee arthroplasties after clinical and radiographic review using the SF-12 and Knee Society Scores at a minimum 10-year follow-up. Selection for hybrid fixation was nonrandomized and based on femoral component fit. Survivorship analysis was performed, and rates of radiolucent lines surrounding the femoral component and occurrence of osteolysis were noted. At 7 and 13 years, survivorship with tibial or femoral revision as the end point was 0.9926 and 0.9732, respectively. Radiolucencies were found adjacent to 25 femoral components at final follow up (seven in Zone 1, three in Zone 2, five in Zone 3, one in Zone 4, two in Zone 5, zero in Zone 6). Osteolysis was observed in one knee after secondary evaluation. Hybrid fixation in a selected patient population can result in excellent results in long-term follow up.

Date: 2010-09-01
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: G4

Abstract number: 24005

TOTAL KNEE REPLACEMENT IN VARUS KNEES WITH BONE DEFECTS

Mrinal SHARMA, Yatinder KHARBANDA
Indraprasth Apollo Hospital, New Delhi (INDIA)

Introduction: Large posteromedial asymmetrical osseous defects are often seen in tibia while doing a primary total knee arthroplasty. Such defects may be treated with cementoplasty, augments and wedges that constitute an integral part of modern knee systems, replacing deficient bone. The use of structural bone grafts is a viable alternative. To achieve axial implantation of the prosthesis and stable fixation of the components, we performed osseous reconstruction of the medial tibial condyle using autologous structural bone grafts. **Materials and methods:** we bone grafted 55 tibial defects in severe varus knees in 675 primry TKR. Grafts originating from the femoral condyles were fixed with screws. Morselised autograft supported by mesh, fixed with screws, was used in 6 patients. Bilateral bone grafting was done in 24 patients. Goal was to obtain firm seating of the tibial tray on a rim of viable bone along with rigid press fixation of the medullary stem. We observed an average 70-point postoperative increase in knee function according to the Hospital for Special Surgery system. Graft incorporation was seen in all patients at av 7 yr followup. **Discussion:** CT scan have shown that > 1 cm below joint line quality and quantity of the supporting cancellous bone diminishes and attachments of iliotibial band, pes anserinus, patellar ligament, & PCL can be compromised. Reinforcement of the proximal tibia with autogeneic bone grafts preserves an area of subchondral bone essential for optimal thickness of cement and fixation of the implants. It is available then and there, is biological and cost effective.

Date: 2010-09-01
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: G4

Abstract number: 26580

EFFECT OF FEMORAL COMPONENT DESIGN ON PATELLAR TRACKING IN TOTAL KNEE ARTHROPLASTY

Raman THAKUR¹, Ajit DESHMUKH², Panagopoulos GEORGIA², Jose RODRIGUEZ²

¹*William Harvey Hospital, Ashford (UNITED KINGDOM)*, ²*Lenox Hill Hospital, New York (UNITED STATES)*

Persistent patellofemoral symptoms can cause patient dissatisfaction after Total Knee Arthroplasty (TKA). We reviewed the medical records of two groups of 100 consecutive patients each who underwent posterior stabilized TKA by a single surgeon (JAR). The operative technique was same but two different implant designs were used (Group 1: Asymmetric femoral component with deep congruent trochlear groove and Group 2: Asymmetric femoral component with shallow trochlear groove). Data was collected on demographic characteristics, patellar tilt, displacement, prosthesis-bone angle, HSS Patella Score, Knee Society Knee and Function Score. Patellar tilt more than 5° was considered significant. Statistical analysis was done using the SPSS software. Patients' age and sex were equivalent ($p > 0.57$). Median follow up was 2.2 years. Pre-operative incidence of patellar tilt was similar in both groups (18% vs. 17%). After surgery, these values changed to 30% and 77% respectively ($p < 0.001$). The Knee Society Knee and Function Score improved significantly in both groups, the improvement in the function score was greater in the first group ($p = 0.001$). The post-operative HSS Patella Score (93 vs. 91; $p = 0.19$) was similar. There were no revisions for patellofemoral symptoms in either group. Our findings suggest that despite using the same operative technique, patellar tracking was significantly different between the two groups, a finding most likely attributable to the design of the femoral component. Whether this difference in patellar maltracking will affect long-term survival of the patellar component remains to be seen.

Date: 2010-09-01
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: G4

Abstract number: 26214
FEMORAL SIZE IS ROTATION DEPENDENT
Emmanuel THIENPONT
Saint Luc University Hospital, Brussels (BELGIUM)

Abstract Introduction: Recent literature found a correct relation between the distal femoral anatomy and the anteroposterior (AP) or mediolateral (ML) size of femoral components in total knee arthroplasty. However, overhang is observed frequently and especially in valgus and female knees. Gender knees have been developed.

Abstract Methods: Peroperatively the AP and ML size of distal femurs were measured in neutral rotation referencing of the medial anterior cortex and in external rotation referencing of the lateral anterior cortex. Mediolateral size was measured in mm. Sizes and differences in mm were noted. Height differences between medial and lateral cortex were measured in both sexes.

Abstract Results: With external rotation (3°) and referencing of the lateral cortex the AP size increases about 3 mm (range 2 to 5 mm). Compared to the ML measurement this size is usually 2 to 3 mm more. Neutral rotation and referencing of the medial cortex results in same size as ML sizing.

Abstract Discussion and Conclusion: AP sizing in external rotation referencing of the lateral cortex leads to oversizing of the femur. AP sizing in neutral rotation referencing of the medial cortex is more accurate and gives the same result as ML sizing of the femur. AP sizing leads to oversizing secondary to external rotation and the effort to avoid lateral notching but creates an AP - ML mismatch. Oversizing is relative to the amount of external rotation and the anatomy of the lateral cortex. AP oversizing leads to ML overhang.

Date: 2010-09-01
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: G4

Abstract number: 25051

EX VIVO STABILITY LOSS OF HIGHLY CROSS LINKED ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE (UHMWPE)

Orhun MURATOGLU, Keith WANNOMAE, Shannon ROWELL, Brad MICHELI, Henrik MALCHAU

Massachusetts General Hospital, Boston (UNITED STATES)

Radiation crosslinking decreases the wear of UHMWPE and subsequent heating increases its oxidative stability. Clinical trials are showing lower femoral head penetration rate with highly crosslinked vs. conventional UHMWPE liners. Recently, a follow-up report showed a surprising increase in the femoral head penetration rate with a highly crosslinked UHMWPE, prompting us to closely analyze surgically explanted highly crosslinked UHMWPEs. Thirty-four highly crosslinked components, all irradiated (100kGy) and melted, were included in the study. The components were surgically removed from patients for non-polyethylene related reasons. Oxidation was determined at the rim immediately after explantation. After shelf storage in air for 5-77 months, oxidation and crosslink density were measured at the rim and articular surfaces. An additional retrieval (92 mos. in vivo) was tested on the hip simulator; oxidation and crosslink density were determined after simulator testing. All components showed no detectable oxidation immediately after explantation; however, surprisingly oxidation levels increased during shelf storage. Areas with increased oxidation showed a decrease in crosslink density. These changes correlated strongly with ex vivo duration. The component subjected to hip simulator testing showed no measurable wear and no detectable oxidation or decrease in crosslink density. Two mechanisms may have reduced the oxidation resistance of highly crosslinked UHMWPE: (i) Free radical formation during cyclic loading; and (ii) Oxidation cascade initiated by absorbed lipids. Further studies are necessary to determine the impact of these, if any, on the stability of components in vivo.

Date: 2010-09-01
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: G4

Abstract number: 25620

DRAINS AND TOTAL KNEE REPLACEMENTS – DO WE REALLY NEED THEM?

Rahul KAKKAR, MJ. DAWSON

Northern Deanery, Newcastle (UNITED KINGDOM)

The use of reinfusion drains (autologous unwashed shed blood) has been reported as safe and better due to an apparent reduction in major complications associated with closed suction drains/no drains. Therefore we conducted a prospective study using the reinfusion (CBC II Constavac reinfusion drain -Stryker drain) drains to determine if they actually resulted in a reduction for the requirement of homologous blood transfusion in patients undergoing Unilateral Total Knee Replacement. The patients were divided into two groups- group 1 had 30 patients and did not have any drain while group 2 had 26 patients and all had a reinfusion drain. All patients had the same implant put by a single surgeon and standard BOA (British Orthopaedic Association) transfusion criteria were used to determine transfusion requirements. The group 2 patients received on average 514ml of reinfusate within 6 hrs of surgery but despite this 9/24 patients (37.5%) required homologous blood transfusion as compared to 1/30(3.3%) patients in group 1($p=0.004$). Further more, patients in the drain group a change in haemoglobin concentration (preop vs postop) of $>5\text{gm}\%$. No wound complications or infection were noted in either group. In conclusion, reinfusion drains donot seem to provide any benefit over not using any drains at all and therefore-is a drain really necessary?

Date: 2010-09-01
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: G4

Abstract number: 25762

COMPARISON OF TOURNIQUET VERSUS NON-TOURNIQUET IN TOTAL KNEE ARTHROPLASTY; A META-ANALYSIS

Ilhan ALCELIK¹, Mohamed SUKEIK², Raymond POLLOCK¹, Josette BETTANY-SALTIKOV¹, Anand MISRA¹, Patrick ARMSTRONG¹

¹*West Cumberland Hospital, Whitehaven (UNITED KINGDOM)*, ²*Cumberland Infirmary, Carlisle (UNITED KINGDOM)*

Introduction: Despite advances since Roman times, there are still complications associated with the use of tourniquets including skin burns, soft tissue and muscle injuries, neurovascular damage, increased swelling and stiffness of joints. It is advocated that the main advantage of using a tourniquet in total knee arthroplasties (TKA) though is to reduce blood loss and achieve better cementation. **Objectives:** To compare the use of a tourniquet versus non-tourniquet in reducing blood loss after TKA and other clinical outcomes such as soft tissue and wound complications, deep venous thrombosis (DVT), pulmonary embolism (PE), cardiopulmonary complications and mortality. **Patients and Methods:** A systematic review and meta-analysis of published randomised and quasi-randomised trials which compare a tourniquet versus non-tourniquet approach in TKA was conducted. **Results:** Blood loss Six studies (279 patients) were eligible for this outcome. Using a tourniquet reduced blood loss by an average of 157 ml (P-value<0.00001, 95% CI (101-213), Heterogeneity I² 85 %.) Other outcomes: Haematomas, blisters and wound infections occurred significantly more in the tourniquet group with a risk ratio of 2.42 (P-value 0.00001, 95% CI (1.21-4.84), Heterogeneity I² 0 %.) There were no significant differences in duration of surgery, the length of hospital stay, DVT, PE, cardiopulmonary complications, mortality or range of movement between the study groups. **Conclusion:** The use of a tourniquet in TKA results in reduction of blood loss. However, soft tissue and wound complications occur more significantly with the use of a tourniquet.

Date: 2010-09-01
Session: Trauma - Humerus
Time: 10:45-12:15
Room: G4

Abstract number: 25624

MANAGEMENT OF THE HUMERAL FRACTURE NON-UNION. OUR EXPERIENCE.

Konstantinos TSITSKARIS, Muhammad RASHID, Mohit BANSAL, Joydeep SINHA, Adel TAVAKKOLIZADEH, Graeme GROOM
King's College Hospital, London (UNITED KINGDOM)

The management of a humeral fracture non-union is a challenging problem. We present a retrospective analysis of a series of 53 consecutive cases of humeral fracture non-union that were treated in our limb reconstruction unit. Between June 1994 and August 2006, 53 patients with established humeral non-union were referred to our unit following initial management locally. There were 25 male and 28 female patients with a mean age of 52 years (range 15-86 years). There were 35 (66%) diaphyseal, nine (17%) proximal and nine (17%) distal humeral non-unions. The treatment in our unit involved plate fixation in 41 (77%) cases, intramedullary nailing in three (5.6%) and external fixation in five (9.4%); one patient was treated non-operatively and three with surgical debridement. Iliac crest bone graft, bone morphogenetic protein or combination of these was utilised in 44 (83%) cases. Nine (17%) patients required more than one procedure. The average follow up was 18.4 months. Osseous union was achieved in all but one case at an average time of 9.8 months (range 3-24 months); one case developed a functionally inconsequential pseudoarthrosis. Osseous union for humeral fracture non-unions can be consistently achieved by applying the appropriate mechanical stability and biological optimisation.

Date: 2010-09-01
Session: Trauma - Humerus
Time: 10:45-12:15
Room: G4

Abstract number: 24997

FUNCTIONAL OUTCOME OF PROXIMAL HUMERUS FRACTURE TREATED BY PHILOS PLATE

Munnan AL-NAJJIM, Abubaker MUSTAFA, Stephen LIPSCOMBE, Mohammed WASEEM

Macclesfield General Hospital, Macclesfield (UNITED KINGDOM)

Introduction: The aim of this study was to assess the intermediate functional outcome and complications of the patient who had undergone open reduction and internal fixation with PHILOS Plate following fracture of the proximal humerus. Patients and methods: Retrospective data was collected from 2004 to 2009 of patients who had sustained a proximal humerus fracture and treated with PHILOS plating. Injuries were classified according to the Neer system. Functional outcome was measured using DASH and Oxford systems. Radiographic assessment for osteonecrosis and implant failure was completed. Results: Forty-eight patients were identified. There were 19male and 29female. The mean age 55.3years (range 20-89). Fourteen patients had 4-part, twenty-five part-3 and nine 2-part fractures. Patients were followed up from 9-18 months. All fractures united in satisfactory position. Three patients developed superficial wound infection, one patient developed radial nerve palsy which recovered spontaneously, one patient had broken distal screw, three patients impingement syndrome, one patient had complex regional pain syndrome, rotator cuff tear in two patients. There were no screw perforations, implant failure, avascular necrosis or vascular injury. Thirty one patients returned the DASH and Oxford shoulder questionnaires. The mean post op Oxford score was 42.4(range 20-48) and the mean DASH score was 10.1(0-54). Conclusion: Internal fixation using PHILOS plate is a reliable method of treating fracture of proximal humerus. It provides stable fixation and allow early shoulder mobilisation. The functional outcome is satisfactory with minor complications.

Date: 2010-09-01
Session: Trauma - Humerus
Time: 10:45-12:15
Room: G4

Abstract number: 23368

MANAGEMENT OF GUNSHOT INJURIES OF THE HUMERUS

Imran SHAH, Mohammad Ali SHAH, Junaid SHAH, Saeed ALAM
A.O Clinic, Karachi (PAKISTAN)

Gunshot injuries of the humerus usually present with neurovascular injuries that require urgent attention as well as complex fracture patterns which are difficult to reduce and stabilise using internal fixation methods. This study looks at the fixation methods used for patients presenting with these injuries over the last 3 years. Implants used include broad dynamic compression plate (locking plates), condylar buttress plate and Y-plate (for more distal humeral intra-articular fractures), and semi tubular plates. A total of 22 patients with a mean age of 27 years are included in this study, of which there were 18 males and 4 females. The range of presentation varied from 30 minutes to a few patients presenting several weeks after injury. Patients presenting late with heavily contaminated wounds, were initially treated with surgical debridement and temporary splintage until wounds healed before final definitive fixation was carried out. Most of the patients required autologous iliac bone graft, and two patients (9%) required tricortical bone graft. Twenty patients (91%) with humeral shaft injuries had wrist drop on presentation. Five of these made a full recovery without repair, whereas 6 patients (27%) required primary repair and 2 (9%) underwent tendon transfer for wrist drop. 20 patients (91%) went on to full bony union and achieved good post-operative ranges of movement. The average time to achieve union was 7 weeks, except for two patients (9%) who had their IM humeral nail removed and required sequestrectomy and delayed fixation was carried out with broad DCP.

Date: 2010-09-01
Session: Trauma - Humerus
Time: 10:45-12:15
Room: G4

Abstract number: 25680

MINIMALLY INVASIVE METHODS OF SURGICAL TREATMENT FOR INJURIES OF THE UPPER EXTREMITY IN CHILDREN

Mikhail GERASIMENKO¹, Alexandr BELETSKY², Stanislau TRATSIK¹, Mikhail KOREN¹, Viktor GURKO¹

¹*Minsk City Clinical Centre of Traumatology and Orthopaedics, 6th Minsk City Clinical Hospital, Minsk (BELARUS)*, ²*Republican Theoretical and Practical Centre of Traumatology and Orthopaedics, Minsk (BELARUS)*

Objectives: The aim of this study was to investigate results of the upper extremity injuries in children treated with minimally invasive surgical procedures. **Material and method:** Between the years 2004-2009 504 operations with the use of image intensifiers was carried out on children (ranging in age from 5 to 17 years) with the different upper extremity injuries. **Operation reasons:** transcondylar fractures of the humerus 162 cases, fractures of the surgical neck and shaft of the humerus 37 cases, forearm fractures 200 cases, fractures of the wrist 82 cases, multiple injuries 23 cases. Transcondylar fractures were treated with closed reduction and fixation with wires. Fractures of the surgical neck of the humerus were treated by fixation with Ilizarov nails. Humeral nails were inserted following ways: 1. Through the lateral epicondyle of the humerus; 2. Through the acromion ; 3. Through the diaphysis humerus. The humeral shaft fractures were treated by intramedullary fixation with Ilizarov nails, which were inserted intramedullary through the lateral epicondyle of the humerus. Bone fragments in forearm fractures were stabilized by the use of nails, which pass through olecranon or metaepiphysis of radius. **Results:** The clinical result was considered to be good in 97,62% and poor in 2,38% of the cases. The poor results were due to ulnar neuritis in 10 patients and inflammation of the skin around the wire in 2 patients. **Conclusion:** Minimally invasive methods of surgical treatment for injuries of the upper extremity in children are a highly effective method of treatment.

Date: 2010-09-01
Session: Trauma - Humerus
Time: 10:45-12:15
Room: G4

Abstract number: 23949

FRACTURES OF PROXIMAL HUMERAL HEAD: CLINICAL AND RADIOGRAPHIC RELATIONSHIP IN PATIENTS WITH AVASCULAR NECROSIS HEAD

Juan Gabino GOMEZ MONT, Enrique CALETI, Felix GIL ORBEZO, Miguel Angel CLARA, Efrain FARIAS, Jorge CARDENAS

Hospital Español de Mexico, Mexico City (MEXICO)

The objective of this study is to present the radiological characteristics of elderly patients with fracture of the proximal end of the humeral bone, treated with non surgical procedures, and its relationship with the clinical function of the affected limb. Between 2005 to 2009 there were 72 patients with these fractures that were treated with immobilization. This patients presented signs of avascular necrosis of the humeral head according to the radiologic classification of Nove Josseand and Basso. The functional evaluation was made with the Dash and Oxford questionnaires and the relation between them. We observed that of 72 patients 92% had an adequate function of the affected limb in comparison with the previous functional evaluation, and the contra lateral limb. From these patients, 100% presented avascular necrosis of the humeral head in some degree, being the III degree the most common in 70% of the cases. In 29% of the patients, pain was present, being significant and with functional limitation in only 4 cases. The principal complication of this fractures is the avascular necrosis of the humeral head, that is why the treatment of choice is shoulder arthroplasty. However we have seen that in patients over 60 years of age with non suirgical treatment, the functional outcome is similar in those described by the literature that were treated in any surgical way. The function of the affected limb is similar with the contra lateral limb and with the injured shoulder before the fracture.

Date: 2010-09-01
Session: Trauma - Humerus
Time: 10:45-12:15
Room: G4

Abstract number: 23467

THE ROLE OF EXTERNAL FIXATION IN THE TREATMENT OF ARTICULAR, PERI-ARTICULAR AND SHAFT FRACTURES OF THE HUMERUS DUE TO WARFARE INJURIES

Emal WARDAK¹, Mohd. Mussa WARDAK²

¹Wazir Akbar Khan Teaching Hospital, Kabul (AFGHANISTAN), ²Al-Haj Prof Mussa Wardak Hospital, Kabul (AFGHANISTAN)

Compound articular and peri-articular fractures around the humerus are very challenging to treat for all trauma surgeons. And sometimes there is no other alternative than stabilizing the fracture site with external fixation devices. So far we have treated 75 patients, 34 with distal humeral and elbow fractures, 22 with proximal humeral fractures and 19 with shaft fractures. In all of these cases we have used various types of external fixation devices and the one we found most useful is the Hybrid external fixation technique. In intra-articular fractures of lower end we use olive wires for reduction and aligning the articular fragments. The bony defects are replaced using Prof. Mussa Wardak's method 1982 and periarticular fractures of upper end were mostly treated using the Na'ir-Awais external fixation device. In all cases anatomy of the part was restored, in intra-articular fractures in 30% of the cases the mobility of the joint was restored to 100% [excellent], in 50% of cases the joint range of motion varied from 50-75% [good] and in the remaining 20% of the cases range of motion was less than 50% [poor]. At the end we would like to state that external fixation proving to be a good fixation method for the mentioned fractures and its use should be encouraged.

Date: 2010-09-01
Session: Trauma - Humerus
Time: 10:45-12:15
Room: G4

Abstract number: 26004

EXTRA-ARTICULAR DISTAL HUMERAL FRACTURES TREATED WITH RETROGRADE HALDER HUMERAL NAIL

Anish KADAKIA, Ben BROOKE, Sunil PAI, Subhash C HALDER
Calderdale and Huddersfield NHS Trust, Halifax (UNITED KINGDOM)

Displaced distal humeral fractures are difficult to treat. Numerous techniques have been developed for fixation. Conventional "antigrade" nailing sometimes causes damage to the rotator cuff. We use the retrograde Halder Humeral Nail using a special interlocking system to avoid axillary nerve and rotator cuff damage. The nail is inserted through the roof of the olecranon fossa leaving the rotator cuff of the shoulder free from any iatrogenic injury. 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 were short spiral fractures and 4 were osteolytic lesions. Average age was 60 years with average follow up of at least one year. Postoperatively, these patients were allowed early active and active-assisted ROM exercises under physiotherapy supervision. They were seen in the clinic till their fracture united and at the last follow up during the evaluation of this case series. In all cases, early pain relief was obtained with return of shoulder and elbow functions. By six weeks, 95% of patients could perform the majority daily tasks. Fracture united in 90% of patients by 3 months. No implant related fractures. No infections. There was average loss of extension of the elbow by 10-15 degrees. No significant complications, except three non-union, which united with revision surgery. This nail provides stable fixation of difficult extra-articular distal humeral fractures with early pain relief and rapid return of shoulder and elbow functions.

Date: 2010-09-01
Session: Trauma - Humerus
Time: 10:45-12:15
Room: G4

Abstract number: 24925

OPEN REDUCTION AND INTERNAL FIXATION OF DISPLACED TWO PARTS SURGICAL NECK HUMERAL FRACTURES IN OSTEOPOROTIC PATIENTS BY THE LOCKING COMPRESSION PLATE

Nehad EL MAHBOUB, Waleed ARAFAT

Misr University for Science and Technology, 6 October City (EGYPT)

Successful internal fixation of fractures of the surgical neck of the humerus can be difficult to achieve because of osteopenia of the proximal aspect of the humerus. Controversy exists with regards to the management of this fracture and many methods of treatment have been proposed. Different operative techniques used could result in malunion, non-union, osteonecrosis of humeral head, impingement, loosening of screw and loss of reduction particularly in osteoporotic fractures. Locking compression plate has been proposed for open reduction and internal fixation of these fractures and is associated with less complication rate. The aim of this study is to assess the functional outcome following open reduction and internal fixation with the proximal humeral locking plating system for displaced surgical neck humeral fractures. 18 patients treated surgically with the proximal humeral locking plate. Age of the patients ranged from 57 to 66 years. Patients were assessed clinically and radiologically at an average follow-up time of 12 months. Functional outcome was determined utilizing Constant Murley score. The injury was classified using Neer's 4 part classification. All the fractures were radiologically united by 10 weeks. Excellent and good results were achieved in 13 patients representing 72.2%. Conclusion: Locking compression plate is an advantageous implant in proximal humeral fractures due to angular stability, particularly in osteoporotic bones in elderly patients, thus allowing good fracture stability early mobilization of the shoulder can be achieved without compromising fracture union. Keywords: Locking compression plate, Fractures, Proximal, Humerus, Internal fixation, Osteoporosis

Date: 2010-09-01
Session: Trauma - Upper Femur
Time: 13:30-15:00
Room: G4

Abstract number: 26417

DISLOCATION AND REOPERATION RATE IN UNIPOLAR AND BIPOLAR EXETER HIP HEMIARTHROPLASTY IN PATIENTS WITH FEMORAL NECK FRACTURES

Lasse LAPIDUS, Carl johan HEDBÄCK, Hans TÖRNKVIST, Anders ENOCSON
Department of Clinical Science and Education, Stockholm (SWEDEN)

Background: Hip replacement using a hemiarthroplasty (HA) is a common surgical procedure in elderly patients with fractures of the femoral neck. Bipolar prostheses have been developed for theoretical advantages compared to the unipolar design. Some data suggest that there is a higher risk for revision surgery and dislocation with the bipolar HA compared with the unipolar HA. In this study we analyzed the dislocation rate and the reoperation rate of hip HA in patients with displaced femoral neck fracture. Patients and methods: We have studied 830 HAs in 815 consecutive patients performed between 1 September 2000 and 31 December 2006, either as a primary operation for a displaced fracture of the femoral neck or as a secondary procedure after failed internal fixation of a fracture of the femoral neck. All patients were operated with an anterolateral approach using Exeter Bipolar or Exeter Unipolar HA. Regression analyses were performed in order to evaluate factors associated with reoperation and prosthetic dislocation. Results: No significant difference in the dislocation rate (2.8% vs. 3.0%) and the reoperation rate (7.3% vs. 6.0%) was detected between Exeter Unipolar and Exeter Bipolar hip HA ($p=1.0$ and $p=0.5$, respectively). The Cox regression analysis showed that the indication for surgery was the only factor associated with a significantly increased risk for dislocation. Conclusion: The stability and the reoperation rate of Exeter Unipolar HA and Exeter Bipolar HA seem to be comparable in patients with femoral neck fracture operated with anterolateral approach.

Date: 2010-09-01
Session: Trauma - Upper Femur
Time: 13:30-15:00
Room: G4

Abstract number: 26042

NO GENDER DIFFERENCES IN MORTALITY AND FUNCTIONAL OUTCOME AFTER HIP FRACTURE IN PATIENTS WITH NORMAL COGNITIVE FUNCTION

Bodil SAMUELSSON¹, Margareta HEDSTRÖM², Sari PONZER³, Anita SÖDERQVIST³, Eva SAMNEGÅRD¹, Karl-Göran THORNGREN⁴, Tommy CEDERHOLM⁵, Maria SÄÄF⁶, Dalen NILS⁴

¹*Dep of Clinical Science, Karolinska Institutet, Danderyd Hospital and Sophiahemmet University College, Stockholm (SWEDEN)*, ²*Dep of Clinical Science, Intervention and Technology (Clintec), Karolinska Institutet, Stockholm (SWEDEN)*, ³*Dep of Clinical Science and Education, Karolinska Institutet, Söder Hospital, Stockholm (SWEDEN)*, ⁴*Dep of Orthopaedics, Lund University Hospital, Lund (SWEDEN)*, ⁵*Dep of Public Health and Caring Science, Clinical Nutrition and Metabolism, Uppsala University, Uppsala (SWEDEN)*, ⁶*Div of Molekylar Medicine and Surgery (MMK) Karolinska Institutet, Stockholm (SWEDEN)*

Background: Men with hip fracture have been described as more fragile, with more comorbidity and higher mortality. Gender differences in functional outcome have been reported, with inconsistent results. We analyzed functional outcome, with respect to gender and cognitive function in a population-based cohort study of 2 134 patients admitted with hip fracture during 2003 to four university hospitals in Stockholm, Sweden. Methods: Gender differences in residence, walking ability and activity of daily living (ADL) were analyzed at baseline, after 4 and 24 months in patients with and without intact cognitive function. Cognitive function was assessed with the Short Portable Mental Status Questionnaire (SPMSQ). Results: About half of the total population had a cognitive dysfunction (SPMSQ 0-7), equally common by gender. Among patients with normal cognitive function (SPMSQ 8-10), there were no gender differences in residence, ADL, morbidity or mortality, but men had better walking ability ($p<0.001$) at baseline and follow-up. In the cognitive dysfunction group, men had more co-morbidity ($p<0.001$), total loss of walking ability ($p=0.03$) and higher mortality ($p<0.001$). No gender differences in regaining physical function or returning to own home was found in any group. Conclusion: We found no gender differences in mortality and functional outcome after hip fracture in patients with normal cognitive function. Men had a higher risk for loss of walking ability and death only in patients with cognitive dysfunction. Cognitive function was the single most important factor for returning to own home and regaining pre-fracture function.

Date: 2010-09-01
Session: Trauma - Upper Femur
Time: 13:30-15:00
Room: G4

Abstract number: 25018

TREATMENT OF HIP FRACTURES USING A MINIMAL INVASIVE APPROACH FOR BIPOLAR ARTHROPLASTY- A RANDOMIZED TRIAL

Andreas UNGER¹, Felix RENKEN¹, Matthias BRAHM², Svenja RENKEN³, Arndt P. SCHULZ⁴

^{1,3}*University Hospital Lübeck, Lübeck (GERMANY)*, ²*Bispebjerg Hospital, København NV (DENMARK)*, ⁴*University Lübeck, Dept. Trauma&Orthopaedics, Lübeck (GERMANY)*

Introduction: It is known that early postoperative mobilization after hip fractures directly influences morbidity and mortality. We conducted a randomized trial comparing a standard approach with a minimal invasive approach. The main outcome parameter was mobility measured by the 4-item Barthel-Score. **Patients:** Randomization of 60 consecutive patients was performed. Of the 60 patients, 53 were female (88%), the mean age was 84.3years. There was no significant difference in the study arms regarding sex, age and BMI. **Methods:** Study design was prospective, blinding was not performed. Three surgeons performed the operations after at least 30 minimally invasive procedures had been performed. Implants used were the cemented ABGII stem (STRYKER) with a standard bipolar head in all cases. The four-item Barthel-index (focused on lower extremity function) was determined pre-trauma and assessed at day 1/5/16 and 40 after surgery. Assessment was performed by an independent physiotherapist. **Results:** Mean procedure time was 64.8mins (40-94, SD 17.1) for the WJA and mean 73.6 minutes (min. 48, max. 90 min, SD 14.4) for the DAA group (p=0.18). The results of the Barthel-Index showed a higher score at day 5, 16&40 for the DAA approach (p=0,009/p=0,05/p=0,013). Evaluation of the postoperative pain showed a significant difference with a lower pain-score for the DAA at day 16&40. **Discussion:** We could show in our study that the use of this approach positively influences the postoperative mobilization in a geriatric population.

Date: 2010-09-01
Session: Trauma - Upper Femur
Time: 13:30-15:00
Room: G4

Abstract number: 25105

RETEROSPECTIVE AND PROSPECTIVE STUDY OF OSTEOSYNTHESIS OF FRACTURE NECK FEMUR TREATED BY FIBULAR GRAFTING WITH OR WITHOUT COMPRESSION HIP SCREWS

Anubhav AGARWAL, Amit AGARWAL

Chandra Orthopaedic Center & Research Institute & S.N.Medical College, Agra (INDIA)

The management of intracapsular femoral neck fractures remain an unsolved issue of present day. These fractures are conventionally treated with the use of cancellous hip screws or adynamic hip screws. Our study was to evaluate the outcome of surgical management using free fibular graft with or without compression hip screws in intracapsular fracture neck of femur. In this prospective and reterospective study total 80 patients were operated randomly. 54 patients treated with single fibular graft (group A), 26 patients with double fibular graft (group B). Patients were evaluated for 2 years after surgery. Single and double fibular graft with or without compression hip screw inserted by standard surgical technique. In group A 44 patients (94%) and in group B 23 patients (95.8%) fracture united. Complications included infection in 9 cases, cut-through in 2 cases, non-union in 4 cases, avascular necrosis in 4 cases. The patients in whom fracture union was achieved without compression screws were allowed to walk full weight bearing after 6 months of surgery while in patients where compression screws were used were allowed to walk full weight bearing after 3 months of surgery. After conducting the study we concluded that: Technique is simple; It is a procedure for late femoral neck fracture in young adults with good outcome; Trepine shape of fibula give added rotational stability; Chances of non-union are negligible; It preserves natural head in the acetabulum. Later it can be converted into hemireplacement or total hip replacement.

Date: 2010-09-01
Session: Trauma - Upper Femur
Time: 13:30-15:00
Room: G4

Abstract number: 26569

BACKGROUND FACTORS IN YOUNG PATIENTS WITH FEMORAL NECK FRACTURES

Amer AL-ANI¹, Bodil SAMUELSSON², Ekström WILHELMINA³, Richard BLOMFELDT², Gustav NEANDER², Jan TIDERMARK², Margareta HEDSTRÖM⁶

¹*Karolinska Institutet, the Institute of Clinical Science, Intervention and Technology, Stockholm (SWEDEN)*, ²*Karolinska Institutet, Department of Clinical Science, Stockholm (SWEDEN)*, ³*Karolinska Institutet, Department of Molecular Medicine and Surgery, Section of Orthopaedics and Sports Medicine, Stockholm (SWEDEN)*

Background: Hip fractures are rare in young and middle-aged patients. The epidemiology of hip fractures in the elderly population is well studied. Prospective studies on younger patients with hip fractures are lacking. **Methods:** We included 185 patients aged 15-69 years with a femoral neck fracture in a prospective multicentre study (Stockholm Söder Hospital, Danderyd hospital, Karolinska University hospital Solna and Huddinge) in Stockholm between September 2002 and May 2006. The aim of the study was to study background factors including osteoporosis in young and middle-aged patients with femoral neck fractures. **Results:** The median age was 59 years (range 20-69) with 48% being men. In 71% of the patients the fracture was displaced (Garden III or IV). Thirty-nine percent of the patients were smokers and 28 % had harmful alcohol drinking. Only 7% had a normal BMD at the hip (i.e. T-score > -1), while 58% had osteopenia (i.e. T-score ≤ -1 and > -2.5) and 35 % had osteoporosis (i.e. T-score ≤ -2.5). Seventy three percent of the patients had one or more risk factors for osteoporosis. The fracture was the result of a simple fall in 78% of the patients, sport activity in 17% and high energy trauma in only 5 %. **Conclusions:** The vast majority of the young and middle-aged patients with a femoral neck fracture sustained their fracture after a low energy trauma. The majority had several risk factors for osteoporosis and approximately one third had manifest osteoporosis.

Date: 2010-09-01
Session: Trauma - Upper Femur
Time: 13:30-15:00
Room: G4

Abstract number: 23959

HIP HEMIARTHROPLASTY IN FEMORAL NECK FRACTURES CEMENTED VS UNCEMENTED - A COMPARATIVE STUDY

Narayana Prasad KARAKKAD, Kishan PARALAYA
Dhanalakshmi Hospital, Kannur (INDIA)

The prevalence of femoral neck fracture is rising as the population ages, and larger middle-age generation reaches elderly ages. We had reviewed 309 cases of femoral neck fractures over a period of 4 years. The patient age group is from 60 years to 102 years. Average follow up was 3 years. Of the 309 cases 189 patients were operated with Austin-Moore hemiarthroplasty femoral component, 58 with Thompson's femoral component and 62 with Bipolar prosthesis. 168 females and 141 males. Of the 309 cases 211 were cemented and 98 were uncemented. In the uncemented group five cases needs stem revision in 2 years, there was one dislocation and no incidence of periprosthetic fractures. In the cemented group no stem loosening, one dislocation and 7 incidences of periprosthetic fractures. All these cases were analysed on the basis of post operative pain, gait pattern and the time taken for the return to normal activity. The use of cemented hemiarthroplasty has been demonstrated to provide earlier and superior pain relief especially that of anterior thigh pain and return of function.

Date: 2010-09-01
Session: Trauma - Upper Femur
Time: 13:30-15:00
Room: G4

Abstract number: 26519

RESULTS AFTER CERVICAL HIP FRACTURE, A RETROSPECTIVE STUDY AT SÖDRA ÄLVSBORGS HOSPITAL (SÄS) BORÅS

Vasileios SARAKATSIANOS¹, Michael MLLER²

¹Department of Trauma and Orthopaedics, Södra Älvsborgs Hospital, Borås (SWEDEN), ²Department of Trauma and Orthopaedics, Sahlgrenska University Hospital, Göteborg (SWEDEN)

Our aim was to study the outcome after treatment for cervical hip fracture and compare our results with recently published controlled trials. Furthermore we investigated the adherence to the local treatment algorithm. All patients diagnosed with a cervical hip fracture at Södra Älvsborgs Hospital (SÄS) Borås during 2007 and 2008 (n=409) were included in a retrospective study. Results from the inclusion data and the 4 months follow-up regarding functional outcome and complications in the Swedish hip fracture registry (Rikshöft) were obtained. The local registry of performed operations was searched and both sources were analysed. We found that all patients with undisplaced, acute fracture were treated with internal fixation. 83,4 % of all patients (n= 212) with a displaced fracture was treated with either a hemiarthroplasty or a total hip arthroplasty. According to the algorithm patients over 65 years, medical fit and not demented should be treated with hip replacement. In total 18/409 (4,4%) patients were reoperated. In the group operated with primary hip replacement the reoperation rate was 6%. In the group with displaced fractures treated with internal fixation the reoperation rate was 21,7%. In the group of patients with cognitive dysfunction (n=52) only two reoperations were performed (3,8%). Full adherence to the local algorithm would probably have lowered the failure and complication rate. In this limited retrospective analysis we are not able to reproduce the reported bad outcome, previously reported for patients with cognitive dysfunction.

Date: 2010-09-01
Session: Trauma - Upper Femur
Time: 13:30-15:00
Room: G4

Abstract number: 25117

A NEW LOCKING PLATE AND DYNAMIC SCREW SYSTEM FOR INTERNAL FIXATION OF INTRACAPSULAR HIP FRACTURES; RESULTS FOR THE FIRST 211 PATIENTS TREATED

Nikolas JAGODZINSKI, Martyn PARKER

Peterborough District Hospital, Peterborough (UNITED KINGDOM)

The Targon Femoral Neck Hip Screw has been designed to improve fixation of intracapsular hip fractures. Complications after internal fixation occur in 5-10% of undisplaced fractures and 30-40% of displaced fractures. The new implant consists of a small plate with six locking screw ports. Three or four dynamic 6.5mm screws are passed through the proximal holes and across the fracture site, allowing for collapse. Two distal screws are used to fix the plate to the lateral femoral cortex. A jig is used to aid insertion and minimize surgical exposure. We monitored the first 211 patients ever treated with this implant. The mean length of surgery was 46 minutes. The median duration of institutional stay was nine days. Follow-up of patients at present is a minimum of six months. For the 78 undisplaced fractures there has been one case of non-union and two of avascular necrosis. For the 133 displaced fractures, there have been twelve cases of fracture non-union, five of avascular necrosis and three of plate detachment plus one deep wound sepsis. For the fractures that have healed, there has been 0 - 22mm of collapse at the fracture site along the line of the femoral neck. There has been no tilting into varus as occurs with a parallel screw method. The results to date show the incidence of complications is about a third of that expected with a parallel screw method. This new implant may be a significant advance in the treatment of this difficult and common fracture.

Date: 2010-09-01
Session: Trauma - Upper Femur
Time: 13:30-15:00
Room: G4

Abstract number: 26035

THE ROLE OF PFNA BLADE IN THE TREATMENT OF FEMORAL NECK FRACTURES

László GERA, Tamás BÁNYAI, Levente PÓCS
County Hospital, Kecskemét, Kecskemét (HUNGARY)

In the year 2006 in our department we started to use the PFNA blade to stabilize femoral neck fractures, first time in the world. Biomechanical examinations have proved the increased stability after intracapsular fractures. During the last three years we have applied this method 146 times. During the follow up, we have analyzed the movement of the blade in the femoral head, and the resorption zone around it. We have determined the shortening of the femoral neck with the measurement of the lateralization of the blade. Follow up has been performed 6 and 12 weeks after the operations. We had to revise the synthesis in some cases: In 2 cases because of the perforation of the femoral head, and in eight cases a redislocation could be found on the X-ray. There is not necessary the boring of the femoral head, no loss of the bone. Placing the PFNA blade causes bone compaction and more stability. The compression of the fracture is good, it is not necessary to remove the metals. (titanium material). Well, we suggest to use the blade of the PFNA, for the treatment of the femoral head fractures, because of the good rotational stability and the compression resulting in the region of the fracture. In our presentation we would like to present the steps of the operation and our initial results of 146 operated patients.

Date: 2010-09-01
Session: Trauma - Upper Femur
Time: 13:30-15:00
Room: G4

Abstract number: 25623

MORE THAN 36 HOURS OF WAITING FOR SURGERY INCREASES THE RISK OF MEDICAL COMPLICATIONS FOR HIP FRACTURE PATIENTS. A SINGLE-COHORT STUDY OF 583 HIP FRACTURES.

Daniel LINDBOM, Olof SKÖLDENBERG

Karolinska Institutet, Department of Clinical Sciences at Danderyd Hospital, Danderyd (SWEDEN)

Introduction: Recently published studies with focus on time to surgery have not shown an increased mortality as a result of delayed time to surgery but delayed rehabilitation, longer hospital stay and increased risk of pressure ulcers. The aim of this study was to report if increased waiting time to surgery influenced the number of medical complications. Patients and Methods: Data from all acute hip fracture patients 2007 was collected. The primary outcome variable was time from arrival at the emergency room until surgery and how this time affected 1-year mortality, the rate of medical complications during hospital stay. Three cut-off limits were used; surgery within 24, 36 and 48 hours. Result: 576 patients with 583 hip fractures were identified. 50,6% were operated within 24h, 75,6% within 36h and 88,2% within 48h. The mortality rate did not differ between the different cut-off intervals. A univariable regression analysis revealed a significant increased risk of 2.0 and 2.7 for serious medical complications for the higher cut-off limits (36h and 48h). After adjusting for age, sex, cognitive function, ASA-score and reason for delay of surgery, the risk was still significant with odds ratio of 1.9 and 2.4 respectively. Conclusion: This study shows an increased risk of medical complications when delaying surgery more than 36 hours from arrival at the emergency room. Our results confirm that hip fracture patients benefit from being operated as soon as possible after arrival at the hospital.

Date: 2010-09-01
Session: Trauma - Tibia / Fibula
Time: 16:00-17:45
Room: G4

Abstract number: 23264

COMPARISON OF DIFFERENT TIBIAL SHAFT FRACTURE TREATMENT IN ADULTS (1000 CASE STUDY)

Firooz MADADI¹, Alireza EAJAZI², Firoozeh MADADI¹

¹*Shahid Beheshti Medical University, Tehran (IRAN)*, ²*Tehran Medical University, Tehran (IRAN)*

Tibial Fractures constitute a large number of emergency operations that incur a lot of costs for health centres. There are four different approaches for tibial fractures: intramedullary nail fixation, plating, external fixation and casting. But there isn't enough evidence to consider post operative complications in relation to both surgical methods and types of fractures. We present our experience about the efficacy and complications associated with diverse surgical methods for different patterns of adult tibial shaft fractures. All 387 patients we studied were examined and the results were registered. Our methods were interlocking nails, Simple nails, Plating and External fixation. Early and late complications recorded and by DELPHI method the calculated scores were used to compare different treatments, finally the safest way of treatment proposed. In the interlocking nail method the most noticeable complication was delayed union and the highest complications was seen in open oblique fractures. In the Simple intramedullary nail method the most noticeable complication was pain, especially butterfly fractures showed more complications. In the Plating method the highest complication was pain and most of the complications were seen in open comminuted fractures. By External fixation method the most frequent complication was non-union and in the patients with oblique, comminuted and segmented fractures the complications were the highest. We concluded that the proposed method to treat transverse, oblique and with butterfly fractures is Simple intramedullary rods and for comminuted, segmented and spiral fractures Intramedullary interlocking nails is the better candidate.

Date: 2010-09-01
Session: Trauma - Tibia / Fibula
Time: 16:00-17:45
Room: G4

Abstract number: 25767

RESULTS OF SURGICAL TREATMENT OF TIBIA NON-UNIONS AND FALSE JOINTS

Alexander BELETSKY, Alexandre LINOV, Alexandre SITNIK, Oleg KORZUN
*Belarus Republic Scientific and Practical center for Traumatology and Orthopaedics,
Minsk (BELARUS)*

Aim: To study the peculiarities of results of surgical treatment depending on time after the injury and character of non-union. **Materials:** 140 patients with abovementioned pathology were treated in period from 1993 to 2009 with the use of Ilizarov technique. Mean age of patients was 36.4 ± 10.2 years. Non-unions were localized in middle-lower third of tibia most often (118, 84/3%). Non-unions were seen in 66 (47.1%) of patients, false joints in 74 (52.9%). Hypervascular non-unions were noticed in 86 (60%), hypo- and avascular forms in 54 (40%). Results were assessed with three-point scheme according to anatomic, functional results and radiological data. Results were studied in 102 patients (72.9%) in terms from 1 to 12 years. Good results were seen mostly in patients treated at the stage of non-union (41; 40.2%) and earlier than 1 year after the injury (68; 66.6%). Failures in treatment were seen mostly in patients with decreased osteogenic activity at the site of fracture (hypo- and avascular forms) 10 from 13 cases. **Conclusion:** More active surgical tactic at the stage of non-union in cases with consolidation failures depending on the type of failure (hyper or hypo vascular) will provide better possible results.

Date: 2010-09-01
Session: Trauma - Tibia / Fibula
Time: 16:00-17:45
Room: G4

Abstract number: 23265

EPIDEMIOLOGY OF ADULT'S TIBIAL SHAFT FRACTURE

Firooz MADADI¹, Alireza EAJAZI², Firoozeh MADADI¹

¹*Shahid Beheshti Medical University, Tehran (IRAN)*, ²*Tehran Medical University, Tehran (IRAN)*

Introduction: Our epidemiologic study is designed to provide an update on demographic information of patients, frequency, causes, patterns and sites of tibial shaft fractures between 1999-2006. Material and Methods: We studied 854 adult patients in a cross sectional study. All patients were examined and the results including early and late complications registered. The informations classified along with descriptive statistical analysis. Results: The highest frequency was seen in the 20-30 years in both genders and in people aged 50 years old and onward women had a higher rate than men. Car accidents were the most common cause (61%), falling at 18%, direct trauma at 14% and torsion at 7% were the others. 54% were closed fractures. The distributions of fractures were 12% in p/3rd, 40% in mid/3rd, 38% in distal third and 10% in more than one level. The most frequent pattern of fractures in our study was comminuted (31%) and the least were segmented or with butterfly (11% for each one). In females, spiral fractures were the most common pattern (33%) and with butterfly fractures were the least (3%). The most noticeable complication early after treatment was infection and those in follow up were pain, non-union and delayed union. Conclusion: The peak frequency of tibial shaft fractures in Iran was one decade higher than European and North American countries' populations, and from the 50 year olds and onward the rate of these fractures was higher in women than men that was two decades lower than the mentioned populations.

Date: 2010-09-01
Session: Trauma - Tibia / Fibula
Time: 16:00-17:45
Room: G4

Abstract number: 26577

TREATMENT OF OPEN FRACTURES IN RATS WITH A COMBINATION OF BMP AND BISPHOSPHONATES CAUSES BOTH INCREASED FORMATION AS WELL AS INCREASED RETENTION OF THE NEW FORMED CALLUS

Magnus TÄGIL¹, Per BOSEMARK¹, Hanna ISAKSSON²

¹*Department of Orthopaedics, Lund (SWEDEN),* ²*Department of Physics and Mathematics, Kuopio (FINLAND)*

Background: Remodelling of a bone graft during fracture healing can be enhanced by Bone Morphogenic Protein (BMP). However, BMP also boost catabolism and callus resorption. Bisphosphonates inactivate osteoclasts. In the present study the combination of BMP and bisphosphonate was tested. Methods: 48 rats were operated and divided into four groups A. Saline treated graft, B/ BMP treated graft C/ BMP + systemic zoledronate D/ BMP + local zoledronate. All rats were osteotomized at the mid shaft femur and fixed with a single intramedullary K-wire. The muscle and periosteum was scraped away. An autograft was taken from the contralateral proximal tibia. The bone graft was mixed with zoledronate (Zometa, Novartis) solution or saline and mixed with 50 ug Osigraft (BMP-7, Stryker) in a 0.5 ml CMC putty and placed on the fracture. The animals were sacrificed after 6 weeks, the bone taken out for micro-CT, histology and mechanical test. Results: MicroCT Visually, clear differences were observed between all treated groups. Total callus volume (TVc) was higher ($p < 0.01$) in all treated groups compared to the control. Additionally, the TVc was higher ($p < 0.01$) in the group treated with OP1 and local ZO compared to the group treated systemically. Hence, OP1 and OP1+sysZO both increased the callus volume but not the bone volume fraction, whereas the OP1+locZO increased all parameters. Interpretation BMP is a suitable anabolic agents in this model of open fractures. Bisphosphonate treatment, both locally applied as well as systemically increased the callus size when combined sequentially.

Date: 2010-09-01
Session: Trauma - Tibia / Fibula
Time: 16:00-17:45
Room: G4

Abstract number: 23583

A PROSPECTIVE RANDOMISED TRIAL TO COMPARE THE USE OF CLOSED INTRAMEDULLARY NAILING WITH THE PERCUTANEOUS PLATING IN THE TREATMENT OF DISTAL METAPHYSEAL FRACTURES OF TIBIA

Jiong GUO, Huilin YANG, Tiansi TANG

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

We compared the outcome of patients treated for a distal metaphyseal fracture of tibia with a closed intramedullary nailing (IMN) with those treated with a percutaneous locking compression plate (LCP) in a prospective randomised study. Each patient who presented with a distal metaphyseal fracture of tibia was randomized to operative stabilisation with either a closed IMN or a LCP. We treated 44 patients with a IMN and 41 patients with a LCP. Pre-operative variables included patient's age, fracture side, and fracture pattern. Peri-operative variables were operation time and radiation time. Post-operative variables were wound problems, time to fracture union, ankle functional score, and hardware removal questionnaire. We found no significant difference in the pre-operative variables and also no difference in time to union between two groups. However, the mean radiation time and operation time were significantly longer in the LCP group. After one year, fracture was united in all cases. Patients who had IMN had higher mean pain, function, alignment, and total AOFAS scores, although the difference was not statistically significant. 37 patients in the IMN group and 38 patients in the LCP group expressed their wish to have the hardware removed. We concluded that both closed IMN and percutaneous LCP could be used safely to treat OTA type-43A of distal metaphyseal fractures of tibia. Closed IMN have an advantage in shortening operation and radiation time, and hardware removal. We therefore preferred closed IMN in treating patients with distal metaphyseal fractures of tibia.

Date: 2010-09-01
Session: Trauma - Tibia / Fibula
Time: 16:00-17:45
Room: G4

Abstract number: 24123

GROWTH FACTOR RELEASE FOLLOWING TIBIAL FRACTURE

Kambiz SARAH RUDI, Gholam PAJENDA, Vilmos VÉCSEI

Klinik for Trauma Surgery, Medical University of Vienna, Vienna (AUSTRIA)

Introduction: Recent studies demonstrated alterations of local and systemic growth factor level during fracture healing. As a result osteogenic and angiogenic growth factors allow us to monitor fracture healing at the molecular level. Based on this reasoning we hypothesized that closed intramedullary reaming and nail fixation (IM), in contrast to open reduction and internal plate fixation (ORIF), could exert an effect on the cellular elements present in the intramedullary canal leading to increased release of mediators. The purpose of the study was therefore to investigate whether different osteosynthesis techniques can influence the quantity of release of osteogenic and angiogenic cytokines. Methods: 34 patients with tibial fractures treated by IM-fixation and 19 patients treated by ORIF were included into the study. In addition to clinical and radiological examination, TGF-1, M-CSF and VEGF serum concentrations were analyzed at 1, 2, 4, 6, 8, 12, 24 weeks after surgery. Results: Expression of osteogenic growth factors TGF-1 and M-CSF were increased at the first 2 weeks of fracture healing in patients treated by IM-fixation compared to those patients treated by ORIF. Moreover, after 24 weeks M-CSF levels in patients with IM-fixation were clearly higher. Conversely, VEGF levels were found to be higher during the first 2 weeks of fracture healing in patients treated by ORIF compared to IM-fixation. However, these results were not significant. Conclusion: The reaming of intramedullary cavity and closed IM-fixation seem to have no influence on the expression of osteogenic and angiogenic cytokines TGF- 1, M-CSF and VEGF.

Date: 2010-09-01
Session: Trauma - Tibia / Fibula
Time: 16:00-17:45
Room: G4

Abstract number: 25540

RESULTS OF FRACTURE TIBIA USING DCP IMPLANT WITH MIPO METHOD AND TECHNOLOGY

Sanjib Kumar BEHERA

Yashoda Hospital, Secundrabad (INDIA)

In the past large incision was used in exposing the bone for reduction and plate fixation. Soft tissue like skin, muscle and vascularity will be damaged and jeopardized. The insertion of Implant through a small incision will reduce the damage to the muscle, surrounding soft tissue and will preserve the blood supply to the bone. Method, December 2004 - December 2009, 168 tibia fracture was included in the study (those are upper 1/3rd tibia and Middle 1/3rd Tibia). All proximal tibia or lower 1/3rd tibia were excluded. No open fractures were included and all due to high energy trauma. The peculiarity of the study, 4.5 Narrow / Broad DCP used for fracture with MIPO technique and under the image intensifier guidance. Results, In all cases 99% accurate bone contact and alignment achieved in non comminuted fracture and Very acceptable accuracy in severely comminuted fracture. Average time for Union 10 weeks-14 weeks. Delayed union in 16 cases. 8 were non union. Where bone grafting and change of implant was required. Superficial soft tissue infection in 5 cases and deep bone infection in 2 cases. Conclusion, It was technically difficult in the initial stage but gradually the graph of time consumption of surgery started falling with increasing number. Advantage is less exposure to x-ray radiation and very good results with very low cost implant and the same logistic where surgeon is very familiar. The union rate with the plate and screw through MIPO is highly commandable.

Date: 2010-09-01
Session: Trauma - Tibia / Fibula
Time: 16:00-17:45
Room: G4

Abstract number: 25719

ARTHROSCOPIC-ASSISTED OSTEOSYNTHESIS OF TIBIAL PLATEAU FRACTURES

Oleg BONDAREV, Alexandre SITNIK, Alexander BELETSKY

Belarus Republic Scientific and Practical Centre of Traumatology and Orthopaedics, Minsk (BELARUS)

The ideal surgical treatment for fractures of the lateral tibial plateau has not yet been defined. The options include open reduction internal fixation (ORIF) and reduction of fracture via subchondral window with arthroscopic visualization of the articular surface. The purpose of the present study is to compare the results of open reduction and internal fixation via submeniscal arthrotomy under direct joint visualization with less invasive arthroscopic-assisted percutaneous osteosynthesis. We retrospectively studied two groups of patients who had had operative treatment of fractures of the lateral tibial plateau between 2007 and 2008. Eleven patients had had percutaneous plate fixation with arthroscopy (Group A). Eleven patients who had had the submeniscal arthrotomy and open reduction internal fixation (Group B) were followed for 1.6 years on average. The final evaluation was based on the knee score and electromyography. The average Lysholm-like knee score (maximum, 100 points) was 94.1 points in Group A and 81.2 points in Group B. Significant differences between the groups were noted with regard to knee pain, level of activity, and range of motion. The meniscal tear was found intraoperatively in six of eleven patients in Group A (treated by resection). Four patients in Group B demonstrated poor functional outcome. Patients with lateral tibial plateau fracture (Schatzker Type II, III) can be treated without arthrotomy. In contrast to ORIF, less invasive technique allows earlier mobilization and earlier active motion. The present study indicates that invasive percutaneous osteosynthesis with the use of arthroscopy can provide better clinical results.

Date: 2010-09-01
Session: Trauma - Tibia / Fibula
Time: 16:00-17:45
Room: G4

Abstract number: 25786

ROLE OF BONE TRANSPORT USING A STACKED TAYLOR SPATIAL FRAME IN THE MANAGEMENT OF BONE DEFECTS OF THE TIBIA

Taher YOUSRI, Andrew MCBRIDE, Steve MITCHELL, Monsell FERGAL, Livingstone JAMES, Atkins ROGER, Jackson MARK

University Hospitals Bristol NHS Trust, Bristol (UNITED KINGDOM)

Introduction: We present our experience in the management of 40 patients with bone defects. **Patients:** There were 19 cases of infected non union, 9 cases of acute bone loss following fracture, 6 cases of chronic osteomyelitis, 4 cases of aseptic non union, 1 case of neurofibromatosis and 1 case of a loose infected total ankle replacement. **Results:** 28 out of the 40 patients reviewed have completed their treatment. Of these 28 patients, bony union was achieved in 23 patients, of whom 22 were assessed at discharge to have regained good to excellent limb function. In 5 patients docking site union failed, 3 of whom underwent below knee amputation. 2 patients required treatment with an intramedullary nail to achieve consolidated union of the docking site. Anatomic sagittal and coronal alignment was achieved in 19 out of 23 patients. The mean bone regenerate was 53.3mm (range: 15-180mm), with a mean healing index of 9.2 days/mm (range: 4.4-25 days/mm). The majority of patients experienced at least one complication including; pin site and soft tissue infections, refracture, nerve palsy and joint stiffness. Surgical stimulation of the docking site was required in 12 of the 28 patients to promote union. **Conclusion:** The use of a stacked Taylor Spatial Frame system is effective for restoring bone length and limb function in patients with bone loss following complex trauma and orthopaedic cases. The computer assisted nature of the spatial frame allows for predictable bone regenerate, minimal residual deformity and accurate bone docking.

Date: 2010-09-01
Session: Trauma - Tibia / Fibula
Time: 16:00-17:45
Room: G4

Abstract number: 25989

MICROSURGICAL TRANSPLANTATION OF COMPLEX VASCULARIZED FIBULAR GRAFT IN TREATMENT OF PATIENTS WITH LONG BONES DEFECTS

Igor KURINNYI, Sergiy STRAFUN, Oleksandr STRAFUN

Institute of traumatology and orthopaedics of AMS of Ukraine, Kyiv (UKRAINE)

The results of use of vascularized fibular graft in treatment of 30 patients with segmental defects of extremities long bones above 6 cm were studied. There were 25 (83 %) male and 5 (17 %) female (average age of $30 \pm 8,6$ years). The etiology of segmental bone loss were results of surgical treatment of osteomyelitis in 14 (47 %) patients, consequences of highly energetic trauma in 13 (43 %) cases and defects after tumor resection in 3 (10 %) cases. Mainly we treated defects of the tibia (10 cases, 33%) and radius (8 cases, 26,6%). Segmental bone defects of femur were healed in 7 patients (23,4%), humerus in 4 patients (13,3%) and there was one case of ulna defect (3,3%). During the surgery we substituted segmental bone defects from 6 to 17, in average $11,2 \pm 3,6$. In 14 cases (47 %) we used complex bone-skin vascularized fibular graft for concomitant skin defect substitution. Consolidation of vascularized fibula grafts with recipient bones on both ends were achieved in 25 patients during 1 to 17 months (in average $6,96 \pm 3,59$ months) after operation. The velocity of consolidation depends from anatomical localization and etiology of segmental bone loss. 6 patients (20 %) have had fibula graft stress fracture during rehabilitation period. We have good treatment results that meant restoration of weightbearing of the lower extremity or introduction of the upper extremity into everyday life in 25 patients (83%), poor results were in 3 cases (10%) and fair in 2 patients (7%).

Date: 2010-09-01
Session: Tumours - Giant cells
Time: 08:00-09:30
Room: F1

Abstract number: 26818

CLINICAL ASPECTS AND PROGNOSTIC FACTORS OF GIANT CELL TUMOURS OF BONE

Miklós SZENDRŐI¹, Zoltán SÁPI², Imre ANTAL¹

¹*Department of Orthopaedics, Semmelweis University, Budapest (HUNGARY),* ²*1st Institute of Pathol. Semmelweis University, Budapest (HUNGARY)*

Introduction: GCT of bone is still one of the most obscure tumour concerning its biological behaviour and aggressivity. Valuable prognostic factors are needed for prediction the recurrence capacity and potential malignant transformation of GCT. Material and methods: 121 GCT (both primary and recurrent tumours) of 76 patients were analysed for potential prognostic factors, like surgical stage, localization, duration of symptoms, age, use of additional adjuvant therapy (phenol, bone cement), proliferation activity (evaluated by Ki-67 immunohistochemistry) and DNA-ploidy of the mononuclear tumour cells (smear-cytophotometry). All clinical and radiological data of the patients were available in the files of the tumour registry (including min. 3 years follow-up, histological and surgical reports etc.). The resection of the tumour has definitive impact on the results, therefore for creating a homogenous group, only cases treated by intralesional curettage were included. Results: There were no significant correlation between the age, location, duration of symptoms, pathologic fracture and recurrence rate of GCT. Adjuvant therapy increased significantly the recurrence free survival. A significantly higher recurrence rate was observed in aneuploid/aneusomic than in diploid/disomic tumours ($p=0.0318$ - Chi²) and in GCT-s with PA over 15%. Through the course of the recurrences of certain GCT-s the ratio of aneuploidy increased significantly. Uni- and multivariate statistical analysis showed that the DNA-ploidy and PA of the GCT-s correlate more with the biologic behaviour than the widely used Campanacci-Enneking surgical staging system. Conclusion: 98% of GCT can be cured by conservative surgery. Attempt should be taken therefore for preserving of the joint. DNA-image cytophotometry and Ki-67 MIB immunohistochemistry are useful tools for predicting the recurrence capacity of the GCT, they do not predict, however, the malignant transformation of the tumour.

Date: 2010-09-01
Session: Tumor - Giant Cells
Time: 08:00-09:30
Room: F1

Abstract number: 24344

MOLECULAR PATHOGENESIS OF THE GIANT CELL TUMOR OF THE BONE

Yangguan WU¹, Jen Gwang HSIU², Kenneth SOMERS³, Edward YANG¹, Anming CHEN⁴

¹Elmhurst Hospital center / Queens Hospital center, Jamaica, New York (UNITED STATES), ²Depaul Medical Center, Norfolk (UNITED STATES), ³Eastern Virginia Medical School, Norfolk (UNITED STATES), ⁴Tongji Medical University, Wuhan (CHINA)

Human giant cell tumors of bone are a common benign skeletal neoplasm in the Chinese population with unpredictable biological behavior. We demonstrated p53 protein overexpression in 79% of GCTs by immunohistochemistry and p53 gene mutation in 52% of specimens by PCR-SSCP. Further analysis demonstrated that in 15 (52%) of 29 patient specimens, p53 immunostaining and mutations in exons 5-8 were concordant. Eleven of 29 tumors overexpressed p53 in the absence of mutations in exons 5-8, suggesting that other mechanisms were responsible for inactivation of p53 protein. Overexpression of murine double minute-2 (MDM2) protein has been suggested as an additional mechanism for abrogation of p53 function. In the present study, we also evaluated MDM2 expression in 29 GCTs of bone by immunohistochemistry and investigated the relationship between MDM2 expression and p53 alterations and clinicopathological parameters. MDM2 overexpression was detected in 13 (45%) of 29 GCTs. Eleven of 13 MDM2 positive specimens were also immunopositive for p53. Six p53 and MDM2 double positive specimens exhibited no mutations in exons 5-8 by PCR-SSCP analysis. MDM2 overexpression was associated with nuclear anaplasia ($p < 0.05$), previously linked with local recurrence of GCTs. The results indicate that MDM2 overexpression is a frequent abnormality in GCTs of bone and represents an alternative mechanism for inactivation of p53 in these tumors. The data suggest that MDM2 overexpression may contribute to the development of GCTs of bone.

Date: 2010-09-01
Session: Tumor - Giant Cells
Time: 08:00-09:30
Room: F1

Abstract number: 24360

OSSIFYING MASS: BENIGN TUMOR OR MINERALIZING MALIGNANT SOFT TISSUE TUMOR – DIAGNOSTIC DILEMMA & MANAGEMENT

Ashok KUMAR, Akram JAWED, Shah KHAN, Chandra YADAV, Shishir RASTOGI
All India Institute of Medical Sciences, Delhi (INDIA)

Background: Ossifying periarticular lipoma is a very rare entity. Lipomas undergo involutonal changes like chondrification, calcification and very rarely ossification. These changes result in altered clinical, radiological and histopathological features leading to diagnostic challenge in differentiation from the soft tissue tumor like synovial sarcoma, liposarcoma and rhabdomyosarcoma. Material & Method: We present a series of four cases of ossifying lipomas presenting as soft tissue tumor around the knee, shoulder and hip joints. All the tumors revealed calcification and ossification on plain X-rays and on MRI/CT Scans. Clinico-radiological evaluation lead to a similar diagnostic dilemma in our series and a confirmed diagnosis of ossifying lipoma became possible only after histopathology. Result: All the four tumors were excised completely without any recurrence during last 3 1/2 years of follow-up. Conclusion: To our knowledge this is the first case series of this rare entity describing the detailed clinico-radiological and histopathological features and differentiating it from malignant tumors. We recommend the early imaging by MRI/CT scan with closed core biopsy to exclude the malignant pathology and complete excision of the tumor with early mobilization of the adjacent joint.

Date: 2010-09-01
Session: Tumor - Giant Cells
Time: 08:00-09:30
Room: F1

Abstract number: 25204

**CLINICAL, X-RAY AND HISTOLOGICAL DIAGNOSTICS OF STERNUM
NEOPLASMS AND THEIR SURGICAL TREATMENT**

Ludmila PASHKEVICH, Losif VORONOVICH, Ihar SHPILEUSKI

*Belarusian Research Center of Traumatology and Orthopaedic Surgery, Minsk
(BELARUS)*

We have summarized our experience in diagnostics and surgical treatment of 22 patients with sternum tumors (benign 11, malignant - 6, metastatic 5). Clinical, X-ray and histological comparison permits to define early signs of tumorous growth process aggressiveness and probabilities of malignant transformation of some benign neoplasms (chondroma, giant cell tumor). The indications for sectoral and segmental sternum resections, sternectomy and enhanced sternectomy (with part of rib cartilages) were elaborated. Small post-operative sternum defects were filled with allo- or autograft of the wing of ilium. After enhanced sternectomy the defect of chest wall was filled with titanium perforated plate (our design). The outcomes were studied in 10 cases; the follow-up time was from 2 to 20 years.

Date: 2010-09-01
Session: Tumor - Giant Cells
Time: 08:00-09:30
Room: F1

Abstract number: 25892

**MANAGEMENT OF GIANT CELL TUMOR OF LOWER END OF RADIUS:
A COMPARATIVE STUDY**

Saranatra WAIKAKUL

Department of Orthopaedic Surgery, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok (THAILAND)

It was a retrospective study reporting results of management of giant cell tumor of lower end radius at Siriraj Hospital during 1990 to 2007. There were 16 male and 13 female. Their ages ranged between 18 and 35 years. Four methods of treatment have been performed. Group 1, wide resection-allografting were used in 9, group 2, wide resection-auto fibular grafting in 7, group 3, intralesional curettage and bone cement in 3 and group 4, intralesional curettage, warm Ringer lactate irrigation and auto bone grafting were used in 7 patients. Post operative wrist and hand functional were compared. Wide resection was the most common treatment but most patients have significant deformities and functional loss. Group 3 and 4 have better wrist motion and grip strength. Complications, such as infection, delayed union and graft resorption, were found in 5/9 patients of group 1, 2/9 patients in group 2, 1/3 patient in group 3 and non in group 4. In group 4, intralesional curettage, use of warm RLS irrigation and auto grafting gave best results even though all had large tumor mass with soft tissue invasion. The technique is safe and can be used in most giant cell tumor of lower radius.

Date: 2010-09-01
Session: Tumor - Giant Cells
Time: 08:00-09:30
Room: F1

Abstract number: 24486

INDICATION AND RESULTS OF EN BLOCK RESECTION IN AGGRESSIVE GIANT CELL TUMOR (GCT): 20-YEAR PERIOD STUDY

Dariush GOURAN SAVADKOOHI¹, Babak SIAVASHI¹, Seyyed Siamak REZANEZHAD¹, Mozhgan SEIFI¹, Mohammad GOURAN SAVADKOOHI²

¹*Sina Hospital, Tehran University of Medical Sciences, Tehran (IRAN)*, ²*Shahid Behshti University of Medical Sciences, Tehran (IRAN)*

Aim: To analyse our results after en-block resection of aggressive GCT during 20 years period. **Methods:** We review 86 patients with skeletal GCT during the last 20 years, from 1990 until 2009, retrospectively. In the cases of latent and active type, extended curettage and bone graft or cement were our treatment of choice, while in aggressive ones we performed en block resection and reconstruction by fibular autograft (e.g. in distal part of radius) or fusion/hinge joint prosthesis (e.g. in GCT around the knee joint). We describe the recurrences, metastases and complications according to treatment. **Results:** There was no recurrence in 18 cases of en block resection and segmental bone defects were reconstructed with fibular autograft (5), joint fusion (4) and hinge joint arthroplasty (9). We had 2 cases of pulmonary metastasis that underwent resection of the metastasis. In one case, internal fixation failed and the graft broke; thus revision was performed. The rest 68 cases underwent extended curettage and bone graft (51) or cement (17). We had 7 cases of recurrence, 6 treated with repeated curettage and bone cement and one with en lock resection. No death or major complication was reported. **Conclusions:** In comparison of en block resection with extended curretage, the recurrence rate is greater with the latter; however it results in good control of the disease with less morbidity. In recent years, the invention of hinge knee prosthesis has increased the quality of patients' life in whom we could not preserve the involved joint.

Date: 2010-09-01
Session: Tumor - Giant Cells
Time: 08:00-09:30
Room: F1

Abstract number: 23212

GIANT CELL TUMOUR OF THE DISTAL RADIUS: WIDE RESECTION AND RECONSTRUCTION BY NON-VASCULARISED PROXIMAL FIBULAR AUTOGRAFT

Ayman BASSIONY

Ain Shams University, Cairo (EGYPT)

INTRODUCTION: GCT of the bone are aggressive and potentially malignant lesions. GCT of the lower end radius are common and present a special problem of reconstruction after tumour excision. Out of the various reconstructive procedures described, non-vascularised fibular autograft has been widely used with satisfactory functional results. **MATERIALS AND METHODS:** Ten patients with a mean age of 33.4 years, with either Campanacci grade II or III giant cell tumours of lower end radius were treated with wide excision and reconstruction with non-vascularised proximal fibular autograft. Wrist ligament reconstruction was done in all cases. **RESULTS:** The follow-up ranged from 30 to 60 months (mean, 46.8). At last follow-up, the average combined range of motion was 100.5 degrees with range varying from 60 degrees to 125 degrees. The average union time was 7 months (range, 4 to 12). Non-union occurred in 1 case. Graft resorption occurred in another case. Localised soft tissue recurrence occurred in another case after 3 years and was treated by excision. There was no case of graft fracture, metastasis, death, local recurrence or significant donor site morbidity. A total of 3 secondary procedures were required. **CONCLUSIONS:** Enbloc resection of giant cell tumours of the lower end radius is a widely accepted method. Reconstruction with non-vascularised fibular graft, internal fixation with DCP with primary corticocancellous bone grafting with transfixation of the fibular head and wrist ligament reconstruction minimises the problem and gives satisfactory functional results

Date: 2010-09-01
Session: Tumor - Giant Cells
Time: 08:00-09:30
Room: F1

Abstract number: 25735

SURGERY OF GIANT-CELL TUMORS (GCT)

Aleh KEZLIA, Ivan CHARHOVICH, Vladislav ERMOLOVICH, Alexander BENKO, Konstantine CHACHELKO

Belarussian Medical Academy of Post-Graduate Education, Minsk (BELARUS)

During the period 1991-2008 54 patients with GCT have been treated. Examination algorithm included: clinical, X-ray, radionuclide, angiographic study, histological examination. In all cases diagnosis was confirmed by histological examination. All patients were operated using organ-preserving technologies: resection of epiphysis - 17 cases, segmental resection 16, deep marginal excision (up to 2/3 of bone diameter) 8 cases, intranidal resection 7, excochleation 6 cases. Bone defects have been corrected by free bone autoplasty in 12 cases, fibular bone on vascular pedicle in 13 cases, alloplasty of the proximal end of shin bone with symphysis in 3 cases, endoprosthetics in 14 cases. In 12 cases bone defects were corrected with the help of Ilizarov method. Average follow-up period after operation made up 11.6 years. Good results were registered in 92.6 per cent of all cases. Relapses were registered in 4 cases (7.4 per cent), of which 2 cases after excochleation, 1 case after economic marginal excision and 1 case after intranidal resection. Therefore, oncologically adequate are radical (segmental and deep P-shape) bone resections; bone defects corrected using Ilizarov methology, allo- and autotransplants, endoprosthesis. Excochleation and intranidal resection are not recommended to be used because of high rate of relapses and malignization.

Date: 2010-09-01
Session: Tumor - Giant Cells
Time: 08:00-09:30
Room: F1

Abstract number: 23211

CRYOSURGERY AND IMPACTION SUBCHONDRAL BONE GRAFT FOR THE TREATMENT OF GIANT CELL TUMOR AROUND THE KNEE

Ayman BASSIONY, Mohamed ABDEL RAHMAN, Hisham SHALABY, Mohamed ASSAL

Ain Shams University, Cairo (EGYPT)

Giant cell tumors are neoplasms of mesenchymal stromal cells with varied manifestations. There is no uniform accepted treatment protocol for these tumors. Curettage, although an accepted method of treatment, carries a high local recurrence rate. Adjuvant therapies including high-speed burr debridement, cryotherapy, and phenol treatment have been advocated to reduce local recurrence. We have used these adjuvants to determine if improved cure rate with improved outcomes could be attained with regard to local tumor control and functional outcome. Twenty-eight cases of proven giant cell tumors of the distal femur and proximal tibia were included in this prospective case series. The lesions were at the upper tibia in 14 cases and the lower femur in 14 patients. The patients were evaluated clinically, radiologically, and by histological examination. Campanacci grading and Enneking staging were determined. The treatment was done in the following steps: Curettage and further debridement with a high-speed burr, cryotherapy, impaction of the cavity with subchondral iliac crest bone graft, and, finally, cementation with or without internal fixation. Functional evaluation was done by Enneking's system. The follow-up time was between 24-40 months with a mean of 34 months. The functional results of the procedure were rated as good to excellent with a mean of 93.9%. This technique has the advantages of joint preservation, excellent functional outcome, and low recurrence rate when compared with other treatment modalities. For these reasons, it is recommended as an adjuvant to curettage for most giant cell tumors of bone.

Date: 2010-09-01
Session: Tumor - Giant Cells
Time: 08:00-09:30
Room: F1

Abstract number: 25295

RELEVANCE OF MIBI SCAN IN PROGNOSTICATING THE RESPONSE OF CHEMOTHERAPY IN PATIENTS OF PRIMARY MALIGNANT BONE TUMOURS

Aashish CHAUDHRY¹, Sudhir K KAPOOR², Minal CHAUDHRY³

¹*Sushruta Trauma Centre, New Delhi (INDIA)*, ²*Pgimer, Esi Hospital, New Delhi (INDIA)*, ³*Inmas, New Delhi (INDIA)*

MIBI (methoxyisobutyl isonitrile) is a newer radiopharmaceutical that is useful for assessing tumor response to chemotherapy. It has been shown that a negative MIBI scan after preoperative chemotherapy suggests more than 90% tumor necrosis. Our study: 12 patients with malignant bone tumour were included. Tc 99m MIBI scan was performed. The early and delayed phase images were taken. MIBI images were evaluated visually and quantitatively. For quantitative analysis, a region of interest (ROI) was drawn on the lesion and on a contralateral or adjacent normal area. The lesion to normal tissue count (L/C) ratio was then calculated specifically for early and delayed phases of MIBI scan. Comparison of Early & delayed phase L/C ratios of Tc99MIBI scans & wash out rate was done with clinical response to chemotherapy (WHO categories of clinical response: CR: Complete response, PR: Partial response, SD: Stable disease, PD: Progressive disease; All the patients were given standard regime chemotherapy. These patients were followed up for 'Clinical Response' at the end of chemotherapy and correlated with wash out rates (WR %) on MIBI scans using Mann Whitney Exact test. If we group CR & PR as responders and SD & PD as non-responders, then on application of Mann Whitney exact test, there exists significant difference between the two groups (P value 0.030). ROC curve was drawn and it can be deduced that value of 15.5 WR can be taken as an optimal cut off point for differentiating between responders and non-responders. (Sensitivity = 80%, specificity = 71.4%)

Date: 2010-09-01
Session: Tumor - Giant Cells
Time: 08:00-09:30
Room: F1

Abstract number: 24559

TUMOUR LIKE LESIONS: A REPORT OF 37 CASES

Thamer HAMDAN

Dean - Basrah Medical College, Basrah (IRAQ)

It is a non neoplastic lesion of bone that may be mistaken for tumours because it looks like or behave like a tumour. Sometimes it is very confusing status, cannot be solved even by investigation including histopathology. It may lead to a real disaster like amputation. Much of this suffering can only obviated by seeking expert opinion or by performing highly sophisticated investigation. Can be classified as traumatic, infective, infestation, blood dyscrasia, tumour like malformation, metabolic, endocrine, vascular or unclassified lesions. In this paper, I shall present (35) thirty five cases of tumour like lesion, which was managed by me, al the detailed, investigations will be included. I shall also discuss the ways to avoid this confusion. The cases are; lipoblastomasos, dermoid cyst, syphilis hydatid disease, myositisossificans traumatic fibrous cortical defect, aneurismal bone cyst, osteoid osteoma, neurofibromatosis, diaphyseal acalasia, osteomyelitis, actinomycosis, scurvy, paget's disease, synovial osteochondromatosis, bone ganglion and others.

Date: 2010-09-01
Session: Trauma - Knee
Time: 10:45-12:15
Room: F1

Abstract number: 25903

RECOVERY OF KNEE FUNCTION AFTER THE JUDET QUADRICEPSPLASTY

P. Nithin UNNIKRISHNAN, Fiona DAGLISH, Giles STAMPS, Paula WHITTAKER, Norma HOLT, Selvadurai NAYAGAM

Royal Liverpool University Hospital, Liverpool (UNITED KINGDOM)

Knee stiffness from peri-articular fractures, arthroplasty or limb lengthening surgery, if intractable after an extensive programme of physiotherapy, may be resolved by quadricepsplasty. We describe the recovery of knee function in a cohort of 12 patients who underwent a Judet quadricepsplasty for loss of knee flexion. Material and Methods: 12 adult patients underwent a Judet quadricepsplasty for recovery of knee flexion range. The causes of stiffness were trauma, arthroplasty, infection and limb lengthening surgery. A protocol of continuous passive knee movement under epidural analgesia was maintained after surgery. Outcome measures were range of movement, extensor lag, a modified WOMAC score for physical function, KINCOM data (with the contralateral limb as control), SF-36 and complications of surgery. Results: There were 11 male patients and 1 female. The mean age was 30 years. The median period of follow-up was 3 years. The difference between pre-operative and final knee motion ranges was statistically significant. KINCOM data against a contralateral control showed a highly significant difference ($p < 0.001$) in quads strength. The medians for the WOMAC score was 38; PCS of the SF36 34.7 (SD13) and the MCS 53.7 (SD 13). Conclusion: Improvement in knee flexion after a Judet quadricepsplasty is maintained at one year. Extensor lag is common after the procedure but recovers. Most patients found the improvement beneficial but objective measures of knee function showed a return to normal had not been achieved.

Date: 2010-09-01
Session: Trauma - Knee
Time: 10:45-12:15
Room: F1

Abstract number: 24052

CROSS-LEG FLAP: ITS ROLE IN LIMB SALVAGE

Narayana Prasad KARAKKAD, Sambathkumar BALAKRISHNAN
Dhanalakshmi Hospital, Kannur (INDIA)

Pedicated cross-extremity flaps for lower limb wound coverage have been replaced by free tissue transfer in the last two decades. However there are certain difficult situations where the free flap cannot be employed and alternate methods are needed. We describe our experience with cross-leg flap in 32 patients for reconstruction of difficult leg defects in which no suitable recipient vessels were available for micro vascular anastomosis in vicinity of the defects. In addition reliability and affordability of the cross-leg over the free flap make us to go for the conventional method of lower limb reconstruction. 32 Patients (26 men and 6 women) with mean range 37.2years (range from 21-73yrs) Type III B tibial fractures were included in the study. Fasciocutaneous cross leg flap was employed and extremities were immobilised by external fixator. 23 flaps were completely available with 6 had marginal necrosis and 3 superficial epidermal necrosis. 3 cases had donor site infection and 4 cases had pin tract infection where the pin site needs to be revised. Each patient resumed normal gait and activity without any stiffness of joints related with flap or external fixator. The addition of external fixator stabilisation aids greatly in the wound care, as well as for general ease of the patient mobility and positioning. Cross-leg flap offers the possibility of salvaging limbs that are otherwise non reconstructable.

Date: 2010-09-01
Session: Trauma - Knee
Time: 10:45-12:15
Room: F1

Abstract number: 26411

THE ILIZAROV EXTERNAL FIXATOR A USEFUL TREATMENT ALTERNATIVE FOR THE TREATMENT OF PROXIMAL TIBIAL FRACTURES

Telmo DE OLIVEIRA RAMOS¹, Jón KARLSSON², Lars NISTOR¹

¹*Orthopaedic Department / KSS, Skövde (SWEDEN)*, ²*Sahlgrenska Academy, Göteborg (SWEDEN)*

Background and purpose: The basis for treatment of articular proximal tibial fractures is the hypothesis that post-traumatic osteoarthritis can be avoided if the knee is stable and the joint incongruency is less than one cm. The aim of this study was to report on the results after using the classical Ilizarov technique. Patients and methods: Prospective data of 30 patients with isolated fractures. A fixation with a two-five ring construction to the leg. Bicondylar fractures were fixed with a femoral extension bridging the knee joint. Bone defects were filled with sulphate calcium pellets. All patients were evaluated with preoperative and postoperative conventional radiographs, CT scans, functional assessments and patients' self appraisal of function such as Euroqvol (EQ 5-D) score. Results: The median operation time was 164 min (92-275). In 15 patients, there was applied the femoral extension. In 18 patients sulphate calcium substitutes were used. Two patients underwent fasciectomy due to compartment syndroms, two patients had DVT. The median hospital stay was 7 days (3-13). One patient had a pintract infection, which required reoperation. The fixator was removed after a median time of 12 weeks (6-24). EQ-5D at 1, 3 resp. 12 months was 0.620, 0.655 and 0.796 respectively. Knee flexion was less than 90 degrees in 2 patients. In only one patient the functional result is so bad that a total knee replacement is planned. Conclusions: The Ilizarov method shows a low complication rate.

Date: 2010-09-01
Session: Trauma - Knee
Time: 10:45-12:15
Room: F1

Abstract number: 25910

ARTHROSCOPIC-ASSISTED SURGICAL TECHNIQUE FOR TREATING PATELLA FRACTURES

Waleed ARAFAT, Nehad MAHBOUB

Misr Univeristy for Science and Technology, Giza (EGYPT)

The main goals in treatment fractures of the patella are; precise reduction of the articular surface and stable fixation of the fragments restore the extensor mechanism of the knee, allowing early mobilization. Lacerations or abrasions over the skin of the patella seem most often to cause a delay in surgery, poor results because of intra-articular incongruity, nonunion, and poor motion lead to unsatisfactory results in >50% in these patients. To avoid these problems, arthroscopic-percutaneous internal fixation with two cannulated screws and tension band cerclage is a valid alternative for the treatment of intra-articular displaced patella fractures. This technique allows healing of the fracture with low patient morbidity, a short hospitalization period, and an accelerated rehabilitation of the affected knee. We applied this technique in 40 patients who presented a displaced patellar fracture and were followed-up for an average of 18 months. At final follow-up, radiographic consolidation was achieved in all patients obtaining full range of motion and returning to the activity level previous to the fracture. This technique allows healing of the fracture with low patient morbidity, a short hospitalization period, and an accelerated rehabilitation of the affected knee. Keywords: patella-fractures- percutaneous- fixation -arthroscopically.

Date: 2010-09-01
Session: Trauma - Knee
Time: 10:45-12:15
Room: F1

Abstract number: 26069

SURGICAL TREATMENT OF AVULSION FRACTURE OF POSTERIOR CRUCIATE LIGAMENT: OUR EXPERIENCE

Vijay SHARMA¹, Kamran FAROOQUE², Purva MATHUR¹

¹All India Institute of Medical Sciences, New Delhi (INDIA), ²304 JPNApex Trauma Centre, New Delhi (INDIA)

BACKGROUND: Avulsion fractures of the posterior cruciate ligament have long been regarded as rare injuries. In the past, it was common practice to use cast immobilization as an external adjunct after open reduction and internal fixation of fractures. **METHODS:** Eighteen patients with displaced avulsion fractures of the posterior cruciate ligament were treated with open reduction and internal fixation between December 2005 and December 2008. 4 mm partially threaded cancellous screws were chosen as fixation devices in all patients. The postoperative management protocol evolved from an initial regimen of 6 weeks' Immobilization in a cast with the knee flexed to 20 degrees for all the patients followed by muscle strengthening and ROM exercises. The average follow-up period was 6 months. Hughston's criteria were used to assess the clinical results. **RESULTS:** Overall, there were 14 (80%) good and 4 fair (20%) results. There was no poor result. **CONCLUSION:** Avulsion fractures of the posterior cruciate ligament should be treated with open reduction and stable internal fixation if any displacement is seen on initial radiographs at presentation. With the use of aggressive rehabilitation program, satisfactory results can be expected and achieved.

Date: 2010-09-01
Session: Trauma - Knee
Time: 10:45-12:15
Room: F1

Abstract number: 26412

TIBIAL PLATEAU FRACTURE REPAIRS AUGMENTED WITH CALCIUM PHOSPHATE CEMENT HAVE HIGHER IN SITU FATIGUE STRENGTH THAN THOSE WITH AUTOGRAFT

Amir MATITYAHU¹, Erik MCDONALD¹, Thomas CHU¹, Michael TUFAGA¹, Meir MARMOR¹, Ravinder SINGH², Duran YETKINLER², Jenni BUCKLEY¹, R. Trigg MCCLELLAN¹

¹UCSF/SFGH Orthopaedic Trauma Institute Department of Orthopaedic Surgery, San Francisco (UNITED STATES), ²Skeletal Kinetics, Cupertino (UNITED STATES)

INTRODUCTION: The goal of this study was to compare the biomechanical fatigue strength of calcium phosphate vs. autograft augmentation in the lateral tibia plateau with a split-depression fracture type under simulated physiologic loading conditions. **METHODS:** 8 matched pairs of cadaver tibias (6 M, 2 F: age 75±14) were fractured and repaired by an orthopaedist using a lateral tibial plateau plate. One tibia from each donor was randomly assigned to either calcium-phosphate or autograft as augmentation. Cyclic, physiological compression loads were applied at 4Hz using the femoral component of a hemi-total knee replacement, starting with a maximum load of 15% bodyweight, and increasing by 15% BW every 70,000 cycles. Fragment depression was measured using a dial indicator which was mounted to the test frame. Stiffness was calculated by taking the slope of a least squares regression line fit to the force displacement curves output by the testing machine. Specimens were then loaded to failure at 1 mm/min. **RESULTS:** Calcium-phosphate augmented repairs subsided less and were more stiff during the fatigue loading than autograft at the 70k, 140k, and 210k cycle intervals ($p<0.03$). The average ultimate load of the Calcium phosphate repairs was $2241 \pm 455\text{N}$ (N=6), and $1717 \pm 508\text{N}$ (N=8) for autograft repairs ($p=0.04$). **DISCUSSION:** These results suggest that calcium-phosphate augmentation may increase the immediate weight-bearing capabilities of the repaired knee. These results have important clinical implications with respect to maintenance of articular reduction during the early phase of fracture healing.

Date: 2010-09-01
Session: Trauma - Knee
Time: 10:45-12:15
Room: F1

Abstract number: 23975

RESULTS OF TREATMENT OF SIMPLE AND COMMINUTED PATELLAR FRACTURES. A COMPARATIVE STUDY OF DIFFERENT TREATMENT MODALITIES.

Gershon VOLPIN, Alexander GORSKI, Haim SHTARKER, Alexander KAUHANSKI, Genadi KIRAHNER, Leonid LICHTENSTEIN, Raviv SHACHAR

Western Galilee Hospital, Naharia (ISRAEL)

INTRODUCTION: We present our experience with patellar fractures with correlation of the results of different treatment modalities to the grade of patellar comminution and the final outcome. **PATIENTS:** 104 patients with patellar fractures (71M, 32F), 17-80Y old (mean- 45.5Y), were reviewed 2-7y (Mean 3.7Y) following ORIF (43 Pts.), partial patellectomy (37 Pts.), total patellectomy (12 Pts.), and conservative treatment (12 Pts). Patients were evaluated by the Lysholm functional questionnaire, Knee Society Score and radiographs. **RESULTS:** Excellent and good in 83.4% by Lysholm score and 81.2% by objective knee score were observed following partial patellectomy, ORIF and total patellectomy. No statistical significant differences were found between these groups. Following conservative treatment of 2 fragment fractures excellent good results were observed in 74.53% by Lysholm score and in 73.2% by objective score. Correlation between treatment modalities and grade of patellar comminution revealed that in two fragment fractures, similar results were observed following partial patellectomy and ORIF, whereas in three or more fragments, there were significant better results following partial patellectomy than ORIF. The patients with comminuted patellar fractures treated by partial patellectomy had also better short term and long term outcome than all other techniques. **CONCLUSIONS:** Based on this study it seems that partial patellectomy should be considered as the treatment of choice in patients with comminuted fractures of three or more fragments, whereas open reduction and internal fixation remains as the first optional treatment in simple patellar fractures of two fragments.

Date: 2010-09-01
Session: General Orthopaedics
Time: 13:30-15:00
Room: F1

Abstract number: 26136

A LONGITUDINAL RANDOMIZED STUDY OVER ORTHOPAEDIC APPLIANCE OF A GROUP OF DIABETES PATIENTS AT RISK – BASELINE RESULTS

Ulla TANG¹, Roland ZÜGNER², Roy TRANBERG², Bjarne MILLESTEN¹

¹*Ortopedteknik, Sahlgrenska University Hospital, Gothenburg (SWEDEN),*

²*Lundbergs Laboratory for Motion Analysis, Gothenburg (SWEDEN)*

Neuropathy is a commonly raising problem for the diabetic patients. In its prolongation progressive loss of the periphery sensations in combination with distal muscle atrophy leads to gait disturbance that overload feet. Prophylaxis, which include regularly check of the feet, podiatry and well fitting shoes, has proven to prevent ulcers on diabetic feet. 114 patients, 52 female and 62 men, mean age 57.7 (range 20.2-88.4) were recruited from the waiting list at the orthopaedic work shop in Gothenburg. Patients were randomized into 3 groups and provided with different sorts of insoles. Orthopaedic shoes were offered with a subvention. A health-related quality of life questionnaire, SF-36 was used. Movement status of lower extremity was registered by a R.P.T. as well as monofilament test. Of the 114 participating patients 58 were referred from hospital service and 56 from primary care in Gothenburg with surroundings. 31 patients were risk classified as type I and the remaining 83 as type II. Furthermore the HbA1c was 6.3 ± 1.9 , 107/114. SF-36 divided in PCS and MCS categories show 42.9 and MCS 49.1 respectively. 25% accepted to buy their shoes from orthopaedic work shop in line with recommenaditon. Patients with diabetes not only present lower SF-36 score at PCS categories but also at the MCS category. Moreover, low acceptances for orthopaedic shoes are present although price is reduced with more than 50%.

Date: 2010-09-01
Session: General Orthopaedics
Time: 13:30-15:00
Room: F1

Abstract number: 26585

**INTEGRATED CARE PATHWAYS IN TOTAL JOINT ARTHROPLASTY
– ARE THEY EFFECTIVE? THE CAMBRIDGE EXPERIENCE**

Shruti RAUT, Christian MERTES, Vikas KHANDUJA

Addenbrookes - Cambridge University Hospitals NHS Trust, Cambridge (UNITED KINGDOM)

AIMS: The aim of this study was to evaluate the effectiveness of an Integrated Care Pathway (ICP) for all patients undergoing a TKR and a THR in increasing day of surgery admission (DOSA) rate and reducing length of stay (LOS). **METHODS AND RESULTS:** A multi-disciplinary team was put together including trust pathway leads, physiotherapists, occupational therapists, nursing staff, an Orthopaedics manager, an IT manager and an Orthopaedic consultant. A paper based ICP with an evidence base was put together. A day of surgery admission (DOSA) policy was introduced as well and education on the pathway was commenced to roll out the pathway to all those responsible for the care of the patient. The journey of each of the patients was carefully documented in the ICP and any variation in patient care was mapped. Since introduction of the ICP in March 2008 DOSA had increased from <5% to 80%. Mean length of stay for patients undergoing TKR and THR had fallen from 8.7 to 6.3 days from February to May 2008. In 1999-2000 modal LOS for patients undergoing TKR and THR was 8 days compared with 4 days in 2008-9, following introduction of the ICP. **CONCLUSIONS:** While the introduction of an ICP has certainly resulted in a substantial increase in DOSA rate and a 28% reduction in length of stay following elective TKR or THR; further evaluation of patient reported outcome measures (PROMs) would show whether the implemented changes are really affecting patient satisfaction.

Date: 2010-09-01
Session: General Orthopaedics
Time: 13:30-15:00
Room: F1

Abstract number: 23356

TREATMENT OF PATIENTS WITH PSEUDARTHROSES AND BONE DEFECTS WITH THE METHOD OF TRANSOSSEOUS OSTEOSYNTHESIS AFTER ILIZAROV

Dmitry BORZUNOV

Russian Ilizarov Scientific Centre Restorative Traumatology and Orthopaedics, Kurgan (RUSSIA)

Introduction: There has been a systemic approach developed at RISC RTO for rehabilitation of patients with posttraumatic conditions of long bones using transosseous osteosynthesis. Material and methods: The system of Ilizarov reconstructive and restorative treatment of more than 1600 patients with bone defects and pseudarthroses includes bone lengthening, healing at the docking site, tibiofibular synostosis and closed gradual stretching of interfragmental tissues with regenerate formation. Results: Monofocal compression-distraction osteosynthesis was primarily applied for hypertrophic pseudarthroses of long bones. Unifocal bone lengthening was produced in 81.7% cases of bone repair. Polyfocal technologies of distractional regenerate formation were employed for the repair of long bone defects greater than 5-7 cm. Various types of tibiofibular synostosis were used for sub- and total tibial defects to restore bony frame of tibia. Stimulation of reparative process was provided by techniques of surgical intervention additional traumatisation and compactisation of regenerate bones, implantation of cellular elements and tissues into osteogenesis nidus, usage of materials with osteoinduction coating. Reduced length of treatment was related to combined application of transosseous osteosynthesis technologies, intramedullary hydroxyapatite coated wires, locking intramedullary osteosynthesis. Discussion of the results: Differentiated usage of non-free bone plasty with the Ilizarov method provided positive outcome of treatment and rehabilitation in 90.5-100% of clinical observations.

Date: 2010-09-01
Session: General Orthopaedics
Time: 13:30-15:00
Room: F1

Abstract number: 23369

RANDOMISED CONTROLLED TRIAL OF THE USE OF TOPICAL APPLICATION OF TRANEXAMIC ACID IN TOTAL HIP REPLACEMENT

Sattar ALSHRYDA¹, Praveen SHARDA¹, Antoni NARGOL¹, S. MAHESWARAN¹, Chris TULLOCH¹, Anjani SINGH¹, S. LAKKOL¹, James MASON²

¹*University Hospital of North Tees and Hartlepool, Stockton-on-Tees (UNITED KINGDOM)*, ²*Durham University, Stockton-On-Tees (UNITED KINGDOM)*

Introduction: Total knee replacement (TKR) is one of the commonest operations in orthopaedic practice. Literature showed that 20-70% of patients who had TKR needed 1-3 units of blood. Although safer than ever, allogeneic transfusion is not free of risks for the recipient. OBJECTIVES: To find out whether Tranexamic acid can reduce blood loss and subsequent blood transfusion significantly after total knee replacement when applied topically without extra side effects. DESIGN: A double blind randomised controlled trial of 158 patients who underwent unilateral primary cemented total knee replacement. This number gives a 90% power to detect a 50% reduction in blood loss and 80% power to detect a reduction in blood transfusion from current local standard 30% to 10%. OUTCOME MEASURES: Primary outcome: - Blood transfusion rate. Drain blood loss. Secondary outcomes: Haemoglobin and Haematocrit drops General quality of life measure (EUROQOL) (EQ5). Oxford knee score (OKS). Length of stay. Complications as per protocol definitions. RESULTS: The two groups were comparable in age, weight, height, BMI, co-morbidities, preoperative Hb, OKS, EQ5, tourniquet time, type of anaesthesia. There have been significant differences in the amount of blood loss, blood transfusion, Hb drop and length of stay in favour of tranexamic acid group. Fourteen patients needed blood transfusion ranged from 2-6 units. Thirteen were in the Placebo group and only one in the Tranexamic acid. There has been no significant difference among other outcomes in particular complications rates such as DVT and pulmonary embolism.

Date: 2010-09-01
Session: General Orthopaedics
Time: 13:30-15:00
Room: F1

Abstract number: 25534

MINIMAL INVASIVE TOTAL KNEE ARTHROPLASTY WITH OR WITHOUT NAVIGATION SYSTEM: A PROSPECTIVE, RANDOMIZED STUDY

Kang-II KIM, Dae-Kyung BAE, Kye-Youl CHO, Seung-Mok SHIN
Kyung Hee University East-West Neo Medical Center, Seoul (KOREA)

Although minimal invasive surgery (MIS) has advantage of rehabilitation in total knee arthroplasty (TKA), it may be associated with component malposition due to poor visualization. Navigation has been shown more accurate alignment and can compensate the restricted visualization in MIS. The purpose of this study was to compare the results of MIS TKA using either computer assisted navigation system (MIS-NAV group) or conventional alignment guide system (MIS-CON group). Forty-four TKAs were performed using navigation system and 44 TKAs using conventional technique with using mini-midvastus approach without patellar eversion. The tourniquet time was longer in MIS-NAV group ($p=0.000$). Amount of transfusion was higher in MIS-CON group ($p=0.025$). Radiographic results showed significant different ($p=0.027$) and angle ($p=0.000$) between two groups but all parameters exist within normal value except angle in MIS-CON group. MIS-NAV group showed fewer outliers (1 case) in hip-knee-ankle axis than MIS-CON group (4 cases) ($p=0.167$). Regardless of significant better points in Knee Society function score at postoperative 6 weeks ($p=0.003$) and 3 months ($p=0.030$) in MIS-NAV group, these differences were not significant after 3 months. MIS-NAV group showed less blood loss and more accurate radiographic parameters but requested longer operation time. In contrast, although there was a tendency of more outliers in mechanical axis and angle in MIS-CON group, it showed shorter operation time and comparable short-term clinical outcomes.

Date: 2010-09-01
Session: General Orthopaedics
Time: 13:30-15:00
Room: F1

Abstract number: 26053

PERIOPERATIVE CELECOXIB ADMINISTRATION FOR PAIN MANAGEMENT AFTER TOTAL KNEE ARTHROPLASTY – A DOUBLE-BLIND, RANDOMIZED CONTROLLED STUDY

Ching-Chuan JIANG

Department of Orthopaedic Surgery, National Taiwan University Hospital, Taipei (TAIWAN)

Introduction: To evaluate the morphine-sparing effect and improved post-operative range of motion (ROM) obtained with celecoxib prescription in patients undergoing total knee replacement surgery. Methods: Eighty patients for TKR surgery from June 2006 to March 2007 were randomized into two groups receiving pre- and postoperative celecoxib or placebo. The first dose of celecoxib 400mg was prescribed orally about 1hour before surgery, and celecoxib 200mg twice a day were administered in the first five days after surgery. And placebo with starch contain was prescribed in the same way. The outcome measures included pain scores, postoperative ROM, patient-controlled analgesia (PCA), morphine dosage and side effect after morphine administration. Results: The groups were comparable in age, sex, pre-operative ROM, duration, and pre-operative knee score in both groups. After surgery, Visual Analog Score had significant improved in the study group at rest ($p=0.002$). The active ROM significantly increased in patients receiving Celecoxib therapy, especially in the first 72 hrs. The Dosage of morphine decreased about 40% ($p=0.03$) and the frequency of postoperative nausea and vomiting decreased about 25% in the study group. There was no significantly difference in the amount of blood loss between two groups. Discussions: In our study, perioperative Celecoxib administration has been proved effectively in pain control for patients receiving TKR surgery. Patients treated with Celecoxib had better postoperative recovery and used less narcotic dosage.

Date: 2010-09-01
Session: General Orthopaedics
Time: 13:30-15:00
Room: F1

Abstract number: 26389

THE IMPACT OF SMOKING ON COMPLICATIONS AFTER OPERATIVELY TREATED ANKLE FRACTURES – A FOLLOW-UP STUDY ON 906 PATIENTS

Hans NÅSELL, Hans NÅSELL, Sari PONZER, Hans TÖRNQVIST, Johannes LINDÉ, Carin OTTOSSON

Section of Orthopaedics, Department of Clinical Science and Education, Södersjukhuset, Karolinska Institutet, Stockholm (SWEDEN)

Background and purpose: Ankle fracture is one of the most common injuries treated by orthopaedic surgeons and is generally considered as a low risk procedure. The main purpose of this follow-up study on patients operatively treated ankle fractures was to investigate the impact of smoking on postoperative complications, especially wound infections. Patients and methods: A consecutive series of patients operatively treated due to an acute ankle fracture during a three year period (n=906) were identified. For the analysis the patients were categorized as non-smokers (n=721) and smokers (n=185). Data was collected from the department database and completed with a review of the patients' medical charts. Results: Follow-up data at 6 weeks was available for 98.2% of the patients. Post-operative complications generally (p=0.024), as well as all wound infections (p=0.004) and deep wound infections (p=0.003) were more common among smokers compared to non-smokers. Multivariate analyses showed that smokers had a 4 times higher risk developing a deep infection compared to non-smokers. In total 12 patients developed a deep infection, generating in average 3.25 secondary surgical procedures. Interpretation: We conclude that cigarette smoking increases the risk of postoperative complication in patients operatively treated for an ankle fracture. Even if smoking is a considerable risk factor, it is a modifiable one. Therefore physicians, nurses and others health care professionals should be alerted to support patients to stop smoking while still under acute treatment.

Date: 2010-09-01
Session: Infections in Paediatric Orthopaedics
Time: 16:00-17:45
Room: F1

Abstract number: 26822

SPINE INFECTIONS IN CHILDREN

David ARONSSON

University of Vermont College of Medicine, Shelburne (UNITED STATES)

Goals: Review the etiology, microbiology, and treatment of common spine infections in children. Discuss the differences between infections involving children from birth to 3 years of age compared with older children. Analyze the types of infections and prognosis between children living in developed countries compared with developing countries. Discitis must be included in the differential diagnosis of toddlers who refuse to bear weight and it should also be considered in limping children of all ages. Symptoms include limp, refusal to bear weight, and back pain. MRI reveals a paraspinal mass and most investigators believe that the etiology is an occult *S aureus* infection. Although *S aureus* is the most common organism, mycobacterium tuberculosis (TB), and *Kingella kingae* have also been identified. Most clinicians recommend antibiotics for 3 weeks to 3 months, but symptomatic treatment only has been successful. Symptoms typically resolve in 1-3 weeks. In some countries, consumption of unpasteurized milk products can cause discitis secondary to brucellosis. Treatment with co-trimoxazole and rifampicin is usually effective. Older children may develop a spondylodiscitis secondary to TB and although antibiotic treatment is successful in 90% of cases, patients with multi-level involvement, kyphosis, and neurologic deficits benefit from decompression. Decompression alone further destabilizes the spine, so anterior decompression and posterior stabilization is recommended. In infants, MRSA pneumonia can lead to septicemia with an extensive epidural abscess. If identified and treated early with antibiotics a complete recovery can be anticipated. Postoperative spinal infections are not common in children with idiopathic scoliosis (IS), but are common in patients with neuromuscular conditions; the most common organisms are *S aureus*, *S epidermidis*, and *Pseudomonas aeruginosa*. Two surgeries will usually eradicate the infection and 50% will require instrumentation removal. A late-developing infection in patients with IS can be successfully treated with instrumentation removal and primary wound closure.

Date: 2010-09-01
Session: Infections in Paediatric Orthopaedics
Time: 16:00-17:45
Room: F1

Abstract number: 26862
INFECTIONS SIMULATING TUMORS

John P. DORMANS

University of Pennsylvania School of Medicine, Philadelphia (UNITED STATES)

Osteomyelitis (caused by *Staphylococcus aureus*), musculoskeletal tuberculosis (caused by *Mycobacterium tuberculosis*), and Langerhans cell histiocytosis (recently suggested to be caused by the human herpes 6 virus) are three common infections simulating bone tumors. Subacute osteomyelitis, a specific type of osteomyelitis, is difficult to diagnosis because of its nonspecific clinical presentation and radiographic ambiguity. 1 Radiographic images of the lesions frequently mimic benign and malignant conditions. 2 Laboratory findings are often unremarkable. 2-4 Treatment requires biopsy in conjunction with thorough decompression and debridement.2 Administration of appropriate antibiotics is also recommended. 5 Brodie's abscess, acute osteomyelitis, and chronic recurrent multi-focal osteomyelitis are three additional subtypes of osteomyelitis that frequently mimic bone tumors. 6 Although Langerhans cell histiocytosis (LCH) is a multisystem disease, it often manifests as an orthopaedic issue in the form of isolated or multiple bone lesions, commonly found in the skull.7,8 Infection by the human herpes virus 6 has recently been linked to the incidence of this disease. 7 Radiographic appearance varies depending on the location of the lesion, as well as the degree to which the disease has progressed. LCH associated lesions usually destroy bone, simulating benign and malignant conditions. Diagnosis requires biopsy to rule out any malignancies. 9 When LCH has been confirmed, curettage and grafting are recommended to facilitate healing.10Musculoskeletal tuberculosis can affect any bone, joint, or bursa, but the spine is the most common site of osseous involvement. 2, 11 Once the bacteria have reached the skeletal system, a lesion surrounded by lymphocytes and polymorpholeukocytes arises, mimicking the development of a malignant lesion.11 Biopsy and early quadruple drug therapy are often indicated. 2,11

Date: 2010-09-01
Session: Infections in Paediatric Orthopaedics
Time: 16:00-17:45
Room: F1

Abstract number: 26824

LATE SEQUELAE OF INFECTIONS

Patricia FUCS

Santa Casa Medical School and Hospitals, São Paulo (BRAZIL)

The main goal in the treatment of bone and joint infections is to avoid the late complications, which is bone and joint destruction. To achieve this early diagnosis and treatment are extremely important. The treatment of the late sequelae of infections in children and adolescents is very challenging, especially in the lower extremities and in the hip joint because could led to severe dysfunction the patients. To the sequelae of septic hips could present as degenerative joint disease, abductor insufficiency, instability, stiffness, malalignment and leg length discrepancy. The treatment is based on providing joint stability and equalization of the limb length. Surgical reconstruction and salvage procedures are discussed according to Choi classification the deformity. The sequelae in the long bones could cause angular and rotational deformities and length inequality, to all of them care should be taken to plan corrections according to the age of the child. Treatment with corrective osteotomies and the use of external fixators to correct and lengthen long bones modify the outcomes of the treatment.

Date: 2010-09-01
Session: Trauma Forearm / Wrist
Time: 08:00-09:30
Room: F2

Abstract number: 25674

INFUENCE OF THE TYPE OF TREATMENT FOLLOWING DISTAL RADIUS FRACTURE ON THE QUALITY OF LIFE

Klaudiusz KOSOWSKI¹, Wieslaw WISNIEWSKI², Leszek ROMANOWSKI³

¹*MedPolonia Hospital, Pozna (POLAND)*, ²*Department of Trauma and Orthopaedics, Turek (POLAND)*, ³*University Hand Surgery Dpt, Pozna (POLAND)*

These days the indications for surgical treatment of distal radius fractures are commoner than before. In many cases of patients treated surgically we notice better outcome than in patients treated with POP immobilization. We have to ask ourselves a question if surgical treatment leads to a better quality of life. Aim: to evaluate quality of life in patients treated with minimally invasive technique (K wires and plaster cast) with surgically treated (volar plating without plaster cast). Material and methods: in this prospective study we decided to evaluate 50 patients divided into 2 groups. Inclusion criteria: distal radial fractures AO classification type A, B and C. Exclusion criteria: lack of communication, lack of consent. Type of treatment was randomized. Method of evaluation: DASH questionnaire, VAS pain score, Garland and Warley questionnaire and OFC (our own functional scale). Additionally we assessed ROM, grip power. Radiological assessment conducted according to Lindstrom scale. Results: in the first 10 weeks following surgical treatment patients have statistically significant better quality of life however later we observe still better function but not statistically significant.

Date: 2010-09-01
Session: Trauma Forearm / Wrist
Time: 08:00-09:30
Room: F2

Abstract number: 26128

VOLAR LOCKING PLATES; WHAT IS THE MINIMUM NUMBER OF LOCKING UNITS NEEDED FOR ADEQUATE FIXATION?

Santosh BALIGA, Alan JOHNSTONE

Aberdeen Royal Infirmary, Department of Trauma Orthopaedics, Aberdeen (UNITED KINGDOM)

Background: Angular stable volar locking plates have become increasingly popular for more comminuted fractures of the distal radius. Although they have been shown to be successful at maintaining reduction to allow early mobilisation the main drawback is from screw cut-out. We aimed to quantify the minimum number of locking pegs and or screws need to maintain the operative reduction. Method: We retrospectively looked at a series of 46 patients that had undergone volar plating. We assessed there fracture severity on pre-operative films and compared radiographic parameters (volar tilt, radial inclination and radial height) on post-operative films. We calculated the amount of reduction lost from initial post of x-rays to radiographs taken when union was confirmed. We compared this to the number of locking units used to fix the distal radius and also the configuration they were inserted, i.e. the number in the radial and middle columns. Results: The mean loss of reduction in all plates was 0.9mm of radial height, 2.2degs of radial inclination and 2.8degs of volar tilt. We found that there was no difference in means when a total of 2 or 3 locking units were used. This was also case when analysing more severe OTA Type C fractures. Conclusion: Only one locking peg is needed under each column for adequate stability. Any more than this confers no additional benefit in maintaining reduction. The extra rigidity provided by more screws and also thick plates may make them more prone to cut out.

Date: 2010-09-01
Session: Trauma Forearm / Wrist
Time: 08:00-09:30
Room: F2

Abstract number: 22866

RADIOLOGICAL OUTCOMES OF DISTAL RADIUS EXTRA-ARTICULAR FRAGILITY FRACTURES TREATED WITH EXTRA-FOCAL KIRSCHNER WIRES

Cian KENNEDY¹, Muiris KENNEDY², Aiden DEVITT¹

¹*University College Hospital, Galway (IRELAND)*, ²*Tullamore Regional Hospital, Offaly, Portarlington (IRELAND)*

The classical Colles fracture (extraarticular, dorsally angulated distal radius fracture) in patients with osteoporotic bone is becoming increasingly more frequent. There still appears to be no clear consensus on the most appropriate surgical management of these injuries. **Methods:** We retrospectively analysed 72 consecutive cases of Colles fractures treated with interfragmentary K-wire fixation, in female patients over sixty years of age, in two orthopaedic centres. We correlated the radiographic distal radius measurements (ulnar variance, volar tilt, and radial inclination) at the pre-operative and intra-operative stages with the final radiographic outcome. **Result:** Mean dorsal angulation was 21° at presentation. Closed reduction significantly improved fracture position to a mean of 2.7° volar angulation ($p < 0.05$). Mean angulation at time of k-wire removal was 1.6° dorsal, this was not significant in comparison to post reduction measurements ($p < 0.05$). Mean ulnar variance at time of presentation was 2.5mm (range 7.4 to -4.2). Reduction improved fracture displacement to a mean of 0mm, ($p < 0.05$). Mean ulnar variance at time of k-wire removal was 2.4mm ($p < 0.05$). 56.8% of cases demonstrated radial shortening of 2mm or more. **Conclusion:** In female patients over 60 years of age, the best predictor of radial length, when K-wire fixation is to be used, is the radial length prior to fracture reduction. Thus if there is radial shortening visible in the initial radiographs as measured in terms of ulnar variance, one should consider a method of fixation other than inter-fragmentary K-wires.

Date: 2010-09-01
Session: Trauma Forearm / Wrist
Time: 08:00-09:30
Room: F2

Abstract number: 26067

MECHANISMS OF TFCC INJURY IN COLLES' FRACTURES

Johan SCHEER, Lars ADOLFSSON

Linköping University, Linköping (SWEDEN)

Background: TFCC injuries are common in distal radius fractures and have been claimed to be an independent worsening factor in functional outcome. Mechanisms and pattern of injury are previously poorly described. The aim of this prospective study was to describe and classify these injuries in dorsally displaced distal radius fractures (Colles'). Methods: Fourteen consecutive with an AO type A2 distal radius fracture were included. Under general anaesthesia the competence of the TFCC was manually tested and all found abnormally lax. After volar plating of the distal radius fracture the TFCC was explored from an ulno-volar incision and injuries were documented and repaired. In seven cases a wrist arthroscopy was also performed. Results: All patients had both dorsal and volar injuries. Three progressive stages of rupture of the foveal TFCC fibres were observed. This injury pattern progressed from the volar to the dorsal side and the extent of the injury could not easily be assessed by the wrist arthroscopy. Conclusions: A sequential pattern of injury can be described for ulnar sided TFCC injuries in distal radius fractures. Based on these findings we propose a new classification. We also suggest that proper repair of some of these injuries is impossible with currently used dorsal or arthroscopic approaches. We also present a possible simple test of disclosing complete ligament rupture.

Date: 2010-09-01
Session: Trauma Forearm / Wrist
Time: 08:00-09:30
Room: F2

Abstract number: 24389

COMPLICATIONS OF PALMAR LOCKING PLATE SYSTEM FOR DISTAL RADIUS FRACTURES

Yoshiki OKUDA

Kyoto Second Red Cross Hospital, Osaka (JAPAN)

(Purpose) Palmar locking plate system (PLPS) is a widely accepted tool for the treatment intraarticular distal radial fractures (A-O C2 or C3). However, various complications have been reported recently. Complications of PLPS in our institution were investigated retrospectively. (Materials and methods) We have operated 98 cases of distal radial fractures using PLPS since 2004. Plates were removed in 16 cases for some complaints. Direct interview or questionnaire was performed, and reduction of fractures was evaluated radiologically. (Results) Uncomfortableness of plate or screw was seen in 12 cases. Raptures of tendons (two cases of FPL and one case of EPL) were in three cases. Loss of reduction due to osteoporosis was seen in one case. One case of ganglion was also seen. There were cases of irritation or disturbance of excursion of tendon in some case. Reductions of fractures were maintained in all cases except one case of osteoporosis. There were three cases of CTS related to flexor tenosynovitis. (Discussion) The causes of uncomfortable ness and irritation were attributed to inappropriate positioning of the plates and the screws, and the poor fitness of plate design. FPL tendon runs closest to the plate and most vulnerable in surgery. Meticulous care should be taken about the position of the plate in surgery. Penetration of screws to extensor compartment may injure the extensor tendons. To solve these problems, low profile and well adapted PLPS should be designed desirably in future.

Date: 2010-09-01
Session: Trauma Forearm / Wrist
Time: 08:00-09:30
Room: F2

Abstract number: 24556

12 MONTH FOLLOW-UP OF 115 INTRAARTICULAR DISTAL RADIUS FRACTURES OPERATED WITH A DORSAL PI-PLATE AND A VOLAR T-PLATE

Daniel REISER, Örjan WALLGREN, Kurt PETTERSSON
Dept of Hand Surgery, Örebro (SWEDEN)

Background: Recent studies have shown postoperative sequel with malalignment of the fractures and ruptures of both the flexor and extensor tendons with volar approach. Earlier studies with dorsal and volar technique are few and very small series. Our study reports the results of 115 cases. Material and Methods: A prospective consecutive series of 115 patients. Mean age 50.4 years. Physiotherapy was initiated after 2 weeks in plaster. Follow-up were performed by an independent physiotherapist at 1,6, and 12 months. X-ray was performed 1, and 12 months after surgery. Results: Initial x-ray showed according to AO staging 5 B2, 2 B3, 7 C1, 26 C2 and 75 C3 fractures. At 12 follow-up extension were 48°, flexion 54, supination 80, pronation 79, ulnarabduction 21 and radial abduction 22. Grip strength measured with Jamar dynamometer 31kg (97% of the unaffected hand), Key pinch 6.9 (103%). Pain measured with VAS in activity was 0.6. 90% were classified as excellent or good. 2 patients had intermittent numbness in thumb and index finger. 1 infection and pseudartrosis. 2 patients with flexor pollicis longus ruptures. The plates were removed in 51% of the cases. Discussion: We recommend the double-plating system in comminute intraarticular distal radius fractures, despite several secondary plate removals.

Date: 2010-09-01
Session: Trauma Forearm / Wrist
Time: 08:00-09:30
Room: F2

Abstract number: 25898

**A NEW POLYAXIAL DISTAL RADIUS LOCKING PLATE (VARIAX®):
EXPERIENCE WITH FIRST 100 CASES.**

Vasudev SHANBHAG, S. MALEK, N. VANNET, D. NEWINGTON, I. D. RUSSELL
Swansea Hand Unit, Morriston Hospital, Morriston (UNITED KINGDOM)

Aim: We looked at the radiological and clinical outcomes in 100 distal radius fractures treated with Variax® (Stryker) polyaxial distal radial volar locking plates which allow upto 30 degrees variation in the angle of insertion of each screw, to respond to variation in the normal bony anatomy and to target specific bone fragments. **Patients & Methods:** Case notes, operative records and x-rays of patients who underwent Variax® plate fixation were reviewed. Fractures were classified using Frykman's and Melone's classification systems. Post operative x-rays were reviewed to asses initial reduction, maintenance of fixation until union and overall result at union. Fracture reduction was assessed for correction of length, restoration of Volar and radial angle and articular reduction. The quality of plate fixation was assessed for position along long axis, distal overhang, radial and ulnar overhang and screw lengths. **Results:** 100 distal radius fractures treated with Variax plates with minimum follow up of 3 months were included. Fracture types were mixed. Results were classified as good fixation, acceptable fixation or poor fixation. 96% had good or acceptable outcomes. **Conclusion:** The development of volar locking-plate technology has changed the way in which fractures of the distal radius are managed. A locking plate has the advantage over the conventional non-locking implant of reliable fixation in osteoporotic bone and it facilitates early mobilisation. Our study shows that Variax® distal radius locking plates can be successfully used for anatomical reduction of intra-articular and extra-articular fractures with good outcomes and a very low failure rate.

Date: 2010-09-01
Session: Trauma Forearm / Wrist
Time: 08:00-09:30
Room: F2

Abstract number: 22859

COMPARATIVE EVALUATION OF POST-REDUCTION INTRA-ARTICULAR DISTAL RADIUS FRACTURES BY RADIOGRAPHS AND MULTI DETECTOR COMPUTED TOMOGRAPHY WITH MULTIPLANAR AND THREE DIMENSIONAL RECONSTRUCTIONS AND ITS IMPACT ON TREATMENT

Sumit BATRA¹, Sumit ARORA², V.K. SHARMA¹, S.B. GROVER³

¹*Central Institute of Orthopaedics, Safdarjang Hospital, New Delhi (INDIA),*

²*Department of Orthopaedic Surgery, Maulana Azad Medical College & Associated Lok Nayak Hospital, New Delhi (INDIA),* ³*Department of Radio-diagnosis, Safdarjang Hospital, New Delhi (INDIA)*

Striving for anatomic reduction of the articular surface is generally accepted as a desirable goal among orthopaedic surgeons and the articular incongruities after fracture healing have been documented to adversely affect the functional outcome. Plain radiographs are two dimensional in nature, true lateral views are difficult to obtain and casting surfaces further deteriorate the film quality. Owing to technical advances, acute phase Multidetector CT (MDCT) has better temporal, spatial and contrast resolution than conventional scanners. Two dimensional reformats (Multiplanar Reconstructions MPR) and three dimensional (3D) volume rendered reconstructions from multislice scanner are of excellent quality and can be created in subminute examination time. If it is justified to use 1-2 mm of articular incongruity as the guiding parameter for ruling surgical treatment in or out, then the reliability of plain radiographs in measuring this incongruity remains questionable. We have comparatively evaluate (N= 120) the two radiographic modalities on the virtue of their abilities to measure or detect intra-articular step and gap displacements, central articular depression, coronal plane fracture, number of articular fragments, comminution and associated injuries in the wrist region (carpal bone fractures, distal radio-ulnar joint subluxation, ulnar styloid fracture). Overall, the literature on the impact of 3D-CT scan on the treatment of intra-articular distal radius fractures remains sparse. The aim of our study is to prospectively determine whether the addition of MDCT scan with multiplanar (MPR) and 3D reconstructions results in significant changes of the evaluation of intra-articular distal radius fractures, and thus planning further course of management.

Date: 2010-09-01
Session: Trauma Forearm / Wrist
Time: 08:00-09:30
Room: F2

Abstract number: 24058

CORRECTIVE OSTEOTOMY OF MALUNITED BOTH BONE FOREARM FRACTURES USING CUSTOM-MADE SURGICAL TEMPLATES

Tsuyoshi MURASE, Junichi MIYAKE, Yukari TAKEYASU, Kunihiro OKA, Sayuri ARIMITSU, Hisao MORITOMO, Hideki YOSHIKAWA

Department of Orthopaedic Surgery, Osaka University, Graduate School of Medicine, Osaka (JAPAN)

Introduction: To achieve anatomical correction for malunited fractures, we developed a three-dimensional preoperative simulation system and custom-designed surgical template that assists to reproduce the simulation in the actual surgery. We hypothesized that this system provides good clinical results even for long-standing malunited both bones fractures of the forearm. **Methods:** 12 consecutive cases participated in this study. The age at the initial injury was 14 years and the time between injury and surgery was 45 months on average. Their chief complaints were decreased range of forearm rotation in 9 and recurrent dislocation of the radial or ulnar head in 3. Both radius and ulna were operated on with use of computer simulation and custom templates. The range of forearm rotation and stability of the distal and proximal radioulnar joints were evaluated before surgery and at the final follow-up. **Results:** Bony union was obtained in all cases. In 7 cases with duration under 72 months, the final range of forearm rotation was 157 degrees; however, it was 85 degrees in two cases with duration more than 100 months. Instability of the distal and proximal radioulnar joints improved in all cases who had presented recurrent dislocation of the joints. **Discussion:** The simulation system considerably improved the range of forearm rotation for the cases with duration up to 6 years. Instability of the distal and proximal radioulnar joints could also be well managed with this technique. Cases with duration over 100 months are still a difficult problem and needs further investigation.

Date: 2010-09-01
Session: Trauma Forearm / Wrist
Time: 08:00-09:30
Room: F2

Abstract number: 26477

COMPARISON OF THE CLINICAL RESULTS OF DISTAL RADIUS FRACTURES TREATED WITH VCP PLATE AND A THREAD STABLE IMPLANT

László VÁMHIDY, Norbert WIEGAND

Inst. of Musculoskeletal Surg. Dept. of Traumatology and Hand Surgery, Pécs (HUNGARY)

Introduction: The treatment of unstable radius fractures can be a great challenge for the surgeons. The Synthes VCP is an anatomically countered plate, providing a multiple fix angled screw fixation for the joint fragments. The thread stable plate (Medimetal Kft) provides a fixed angled plate fixation as well, but the fixation of the articular fragments is far not stable, because the lesser number of screws. Material and methods: Between 07.01.2008 and 07.01.2009 31 patients were treated with the VCP plate, and 78 patients with the thread stable implant. Osteotomy was performed in two patients with VCP plate. Follow up examinations were performed 3, 6, 12 weeks and one year after the injury. During the follow up examinations the range of motion and the strength of the grip strength were detected. There was no any cast fixation in the VCP group, and additional cast fixation was performed in the thread stable implant group on the surgeon choice (41 of the 78 patients) until the wound healing. Results: According to our experiences there was a significant improvement in wrist function in these VCP group at 3, and 6 weeks postoperatively. The satisfaction of the patients was significantly higher among the patients treated with VCP plates. Conclusion: According to our experiences the VCP plate provides a better result for the patients in the VCP group, but further investigations are needed to check the cost/benefit ratio with these fixed angle implants.

Date: 2010-09-01
Session: Spine
Time: 10:45-12:15
Room: F2

Abstract number: 23589

A RANDOMIZED TRIAL (FREE) OF BALLOON KYPHOPLASTY AND NONSURGICAL CARE FOR PATIENTS WITH ACUTE VERTEBRAL COMPRESSION FRACTURES: TWO YEAR RESULTS

Jan VAN MEIRHAEGHE¹, Douglas WARDLAW², Leonard BASTIAN³, Steven BOONEN⁴

¹*AZ St-Jan Brugge-Oostende AV, Brugge (BELGIUM)*, ²*Woodend Hospital, Aberdeen (UNITED KINGDOM)*, ³*Klinikum Leverkusen, Leverkusen (GERMANY)*, ⁴*Leuven University, Leuven (BELGIUM)*

Background & methods: Balloon kyphoplasty (BKP) is a percutaneous treatment for acute vertebral fractures (VCF) that aims to correct vertebral deformity. Patients with up to 3 non-traumatic acute VCFs (max 3 months old) were randomly assigned to receive either BKP (N=149) or usual nonsurgical care (NSC) (N=151) and were followed-up through 24 months. **Results:** BKP improved the PCS score by an average of 3.0 points (95%CI,1.6-5.4;p=0.002) during the two-year follow-up. With early improvement that persists in the BKP group and slow incremental improvement in the NSC group. Overall, patients assigned to BKP also had statistically significant improvements over the two years compared to the NSC group in global quality of life (EQ-5D); pain relief, back disability and days of limited activity due to back pain. There was no statistical significant difference in the number of patients with adverse events or new VCF's between groups over 24 months. Three serious adverse events were attributed BKP; a hematoma, a urinary tract infection, and a re-collapse of a fracture with anterior cement migration. **Conclusion:** Compared to NSC, BKP improved quality of life and reduced back pain and disability and did not increase adverse events including the risk of vertebral fracture over 2 years.

Date: 2010-09-01
Session: Spine
Time: 10:45-12:15
Room: F2

Abstract number: 25361

**PSEUDARTHROSIS FOLLOWING OSTEOPOROTIC VERTEBRAL
COMPRESSION FRACTURE**

Ramprasad KANCHERLA, Aravind JAYASWAL
AIIMS, New Delhi (INDIA)

INTRODUCTION: Spine fractures are common manifestation of osteoporosis. After an acute osteoporotic vertebral compression fracture pain persisting even after 3 months and clinical tenderness should raise the suspicion of pseudarthrosis. Pseudarthrosis is not a rare complication of a benign osteoporotic vertebral collapse occurs in about 10% of cases after an acute collapse. Treatment plan needs to be individualized. Cement augmentation procedures such as kyphoplasty and vertebroplasty can be performed in the absence of neurological deficit, whereas decompression and stabilization is necessary in presence of neurological deficit. **STUDY DESIGN:** Prospective cohort study. **METHODS:** 31 patients who were diagnosed to have an acute osteoporotic vertebral compression fracture were managed conservatively. Pain persisting after 3 months and clinical tenderness in 5 patients prompted further investigation, revealing pseudarthrosis. None of them had neurological deficit. Imaging of two patients revealed vacuum sign with intravertebral cleft on plain radiographs and on MRI. All of them were at the Dorsolumbar junction and of crush type of VCF. **RESULTS:** The incidence of pseudoarthrosis after an osteoporotic VCF was found to be 16.12%. One patient was treated with kyphoplasty, one with vertebroplasty with good pain relief and restoration of functional ability, and rest three which refused surgery continued on conservative management had poor outcome. **CONCLUSION:** High suspicion of pseudarthrosis is to be kept in mind as it is not an uncommon complication of benign osteoporotic collapse. Vertebral augmentation procedures such as kyphoplasty and vertebroplasty are promising procedures for treatment in absence of neurological deficit.

Date: 2010-09-01
Session: Spine
Time: 10:45-12:15
Room: F2

Abstract number: 23891

POSTERIOR AND ANTERIOR/POSTERIOR SURGERY IN THORACOLUMBAR VERTEBRA FRACTURES: A COMPARATIVE STUDY

Mehmet BALIOGLU, Umit AYKUT, Alper KOKSAL

Baltalimani Bone Disease Teaching Hospital, Istanbul (TURKEY)

PURPOSE: Mid term functional and radiological results of the sagittal plane of posterior surgery (G1) and anterior surgery (alone or combined; G2) were compared. **MATERIAL and METHOD:** 20 patients (7F, 13M) were operated on for Thoracolumbar (TL) vertebra fractures (G1:15, G2:5). The average age of G1 was 34.6, and G2 was 35.4. Local kyphos angle (LKA), anterior compression angle (ACA), anterior height (AH) were measured radiologically and compared postoperatively in the early and late term. Patient satisfaction was evaluated using visual analog score (VAS). Patients were evaluated for implant failure. The average follow up period was 8.4 years for G1, and 8.9 years for G2. **RESULT:** The average LKA for all groups preop, early and late term results were measured. G1:12.6, 0.21, 6.9° (p<0.001). G2:26.6, 21, 21° (p>0.05). The average ACA measurements were G1:14.1, 5.83, 6.25° (p<0.001). G2:17.6, 13.63, 9.5° (p>0.05). The average AH values were G1:2.4, 2.87, 2.83 cm (p<0.001). G2:1.83, 2.13, 2.03 cm (p>0.05). Implant failure was only detected in G1 (70%). G1 average VAS was higher than G2 (p<0.05). **CONCLUSION:** G1 showed a significant correction on the sagittal plane but satisfaction was higher in G2. For TL fractures that receive anterior/posterior methods the risk of implant failure is lower and satisfaction is higher.

Date: 2010-09-01
Session: Spine
Time: 10:45-12:15
Room: F2

Abstract number: 24941

PERCUTANEOUS AUGMENTED INSTRUMENTATION OF UNSTABLE THORACO-LUMBAR BURST FRACTURES

Nimrod RAHAMIMOV, Hani MULLA, Adi SHANI, Shay FREIMAN
Western Galilee Hospital, Naharia (ISRAEL)

Short Segment Pedicle Instrumentation (SSPI) of unstable thoracolumbar spine fractures can be done percutaneously in less than one hour, involves minimal blood loss, and can enable early patient mobilization, but has a 50% failure rate if patients are not carefully pre-selected according to anterior column integrity. Recent publications have reported success with combined SSPI and fractured vertebraVertebroplasty. We present our experience with a novel approach, combining percutaneous SSPI of one vertebra cranial and one vertebra caudal to the fracture, balloon kyphoplasty of the fractured vertebra and augmentation of the pedicle screws with PMMA. 32 consecutive patients presenting at our emergency department over a 2 year period were retrospectively reviewed. All of the patients had unstable burst fractures secondary to trauma. All of the patients were intact neurologically, and had no other significant injury. Surgery was performed within 72 hours of arrival. Radiographic evaluation was repeated on post operative day 1 or 2 and on 3, 6 and 12 month follow up visits. All patients completed an Oswestry Disability questionnaire and Visual analog scores were collected. Average operative time was 75 minutes, with blood loss less than 50cc. Excellent fracture correction and restoration of spinal alignment was achieved in most cases with average loss of reduction of 2.5 degrees on follow-up. Virtually all of the patients demonstrated some leak of PMMA, although this resulted in no apparent adverse effect.

Date: 2010-09-01
Session: Sports Medicine - Ankle / Foot
Time: 13:30-15:00
Room: F2

Abstract number: 25724

ACUTE ACHILLES TENDON RUPTURE: A RANDOMIZED, CONTROLLED STUDY COMPARING SURGICAL AND NON-SURGICAL TREATMENTS USING VALIDATED OUTCOME MEASURES

Katarina NILSSON HELANDER, Karin GRAVARE SILBERNAGEL, Roland THOMEÉ, Eva FAXÉN, Nicklas OLSSON, Bengt I. ERIKSSON, Jon KARLSSON
Institute of Clinical Sciences, Sahlgrenska Academy University of Gothenburg, Kungälv (SWEDEN)

Background: There is no consensus regarding the optimal treatment for patients with acute Achilles tendon rupture. Few randomized controlled studies have compared outcomes following surgical or non-surgical treatment with both groups receiving early mobilization. Purpose: To compare outcomes of patients with acute Achilles tendon rupture treated with or without surgery using identical mobilization and rehabilitation protocols. Study design: Randomized, controlled trial. Level of evidence: 1. Methods: Ninety-seven patients (79 men, 18 women; mean age, 41 years) with acute Achilles tendon rupture were treated and followed for one year. The primary end-point was re-rupturing. Patients were evaluated using Achilles tendon Total Rupture Score (ATRS), functional tests, and clinical examination at 6 and 12 months after injury. Results: There were six (12%) re-ruptures in the non-surgical group and two (4%) in the surgical group ($p = 0.377$). The mean 6- and 12-month ATRS were 72 and 88 points in the surgical group, and 71 and 86 points in the non-surgical group, respectively. Improvements in ATRS between 6 and 12 months were significant for both groups, with no significant between-groups differences. At the 6 month evaluation the surgical group performed significantly better results compared to the non-surgical treated group, however at the 12 month evaluation there were no differences between the two groups except on the heel-rise work test in favor for the surgical group. At the 12 months follow-up, the level of function of the injured leg remained significantly lower than that of the uninjured in both groups.

Date: 2010-09-01
Session: Sports Medicine - Ankle / Foot
Time: 13:30-15:00
Room: F2

Abstract number: 25817

ARTHROSCOPIC TREATMENT OF SOFT TISSUE ANKLE IMPINGEMENT

Stephen BRENNAN, Fadilla RAHIM, Jamie DOWLING, Stephen KEARNS
University College Hospital Galway, Galway (IRELAND)

Anterolateral soft tissue impingement syndrome of the ankle is a chronic painful condition due to entrapment of the hypertrophic soft tissues or torn ligaments in the lateral gutter and anterolateral aspect of the ankle. It occurs in up to 3% of all ankle sprains. We performed forty-one ankle arthroscopies for soft tissue impingement between April 2007 and April 2009. There were 26 men and 15 women and the mean age was 30.1 years. Arthroscopy was performed on average 21 months after injury. The Visual-Analogue-Scale Foot and Ankle (VASFA) score and Meislins' criteria were used to assess response to treatment. The mean pre-operative VASFA score was 44.5. This increased to 78.3 postoperatively ($p < 0.0001$). According to Meislins' criteria there were 34 good or excellent results, 5 fair and 2 poor results. Pre-operative magnetic resonance imaging (MRI) was useful in detecting tears of the anterior talofibular ligament and excluding osteochondral defects; however synovitis and soft tissue impingement was under-reported. We conclude that arthroscopy is an effective method for the diagnoses and treatment of soft tissue impingement of the ankle joint.

Date: 2010-09-01
Session: Sports Medicine - Ankle / Foot
Time: 13:30-15:00
Room: F2

Abstract number: 25040

ACHILLES TENDON HEALING WITH GROWTH FACTORS

Martin MAJEWSKI

University of Basel, Basel (SWITZERLAND)

Abstract: Tendon ruptures are common. As the healing process become clear, one can consider introducing biological therapy into clinical use. This study compares the benefits of three different approaches, TGF- (multifunctional growth factor), BMP-12 (specific growth factor), and activated serum (AS) as an example for biological therapy. Materials: The transected rat Achilles tendon was used for the evaluation of the effect of all growth factors (BMP-12, TGF-, activated serum). Animals were sacrificed and Achilles tendon tendon-bone units were collected. Biomechanical testing, histochemical and immunochemical analyses of regenerate sections were performed using standard techniques. Results: Biomechanical testing of the healing rat Achilles tendon treated with TGF- / BMP-12 showed an increased maximum load. 1 week after surgery ($p=0.0012$ / $P=0.0379$). Achilles tendons treated with AS showed no differences in maximum load to failure. Histological examination was quite similar if TGF- or BMP-12 was used. Tissue treated with AS had a smooth appearance resembling very much normal tendons. Control tendons contain mainly collagen I, and approximately 3% collagen III. In regenerates formed under the influence of TGF- this collagen ratio is reached after 2 weeks, BMP-12 by week 4, and with AS by week 8. Conclusions: Our data indicate that the mix of growth factors and cytokines in activated serum yields superior tendon healing than single growth factors as judged by histological appearance of the regenerate. However, growth factors BMP-12 and TGF- yielded better biomechanical results and more favorable collagen expression ratios, respectively.

Date: 2010-09-01

Session: Sports Medicine - Ankle / Foot

Time: 13:30-15:00

Room: F2

Abstract number: 26078

INTERMITTENT PNEUMATIC COMPRESSION PROMOTES SOFT TISSUE REPAIR AND ENHANCES BIOMECHANICAL PROPERTIES DURING IMMOBILIZATION

Paul ACKERMANN¹, Nicos SCHIZAS¹, Jian LI¹, Therese ANDERSSON², Anna FAHLGREN², Per ASPENBERG²

¹*Karolinska Institutet, Stockholm (SWEDEN)*, ²*Linköping University, Linköping (SWEDEN)*

Traumatized soft tissue often exhibits prolonged time to healing, mostly due to low blood flow and innervation. Intermittent Pneumatic Compression (IPC) increases blood flow and decreases thromboembolic events after Orthopaedic surgery, but little is known about its effects on healing. We hypothesized that, during tissue repair, IPC could stimulate blood flow, nerve ingrowth, tissue proliferation and enhance mechanical tissue properties. Study 1: In 104 male SD-rats, the right Achilles tendon was ruptured. Healing was assessed at 1, 3, 6 weeks, with or without IPC, by perfusion-analysis, histology and mechanical testing. Study 2: 48 male SD-rats were ruptured as above and allocated to 3 groups: mobilized, immobilized and immobilized with IPC-treatment. Healing was assessed at 2 weeks with histology and mechanical testing. Results: Study 1: At 3 and 6 weeks, reperfusion was increased by 21% and 23% ($p < 0.05$) after IPC-treatment. Numbers of blood vessels, nerves and fibroblast were at all time-points increased ($p < 0.05$). At 3 and 6 weeks, the IPC treated tendons displayed an improved tissue organization ($p < 0.05$). No significant differences ($p = 0.10$) were observed regarding strength or stiffness. Study 2: Compared to mobilization, immobilization caused a reduction of all biomechanical and histological parameters. When immobilization was combined with IPC, the values of 5 of 7 parameters tested demonstrated a significant increase compared to immobilization only: eg. maximum force increased by 63% and collagen III occurrence by 150%. This study demonstrated that IPC treatment promotes tissue repair and can improve tissue strength during immobilization.

Date: 2010-09-01
Session: Sports Medicine - Ankle / Foot
Time: 13:30-15:00
Room: F2

Abstract number: 26160

DIAGNOSTIC INTERVENTION IN PERSISTENT PAIN AFTER ANKLE SPRAIN DETECTED TALAR INJURIES IN ALL CASES

Dimosthenis ALASEIRLIS¹, Ioannis TERZIDIS², Eleftherios STEFAS¹, Konstantinos MICHAIL¹, Vasilios PAPAIOANNOU¹

¹*Department of Orthopaedic Surgery of General Hospital of Giannitsa, Giannitsa (GREECE),* ²*Saint Lukas General Hospital of Thessaloniki, Thessaloniki (GREECE)*

Aim: To present the results of diagnostic intervention in patients with persistent pain after ankle sprains. **Materials and Methods:** Fifteen patients presented with persistent pain after ankle sprains. Two patients had been initially evaluated as grade I ankle sprain, eleven patients as grade II and two patients as grade III. All patients received a conservative treatment protocol depending on the severity of the injury. The patients underwent MRI evaluation after eight weeks of persisting pain, edema and inability to regain participation in sports activities. **Results:** MRI detected extended talar bone edema in eight patients, osteochondral lesion grade I in one patient, lesion grade II in four patients and lesion grade III in two patients according to Berndt and Harty classification system. Anterolateral talar osteochondral injuries detected in three patients and posteromedial injuries in four patients. Fourteen patients were treated successfully with cast immobilization and weight bearing protection for a period of ten weeks, followed by a functional rehabilitation protocol. One patient with a diagnosed grade I osteochondral lesion of the posteromedial talus showed a poor outcome and undergone an arthroscopic procedure. A grade III osteochondral injury of the medial and posteromedial talus was detected, additionally to an impingement of torn posterior tibiofibular and talofibular ligaments. **Conclusions:** Persisting symptoms after ankle sprains are probably strong indicators of significant injuries of the talus. Early diagnostic MRI intervention seems to be essential in selecting the appropriate treatment. Arthroscopic intervention may be critical when MRI images can not be correlated to symptoms.

Date: 2010-09-01
Session: Sports Medicine - Ankle / Foot
Time: 13:30-15:00
Room: F2

Abstract number: 24569

HISTOPATHOLOGY OF THE SUBCALCANEAL INSERTION SITE OF THE PLANTAR FASCIA – HEEL SPUR IS NOT A TRACTION SPUR

Takeori MATSUDA, Tsukasa KUMAI, Ichiro HIGASHIYAMA, Yasushi SHINOHARA, Yasuhito TANAKA, Yoshinori TAKAKURA
Nara Medical University, Kashihara (JAPAN)

Purpose: The purpose of this study is to provide the histopathological characteristics and the development of subcalcaneal heel spurs associated with the plantar fascia entheses. **Materials and Methods:** The subcalcaneal plantar fascia entheses were removed from 17 elderly dissecting room cadavers (64-97 years of age), with no evidence of systemic rheumatological disease. Lateral radiographs were taken and the tissue processed for routine histology. Sagittal sections were stained, and accurately matched with the corresponding radiographs, so that putative stages in spur development could be described. **Results:** Subcalcaneal entheses were highly fibrocartilaginous and included a number of histopathologies. Spurs develop on the deep surface of the plantar fascia but their formation is heralded by degenerative changes that occur within it. Their formation is associated with mechanical damage to the weight-bearing entheses of the plantar fascia, where histopathological changes parallel those seen in osteoarthritic cartilage. Three stages in their development can be recognized. (1) an initial formation of cartilage cell clusters and fissures at the plantar fascia entheses that commences prior to spur formation (2) thickening of the subchondral bone plate as small spurs form (3) the development of vertically-oriented trabeculae buttressing the proximal end of larger spurs. **Conclusions:** Contrary to popular belief, subcalcaneal heel spurs cannot be traction spurs as they do not develop within the plantar fascia itself. We conclude that the subcalcaneal heel spurs can be compared to peripheral osteophytes in osteoarthritic cartilage and they develop as a consequence of degenerative changes that occur in the plantar fascia entheses.

Date: 2010-09-01
Session: Sports Medicine - Ankle / Foot
Time: 13:30-15:00
Room: F2

Abstract number: 24419

DEVELOPMENT AND VALIDATION OF THE SPORTS ATHLETE FOOT AND ANKLE SCORE: AN INSTRUMENT FOR SPORTS-RELATED ANKLE INJURIES.

Marjolein MORSSINKHOF¹, Otis WANG², Laurence JAMES³, Huub VAN DER HEIDE¹, Ian WINSON³

¹Leiden University Medical Centre, Leiden (NETHERLANDS), ²St Vincents and Mercy Private Hospital, Melbourne (AUSTRALIA), ³Avon Orthopaedic Centre, Southmead Hospital, Bristol (UNITED KINGDOM)

Background: Whilst many scoring systems exist that assess ankle function, none has proven to be valid for use in a patient-group with a higher demand on ankle function. Arising problems are ceiling effects, not sensitive to detect change or not containing a sports-subscale. Methods: Aim of this study was creating a validated self-administered scoring system for ankle injuries in higher performing athletes by studying existing scoring systems and key-informant interviews. The Sports Athlete Foot and Ankle Score (SAFAS) has been developed from information gathered from 26 athletes and expert-opinions. The final score, which is adjusted from the Foot and Ankle Outcome Score (FAOS). Results: SAFAS is a self-administered region specific sports foot and ankle score, validated in a group of 25 patients with a wide range of injuries and 14 athletes without ankle injury. It contains 4 subscales assessing limitations on the levels of symptoms/swelling, pain, daily living and sports. Spearman correlation coefficients between SAFAS and the Foot and Ankle Ability Measure (FAAM) are 0.88 for daily living and 0.78 for sports. Content validity is established by key-informant interviews, expert-opinions and a high patient satisfaction (75%). Cronbach's alpha's were respectively; 0.77 symptoms/swelling, 0.92 pain, 0.92 daily living, 0.88 sports. SAFAS shows to be able to differentiate between injured and non-injured athletes since patients score significantly higher. Conclusion: SAFAS is a measurement tool suitable for use by clinicians to assess differences in ankle function and disability between these groups of athletes.

Date: 2010-09-01

Session: Sports Medicine - Ankle / Foot

Time: 13:30-15:00

Room: F2

Abstract number: 25907

FUNCTIONAL RESULTS AFTER SURGICAL TREATMENT OF ANKLE FRACTURES IN ATHLETES: REVIEW OF 60 CASES

Sofia FERNANDES, Rui CERQUEIRA, José FRAGA, Tiago BARBOSA, João OLIVEIRA, António MOREIRA

Centro Hospitalar do Alto Ave - Guimarães, Guimarães (PORTUGAL)

Introduction: Athletes with unstable ankle fractures, treated surgically and submitted to an adequate programme of physical rehabilitation had better functional results. The objective of this study is to evaluate retrospectively the functional results and return to sports activity in athletes after surgical treated ankle fractures. Material and Methods: This study included 60 patients who between January 2000 and December 2007 had unstable ankle fracture during sports activity and were submitted to open reduction and internal fixation. The patients were evaluated using the Short Musculoskeletal Function Assessment (SFMA) and the American Orthopaedic Foot and Ankle Society (AOFAS) score. Results: There were 16 women and 44 men with medium age of 24,2 years (18-45 years) and follow-up of 2 years (1-6 years). The majority of the fractures (50%) occurred in soccer. Most fractures were bimalleolar (n=30). 6 months after surgery 22% returned to sports and at 12 months 43%. At 12 months younger patients ($p=0,0001$) and men ($p=0,001$) returned earlier to sports activity. At one year 80% amateur and 20% professional athletes, had returned to sports practice. Lateral malleolus fractures returned earlier(16,2 weeks) than medial malleolus fracture(59,5 weeks). SMFA and AOFAS scores were high in all patients. Discussion: Correct treatment of these fractures in athletes, with anatomic reduction and preservation of articular surface integrity, is crucial to the return to sports practice. Younger age, male sex and less severe fracture returned earlier to sports. Negative predictors were older age and female sex.

Date: 2010-09-01
Session: Sports Medicine - Ankle / Foot
Time: 13:30-15:00
Room: F2

Abstract number: 25369

QUANTITATIVE ANALYSIS OF MRI-FEATURES AFTER SURGICAL REPAIR OF ACHILLES TENDON RUPTURE

Alexandre SITNIK, Ruslan SAKOVICH, Aleksandr BELETSKY

Belarus Republic Scientific and Practical center for Traumatology and Orthopaedics, Minsk (BELARUS)

AIM: To quantify changes after surgical repair of Achilles tendon rupture. **MAT. and METHODS:** MRI investigations of 38 patients after surgical repair of subcutaneous Achilles tendon rupture were performed in terms 3, 6, 12 weeks, 6 and 12 months after the surgery. Beside the analysis of dimensional characteristics, quantitative analysis of signal intensity was performed. The intensity of signal was graded from absolutely white (256 points) to absolutely black (0 points). The margins of Achilles tendon were marked on transverse scans in the weakest zone of repair in each case and the mean signal intensity was calculated with specially designed program. **RESULTS:** The intensity of signal within the rupture immediately after the injury comprised $155,4 \pm 11,0$ points and the intensity of healthy tendon was $15,5 \pm 7,66$ points what reflects the predominance of rupture hematoma and dense fibrous tissue respectively. The mean intensity of MRI signal comprised $98,25 \pm 27,1$ points in terms up to 3 weeks after surgery, $61,41 \pm 13,03$ points at 6th week, $32,14 \pm 14,83$ at 12th week, $31,83 \pm 8,63$ at 6th month and $16,28 \pm 4,02$ points in terms one year and later after the surgery. **CONCLUSIONS:** This gradual decrease of signal intensity corresponds to substitution of rupture haematoma and injured tendon tissues with newly formatted scar tissue and its rebuilding in tendon-like tissue. Quantitative analysis of MRI-features may be used in staging of Achilles tendon reparative processes and building/correction of individual rehabilitation program.

Date: 2010-09-01
Session: Sports Medicine - Ankle / Foot
Time: 13:30-15:00
Room: F2

Abstract number: 26342

EXTERNAL FIXATION FOR THE TREATMENT OF CHRONIC ACHILLES TENDON RUPTURES. COMPARATIVE STUDY

Andrey SEREDA, Vadim SEMENSOV, Andrey GRITSYUK
National Pirogov Medicine Center, Moscow (RUSSIA)

Some authors advocated external fixation for the treatment of Achilles tendon rupture, but this method in our days is forgotten. Hypothesis: with the use of external fixation we can restore anatomical relationships between the lengths of triceps surae muscle and Achilles tendon in patients with diastasis of tendon stumps due to muscle retraction. 15 patients with chronic Achilles tendon ruptures were treated with external fixation. The method of external fixation utilizes Kirschner wires in the proximal tendon stump. Then traction is applied (5 mm per day) until diastasis disappears. It takes often 6-9 days. Then tendon was sutured with Krackow stitch, the external fixator was left with the foot in equinus for 7-8 weeks. There were no infections or re-ruptures. One patient had sural nerve injury. Patients were evaluated at an average follow-up time of 14 months using the modified Leppilahti Ankle Score. Moreover, an MRI study was done to assist the relationship between length of the tendon and the length of the contralateral Achilles tendon. Comparison was performed between the results of external fixation group and those of open suture with turndown flap. Mean overall results measured with the modified Leppilahti score was equal in both groups, but peak torque strength was better in external fixation group ($p < 0.05$). This is due to anatomical reconstruction of the length of the Achilles tendon: mean length deficit was 5.7% in external fixation group and 15.7% in the control group ($p < 0.05$).

Date: 2010-09-01

Session: Sports Medicine - Ankle / Foot

Time: 13:30-15:00

Room: F2

Abstract number: 23769

THE INFLUENCE OF SPORTS WITH TARSAI COALITION

Ichiro HIGASHIYAMA¹, Tsukasa KUMAI², Yasushi SHINOHARA², Yasuhito TANAKA²

¹*Matsukura Hospital, Nara City (JAPAN)*, ²*Nara Medial University, Kashihara City (JAPAN)*

Object: Tarsal coalition is one of the differential diagnoses of foot pain with sports. In this study, we evaluated the effect of sports in the development of tarsal coalition, its pathology, and treatment. **Patients and results:** In 104 patients (163 feet) of tarsal coalition, sporting activities triggered symptoms in 58 of them (95 feet). The mean age was 14.6 (5-43) years old. The coalition site was talocalcaneal, calcaneonavicular, and naviculo-1st cuneiform in 34 cases (60 feet), 20 cases (29 feet), and 4 cases (6 feet). The sport which caused the symptom was baseball (11 feet), followed by track and field and soccer (9 feet each). Surgical treatment was performed in 45 cases (59 feet), which were not responsive to conservative treatment. Resection was performed in 43 cases (57 feet), and fixation was carried out in 2 cases (2 feet). The postoperative evaluation was excellent in 59 feet (89%). **Discussion:** In half of the patients, tarsal coalition was triggered by sporting activities. The onset often occurs between 10 and 15 years old, and it is assumed that the disorder prevents sporting performance during the developmental period. With tarsal coalition in adolescence, symptoms are usually mild during daily activities, and simple X-ray often fails to show the coalition clearly; therefore, it is sometimes overlooked. So, careful examination with the disorder in consideration and imaging including CT are important for diagnosis. In cases which are unresponsive to conservative treatment, resection in the early stage is with successful result.

Date: 2010-09-01
Session: Spine - Surgery / Fusion
Time: 16:00-17:45
Room: F2

Abstract number: 26863
SURGERY FOR LOW BACK PAIN
Shinichi KONNO
Fukushima Medical University (JAPAN)

Systematic reviews of surgery for low back pain are presented based on Cochrane databases and recent papers. Surgery for radiculopathy with lumbar disc herniation and lumbar spinal stenosis is associated with short-term benefits compared to nonsurgical therapy. However, the benefits decrease with long-term follow-up in some trials. For nonradicular back pain with common degenerative changes, fusion is no more effective than intensive rehabilitation with a cognitive-behavioral emphasis for improvement in pain or function, but slightly to moderately superior to standard nonsurgical therapy.

Date: 2010-09-01
Session: Spine - Surgery / Fusion
Time: 16:00-17:45
Room: F2

Abstract number: 24585

A RCT BETWEEN TRANSFORAMINAL LUMBAR INTERBODY FUSION (TLIF) AND POSTEROLATERAL FUSION IN THE DEGENERATIVE LUMBAR SPINE

Pavel NEUMANN¹, CHRISTER JALALPOUR², Christer JOHANSSON³, Rune HEDLUND³

¹*Institute of Clinical Sciences, Gothenburg (SWEDEN)*, ²*Clintec, Stockholm (SWEDEN)*, ³*Dep of Orthopaedics, Göteborg (SWEDEN)*

INTRODUCTION: Interbody fusion has been suggested to result in an improved outcome compared to posterolateral fusion (PLF). Data to support this view, however, are scarce. In a randomised controlled trial we compared the outcome of TLIF and PLF in the degenerative lumbar spine. **METHODS:** 135 patients, 74 men and 61 women, (age range 25-65 years, mean 45 years) with degenerative disc disease (DDD) were randomised to non-instrumented PLF (n=67) or TLIF (n=68) with pedicle screw fixation. Before surgery and at the 2-year follow-up, pain (VAS) and functional disability were quantified by the Disability Rating Index (DRI) and the Oswestry Disability Index (ODI). The global outcome was assessed by the patient as much better, better, unchanged, or worse. **RESULTS:** The 2 year follow-up rate was 98%. Both groups improved significantly from preop to 2 years follow up. At 2 years the TLIF group was significantly better than the PLF group in pain index (27 vs 40, p=0.007) and DRI (25 vs 36, p=0.003). Similarly, the percent much better/better was higher in the TLIF group compared to the PLF group (91% vs 69%, p=0.012). ODI was non-significantly better in the TLIF group (23 vs 28, p=0.11). **CONCLUSION:** The study shows that the outcome of the TLIF procedure in DDD is better than that of un-instrumented PLF. The overall results strongly suggest interbody fusion to be considered a primary choice in the degenerative lumbar spine.

Date: 2010-09-01
Session: Spine - Surgery / Fusion
Time: 16:00-17:45
Room: F2

Abstract number: 24086

EARLY REHABILITATION TARGETING COGNITION, BEHAVIOUR AND MOTOR FUNCTION AFTER LUMBAR FUSION.

Allan ABBOTT¹, Raija TYNI-LENNÉ¹, Rune HEDLUND²

¹*Karolinska Institute, Stockholm (SWEDEN)*, ²*Gothenburg University, Gothenburg (SWEDEN)*

Study Design: Open label randomised controlled trial with 3, 6, 12 month and 2-3 year follow-up. Objective. To investigate the effectiveness of a psychomotor therapy focusing on cognition, behaviour and motor relearning compared to exercise therapy applied during the first 3 months after lumbar fusion. Methods: The study recruited 107 patients, aged 18 to 65 years, selected for lumbar fusion due to 12 months of symptomatic spinal stenosis, degenerative/isthmic spondylolisthesis or degenerative disc disease. The exercise therapy group received a home program focusing on pain contingent training of back, abdominal and leg muscle functional strength and endurance, stretching and cardiovascular fitness. The psychomotor therapy group received a home program and 3 outpatient sessions focusing on modifying maladaptive pain cognitions, behaviours and motor control. Patient-rated questionnaires investigating functional disability, pain, health related quality of life, functional self-efficacy, outcome expectancy, fear of movement/(re)injury and coping were assessed at baseline, 3, 6, 12 months and 2-3 years after surgery. Results: Follow-up rates were 93% at 12 months and 81% at 2-3 years after surgery. Psychomotor therapy improved functional disability, self-efficacy, outcome expectancy and fear of movement/(re)injury significantly more than exercise therapy at respective follow-up occasions. Similar results occurred for pain coping but group differences were non-significant at 2-3 year follow-up. Conclusions: The study shows that post-operative rehabilitation can be effectively implemented during the first 3 months after lumbar fusion and should include measures to modify psychological as well as motor functions.

Date: 2010-09-01
Session: Spine - Surgery / Fusion
Time: 16:00-17:45
Room: F2

Abstract number: 25611

TRANSFUSION PATTERNS ASSOCIATED WITH PREOPERATIVE AUTOLOGOUS BLOOD DONATION IN ELECTIVE POSTERIOR MULTI-LEVEL LUMBAR SPINAL SURGERY

Cian KENNEDY¹, Frank P CAMMISA JR², Aiden DEVITT¹

¹*University College Hospital Galway, Galway City (IRELAND)*, ²*Hospital of Special Surgery, New York (UNITED STATES)*

Background: The preoperative autologous blood donation in joint arthroplasty is well established, however there is a paucity of evidence in the literature evaluating the efficacy of PABD in elective spinal surgery. **Methods:** Retrospective review of 541 patients who underwent elective multi-level posterior lumbar spinal surgery between January 1997 and December 2000. Patients were divided into autologous blood donation group (PABD : n=413), and non donors (NPABD: n= 128). **Results:** The rate of transfusion were significantly higher in the PAD group ($p<0.001$). 64.6% of PABD patients and 29.7% of NPABD patients required a transfusion. The odds of a patient who donated 1 unit of blood being transfused was 4.13 times (95% CI:97 TO 8.67) the odds of NPABD patient. The odds of a patients who donated blood one unit being transfused within 24 hours was 7.45 times (95% CI 4.41 to 16.27) the odds of a NPABD patient. The odds of a patient who donated one unit of blood being transfused with cross-matched blood was 86% less (OR:0.14 95% CI : 0.05 to 0.37) than the odds of a patient who did not donate blood. Total units wasted was 281(46.6%) and 100(62.9%), for PABD and NPABD groups respectively. **Conclusion:** PABD does reduce allogeneic transfusion requirements in elective spinal surgery, however the threshold for transfusion appears to be lower for patients who donate their own blood.

Date: 2010-09-01
Session: Spine - Surgery / Fusion
Time: 16:00-17:45
Room: F2

Abstract number: 26773

A PROSPECTIVE RANDOMIZED TRIAL BETWEEN TRANSFORAMINAL (TLIF) AND INSTRUMENTED POSTEROLATERAL FUSION (PLF) – A ONE YEAR FOLLOW-UP

Kristian HØY, Bent NIEDERMAN, Peter HELMIG, Ebbe Stender HANSEN, Li Hei SHENG, Thomas ANDERSEN, Cody BÜNGER
Aarhus University Hospital, Aarhus (DENMARK)

Introduction: To show that Transforaminal interbody fusion (TLIF) compared to posterolateral fusion group (PLF) implicate the benefits of 360 degrees fusion. Materials and method: During 01.11.2003-.01.11.2008 100 pat's were prospectively randomized to TLIF or PLF. The TLIF-group was operated using TSRH (Medtronic) and Implex (Zimmer) and allograft. The PLF- group was operated using TSRH (Medtronic) and allograft. Inclusions criteria: segmental instability due to disc degeneration, former disc herniation, spondylolisthesis < 2. Functional outcome was registered prospectively, after one year, using Dallas Pain questionnaire (DPQ), SF-36, Low Back pain questionnaire. Results: Sex ratio was 40/58. 51 patients had TLIF, 47 PLF. Mean age 49(TLIF)/45(PLF). No statistic difference in outcome between groups could be detected, concerning, daily activity, work leisure, Anxiety/depression, social interest. No statistic difference concerning Back pain or Leg pain. In both the TLIF and the PLF group the patients had significant improvement in functional outcome, back pain, and leg pain compared to preoperative. Daily activities $p > 0.0002/0.00001$, Back pain $> 0.00001/0.00001$, Leg pain $> 0.0007/0.0002$. Operation time in the TLIF group was significant higher $p < 0.00001$, than PLF group. The blood loss was significantly higher in the TLIF $p > 0.0011$. No statistic difference in radiological fusion. Conclusions: Spinal fusions significant improve patient`s Functional outcome, Back Pain and Leg pain after one year. No statistical significance difference between TLIF/PLF in functional outcome, Back or Leg pain appeared. Long term results may in the future show the benefits of circumferential fusion as seen in prior studies.

Date: 2010-09-01
Session: Spine - Surgery / Fusion
Time: 16:00-17:45
Room: F2

Abstract number: 24101

COMPARISON OF MONOSEGMENTAL POSTERIOR LUMBAR INTERBODY FUSION BETWEEN CAGE AND ALLOGRAFT MIXED WITH AUTOLOGOUS BONE MARROW

Yongsoo CHOI, Daehee KIM
Kwangju Christian Hospital, Gwangju (KOREA)

The objective is to compare radiological and clinical results of cage and allograft mixed with bone marrow for posterior lumbar interbody fusion (PLIF). PLIF was performed for one segment using cage for 28 patients (cage group), and allograft mixed with bone marrow for 23 patients (allograft group). The mean follow-up was 26.3 months. The mean Korean Oswestry Disability Index (KODI) was 17.3 ± 60.9 in cage group and 17.3 ± 23.9 in allograft group. Visual Analogue Score (VAS) for back pain was 2.6 ± 3.7 in cage group and 2.3 ± 2.4 in allograft group. VAS for radiating pain to leg was 2.3 ± 4.8 in cage group and 1.7 ± 3.3 in allograft group. There was no significant difference in clinical results (KODI; $p=0.97$, back pain; $p=0.54$, radiating pain; $p=0.27$). The radiological fusion rate was better in cage group, $92.8 \pm 6.8\%$ than the allograft group, $82.6 \pm 15.0\%$ ($p=0.02$). Postoperative disc height was restored to $4.6 \pm 6.9\text{mm}$ in cage group and $4.9 \pm 6.6\text{mm}$ in allograft group ($p=0.71$). At the last follow up, there was significant loss of disc height in allograft group, $2.9 \pm 2.3\text{mm}$ compared with cage group, $1.4 \pm 0.6\text{mm}$ ($p=0.0001$). PLIF using a cage showed better fusion rate and well maintenance of the disc height. But there was no significant difference in clinical results between two groups.

Date: 2010-09-01
Session: Spine - Surgery / Fusion
Time: 16:00-17:45
Room: F2

Abstract number: 26185

IMPROVED QUALITY OF LIFE, PAIN, AND FUNCTION AFTER SPINAL FUSION IN CHRONIC LOW BACK PAIN ARE NOT DEPENDENT ON OPERATIVE TECHNIQUE: 2-YEAR-RESULTS OF 822 PATIENTS TREATED WITH POSTEROLATERAL OR POSTERIOR INTERBODY FUSION FROM THE SWEDISH NATIONAL SPI

Yohan ROBINSON, Bengt SANDÉN
Institute for Surgical Sciences, Uppsala (SWEDEN)

Background: Despite being a widely accepted treatment for chronic low back pain (LBP) the published long-term-results of spinal fusion surgery are far from equivocal. Patients and Methods: A total number of 822 patients (461 female) with chronic LBP were followed prospectively within the Swedish National Spine Registry program after spinal fusion surgery. Functional parameters as SF-36 subscores and Oswestry Disability Index (ODI) were obtained preoperatively and after 2 years. Furthermore VAS for leg and back pain was determined. Quality of life was evaluated by EQ-5D. Results: Sixty-four patients were operated with uninstrumented fusion (UIF), 380 patients with instrumented posterolateral fusion (PLF), and 378 patients with posterior or transforaminal lumbar interbody fusion (PLIF). Average leg pain improved in VAS from 45 to 27, back pain improved in VAS from 63 to 34. SF-36 MCS (Mental Component Score) improved from 33.7 to 39.0, SF36 Physical Component Score (PCS) from 36.2 to 45.4. ODI improved from 45.6 to 28.1. EQ5D improved from 0.33 to 0.61. A slightly greater improvement of ODI was seen in the PLIF-group of about 3 points compared to the PLF-group. No clinically relevant differences were seen between the outcome of the subgroups. Conclusion: The presented results are in line with previously publishes studies, that fusion surgery does improve function, pain and quality of life of patients with chronic LBP. Interestingly in the investigated patient cohort operative fusion technique does not seem to have a significant impact on patient outcome.

Date: 2010-09-01
Session: Spine - Surgery / Fusion
Time: 16:00-17:45
Room: F2

Abstract number: 24905

RISK FACTORS OF NONUNION AFTER LUMBAR POSTEROLATERAL FUSION

Chul won LEE, Kyu yeol LEE, Hyeon Jun KIM
Dong-A University, Busan (KOREA)

Study design: A retrospective study for radiographic and clinical assessment. Objectives: To clarify the clinical significance of the nonunion after lumbar spine arthrodesis and related risk factors. Materials and Methods: Plain films were evaluated 1317 patients who could be followed up more than 1 year from 1537 patients after lumbar arthrodesis. Nonunion was diagnosed 1 year after arthrodesis by instability on flexion-extension radiograph and clinical findings like as sustained pain, local tenderness and neurologic symptoms. Risk factors reviewed included age, number of levels fused, smoking, alcohol drinking, infection, associated disease, clear zone, initial diagnosis and previous spinal operation history. And relations nonunion between them were investigated. Results: 39 patients diagnosed as nonunion were underwent reoperation and all were confirmed the nonunion intraoperatively. Significant statistical differences were noted between the nonunion and smoking, infection, previous spine operation history. And there were significant statistical differences between the nonunion and persistent clear zones more than 1 year. There were no significant statistical differences between the nonunion and age, number of levels fused, initial diagnosis and alcohol drinking. Conclusion: There are the limits to diagnose the nonunion by only radiologic images. So it is desirable to concern clinical symptoms for evaluating the nonunion. And risk factors such as accompanying disease, previous spine operation history, infection, smoking and metal failure showed statistically significant relation to nonunion. Additionally, preoperative and postoperative evaluation about these parameters must be concerned to achieve the bone union.

Date: 2010-09-01
Session: Spine - Surgery / Fusion
Time: 16:00-17:45
Room: F2

Abstract number: 25688

FACET JOINT BIOMECHANICS AT THE TREATED AND ADJACENT LEVELS AFTER TOTAL DISC REPLACEMENT

Evalina BURGER¹, Sergiu BOTOLIN¹, Christian PUTTLITZ², Todd BALDINI¹, Anthony PETRELLA³, Celeste ABJORNSON⁴, Vikas PATEL¹

¹*University of Colorado Denver, Aurora (UNITED STATES)*, ²*Colorado State University, Ft Collins (UNITED STATES)*, ³*Colorado School of Mines, Golden, (UNITED STATES)*, ⁴*Hospital for Special Surgery, New York (UNITED STATES)*

Introduction: Total disc replacement (TDR) provides an alternative to fusion that is designed to preserve motion at the treated level and restore disc height. However, the effects of TDR on spine biomechanics at the treated and adjacent levels are not fully understood. **Methods:** Seven fresh-frozen human cadaveric lumbar spines were potted at T12 and L5 and installed in a 6-DOF displacement-controlled testing system. Displacements of 15° flexion/extension, 10° right/left bending, and 10° right/left axial rotation were applied. Contact pressure, peak contact pressure, force, peak force and contact area for each facet joint were recorded at L2-L3 and L3-L4 before and after TDR at L3-L4. The data were analyzed with ANOVAs/t-tests. **Results:** Axial rotation had the most impact on all measures in intact spines. During lateral bending and axial rotation, TDR resulted in a significant increase in facet forces at the level of treatment and a decrease in contact pressure, peak contact pressure, and peak force at the level superior to the TDR. With flexion/extension, there was a decrease in peak contact pressure and peak contact force at the superior level. **Conclusions:** Our study demonstrates that rotation is the most demanding motion for the spine. We also found an increase in facet forces at the treated level after TDR. In general, our findings suggest there is an increase in loading of the facet joints at the level of disc implantation and an overall unloading effect at the level above.

Date: 2010-09-01
Session: Spine - Surgery / Fusion
Time: 16:00-17:45
Room: F2

Abstract number: 26735

**ADJACENT SEGMENT DEGENERATION AFTER LUMBAR SPINAL FUSION:
THE IMPACT OF ANTERIOR COLUMN SUPPORT – A RANDOMIZED CLINICAL
TRIAL WITH AN 8- TO 13-YEAR MRI FOLLOW-UP**

Cody BÜNGER, Tina Senholt VIDEBAEK

*Aarhus University Hospital - Orthopaedic Research Laboratory, Aarhus C
(DENMARK)*

Objective: To analyze long-term adjacent segment degeneration (ASD) after lumbar fusion on MRI and compare randomization groups with and without anterior column support. Summary of background: The prevalence and the cause of ASD are not well documented, but ASD are one of the main arguments for introducing the use of motion preserving techniques as an alternative to fusion. Anterior lumbar interbody fusion combined with posterolateral fusion (ALIF +PLF) has been proved superior to posterolateral fusion alone regarding outcome and cost-effectiveness. Methods. From 1996 through 1999, 148 patients with severe chronic low back pain were randomly selected for ALIF +PLF or for posterolateral lumbar fusion alone. Ninety-five patients participated. ASD was examined on MRI with regard to disc degeneration, disc herniation, stenosis, and endplate changes. Outcome was assessed by validated questionnaires. Results: The follow-up rate was 76%. ASD was similar between randomization groups. In the total cohort, endplate changes were seen in 26% of the participants and correlated significantly with the presence of disc degeneration and disc herniation. Disc degeneration and dorsal disc herniation were the parameters registered most frequently and were significantly more pronounced at the 1st adjacent level than at the 2nd and the 3rd adjacent levels. Disc degeneration and stenosis correlated significantly with outcome at the 1st adjacent level. Conclusion: Compared with findings reported in the literature, the prevalence of ASD is likely to be in concordance with the expected changes in a non-operated symptomatic population and therefore not accelerated by fusion.

Date: 2010-09-01
Session: Spine - Surgery / Fusion
Time: 16:00-17:45
Room: F2

Abstract number: 25183

A FULL ECONOMIC EVALUATION OF DISC PROSTHESIS VS. LUMBAR FUSION IN PATIENTS WITH CHRONIC LOW BACK PAIN – A RANDOMIZED CONTROLLED TRIAL WITH TWO-YEAR FOLLOW UP

Peter FRITZELL¹, Svante BERG², Tycho TULLBERG², Fredrik BORGSTRÖM³, Hans TROPP⁴

¹*Department of Orthopaedics, Falun (SWEDEN)*, ²*Stockholm Spine Center, Stockholm (SWEDEN)*, ³*linnovus, Stockholm (SWEDEN)*, ⁴*Orthopaedic Department Linköping University Hospital, Linköping (SWEDEN)*

We conducted a cost effectiveness study in a RCT setting to assess the cost-effectiveness of total disc replacement (TDR) compared with instrumented lumbar fusion (FUS). Perspectives were those of the Society and the Health care sector. FU two years 152 patients with at least 12 months discogenic pain in one or two motion segments L3 and S1 were included. Patients in the TDR group (n=80) received Charité/Prodisc/Maverick. Procedures used in the FUS group (n=72) were PLF/PLIF Direct and indirect costs were assessed. Cost information was collected from the cost diary, the participating clinic, and from the social insurance system. For clinical effects we used EQ-5D. Incremental cost-effectiveness ratios were illustrated in the cost-effectiveness plane. Net benefit was assessed. Results: FU was 99%. Societal cost for TDR was SEK 599,560 (400,272), and for FUS SEK 685,919 (422,903) (ns). TDR was significantly less costly from a healthcare perspective, SEK 22,996 (43,055- -1,202). Number of days on sick leave among those who returned to work was 185 (146) in the TDR group, and 252 (189) in the FUS group (ns). The total gain in quality adjusted life years over two years was 0,41 units for TDR and 0,40 units for FUS (ns). The net benefit (with CI) was SEK 91,359 (-73,643 - 249,114) (ns) Conclusion: It was not possible to state whether TDR or FUS is cost-effective after two years. Results should be followed over time

Date: 2010-09-01
Session: Spine - Surgery / Fusion
Time: 16:00-17:45
Room: F2

Abstract number: 24199

DISC HEIGHT AND MOTION PATTERNS IN THE LUMBAR SPINE IN PATIENTS TREATED WITH TOTAL DISC REPLACEMENT OR FUSION FOR DISCOGENIC BACK PAIN. RESULTS FROM A RANDOMIZED CONTROLLED TRIAL.

Svante BERG¹, Hans TROPP², Gunnar LIEVSETH³

¹*Stockholm Spine Center, Stockholm (SWEDEN)*, ²*Orthopaedic Clinic, Linköping (SWEDEN)*, ³*Institute of Clinical Neuroscience, Norwegian University of Science and Technology, Trondheim (NORWAY)*

Comparison of X-ray measurements in a RCT between instrumented posterior fusion and total disc replacement (TDR) to see if the surgical goals for respective treatments was reached, if clinical outcome was related to this, and if differences in disc height and adjacent segment motion patterns between groups occurred. Fusion used in surgical treatment of degenerated disc disease may induce degeneration in adjacent segments. TDR aims to restore and maintain mobility by replacing a painful disc. Little is known about the degree and quality of mobility in artificial discs in vivo, and whether maintained mobility reduces stress on adjacent segments. Flexion-extension X-rays were analyzed pre- and two years postoperatively using Distortion Compensated Roentgen Analysis (DCRA) at treated and adjacent levels, mobility following fusion and TDR was estimated. Changes in disc height and changes in mobility patterns in adjacent segments were compared. The results were compared with clinical outcome. Results: 78% of fused patients had no mobility whereas 89% of TDR-patients were mobile, but with less than normal mobility. The fulfilment of surgical goals was not correlated to clinical outcome. Fused segments were lower and TDR-segments were higher than normal. There was more translation or flexion-extension at adjacent levels in the fusion group than in the TDR group. Conclusions: Surgical goals were reached in most patients but without correlation to outcome. Differences between the groups in postoperative disc height and motion patterns at adjacent segments may lead to differences in outcome in the long-term perspective, but was not after two years.

Date: 2010-09-01
Session: Biomaterials
Time: 10:45-12:15
Room: F4

Abstract number: 26848

IMPLANTATION OF A NOVEL SYNTHETIC, BIODEGRADABLE SCAFFOLD FOR MENISCUS TISSUE REGENERATION

Peter VERDONK, Wouter HUYSSSE, Ramses FORSYTH, Rene VERDONK
Ghent University Hospital, Gent (BELGIUM)

Objectives: To assess the safety and performance of a meniscus scaffold designed to restore the function of the meniscus after meniscectomy. **Material and methods:** Fifty two subjects with an irreparable medial or lateral meniscus tear or partial meniscus loss, intact rim, presence of both horns and a stable, well aligned knee have been treated with the novel scaffold to date. Tissue ingrowth post-implantation was assessed by contrast enhanced magnetic resonance imaging at 3 months (n=43), and at 12 months by gross examination (n=44) and histological examination of biopsies (n=44) collected during re look arthroscopy. Clinical outcomes were assessed using the Visual Analog Scale (VAS), Knee and Osteoarthritis Outcome Score (KOOS), Lysholm and International Knee Documentation Committee (IKDC) at baseline and up to 24 months. **Results:** Clinically and statistically significant improvements in all scores were observed at 6, and 12 months post-implantation. MRI scans indicated that articular cartilage grading remained stable or improved in 43/47 (91%) subjects. There was no indication that the scaffold caused cartilage damage. All 12 month biopsies showed fully vital material illustrating biocompatibility and successful tissue ingrowth, with no signs of necrosis or cell death. A layered organisation, each with its own histological characteristics, supports an ongoing process of regeneration, and maturation towards tissue resembling the human meniscus. No safety issues related to the scaffold were reported. It is anticipated that the 24 month data will be presented here. **Conclusions:** These data show improvement for all clinical outcome scores and suggest the scaffold supports tissue ingrowth with potential to develop meniscus-like tissue.

Date: 2010-09-01
Session: Biomaterials
Time: 10:45-12:15
Room: F4

Abstract number: 26190

DEVELOPMENT OF A NEW CARRIER FOR BONE MORPHOGENETIC PROTEIN

Anders WESTERMARK

Institutionen för Kirurgiska Vetenskaper, Uppsala (SWEDEN)

Background: Understanding of the biology behind bone healing has resulted in development of osteoinductive products. Bone morphogenetic protein 2 and 7 (BMP-2 and BMP-7) are two examples that are used clinically. BMP-2/7 is administered peroperatively at the fracture site with the help of a carrier, usually a collagen sponge or powder. These carriers don't provide enough containment and protection from degradation of the BMP. In this experiment we tested a carrier made of hyaluronic acid polymer gel (HAP). Methods: 40 Sprague-Dawley rats received external fixation and a 5mm mid-femoral defect. The animals were divided into five groups: empty defect, defect filled with HAP, HAP + hydroxyapatite (HA), HAP+HA+ BMP-2 low dose and HAP+HA+ BMP-2 high dose. After five weeks the animals were killed and the femora analysed with x-ray, peripheral quantitative computed tomography (PqCT), biomechanical testing and histological analysis. Results: No one of the defects healed in the groups without BMP-2. In the low dose group, 50% of the animals showed healing and in the high dose group 100% showed good healing with a large and biomechanically mature callus formation. Compared to controls, bone mineral content was 2,5 times higher in the low dose group and 4-5 times higher in the high dose group. Histology showed trabecular bone tissue with vessel formation. Conclusion: The hyaluronic acid polymer gel is very promising as a carrier for BMP with easy peroperative handling and perhaps also osteoconductive features.

Date: 2010-09-01
Session: Biomaterials
Time: 10:45-12:15
Room: F4

Abstract number: 25770

WHICH FIXATOR IS MORE ELIGIBLE FOR PELVIC SUPPORT OSTEOTOMY?

Sarper GURSU¹, Bilal DEMIR², Timur YILDIRIM², Aysegul BURSALI², Timur ER²,
Ramadan OKE², Vedat SAHIN²

¹*Siirt State Hospital, Istanbul (TURKEY)*, ²*Baltalimani Bone and Joint Diseases Hospital, Istanbul (TURKEY)*

Pelvic support osteotomy, in the manner described by Ilizarov, is a very good option to restore stability of instable hips. Ilizarov used circular fixator to fix the osteotomy sites. In this paper, we have compared the usage of circular external fixators for pelvic support osteotomy with the monolateral fixators. Pelvic support osteotomy was performed for 19 hips of 19 patients, using external fixators. Among these, Ilizarov fixator was used for 8 patients and Limb Reconstruction System (LRS) was used for 11. The mean age of the patients for whom circular fixators were used was 22,9 (12-34) years and 22,6 (18-34) years for the patients operated using LRS. The mean follow-up period was 33,5 months. The mean Harris hip score increased from 52,1 (41-73) to 81,2(73-92) in the patients operated using circular fixators and from 45,6 (28-79) to 79,6 (60-93) in the patients for whom LRS fixators were used. There was no significant difference between the 2 groups according to end scores. The mean length of fixator stay was 278,5 (147-429) days in the Ilizarov group and 415,4 (270-623) days in the LRS group and the difference was significant ($p < 0,05$). According to our study there is no significant difference between using circular or monolateral fixators when functional end results are considered. Circular fixators are worn for a significantly shorter period and thus we conclude that these fixators have a superiority when compared to monolateral fixators.

Date: 2010-09-01
Session: Biomaterials
Time: 10:45-12:15
Room: F4

Abstract number: 25175

STAINLESS STEEL ORTHOPAEDIC IMPLANT – HOW SAFE ARE THEY?

Sitaram GIRI¹, S. C. GOEL²

¹*Good Hope Hospital, Sutton Coldfield (UNITED KINGDOM),* ²*Institute of Medical Sciences, Varanasi (INDIA)*

AIM OF THE STUDY: To assess the corrosion of stainless steel implant both in-vivo and in-vitro and to assess if there is any change in the mechanical properties of these implants after human use. **MATERIAL AND METHODS:** 2 groups of implants were included in the study. Group 1- 20 unused orthopaedic implants. Group 2- 20 used implants retrieved after human use after varying length of periods ranging from 7-84 months. Both the groups of implants were studied for their mechanical properties including the tensile strength, hardness and elasticity. The unused samples were tested for corrosion by an electrochemical technique using a corrosion cell containing Ringer's solution. Both groups of implants were viewed under scanning electron microscope to check for corrosion. **RESULT AND CONCLUSIONS:** There was no change in the mechanical properties of the implants after human use. All implants underwent corrosion and the degree of corrosion was directly related to the duration of human use. There are animal models, which have shown carcinogenic effect of nickel and cobalt contained in the stainless steel. There are case reports in literature about the association of malignancy in the region of joint replacement, whether these were coincidental or related to corrosion product of steel is not known. The effect of the corrosion products on humans should be further investigated.

Date: 2010-09-01
Session: Biomaterials
Time: 10:45-12:15
Room: F4

Abstract number: 26729

SCAFFOLD MECHANO TRANSDUCTION IN A FUSION MODEL

Jens Vinge NYGAARD, Casper FOLDAGER, Peter CLOETENS, Cody BÜNGER
Aarhus University Hospital, Aarhus (DENMARK)

By the paper published in Bone 45 (2009) 267-273 we have demonstrated that fluid induced micro motions, occurring in an anterior lumbar interbody fusion model, influence the morphology during early bone formation. A mathematical finite element model was developed to investigate the aqueous behaviour within the cages when exposed to external compressive forces. Changes in trabeculae orientation for both autograft and rhBMP-2 loaded scaffolds was realised by CT analysis, and the mathematical results indicate changes in the flow pattern with varying boundary conditions. At four weeks there was an evident correlation between trabecular orientation and the calculated fluid flow streamline pattern. Here we hypothesize that it is possible to calculate single cell stress levels critical to osteogenesis arising from fluid induced mechano transduction. From the developed mathematical model we extract boundary conditions shown to vary within the cage. Thus, two sets of different boundary conditions, corresponding to two different locations within the cage, are then superimposed over two new finite element models of a single cell growing in a 3D scaffold at those particular locations. The morphology of a representative single cell construct is acquired by high resolution synchrotron radiation tomography of a scaffold cultured with human stem cells for 21 days. The construct mimics the situation in which a preseeded scaffold is loaded into the cage. If the hypothesis holds we will realise distinct stress fields within the single cell for each location.

Date: 2010-09-01
Session: Biomaterials
Time: 10:45-12:15
Room: F4

Abstract number: 26303

OSSEOINTEGRATION ON THE NANO-LEVEL REVEALED BY FOCUSED ION BEAM (FIB) AND TRANSMISSION ELECTRON MICROSCOPY (TEM) ANALYSIS

Anders PALMQUIST¹, Kathryn GRANDFIELD², Håkan ENGQVIST², Peter THOMSEN¹

¹*Department of Biomaterials, The Sahlgrenska Academy at University of Gothenburg, Göteborg (SWEDEN),* ² *Department of Engineering Sciences, Ångström Laboratory at Uppsala University, Uppsala (SWEDEN)*

To further understand the osseointegration process, high-resolution tools are required. Conventional tools for evaluating retrieved specimens with regard to bone implant contact are light microscopy or backscattered scanning electron microscopy. At these resolutions large amount of information about the interaction between implant and tissue on the atomic level cannot be resolved. The use of analytical TEM allows imaging, chemical and structural analyses in high-resolution where the interfacial zone between the bone tissue and implant can be evaluated. However, the sample preparation for TEM is cumbersome and for interfaces between hard implant materials and biological tissue it has been impossible to prepare intact sections until recently. FIB permits sectioning of intact foils containing both implant material and bone tissue for subsequent TEM analysis. The materials analyzed span from metal implants to bioceramic implants/coatings, retrieved from animal models and humans. Important factor for the success of sample preparation with FIB is the protocol for fixation, dehydration and resin embedding where artifacts could be created due volume changes of the tissue. The results from the analysis show mineralized tissue at direct contact (at nano-level) with the implant. The results show that interfaces between bioactive implants and tissue can generally be imaged as intact and allows high-resolution analytical TEM. Smooth titanium surfaces show either separation or resin-filled artifacts at the interface, while demonstrating bone-implant contact at the light optical resolution. The FIB/TEM combination is a novel, versatile tool for exploring the ultrastructural basis of osseointegration and true bone bonding to prosthetic materials.

Date: 2010-09-01
Session: Biomaterials
Time: 10:45-12:15
Room: F4

Abstract number: 25601

EMBROIDERED AND SURFACE MODIFIED POLYCAPROLACTONE-CO-LACTIDE SCAFFOLDS AS BIOARTIFICIAL BONE SUBSTITUTE – IN VITRO CHARACTERIZATION AND IMPLANTATION IN CRITICAL SIZE DEFECTS IN THE SHEEP TIBIA

Claudia RENTSCH¹, Barbe RENTSCH², Ricarda HESS³, Annette BREIER⁴, Dieter SCHARNWEBER³, Ricardo BERNHARDT³, Achim BIEWENER¹, Hans ZWIPP¹

¹*University Hospital Carl Gustav Carus, Clinic and Polyclinic for Trauma and Reconstructive Surgery, Dresden (GERMANY)*, ²*Catgut GmbH, Markneukirchen (GERMANY)*, ³*Max Bergmann Center of Biomaterials, Dresden (GERMANY)*, ⁴*Leibnitz Institute of Polymer Research, Dresden (GERMANY)*

The aim of this study was to characterize embroidered, and surface modified polycaprolactone-co-lactide (PCL) scaffolds in vitro and in vivo to evaluate the osteogenic potential of these scaffolds for reconstruction of large bone defects. Noncoated, collagen I (coll I) and collagen I/chondroitin sulfate (CS) coated PCL scaffolds were seeded with human mesenchymal stem cells (hMSC) in vitro. Proliferation and differentiation of the hMSC were characterized. The developed bioresorbable scaffold had an adequate porosity and pore size over a physiologically relevant range. The use of components of the extracellular matrix enhanced cell attachment and proliferation, especially CS as part of the artificial matrix could induce the osteogenic differentiation of hMSC without other differentiation additives. Coll I/CS coated PCL scaffolds were then implanted in a sheep tibia critical size defect (3 cm) for up to 12 month. The explanted bone specimens were quantitatively assessed by X-ray, computed tomography (CT), biomechanical testing and histological evaluation. The authors conclude that the coll I/CS coated scaffolds supported bone ingrowth while they allowed cell recruiting from the surrounding tissue. The defect reconstruction started from periphery bone ends and incorporated into the scaffold material up to the point of bridging the critical size defect. The present study on a clinically relevant animal model provides the first evidence that embroidered PCL scaffolds can act as temporary matrix for cell migration, proliferation and differentiation for bone tissue engineering applications and describes an alternative approach using bioresorbable, embroidered, surface modified scaffolds for reconstruction of large bone defects.

Date: 2010-09-01
Session: Biomaterials
Time: 10:45-12:15
Room: F4

Abstract number: 25327

SURFACE MODIFICATION OF MAGNESIUM-BASED ORTHOPAEDIC IMPLANTS BY AL₂O₃ PLASMA IMMERSION ION IMPLANTATION (PIII)

Kelvin YEUNG¹, Hoi Man WONG¹, Kin On LAM¹, Vivian TAM¹, Paul CHU², Keith LUK¹, Kenneth CHEUNG¹

¹*The University of Hong Kong, Hong Kong (HONG KONG)*, ²*City University of Hong Kong, Hong Kong (HONG KONG)*

Metallic implants are commonly applied for fracture fixation. One desirable characteristic of an implant is its ability to be degraded after bone healing, thus implants made from degradable metals, including magnesium-based alloys, may substitute conventionally used metals. However, problems associated with use of magnesium alloys include its rapid corrosion and hydrogen gas release. Surface modification may be used to solve these problems. Our group has recently applied an Al₂O₃ layer using PIII technology onto magnesium alloy to enhance its corrosion resistance. This study aims to investigate the corrosion resistance and biocompatibility of the Al₂O₃ plasma-treated magnesium alloy. To evaluate the corrosion resistance properties of the plasma-treated magnesium alloy, the immersion test using DMEM medium was conducted at 37°C for 1 and 3 day(s). Green fluorescent protein osteoblasts (GFPOB) were cultured on plasma-treated and untreated samples for 1 and 3 day(s) to evaluate their cell attachment and proliferation. Gas bubbles were observed on day 1 on the untreated sample where the medium changed from red to purple on day 3, indicating that vigorous corrosion had occurred. No gas bubbles or colour change of the medium was observed for the Al₂O₃ plasma-treated sample. This suggested that the Al₂O₃ layer was able to improve the corrosion resistance of the magnesium alloy. The GFPOBs grew on the plasma-treated sample but not the untreated sample, which indicated good biocompatibility with the plasma-treated sample. Future mechanical property studies during corrosion are required for further validation of this material for clinical use.

Date: 2010-09-01
Session: Biomaterials
Time: 10:45-12:15
Room: F4

Abstract number: 22864

STATIC MAGNETIC FIELD CONCURRENT WITH AUTOGENOUS BONE MARROW EFFECTS ON BONE DEFECT HEALING

Zahra SHAFIEI SARVESTANI¹, Amin BIGHAM SADEGH², Mohamad SHADKHAST², Homayon Reza SHAHBAZKIA²

¹*Shiraz University, Shiraz (IRAN)*, ²*Shahrekord University, Shahrekord (IRAN)*

To stimulate the process of bone healing, several methods have been used previously. These methods include use of ultrasound, electrical stimulation, exposure to electromagnetic field, bone graft, interporous hydroxyapatite (as a bone graft substitute). The aim of this study was evaluation of bone defect healing with autogenous bone marrow concurrent with static magnetic field. Twenty adolescencet, 2-kg- weighing, white New Zealand male rabbits were used in this study. In control group (n=10) mid radii bone defect created and filled with harvested bone marrow. In experimental group (n==10) the procedure was similar to control group with static magnetic application over the bone defect area. Radiological, histopathological and evaluations were performed blindly and results scored and analyzed statistically. The results show those experimental groups were superior to control group in radiological and histological evaluation.

Date: 2010-09-01
Session: Biomaterials
Time: 10:45-12:15
Room: F4

Abstract number: 25258

BIOENGINEERED PERIOSTEAL PROGENITOR CELL SHEETS TO ENHANCE TENDON GRAFT-BONE HEALING IN ACL RECONSTRUCTION

Chih-Hwa CHEN, Chien-Hao CHEN, Chih-Hsiang CHANG, Chun-I SU, Kun-Chung WANG, Hsien-Tao LIU, Chung-Ming YU, Chak-Bor WONG, I-Chun WANG
Chang Gung Memorial Hospital - Keelung, Keelung (TAIWAN)

Periosteum cambium layer contains osteochondral progenitor cells to differentiate into osteoblasts and chondroblasts. We developed a scaffold-free method using polymerized fibrin-coated dishes to make functional periosteal progenitor cell (PPC) sheets for simulate periosteum-like tissue. Small intestines submucosa (SIS) was used as a cell sheet delivery vehicle for periosteal progenitor cell in tendon graft-bone tunnel interface in a rabbit model. Methods: PPC derived from rabbit tibia periosteum were cultivated on polymerized fibrin-coated polyethylene dishes to form a PPC cell sheet. SIS was used as a cell sheet delivery vehicle. Three groups with PPCs, PPCs+SIS, and SIS were designed to evaluate the effect in tendon-bone healing. ACL reconstruction model in rabbits was used. Histological, immunohistochemistry, and biochemistry were used for evaluation. Results: Confocal microscopy assays revealed that cultured CPCs did indeed deposit extracellular matrix (ECM) components on the basal surface. Histological staining revealed that only the PPC group showed higher matrix deposition with fibrocartilage formation in the tendon-bone junction at 4 weeks. Fiber collagen with fibrocartilage formation as tendon-bone reconstruction was found in CPCs-SIS group at 8 weeks. Conclusion: These results suggest that a well-organized and functional PPC cell sheet maintains the differentiated capacity of PPCs and osteochondral regeneration potential. Bioengineered PPC sheets can offer a new therapeutic strategy of a novel approach to enhance tendon-bone healing in ACL reconstruction.

Date: 2010-09-01
Session: Biomaterials
Time: 10:45-12:15
Room: F4

Abstract number: 26120

CO-SUBSTITUTED STRONTIUM AND SILICON APATITE COATINGS FOR METALLIC IMPLANTS

Carl LINDAHL¹, Wei XIA¹, Jukka LAUSMAA², Per BORCHARDT², Peter THOMSEN³, Håkan ENGQVIST¹

¹*Applied Materials Science, Department of Engineering Sciences, Uppsala University, Uppsala (SWEDEN)*, ²*Department of Chemistry and Materials Technology, SP Technical Research Institute of Sweden, Borås (SWEDEN)*, ³*Institute for Clinical Sciences, Sahlgrenska Academy at University of Gothenburg, Gothenburg (SWEDEN)*

Improving the bonding between the implant and the bone could improve the life-time of implants and reduce the risk of revision surgery. Hydroxyapatite (HA) is a material that is widely used as coatings to improve the bone-implant interaction for metallic implants. A way to improve the bioactive properties of HA coatings and thereby promote the bone response to implants is to substitute different ions into HA coatings. Sr²⁺ and Si⁴⁺ ions have proven to have a positive effect on bone formation. Strontium has shown to reduce bone resorption and demonstrated beneficial effects in the treatment of osteoporosis. Silicon can increase the bone mineralization rate. Co-substituting the strontium and silicon into the coatings could improve the bone formation and the bone fixation of implants. The strontium and silicon co-substituted coating was prepared by a biomineralization method via soaking heat treated titanium plates in phosphate buffer saline with added strontium nitrate and sodium silicate at 37 °C and 60 °C for 1 and 2 weeks. Analysis with scanning electron microscopy (SEM) showed that the strontium and silicon co-substituted HA coating had different morphology than HA. X-ray diffraction analysis showed specific HA peaks and time of flight secondary ion mass spectrometry (TOF-SIMS) showed that strontium and silicon was included in the coating. In the present study a strontium and silicon co-substituted apatite coating was prepared using a biomineralization method. This strontium and silicon co-substituted apatite coating may be used to improve bone formation and the bonding between bone and metallic implants.

Date: 2010-09-01
Session: Tumors - Soft Tissue / Sarcomas
Time: 13:30-15:00
Room: F4

Abstract number: 26316

**TRENDS IN INCIDENCE OF SOFT TISSUE SARCOMAS 1984-2004
– EPIDEMIOLOGIC STUDY AND LITERATURE REVIEW**

Christine WIBMER¹, Andreas LEITHNER¹, Nadine ZIELONKE², Matthias SPERL¹, Reinhard WINDHAGER¹

¹*Dept. of Orthopaedic Surgery, Medical University of Graz, Graz (AUSTRIA),*

²*Austrian National Cancer Registry, Statistics Austria, Vienna (AUSTRIA)*

Objective: Increasing incidence rates of soft tissue sarcomas (STS) have been reported. Discussed reasons are the increase of AIDS-related Kaposi's sarcoma, increased exposure to radiation or herbicides, or shifts in diagnostic criteria and classification. This population-based epidemiologic study analyzed the incidence of STS in Austria in comparison with seven international studies. Methods: Age-adjusted incidence rates, gender- and age-predilection, and geographic differences were analyzed, comprising data from the Austrian National Cancer Registry, including all cases of STS in Austria between 1984 and 2004. Results: In total, 5333 cases were registered, male to female ratio was 0.8. The most common histotypes were sarcoma NOS (36%), leiomyosarcoma (24%), liposarcoma (12%), malignant fibrous histiocytoma (MFH) (9%) and fibrosarcoma (5%). Nearly 2% of all cases were Kaposi's sarcoma. Age-adjusted incidence rate was 2.4 per 100,000 per year. Analysis of annual incidence rates and three-year-periods showed no increasing trend (annual increasing gradient = -0.0025). Discussion: Analysis of recent data from a European population showed no increase of incidence of STS, as postulated elsewhere. The incidence rate of STS in Austria (2.4 per 100 000 per year) ranges in the lower half of international incidence rates (1.8-5.0 per 100 000 per year). Different inclusion criteria (Kaposi's sarcoma and dermatofibrosarcoma) and classifications in the various studies could be seen. These findings are more likely to cause the increase of incidence in some studies than true increase of STS due to new or accumulated risk factors.

Date: 2010-09-01
Session: Tumors - Soft Tissue / Sarcomas
Time: 13:30-15:00
Room: F4

Abstract number: 25360

COMPLICATIONS IN SACRAL AMPUTATION FOR CHORDOMA

Wichien LAOHACHAROENSOMBAT, Adisak NATTHANARUNG, Ekkawit THAWORN

Ramathibodi Hospital, Mahidol University, Bangkok (THAILAND))

From 1997-2009, eighteen cases of sacral chordoma underwent marginal excision. All cases were removed by posterior approach. Eight cases involved higher than S2 level while the rest involved lower levels. Major complication included 1 case of early post-operative mortality, 6 cases of local recurrence, 1 case of distant multiple metastasis, 2 cases of development of bowel and bladder problems, 1 case of rupture of the rectum 2 cases of wound infection and one case of late bilateral sacroiliac instability 5 years after resection. The important risk factors leading to recurrence are the tumor size of over 20 centimeters, and involvement of higher than S2 levels. The common locations of recurrence are the sacroiliac ligament, sacrotuberous ligament, sacroiliac joint and adjacent muscles and nerve roots. Fifteen patients still survive, 10 of which are disease free. Evidence of local recurrence could be detected by MRI study as early as 3 months post-operatively.

Date: 2010-09-01
Session: Tumors - Soft Tissue / Sarcomas
Time: 13:30-15:00
Room: F4

Abstract number: 26302

COMPARISON OF THE PREOPERATIVE SCORING SYSTEM OF BAUER WITH FIVE INTERNATIONALLY USED SCORES FOR SPINAL METASTASES

Christine WIBMER¹, Andreas LEITHNER¹, Guenter HOFMANN², Heimo CLAR¹, Magdalena KAPITAN³, Andrea BERGHOLD³, Reinhard WINDHAGER¹

¹*Dept. of Orthopaedic Surgery, Medical University of Graz, Graz (AUSTRIA)*, ²*Dept. of Internal Medicine, Division of Oncology, Medical University of Graz, Graz (AUSTRIA)*, ³*Institute for Medical Informatics, Statistics and Documentation, Medical University of Graz, Graz (AUSTRIA)*

Objective: Considering oncologic aspects as well as quality of life, treatment decision for patients with spinal metastases should include the survival prognosis. This study evaluated the scoring systems of Bauer, Bauer modified, Tokuhashi, Tokuhashi revised, Tomita, van der Linden and Sioutos, and the parameters they consist of, for their predictive value. **Methods:** This study analyzed 254 patients with confirmed spinal metastases retrospectively; treatment 1998-2006; surgery (62), conservative (192). Factors related to survival, such as primary tumor, general condition, neurological deficit, number of spinal and extraspinal bone metastases, visceral metastases, and pathologic fracture were analyzed. Survival period was calculated from date of diagnosis of the spinal metastases with a minimum follow-up of 12 months. For statistical analysis univariate and stepwise multivariate Cox regression analyses were performed. **Results:** Median overall survival for all patients was 10.6 months (min. 8 days, max. 128.4 months). Systemic therapy, visceral metastases, primary tumor, and general condition showed significant influence on survival ($p < 0.05$ regarded significant). Using the recommended group assignment for each system, only Bauer and Bauer modified showed significant results for the distinction between good, moderate and poor prognosis. However, the hazard ratio of the absolute score of all analyzed systems was statistically significant; a better score leading to lower risk of death. **Conclusions:** According to this analysis, the Bauer and the Bauer modified score are the most reliable systems for predicting survival. Since the Bauer modified score furthermore consists of only four positive prognostic factors, we emphasize its impact and simplicity.

Date: 2010-09-01
Session: Tumors - Soft Tissue / Sarcomas
Time: 13:30-15:00
Room: F4

Abstract number: 26465

ENDOPROSTHETIC RECONSTRUCTION OF THE DISTAL TIBIA AND ANKLE JOINT AFTER RESECTION OF PRIMARY BONE TUMOURS

Andreas SHEKKERIS, Sammy HANNA, MD. SEWELL, BGI. SPIEGELBERG, W.JS. ASTON¹, G.W. BLUNN, S.R. CANNON¹, TWR BRIGGS

Royal National Orthopaedic Hospital, Stanmore, Middlesex, London (UNITED KINGDOM)

Endoprosthetic replacement of the distal tibia and ankle joint for a primary bone tumour is a rarely attempted and technically challenging procedure. We report the outcome of six patients treated between 1981 and 2007. There were four males and two females, with a mean age of 43.5 years (15 to 75), and a mean follow-up of 9.6 years (1 to 27). No patient developed a local recurrence or metastasis. Two of the six went on to have a below-knee amputation for persistent infection after a mean 16 months (1 to 31). The four patients who retained their endoprosthesis had a mean musculoskeletal tumour society score of 70% and a mean Toronto extremity salvage score of 71%. All were pain free and able to perform most activities of daily living in comfort. A custom-made endoprosthetic replacement of the distal tibia and ankle joint is a viable treatment option for carefully selected patients with a primary bone tumour. Patients should, however, be informed of the risk of infection and the potential need for amputation if this cannot be controlled.

Date: 2010-09-01
Session: Tumors - Soft Tissue / Sarcomas
Time: 13:30-15:00
Room: F4

Abstract number: 24491

THE IMPACT OF SURGICAL MARGIN AND LOCAL RECURRENCE ON OVERALL SURVIVAL FOR INTERMEDIATE AND HIGH GRADE SOFT TISSUE SARCOMA OF THE EXTREMITIES

Bahtiyar DEMIRALP¹, Joseph ALDERETE², Eduardo NOVAIS², Peter ROSE², Kristy WEBER³, Franklin SIM²

¹*Gulhane Military Medicine Academy Orthopaedics and Traumatology Department, Ankara (TURKEY)*, ²*MAYO Clinic Department of Orthopaedic Surgery, MN (UNITED STATES)*, ³*Johns Hopkins University Department of Orthopaedic Surgery, MD (UNITED STATES)*

Soft tissue sarcomas (STS) are a heterogeneous group of relatively rare malignant neoplasms that arise in mesenchymal tissue. In the United States, it is estimated that around 10600 new cases will be diagnosed and 3820 patients will die of soft tissue sarcomas in the year of 2009. Conventional treatment of soft tissue sarcomas of the extremities includes wide margin surgery and radiotherapy. This multimodality approach has replaced amputation as the primary surgical treatment of choice. Several analyses of prognostic factors influencing both local recurrence and overall survival in patients with extremity soft tissue sarcomas have shown that tumor stage, grade, size, depth and anatomic site are most important for patient survival. Surgical margin, grade and association with radiotherapy are the most important factors in achieving local control. The question remains as to whether increasing morbidity and cost with a multimodality aggressive approach in order to obtain appropriate local tumor control would have an impact on local and distant disease-free survival and overall survival in patients with soft tissue sarcomas. Ideally we would want to precisely identify patients with high risk for distant recurrence and for poor survival to justify the use of these aggressive therapies. The purpose of this investigation was to define the effect of microscopic surgical margins on local recurrence, distant metastasis and overall survival in patients with extremity soft tissue sarcoma. In addition we analyzed the impact of local recurrence as a prognostic factor for overall survival in patients with intermediate to high-grade STS of the extremities.

Date: 2010-09-01
Session: Tumors - Soft Tissue / Sarcomas
Time: 13:30-15:00
Room: F4

Abstract number: 25848

LEIOMYOSARCOMA OF THE BONE - A SINGLE CENTRE EXPERIENCE WITH 15 CASES OF A RARE ENTITY

Philipp Theodor FUNOVICS, Martin DOMINKUS

Medical University of Vienna Department of Orthopaedics, Vienna (AUSTRIA)

Leiomyosarcoma of bone (LMS-B) is an unusual entity. Current literature identifies hardly more than 100 cases and mostly involves only single case presentations. Fifteen consecutive cases (10 males, 5 females; mean age 52 years, range 23-85) of LMS-B have been treated at our institution from 09/1996 to 10/2008. Tumours arose in the tibia (6), femur (4), humerus (3) and thoracic spine (2) as G3 in seven, G2 in seven and only one G1 lesion. All patients underwent resection of their tumour (prosthetic reconstruction in 11, compound osteosynthesis in 3, amputation in 1), 11 patients had adjuvant chemotherapy and 10 patients had radiation. Mean follow-up was 24 months (range 2-85). Two patients underwent revision of their prosthetic reconstruction due to instability and infection, respectively. Two patients died of their disease, four died of unrelated causes. Two patients had metastatic disease at diagnosis, two patients developed metastases 23 and 25 months postoperatively; only one of them is without evidence of disease after pulmonary metastasectomy. There were no local recurrences. One patient had a retinoblastoma of the eye in her history, one patient had suffered a malignant giant cell tumour; one died of lymphoma as a secondary malignancy. Overall survival after 5 years was 41%. LMS-B is a rare but aggressive malignant skeletal tumour. Wide excision is the mainstay of therapy, adjuvant procedures may be useful. Survival is dependant on tumour grade; metastatic disease and secondary malignancies were the strongest limitations to survival in our series.

Date: 2010-09-01
Session: Tumors - Soft Tissue / Sarcomas
Time: 13:30-15:00
Room: F4

Abstract number: 26466

CLINICAL ASPECTS AND PROBLEMS OF MANAGEMENT OF BONE TUMOURS IN AFRICA

Farikou IBRAHIMA¹, Bernadette NGO NONGA¹, MATHIEU MOTAH², Jean BAHEBECK³

¹*Department of Surgery and Specialties, FMBS, University of Yaoundé I, Yaounde (CAMEROON),* ²*Douala General Hospital, Douala (CAMEROON),* ³*Faculty of Medicine and Biomedical Sciences, University of Yaoundé, Yaounde (CAMEROON)*

Introduction: While in the developed countries progress is recorded each day in the diagnosis and the treatment of the bone tumours, in Africa, we still face with the problems of basic management of bone tumours. The goal of this study is to report and share our experience of management of the bone tumours under these difficult conditions of practice in Africa. **Patients and methods:** The diagnosis was made mainly on the basis of clinical examination supplemented by a standard plain X-rays. Rarely the histological confirmation of the tumour was obtained. **Results** Of the 43 patients, 16 are lost sight after the first consultation. The average time between symptoms and consultation was 21.9 months. A histological proof of the tumour was possible among only 11 patients. The size of the tumour at the time of the consultation exceeded 2cm in 80.5% of cases. The treatment resulted in 3 amputations and 1 death. **Discussion:** The rare studies undertaken on the bone tumours in Africa have all insisted on the precariousness of their ethological and therapeutic management. This situation was embarrassing to take the decision of a radical surgery. Remainder, the amputation of cancer origin is sometimes the only recourse in Africa: it represents from 1.4% to 12% elsewhere and 6.9% for our series. **Conclusion:** The improvement of management of bone tumours requires the formation of medical personnel and general public for an early diagnosis and adequate infrastructures of diagnosis and treatment with a generalization of the social security.

Date: 2010-09-01
Session: Tumors - Soft Tissue / Sarcomas
Time: 13:30-15:00
Room: F4

Abstract number: 26196

MULTISEGMENTAL EN-BLOC RESECTIONS FOR PRIMARY TUMORS AND SOLITARY METASTASIS OF THE THORACOLUMBAR SPINE

Alexander DISCH¹, Klaus-Dieter SCHASER¹, Ingo MELCHER¹, Claudia DRUSCHEL¹, Alessandro LUZZATI²

¹*Center for Musculoskeletal Surgery, Charité - University Medicine Berlin, Berlin (GERMANY),* ²*Section for Oncological Orthopaedics and Reconstruction of the Spine, IRCCS Istituto Ortopedico Galeazzi, Milano (ITALY)*

Introduction: Total en-bloc-spondylectomy (TES) as radical treatment option for sarcoma and solitary metastases of the spine markedly improves onco-surgical outcome rates. This study analyzes clinical results after multilevel thoracolumbar TES. Methods: All patients treated by multilevel TES and reconstruction with a carbon composite vertebral body replacement system were investigated. Patient charts, the serial and last clinical follow up investigation were analyzed in terms of histopathological tumor origin, preoperative symptoms, surgical peri- and postoperative data, applied adjuvant therapies and course of disease. In the case of solitary metastases time until occurrence and prognostic scores were evaluated (Tomita/Tokuhashi Score). CT-Scans were performed and analyzed at follow up. Oncological status was evaluated including local recurrence rates, cumulative disease specific and metastases-free survival. Results: Multilevel (2-5segments) TES for 15 sarcomas/5 solitary spinal metastases of the thoracolumbar spine was performed in 20 patients (9m/11f, mean age at surgery: 54±15yrs.). Wide/marginal surgical margins were achieved in 7/13 patients, respectively. The mean follow-up period was 25.0(9-53) months. Adjuvant therapy was conducted in 13 cases. No implant breakdown or loosening was observed. Local recurrence occurred in one patient. 13 patients showed no evidence of the disease, 5 were alive with disease. Two died of systemic disease. Conclusion: Multilevel TES offers a radical resection option attaining oncologically adequate resection margins with low local recurrence rates. However, metastatic disease developed in one third of patients. Careful patient selection and realistic evaluation of resection feasibility has to precede decision for surgery.

Date: 2010-09-01
Session: Tumors - Soft Tissue / Sarcomas
Time: 13:30-15:00
Room: F4

Abstract number: 26567

COMBINED EN BLOC CHEST WALL RESECTION AND VERTEBRECTOMY OF PRIMARY MALIGNANT SPINE TUMORS

Claudia DRUSCHEL, Alexander DISCH, Ingo MELCHER, Norbert HAAS, Klaus-Dieter SCHASER

Charite university medicine Berlin, CMSC, Berlin (GERMANY)

Aim: Description of oncological and surgical results of combined en bloc vertebral and chest wall resection for spinal sarcoma involving the thoracic wall. **Method:** From 06/07-12/09 16 patients (f/m: 7/9; age: 27-83yrs) underwent a combined en bloc resection of chest wall and vertebrectomy for solitary primary spinal sarcoma (13) and metastatic lesions (3). The median follow-up was 21,4 (3-84) months. All patients underwent a chestwall resection en bloc with multilevel hemi (n=9) or total vertebrectomy (n=7) with subsequent defect reconstruction. Reconstruction of the spinal defect following total resections was accomplished by combined dorsal stabilization and carbon cage interposition. The chest wall defects were closed with a goretex®-patch and in one case with musculocutaneous latissimus dorsi flap. **Results:** The surgical margins were R0 in 15(wide: 12, marginal: 3) and R1 in 1 patient, due to extracompartmental sarcoma invasion and dural involvement. In these patients postoperative radiotherapy was performed. Surgical complications requiring revision occurred in 1 patient due to injury of the ductus thoracicus and persisting chylothorax. Temporary subileus or mild pneumonia appeared in 3 patients. No superficial/deep infection or neurological deficits were observed. At follow up 3 patients died due to disease (10,5 months). 3 Local recurrences were seen after median 21,4 months(3-84). Pulmonary metastases necessitating polychemotherapy were seen in 3 patients (15 months). **Conclusion:** The combined en bloc resection of chest wall and multilevel en bloc spondylectomy/hemivertebrectomy is a challenging but safe and effective technique.

Date: 2010-09-01
Session: Tumors - Soft Tissue / Sarcomas
Time: 13:30-15:00
Room: F4

Abstract number: 26014

ASSESSMENT OF THE TOKUHASHI SCORE AND ITS MODIFICATIONS IN 470 PATIENTS OF AARHUS METASTASES DATABASE WITH VERTEBRAL METASTASES

Miao WANG, Haisheng LI, Kristian HOEY, Ebbe Stender HANSEN, Bent NIEDERMANN, Peter HELMIG, Yu WANG, Cody BÜNGER

Orthopaedic Research Lab, Aarhus University Hospital, Aarhus C (DENMARK)

Introduction: We conducted a retrospective evaluation of the predictive value of Tokuhashi and its revised edition for survival in the 470 patients with spinal metastases underwent surgical treatment in Aarhus University Hospital. Materials and Method: 470 patients with a histologically confirmed diagnosis of spinal metastases and surgical intervention were included. The life expectancy was calculated by both Tokuhashi 12(T12) and Tokuhashi 15(T15) scoring system. The survival was measured using the Kaplan Meier curves. Results: We studied 470 patients in the average of 63 years (24-89y), M:F : 6:4, mean survival 19.4±28.4 months' range:0.2-186.3 m; median: 7.6 m. According to the T12 scoring system there are 218 patients (mean survival 10.6±16.9m) in the 0-5 points group, 208 patients (22.1±28.3m) in the 6-9group, 44 patients (50.4±45.3m) in the 10-12 group. The T12 scoring system showed in 186 patients a correct assignment to their prognostic groups. According to the T15 scoring system there are 314 patients (13.6±21.2m) in the 0-8 group, 114 patients (26.8±33.9m) in the 9-11group, 42 patients (42.0±40.6m) in the 12-15 groups. The T15 scoring system showed in 232 patients a correct assignment to their prognostic groups. Conclusions: T15 showed better predictive value than T12. The reliability between the predicted prognosis and real survival is high in the 10-12 groups in T12 system, and in the 12-15 groups in the T15 system.

Date: 2010-09-02

Session: Symposium - Surgical treatment for primary spinal infection (JOA)

Time: 10:45-12:15

Room: Congress Hall

Abstract number: 26813

CLINICAL AND RADIOLOGICAL OUTCOME OF SURGERY FOR PYOGENIC AND TUBERCULOUS SPONDYLITIS – COMPARISON BETWEEN SURGICAL TECHNIQUES AND BETWEEN DISEASE TYPES

Hiroshi MIYAMOTO¹, Yoshiyuki OKADA¹, Koki UNO¹, Masatoshi SUMI²

¹*Dept. of Orthopaedic Surg., National Hospital Organization Kobe Medical Center, Kobe (JAPAN),* ²*Kobe Rosai Hospital, Kobe (JAPAN)*

Introduction: Choice of surgical techniques for patients with pyogenic spondylitis (PS) and tuberculous spondylitis (TB) such as anterior approach (technique A), combination of anterior and posterior approaches (A'P and P'A), and posterior approach (P), are controversial. The present study compared, between disease types and between surgical techniques, the clinical and radiological outcomes of surgery for these patients with PS and TB. Methods: Fifty-two patients were involved, comprising 25 PS and 27 TB, with a mean age of 63.3±13.3 years. The affected sites included any lesions of the spine. Surgical techniques A, AP and PA were each performed in 15 patients, and technique P was performed in 7. Frankel scale was used for clinical evaluation. As radiological evaluation, correction of kyphosis and loss of correction were measured. Outcomes were evaluated between disease types and surgical techniques. Results: There was no difference in neurological recovery and in radiological assessment between disease types and between surgical techniques. Favorable degrees of correction were obtained in all groups, but favorable alignments were maintained until follow-up in both A'P and P'A groups, in which instrumentation was used. On the other hand, in groups A and P, in which no instrumentation was used, correction losses were detected at follow-up. The period of hospitalization was significantly shorter in groups A'P and P'A compared with that in groups A and P respectively. Conclusion: From the result of the present study, A'P and P'A can be recommended as they provide a significantly smaller loss of correction and shorter hospital stay than those without instrumentation. Whereas, there were no differences in clinical or radiographic parameters between groups A'P and P'A, indicating that surgical techniques may be selected flexibly depending on patient's condition.

Date: 2010-09-02

Session: Symposium - Surgical treatment for primary spinal infection (JOA)

Time: 10:45-12:15

Room: Congress Hall

Abstract number: 26850

ANTERIOR DEBRIDEMENT AND FUSION FOLLOWED BY POSTERIOR PEDICLE SCREW FIXATION IN INFECTIOUS SPONDYLITIS

Masato TANAKA

Okayama University Hospital, Okayama (JAPAN)

The purpose of this study is to investigate if the use of pedicle screw instrumentation could be beneficial for successful outcome of the operative treatment for infectious spondylitis. There is a controversy concerning the optimal treatment for pyogenic spondylitis regarding approach and instrumentation. Methods: Sixty patients aged from 15 to 81 years suffering from persistent or complicated infectious spondylitis were treated by single-stage anterior debridement and fusion followed by posterior pedicle screw fixation in infectious spondylitis. There were 56 patients with pyogenic spondylitis, 2 tuberculous spondylitis and 2 fungus spondylitis. Patients were evaluated before and after surgery in terms of pain and neurologic level, radiologic fusion. The indications for surgery included neurologic compromise, significant vertebral body destruction and failure of medical treatment. Needle biopsy or percutaneous drainage was performed in all patients before surgery. Results: Total pain relief was obtained for 77% of the cases. Favorable correction and bony union were obtained in all patients but one. Average blood loss and surgical time were 261 minutes and 775ml, respectively. The surgical complications were 3 cases, including 1 epidural hematoma, 1 instrument infection and 1 instrument migration. Patients with incomplete neurologic impairment improved after surgery. There was only one exacerbation of infection but no posterior instrumentation failure at the last follow-up observation. Conclusion: The present study showed that the pedicle screw instrumentation should have had a beneficial influence on the eradication of infection, segmental and global spinal reconstruction and fusion. The technique enhanced bony union rate and early rehabilitation.

Date: 2010-09-02

Session: Symposium - Surgical treatment for primary spinal infection (JOA)

Time: 10:45-12:15

Room: Congress Hall

Abstract number: 26811

EFFECTIVENESS OF POSTEROLATERAL ENDOSCOPIC DEBRIDEMENT AND IRRIGATION FOR VARIOUS TYPES OF SPINAL INFECTION AT THORACIC AND LUMBAR SPINE

Manabu ITO, Kuniyoshi ABUMI, Yoshihisa KOTANI, Hideki SUDO, Yuichiro ABE, Akio MINAMI

Department of Orthopaedic Surgery, Hokkaido University Graduate School of Medicine, Sapporo (JAPAN)

Purpose: This study aimed to report the effectiveness of posterolateral endoscopic debridement and irrigation for treatment of various types of spinal infections at the thoracic and lumbar spine. **Methods:** Seventy patients treated with this technique were enrolled. There were 59 patients with pyogenic, 8 with tuberculous (TB), 2 with fungal and 1 with non-tuberculous mycobacterium infection (NTBM). Local anesthesia combined with intravenous anesthesia or general anesthesia was used according to both the spinal level of infection and general conditions of patients. A single portal was used for the thoracic spine and biportals for the lumbar spine. Posterolateral endoscopic surgery consisting of debridement of infected tissues and pressurized irrigation was performed. Operation time, changes of VAS and CRP, and complications were investigated. **Results:** In patients with pyogenic infection, remarkable pain reduction was obtained in all the patients immediately after surgery. Average CRP was 4.56mg/dL before surgery, 1.59mg/dL at postoperative one week, and 0.73 mg/dL at postoperative 3 weeks. The detection of organisms was successful in 72%. Relapse of infection was seen in 7 patients with severe comorbid medical problems. In the 8 patients with TB, 6 patients could be successfully treated only with this procedure. The postoperative clinical course of the 2 patients with fungal infection was similar to those of pyogenic infections. **Discussion:** This technique is minimally invasive and safely applicable even for patients with poor general conditions due to multiple comorbidities. The best indication of this technique is the early stage of spinal infections regardless of the types of organisms. Once spinal infection is diagnosed in an early phase with the aid of imaging studies including MRI, this technique should be selected to identify the organisms and the most sensitive antibiotics and to subside spinal infection without causing destructive changes to the spine.

Date: 2010-09-02
Session: Trauma - Pertrochanteric fractures
Time: 13:30-15:00
Room: Congress Hall

Abstract number: 26859

TROCHANTERIC FRACTURES

Nikolaj WOLFSON

University of Southern California, Keck School of Medicine, San Francisco (UNITED STATES)

Most of the Trochanteric fractures in adult population occur in patients who are older than 65 years old. They are mainly due to osteoporosis and are more commonly found in the older group of the old patients. In a younger patient fractures are caused by high energy trauma and are more of unstable pattern. Non-operative treatment of these fractures is reserved for those who have significant medical contraindication. Choice of surgical treatment of fractures in the intertrochanteric region of the proximal femur is mainly based on the fracture pattern. While more stable fracture types require more traditional Compression Hip Screw and plate, the unstable types, such as reverse obliquity fractures and those that are extending into subtrochanteric region are treated mainly with intramedullary devices. There is some controversy exist regarding type of fixation device for more stable fracture patterns. Appropriate choice of the surgical implant used and surgical technique are important factors in preventing complications that do occur. Among them are: loss of fixation, non-union and malunion, wound infection, and others. Some new and evolving technologies are out there and will be discussed in this presentation. The following presentation will outline the trochanteric fractures classification, treatment rational and possible complications.

Date: 2010-09-02
Session: Trauma - Pertrochanteric Fractures
Time: 13:30-15:00
Room: Congress Hall

Abstract number: 25341

A PROSPECTIVE COHORT STUDY ON FUNCTIONAL OUTCOME IN PATIENTS WITH PERTHROCANTERIC FRACTURES AFTER SURGERY WITH THE SHORT GAMMA NAIL

Max GORDON, Per Olov BERNTSSON, André STARK, Olof SKÖLDENBERG
Karolinska Institutet, Stockholm (SWEDEN)

Background: The intramedullary fixation rate for perthrochanteric fractures has increased dramatically in the U.S. from 3% in 1999, to 67% in 2006 (Anglen et al, 2008). Utrilla et al (2005) indicated that unstable perthrochanteric fractures seem to fare better with a Gamma Nail of the third generation compared to a standard dynamic hip screw (DHS) perhaps motivating this dramatic increase in use. Little is known of the morbidity associated with this latest version of the short Gamma Nail. Study aim: To investigate the clinical outcome and morbidity after short Gamma Nail surgery. Methods: A consecutive prospective cohort of 100 patients were examined after at least 1 year postoperative. Harris hip score, EQ-5D, local pain over the collum screw were recorded together with new x-ray measurements. Significance: We want to evaluate if there is a reason to modify the indications for fixation with the short Gamma Nail for this common fracture type. Preliminary results: Out of 100 patients, 99 have healed although a large group seem to have local discomfort.

Date: 2010-09-02
Session: Trauma - Pertrochanteric Fractures
Time: 13:30-15:00
Room: Congress Hall

Abstract number: 24915

3066 CONSECUTIVE GAMMA NAILS. 12 YEARS EXPERIENCE AT A SINGLE CENTRE

Alicja Joanna BOJAN¹, Claudia BEIMEL², Andreas SPEITLING², Gilbert TAGLANG³, Carl EKHOLM¹, Anders JÖNSSON²

¹*Sahlgrenska University Hospital, Mölndal (SWEDEN)*, ²*Stryker Osteosynthesis, Schönkirchen (GERMANY)*, ³*Trauma Unit University Hospital of Strasbourg, Strasbourg (FRANCE)*

Background: Fixation of trochanteric hip fractures using the Gamma Nail has been performed since 1988 and is today well established and wide-spread. However, a number of reports have raised serious concerns about the increased risk of a subsequent femoral shaft fracture for which reason some authors have argued against its use despite other advantages of this implant. We evaluated performance of the Gamma Nail in a uniquely large patient data base collected over a twelve year period. **Methods:** 3066 consecutive patients were treated for trochanteric fractures using Gamma Nails between 1990 and 2002 at Centre de Traumatologie et de l'Orthopedie, Strasbourg, France. These patients were retrospectively analysed. Information on epidemiological data, intra- and postoperative complications and patients outcome was retrieved from patient notes and all available radiographs were assessed by single reviewer. **Results:** Complication rate with the use of the Gamma Nail was low. There were 137 (4.5%) intraoperative fracture-related complications and 189 (6.2%) complications were detected post-operatively and during follow-up. Cut-out of the lag screw was the most frequent mechanical complication (57 patients, 1.85%). Femoral shaft fracture occurred only in 19 patients (0.6%). Infection, delayed healing/non-union, avascular femoral head necrosis and distal locking problems occurred in 103 patients (3.7%). **Conclusions:** The use of the Gamma Nail in trochanteric fractures is a safe treatment method. In particular, low rate of femoral shaft fractures was reported. Low complication rate reported in this series can probably be explained by strict adherence to a proper surgical technique.

Date: 2010-09-02
Session: Trauma - Pertrochanteric Fractures
Time: 13:30-15:00
Room: Congress Hall

Abstract number: 24599

TIP TO APEX DISTANCE IN DHS FIXATION. AN AUDIT OF PRACTICE AT A DISTRICT GENERAL HOSPITAL

Dionysios TRIGKILIDAS, George MURPHY
Milton Keynes Hospital, Milton Keynes (UNITED KINGDOM)

Background: Dynamic Hip Screw is a successful device for extra-capsular neck of femur fractures. A recognised complication of this procedure is the screw cut-out. The tip-apex distance is a reliable predicting factor of screw cut-out. Aim The purpose of this audit was to assess the position of the lag screw, in dynamic hip screws performed in a district general hospital and to assess if the principle of tip to apex distance is put into practice. Method: We used our theatre logbooks to retrospectively identify all the patients who underwent DHS fixation over the period of Aug08-Nov08. The tip-apex distance for every DHS was measured using the intra-operative radiographs. The results were presented in a departmental audit meeting and the importance of tip-apex distance was emphasized. The audit cycle was repeated 3 months later between Mar09 and Jun09. Results In the first cycle, 36 patients were studied. 9 out of 36 (25%) had a tip-apex distance of >25mm and there were 3 cut-outs requiring revision surgery. In the second cycle, 31 patients were studied. 5 out of 31 (16%) had a tip-apex distance of >25mm and 1 cut-out. Conclusion: By simply raising awareness and emphasising the importance of the tip-apex distance, we lowered our DHS cut-out rate, improving patient's safety and quality of life. We recommend that the tip-apex distance principle is emphasised and regularly re-enforced to all trainee surgeons, in order to improve the outcome of dynamic hip screws in patients with neck of femur fractures.

Date: 2010-09-02
Session: Trauma - Pertrochanteric Fractures
Time: 13:30-15:00
Room: Congress Hall

Abstract number: 24444

FUNCTIONAL OUTCOMES FOLLOWING INTRAMEDULLARY NAILING OF TROCHANTERIC HIP FRACTURES: A PILOT MULTICENTER, RANDOMIZED CONTROLLED TRIAL

Mohit BHANDARI¹, Alicja BOJAN², Carl EKHOLM², Ole BRINK³, Anthony ADILI¹, Sheila SPRAGUE¹, Nasir HUSSAIN¹, Anders JÖNSSON⁵

¹*Division of Orthopaedic Surgery, Hamilton, Ontario (CANADA)*, ² *Department of Orthopaedic Surgery, Göteborg (SWEDEN)*, ³*Department of Orthopaedics, Aarhus C (DENMARK)*, ⁵*Global Medical Science, Schönkirchen (GERMANY)*

Purpose: The popularity of intramedullary nails (IMN) for trochanteric hip fractures has grown substantially with little supportive evidence that IMN are superior to conventional sliding hip screws (SHS). **Methods:** We conducted a multi-center, pilot randomized trial including 3 clinical sites across Sweden, Denmark, and Canada. We randomized 85 elderly patients with stable and unstable trochanteric hip fractures to either SHS or an IMN. The primary outcome, revision surgery, was independently adjudicated at one year. Secondary functional outcomes included the Parker Mobility Score (PMS), the Merle D'Aubigne Score and the Euroqol-5D. **Results:** Eighty five patients were enrolled. Fifteen patients died prior to the one year follow up. Across treatment groups, patients did not differ in age, gender and fracture type. The overall revision risk was 11.6% (8/69) and did not differ significantly between groups (IMN: 5; SHS: 3). Patients treated with IMN had significantly higher Merle D'Aubigne function subscores at 6 (p=0.01) and 12 months (p=0.05). Gamma3 nails approached significantly higher scores in the Parker mobility score at 6 (p=0.08) and 12 months (p=0.056). Non-significant differences were identified in the Euroqol-5D quality of life measures; however, the Gamma3 nailed trended to higher scores than the sliding hip screw. **Conclusion:** Our findings of early functional gains without increased risk of revision surgery support the increased popularity of IMN for the management of trochanteric hip fractures in elderly patients.

Date: 2010-09-02

Session: Trauma - Pertrochanteric Fractures

Time: 13:30-15:00

Room: Congress Hall

Abstract number: 23584

COMPARISON OF THE PROXIMAL FEMORAL NAIL ANTIROTATION AND THE DYNAMIC HIP SCREW FOR UNSTABLE PROXIMAL FEMUR FRACTURES: A RANDOMISED, CONTROLLED TRIAL FROM CHINA

Jiong Jiong GUO, Huilin YANG, Tiansi TANG

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

The superiority of extramedullary or intramedullary implants in the treatment of unstable extracapsular proximal femoral fractures is still controversial. Recently a new fixation device, the proximal femoral nail antirotation (PFNA), was introduced for the treatment of intertrochanteric fractures. We hypothesized that PFNA is a better method than the dynamic hip screw (DHS) for the treatment of unstable proximal femur fractures in young Chinese adults. 136 patients who had unstable pertrochanteric femoral fracture were randomized to treatment with a DHS (68 patients) or a PFNA (68 patients). All patients were followed prospectively for one year. We compared walking ability before fracture, intraoperative variables and post-operative mobility. The operative time and estimated intraoperative blood loss of PFNA were significantly less than of DHS ($p < 0.001$), but use of DHS was associated with much less radiation time ($p < 0.001$). The patients who had a PFNA had, on the average, significantly better mobility at three and six months postoperatively ($p < 0.001$). This difference was no longer seen at twelve months ($p = 0.479$). One patient had the PFNA removed because of the large fracture gap was detected postoperatively. Our results suggest that the use of the PFNA may allow faster postoperative restoration of walking ability, when compared with the DHS.

Date: 2010-09-02

Session: Trauma - Pertrochanteric Fractures

Time: 13:30-15:00

Room: Congress Hall

Abstract number: 25113

INTRAMEDULLARY FIXATION WITH A THIRD GENERATION NAIL VERSUS THE SLIDING HIP SCREW FOR TROCHANTERIC HIP FRACTURES; A RANDOMISED TRIAL OF 600 PATIENTS

Nikolas JAGODZINSKI, Martyn PARKER

Peterborough District Hospital, Peterborough (UNITED KINGDOM)

The Sliding Hip Screw (SHS) is currently the treatment of choice for trochanteric hip fractures. An alternative treatment is the proximal femoral nail. Earlier nail designs were associated with an increased complication rate compared to the SHS. We conducted a large randomised trial to compare a third generation Targon Proximal Femoral Nail with the SHS in 600 patients with trochanteric hip fractures. All surgery was supervised by one surgeon. All patients were followed up for a minimum of one year by a blinded observer. Length of surgery was slightly increased for the nail (44 versus 49 minutes, $p=0.0002$). Fluoroscopic screening time was increased in the nail group (0.3 versus 0.6 minutes, $p<0.0001$). Intra-operative complications were more common with nail. There was no difference in blood transfusion requirement, medical complications or mortality between groups. Deep wound infection requiring removal of SHS occurred once. In addition there were three cases of cut-out, three of plate detachment and one non-union in the SHS group, requiring secondary surgery. There were two complications in the nailed group, one case of cut-out which required secondary surgery and one case of fracture non-union. At follow-up no difference in pain scores was seen but there was a tendency to improved mobility in the nailed group ($p=0.004$). This is the largest randomised trial to date comparing a short proximal femoral nail with a SHS. Intramedullary fixation can result in a lower re-operation rate and improved mobility in comparison to the SHS.

Date: 2010-09-02
Session: Trauma - Pertrochanteric Fractures
Time: 13:30-15:00
Room: Congress Hall

Abstract number: 22837

USE OF PROXIMAL FEMORAL NAILING ANTIROTATION (PFNA) FOR HIP FRACTURES

Kiran SINGISETTI, Nicholas COOKE

University Hospital of North Tees, Stockton on Tees (UNITED KINGDOM)

INTRODUCTION: Proximal femoral nailing is a recommended internal fixation technique for unstable pertrochanteric fractures of femur. The aim of the study is to investigate and share our experience with the Proximal Femoral Nail Antirotation (PFNA), a newer implant from AO/ASIF designed to compact the cancellous bone. **PATIENTS AND METHODS:** 68 patients involving 68 PFNA nailing procedures done over a period of 2 years (2007-09) were included in the study. Average follow-up period was 1 year. AO classification for trochanteric fractures was used to classify all the fractures. Radiological parameters including tip-apex distance and neck shaft angle measurement were assessed. **RESULTS:** Average age of patients included in the study was 80 years. 18 patients died during the follow up period due to non-procedure related causes. Average tip-apex distance is 12.7 mm and radiological fracture union time is 5 months. Revision of short to a long PFNA was needed for periprosthetic fracture of shaft of femur in two patients. Two patients needed a complex total hip replacement eventually and further two patients had removal of the implant due to PFNA blade penetration through the femoral head. **CONCLUSIONS:** PFNA is a technically demanding procedure and has a learning curve. It is considered a useful implant in unstable pertrochanteric fracture fixation. A close radiological and clinical follow up is recommended due to the risk of late fracture and implant related complications.

Date: 2010-09-02
Session: Trauma - Pertrochanteric Fractures
Time: 13:30-15:00
Room: Congress Hall

Abstract number: 25717

COMPARATIVE STUDY BETWEEN DYNAMIC HIP SCREW AND PROXIMAL FEMORAL LOCKED PLATE IN THE TREATMENT OF INTERTROCHANTERIC FEMORAL FRACTURES WITH DISTAL EXTENSION INTO SHAFT OF FEMUR

Waleed ARAFAT, Nehad EL MAHBOUB

Misr Univeristy for Science and Technology, Giza (EGYPT)

Comminuted and unstable inter trochanteric fractures with extension into the proximal femur, are challenging injuries that are prone to complications. The standard treatment for intertrochanteric fractures of the femur is the sliding hip screw and plate. The locking compression plate was introduced in the 21st century as a new implant that allows angular-stable plating for the treatment of complex comminuted and osteoporotic fractures. Despite promising results with use of the locking compression plate for complex fractures in different anatomic regions, until recently locked plating had not been applied to treatment of unstable proximal femur fractures. The objective of this study is to compare the results of the Proximal Femoral locking plate system versus sliding hip screw and plate in the treatment of intertrochanteric hip fractures with distal extension into the femoral shaft. Sixty patients were included in this study, age ranged from 35 to 65 years divided into two groups: those treated by long proximal femoral locking plate fixation device (Group 1; n=30) and those treated by sliding hip screw and plate (Group 2; n=30) cases were evaluated postoperatively radiologically, and clinically using Harris hip score system and followed up for minimum period of one year or death. Conclusion: No significant difference between the two groups as regarding union rate, weight bearing, limb length discrepancy. However as regarding implant failure we have three cases with cut through of the lag screw and were revised by locked plate system. Keywords: fracture-intertrochanteric shaft of femur-locked plate-dynamic hip screw.

Date: 2010-09-02
Session: Trauma - Pertrochanteric Fractures
Time: 13:30-15:00
Room: Congress Hall

Abstract number: 23797

A BIOMECHANICAL ANALYSIS OF LAG SCREW POSITION IN THE FEMORAL HEAD FOR CEPHALOMEDULLARY NAILS USED TO FIX UNSTABLE PERITROCHANTERIC FRACTURES

James WADDELL, Paul KUZYK, Zdero RADOVAN, Suraj SHAH, Michael OLSEN, Gordon HIGGINS, Emil SCHEMITSCH
University of Toronto, Toronto (CANADA)

Minimizing tip-apex distance (TAD) has been shown to reduce clinical failure of extramedullary sliding hip screws used to fix peritrochanteric fractures. The purpose of this study was to determine if such a relationship exists for the position of a cephalomedullary nail lag screw. Unstable four-part fractures were created in 30 synthetic femurs and repaired using Long Gamma 3 nails with one of 5 lag screw placements in the femoral head: superior, inferior, anterior, posterior, central. All specimens were radiographed and radiographic measurements including TAD and a calcar referenced tip-apex distance (CaTAD) were calculated. All specimens were tested for axial, lateral, and torsional stiffness, and then loaded to failure in the axial position. ANOVA was used to compare the five treatment groups. Linear regression analysis was used to compare stiffness and load-to-failure (dependant variables) with radiographic measurements (independent variables). The inferior lag screw position had significantly greater axial stiffness than superior ($p < 0.01$), anterior ($p = 0.02$) and posterior ($p = 0.04$) positions. Analysis revealed significantly less torsional stiffness for the superior lag screw position compared to other lag screw positions ($p < 0.01$ all 4 pairings). Superior and central lag screw positions had significantly greater load-to-failure than anterior ($p < 0.01$ and $p = 0.02$) and posterior ($p < 0.01$ and $p = 0.05$) positions. There were significant negative linear correlations between stiffness tests with CaTAD, and load-to-failure with TAD. Central placement of the lag screw with minimization of TAD may provide the best combination of stiffness and load-to-failure.

Date: 2010-09-02

Session: Spine Spondylolisthesis / Low Back Pain / Basic Science

Time: 08:00-09:30

Room: H1

Abstract number: 25211

A 29 YEAR FOLLOW-UP OF PATIENTS WITH ISTHMIC SPONDYLOLISTHESIS GRADE III-V TREATED WITH FUSION IN SITU AT YOUNG AGE.

Anders JOELSON, Karin FRENNERED

Sahlgrenska University Hospital, Göteborg (SWEDEN)

OBJECTIVE: In order to evaluate outcome of patients fused in situ for severe isthmic spondylolisthesis at young age, patients were invited to retrospective clinical follow-up. **METHODS:** Thirty-five of forty consecutive patients fused in situ for isthmic spondylolisthesis (17 Meyerding grade III, 14 grade IV and 4 grade V) were physically examined and reevaluated by validated questionnaires. The mean age at surgery was 15 years (range 9-25) and time to assessment was 29 years (range 23-35). Quality of life was assessed by Short Form-36 (SF-36) and EQ-5D, depression by Zung depression scale (ZDS), physical function by Million score and Oswestry disability index (ODI) and pain by Visual Analogue Scale (VAS). Certain data were compared with results from an 8 year follow-up for the same patients. **RESULTS:** SF-36 averaged: Physical Function 88 (range 50-100), Role Physical 89 (range 0-100), Bodily Pain 76 (range 10-100), General Health 79 (range 35-100), Vitality 70 (range 15-100), Social Function 92 (range 50-100), Mental Health 85 (range 40-100) and Role Emotional 93 (range 0-100). EQ-5D index averaged 0.84 (range 0.62-1). ZDS averaged 30 (range 20-52). Million score averaged 28 (range 0-109) and ODI 10 (range 0-34). Mean back pain VAS was 13 (range 0-72) and leg pain VAS 9 (range 0-60). **CONCLUSIONS:** After 29 years, patients fused in situ for severe isthmic spondylolisthesis at young age, reported high quality of life, low pain intensity and good physical function which is in accordance with earlier studies.

Date: 2010-09-02

Session: Spine Spondylolisthesis / Low Back Pain / Basic Science

Time: 08:00-09:30

Room: H1

Abstract number: 25404

THE EFFECTS OF INTERVERTEBRAL DISC CELLS ON NERVE TISSUE;

Karin LARSSON¹, Eva RUNESSON¹, Katarina JUNEVIK², Björn RYDEVIK¹, Helena BRISBY¹

¹*Dept. of Orthopaedics, Inst. of Clinical Sciences, University of Gothenburg, Gothenburg (SWEDEN),* ²*Dept. of Clinical Chemistry and Transfusion Medicine, University of Gothenburg, Gothenburg (SWEDEN)*

Introduction: The cells in nucleus pulposus (NP) have been demonstrated to negatively influence nerve tissue, in vitro and in vivo. NP consists of at least two cell populations, notochordal cells (NC) and chondrocyte-like cells (CLC). In the present study the effects on neurite outgrowth and morphology in an in vitro explant system after applying these two cell populations were examined. Methods: NP was harvested from tail discs in Sprague Dawley rats and NP cells separated into two populations, NC and CLC. Dorsal root ganglia (DRGs) were harvested from newborn rats and cultured for 24 hours before NC and CLC were applied alone or in combination. Determination of neurite outgrowth was performed microscopically by measuring neurite outgrowth in 4 directions after 24 and 48 hours culture. The mean of the 4 measurements was calculated and the ratio between 48 and 24 hours outgrowth was determined in a total of 939 DRGs. The cultures were fixed in Karnovsky's fixative and prepared for scanning electron microscopy analysis (SEM). Results: NC in medium and high cell concentration, CLC in high cell concentration and the combination of NC and CLC in a concentration dependent relation induced a significant reduction of the DRG neurite outgrowth. Differences in DRG neurites morphology were seen in SEM analysis when comparing exposure of the two cell types. Conclusion: These results suggest that both NC and CLC from the intervertebral disc can influence nerve tissue. Further, there seems to be a cell interaction response between the two different cell types.

Date: 2010-09-02

Session: Spine Spondylolisthesis / Low Back Pain / Basic Science

Time: 08:00-09:30

Room: H1

Abstract number: 25936

THE IMPACT OF FEAR-AVOIDANCE MODEL VARIABLES ON DISABILITY IN PATIENTS DIVIDED IN TWO SUBGROUPS: SPECIFIC- OR NON-SPECIFIC CHRONIC LOW BACK PAIN

Mari LUNDBERG, Karin FRENNERED, Olle HÄGG, Jorma STYF

Department of Orthopaedics, Institute of Clinical Sciences, Sahlgrenska Academy, University of Gothenburg, Gothenburg (SWEDEN)

Background: Fear avoidance variables predict disability, disuse and depression in patients with chronic low back pain (CLBP). This relationship is unexplored in patients sub-grouped as specific-or non-specific CLBP. Objective: To describe the occurrence, and to investigate the association of the fear-avoidance model variables (pain intensity, kinesiophobia, depression, and disability) in patients with specific- or non-specific CLBP. Methods: All 147 patients (81 women, 66 men) were examined by an orthopaedic surgeon and diagnosed as either specific- or non-specific CLBP. Hierarchical multiple regression analysis was used to assess the ability of four independent variables (back pain intensity, VAS; kinesiophobia, TSK; depressed mood, Zung) to predict levels of disability, after controlling for the influence of age and gender. Results: Both groups (specific- and non-specific CLBP) presented elevated values on the fear-avoidance model variables. All the independent fear-avoidance variables contributed in a statistically significant manner to predict disability in patients with specific CLBP, 67.0%, $F(5, 59) = 24.46$, $p < 0.000$. In patients with non-specific CLBP, all variables except kinesiophobia predicted disability in a statistically significant manner, 63.0%, $F(5, 59) = 22.64$, $p < 0.000$. Conclusions: Persistent musculoskeletal pain seems to affect the individual in similar manner, regardless of the cause of the pain. In clinical terms, this means that pain must be analyzed and treated as a parallel process to searching for the cause of the pain. Key Words: depression, disability, fear of movement, kinesiophobia, pain-related fear

Date: 2010-09-02

Session: Spine Spondylolisthesis / Low Back Pain / Basic Science

Time: 08:00-09:30

Room: H1

Abstract number: 26457

A POTENTIAL SPECIFICITY PROBLEM REVEALED BY INTRADISCAL PRESSURE INCREASE TRANSFERRED TO ADJACENT DISCS DURING DISCOGRAPHY.

Hanna BOLMINGER HEBELKA, Arne GAULITZ, Andreas NILSSON, Sten HOLM, Tommy HANSSON

Department of Radiology, Sahlgrenska University Hospital, Gothenburg (SWEDEN)

INTRODUCTION: Discography is used to preoperatively identify painful discs. A pain response during discography that is concordant to the patient's experienced back pain is regarded as an indication that the injected disc is the source of pain. However, the sensitivity and specificity of discography has been questioned. Pressure controlled discography have been reported to reduce the number of false positive discs using low pressure criteria. The objective of this study was to investigate pressure transmission to adjacent discs during discography. Pressure transmission in vivo during lumbar discography, not reported before, may contribute to false positive diagnosis. **METHOD AND MATERIAL:** Nine adolescent domestic, anesthetized pigs and four lumbar disc levels in every animal were studied. Intradiscal pressure was recorded using a 0.36/0.25mm fibre-optic pressure sensor inserted into nucleus pulposus via a 22 gauge needle. The pressure was simultaneously measured in two adjacent discs during contrast injection into one of the discs at pressures up to 8 Bar. Pressure transmission was evaluated both in non-injected and pre-filled adjacent discs. **RESULTS:** 33 discs were successfully examined. During contrast injection, an intradiscal pressure rise of median 16.0% (range 3.2-37.0) over the baseline was detected in the adjacent discs. There was no significant difference in pressure increase between non-injected and discs pre-filled with contrast. **DISCUSSION:** Transfer of pressure to adjacent discs during discography has not been reported earlier. Similar pressure transfers during human clinical discography might elicit false-positive pain reactions.

Date: 2010-09-02

Session: Spine Spondylolisthesis / Low Back Pain / Basic Science

Time: 08:00-09:30

Room: H1

Abstract number: 25988

THE EFFECTS OF MAL-PLACEMENT ON THE KINEMATICS OF THE INTERVERTEBRAL DISC ALLOGRAFT TRANSPLANTATION

Keith D.K LUK¹, Stephen KL LAM¹, Jun XIAO², Dike RUAN³, Yu DING³, William W LU¹

¹The University of Hong Kong, Hong Kong (HONG KONG), ²Nanfong Hospital, Guangzhou (CHINA), ³The Navy General Hospital, Beijing (CHINA)

Remodelling in the intervertebral disc (IVD) allograft was observed in a clinical study on IVD allograft transplantation. We hypothesize that through remodelling, kinematics of a mal-aligned IVD allograft will be restored to normal. 15 male goats were randomly assigned into a control group A (n=5), centred allograft group B (n=5) and mal-positioned allograft group C (n=5). Transplantation of a size-matched cryopreserved IVD allograft was performed in the lumbar region (L4-L5) following disc excision. In group B the IVD allografts were placed centred and flush with the vertebral margin. In group C the allografts were placed proud anteriorly by 25% of the anterior-posterior diameter of the allograft. The whole lumbar spine from L1-L6 was harvested at 6 months after transplantation. 3D kinematics assessments of the lumbar spines in the flexion-extension direction were then performed using a MTS testing machine and an optoelectronic camera system. The range of motion (ROM), neutral zone (NZ), and instantaneous axis of rotation (IAR) were calculated for the L4-L5 segment. When compared to the control intact spine, no significant difference in the ROM, NZ and IAR was found in the flexion-extension motion between the mal-positioned group and the centred group. Key kinematic parameters of both the centrally placed and the mal-positioned allograft were similar to the intact spine. Mal-placement of the allograft during surgery is compatible with good functional outcome through remodelling. In contrast to artificial disc replacement, precise positioning of allograft may not be essential for functional success of the IVD allograft transplantation.

Date: 2010-09-02

Session: Spine Spondylolisthesis / Low Back Pain / Basic Science

Time: 08:00-09:30

Room: H1

Abstract number: 25203

HISTOLOGICAL CHANGES IN THE YOUNG PORCINE LUMBAR SPINES AFTER CYCLIC LOADING

Olof THORESON¹, Adad BARANTO¹, Lars EKSTRÖM¹, Hans-Arne HANSSON², Mikael HELLSTRÖM¹, Leif SWÄRD¹

¹*Department of Orthopaedics University of Gothenburg, and Sahlgrenska University Hospital, Gothenburg, Karlstad (SWEDEN),* ²*Institute of Anatomy and Cell Biology, University of Gothenburg and Sahlgrenska University Hospital, Gothenburg (SWEDEN)*

Introduction: The human spine is exposed to cyclic loading during daily activities and more extremely during sports. Despite this there remains a lack of knowledge regarding the histological and MRI changes in the spine due to this mode of loading. The purpose of the present study was to investigate the histological changes due to cyclic loading in functional spinal units (FSU) in an experimental model. Methods: Six FSUs from four young porcine lumbar spines were used. Two FSUs were cyclic loaded with 20,000 cycles 3Hz, two were axially compressed to failure and two were used as controls. The FSUs were examined with MRI, macroscopically and histologically. Results: The FSUs that had been exposed for cyclic loading displayed histologically an increased density of nucleus cells, such as megacaryocytes, adjacent to the epiphysis and a decrease of fat cells in the surrounding area of the epiphysial cartilage. The FSUs that had been axially compressed to failure and the control FSUs displayed normal porcine lumbar spine histology. There was decreased signal intensity in the vertebral bodies, the endplates, the discs and also slight/moderate disc height reduction on MRI in all cyclic loaded cases. Conclusion: The cyclic loaded FSUs showed histological changes in the epiphysis and the epiphysial cartilage. There was decreased signal intensity in the vertebral bodies, the endplates, the discs and also disc height reduction on MRI. These findings suggest that the redistribution of cells was not caused by bone failure but rather a direct effect due to cyclic loading.

Date: 2010-09-02

Session: Spine Spondylolisthesis / Low Back Pain / Basic Science

Time: 08:00-09:30

Room: H1

Abstract number: 25169

EFFECT OF ANNULAR TEARS ON LUMBAR DISC BIOMECHANICS

Gunnar ANDERSSON, Raghu NATARAJAN

Rush University Medical Center, Chicago (UNITED STATES)

Annular tears occur as part of normal aging of the disc and also as part of the degenerative disc process. We hypothesized that these tears would cause changes in the biomechanical function of the disc and that the biomechanical effect would be influenced by the size of the tear and its location. A previously validated three-dimensional poroelastic finite element model was used to study the progression of microtears (as small as 0.01% of the annulus volume) and their effects on the biomechanical properties of the disc. The models were preloaded in compression and then moments applied in all principal planes and flexibility determined. A small increase in the tear volume was found to cause an abrupt increase in motion. There was however a nonlinear relationship between the volume of the tear and its biomechanical effects. Even small tears cause considerable increase in motion which initiates further increase in failure volume. The largest increase in flexibility occurred with torsion loading.

Date: 2010-09-02

Session: Spine Spondylolisthesis / Low Back Pain / Basic Science

Time: 08:00-09:30

Room: H1

Abstract number: 26201

HUMAN LIGAMENTUM FLAVUM CELLS EXPRESSED OSTEOGENESIS IN BONE MORPHOGENETIC PROTEIN-2 TETHER PHOTOPOLYMERIZED GEL

Chih-Hwa CHEN¹, Chak-Bor WONG¹, Shu-Wen WHU¹, Hsia-Wei LIU², Mei-Yun WU¹

¹*Department of Orthopaedic Surgery, College of Medicine, Chang Gung Memorial Hospital-Keelung, Chang Gung University, Keelung (TAIWAN),* ²*Department of Life Science, Fu Jen Catholic University, Taipei county (TAIWAN)*

Introduction: Osteogenesis of the ligamentum flavum (LF) is a widely recognized pathophysiologic factor in pathologic ossifications of the spinal ligament. We expect the novel BMP-2 tether photopolymerized gel will induce LF cells to osteogenesis. This preliminary study will define the role of LF cells for bone regeneration. **Methods:** LF tissue was obtained from spinal stenosis patients. BMP-2 (500 ng/ml) was conjugated to polyethylene glycol (PEG) by reacted with an equimolar amount of acrylate-PEG-N-hydroxysuccinimide. Three 2×10⁵ cells/construct groups were prepared, included LF cells encapsulated in no BMP-2 (Control), in soluble BMP-2 (BMP), and in PEG-BMP-2 (PEG-BMP). The constructs were incubated in a bioreactor for 7 days before surgery, and implanted into nude mice respectively. After 6 weeks, alkaline phosphatase (ALP) activity, DNA content, histological and immunofluorescence assays were examined for the evidence of osteogenesis. **Results and discussion:** Significant opaque constructs in PEG-BMP group and clear constructs in control group were observed. Similar DNA content was found among three groups. The tendency of ALP activity was PEG-BMP> BMP> Control. The higher expression of collagen type I and ALP of LF cells in PEG-BMP group than in BMP and control group was found. LF cells performed low osteogenesis without BMP-2. The LF cells maintained osteogenesis in PEG-BMP group longer due to chemical bond between PEG and BMP-2. LF cells in PEG-BMP group had shown potential in the application of tissue engineering for osteogenesis.

Date: 2010-09-02
Session: Foot / Ankle
Time: 10:45-12:15
Room: H1

Abstract number: 25437

PERCUTANEOUS DISTAL METATARSAL OSTEOTOMY VERSUS DISTAL CHEVRON OSTEOTOMY FOR CORRECTION OF MILD-TO-MODERATE HALLUX VALGUS DEFORMITY

Yasser A. RADWAN, Ali M. R. MANSOUR
Cairo University, Cairo (EGYPT)

Background: Different procedures were described for managing hallux valgus. Percutaneous metatarsal osteotomies have received increasing recognition. The proposed benefits revolve primarily around the shorter surgical time, lower incidence of complications, and higher patient satisfaction. However, there is insufficient evidence to determine whether this technique is comparable to traditional open approaches. **Material & Methods:** A total of 64 consecutive feet in (43 patients) with mild-to-moderate symptomatic hallux valgus were randomly assigned into two groups to compare the results of percutaneous distal metatarsal osteotomy (Group I, 31 cases) and distal chevron osteotomy (Group II, 33cases). The patients were assessed using the American Orthopaedic Foot and Ankle Society (AOFAS) Radiographical assessment was done using the hallux valgus angle and intermetatarsal angles. **Results:** The mean follow-up period was 27 months. The mean correction of HVA and IMA achieved in group I was 14.4° and 7.8° respectively, while in group II it was 11.1° and 5.9° respectively. The mean AOFAS-score improved from a pre-operative of 44.6 points to 90.2 points in group I, and from 47.5 points to 81.7 points in group II. In group I 26/29 patients (89.6%) were happy with the cosmetic results of the surgery, compared to 20/31 patients (64.5%) in group II. **Conclusion:** The results of these studies support the idea that percutaneous distal metatarsal osteotomy yield good radiological realignment, and are associated with a high degree of postoperative patient satisfaction.

Date: 2010-09-02
Session: Foot / Ankle
Time: 11:30-12:15
Room: H1

Abstract number: 25140

THE CLINICAL OUTCOME OF ANKLE ARTHRODESIS AND TOTAL ANKLE ARTHROPLASTY IN THE RHEUMATIC PATIENT: A SYSTEMATIC REVIEW

Jacqueline VAN HEIJNINGEN, Huub J.L. VAN DER HEIDE, Thea P.M. VLIET VLIELAND

Leiden University Medical Center, Leiden (NETHERLANDS)

Introduction: While arthrodesis is the standard treatment of a severely arthritic ankle joint, total ankle arthroplasty have become a popular alternative. The positive tendency towards total ankle arthroplasty was shown in observational articles. This review provides a summary of the patient-centered outcome and complications of ankle arthrodesis and total ankle arthroplasty in the rheumatic patient. Material & Methods: A systematic review of studies which analyzed third generation total ankle implants or ankle arthrodesis was conducted. Inclusion criteria were a minimal sample size of 5 RA patients and the use of clinical evaluation scales. Data; as the clinical outcome score, complication- and failure rate were extracted. Results: No randomized controlled trials were found, 20 observational studies of 713 citations were included to form the basis of this review. The mean effect size, conducted from 6 arthroplasty studies, was 3(range: 2-4.3). The mean effect size of 1 arthrodesis study was 4. The weighted average of all clinical outcome scores from the articles was 75,5 points for total ankle arthroplasty and 63,1 points for ankle arthrodesis. The failure rate, which is formulated as reoperation due to implant failure or non-union, was higher in the arthrodesis group.pre-operative data were incomplete, so it was difficult to compare the clinical outcome of both treatment options. Regardless of these limitations it can be concluded that both interventions show clinical improvement, in which total ankle arthroplasty is favorable.

Date: 2010-09-02
Session: Foot / Ankle
Time: 11:30-12:15
Room: H1

Abstract number: 26283

TRIPLE OSTEOTOMY FOR TREATMENT OF SEVERE HALLUX VALGUS

Syah BAHARI, Ahsan Javid BUTT, Lester D'SOUZA

Department of Orthopaedic and Trauma, Limerick (IRELAND)

Introduction: Corrective surgery for severe hallux valgus (HV) deformity associated with distal metatarsal articular (DMMA) angle more than 10 degree is challenging. We reported a series of patient undergoing triple osteotomy of the 1st ray for correction of the deformity. Patients and Methods: Patients were identified from our operative database. Demographic data, preoperative and postoperative radiological measurement of HV, intermetatarsal (IM) angle 1st and 2nd, DMMA angle, 1st metatarsal length, 1st metatarsophalangeal joint (MTPJ) articular changes, AOFAS score were prospectively collected in all patients. Results: 348 HV corrections were performed over 3 years period. 10 patients with symptomatic HV deformity underwent triple osteotomies were identified. Mean age was 53.4 years and mean follow-up at 9.7 months post operatively. All patients had IM angle of over 20 degrees and DMAA angle over 10 degrees and no degenerative changes at MTPJ. Lateral soft tissue release, a proximal open medial based wedge and a distal closing medial based wedge osteotomy of the 1st metatarsal and a closing medial based wedge osteotomy of the 1st proximal phalanx. Mean HV and IM correction was 22 degrees and 9 degrees respectively. Mean DMAA correction was 4 degree and the average length of the 1st metatarsal was shorter by 2.43 mm postoperatively. Mean AOFAS score was improved from 55 preoperatively to 83.9. Conclusion: Hallux valgus deformity with an IM angle over 20 degrees and DMMA over 10 degrees can be treated with triple first ray osteotomies with satisfactory radiological and clinical outcome.

Date: 2010-09-02
Session: Foot / Ankle
Time: 11:30-12:15
Room: H1

Abstract number: 25056

TREATMENT OF PLANTAR FASCIITIS BY PERCUTANEOUS SURGERY

Fèlix PARALS, Xavier GONZALEZ-USTÉS, David BRAVO, Miguel Angel RIBAU, Jaume RIERA, Octavi VIA-DUFRESNE

Hospital Municipal de Badalona, Badalona (SPAIN)

We present a series of 44 patients (48 feet) diagnosed with plantar fasciitis treated by percutaneous surgery reviewed from March 2003 until September 2008. We review the surgical technique used and results achieved. The median age was 54.4 years (32-79) with a median follow-up of 3.33 months. The average duration of symptoms until surgery was 3 years, having been previously treated with orthotics, NSAIDs and local injections. The treatment consisted of the section of the plantar fascia and Heel Spur resection if it should coexist through a medial approach at the heel by MIS technique. The protocol after surgery consist of postoperative ambulation in early loading, use of Orthopaedic shoes and patterns of stretching of the plantar fascia and Gastrocnemius from the first week. During the review pain scales and specific AOFAS hindfoot had been applied, with the median of 1.56 EVA / 10 and AOFAS 94.35 / 100. Percutaneous surgery allows us to be very little aggressive and we value it as a very satisfactory method in our setting for the treatment of plantar fasciitis, emphasizing comfort and better tolerated by the patient's the medial approach.

Date: 2010-09-02
Session: Foot / Ankle
Time: 11:30-12:15
Room: H1

Abstract number: 25303

FIRST METATARSOPHALANGEAL ANKLE REPLACEMENT FOR MANAGEMENT OF HALLUX RIGIDUS

Igor PAKHOMOV, Mihail SADOVOY, Valery PROHORENKO

Scientific Research Institut of Traumatology and Orthopaedics,, Novosibirsk (RUSSIA)

A range of methods for management of Hallux Rigidus exist. Unhesitatingly, arthrosis of 1 MTF joint at the end stage (Hallux Rigidus) is an indication for operation. But which type of operation must be chosen - What should we do when concomitant deformation of the foot exists - An experience of Hallux Rigidus surgical management in 55 patients was estimated during last 8 years. There were 38 women, 17 men. Mean age 48 ± 6 yrs. Patients were divided in two groups, according to method of treatment. Control group - 20 patients were operated with arthroplastic resection. Estimated group counted 35 patients, who were operated with total 1 metatarsal joint replacement. Results of treatment estimated in both groups, the medial estimation time was $1,3 \pm 3$ yrs. We estimated our results clinically, X-rays, statistically. A rate of pain dynamics was estimated with VAS- scale. A range of motion in 1 metatarso falangeal joint calculated via functional X-ray films. Issues are as follows: 1. Results of total 1 metatarso-falangeal joint replacement are much better due to higher rate of a pain decrease, and higher range of motion. 2. Additional operations are indicated to correct concomitant foot deformations to make better results of the Hallux Rigidus. 3. Arthroplastic resections demonstrated their disadvantages, correctable with total 1 metatarso falangeal arthroplasty.

Date: 2010-09-02
Session: Foot / Ankle
Time: 11:30-12:15
Room: H1

Abstract number: 25739

CONCERNING TREATMENT OF OPEN FRACTURES OF ANKLE JOINTS

Aleh KEZLIA, Konstantine CHACHELKO, Ivan CHARHOVICH

Belarussian Medical Academy of Post-Graduate Education, Minsk (BELARUS)

Chief aspect of treatment for these cases is fighting infection and optimization of consolidation processes. Method of reposition and fixation of open fractures is osteosynthesis with the use of external fixation devices. Material and methods: 51 patients were treated. According to AO classification soft tissues damage IO1- IO2 was observed with 18 patients, IO3- 16 patients, IO4-IO5 - 17 patients. Results and discussions. 18 patients with damages type IO1-IO2 after initial surgery had joint immobilization with the help of gypsum «shoe». Due to development of septic arthritis at 5 patients osteosynthesis was carried out by Ilizarov apparatus. Inflammation was liquidated during 3 - 8 weeks. Apparatus were disassembled during 2-2.5 months with further application of gypsum dressing for 1 month and full weight bearing in gypsum shoe. In case of damages type IO3-IO4-IO5, 33 patients received initial surgical wound treatment, joint drainage, fixation in Ilizarov apparatus. All wounds were closed up with primary intention. After 5- 2 months from the moment of operative intervention the apparatus were disassembled, joints were fixed with the gypsum shoe for the period of 1.5-2 months. Introduction of modern technologies in treatment of this type of patients allows to improve treatment results. Usage of external fixation apparatus at open ankle fractures of heavy degree allows to shorten treatment period, reduces the number of complications and recovers support ability of the joint.

Date: 2010-09-02
Session: Spine - Deformity
Time: 13:30-15:00
Room: H1

Abstract number: 25334

ANALYSIS OF MRI RESULTS FOR ADOLESCENT IDIOPATHIC SCOLIOSIS WITH SPONDYLOLYSIS AND SPONDYLOLISTHESIS

Mehmet BALIOGLU¹, Birol ORAL²

¹*Baltalimani Bone Disease and Training Hospital, Istanbul (TURKEY)*, ²*Spektromar Medical Radiology Center, Istanbul (TURKEY)*

INTRODUCTION: Lower back pain in Adolescent Idiopathic Scoliosis (AIS) may be due to Spondylolysis / Spondylolisthesis, a condition which refers to a defect in the pars interarticularis. An X-ray may not suffice in determining the nature of this pain. It is important to evaluate MRI results in order to reach an accurate diagnosis. **PURPOSE:** To use MRI results to investigate how often Spondylolysis or Spondylolisthesis occurs with AIS. **METHODS:** 107 AIS patients (17 male, 90 female). 9 patients were diagnosed with spondylolysis / spondylolisthesis. The MRI results taken over a 10 year period of 107 AIS patients (17 male, 90 female) were evaluated retrospectively. Mean age was 13.7 (7 - 18) years. All patients met the Cobb angle criteria: >10 degrees. The presence of lower back pain was investigated. **RESULTS:** MRI results revealed 98 spinal colons (91.6%) as normal: no spondylolysis or spondylolisthesis. Of the remaining 9 patients (8.6%) the following irregularities were diagnosed; grade 1 (8 case) spondylolisthesis or spondylolysis and grade 4 spondylolisthesis (1 case). All patients diagnosed with spondylolysis/spondylolisthesis showed defects in the pars interarticularis on the L5 vertebra. **CONCLUSIONS:** According to medical literature, spondylolysis or spondylolisthesis occurs in 6% of patients with Idiopathic Scoliosis. Our study showed that 8% of 107 AIS patients were diagnosed with either spondylolysis or spondylolisthesis. This indicates the condition is relatively common in AIS patients and not always easily diagnosed. Particularly for lower grade spondylolysis, in which pain may not be detectable, MRI results offer the most accurate diagnosis.

Date: 2010-09-02
Session: Spine - Deformity
Time: 13:30-15:00
Room: H1

Abstract number: 24131

POSTERIOR CORRECTION OF ADOLESCENT IDIOPATHIC SCOLIOSIS: SOME INTERMEDIATE RESULTS USING DIFFERENT TECHNIQUES

Sergey MLYAVYKH, Olga PERLMUTTER, Andrey SOSNIN, Andrey LEONTIEV
Nizhni Novgorod Research Institute of Traumatology and Orthopaedics, Nizhni Novgorod (RUSSIA)

INTRODUCTION: In this retrospective study, the effectiveness of various deformity-reduction techniques of adolescent idiopathic scoliosis (AIS) is evaluated in a 5 -year period. **METHODS:** 107 patients with AIS were operated. An average coronal main Cobb-angle was 84.3° and an average age was 16.6 yrs. Posterior correction was performed using rod derotation (RD) 38 (28 - hooks alone, 10 proximal hooks and distal screws), rod translation (RT) 20 (6 - proximal hooks and distal screws, 14 screws alone), in-situ translation (IT) 21 and translation with bilateral apical vertebral derotation (BAVD) 28 (screws alone) cases. Average follow up was 15.6 months. **RESULTS:** The average operative time was 5.09h in RD-group, 5.36h in RT-group, 4.50h in IT-group and 4.52 in BAVD-group. The average blood loss was 1380cc in RD-group, 1310cc in RT-group, 960cc in IT-group and 840cc in BAVD-group. The average correction rates of the main scoliotic curve were 49% in RD-group, 57% in RT-group, 72% in IT-group and 79% in BAVD-group. The average loss of correction was 8.7° in RD-group and 5.4° in RT-group at the last follow-up. There were 2 persistent postoperative neurological deficits and 5 implant failures in RD- and RT-groups. **CONCLUSION:** Posterior segmental pedicle screw instrumentation using IT and BAVD techniques is a safe and promising procedure. It gives the best coronal plane correction without increasing operative time and blood loss. There is no evidence of implant failure and loss of correction in IT- and BAVD-groups at latest follow up.

Date: 2010-09-02
Session: Spine - Deformity
Time: 13:30-15:00
Room: H1

Abstract number: 24036

TREATMENT OF STATIC SCOLIOSIS AND PELVIC OBLIQUITY

Ghassan SALAMEH

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

Often we find mobile scoliosis which is not fixed deformity and depends of pelvic obliquity which is related to many factors often of hip deformities, knee deformities or limb length discrepancies or both and in some cases paralytic insufficiency. Treatment of pelvic obliquity Consists of Femur congenital and acquired deformities, hip and knee deformities like old hip dislocations or subluxations or even paralytic malformations and knee deformities consider a special method for correction, hip and knee axis need a special correlation of alignment for this reason a special hinges are modified for treatment of either isolated hip, knee deformities or when we have combined deformity an combined hinges modified for treatment both of hip and knee deformities, the used hinges are modified system of Salamehfix4, [SLDF4] .From 2002 to 2008, 85 cases where treated with various hip and knee deformities combined with static scoliosis Changing the hip angel in order to replace some of muscle paralyses insufficiency this will decrees of Trandelenburg gait and limping and at the same time we can restore limb length inequality and correction of static scoliosis .Complications where mostly superficial pin infection which treated locally. Conclusions: Correction of pelvic obliquity is a good method of treatment of static scoliosis and we have to consider it. The used system is differs by simplicity, small size in correlation to its functional hinges and stability of fixation and gives good results.

Date: 2010-09-02
Session: Spine - Deformity
Time: 13:30-15:00
Room: H1

Abstract number: 26442

NIGHT-TIME PROVIDENCE BRACING COMPARED TO FULL TIME BOSTON BRACING IN ADOLESCENT IDIOPATHIC SCOLIOSIS. A PROSPECTIVE RANDOMIZED STUDY.

Per WESSBERG, Anders NORDWALL

Spine Surgery Unit, Sahlgren University Hospital, Göteborg (SWEDEN)

Introduction: Boston bracing is the gold standard in non-operative treatment of adolescent idiopathic scoliosis (AIS). Effective treatment requires bracing more than 20 hours per day until skeletal maturity, typically for 1-3 years. Failure to comply with the regime is a major reason for unsatisfactory treatment effect. Long time follow-up studies have shown negative psychological experiences of brace treatment. It is probable that night-time bracing would improve compliance and impose less negative psychological effects on AIS patients. Material: A prospective randomized (based on day of birth) study was started in 2004. Regimes were Boston full time bracing aiming at 23 hours per day and the Providence brace concept at least 8 hours every night. AIS girls 10-16 years of age with curves 25^o-35^o and apex at T7 or below were invited. 65 girls were included until end of 2007 (30 Boston and 35 Providence). Mean age was 13 in both groups. Results: Ending 2009 there were 2 failures requiring surgery in the Boston group. 1 case failed to comply with the brace. 17 treatments were ongoing and 10 were finished. In the Providence group there were 5 treatment failures, 3 requiring surgery and 2 changes to a Boston brace. 13 treatments were ongoing and 17 were finished. Conclusion: These are early results of this study indicating a somewhat higher failure rate using Providence night-time brace in AIS compared to Boston full time bracing. Further results will be studied.

Date: 2010-09-02
Session: Spine - Deformity
Time: 13:30-15:00
Room: H1

Abstract number: 24260

RESULTS OF BIPOLAR RELEASE IN THE TREATMENT OF CONGENITAL MUSCULAR TORTICOLLIS IN PATIENTS OLDER THAN 10 YEARS OF AGE

Kamal BALI, Sudesh PEBAM, Mandeep DHILLON
PGIMER, Chandigarh (INDIA)

Congenital muscular torticollis (CMT), a difficult condition to treat normally, often presents with neglect and delay in developing countries like India; the primary concern of the patients is cosmesis, and some functional improvement. Neglect makes surgical intervention more difficult, and it is generally presumed that outcomes may not be optimal. **Material:** Over a period of 5 years, fourteen patients of neglected CMT with age older than 10 years were operated with bipolar release of sternocleidomastoid muscle and Z plasty lengthening of the sternal end. Postoperative protocol included a head halter traction for 3 weeks followed by intensive physical therapy. Results were evaluated using a modified version of Lee et al's system. At an average follow up of around 3 years, excellent results were noted in 3 patients, good in 7, fair in 2 and poor in 2. Postoperative improvement in range of motion, head tilt, chin deviation and cosmesis was noted in all the patients. No surgery related complications or recurrences requiring surgery occurred in any of the patients. **Discussion:** We conclude that despite neglect, CMT presenting even after 10 years of age definitely benefits from surgery; bipolar release is an adequate and complication free method for such patients. However it is important to realize that postoperative traction and intensive physiotherapy protocol are essential to ensure a good surgical outcome.

Date: 2010-09-02
Session: Spine - Deformity
Time: 13:30-15:00
Room: H1

Abstract number: 25801

TRUNK PROPORTIONALITY CHANGE FEATURES IN PATIENTS WITH HEAVY PROGRESSIVE SCOLIOTIC SPINE DEFORMITIES

Darya TESAKOVA, Dmitry TESAKOV

Republic Scientific Practical Center of Traumatology and Orthopaedics, Minsk (BELARUS)

The aim of work was to study the trunk proportionality change features in patients with idiopathic scoliosis (IS) heavy progressive spine deformities. 731 patient with IS at the age of 4-18 years with spine deformity arches from 41 °-168 ° by J.R.Cobb were examined. Clinical and radiological methods taking into account physiological trunk and extremities plastic anatomy were used. The results have shown that in patients with progressive spine deformities with arches from above 40 ° the infringement of the trunk anatomic departments proportionality developed accompanied with trunk shortening and its disproportionation in relation to length of extremities. The revealed changes were named as the Scoliotic Disproportionate Syndrome and have been divided into four stages of the expressiveness depending on deformity value. The first stage is defined for deformities with angular size of arches 41 °-60 °; the second at arches 61 °-90 °; the third - 91 °-120 ° and the fourth at arches from above 120 °. The given syndrome starts to be shown at deformities with arches from above 40 ° (when the pathological process completely absorbs physiological anatomy-biomechanical spine stability resource). The presented syndrome and its development stages are expedient for considering as objective additional diagnostic information for deformity process character definition, real prognosis estimation, its possible independent development that allows defining adequate corrective medical and rehabilitation recommendations in concrete clinical situation.

Date: 2010-09-02
Session: Sports Medicine Knee / Hip
Time: 08:00-09:30
Room: G4

Abstract number: 26861

EVIDENCE-BASED UPDATE: DOUBLE BUNDLE ACL RECONSTRUCTION

Robert A PEDOWITZ

David Geffen School of Medicine at UCLA, Los Angeles (UNITED STATES)

The goals of ACL reconstruction are restoration of anatomy / isometry, and avoidance of high graft strain / abrasion. The most important technical issues affecting clinical outcome are tunnel position and graft fixation; graft selection is also an important factor. Recent appreciation has emerged regarding the importance of graft obliquity, to enhance rotational control and decrease PCL impingement. Recent studies show that lower femoral position on the clock face is associated with improved clinical results compared to more sagittal position. Technical solutions to achieve a lower femoral tunnel include drilling through the anteromedial portal. Most ACL reconstructions are performed by surgeons doing less than 20 reconstructions per year. Although results are generally good with single bundle reconstruction, it is not unusual to observe technically-related ACL complications. Logically, broad transition to double bundle reconstruction may be associated with increased overall complication rates and greater difficulty with revision surgeries. Double bundle reconstruction is associated with higher cost (greater implant costs and surgical time). Therefore broad practice transition to double bundle reconstruction (beyond defined research protocols) should be based upon solid clinical evidence. Laboratory studies show that double bundle reconstruction may be associated with improvement of some biomechanical parameters compared to single bundle surgery. However, in-vitro studies do not assess key biological processes, including graft incorporation and re-modeling, which can significantly affect in-vivo joint stability. To date, the best available evidence does not demonstrate a compelling advantage of double bundle over single bundle ACL reconstruction with regard to clinical function or sagittal joint stability. However, these studies involve short term follow-up, since double bundle techniques are relatively new. Long term follow-up is required to assess other potentially important clinical issues, such as differential rates of post-reconstruction meniscus tear and/or severity of chondrosis.

Date: 2010-09-02
Session: Sports Medicine Knee / Hip
Time: 08:00-09:30
Room: G4

Abstract number: 24259

PROPRIOCEPTIVE POTENTIAL OF THE RESIDUAL STUMP OF AN INJURED ANTERIOR CRUCIATE LIGAMENT: AN IMMUNOHISTOLOGICAL STUDY

Kamal BALI, Mandeep DHILLON, R.K. VASHISHTA
PGIMER, Chandigarh (INDIA)

Aim: To evaluate the presence of proprioceptive potential in the residual remnants of the ruptured ACL, by indirectly picking up receptors in ACL residual tissue. **Methods:** Tissue from the ACL remnants was harvested during arthroscopy prior to ACL reconstruction in 63 consecutive patients. This was evaluated for evidence of residual proprioceptive fibers immunohistologically using H&E, and monoclonal antibodies to S-100 and NFP (Neurofilament protein). **Observations:** Histological examination of harvested ACLs showed good subsynovial and intra-fascicular vascularity with free nerve endings in most of the injured stumps. Morphologically normal mechanoreceptors (H&E) and proprioceptive fibres (positivity with monoclonal antibody for NFP) were found in many of the injured stumps (46% and 52.4% respectively). A statistically significant correlation between injury duration and persistence of mechanoreceptors and proprioceptive fibres was noted. More fibers were seen in patients with ACL remnant adherent to the PCL, and this difference was also statistically significant. **Discussion:** Since proprioception is now understood to be major factor to maintain knee stability, mechanical reconstruction alone may not give the best results in ACL deficient knees. We have indirectly demonstrated persistent residual proprioceptive fibers in injured ACLs, more so in the early injury phase and with PCL adherence. We conclude that leaving the ACL remnants, if surgically possible, may be of potential benefit during ACL reconstruction, as some re-innervation and regaining of proprioceptive potential maybe possible. This would improve clinical outcomes.

Date: 2010-09-02
Session: Sports Medicine Knee / Hip
Time: 08:00-09:30
Room: G4

Abstract number: 23626

ARTHROSCOPIC RECONSTRUCTION OF THE HIP LABRUM WITH GRACILIS AUTOGRAFT

Dean MATSUDA

Kaiser Permanente West Los Angeles Medical Center, Los Angeles (UNITED STATES)

There has been a growing trend towards labral preservation in the nonarthritic hip. During open or arthroscopic hip surgery, the labrum may not be salvageable by current repair/refixation methods. We present an arthroscopic method of hip labral reconstruction using the gracilis tendon autograft. We present the case of a 30 year old mixed martial artist with bilateral symptomatic global femoroacetabular impingement with calcific metaplasia of his right labrum. We show professionally-edited video segments highlighting 1. Arthroscopic rim reduction of global FAI (coxa profunda) once thought not treatable with the arthroscopic techniques and 2. Labral reconstruction using the gracilis autograft. We finish with an arthroscopic femoral osteoplasty to protect the new labral construct. We present the clinical outcome after bilateral arthroscopic rim trimming, right labral reconstruction, left labral refixation, and bilateral femoral head-neck osteoplasties. This patient was back to running 5 miles daily as early as 2 months post-operatively and is highly satisfied with the outcome as reflected in his self-assessed pain relief, resolution of mechanical symptoms, and improved Nonarthritic Hip Scores. We also summarize the recent literature showing promising outcomes with both open and arthroscopic labral reconstruction. Arthroscopic reconstruction of the non-salvageable hip labrum may be performed using the gracilis tendon. Benefits of this graft source include a homogeneous autograft requiring no tubularization with universal availability via a user-friendly harvest from the knee that is familiar to many sports medicine surgeons. The larger adjacent semitendinosus tendon is an immediately available option.

Date: 2010-09-02
Session: Sports Medicine Knee / Hip
Time: 08:00-09:30
Room: G4

Abstract number: 24426

THE REHARVESTED PATELLAR TENDON HAS THE POSSIBILITY FOR LIGAMENTIZATION WHEN USED FOR ANTERIOR CRUCIATE LIGAMENT REVISION SURGERY

Sven STENER¹, Jüri KARTUS¹, Tomas MOVIN², Lars EJERHED¹

¹*NU-Hospital Organization, Trollhättan (SWEDEN)*, ²*Karolinska Institute, Stockholm (SWEDEN)*

Objectives: The aim was to make a clinical, radiographic and histologic evaluation of patients who underwent ACL revision using reharvested central third patellar tendon autograft. **Methods:** Four patients underwent ACL revision reconstruction using reharvested patellar tendon autograft. The patients underwent MRI and clinical examination at two and ten years and arthroscopy involving a biopsy procedure from the reconstructed ACL at three years. **Results:** The clinical results were poor both at two and 10 years. The MRI at two years revealed that the reconstructed ACL appeared thinner than normal in two patients and thickend/oedematous in one patient. At 10 years the reconstructed ACL appeared normal in one patient, thickend/oedematous in two patients and thin/oedematous in one patient. At arthroscopy the graft appeared macroscopically normal in all four patients with visible blood vessels in two. Histologically two patients had a normal or close to normal appearance of the reconstructed ACL with no or slight increase in cellularity and vascularity, parallel or slightly separated fibre structure and no or slight presence of GAGs. One patient had slight separation of fibres, moderate and marked increase in cellularity and vascularity respectively, but no GAGs. One further patient revealed a deteriorated fibre structure, moderate increase in cellularity and vascularity and a marked increase in GAGs. **Conclusions:** It appears that reharvested patellar tendon autograft has the possibility for ligamentization in some patients. The poor clinical results might be explained by concomitant injuries and multiple traumatic episodes to the knee rather than insufficient graft material.

Date: 2010-09-02
Session: Sports Medicine Knee / Hip
Time: 08:00-09:30
Room: G4

Abstract number: 25902

POOR RESULTS AFTER ALLOGRAFT ACL RECONSTRUCTION WITH CHEMICALLY PREPARED TISSUE

Vasudev SHANBHAG, G. EDWARDS, K. VERAVALI, A. P. DAVIES
Morrison Hospital, Morrison (UNITED KINGDOM)

We report the clinical results of seven allograft knee ligament reconstructions using Achilles tendon prepared using chemical treatment. Results have been disappointing with six clinical failures at short follow-up. All allografts are not the same and method of tissue preparation may have important consequences for clinical outcomes. Variety of allograft tissues is available from commercial and NHS sources: fresh frozen, freeze dried, irradiated or chemically prepared. A recent systematic review indicated similar short-term clinical outcomes for fresh frozen allografts and autografts. The senior author began using allograft Achilles tendon for ligament reconstruction in 2007. Tissues were obtained from a commercial supplier. These tissues had been harvested in Eastern Europe, transported to the USA and sterilised using a patented Biocleanse chemical treatment process. This involves sequential ultrasonic baths of detergent, peroxide and alcohol for fixed periods of time along with pressure and vacuum cycles. Between April 2007 and April 2009, 7 allograft ligament reconstructions were performed in 5 knees. These comprised 5 ACL and 2 LCL reconstructions. At follow up of between 4 months and 2 years, clinical failure of 6 grafts has been observed. We are aware of one previous series of results for ACL reconstructions using chemically sterilised and irradiated allograft tissues. A 45% graft failure rate was reported. We have not been able to identify any clinical outcome studies for grafts prepared using the Biocleanse process. Our results have prompted us to change to UK sourced, donor screened allografts, which are fresh frozen after decontamination with 70% ethanol.

Date: 2010-09-02
Session: Sports Medicine Knee / Hip
Time: 08:00-09:30
Room: G4

Abstract number: 25788

A POPULATION BASED NATIONWIDE STUDY OF ANTERIOR CRUCIATE LIGAMENT (ACL) INJURY AMONG 55,559 PATIENTS IN SWEDEN

Richard NORDENVALL¹, Shahram BAHMANYAR², Johanna ADAMI², Carin STENROS¹, Torsten WREDMARK¹, Li FELLÄNDER-TSAI¹

¹*Department of Clinical Science, Intervention and Technology, Div. of Orthopaedics. Karolinska Institutet., Stockholm (SWEDEN),* ²*Department of Medicine Clinical Epidemiology Unit. Karolinska Institutet., Stockholm (SWEDEN)*

Introduction: Anterior Cruciate Ligament (ACL) injury and ACL-reconstruction is one of the most common orthopaedic diagnoses and surgical procedures. The population is young and might sustain life long disability, and in the end stage osteoarthritis. Several national ACL registries have been initiated with postoperative surveillance and outcome monitoring. Objectives: To study the incidence and characteristics of patients diagnosed with ACL-injury. Methods: Data for all patients being diagnosed with ACL injury between 1987 and 2004 were identified from the National Swedish Patient Registry. Analyses were performed according to age, gender, geographic region, surgery and time at hospital. Incidence was estimated for two time periods; before and after 1997. Results: A total number of 55,559 patients with ACL injury were identified, out of which 63 % were men. The mean age was 30 years and 60 % of the cohort was younger than 30 years. In general, there was an excess rate of injury among women under 20 years as compared with men. Among patients with ACL injury 45 % underwent reconstructive surgery. In this group 63 % were men; the mean age was 27 years and 73 % were younger than 30 years. The incidence of ACL injury between 1987-1997 was 19/100,000 as compared to 54/100,000 between 1997-2004. Conclusion: Despite the fact that men were more likely to be diagnosed with ACL injury as well as undergo surgery, there was a sex difference in age distribution of both ACL injury and surgery. The incidence increased over time.

Date: 2010-09-02
Session: Sports Medicine Knee / Hip
Time: 08:00-09:30
Room: G4

Abstract number: 23582

RECONSTRUCTION OF THE MEDIAL PATELLOFEMORAL AND PATELLOTIBIAL LIGAMENTS IN CASES OF RECURRENT PATELLAR DISLOCATION

Ayman EBIED¹, Adel EL SAIDEY¹, Ahmed Hany SALEH²

¹*Menoufia University, Shebin El Kom (EGYPT)*, ²*El Helal Insurance Hospital, Shebin El Kom (EGYPT)*

Medial patellofemoral ligament (MPFL) has been defined as the most important static stabilizer of the patella against lateral dislocation. We are describing a novel technique for reconstructing the medial patelofemoral and patellotibial ligaments (MPTL) using a distally attached gracillis tendon autogenous graft. The harvested gracillis tendon is left attached to its insertion. The tendon then passed through a bony tunnel prepared in a vertical direction from distal to proximal poles of the patella using 5 mm cannulated drill pit. Having retrieved the graft at the level of the proximal pole of the patella the graft is passed through the medial retinaculum to be attached just inferior to the medial femoral epicondyle using interference screw. We have used this technique in 11 patients with recurrent patellar dislocation. In 4 of these patients tibial tubercle osteotomy was added to the ligament reconstruction to correct an underlying increased Q angle. All patients were females with an average age 26 years (18-34 years). At 24 months post-operative there was no recurrence of dislocation or subluxation in all patients. The MPFL and MPTL are two important static stabilizers of the patella. Reports have shown the importance of these ligaments but reported variable rates of success. The main reason for failure in reconstructing these ligaments was related to the failure of fixation at the medial border of the patella. We are introducing a simple and novel technique for reconstruction of the two main stabilizers of the patella that can safely be used in traumatic patellar dislocation.

Date: 2010-09-02
Session: Sports Medicine Knee / Hip
Time: 08:00-09:30
Room: G4

Abstract number: 24988

ARTHROSCOPIC SINGLE-BUNDLE ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION WITH PERIOSTEUM-ENVELOPING HAMSTRING TENDON GRAFT

Chih-Hwa CHEN

Chang Gung Memorial Hospital-Keelung, Keelung (TAIWAN)

Tendon-bone incorporation of a tendon graft within the bone tunnel is of priority concern when using for ACL reconstruction. Superior tendon graft-bone healing can be achieved when periosteum was sutured on the tendon inserted into a bone tunnel. This is a case series outcome study with surgical technique for single-bundle ACL reconstruction with periosteum-enveloping hamstring tendon graft at 2-7 years follow-up. Methods: From 2000 to 2005, ACL reconstruction with a periosteum-enveloping hamstring tendon graft was performed on 368 patients (372 knees). Of those, 312 patients who complete at least two years of follow-up were included for analysis. Four-strand periosteum-hamstring tendon grafts were used for single-bundle reconstruction. Results: The 312 study patients were followed for an average of 4.6 (2-7) years. Their median Lysholm knee scores were 56 (40 to 70) and 95 (60 to 100) points before and after surgery, respectively. After reconstruction, 85% of patients could return to moderate or strenuous activity, 5.1 % exhibited grade 2 or higher ligament laxity with anterior drawer test, and 6.1% had positive pivot shift. Complete range of motion was achieved in 88% of patients. IKDC assessment rated 93% of patients as normal or nearly normal. Conclusion: The study shows that satisfactory results can be achieved with the periosteum-enveloping hamstring tendon graft in single-bundle ACL reconstruction with minimal tunnel widening. Bone-tunnel enlargement of more than 1 mm was identified in 5.4% of femoral tunnels and 6.1% of tibial tunnels, which was less than in other studies using comparable fixation.

Date: 2010-09-02
Session: Sports Medicine Knee / Hip
Time: 08:00-09:30
Room: G4

Abstract number: 26460

HIGH INCIDENCE OF RADIOGRAPHIC FINDINGS OF FEMOROACETABULAR IMPINGEMENT IN ASYMPTOMATIC PATIENTS

Dimosthenis ALASEIRLIS, Nikolaos ZISIS, Anastasios PANAGIOTOU, Nikolaos AILAMAKIS

Department of Orthopaedic Surgery of General Hospital of Giannitsa, Giannitsa (GREECE)

Aim: To present the high incidence of positive radiographic findings of femoroacetabular impingement in asymptomatic patients. **Materials and Methods:** 40 patients who were completely asymptomatic from the hip joint were included in the study. 20 patients in group A were between 20-35 y.o. and 20 patients in group B between 35-50 y.o. Eight patients in group A and thirteen patients in group B presented a history of at least one episode of mild back pain with no radiating symptoms to the hip joint. All patients received radiographic examination of both hip joints. **Results:** Radiographic examination demonstrated the following results: osseous bump with a reduced off-set at the femoral-head neck junction in seven patients (35%) in group A and nine patients (45%) in group B; acetabular rim calcification in six patients (30%) in group A and thirteen patients (65%) in group B; a crossover acetabular sign in two patients (10%) in group A and one patient (5%) in group B; acetabular osteophytes in three patients (15%) in group A and ten (50%) patients in group B; os acetabuli in one patient (5%) in group A and one patient (5%) in group B; the mean alpha angle measured $44^{\circ} \pm 3.3^{\circ}$ in group A and $54^{\circ} \pm 3.6^{\circ}$ in group B. **Conclusions:** The high incidence of the osseous bump at femoral head-neck junction, the acetabular rim calcification and osteophytes in asymptomatic patients indicate that these findings are not probably strong radiographic indicators of femoroacetabular impingement syndrome.

Date: 2010-09-02
Session: Sports Medicine Knee / Hip
Time: 08:00-09:30
Room: G4

Abstract number: 23223

**LONG-TERM RESULTS OF HIP ARTHROSCOPY FOR LABRAL TEARS:
PREDICTORS OF OUTCOMES**

Morteza MEFTAH¹, Jose RODRIGUEZ², Michael ALEXIADES¹

¹*Hospital for Special Surgery, New York (UNITED STATES)*, ²*Lenox Hill Hospital, New York (UNITED STATES)*

Purpose: Our aim in this study was to evaluate the long-term results after arthroscopic labral debridement. Also we investigated the predictors of outcomes and correlation of any co-existing hip pathologies on such results. Lastly, we retrospectively reviewed the radiograph images for diagnosis of FAI that was not initially noted. **Methods:** 50 patients (age range 19 - 77, mean: 40.1) who underwent hip arthroscopy and labral debridement between 1996 and 2006 with mean follow-up of 6.2 years (range 4 - 12.6) were included in our study. Patients pre-operative Harris Hip Score (HHS, mean 79.34), co-existing pathologies such as FAI (31 cases), dysplasia (eight cases) or arthritic changes (18 cases) were recorded as variables. Further, patients post-operative HHS (mean 92.2) and pain relief (on scale of 1-4, 4 being excellent pain relief) at the time of follow-up were recorded as outcomes. Spearman's rho correlation coefficient and regression analysis were calculated between these variables and outcomes. **Results:** Patients without co-existing pathology had significantly higher PSS (mean 4) compared to patients with co-pathology (mean 3.4). Patients with labral tear and FAI but without any bony decompression had 88% good/excellent outcomes. Co-pathology has a significantly negative correlation with post-op HHS ($\rho = -0.27$, $P < 0.05$) and PSS ($\rho = -0.32$, $P < 0.05$). In regression analysis, co-pathology and pre-op HHS were the strongest independent predictors of post-op HHS and PSS ($P < 0.005$). Retrospective review of images revealed 32 cases of FAI that included three cases of cam, 14 cases of pincer and six cases of combined lesions. **Conclusion:** Arthroscopic labral debridement of symptomatic tears can result in favorable long-term results. Co-existing pathology such as dysplasia, FAI and arthritis is a strong predictor of long-term outcomes. Pre-operative HHS and co-pathology are the strongest independent predictors of outcomes.

Date: 2010-09-02

Session: Arthroplasty Hip - Revision / Infections

Time: 10:45-12:15

Room: G4

Abstract number: 23833

ACETABULAR REVISION AS A COST-EFFECTIVE METHOD

László BUCSI, Ferenc DOBOS

Centre for Musculoskeletal Disorders and Trauma St. George County Hospital, Székesfehérvár (HUNGARY)

Following a literary overview was given in the subject of aseptic acetabular revision; authors report their personal experience in this topic. They analyse the result of acetabular revisions with using deep frozen allograft, with or without using pelvic reinforcement ring or X-change mesh and cemented cup. Material and methods: 202 total hip revisions have been followed from January 2000 to December 2008. Aseptic acetabular revisions have been performed in 146 cases; deep frozen allograft was used in 122 cases. (Sloof technique: 102, acetabular reinforcement ring: 15 and X-change mesh: 5 cases.) The average age of the patients was 66 (31-91) years, and the average follow up time was 6,3 (0,5-9,5) years. D'Antonio classification, Harris hip score and x-R analysis have been performed for assessment. Results: According to the functional assessment the postoperative Harris hip score improved significantly. Concerning the x-R analysis there was observed a radiolucent line between the impacted and the host bone in 12 cases without severe clinical symptoms. Complications: 2 dislocations, 2 deep infections-Girdlestone procedure, and 2 aseptic loosening with re-revisions. Conclusion: Using deep frozen allograft impacted alone in cavitory defects, deep frozen allograft and reinforcement ring or X-change mesh in combined or segmental defects with cemented cup are safe and cost-effective methods in our circumstances, even in the cases of extensive bone loss.

Date: 2010-09-02
Session: Arthroplasty hip - revision
Time: 10:45-12:15
Room: G4

Abstract number: 26808

A CEMENTLESS REVISION SYSTEM FOR PELVIC DEFECTS (D'ANTONIO TYPE I-IV)

Maximilian RUDERT, Boris HOLZAPFEL
Orthopaedic Department, Würzburg (GERMANY)

Management of primary or secondary acetabular bone loss (D'Antonio type I-IV = pelvic discontinuity) in endoprosthetics is difficult. Our aim is the implantation and stable fixation using a cementless cranial extended oval press-fit cup to restore painless joint function and loading capacity. In type I and II defects with teardrop lysis mostly involving the craniolateral acetabulum eccentric cranial sockets without a craniolateral flap are used if a press-fit fixation is possible. Supplementary screw fixation is possible. If a type III defect is present, we recommend the use of cranial sockets with an anatomic flap in order to increase primary stability by supplementary screw fixation. This is especially recommended for the management of deficiencies in the medial or posterior wall. In the case of pelvic discontinuity (type IV), adequate acetabular reconstruction with primary stability of the component can only be achieved by a supplementary intramedullary structured stem fixed in the dorsal part of the Ilium. A total of 45 cup revisions using the ESKA-cranial socket system were clinically and radiologically analyzed with an average follow up of 65 ± 28 months (26-120 months). Defects were classified according to D'Antonio et al. There were 19 type II, 21 type III and 5 type IV defects. The Harris Hip Score increased from 40 preoperatively to 68 points postoperatively. Four patients had recurrent hip dislocation therefore a modification of the inserted inlay had to be performed respectively. In four cases of aseptic loosening the acetabular component had to be revised. With revision of the acetabular component as an end point, survivorship was 92% after an average of 5 years. The cranial socket system is ideal in the treatment of different acetabular defects in revision arthroplasty. Primary stability is the key to a bony ingrowth into the macroporous surface of the implant.

Date: 2010-09-02

Session: Arthroplasty Hip - Revision / Infections

Time: 10:45-12:15

Room: G4

Abstract number: 25366

**HIP REVISION USING IMPACTION BONE GRAFTING AND A CEMENT:
RADIOSTEREOMETRIC ANALYSIS OF 25 CONSECUTIVE PATIENTS
FOLLOWED UP TO 9 YEARS**

Vasilios ZAMPELIS¹, Ewald ORNSTEIN¹, Herbert FRANZÉN², Isam ATROSHI¹

¹*Department of Orthopaedics, County Hospital Hässleholm-Kristianstad, Hässleholm (SWEDEN),* ²*Department of Orthopaedics, Ängelholm Hospital, Ängelholm (SWEDEN)*

Introduction: Migration of the Exeter stem after hip revision with impaction bone grafting and cement (IBGC) has been measured with radiostereometric analysis (RSA) up to 5 years after revision. Longer-term migration has not been evaluated. **Patients and Methods:** 25 consecutive aseptically loose hip stems primarily operated on because of osteoarthritis and revised for the first time with IBGC using the Exeter stem were followed with repeated RSA measurements. After revision, 2 patients died and 1 sustained a femoral fracture within 5 years. Another 4 patients declined further participation before the 9-year examination. The remaining 17 patients (9 men and 8 women; mean age at revision 73 years) were followed 9 years. Subsidence and migration in the posterior-anterior and medial-lateral directions were analyzed. The radiographs were assessed before and after surgery. **Results:** No hip had been rerevised. At the 9-year follow-up all 17 femoral stems had subsided (mean 3.9 mm) and all stems had also migrated in the medial or lateral direction (mean 0.7 mm) and posterior direction (mean 3.8 mm). In 1 patient examined up to 6 years after revision major migrations (>20 mm) were observed but with no radiographic signs of loosening. **Conclusion:** After hip revision using IBGC, migration of the Exeter stem seems to continue up to 9 years after surgery though at a very slow rate after the first year and without evident radiographic or clinical deterioration.

Date: 2010-09-02
Session: Arthroplasty Hip - Revision / Infections
Time: 10:45-12:15
Room: G4

Abstract number: 25638

TOTAL HIP REPLACEMENT FOR ARTHRITIS FOLLOWING TUBERCULOSIS OF HIP

Vijay KUMAR, Bhavuk GARG, Rajesh MALHOTRA
All India Institute of Medical Sciences, New Delhi (INDIA)

25 patients (15 male, 10 female) with treated tuberculosis of hip underwent cementless total hip replacement for post tubercular arthritis. The average age at the time of THA was 51 years (29 to 60 Years). Preoperatively MRI was done to rule out any residual disease. Intra-operative samples were taken for microbiological examination, polymerase chain reaction (PCR) and histological examination. Patients were started on Anti-tubercular drugs one week before the operation and were continued for 6 months post operatively. In addition antibiotic prophylaxis was done using Cefazolin which was continued for 5 days. The patients were followed up clinically using the Harris hip Score as well as radiologically for any loosening of the implants and also for any recurrence of Tuberculosis. The average follow up was 4.3 years (range 3-5 years). The average Harris Hip score improved from 27 preoperatively to 91 at the final follow up. There were 2 patients who developed a discharging sinus at 9 and 11 months postoperatively which was positive for TB on PCR. Both these patients were put on ATT for another one year. Both of them recovered and had no evidence of any loosening or Osteolysis on X-rays. There were no other complications recorded. 7 patients had acetabular protrusion for which impaction allografting and cementless cup was used. The bone graft had consolidated in all these 7 patients. Total hip replacement restores good function to patients suffering from TB provided a good preoperative work up is done to rule out any residual disease.

Date: 2010-09-02
Session: Arthroplasty Hip - Revision / Infections
Time: 10:45-12:15
Room: G4

Abstract number: 25922

REVISION TOTAL HIP ARTHROPLASTY USING THE TAPERED PRESS-FIT CEMENTLESS STEM IN ELDERLY PATIENTS

Jun-Dong CHANG, Manish CHAUDHARI, Yong-Kuk KIM, Jae-Chul BYUN
Hangang Sacred Heart Hospital, Hallym University College of Medicine, Seoul (KOREA)

Purpose: In revision total hip arthroplasty using cementless stem, maximizing fit, immediate press-fit stability, control of axial and rotational stability, and optimal bone-remodeling are important. However, those may not be easily achieved in elderly patients with osteoporosis. The purpose of this study is to evaluate the clinical and radiographic outcome in consecutive series of femoral revisions using the tapered press-fit stem in elderly patients. **Materials and Methods:** We analyzed the clinical and radiographic outcome after revision THA using SLR-Plus® revision stem (Smith & Nephew, Switzerland) in 48 hips (28 men and 20 women). Acetabular components were revised in 40 hips with cementless cup. Their mean age was 66.5 years (60 - 81 years), mean weight 62.6 ± 5.9 kg, mean height 162.4 cm, and BMI 22.5. Average T-score of BMD was -3.1. Extended trochanteric osteotomy was performed in 18 hips and trochanteric osteotomy in 14 hips. The duration of follow-up was 5.6 years (3.4-8.0 years). **Results:** At final follow-up, the average Harris Hip Score was 91.6. There were no re-revision, infection, dislocation, and osteolysis during follow-up. Stem loosening on the radiograph was observed in one hip. In 9 hips, minor complications were observed: 3 intra-operative periprosthetic fractures, 3 breakages of wires, and 3 heterotopic ossifications. **Conclusion:** Clinical and radiographic outcomes after revision THA using SLR-Plus® revision stem in elderly patients are favorable. The tapered press-fit cementless stem seems to provide reliable stable fixation in revision surgery in the patients with osteoporosis.

Date: 2010-09-02
Session: Arthroplasty Hip - Revision / Infections
Time: 10:45-12:15
Room: G4

Abstract number: 25656

RECONSTRUCTION OF A SEVERE ACETABULAR DEFECT (PAPROSKY TYPE 3B) USING A TOTAL ACETABULAR ALLOGRAFT

Rajesh MALHOTRA, Vijay KUMAR, Bhavuk GARG
All India Institute of Medical Sciences, New Delhi (INDIA)

Introduction- One of the most challenging aspect of an acetabular revision is the management of severe bone loss which compromise implant fixation and stability. Material and Methods- We present a case of failed acetabular revision with extensive bone loss (Paprosky Type 3b) in a 50 year old rheumatoid female which was treated using Total acetabular allograft. The details of technique is presented. Results- At a follow up of 1 years and 3 months, the allograft has united with the host bone and there is no evidence of any loosening, Osteolysis or resorption around the allograft. The patient is walking unaided and has a Harris Hip score of 85. Discussion- This is the first report of use of a total acetabular allograft for Revision Total Hip Arthroplasty in India. The total acetabular allograft allows the placement of the component closer to the normal hip center. These grafts provide initial stability for the acetabular component and also restore bone stock to the host pelvis .These grafts unite with the host bone and provide a scaffold for future revisions. Conclusion- These patients with a Type 3B Paprosky Acetabular bone defects which were previously considered to be unreconstructable and were subjected to salvage procedures like Girdlestone arthroplasty can be managed successfully with a Total acetabular allograft.

Date: 2010-09-02
Session: Arthroplasty Hip - Revision / Infections
Time: 10:45-12:15
Room: G4

Abstract number: 24090

THE USE OF ALLOGRAFT PROSTHESIS COMPOSITE FOR EXTENSIVE PROXIMAL FEMORAL BONE DEFICIENCIES: A 2-TO 9.8 YEAR FOLLOW-UP STUDY

Ji-hyo HWANG

Kangnam Sacred Heart Hospital, Hallym university, Seoul (KOREA)

Abstract: We report here results for 15 hips that we repaired using allograft prosthesis composite (APC) and monitored for a mean of 4.2 years. Two hips underwent repeat revisions with new APCs after a mean of 83.7 months. The average Harris Hip Score improved from 21.8 before revision surgery to 83.2 afterward, and 12 stems showed good stability. Thirteen of the 15 hips repaired with APC had good junctional union. One of the 2 remaining hips showed nonunion, which was repaired with an onlay graft 3.3 years later, and the other hip showed both infection and nonunion. There was 1 dislocation, and 2 hips had complications related to the greater trochanter. Our findings demonstrate that the use of APC produces satisfactory results. Key words: proximal femur, allograft prosthesis composite, femoral bone deficiency, hip arthroplasty.

Date: 2010-09-02
Session: Arthroplasty Hip - Revision / Infections
Time: 10:45-12:15
Room: G4

Abstract number: 26661

2 YEAR FOLLOW UP OF TANTAL AUGMENTATION IN REVISION THA

Yannic BANGERT, Daniel KENDOFF, Bernd SCHWANTES, Thorsten GEHRKE
Endo-Klinik Hamburg, Germany, Hamburg (GERMANY)

Reconstructing acetabular defects in revision THA is still challenging. A new approach to manage uncontained acetabular defects is with Tantal augments. We report preliminary results of revision procedures where Tantal augments were used with allografting in combination with a cemented cup. We retrospectively followed clinically and radiographically 38 patients after aseptic acetabular cup revision with a noncemented Tantal augmentation in combination with a cemented cup for a follow up time of 2 years after implantation. Clinical evaluation included the Harris hip score (HHS); preoperative radiographs were evaluated for acetabular loosening and defect classification according to Paprosky. Postoperative images were judged by osteointegration. Average patient age at acetabular revision was 65 years, while 14 male and 24 female patients were included at an average follow up time of 23 month (16-30). The HHS improved from 46 to 81 points. Complications: 4 patients (11 %) sustained a dislocation postoperatively (3 closed reductions and 1 open revision). 1 further acetabular revision was necessary 10 month after implantation, because of early cup loosening with combined cranio-lateral migration of the TM augment. Radiographs: 25 patients (66%) showed at revision time defects as graded 2B and 13 patients (34%) 3A by Paprosky. At latest radiographic follow up all TM augments appeared stable without change of position and showed signs of full osteointegration. Tantal augmentation in combination with allografting seems to be an adequate technique to manage uncontained acetabular defects in cemented cup revisions. The early results with TM augments are promising but longer follow up is required.

Date: 2010-09-02

Session: Arthroplasty Hip - Revision / Infections

Time: 10:45-12:15

Room: G4

Abstract number: 25645

USE OF A CEMENT IMPREGNATED SPACER IN TWO STAGE REVISION HIP ARTHROPLASTY FOR INFECTED HIP ARTHROPLASTY

Vijay KUMAR, Dharmesh KHATRI, Bhavuk GARG, Rajesh MALHOTRA

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

Introduction- We report the treatment outcome of two-stage revision THA for infected hip arthroplasty, including hemiarthroplasty, using an antibiotic-impregnated cement spacer for the interval between the first and second stages. **Material and Methods-** To fabricate the spacer, antibiotic-loaded cement was inserted into a specially designed mold. A central rod pin was superficially imbedded as an endoskeleton once the cement reached a doughy state. After polymerization, the final product was removed from the mold and inserted as an articulating spacer. The first stage operation involved complete debridement, removal of infected prosthesis, implantation of cement spacer with antibiotics, and concomitant administration of 3 weeks of intravenous (IV) and 1 month of oral antibiotic. After eradication of infection, it was converted to THA in the second stage. **Results-** 27 patients with infected Total hip replacement were treated in 2 stages using an antibiotic impregnated spacer. The mean duration of follow-up was 32 months (range 10-45 months). Average Harris hip score improved from 38 before surgery to 95 at final follow-up. The mean interval between the first and second stages was 10.1 weeks (range 6-19 weeks). Of the 27 hips, 24 were successfully converted to THA whereas resection arthroplasty was done in 3 cases. Complications with the spacer included 2 fractures and 2 dislocations. **Discussion-** This cost-effective technique provides efficient local antibiotic delivery, early mobilization, facilitation of reimplantation, prevents leg-length discrepancy and atrophy of bones or muscles and improved patient satisfaction.

Date: 2010-09-02
Session: Arthroplasty Hip - Revision / Infections
Time: 10:45-12:15
Room: G4

Abstract number: 25774

AGGRESSIVE EARLY DEBRIDEMENT CAN BE SUCCESSFUL FOR INFECTED TOTAL HIP ARTHROPLASTY

Mohamed SUKEIK, Fares Sami HADDAD

University College London Hospital, London (UNITED KINGDOM)

Introduction: Up to 2% of total hip arthroplasties (THA) are complicated by infection. This leads to dissatisfied patients with poor function, and has far-reaching social and economic consequences. The challenge in these cases is the eradication of infection, the restoration of full function and the prevention of recurrence. We report the outcome of early aggressive debridement in the acutely infected THA. Methods: We studied 28 consecutive patients referred with acutely infected THA (18 primaries, 10 revisions) which occurred within 6 weeks of the index operation or of haematogenous spread between 1999 and 2006. Microbiology confirmed bacterial colonisation in all cases with 20 early post-operative infections and 8 cases of acute haematogenous spread. Patients with a cemented THA underwent aggressive open debridement, a thorough synovectomy and exchange of all mobile parts. Uncemented THA were treated as a single stage revision with removal of all implants, aggressive debridement and re-implantation of new prosthesis. Antibiotics were continued in all cases until inflammatory markers returned to within normal limits. Results: Ten patients required multiple washouts. 7 patients needed a two-stage revision. 21 patients returned to their expected functional level without removal of the implants and with no radiographic evidence of prosthetic failure. At a minimum 2 years follow-up, we had a 75% infection control rate. The outcome was significantly better in patients treated in the first 120 hours after presentation. Conclusion: Our data suggests that a role for early aggressive open debridement in acute infections after THA with an excellent chance of eradicating infection.

Date: 2010-09-02
Session: Arthroplasty Hip - Revision / Infections
Time: 10:45-12:15
Room: G4

Abstract number: 25296

**IMPINGEMENT FOLLOWING CONTEMPORARY RESURFACING
ARTHROPLASTY OF THE HIP**

Youn-Soo PARK, Seung-Jae LIM, Chul-Hee JUNG
Samsung Medical Center, Seoul (KOREA)

Femoro-acetabular cup impingement (FACI) between retained femoral neck and metallic cup was observed in a cohort of patients with resurfacing arthroplasty of the hip. We then questioned whether patient demographics, component features or suboptimal component positions would be risk factors for FACI. A consecutive series of 75 patients (84 hips) who underwent hip resurfacing arthroplasty were retrospectively analysed at a mean of 38 months (24 to 72) postoperatively. Mean age was 38 years (18 to 64). All procedures were performed by one surgeon through an anterolateral approach. Radiographic evidence of FACI was observed in nine (11%) of the 84 hips. All FACIs occurred in men after a mean of 14 months (8 to 24) postoperatively. Five patients had persistent pain in the groin area when flexing and rotation the hip. One of these sustained a late-onset fracture through the femoral neck at 52 months postoperatively. Mean postoperative Harris hip score in the FACI group (87.1 points; 76 to 96) was poorer than in the non-FACI group (95.9 points; 83 to 100) ($p = 0.003$). Multiple logistic regression analysis showed a significant association of FACI with a low acetabular cup inclination (OR = 1.42; 95% CI 1.01 to 1.99, $p = 0.046$) and a high cup uncoverage ratio (OR = 1.36; 95% CI 1.01 to 1.84, $p = 0.045$). Our experience of contemporary resurfacing arthroplasty of the hip reveals a worrisome frequency of impingement between retained femoral neck and metallic acetabular cup.

Date: 2010-09-02

Session: Arthroplasty Hip - Position / Approach / Complications

Time: 13:30-15:00

Room: G4

Abstract number: 23741

THE EFFECT OF FEMORAL NECK NOTCHING WITH THE BIRMINGHAM MID-HEAD RESECTION

James P. WADDELL, Michael OLSEN, Peter M. LEWIS, Emil H. SCHEMITSCH
St. Michael's Hospital, Toronto (CANADA)

The Birmingham Mid-Head Resection (BMHR) is a short-stem alternative to hip resurfacing for patients with unsuitable femoral head anatomy. It is unknown if femoral neck fracture risks associated with hip resurfacing pose the same hazard to mid-head resection arthroplasty. The current study investigated the effect of superior femoral neck notching with the BMHR. Twenty-four composite femurs were implanted with the BMHR prosthesis and tested in axial compression. Six specimens each were prepared with a 2 mm and 5 mm notch in the superior cortex of the femoral neck. These groups were compared to a control group prepared without a superior neck notch. All components were positioned in neutral coronal alignment. To investigate the effect of valgus alignment, six specimens were prepared and tested with a 5 mm superior neck notch with the implant aligned in an additional 10 degrees of valgus alignment. Compared to the no-notch control group, peak failure load for the 5 mm notch group was significantly reduced ($p=0.049$), while the 2 mm notch group showed no significant difference ($p=0.261$). Relative valgus alignment had a protective effect on a 5 mm superior neck notch and was not significantly different from controls ($p=0.405$). This study provides biomechanical evidence that substantial notching of the femoral neck with preparation of a BMHR significantly weakens the proximal femur. However, mid-head resection arthroplasty may be more forgiving to minor preparatory errors than a typical hip resurfacing. Valgus alignment provides a protective effect if superior neck notching occurs.

Date: 2010-09-02

Session: Arthroplasty Hip - Position / Approach / Complications

Time: 13:30-15:00

Room: G4

Abstract number: 23002

CONSTRAINED VERSUS STANDARD LINER IN NEUROLOGIC HIP ARTHROPLASTY

Philippe HERNIGOU, Alexandre POIGNARD, Paolo FILLIPINI

Hopital Henri Mondor, Creteil (FRANCE)

THA performed in patients with cognitive deficits or neuromuscular diseases (NMD patients) has been associated with a high post operative dislocation rate. We asked whether constrained liners can be used safely in primary THA for patients with neurologic diseases. We performed a retrospective review of 144 NMD patients receiving a constrained polyethylene insert from 1999 to 2004 and compared them to the 120 NMD patients operated immediately before this date (from 1994 to 1998) who received a conventional polyethylene insert. 123 were cognitively impaired patients; thirty patients had decreased muscle tone; 52 patients had increased muscle tone; and forty patients were with stroke. In absence of constrained liner, Thirty-three (25%) of the 132 hips were known to have had at least one dislocation. Two underlying diagnoses acute fracture in cognitively impaired patients, neurologic disease with increased muscle tone were associated with a significantly greater risk of dislocation than osteoarthritis in patients with neurologic disease with decreased muscle tone. Ten other hips had revision for loosening of the cup in patients with Parkinson disease, cerebral palsy and stroke. The survival rate at five years was 82%, and 77% at ten years, with revision because of recurrent dislocation or loosening of the cup as the end point. With a constrained liner, at minimum 7 year follow up (range 5 - 10 yrs), the prevalence of complications, particularly dislocation, was significantly decreased (3 dislocations among 164 hips; 2%), without any loosening. We concluded that this constrained acetabular component provides protection against dislocations.

Date: 2010-09-02

Session: Arthroplasty Hip - Position / Approach / Complications

Time: 13:30-15:00

Room: G4

Abstract number: 23735

PROPRIOCEPTION AND BALANCE IMPROVEMENT AFTER TOTAL HIP ARTHROPLASTY THROUGH A MODIFIED DIRECT LATERAL APPROACH IN PATIENTS WITH HIGH HIP DYSPLASIA

Goran BICANIC¹, Ana ALJINOVIC², Domagoj DELIMAR¹

¹*Dpt of Orthopaedic Surgery, Clinical Hospital Centre Zagreb, Zagreb (CROATIA),*

²*Dpt of Physical MEDicine and Rehabilitation, Clinical Hospital Sveti Duh, Zagreb (CROATIA)*

Aim was to evaluate proprioception and body balance after total hip arthroplasty with new operative approach in patients with high hip dysplasia. Prospective study included 28 patients with secondary hip arthritis due to hip dysplasia which were scheduled for the total hip arthroplasty. Patients were divided in two groups; test group (patients with severe hip dysplasia, Crowe 3 and 4, 14 patients) and control group (Crowe 1 and 2, 14 patients) and were tested before and 6 months after the operation. Testing was performed on the Balance board (Phyaction balance, Uniphy) and results significantly improved (average total score) in frontal (from 17.4 to 14.3 in test and from 17.6 to 15.9 in control group) and in sagittal plane (from 16.3 to 113.4 in test and from 17.9 to 15.7 in control group) when tested with open eyes in both groups and there was no difference between the groups after operation. Interestingly, with the eyes closed total score did not improve neither in test nor in control group, neither in frontal (from 20.8 to 21.2 in test and from 21.9 to 20.0 in control group) nor in the sagittal plane (from 19.0 to 18.5 in test and from 19.5 to 17.1 in control group). Body balance significantly improves with the new approach in patients with severe hip dysplasia and results are comparable with results in patients with mild dysplasia operated through standard direct lateral approach.

Date: 2010-09-02

Session: Arthroplasty Hip - Position / Approach / Complications

Time: 13:30-15:00

Room: G4

Abstract number: 24274

THE EFFECT OF PROSTHESES PLACEMENT AND ROTATION ON DEXA MEASUREMENT IN HIP ARTHROPLASTY

Pim VAN EGMOND, Petra DIBBETS, Imad AL YOUNIS, Huub J.I. VAN DER HEIDE
Leiden University Medical Center, Leiden (NETHERLANDS)

Introduction: BMD is measured with Dual-energy X-ray absorptiometry (DEXA) in patients with and without total hip arthroplasty, both as a single measurement and for longitudinal follow-up. To analyze the reproducibility and reliability of repeated DEXA measurements with and without a femoral implant, we analyzed these measures in a cadaver experiment. Material and methods: Ten human cadaver femora were used. All femora were scanned before preparation in neutral position, in 20 degrees of internal and external rotation. We prepared the femora for femoral component insertion. After preparation, we scanned the femora with the rasp inserted, resembling an uncemented femoral component. Finally, we cemented the stems and repeated the measurements. All scans were analyzed by two persons independently. We analyzed the data with an intraclass correlation for absolute values, data were also analyzed using a general linear model and a Bland-Altman analysis. Results: The different values in the measurements are influenced by the different steps of preparation and cementing, the individual BMD of the femur, the rotation, and finally the selection of the region of interest by the investigator. The largest difference in BMD was between the different femora and the different steps of preparation and cementing. The measurements after cementing showed an overestimating of the BMD of 35%, this overestimation was larger with a lower BMD. All other measurements showed an intraclass correlation of 0.8 or higher, indicating a good correlation. Conclusion: Bone mineral density measured with DEXA might show a mean overestimation after cemented femoral arthroplasty of 35%.

Date: 2010-09-02

Session: Arthroplasty Hip - Position / Approach / Complications

Time: 13:30-15:00

Room: G4

Abstract number: 24500

A SPECIFIC COMPLICATION OF DUAL MOBILITY CUP, THE INTRA-PROSTHETIC DISLOCATION

Remi PHILIPPOT, Bertrand BOYER, Frederic FARIZON

CHU Saint Etienne, Saint Etienne (FRANCE)

Long-term results of dual-mobility cups confirm the good stability of this implant. However, dual mobility reports a specific complication which is intra-prosthetic dislocation: such phenomenon occurs when the polyethylene liner loses its retentive properties therefore leading to the expulsion of the prosthetic head from the liner. A 2% rate at 12-year follow-up has been described in the literature. We prospectively assessed all cases of intra-prosthetic dislocations having occurred in our department since 1985. The purpose of our study was to analyse this complication and find out its main features. 91 intra-prosthetic dislocations were observed in 85 patients of mean age 50.7 years. Intra-prosthetic dislocation occurred after a mean period of 8.8 years. Intra-operative clinical data revealed 3 types of intra-prosthetic dislocations. Type I was associated with loosening and induced by a third body wear, type II resulted from a periprosthetic fibrosis and locking of the dual-mobility cup larger articulation, type III called - pure intra-prosthetic dislocation revealed a homogeneous wear of the retentivity without locking of the system nor appearance of a third body. These complications occurred after a mean period of 9.2, 7.5 and 10.6 years respectively. A significant difference was found between the time of appearance of these various types of dislocations. Therefore, analytic study of intra-prosthetic dislocation has diagnostic and therapeutic objectives; All dislocation types were surgically managed which includes change of the polyethylene associated with systematic change of the cup in type I dislocations and with extended synovectomy in type II.

Date: 2010-09-02

Session: Arthroplasty Hip - Position / Approach / Complications

Time: 13:30-15:00

Room: G4

Abstract number: 23642

INTERPROSTHETIC FEMORAL FRACTURES: ANALYSIS OF OUR EXPERIENCE, AND PRESENTATION OF A NEW CLASSIFICATION SCHEME

Patrick PLATZER, Monika LUXL, Rupert SCHUSTER, Gerhild THALHAMMER, Manuela JAINDL, Vilmos VÉCSEI

Department of Trauma Surgery, Medical University of Vienna, Vienna (AUSTRIA)

Background: Interprosthetic fractures of the femur are continuously rising due to an increasing number of ipsilateral hip and knee joint replacement. The purpose of this study was to present our experience in the management of these injuries, and to introduce a new classification scheme for interprosthetic femoral fractures. Methods: We reviewed the clinical and radiographic records of 146 patients with periprosthetic fractures of the femur between 2000 and 2008. 11 patients showed a periprosthetic femoral fracture following ipsilateral hip and knee arthroplasty and were included in this study. All 11 patients underwent surgical stabilization by plate fixation, with additional cerclage wiring in 4 cases. Results: 8 patients (73%) returned to their pre-injury activity level and were satisfied with their outcome. In two patients we saw a relevant decrease of hip and knee function and severe limitations in gait and activities of daily living. One patients died related to surgery. Successful fracture healing was achieved in nine patients (82%). Re-operation due to technical failures was necessary in one case. Based on our experience, the fractures were divided into three sub-types, mainly depending on the fracture site and involvement of the prostheses. Conclusions: Referring to the limited bone available for fixation and the compromised intramedullary blood supply in predominantly geriatric patients, interprosthetic femoral fractures constitute a challenging problem with a high risk for complications. Our classification scheme, dividing these injuries into three sub-types, assists in developing an appropriate treatment concept.

Date: 2010-09-02

Session: Arthroplasty Hip - Position / Approach / Complications

Time: 13:30-15:00

Room: G4

Abstract number: 23767

COMPARATIVE STUDY CLINICAL, RADIOLOGICAL AND DIGITALLY ON BONE INTEGRATION FEMORALE ON MIS DIRECT ANTERIOR APPROACH VERSUS HARDINGE APPROACH IN TOTAL HIP REPLACEMENTS

Stefan CRISTEA¹, Florin GROSEANU¹, Andrei PRUNDEANU¹, Vlad PREDESCU¹, Vlad GEORGEANU¹, Constantin VERTAN², Mihai Viorel POPESCU³

¹*Clinic of Orthopaedic and Trauma Surgery, St. Pantelimon Hospital, Bucharest (ROMANIA)*, ²*Politechnic Institute Bucharest, Bucharest (ROMANIA)*, ³*Foisor Orthopaedic Hospital, Bucharest (ROMANIA)*

Goals: the study is to evaluate the benefits of two approach on THR using a same prosthesis. Material and method: it was 120 patients to which we have operated between 2006-2009 with total replacement of the hip using the AGB II prosthesis; for 60 patients we used a lateral Hardinge approach and other 60 patients with anterior lateral direct approach. Interventions have been done by 3 surgeons. We appreciated for all patients intervention, or blood loss, clinical results using EQ - 5 d and SF-36, the radiological results (in subsequent anterior and lateral impact); after 2 years of the intervention we performed a computerized analyze, radiological images taken with a digitally camera to the negatoscope and then digital analyzed by ensuring a resolution of 10 pixs/mm at femoral level. Results: The clinical results in the first 3 months postoperative are better for deals it earlier direct, discusses it side with several complications. The response time was similar to the 2 approaches, but blood losses have been high for Hardinge approach. Radiological results were similar and digital analyze has no significatif differences of bone integration between the 2 types of approaches. Conclusions: Total replacement of the hip using direct anterior lateral approach is a predictable intervention, reproducible witch permit a quickly rehabilitation of patients with few complications face of Hardinge approach. This approach has the specific indications. The digital analyze can be useful as a postoperative evaluation method.

Date: 2010-09-02

Session: Arthroplasty Hip - Position / Approach / Complications

Time: 13:30-15:00

Room: G4

Abstract number: 23734

IMPROVEMENT OF THE STRENGTH OF THE HIP MUSCLES AFTER TOTAL HIP ARTHROPLASTY THROUGH A MODIFIED DIRECT LATERAL APPROACH IN PATIENTS WITH HIGH HIP DYSPLASIA

Goran BICANIC¹, Ana ALJINOVIC², Domagoj DELIMAR¹

¹*Dpt of Orthopaedic Surgery, Clinical Hospital Centre Zagreb, Zagreb (CROATIA),*

²*Dpt of Physical Medicine and Rehabilitation, Clinical Hospital Sveti Duh, Zagreb (CROATIA)*

Aim was to evaluate improvement of muscle strength after total hip arthroplasty with new operative approach in patients with high hip dysplasia. Prospective study included 28 patients with secondary hip arthritis due to hip dysplasia which were scheduled for the total hip arthroplasty. Patients were divided in two groups; test group (patients with severe hip dysplasia, Crowe 3 and 4, 14 patients) and control group (patients with mild hip dysplasia, Crowe 1 and 2, 14 patients) and were tested before the operation and 6 months after the operation. Testing was performed with dynamometer (Chatillon MSC, AMETEK France) and results significantly improved postoperatively in both groups and there was no difference between the groups in almost all directions (internal rotation was worse in test group). Interestingly, in test group muscle strength in all directions but flexion and internal rotation reached the strength of nonoperated (healthy) leg, but in control group muscle strength of only flexion and adduction reached the level of nonoperated leg. This could be explained by larger lever arm of all hip muscles since the elongation was greater in test group (4.5 cm) then in control group (1.4 cm). Strength of hip muscles significantly improves with the new approach in patients with severe hip dysplasia and results are comparable with results in patients with mild dysplasia operated through standard direct lateral approach, but for both groups additional physical therapy and muscle strengthening even 6 months after the operation is advisable since there is still room for improvement.

Date: 2010-09-02

Session: Arthroplasty Hip - Osteotomy / Avascular Necrosis

Time: 16:00-17:45

Room: G4

Abstract number: 25877

**SPHERICAL ACETABULAR OSTEOTOMY FOR OSTEOARTHRITIS OF THE HIP:
OUTCOMES AFTER MORE THAN 15 YEARS FOLLOW-UP**

Yoshihiro NAKAMURA, Yoshitaka NAGATSURU, Tomomi MATSUOKA, Akihiro KAWANO, Etsuo CHOSA

Orthopaedic Surgery, Faculty of Medicine, University of Miyazaki, Miyazaki-Gun (JAPAN)

Background: Satisfactory intermediate and long-term results of acetabular osteotomy for the treatment of early and advanced coxarthrosis secondary to developmental dysplasia of the hip have been reported. The purpose of this study was to evaluate the long-term clinical and radiographic results in patients with coxarthrosis secondary to developmental dysplasia of the hip. Method: We performed a retrospective review of the results of spherical acetabular osteotomy by a single surgeon in one hundred eighty-two hips (one hundred fifty patients). One hundred thirty-five patients were female, and fifteen were male. The mean age was 33.3 years at the time of surgery, and the mean duration of follow-up was 17.3 years. The Japanese Orthopaedic Association (JOA) hip score and overall patient satisfaction with surgery were used to assess hip function and clinical results. Plain radiographs were used to assess the correction of the dysplasia and progression of degenerative arthritis. Results: The mean preoperative JOA hip score was 82.4 points in pre and early coxarthrosis and 67.0 points in advanced coxarthrosis, which improved to 95.0 points and 89.2 points respectively. The mean center-edge angle improved from -2.9° preoperatively to 39.5° postoperatively, the mean acetabular roof obliquity improved from 28.5° to -6.2° . Nine hips had radiographic evidence of progression of osteoarthritis. Conclusion: Our results indicate that Spherical acetabular osteotomy for hip dysplasia can give satisfactory and reproducible long-term clinical results in most patients. The ideal candidate is the patient who has good hip joint congruency and no severe degenerative arthritis.

Date: 2010-09-02

Session: Arthroplasty Hip - Osteotomy / Avascular Necrosis

Time: 16:00-17:45

Room: G4

Abstract number: 23237

WEAR ANALYSIS OF METAL-ON-METAL HIP RESURFACING IMPLANTS REVISED DUE TO PSEUDOTUMOURS

Young-Min KWON¹, Sion GLYN-JONES², David SIMPSON², Amir KAMALI³, Peter MCLARDY-SMITH², Harinderjit S GILL², David MURRAY²

¹*Department of Orthopaedic Surgery, Massachusetts General Hospital, Harvard Medical School, Boston (UNITED STATES),* ²*Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, Nuffield Orthopaedic Centre, Oxford (UNITED KINGDOM),* ³*Smith & Nephew Orthopaedics Ltd, Leamington Spa (UNITED KINGDOM)*

Pseudotumours (soft-tissue masses relating to the hip joint) following metal-on-metal hip resurfacing arthroplasty (MoMHRA) have been associated with elevated serum and hip aspirate metal ion levels, suggesting that pseudotumours occur when there is increased wear. This study aimed to quantify the wear of implants revised for pseudotumours and a control group of implants revised for other reasons of failure. A total of 30 contemporary MoMHRA implants in two groups were investigated: (1) 8 MoMHRA implants revised due to pseudotumour; (2) 22 MoMHRA implants revised due to other reasons of failure. The linear wear of retrieved implants was measured using a Taylor-Hobson Roundness machine. The average linear wear rate was defined as the maximum linear wear depth divided by the duration of the implant in vivo. In comparison with the non-pseudotumour implant group, the pseudotumour implant group was associated with significantly higher median linear wear rate of: (1) the femoral component: 8.1 $\mu\text{m}/\text{year}$ vs. 1.97 $\mu\text{m}/\text{year}$; and (2) the acetabular component: 7.36 $\mu\text{m}/\text{year}$ vs. 1.28 $\mu\text{m}/\text{year}$. Wear on the acetabular cup components in the pseudotumour group always involved the edge, indicating edge-loading of the bearing. Significantly greater linear wear rates of the MoMHRA implants revised due to pseudotumour support the in vivo elevated metal ion concentrations in patients with pseudotumours. This study is the first to confirm that pseudotumour occurs when there is increased wear at the MoM articulation. Furthermore, edge-loading may be the dominant wear generation mechanism in patients with pseudotumour.

Date: 2010-09-02

Session: Arthroplasty Hip - Osteotomy / Avascular Necrosis

Time: 16:00-17:45

Room: G4

Abstract number: 25682

OUR EXPERIENCE IN THE TREATMENT OF PERIPROSTHETIC VANCOUVER B TYPE FRACTURES

Razvan Silviu CISMASIU, Emil George HARITINIAN, Dan Constantin GEAMANU, Mihai Viorel POPESCU

Clinical Hospital of Orthopaedics "Foisor", Bucharest (ROMANIA)

INTRODUCTION: Periprosthetic fractures are a serious complication of total hip arthroplasty, increasing in incidence as patient longevity and the number of primary and revision arthroplasty procedures continue to increase. Their treatment may represent a challenging problem for the orthopaedic surgeon in absence of an explicit treatment protocol. **MATERIALS:** With use of Romanian Arthroplasty Register database in a retrospective study, we identified between 2004 - 2008 a number of 23 patients who undertook surgery for periprosthetic fractures 14 Vancouver B2 (60.87%) and 9 B3 (39.13%). In B2 fractures the fixation was obtained by using a long, uncemented femoral stem Revitan, while in type B3 fractures the treatment consisted in revision arthroplasty with a long, distal locked femoral stem DLS and bone augmentation with spongy grafts. The parameters used to evaluate the results were: -Harris Score pre- and postoperative; - the radiographic evaluation of fracture union; - the moment of patient mobilization with full weight bearing. **RESULTS:** Type B periprosthetic fractures united both clinically and radiographically after a mean of 6 months, the healing interval being shorter in B2 fractures. The Harris Score approximate doubled this value in postoperative 78vs.36 preoperative. **CONCLUSIONS:** In our study, periprosthetic fractures represented the 5th cause of revision arthroplasty. The patient profile showed a female preponderance old woman, with osteoporosis and a mean of 5 years from hip arthroplasty. Heal time fracture is less important than a competent mechanical assemblage - fixation through a long, uncemented femoral stem prosthesis leads to fair outcome results.

Date: 2010-09-02

Session: Arthroplasty Hip - Osteotomy / Avascular Necrosis

Time: 16:00-17:45

Room: G4

Abstract number: 25878

TROCHANTERIC OSTEOTOMY. THE INCIDENCE OF TROCHANTERIC NON-UNION, SUBLUXATION AND REVISION FOR DISLOCATION

Michael WROBLEWSKI, Paul SINEY, Patricia FLEMING

The John Charnley Research Institute (UNITED KINGDOM)

Introduction: Trochanteric osteotomy is an integral part of both the concept and the surgical technique of the Charnley low-frictional torque arthroplasty (LFA). The fear of trochanteric non-union and dislocation continue to be the main reasons why some surgeons avoid the Charnley method despite the well-documented benefit of the low-frictional torque principle and the long-term successful survivorship results. We report the 47 year results of the Charnley LFA: 1962-2009. Methods and Results: 23,403 primary LFAs carried out by over 330 surgeons. Patients' mean age was 65 years (12-95). The mean follow-up was 4.8 years (0-40.5). Trochanteric non-union was recorded in 1894 cases (8.1%) with 20 cases revised for dislocation (1.1%). 16 cases were revised early. Trochanteric union was recorded in 21,509 cases (91.9%) with 42 cases revised for dislocation (0.2%): 11 with cup loosening, the other 31 are subject of a detailed study. There were 227 cases (1%) with a history of subluxation. Six had been revised for dislocation. Conclusions: The incidence of revision for dislocation has been remarkably low (0.3%). Surgeon's experience and the quality of the bone stock and materials used for osteosynthesis are important. Late dislocations are related to cup loosening. Low wear materials and designs to put off neck impingement will be of benefit.

Date: 2010-09-02

Session: Arthroplasty Hip - Osteotomy / Avascular Necrosis

Time: 16:00-17:45

Room: G4

Abstract number: 26370

TO COMPARE THE CLINICAL OUTCOME BETWEEN CORE DECOMPRESSION WITH BONE GRAFTING AND CORE DECOMPRESSION WITHOUT BONE GRAFTING IN AVASCULAR NECROSIS OF HIP

Amit AGARWAL¹, C.S. YADAV¹, Ashok KUMAR¹, Dilpreet SINGH¹, Sujit TRIPATHY²
¹Aiims, New Delhi (INDIA), ²Pgimer, Chandigarh, (INDIA)

The role of core decompression in altering the natural history of avascular necrosis of hip has not been clearly defined. Core decompression with cortical strut grafting has been widely used since a long time. There have been very few, if any, studies on the comparison of core decompression with and without cortical strut grafting. Our study aims to determine whether the placement of a cortical fibular graft in the core is better than core decompression without fibular graft in improving the functional capacity of the patient and altering the disease progression. Forty hips (twenty six) patients were evaluated with Ficat & Arlet classification Stages I, IIA, IIB and III. Decompression was done without fibular grafting (Group I) in a total of 21 (52.5%) hips and with fibular grafting (Group II) in 19 (47.5%) hips. The clinical success of core decompression in a patient was defined as an improvement of 10 or more points in the Harris Hip score and an improvement of 4 or more points in the Pain Score. We conclude that Core decompression with fibular strut grafting has no significant advantage over core decompression without fibular strut grafting. On the contrary, the procedure increases the morbidity and can be avoided. Core decompression is useful in providing symptomatic pain relief and improvement in function in all cases.

Date: 2010-09-02

Session: Arthroplasty Hip - Osteotomy / Avascular Necrosis

Time: 16:00-17:45

Room: G4

Abstract number: 25852

AVASCULAR NECROSIS OF FEMORAL HEAD: RESULTS OF TREATMENT WITH BONE GRAFT AND SURGICAL HIP DISLOCATION

Jaime LOPEZ, Dante PARODI, Javier BESOMI, Carlos TOBAR, Luis MOYA, Joaquin LARA, Claudio MELLA

Clinica Alemana de Santiago, Santiago (CHILE)

With the aim of evaluate the results of the surgical treatment with impacted bone graft for lift up the joint surface, through surgical hip dislocation technique in patients with avascular necrosis of femoral head. It were evaluated 5 patients with avascular necrosis of femoral head Ficat 4, with 32 years old average age and 24 months average follow up, in which there was performed a lift of the depressed area using bone graft trough surgical hip dislocation. There were evaluated with radiography and computed tomography at 3, 6, 12 months and then annually. Clinical evaluation was performed using harris hip score(HHS). In all cases an adequate joint surface lift was achieved, evaluated with computed tomography and an initial clinical improvement according to HHS during the first 6 months. Later the patients began with progressive pain and clinical and radiological deterioration. At 24 months (18-36) all the cases had decreased their HHS, being stated a collapse and bone graft reabsorption on radiography and computed tomography, similar to the pre operative condition. There had not other complications. All the cases required total hip arthroplasty. The use of bone graft through surgical hip dislocation for the treatment of avascular necrosis of the femoral head is a bad choice of treatment, with no impact on the natural history of disease. Patients have no clinical neither radiological improvement. Should be available other therapeutic alternatives for treat young patients in wich it search to preserve this joint.

Date: 2010-09-02

Session: Arthroplasty Hip - Osteotomy / Avascular Necrosis

Time: 16:00-17:45

Room: G4

Abstract number: 25324

METAL-ON-METAL HIP RESURFACING ARTHROPLASTY FOR AVASCULAR NECROSIS OF THE FEMORAL HEAD

Youn-Soo PARK, Seung-Jae LIM, Chul-Hee JUNG

Samsung Medical Center, Seoul (KOREA)

While hip resurfacing arthroplasty has emerged as a viable treatment option for young patients with end-stage hip disease, it remains controversial whether this procedure can be safely performed in patients with avascular necrosis of the femoral head. The purpose of this study was to evaluate the safety and efficacy of contemporary metal-on-metal hip resurfacing arthroplasty in patients with avascular necrosis of the femoral head. We evaluated 57 patients (67 hips) who had been managed by hip resurfacing arthroplasty for the treatment of avascular necrosis of the femoral head between September 2003 and February 2007. All operations were performed by a single surgeon through an anterolateral approach. There were 49 men (57 hips) and 8 women (10 hips) with a mean age of 39 years (22 to 64). All the patients were assessed clinically and radiographically at a mean of 39 months (24 to 61) postoperatively. The mean Harris hip score improved from 41 points preoperatively to 94 points postoperatively. All prostheses showed radiographic evidence of stable fixation. There was no femoral neck fracture or femoral component loosening. No implant was revised. Periprosthetic osteolysis was observed in 1 hip, femoral neck narrowing in 2 hips, and heterotopic ossification in 3 hips. The short-term results of contemporary metal-on-metal hip resurfacing arthroplasty in patients with avascular necrosis of the femoral head were excellent without encountering any complications unique to this kind of arthroplasty.

Date: 2010-09-02

Session: Arthroplasty Hip - Osteotomy / Avascular Necrosis

Time: 16:00-17:45

Room: G4

Abstract number: 23141

OUTCOME OF METAL ON METAL RESURFACING SURGERY BETWEEN AVN AND OA OF HIPS (SHORT TERM STUDY)

Firooz MADADI¹, Seyyed Morteza KAZEMI¹, Armin ALAMI HARANDI¹, Mohammad Reza ABBASIAN¹, Firoozeh MADADI¹, Alireza EAJAZI²

¹*Shahid Beheshti Medical University, Tehran (IRAN)*, ²*Tehran Medical University, Tehran (IRAN)*

Osteonecrosis affects younger patients who typically refer to the Orthopaedic surgeon for the first time in the third to fifth decades of life in the late stages of the disease. Femoral metal-on-metal (MOM) hip resurfacing is as an alternative to conventional total hip arthroplasty (THA) in treating osteoarthritis of the hip. The purpose of this study was to analyze the clinical outcomes of this procedure in patients with osteonecrosis of the femoral head and comparing them with the matched group of patients with osteoarthritis. In a historical cohort study a consecutive series of 42 patients with end-stage osteonecrosis (28 patients) and osteoarthritis (24 patients) of the femoral head managed by MOM hip resurfacing in a referral Orthopaedic center from Feb 2002 to May 2007. The two groups were matched by gender, surgeon, prosthesis and surgical approach. The pain, function and deformity were evaluated with the use of Harris Hip Score (HHS) after the operation. Patients were followed clinically for a mean of forty-one months. The clinical outcomes were similar for both groups. There was no significant difference regarding the mean HHS ($p=0.347$) and hip joint range of motion ($p=0.346$) between two groups after surgery. The patients in the osteoarthritis group had a significantly higher mean age than the ones in the osteonecrosis group (47.88 ± 12.6 vs 30.86 ± 7.5 , $p=0.003$). The short-term results for MOM hip resurfacing were excellent in the patient with osteonecrosis and comparable with those seen in osteoarthritis.

Date: 2010-09-02

Session: Arthroplasty Hip - Osteotomy / Avascular Necrosis

Time: 16:00-17:45

Room: G4

Abstract number: 24275

THE LONGEVITY OF HEMIARTHROPLASTIES IN YOUNG PATIENTS

Pim VAN EGMOND, Antonie H.M. TAMINIAU, P.D. Sander DIJKSTRA, Huub J.I. VAN DER HEIDE

Leiden University Medical Center, Leiden (NETHERLANDS)

Introduction: Hemiarthroplasties are mostly used to treat proximal femoral fractures in the elderly, but there are valid indications for younger patients. We reviewed all consecutive hemiarthroplasties, both monopolar and bipolar, with osteonecrosis or tumour resection as indication. Material and methods: Between 1985 and 2008, 45 hemiarthroplasties were performed with osteonecrosis or a tumour of the proximal femur as indication. All medical records and radiographs were reviewed. Revision of the femoral component, or conversion to a total hip arthroplasty (THA), was regarded as a failure of the implant. A Kaplan Meier analysis was performed for both monopolar and bipolar arthroplasties. Results: After a mean follow-up of 6 years, 14 patients have died, leaving 28 patients (31 implants) for analysis. Conversion to THA was performed 7 times. The Kaplan-Meier survival analysis shows a 90% survival at 10, and 80% at 15 years with conversion to THA or revision as endpoint for the bipolar hemiarthroplasties. In the monopolar type we found a conversion rate of more than 50% within 3 years. Discussion: Because longevity of a THA, and especially the acetabular component, is known to be limited in younger patients, placement of a bipolar hemiarthroplasty might be of value. The advantage of 10 or more years before converting to a total hip, in our view, outweighs the possible early loosening of an acetabular component. Because of the high conversion rate after monopolar hemiarthroplasties, we would not recommend this type of prosthesis in the young patient.

Date: 2010-09-02

Session: Arthroplasty Hip - Osteotomy / Avascular Necrosis

Time: 16:00-17:45

Room: G4

Abstract number: 26112

BLOOD METAL ION LEVELS AND CHROMOSOMAL ABERRATIONS IN PATIENTS WITH METAL ON METAL RESURFACING ARTHROPLASTY OF THE HIP

Ashley BLOM, Michael PARRY, Martin FIGGETT, Patrick CASE
University of Bristol, Bristol (UNITED KINGDOM)

The success of hip arthroplasty in treating disabling has meant younger patients are presenting for total hip replacement. NICE has stated that metal-on-metal hip resurfacing is a treatment option for advanced hip disease in young patients. These implants generate particles and ions of cobalt and chromium (CoCr) which the Department of Health concluded are associated with increased genotoxicity. Increases in metal ions produce chromosomal aberrations in the peripheral blood of patients with metal on metal devices though no correlation has been identified between metal ion levels and the degree of chromosomal aberrations. Seventy two patients with two differing designs of resurfacing arthroplasty (BHR and ASR) were recruited preoperatively. Blood metal ion levels were measured by HR-ICPMS pre operatively and at 6 and 12 months post operation. Chromosomal aberrations were detected in blood using multicolour FISH. There is an increase in metal ion levels for both designs of prosthesis at six months though this declined at 12 months in the BHR group. In both groups, there is an increase in chromosomal aberrations correlating with the change in metal ion level. At six months, there is an increase in aneuploidy though at 12 months, there is an increase in tetraploidy in comparison to pre operative chromosomal aberrations. This is the first study of its kind to demonstrate a correlation between chromosomal aberrations with changes in metal ion levels in patients with metal on metal hip prostheses. This continues to draw attention to the potential side effects of metal bearings in hip arthroplasty.

Date: 2010-09-02

Session: General Orthopaedics - Management in Orthopaedics

Time: 08:00-09:30

Room: F1

Abstract number: 25049

OPTIMIZATION OF A TEACHING CONFERENCE

William HARRIS

Massachusetts General Hospital, Boston (UNITED STATES)

All of us are either orthopaedic teachers or learners. But, scant attention focuses on optimizing teaching conferences. Socratic techniques are best, but certain guidelines optimize teaching conferences. The first rule is - Never Give Away the Answer, such as Next is a case of eosinophilic granuloma. That is an educational disaster. Second, Titrate the question appropriately to the level of the student, neither markedly below nor above their capacity, but teaching situations should also challenge the student. Thirdly, It is Not Necessary For The Student To Know The Answer. What is necessary is that the student to try to think. Fourthly, Probe. Probe the source of the reply, the quality of the reply and probe alternate answers. Probe the thought process behind the reply and the decision making process itself. Fifth, Teach Data Gathering. Teach how to gather data, how to manage data deficiencies and conflicts in data. Sixth, teach What are you going to do when you don't know what to do. In the operating room, this problem is not a conceptual exercise. Therefore, teach it in the conference room. In summary, surgical conferences modify human behavior. They underlie best medical practices. Key features to successful Socratic conferences are: Never give away the answer Titrate the question to the level of the student. Require the student to try and to think. Probe factual information, thought processes, and decision making. Teach data gathering. Teach what to do when you don't know what to do.

Date: 2010-09-02

Session: General Orthopaedics - Management in Orthopaedics

Time: 08:00-09:30

Room: F1

Abstract number: 24923

**MISDIAGNOSIS AND DELAYED DIAGNOSIS IN ORTHOPAEDICS
– EVALUATION OF INCIDENT REPORTS AT A JAPANESE HOSPITAL**

Takashi YAMAZAKI, Yoshiyasu KOKUBO

Musashino Red Cross Hospital, Tokyo (JAPAN)

Introduction: Few reports exist about misdiagnosis in Orthopaedic practice, although many reports discuss individual Orthopaedic conditions. Our 611 beds hospital adopted an incident report system as a tool of medical risk management. Many diagnostic problems have been found through its use, and here we publish the Orthopaedic results to emphasize the reality of misdiagnosis. Methods: We retrospectively identified and evaluated 571 incident reports submitted by orthopedists from 1997 to 2008. Results: Ninety-nine reports concerned diagnosis: 30 non-Orthopaedic diseases, 21 fractures, 20 infections, 13 tumors, 8 spine disease and 7 other disorders. Correct diagnosis was made after re-examination by the same physician in 58 cases, with correction by another physician in 41 cases. In 77 cases, estimated prognosis was the same as if correctly diagnosed in timely fashion, but prognosis was worse in 22 cases. Causes of misdiagnosis varied widely; one was lack of physician knowledge, but another involved negligence in not checking ordered test results. Some misdiagnoses should have been avoided because textbooks urge physicians not to overlook the possibility; examples included Pancoast tumor, scaphoid fracture, Galeazzi fracture, and pneumothorax. Some errors may have been due to physician working conditions or the medical triage system. Conclusions: Patients who visit hospital Orthopaedic departments depend on the structure of the medical system, but our results show it is important to comprehensively examine the patient as often as necessary, to check test results, and to consult with others to prevent misdiagnosis.

Date: 2010-09-02

Session: General Orthopaedics - Management in Orthopaedics

Time: 08:00-09:30

Room: F1

Abstract number: 26456

INTERNET USE BY ORTHOPAEDIC OUTPATIENTS

Joseph BAKER¹, James GREEN², Synnott KEITH¹, Michael STEPHENS¹, Ashley POYNTON¹, Kevin MULHALL¹

¹*Mater Misericordiae University Hospital, Dublin (IRELAND)*, ²*University of Otago, Dunedin (NEW ZEALAND)*

Introduction: Over 60% of people in the Republic of Ireland now have access to the internet. We aimed to assess level of access to the internet within our practice population and gauge the level of internet use by these patients and ascertain what characteristics define these individuals. Method: A questionnaire based study. Patients attending a mix of outpatient clinics were invited to complete a self-designed questionnaire. Details collected included basic demographics, education level, number of clinic visits, history of surgery, previous clinic satisfaction, body area affected, whether or not they had internet access, health insurance and by what means had they researched their orthopaedic complaint. Results: 292 completed the questionnaire (146 M). 17 were incomplete and excluded from analysis. Multiple logistic regression found younger age (O.R. 2.22 in 20-35 age group), possession of health insurance (O.R. 2.65) and higher levels education (O.R. 8.22 for tertiary) were all significantly associated with a higher level of access to the internet. Among those with internet access, a second regression analysis showed that a positive history of surgery (O.R. 2.82) and possession of a trade qualification (O.R. 5.15) were the best predictors of internet use. Conclusion: We found a level of access comparable with national statistics. It was consistent with previous studies showing younger and better educated had greater access. We must be aware access is not available to everyone in the community if we are to provide information via this medium.

Date: 2010-09-02

Session: General Orthopaedics - Management in Orthopaedics

Time: 08:00-09:30

Room: F1

Abstract number: 25790

**MITIGATING GLOBAL MUSCULOSKELETAL BURDEN THROUGH
TRANSNATIONAL ACADEMIC COLLABORATION: IGOT**

Richard COUGHLIN, Jonathan PHILLIPS, Thomas PENOYAR, Amber CALDWELL,
Richard GOSSELIN, Harry JERGESEN

*Institute for Global Orthopaedics and Traumatology: UCSF+SFGH, San Francisco
(UNITED STATES)*

Musculoskeletal disease and injury is recognized as a growing epidemic in low-and middle-income countries (LMICs), with trauma care rapidly becoming a global public health priority. Seldom resulting in death, musculoskeletal injury is a substantial cause of morbidity and life long disability with tens of millions injured or disabled annually. Estimates hold that 11% of global disability adjusted life years (DALYs) are amenable to surgery, with injuries comprising 38%.¹ LMICs suffer disproportionately, with two to five times the incidence of extremity injuries compared to high-income countries. ² In attempt to mitigate the global musculoskeletal burden, especially in LMICs, a paradigm shift has begun. Interested parties are focusing less on traditional provision of material and surgical service, and increasingly on building infrastructure and capacity. Generating sustainable solutions like orthopaedic education initiatives has become top priority. The Institute for Global Orthopaedics and Traumatology (IGOT) at UCSF has chosen an intervention model focused on global academic partnerships to build infrastructure, allowing each country to build its own capacity, address it's own problems and answer its own clinical and policy questions. The IGOT mission is threefold: - Build relationships focused on academically driven initiatives that promote synergistic collaboration for evidence based research. - Analyze determinants of inequity in the musculoskeletal disease and injury burden within underserved populations - Develop recommendations and strategic action plans to mitigate the burden. Partnerships have been established in So-Africa, Nicaragua, Afghanistan, and Uganda working towards mutual beneficial goals. In each locale, IGOT will catalyze capacity building to strengthen musculoskeletal healthcare systems.

Date: 2010-09-02

Session: General Orthopaedics - Management in Orthopaedics

Time: 08:00-09:30

Room: F1

Abstract number: 26131

SURGICAL SAFETY CHECKLISTS: AUDIT OF NPSA AND WHO CHECKLIST USAGE

Gill SUKHDEEP, Sunny DEO, Matt OWEN

Great Western Hospital, Wilts (UNITED KINGDOM)

Aim: To assess and quantify the improvement of surgeon-confirmed identification of patients prior to and after the introduction of the W.H.O. surgical safety checklist. **Method:** We looked at the perioperative notes of elective patients having orthopaedic elective operations before and after the implementation date of the W.H.O. surgical safety checklist. Prior to this time, the hospital was meant to be following NPSA (National Patient Safety Agency) guidelines for safe practice. **Results:** Prior to the surgical safety checklists being used, no orthopaedic surgeons had documented whether they had checked the patient pre-operatively. After introduction of the checklists, there was an immediate and sustained use of the checklist; 87% of patients had a full surgical safety checklist completed by all parts of surgical team. **Discussion:** There is a documented iatrogenic injury rate of 6-13% a year following surgery, with the largest proportion due to orthopaedic operations. The new Surgical Safety Checklist has been introduced by the World Health Organisation in a bid to improve surgical safety. The checklist has been shown to improve patient safety, reduce operating time with improved communication in the operating theatre and ensures instructions for the postoperative period are given in a timely fashion. **Conclusion:** The new surgical safety checklist is easy to implement, has high early uptake and satisfaction, and is being used more than the previous NPSA guidelines, but is still undergoing local modifications. We recommend its use and development.

Date: 2010-09-02

Session: General Orthopaedics - Management in Orthopaedics

Time: 08:00-09:30

Room: F1

Abstract number: 26149

TONK SCORE; AN OBJECTIVE METHOD OF ANALYSING MEDICAL NOTES

Adele Elizabeth SAYERS, Zeeshan KHAN, Iain CHAMBERS

Trauma and Orthopaedic department, Scunthorpe (UNITED KINGDOM)

Good medical record keeping is essential for medicolegal, research and audit purposes. The Royal Colleges and the General Medical Council (UK) have published guidelines for best practice. A need was felt to devise an objective method of analysing trauma & orthopaedic case note quality, which is why we propose the Trauma & Orthopaedics Notes Keeping (TONK) score. This system is specialty specific and tries to eradicate the weaknesses in a previously published generic scoring system. A total score of 100 is assigned to each firm from the beginning and marks are deducted for missed documentation. 2 sets of notes are randomly selected from discharged patients per firm, one from trauma and one from elective surgery, each having at least 2 entries. Each case note is given 50 marks and the total deduction for both case notes are then subtracted from the total score of 100. The TONK score has four major parts including initial clerking, subsequent entries, discharge letter and an objective system of scoring the legibility of medical notes. Each subset has further subsets with scores allocated in order of importance. This system has been in use in our department for assessing medical notes and is a fixed agenda in audit meetings. This has created a healthy competitive environment between firms in the department, resulting in a marked improvement in medical notes quality. This is an easy and reliable tool and to the authors knowledge there is no other published scoring systems for Trauma & Orthopaedic medical notes keeping.

Date: 2010-09-02

Session: General Orthopaedics - Management in Orthopaedics

Time: 08:00-09:30

Room: F1

Abstract number: 24310

POST-OPERATIVE NOTES: DO WE WRITE ENOUGH?

Paraskumar MOHANLAL, Sunil JAIN

Medway Maritime Hospital, Medway (UNITED KINGDOM)

INTRODUCTION: We present the results of a completed loop of an audit performed against the RCS Good Surgical Practice 2008 guidelines for adequacy of operative notes. **MATERIALS AND METHODS:** A prospective audit was performed with random selection of 50 case notes from two Orthopaedic wards. The results suggested that our operative notes did not confirm to RCS guidelines. Hence a generic template was introduced confirming to RCS guidelines and 6 months later the audit was repeated to analyse the change in practice. Fifty random case notes were selected to avoid any bias, and data collected with the standard proforma used earlier. **RESULTS:** All operative notes had the correct Name, Hospital number, details of the surgical team, type, site and side of the procedure. However, there was no change in the entry for dates of the surgical procedure with two notes having wrong dates. Documentation of the name of anaesthetist improved from 40 to 47 notes, type of anaesthesia from 29 to 34, intra-operative findings from 40 to 48, intra-operative problems from 14 to 20 and details of prosthesis used from 35 to 42 notes. The number of typed notes improved from 78%-88% and the number of notes with signature of the surgeon improved from 76-84%. **CONCLUSION:** Accurate and adequate documentation in the operative notes is essential. This audit cycle with implementation of generic template has resulted in significant improvement in the operative notes confirming to RCS Good surgical practice guidelines.

Date: 2010-09-02

Session: General Orthopaedics - Management in Orthopaedics

Time: 08:00-09:30

Room: F1

Abstract number: 25067

FIRST-YEAR MORTALITY FOLLOWING HIP FRACTURE SURGERY AND PREOPERATIVE USE OF LOW-DOSE ACETYLSALICYLIC ACID: A SUBGROUP ANALYSIS OF A RANDOMIZED CONTROLLED TRIAL

Annika KRAGH EKSTAM, Isam ATROSHI, Markus WALLDÉN, Anna APELQVIST
Dep of Orthopaedics, Kristianstad (SWEDEN)

Background: Hip fracture (HFx) is associated with high first-year mortality. Cardiovascular diseases requiring long-term anticoagulant medication are common in elderly patients. Objective: Study relationship between first-year all-cause mortality in HFx patients and preoperative use of low-dose acetylsalicylic acid (LdAA). Design: Subgroup analysis of mortality in a randomized controlled trial (RCT) that showed lack of efficacy of a pneumatic compression bandage in reducing bleeding. Patients and Methods: 288 patients (>50 years) with HFx admitted for surgery participated in the RCT. Subgroup analysis of 255 patients, 118 (46%) were on LdAA and 137 (54%) not on LdAA presurgery. All-cause 30-day, 90-day, and 1-year mortality was ascertained and compared in patients with or without LdAA treatment. Logistic regression adjusted for baseline variables (age, sex, NSAID, ASA, hemoglobin, type of surgery, comorbidities). Results: 30-day mortality in LdAA-treated patients was 12% (n=14). Non-treated 2% (n=3), 90-day mortality was 18% (n=21) and 4% (n=6), and 1-year mortality 30% (n=35) and 10% (n=14), respectively. Adjusted mortality risk ratio (95% CI) at 30 days was 5.4 (1.04-28.5), 90 days 3.1 (1.01-9.3), and 1 year 2.8 (1.3-6.3). Cardiac disease predicted increased 30-day (p=0.032) and 90-day mortality (p=0.006). Conclusion: Hip fracture patients on LdAA before surgery have significantly higher all-cause mortality during first year after surgery.

Date: 2010-09-02

Session: General Orthopaedics - Management in Orthopaedics

Time: 08:00-09:30

Room: F1

Abstract number: 23942

HEALTH RELATED QUALITY OF LIFE (EQ-5D) BEFORE AND AFTER ORTHOPAEDIC SURGERY

Karl-Åke JANSSON¹, Fredrik GRANATH²

¹Department of Molecular Medicine and Surgery, Section of Orthopaedics, Karolinska Institutet, Stockholm (SWEDEN), ²Karolinska Institutet, Department of Medicine Unit of Clinical Epidemiology, Stockholm (SWEDEN)

Purpose: The aim of this study was to report the pre- and postoperative HRQOL outcome by the EQ-5D instrument in a cohort of patients operated on for elective orthopaedic indications. **Methods** EQ-5D data from 2444 patients operated on for orthopaedic indications at the department of orthopaedic surgery at Karolinska University Hospital 2001-2005 were used. A comparison between this cohort and a Swedish EQ-5D population survey was also performed. **Results:** The mean EQ-5D index score improved from 0.54 to 0.72. Total hip and knee arthroplasty, operations related to a previous surgery, trauma related procedures and rheumatoid arthritis surgeries have preoperative EQ-5D index scores 0.48 to 0.52. All these groups show significant improvement in scores (0.63 to 0.80). Patients with tumours or elbow/hand diseases demonstrate higher preoperative scores 0.66-0.77. Postoperatively these groups show no significant changes. In the majority of patients the EQ-5D index score improved but did not reach the level reported by an age- and gender matched population sample (mean difference 0.11). **Conclusion:** Orthopaedic surgically treated patients had low EQ-5D scores preoperatively but the majority experienced improved HRQOL. In the future it will be possible, but not easy to use the EQ-5D instrument as a compliment in clinical priority assessment.

Date: 2010-09-02

Session: General Orthopaedics - Management in Orthopaedics

Time: 08:00-09:30

Room: F1

Abstract number: 23393

QUALITY OF REFERRALS FROM MINOR INJURIES UNIT

Santosh VENKATACHALAM, Paul DIXON

City Hospitals Sunderland, Sunderland (UNITED KINGDOM)

Minor injuries unit are becoming increasingly popular in a variety of locations as a means of front-ending emergency and urgent care services with an on-appointment primary care service in the UK. These are generally led by emergency nurse practitioners. Patients would be able to walk in without prior assessment and get treated for minor injuries. We performed a prospective audit on the quality of referrals from a minor injuries unit at our hospital over a period of 7 days during a trauma week. All referrals from minor injuries unit were identified. The diagnosis made on referral was compared to the diagnosis of the orthopaedic team in the trauma clinic. There were 33 patients who fulfilled the inclusion criterion. In 23 out of the 33 patients, the diagnosis made by the minor injuries unit matched with the diagnosis made by the orthopaedic team in the hospital. This indicates almost 70% diagnostic accuracy by the minor injuries unit. This audit indicates that minor injuries unit are able to identify injuries that need referral on to the hospital in majority of the cases. This could be improved further by education through lectures, case discussion or hospital attachment of the nurse practitioners during trauma clinic.

Date: 2010-09-02

Session: General Orthopaedics - Management in Orthopaedics

Time: 08:00-09:30

Room: F1

Abstract number: 26235

A NOVEL MODEL FOR LEAN PRODUCTION CLINICAL IMPROVEMENTS AND A SUPPORTING INTERNATIONAL DATABASE FOR CLINICAL HEALTHCARE IMPROVEMENT IN GENERAL

Erik VESTBERG, Kerstin CARLSSON, Dan JOHANNESSON

Kalmar County Hospital, Kalmar (SWEDEN)

When we systematically developed the new award winning fast track Lean Hipcare process for patients with hip fractures at Kalmar County Hospital in Sweden 2008-2009, we also developed a model for handling subprojects and the implementation of new routines. A whiteboard was designed for visualisation of ongoing projects and results, and a second whiteboard to collect ideas and problems for future improvement projects. We designed concise forms to enhance project planning, reports and documentation. This model for systematic clinical improvement is now generally adopted at the Orthopaedic Department in Kalmar County Hospital. Our model for systematic clinical improvement (i) early solves problems that otherwise would give drawbacks later, (ii) involves all employees concerned and consequently yields a greater acceptance and a smoother implementation phase (iii) contributes to a continuously learning organization. The model ensures that the County Council's goal, that all employees must be involved in the actual development of the healthcare production, is met. Our ambition is to facilitate the adoption of this model for clinical improvement in other departments at Kalmar County Hospital and other hospitals around the world, as well as enabling international spread of other successful cases of clinical improvements performed at hospitals around the world. Therefore the design of an international database for clinical healthcare improvement has started.

Date: 2010-09-02

Session: General Orthopaedics - Management in Orthopaedics

Time: 08:00-09:30

Room: F1

Abstract number: 25567

SHO'S BETTER AT CONSENT THAN CONSULTANTS

Yusuf MIRZA, Sibtain HUSSAIN

Lancaster Royal Infirmary, Lancaster (UNITED KINGDOM)

Consent is an essential part of any operative procedure. In the UK the general consensus is that patients should be consented by, ideally the operating surgeon, if not by an adequately qualified individual who is thoroughly aware of the indications, complications and likely outcome of the procedure. Our study considered consent in patients having a total hip replacement (THR) in our busy orthopaedic department. We used a standard British Orthopaedic Association consent form as a template to compare the accuracy of consent forms between consultants, registrars, associate specialists and senior house officers (SHO's). We paid particular attention to the difference in common (joint dislocation, DVT etc.) and rare (nerve damage, PE, death etc.) side effects documented on the consent forms. We evaluated a total of 55 THR consent forms. Of these 24 were completed by consultants, 3 by registrars, 12 by associate specialists and 16 by SHO's. Our results revealed that consultants were especially poor at including side effects such as bleeding (0%), pulmonary embolism (8%), nerve damage (29%) and blood vessel damage (29%) when compared to SHO's, bleeding (81%), pulmonary embolism (81%), nerve damage (94%), blood vessel damage (75%). Consultants only scored higher than juniors in joint dislocation (96% compared to 75%). This is very surprising as the SHO's appear to be better at recording complications on consent forms than consultants. Standardised consent forms used by all should be considered for implementation in orthopaedic departments to ensure all patients are fully informed about their surgery.

Date: 2010-09-02
Session: Infections
Time: 08:00-09:30
Room: F2

Abstract number: 23299

A REVIEW OF NECROTIZING FASCIITIS IN THE EXTREMITIES

Jason Pui Yin CHEUNG

Queen Mary Hospital, Hong Kong (HONG KONG)

Objective: To review currently available evidence on the epidemiology and management methods of necrotizing fasciitis in particular reference to Hong Kong. Data Sources and study selection: MEDLINE, Pubmed and Cochrane Library searches of local and internationally published English journals between years 1990 to 2008 regarding necrotizing fasciitis. Data extraction: All articles involving necrotizing fasciitis in Hong Kong were included in the review. Discussion: The incidence of necrotizing fasciitis in Hong Kong and around the world is on an increasing trend. Hong Kong being a coastal city is a major risk factor shown by the high prevalence of positive vibrio culture growths in 83.3% of cases. This rapidly progressive infection is a major cause of concern due to its high rates of morbidity and mortality. Up to 93% of patients with this condition are admitted to the Intensive Care Unit and many patients still die by septic complications. Early recognition and treatment of necrotizing fasciitis is important but is difficult because of its similarities with other soft tissue disorders like cellulitis. Repeated surgical debridement or incisional drainage remains essential to survival. Radical debridements in the form of amputations and disarticulations are vital in 45.8% of patients. Many articles report that the timing of first fasciotomy and radical debridement within a window period of 24 hours from symptom onset is associated with significant improvement in survival. Clinicians must have a high index of suspicion for necrotizing fasciitis and maintain a low threshold for tissue biopsy and surgery.

Date: 2010-09-02
Session: Infections
Time: 08:00-09:30
Room: F2

Abstract number: 23294

**EVALUATION OF SENSITIVITY AND SPECIFICITY OF 99mTc-CIPROFLOXACIN
IN LOCALIZING SKELETAL TUBERCULOSIS**

Vishal KUMAR, Vijay GONI
PGIMER, Chandigarh (INDIA)

BACKGROUND: Radiological and microbiological examinations are mainstay for diagnosis of tuberculosis (TB). Moreover, culture for confirmation of TB takes 4-8 weeks to deliver a result. Thus, a need for invasive or semi-invasive methods, which will be reliable and quick, is warranted. **METHODS:** 15 patients with history suggestive of skeletal tuberculosis underwent three phases of 99mTc-MDP bone and 99mTc-ciprofloxacin scanning. The lesion to background ratio of the radiotracer was derived from 1h, 4h and 24 h static anterior images. **RESULTS:** Statistical analysis revealed 80% sensitivity, specificity 60%, positive predictive value 50%, negative predictive value of 86% and a diagnostic accuracy of 67%. **CONCLUSION** We recommend using 99mTc-Ciprofloxacin scintigraphy in clinically suspicious, symptomatic cases of skeletal tuberculosis.

Date: 2010-09-02
Session: Infections
Time: 08:00-09:30
Room: F2

Abstract number: 23468

MANAGEMENT OF POSTTRAUMATIC LONG BONE DEFECTS COMPLICATED WITH OSTEOMYEILITIS USING POLYLOCAL EXTRAFOCAL OSTEOSYNTHESSES METHOD

Mohd. Mussa WARDAK¹, Emal WARDAK²

¹*Al-Haj Prof Mussa Wardak Hospital, Kabul (AFGHANISTAN)*, ²*Wazir Akbar Khan Teaching Hospital, Kabul (AFGHANISTAN)*

Long bone defects complicated with osteomyelitis and shortening is still one of the most challenging issues for trauma surgeons, the method which are describing has been used on 1127 patient over period of 30 years in Central Medical Military Academy, Kabul and Prof. Mussa Wardak Hospital, Kabul. The technique consists of a thorough debridment of the infected part and acute shortening and fixing the limb with ring external fixator and performing more than one osteotomies for achieving the limb length back, the advantages of performing more than one osteotomy are many but important ones are, reducing the duration of treatment drastically, more neoosteogenesis means more of neoangiogenesis which is a very good treatment for eradication of infection, we have performed in these patients , 2, 3, even four osteotomy at one go using the Gigli saw technique. Our results showed us that in 72.2% of the cases we had achieved good clinical results meaning by union and length and physiological function of the adjacent joints. In 20.6% of the cases the results were fair and in remaining 7.2% results were bad which either caused death or amputation of the part. Our obtained results encourages recommending this technique for use in such types of conditions.

Date: 2010-09-02
Session: Infections
Time: 08:00-09:30
Room: F2

Abstract number: 23186

ARE WE MANAGING ACUTE KNEE EFFUSION WELL?

Umer BUTT¹, Riaz AHMED², Sajid MEHMOOD³, Azhar HUSSAIN

¹North Bristol NHS Trust, Bristol (UNITED KINGDOM), ²Western General Hospital, Western Supermere (UNITED KINGDOM), ³Yeovil District Hospital, Yeovil (UNITED KINGDOM)

Background: Non-traumatic knee effusion is a common referral to an on-call orthopaedic team, yet this rarely requires surgical intervention. The aim was to investigate the management of patients with suspected septic arthritis and secondly to investigate the proportion of patients with proven crystal arthropathy (as identified on Polarized light microscopy), who received a rheumatology referral. Materials and method: A total of 180 patients were identified. Patients with previous history of trauma, on antibiotic treatment, known crystal arthritis or acute rheumatoid arthritis were excluded, leaving a total of 60 patients. We analysed their clinical details, microscopic and blood results, conservative or surgical management and subsequent follow-up. Data was analysed using SPSS for windows, with significance at $p < 0.05$. Results: Twenty six were admitted and given antibiotics. Eight patients had arthroscopic washout because of persistent concern of septic arthritis. Four patients had positive growth of bacteria on synovial fluid microscopy. Eight patients had positive crystals identified on polarized light microscopy. 25% of patients who showed crystals were referred to rheumatologist. Reduced knee flexion, pyrexia, a raised white cell count and CRP count correlated significantly with a positive gram stain for organism. Conclusion: We recommend if no organism is identified on 48 hour culture, antibiotics should be discontinued unless the patients are clinically septic. Optimal management of crystal arthropathy requires rheumatology referral which we only achieved in 25% of patients. From this retrospective study we have changed over departmental policy and strongly recommend stringent follow-ups of crystal results and appropriate referral.

Date: 2010-09-02
Session: Infections
Time: 08:00-09:30
Room: F2

Abstract number: 26568

OUTCOME OF SINGLE STAGE TREATMENT OF CHRONIC OSTEOMYELITIS

Jagwant SINGH, S. MARWAH, A. PLATT, G. BARLOW, R. RAMAN, H. K. SHARMA
Hull Royal Infirmary, Hull (UNITED KINGDOM)

Aim: Chronic osteomyelitis still remains challenging and expensive to treat inspite of advances in antibiotics and operative techniques. We present our experience with free muscle flap after radical debridement of chronic osteomyelitis, performed as a single stage procedure. **METHODS:** We retrospectively identified eight patients (5 Females) with mean age of 63 yrs (Range 40- 71 yrs) Case notes were reviewed for co morbidities, Pre and post treatment inflammatory markers (plasma viscosity and CRP) and clinical staging. Mean follow up was 3 yrs (Range 1- 6 yrs) All the patients were jointly operated by orthopaedic and plastic surgeons and underwent thorough debridement and muscle flap (Seven free flaps and one rotational flap) in the same sitting. All the patients were reviewed regularly by plastic and orthopaedic surgeons. Seven patients had free Gracilis flap and one had Triceps flap. Clinical assessment of reinfection was made on presence of erythema and wound discharge. Primary outcome measure was resolution of infection. **RESULTS:** All patients had full resolution of osteomyelitis as evident by clinical examination and inflammatory markers. One patient had minor wound discharge at three years which settled with conservative management. One further patient developed eczematous dermatitis around the flap which was managed successfully by the dermatologist. **CONCLUSIONS:** We believe this to be the only study in which both the procedures (debridement and muscle flap) are performed in one sitting. This technique is a successful and useful addition to the armamentarium of surgeons in the management of chronic osteomyelitis.

Date: 2010-09-02
Session: Infections
Time: 08:00-09:30
Room: F2

Abstract number: 23297

PROGNOSTIC FACTORS OF MYCOBACTERIUM MARINUM INFECTION OF THE HAND AND WRIST

Jason Pui Yin CHEUNG

Queen Mary Hospital, Hong Kong (HONG KONG)

Introduction: There is inadequate information on prognostic factors of Mycobacterium marinum infection in the literature. The objective of this study is to identify prognostic factors that affect the functional outcome of this condition. Methods: 166 patients treated from 1981 to September of 2009 were included in this prospective study. Inclusion criteria include exposure to marine environment, history of trauma and positive histology of granulomata by biopsy or culture for mycobacterium marinum. Exclusion criteria include positive culture of organisms other than mycobacterium marinum. Statistical analysis was performed by SPSS version 16.0. Mann-Whitney U nonparametric test and X2 test were used. A P-value of <0.05 was significant. Results: Positive marine exposure was associated with earlier presentation (median of 2 months versus 3.5 months, $p=0.001$) and less resulting deformity (no deformity versus residual stiffness, $p=0.03$). Incorrect diagnosis was seen in 100 (60.2%) patients and usually presented late (41 of 98 patients presented later than 3 months). The use of steroid injections was associated with incorrect diagnoses ($P=0.000$). Patients given steroid injections prior to admission resulted in more debridements (2 versus 1; $P=0.026$), more deformity (stiffness versus no deformity; $P=0.000$) and longer antibiotic duration (7 months versus 6 months; $P=0.017$). Conclusion: Positive marine exposure was associated with earlier consultations and this lead to less deformity. Misdiagnoses such as trigger finger would lead to intralesional steroid injections, ultimately prolonging antibiotic duration, leading to more debridements and further residual deformities.

Date: 2010-09-02
Session: Infections
Time: 08:00-09:30
Room: F2

Abstract number: 26207

THE USE OF ANTIMICROBIAL PEPTIDES IN THE PREVENTION OF BIOFILM FORMING S. EPIDERMIDIS STRAINS ASSOCIATED WITH ORTHOPAEDIC INFECTION

Stephanie SANDIFORD¹, Peter KAY², Mathew UPTON¹

¹*The University of Manchester, Manchester (UNITED KINGDOM)*, ²*Wigan and Leigh NHS Trust, Wigan (UNITED KINGDOM)*

Objectives: Staphylococcus epidermidis is a major causative agent of prosthetic joint infections. One of the major pathogenic attributes of this organism is the ability to form biofilms, making it extremely resistant to currently available antimicrobial therapies. Antimicrobial peptides represent a novel group of agents that show good activity towards biofilm forming S. epidermidis strains. The aim of the current study was to assess the effect of antimicrobial peptides gallidermin and novel peptide NI01 on the growth of reference and clinical isolates of S. epidermidis on polymethylmethacrylate (PMMA) cement. **Methods:** A novel biofilm flow through model was used to determine the effect of the peptides on growth of the strains allowing the assessment of planktonic and biofilm cells. The antimicrobial peptides were incorporated into 4mm diameter PMMA beads (1% w/w) created using a specially developed poly (tetrafluoroethylene) (PTFE) mould. 10 beads were used per housing unit for each of the different treatments. Each of the 10 beads was inoculated with 6×10^8 cfu/ml of strains RP62a, 53 and 156. The growth of the strains was then monitored over a period of five days and the effect of the peptides assessed. **Results:** Both gallidermin and NI01 caused a significant decrease in the growth of S. epidermidis reference strain RP62a and clinical isolates 53 and 156 ($P < 0.05$). **Conclusions:** The results obtained in this study clearly identify the effectiveness of antimicrobial peptides against S. epidermidis and highlights their potential use in the orthopaedic setting.

Date: 2010-09-02
Session: Infections
Time: 08:00-09:30
Room: F2

Abstract number: 25754

AGGRESSIVE EARLY DEBRIDEMENT CAN BE SUCCESSFUL FOR INFECTED TOTAL KNEE ARTHROPLASTY

Mohamed SUKEIK, Mike DOBSON, Bridgens ANNA, Fares Sami HADDAD
University College London Hospital, London (UNITED KINGDOM)

Introduction: Up to 2% of total knee arthroplasties (TKA) are still complicated by infection. This leads to dissatisfied patients with poor function, and has far-reaching social and economic consequences. The challenge in these cases is the eradication of infection, the restoration of full function and the prevention of recurrence. We report the outcome of prosthesis sparing early aggressive debridement in the acutely infected TKA. Methods: We studied 29 consecutive patients referred with acutely infected TKA (18 primaries, 11 revisions) which occurred within 6 weeks of the index operation or of haematogenous spread. Microbiology confirmed bacterial colonization in all cases with 20 early post-operative infections and 9 cases of acute haematogenous spread. All patients underwent aggressive open debridement, a thorough synovectomy and a change of insert. Antibiotics were continued until inflammatory markers and the plasma albumin concentration returned to within normal limits. Results: Three patients required multiple washouts. 8 patients needed a two stage revision. 21 patients returned to their expected functional level without removal of the implants and with no radiographic evidence of prosthetic failure. At a minimum 2 years follow-up, we had a 72% infection control rate. The outcome was significantly better in patients treated in the first 120 hours after presentation. Discussion and Conclusion: Our data suggests that there is a role for early aggressive open debridement in acute infections after TKA with an excellent chance of prosthesis salvage.

Date: 2010-09-02
Session: Infections
Time: 08:00-09:30
Room: F2

Abstract number: 24363

**RESULTS OF TOTAL HIP REPLACEMENT IN ACTIVE TUBERCULOSIS
– A CLINICAL STUDY**

Chandra YADAV¹, Ashok KUMAR¹, Devdatt NEOGI², Shah KHAN¹, Sameer NARANJE¹, Shishir RASTOGI¹

¹*All India Institute of Medical Sciences, Delhi (INDIA)*, ²*PGMESI, Delhi (INDIA)*

Background: Osteoarticular tuberculosis (TB) of hip is on the rise and is associated with significant morbidity due to joint destruction and deformities. Material & Methods: We retrospectively reviewed 20 patients with an average age of 45 years who had advanced stages of hip destruction secondary to mycobacterium TB and who were treated with primary THA and prescribed perioperative antituberculous medication for 12 to 18 months postoperatively. Diagnosis in all these patients was confirmed by histopathology and culture. Results: The minimum followup was 29 months (average, 41 months; range, 29-58 months). We observed no reactivation of TB in 20 patients who had Harris hip scores ranging from 86 to 97. One patient who postoperatively did not comply with the antituberculous chemotherapy had reactivation and superimposed infection through a non-healing sinus tract; that patient underwent component removal and resection arthroplasty. Conclusion: Advanced tuberculosis even after healing leaves significant morbidity which waste the productive time of life particularly in young patients due to residual hip stiffness & deformity. Adequate debridement with antituberculous therapy does not have any adverse effects on the outcome of total hip arthroplasty. THA in the tuberculous hip has a low risk of reactivation and produces good functional results.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Trauma Upper & Lower Extremities / Miscellaneous

Time: 10:45-12:15

Room: F2

Abstract number: 25733

PURE ELBOW DISLOCATION IN CHILDREN: A REPORT OF 5 CASES

Sarper GURSU¹, Timur YILDIRIM², Bilal DEMIR², Turgay ER², M Ali DEVECI¹, Vedat SAHIN²

¹*Siirt State Hospital, Istanbul (TURKEY)*, ²*Baltalimani Bone and Joint Diseases Hospital, Istanbul (TURKEY)*

Traumatic elbow dislocation is a rarity in childhood and according to literature accounts for only 3-6% of all elbow injuries. Pure elbow dislocation is even more uncommon. In this paper we evaluated the results of closed reduction we have performed for 5 children with pure elbow dislocation. We have treated 5 boys with elbow dislocation. The mean age of the patients was 8,5 (5-12) years. The first patient was injured after a fall from a horse and the other 4 were injured in bicycle accidents. AP and lateral x-rays revealed pure elbow dislocation in all cases. The elbows were dislocated in the posterolateral direction in 3 cases and in the posteromedial direction in 2. All patients had isolated closed dislocations without any fractures. The children didn't have any neurovascular deficiency. The choice of treatment was closed reduction in all cases. The reduction was confirmed by x-rays. No neurovascular complications were observed following the reductions. The arms were put in long-arm plasters for 2 weeks and after removal of the plasters, immediate physical rehabilitation was initiated for each patient. In the last follow-ups, all patients had full range of motion and they were completely free of any symptoms. Pure elbow dislocation is extremely rare in the paediatric age group. Whenever such a case is seen careful radiological evaluation should be done not to lead to a delay in the diagnosis. Comparative x-rays could be helpful in eliminating accompanying fractures.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Trauma Upper & Lower Extremities / Miscellaneous

Time: 10:45-12:15

Room: F2

Abstract number: 24258

IPSILATERAL PROXIMAL AND DISTAL FOREARM FRACTURE/FRACTURE DISLOCATION IN CHILDREN

Sameer AGGARWAL¹, Sujit TRIPATHY¹, Ramesh SEN¹, Amit AGGARWAL²

¹*Postgraduate Institute of Medical Education and Research, Chandigarh (INDIA),*

²*AIIMS, New Delhi (INDIA)*

Background: Ipsilateral proximal and distal forearm fractures/fracture dislocations (Segmental fractures/fracture dislocations) are rare in children. Literature till date has only few case reports. We report fifteen such cases with details of their injury mechanics and management. Methods: Fifteen children with segmental forearm fractures were retrospectively analyzed. They were categorized into two groups depending on their proximal injury patterns. Children with Monteggia fractures/variant were grouped as A while those having diaphyseal fractures were grouped as B. The distal lesions were either metaphyseal fractures or epiphyseal separations or combination of these two in distal forearm. Eleven children of group A were managed conservatively, whereas three of four in group B required open reduction and internal fixation with Kirschner wire. Results: After 2.67 years of follow up, clinical outcome based on modified Boyd and Boals criteria was good in 8 and fair in 2 children of group A and good in 2 and fair in one child of Group B. Conclusion: The clinical outcome of pediatric-segmental forearm fractures is good (P=0.05) and need appropriate management depending on their fracture pattern. Unlike surgical interventions as per the previous reports, a conservative approach may provide good outcome in Monteggia fracture dislocation or its variant with associated distal forearm fractures. The surgical interventions should be reserved for diaphyseal forearm fractures with distal injuries, where close reduction can not be achieved or the fracture is unstable. Key words: Forearm fracture; Double level fracture; Paediatric fractures; Segmental fracture; Monteggia fracture

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Trauma Upper & Lower Extremities / Miscellaneous

Time: 10:45-12:15

Room: F2

Abstract number: 23917

PROXIMAL RADIUS AND ULNA COMBINED FRACTURES IN CHILDREN: LATE RESULTS OF TREATMENT

Theodoros BESLIKAS, Anastasios CHYTAS, Aleksandros NENOPOULOS, Vasilios GOULIOS, John GIGIS, John CHRISTOFORIDES

2nd Orthopaedic Department Aristotle University of Thessaloniki, Thessaloniki (GREECE)

Fractures of the proximal radius accompanied by fractures of the proximal ulna are always problematic because they are considered high-velocity injuries. The purpose of this study was to investigate and evaluate the long-term results of our cases of combined fractures. We retrospectively studied 45 children with combined fractures of the proximal end of the radius and ulna, who were treated in our department from 1984 to 1999. Of the total, 25 were boys and 20 were girls. The age of the patients ranged from 5 to 12 years. Fall on the outstretched hand with the elbow extended and valgus force being applied to the elbow was the most common mechanism. 35 patients were treated conservatively with plaster immobilization alone or closed reduction and plaster immobilization. 10 patients were treated surgically with open reduction and osteosynthesis of the radial fracture alone (4) or osteosynthesis of both fractures (6). After a mean follow-up period of 12 years, the results were satisfactory in most cases even though in some cases the radiographic appearance was very poor. 3 patients with poor results had mostly restriction in forearm pronation-supination. Poor results related with the patient's age (>10 years) and initial damages at the time of injury. Overgrowth of the radial head was a common finding in the patients who underwent surgery. Coexistence of fractures of the proximal radius and ulna aggravate the prognosis, whereas deformity of the proximal radius is of primary significance for the process of treatment.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Trauma Upper & Lower Extremities / Miscellaneous

Time: 10:45-12:15

Room: F2

Abstract number: 25781

MANAGEMENT AND OUTCOME OF PAEDIATRIC FEMORAL FRACTURES: 10 YEARS EXPERIENCE AT A LONDON TRAUMA CENTRE

Anna BRIDGENS, Jit MANGWANI, Shiv SHANKER, Steve KEY, Manoj RAMACHANDRAN, Matthew BARRY, Mark PATERSON

The Royal London Hospital, London (UNITED KINGDOM)

PURPOSE: The last two decades have witnessed a transition in the management of paediatric femoral fractures, with a shift from a more conservative approach to an increasing trend toward surgical intervention. In view of these changes we reviewed our experience at a London trauma centre with a broad based multicultural community over the past 10 years. **METHODS:** We present a retrospective study of the management and outcome of 224 paediatric femoral fractures between 1998 & 2008. Data was collected on patient demographics, clinical and radiological union, indication for operative stabilisation and need for open reduction, surgeon's experience and complications, and finally, functional outcome. **RESULTS:** We treated 224 paediatric femoral fractures in 220 patients (125 male, 95 female) with a mean age of 9.4 years. Mean duration of follow up was 3.8 years. We report 195 closed isolated femoral diaphyseal fractures resulting from low velocity injury, 14 open fractures, and 11 femoral neck fractures. 77 of the fractures were treated with early hip spica, 84 with elastic nails and 4 with external fixator. Complications include 5 malunions all within acceptable limits and 4 non unions requiring further intervention. 73% of operative interventions were performed by trainees, 20% by paediatric orthopaedic consultants, and the remainder by other consultant staff. The average hospital stay was 6 days. **CONCLUSIONS:** Early intervention has evolved to establish itself at the forefront of our management of paediatric femoral fractures, the consequences of which are far reaching in terms of hospital costing and patient satisfaction.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Trauma Upper & Lower Extremities / Miscellaneous

Time: 10:45-12:15

Room: F2

Abstract number: 26459

TREATMENT OF SUBTROCHANTERIC FRACTURES IN CHILDREN WITH ESIN

Vasileios GOULIOS, Theodoros BESLIKAS, Thomas PAPAGEORGIOU, Nikos PANOS, Ioannis GIGIS, Ioannis CHRISTOFORIDES

2nd Department Orthopaedics Aristotele University Thessaloniki General Hospital Gennimatas, Thessaloniki (GREECE)

Subtrochanteric femoral fractures are uncommon in children, consequently there are no good treatment guidelines in the literature. In subtrochanteric fractures, distal to the lesser trochanter, the proximal fragment is pulled into flexion, abduction, and external rotation. Small children sustain femur fractures usually after low energy injuries and because their femurs have a thick periosteum, fractures are stable and amenable for nonoperative treatment using a spica cast. Subtrochanteric unstable fractures are best treated operatively, with external fixator or a dynamic hip screw, a bridge plating with or without locked screws, rigid intramedullary nail or a retrograde elastic nail. In our department we prefer to use the retrograde elastic titanium nails because is a popular minimally invasive technique. Between 2006-2009 we treated operatively with this method 8 children, the average age 10 years old. The mechanism of injury was high energy in all cases, and the management of treatment was according to the principles of APLS. We achieved callus formation in all cases. In one case we changed the method to internal fixation with a LISS type plate, because the fracture was pathologic and the boy was too heavy. We also found that this method seems to respect the open physes. As a conclusion, earlier mobilization and more rapid return to function than with the nonoperative techniques, and less soft tissue disruption and smaller scars when compared with other surgical methods give us the chance to manage these fractures with ESIN.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Trauma Upper & Lower Extremities / Miscellaneous

Time: 10:45-12:15

Room: F2

Abstract number: 25706

SURGICAL TREATMENT OF ACUTE PATELLAR DISLOCATIONS AND CHRONIC PATELLAR INSTABILITY IN YOUNG PATIENTS

Mikhail GERASIMENKO, Eugene ZHUK, Stanislau TRATSIK

Belarusian State Medical University, Minsk (BELARUS)

The purpose of our research were the estimation and comparison of efficiency of traditional (open) and arthroscopic techniques of surgical treatment of patellar dislocations and chronic patellar instability in young patients. We reviewed 38 operations performed to 36 patients (22 girls and 14 boys, 23 left and 15 right knees) with acute patellar dislocations or chronic patellar instability since 1984 on the basis of children's traumatological-Orthopaedic department of 6th city clinical hospital of Minsk. 14 of 38 operations - arthroscopic lateral release, in 5 cases it was supplemented by applying of duplicature of medial portion of knee joint extensors (2 of them - by original methodic). Middle age of the operated patients was 14,2 years (range 5-25 years). The long-term postoperative results (from 3 month till 20 years) were available at 21 patients (11 from them underwent open operation, and 10 - arthroscopic). Results of open operations: 3 - excellent, 4 - good, 4 - satisfactory (knee pain most of the time, symptoms altered, further surgical treatment required in some instances). Results of arthroscopic operations: 10 - excellent. Thus, on the basis of ours experience of arthroscopic treatment of patients with acute patellar dislocations or chronic patellar instability and literature data, considering advantages of arthroscopic operations in comparison with open interventions, it is possible to conclude, that use of modern mini-invasive techniques allows to raise efficiency of treatment and to lower risk of complications.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Trauma Upper & Lower Extremities / Miscellaneous

Time: 10:45-12:15

Room: F2

Abstract number: 26518

ELASTIC STABLE INTRAMEDULLARY NAILING OF SUPRACONDYLAR FRACTURES OF FEMUR IN CHILDREN

Vasileios GOULIOS, Theodoros BESLIKAS, Kosmas SIDIROPOULOS, Anastasios CHYTAS, Nikos PANOS, Ioannis CHRISTOFORIDES

2nd department of Orthopaedics Aristotele University Thessaloniki, Gennimatas General Hospital, Thessaloniki (GREECE)

We report the use of elastic stable intramedullary nailing (ESIN) in 7 supracondylar fractures of distal part of femur in children of school age. Flexible rods are introduced antegrade through the subtrochanteric area in s-shaped way and the aim is to develop bridging callus. In distal, supracondylar fractures, the main deformity is extension as a result of gastrocnemius muscle pull on the distal main fragment. For this reason and for more primary stability of the knee joint we put a plastic splint for 2-3 weeks after the surgery. Early weight bearing is possible and is recommended. There was none case of bone infection and delayed union. Complications were minimal; the most common being minor skin ulceration caused by the insertion point. We also achieved a shorter hospitalisation. This minimally invasive technique with (ESIN) achieves earlier mobilization and more rapid return to function than with nonoperative techniques, and less soft tissue disruption and smaller scars when compared with other surgical methods.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Trauma Upper & Lower Extremities / Miscellaneous

Time: 10:45-12:15

Room: F2

Abstract number: 25891

SUPRACONDYLAR FRACTURES OF THE HUMERUS IN CHILDREN - RESULTS OF 10 YEARS OF SURGICAL TREATMENT

Sofia FERNANDES, Rui CERQUEIRA, José FRAGA, Tiago BARBOSA, João OLIVEIRA, Joel REIS

Centro Hospitalar do Alto Ave - Guimarães, Guimarães (PORTUGAL)

Introduction: Supracondylar humerus fractures in children are common. Fractures without displacement usually undergo conservative treatment, but the one displaced require surgery with open or closed reduction. The objective of this work is to analyze the fracture characteristics and compare the outcomes of the surgical techniques. Material and Methods: This study included 70 patients who had type IIa, IIb or III according to the Wilkins modification of the Gartland system and underwent surgical treatment (closed reduction and percutaneous fixation with 2 k-wires or open reduction and fixation with 2 cross k-wires), from January 1998 to December 2007. Outcomes were measured according to Flynn criteria. Elbow motion and carrying angles were compared according to surgical technique and fracture type. Results: There were 53 males and 17 females between 2 and 12 years (medium age 5,7) and with medium follow up of 3,5 years; 3% were type IIa fractures, 32% IIb and 65% III. 95% had extension type fracture and 5% flexion. The medium carrying angle were 4,46° in closed reduction and 7,6° in open. According to Flynn criteria the results in open reduction were excellent in 64% and good in 22%; and in closed were excellent in 34% and good in 33%. Discussion: Closed reduction should be tried even in type III because it permits a good outcome, but the reduction is not anatomic and had compromised carrying angles. Open reduction had worse outcome, lost of extension, but is indicated when the fracture is irreducible by closed methods.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Trauma Upper & Lower Extremities / Miscellaneous

Time: 10:45-12:15

Room: F2

Abstract number: 25184

ORAL RISEDRONATE AS TREATMENT OF OSTEOGENESIS IMPERFECTA

Nagy Ahmed SABET

Collage of Medicine Misr University for Science and Technology, Cairo (EGYPT)

Osteogenesis imperfecta (OI) is a heritable disorder. Patients tend to have fragility fractures from the mildest trauma and progressive skeletal deformities. There is no effective medical treatment for OIs. Bisphosphonates are synthetic analogues of pyrophosphate that inhibit bone resorption by their action on osteoclasts. Recently, beneficial effects of intravenous pamidronate treatment are reported in OI. However, this treatment requires frequent hospital admissions and is relatively expensive. Risedronate is an oral bisphosphonate effectively used in adults with osteoporosis. **Methods:** Between 2002 and 2005, 23 patients with OI were referred for bisphosphonate therapy. The various types of OI were classified using the Sillence criteria. All patients underwent baseline biochemistry, radiographic studies and bone mineral density measurements and quality of life score before and every six to twelve months after commencing therapy. Patients were commenced on oral risedronate (5mg every other day in patients below 6 years and every day to the others) along with calcium (500 mg/day) and followed up for a period of three years. Five cases had been operated for correction of deformities and/or fracture fixation. **Results:** Evaluation of the patients after three years of treatment revealed that fracture rate significantly decreased, bone density improved in each individual case. Serum Ca, P, ALP, and urinary Ca/Cr did not change significantly during treatment. All QOL markers, except for mobility score, improved in response to risedronate therapy. **Conclusion:** One can conclude that risedronate is effective, safe and practical alternative to intravenous bisphosphonates in treatment of children with OI.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Limb Lengthening / SCFE / Foot / Miscellaneous

Time: 13:30-15:00

Room: F2

Abstract number: 23355

ROLE OF FLEXIBLE INTRAMEDULLARY NAILING IN LIMB LENGTHENING IN CHILDREN. A COMPARATIVE STUDY

Dmitry POPKOV¹, Pierre LASCOMBES¹, Arnold POPKOV², Pierre JOURNEAU¹, Thierry HAUMONT¹

¹Hôpital d'Enfants, CHU Nancy, Vandoeuvre-lès-Nancy (FRANCE), ²Hôpital Clinique N81, Seversk, Tomsk region (RUSSIA)

INTRODUCTION: This study estimates results of use the flexible intramedullary nailing (FIN) in bone lengthening in children considering the duration of external fixation and complications. **MATERIALS AND METHODS:** Since 2001 we performed 294 bone lengthenings in 250 children. In group I (195 cases) the Ilizarov fixator alone was applied, in group II the Ilizarov fixator or TSF® (99 cases) were combined with FIN. The healing index (HI) was compared between the groups of the same etiology with similar type of distraction osteosynthesis. The date of consolidation corresponded to the day of removal of the external fixator, while intramedullary nails remained in place. **RESULTS:** The association of the external fixator with FIN allows to reduce the HI: from 20% to 40% or from 4.0 to 19.1 d/cm in 12 of 16 compared categories. Thus, in congenital shortening in monofocal femoral lengthening the HI decreased from 29.8 to 21.2 d/cm, in bifocal tibial lengthening from 22.7 to 16.3 d/cm, in forearm lengthening from 30.2 to 21.3 d/cm. In group I four cases of deep infection of soft tissues, 2 osteomyelitis, 21 fractures or deformities after frame removal were manifested. In group II only one case of deformation after frame removal, absence of severe infectious complications, 8 cases of migration of the intramedullary wires. **CONCLUSION:** Combination of the circular fixator and FIN in limb lengthening in children decreases the duration of external fixation and the amount of severe infections and fractures.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Limb Lengthening / SCFE / Foot / Miscellaneous

Time: 13:30-15:00

Room: F2

Abstract number: 25138

BONE DEFORMITIES IN CHILDREN TREATED WITH TSF (TAYLOR SPATIAL FRAME). DIFFICULTIES AND RISK OF THIS PROCESS.

Haridimos TSIBIDAKIS, Vasileios SAKELLARIOU, George MAZIS, Vasileios TSOUPAROPOULOS, George KARALIOTAS, Anastasios KANELLOPOULOS
1st Orthopaedic Department, University of Athens, Chaidari (GREECE)

Aim: To study the use of TSF system in treating bone deformities in children. To determine the difficulties of this process and the risk factors that lead to complications. **Material and Methods:** From January 2004, in 61 children (37 male and 24 female), 67 extremities, with a mean age 8.9 years children a TSF external fixator was applied for the treatment of bone deformities. 21 children were operated for angular deformity, 19 for bone lengthening, 10 for rotational deformity, 6 for combined angular deformity and lengthening and 11 for pseudoarthrosis. Intra and postoperative difficulties were classified using the Palay method in problems, obstacles and complications. **Results:** The rate of difficulties was 22.2 %. Problems were presented in 5.9% (4/67) consisting of 2 non-axial deformities, 1 pin fracture and 1 subluxation of the knee. Obstacles were presented in 10.4% (9/67) including 3 cases with delayed bone healing that needed infusion DBM, 1 peroneal nerve palsy due to hematoma formation treated with decompression of the region, 1 early bone fusion that needed re-operation and 2 cases of percutaneous achilles lengthening. Complications presented in 5.9% of (4/67) the cases including 1 fracture, 1 pseudoarthrosis, 1 peroneal nerve palsy and 1 limitation of range of motion in the knee (0-45°). **Conclusions:** The problems, obstacles and complications that presented during treatment influenced the final therapeutic objective. Initial deformity, preoperative planning and surgeon's experience are associated with reducing the rate of all difficulties.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Limb Lengthening / SCFE / Foot / Miscellaneous

Time: 13:30-15:00

Room: F2

Abstract number: 23567

A NEW HINGE SYSTEM IN THE TREATMENT OF LIMB LENGTHENING AND AXIAL DEVIATIONS

Ghassan SALAMEH¹, Michael SCHMIDT²

¹Head of Center for lengthening and reconstruction, Damascus (SYRIA), ²Waldhof Praxis Kronberg, 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 to 2008 this new system was used in 460 patients with deferent indications in the lower limbs they presented with limb length discrepancies and axial deviations. The External Fixation Hinge System / SLDF1; Salamehfix 1/; is an arch hinged system consists of arches with a various diameters and perimeters, to assemble the deferent sizes of the limb in the upper and distal part with connecting special hinges, deferent 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 angels, the insertion of wires and half pens in a minor painful regions makes the tolerance to the fixator is more acceptable. X- Ray control is easy. Complications where mostly superficial pin infections, No nerve or vascular injuries The new developed hinges are easy to use and allow treatment of complex deformities with lengthening.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Limb Lengthening / SCFE / Foot / Miscellaneous

Time: 13:30-15:00

Room: F2

Abstract number: 24232

LONG-TERM RESULTS OF IMHÄUSER-OSTEOTOMY IN EPIPHYSEOLYSIS CAPITIS FEMORIS

Albert FUJAK¹, Kristin MÜLLER², Wolfgang LEGAL³, Jürgen FORST¹

¹*Department of Orthopaedic Surgery, Friedrich-Alexander University Erlangen Nuremberg, Erlangen (GERMANY),* ²*Klinik Hirslanden, Rhythmologie, Zürich (SWITZERLAND),* ³*Department of Urology, Friedrich-Alexander University Erlangen Nuremberg, Erlangen (GERMANY)*

The treatment of Epiphyseolysis capitis femoris (ECF) has produced in its complexity a great deal of discussion. One well-established method of operative treatment is the corrective intertrochanteric osteotomy according to Imhäuser. This study shows the clinical and radiological long-term results and the biomechanical impacts of this invasive intervention. 28 ECF patients with slip angles between 30 and 60 degrees were treated by Imhäuser osteotomy at an average age of 13.7 (\pm 2.2, 9 - 19) and were examined after an average period of 24 years (\pm 6.7, 12 - 32). 17 patients achieved an excellent, 8 a good and 3 a satisfying result in the clinical assessment according to the Harris Hip Score. There were significant differences in the grades of arthrosis between the affected and unaffected sides. 10 of 27 cases revealed a decrease in grades of arthrosis of the affected side, whereas 3 cases showed an increase. In 14 cases no difference was measured. The results of the biomechanical analyses indicated an increase of force affecting the articulating joint postoperative compared to preoperative, even though the pressure on the joint decreased. We interpret this as a result of the enlargement of the articulating joint surface. Despite the valgisation, the Imhäuser-osteotomy relieves the hip joint, thus counteracting degenerative alteration, even though being unable to fully prevent this progress. The biomechanical, clinical and radiological good results support indication for the Imhäuser osteotomy in slip angles between 30 and 60 degrees.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Limb Lengthening / SCFE / Foot / Miscellaneous

Time: 13:30-15:00

Room: F2

Abstract number: 23937

DE-THREADED SCREW FIXATION OF SLIPPED CAPITAL FEMORAL EPIPHYSES - PRELIMINARY EXPERIENCE

Yuvraj AGRAWAL, Nick NICOLAOU, Mark FLOWERS

Sheffield Children's Hospital NHS Trust, Sheffield (UNITED KINGDOM)

Introduction: Optimal management strategy for slipped capital femoral epiphysis (SCFE) is controversial. There are implications of early epiphysiodesis in skeletally immature patients. We use cannulated de-threaded titanium (DTT) screws for these patients. We studied clinical and radiological outcomes of patients treated with these screws and compared results with those treated with partially threaded screws. Materials and Methods: Prospective review of outcome of patients treated for SCFE. Matched cohorts of patients were compared for any significant difference in growth ($p < 0.05$) radiologically. A difference of $>5\%$ in pin-joint or pin-physis ratio between initial and the follow-up radiograph is considered as an indication of persistent growth. Clinical outcomes were classified as excellent-failure. Functional assessment was done using the ASK scores. Results: We studied 12 patients (18 hips) treated with 2 DTT screws or single cannulated screws. Radiologically, we identified persistent growth of the femoral neck in 89% of the hips treated with DTT screws and in 77.8% in those treated with standard screws. 3 patients (5 hips) in DTT group underwent exchange of screws due to growth of the femoral neck and 1 patient (2 hips) underwent a further advancement. 83% patient had excellent clinical outcome. Discussion: Treatment in SCFE aims to prevent further slippage of the epiphysis. Premature closure of the proximal femoral physis leads to relative greater trochanteric overgrowth, coxa vara, and coxa breva. DTT screws avoid premature closure of the proximal femoral physis allowing continued growth which is greater than with a standard cannulated screw.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Limb Lengthening / SCFE / Foot / Miscellaneous

Time: 13:30-15:00

Room: F2

Abstract number: 26609

UNDIAGNOSED CEREBRAL PALSY IN OLDER CHILDREN WITH LATE ONSET UNILATERAL OR ASYMMETRIC FOOT DEFORMITIES

Ganapathy Raman PERIANAYAGAM, Hari PREM

Birmingham Childrens Hospital, Birmingham (UNITED KINGDOM)

Background: Mild asymmetric foot and ankle deformities encountered as a late presenting symptom in children, who are otherwise normal often pose a diagnostic challenge, especially when there is no history suggestive of Cerebral Palsy or congenital deformity or a progressively unstable gait typical of neuromuscular conditions. A high index of suspicion of an underlying irreversible central neurological cause, should still be maintained especially if there is associated subtle spasm or tightness in the hamstrings and Achilles which have failed to get corrected with repetitive measures. Neuroimaging studies could be very useful in diagnosing an underlying central cause in these cases. Methods: At Birmingham Childrens Hospital, UK we present 16 such cases, between ages of 6 and 13 referred with a diagnosis of idiopathic gait abnormality noticed only in late childhood. All of them were detected to have unilateral foot or bilateral asymmetric foot abnormality which remained unresolved or recurred following previous consultations. Further investigation with MRI scan of the brain and spine showed changes consistent with cerebral palsy (CP) in 8 of these patients. All patients were further referred for a neurological consultation to confirm mild form of CP as the underlying cause. Conclusion: A high index of suspicion of a central neurological cause should be exercised in paediatric patients with late onset gait problems and unilateral or asymmetric foot and ankle deformities, even if there is no associated history of abnormal developmental milestones. MRI scans of the brain and spine should considered in this select group of patients.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Limb Lengthening / SCFE / Foot / Miscellaneous

Time: 13:30-15:00

Room: F2

Abstract number: 26496

CIRCULAR FRAME CORRECTION OF GENU VALGUM IN HURLER SYNDROME

Colm TAYLOR, Eimear CONROY, David MOORE

Our Ladys Childrens Hospital, Dublin (IRELAND)

Despite the beneficial effects of haematopoietic stem cell transplant (HSCT) on survival in Hurler Syndrome (MPS type I), prevention of certain musculoskeletal deformities is less certain. Genu valgum, due to localized lateral dysplasia at the proximal tibial metaphysis, has proven difficult to manage in our large cohort of 23 patients. We describe correction using circular (Ilizarov) frames, which has not yet been described in this condition. Genu valgum was seen in twelve patients, all clinically evident before 5 years. Initially medial epiphyseal stapling was used in ten knees (mean age 7.8 years, mean preoperative tibiofemoral shaft angle of $17 \pm 3^\circ$). Staples dislodged in eight of these knees, however, at a mean of 18 months. Subsequently, corrective surgery was undertaken in four knees using eight-plates (Orthofix) spanning the physis. Although none failed, correction was inadequate in all knees (mean reduction in tibiofemoral angle 4° at 13 months). Recently, three patients have undergone circular external fixation at a mean of 13.8 years, allowing immediate correction of lower limb alignment (mean reduction $8.3 \pm 2.7^\circ$). Accuracy was improved by using bifocal osteotomies in two patients. Frames were well tolerated, and union was achieved at a mean of 4.1 months. Persistent genu valgum, and compensatory ankle changes, interfere with mobility in older patients, where early fatigue is a common symptom. The early success of circular frame correction is encouraging, and will be included in the emerging orthopaedic management of this challenging condition.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Limb Lengthening / SCFE / Foot / Miscellaneous

Time: 13:30-15:00

Room: F2

Abstract number: 24257

PREMATURE EPIPHYSEAL FUSIONS IN BETA THALASSEMIA

Sharad PRABHAKAR, Mandeep DHILLON, Praveen BASANGOUDHAR, Shivinder GILL

PGIMER, Chandigarh (INDIA)

Patients of Thallassemia, conventionally associated with limited life spans, are now living longer due to better transfusion methods and diagnostic awareness. To see whether this longevity is associated with orthopaedic disability, especially physeal growth defects, we did a prospective evaluation of a captive patient population. **Materials:** We examined 105 patients aged 5-25 years for evidence of clinically detectable premature epiphyseal fusions (PEF). Ours is a center focussed on Transfusion dependent beta thalassemia (TDBT) patient management, and so detailed transfusion records related to age at first transfusion, regularity of transfusions and pre-transfusional haemoglobin (Hb) levels were available. **Observations:** Five (4.7%) patients had deformities or limb length discrepancies, which lead to the detection of PEF as the causative factor. Compared to children without PEF, all PEF cases were noted to have pre transfusion haemoglobin levels of less than 8 gm% in the first decade of life. **Discussion:** Thallassemia does have an effect on the epiphysis; previously published literature is scant. Our study shows that the prevalence of clinically detectable PEF in TDBT patients has shown a decrease (compared to previous reports) with modern blood transfusion regimes. Though the pathogenesis of PEF is yet to be conclusively established, it is apparent that better control of the disease to maintain haemoglobin levels consistently above 8 gm% in the first decade of life, can decrease the occurrence of PEF.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Perthes Disease / Limb Lengthening / Spine & Hip / Miscellaneous

Time: 16:00-17:45

Room: F2

Abstract number: 26323

ARTHRODIASTASIS AND SURGICAL CONTAINMENT IN LATE ONSET PERTHES DISEASE: AN ANALYSIS OF 14 PATIENTS

**Kamal BALI, Pebam SUDESH, Mandeep DHILLON, Raghav SAINI
*PGIMER, Chandigarh (INDIA)***

Background: Late onset Perthes disease usually carries a poor prognosis. In severe cases there may be increasing pain, decreased range of motion and lateral extrusion of the femoral head which causes hinged abduction. This may contraindicate surgical containment and lead to even worse final outcome. We have treated 14 such patients in a two staged procedure. Materials and methods: Inclusion criteria included age > 9 years with hip pain; range of motion of hip less than 30 degrees of abduction or hinged abduction; and hip subluxation with > 50% hip involvement. Stage one involved arthrodiastasis or articulated joint distraction using external fixator in all the patients while varus osteotomy of the femur was done later as the second procedure. Results: Arthrodiastasis done at 1st stage dramatically reduced pain and eliminated hinged abduction. There was substantial improvement in range of motion in all the patients. Once the contraindications to surgical containment were overcome by arthrodiastasis, we proceeded with varus osteotomy of the femur at 2nd stage in the hope that femoral head would remodel to some extent with time and would improve the final functional outcome. Conclusions: Arthrodiastasis leads to symptomatic improvement in all cases of severe late onset Perthes disease. It doesn't compromise future surgery and gives chance of surgical containment in patients in whom such a surgery is contraindicated due to stiffness of hip or hinged abduction. A contained hip even if incongruent will have better outcome than a subluxated hip.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Perthes Disease / Limb Lengthening / Spine & Hip / Miscellaneous

Time: 16:00-17:45

Room: F2

Abstract number: 25141

MODELING EFFECT OF TRIPLE PELVIC OSTEOTOMY IN SEVERE CASES AT PERTHES DISEASE

Andrei DZEMIANTSOU, Alexander BELETSKY, Aleh SAKALOUSKI, Ludmila PASHKEVICH, Sergei SERDJUCHENKO, Roman GOLDMAN

State Institution Republican Scientific-Practical Centre of Traumatology and Orthopaedics, Minsk (BELARUS)

To estimate the evolution of proximal department form of a femur in severe cases at Perthes disease we paid attention to the epiphyseal quotient (EQ), which vividly shows the remodeling processes of femoral head form. EQ reflects the percent ratio of healthy and affected epiphysis height and demonstrates the degree of its height decrease relatively the width comparing to health joint. The triple pelvic osteotomy's (TPO) effect on EQ was studied (23 patients, operated patients subgroup); the operations were held at the early stage. The data was compared to Group-II (20 people, control group), with unfavorable signs of disease and who were not involved in operative measures by different reasons. These groups are statistically comparable by key indicators. In both of the groups EQ value before the treatment was noticeably lowered. In Group-I EQ was on average $56,7 \pm 12,01\%$ and it is lower than Group-II: $68,6 \pm 17,54\%$ (Mann-Whitney U test $p=0,02$). Three months after the surgery in Group-I EQ value increased: $60,7 \pm 14,21\%$. Its increase continued during the following years. In Group-II the epiphysis was reducing during the illness. Three years later in Group-I its average value was $75,9 \pm 13,4\%$, in Group-II it was essentially lower: $50 \pm 14,84\%$ (Mann-Whitney U $p=0,00006$). TPO at unfavorable course Perthes disease makes a wholesome impact on remodeling processes, and finally on the form of femur proximal department. Improvement of EQ is the evidence.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Perthes Disease / Limb Lengthening / Spine & Hip / Miscellaneous

Time: 16:00-17:45

Room: F2

Abstract number: 25152

STABILIZING EFFECT OF TRIPLE PELVIC OSTEOTOMY IN SEVERE CASES AT PERTHES DISEASE

Aleh SAKALOUSKI, Alexander BELETSKY, Andrei DZEMIANTSOU, Sergei SERDJUCHENKO, Urii LIHACHEVSKIY

State Institution Republican Scientific-Practical Centre of Traumatology and Orthopaedics, Minsk, (BELARUS)

Hip instability appears already at early stages of Perthes disease's unfavorable course. One of the indicators that define the level of lateral cover is Wiberg angle (WA). We performed 41 triple pelvic osteotomy (TPO) for 40 patients (operated group) to restore the anatomy of the hip. We supervised 20 children (control group) with unfavorable signs of disease, who were not involved in operative measures by different reasons. The groups are statistically comparable by key indicators. When disease was diagnosed and the treatment began the WA in Group-I was on average $5,4 \pm 7,87^\circ$ and much more in Group-II $17,1 \pm 7,67^\circ$ (Mann-Whitney U test $p=0,00001$). In Group-I at single-stage operation the surgery helped to increase WA up to standard size, 3 months later its average value was $33,2^\circ$. The ongoing gradual increase of WA during 3 years resulted in almost 4° growth. At the same time Group-II had a gradual WA decrease, which isn't disastrous, but its constant decrease to several degrees per year led to essential pathologic change of this value. Finally in 3 years reliable considerable WA increase happened in Group-I up to $37,1 \pm 6,47^\circ$ and its decrease in Group-II to $13,2 \pm 8,5^\circ$ (Mann-Whitney U test $p=0$). TPO as the surgery methods for Perthes disease treatment leads not only to single-stage operation anatomy joint recovery and improvement, but also creates conditions for switching on the physiological self-correction mechanism. The result is permanent WA improvement.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Perthes Disease / Limb Lengthening / Spine & Hip / Miscellaneous

Time: 16:00-17:45

Room: F2

Abstract number: 24916

LIMB LENGTHENING WITH A SUBMUSCULAR LOCKING PLATE

Chang-Wug OH, Hyun-Joo LEE, Sang-Hyup YOON, Byung-Chul PARK
Kyungpook National University Hospital, Daegu (KOREA)

Background: During limb lengthening, many complications are inevitable due to the long duration of external fixation. Lengthening over an intramedullary nail is a common technique to remove external fixators earlier. However, it introduces the risk of physeal injury in children and the risks of deep infection. The authors attempted a novel method of lengthening based on the use of a submuscular locking plate to overcome these limitations. Materials and Methods: Ten patients, who were unsuitable for limb lengthening over an intramedullary nail, underwent lengthening with a submuscular locking plate. Their mean age at operation was 18.5 years. After fixing a locking plate submuscularly on the proximal segment, an external fixator was applied to lengthen the bone after corticotomy. Lengthening was at 1 mm/day and on reaching the target length, three or four screws were placed in the plate in the distal segment and the external fixator was removed. Results: All patients achieved the preoperative target length at a mean of 4.0 cm (3.2 to 5.5). The mean duration of external fixation was 61.6 days (45 to 113) and the mean external fixation index was 15.1 days/cm, which was less than one-third of the mean healing index (48 days/cm (41.3 to 55)). There were only minor complications. Conclusions: Lengthening with a submuscular locking plate can successfully permit early removal of the fixator with fewer complications and is a useful alternative in children or when nailing is difficult.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Perthes Disease / Limb Lengthening / Spine & Hip / Miscellaneous

Time: 16:00-17:45

Room: F2

Abstract number: 25129

TSF (TAYLOR SPATIAL FRAME) EXTERNAL FIXATION FOR TREATING THE TIBIAL FRACTURES IN SKELETAL IMMATURE PATIENTS

Haridimos TSIBIDAKIS, Vasileios SAKELLARIOU, George MAZIS, George KARALIOTAS, Anastasios KANELLOPOULOS

1st Orthopaedic Department, University of Athens, Chaidari (GREECE)

Aim: The presentation of TSF system in the treatment of tibial fractures in skeletal immature patients. **Material-Methods:** From January 2003 to December 2007 we treated 21 patients (12 boys and 9 girls) aged 6 to 14 y.o. (mean age 11 y.o) with unstable tibial fractures. Open fractures was 7 type II and 2 type III. Application of the TSF system was made with the use of fluoroscopy with at least 4 stabilization elements from both sides of the fracture line. We accomplished dissociation of the fragments, reduction of smaller fragments and maintenance of the reduction through osteotaxis. Intra and postoperative difficulties were classified using the Palay method in problems, obstacles and complications. **Results:** There was total healing of the fracture approximately 3 months post op. (2.5 - 3.5 months post op.) and the TSF system was removed without leaving any angulation or axial rotation in any of our patients. During follow up (39 months post op.) Problems were presented in 4,7% (1/21) consisting in 1 pin fracture. Obstacles were presented in 9.5% (2/21) including 2 case with delayed bone healing that needed infusion DBM, complication was presented in 14,2% (3/21) of the cases including pin track infection in 8 pin. **Conclusions:** The ability of correction in 6 axes makes TSF system easy to apply and averts the possibility of a necessary revision, giving excellent results in tibial fractures in skeletal immature patients without further complications.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Perthes Disease / Limb

Lengthening / Spine & Hip / Miscellaneous

Time: 16:00-17:45

Room: F2

Abstract number: 23346

MRI EVALUATION OF FEMORAL AND ACETABULAR ANTEVERSION IN DEVELOPMENTAL DYSPLASIA OF HIP: A STUDY IN EARLY WALKING AGE GROUP.

Aditya MOOTHA, Raghav SAINI

PGIMER, Chandigarh (INDIA)

The aim of this study is to assess the FAV and AAV of patients with DDH in an early walking age group as it is the most common age group in whom surgical treatment is planned. Hence we limited the study to the age group of 1-4 years and we have chosen MRI as imaging modality to achieve this goal. All cases of unilateral hip dislocation with DDH of early walking age group who presented to our pediatric orthopaedic department from January 2006 to December 2008 were included in our study. Femoral anteversion, acetabular anteversion, acetabular anteversion of the cartilage anlage and acetabular index were measured by MRI in 45 dislocated hips and in a control group of 37 normal contra lateral hips of index cases. We found that there was no statistically significant difference between these two groups for femoral anteversion. The acetabular anteversion was found to be significantly increased in the dislocated group compared to the normal group. Similar results were obtained for the cartilage anlage of the acetabulum. There was a positive correlation between acetabular anteversion and acetabular index, while there was no correlation between femoral anteversion and other parameters. We conclude that femoral anteversion is not increased, while the acetabulum is excessively anteverted on the dislocated side in developmental dysplasia of the hip in an early walking age group.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Perthes Disease / Limb Lengthening / Spine & Hip / Miscellaneous

Time: 16:00-17:45

Room: F2

Abstract number: 23296

SHOULDER FUNCTION AFTER CORRECTION OF SPRENGEL DEFORMITY WITH WOODWARD PROCEDURE (LONG-TERM FOLLOW UP)

T.D.W. ALTA¹, F.E. WALSTRA², J.W. VAN DER EIJKEN¹, W.J. WILLEMS¹, S.J. HAM¹

¹*Onze Lieve Vrouwe Gasthuis, Amsterdam (NETHERLANDS)*, ²*Academic Medical Center (AMC), Amsterdam (NETHERLANDS)*

INTRODUCTION: Sprengel deformity is a congenital anomaly of the shoulder with superior displacement and rotation of the hypoplastic scapula. Vertebral malformations and omovertebral bone formation between cervical vertebrae and scapula may be present. Aim of this study was to evaluate the long-term results of the Woodward procedure for correction of Sprengel deformity. **METHODS:** In this retrospective study with prospective collected data, eight shoulders were examined at three different periods in time. The age of the patients varied between 3.5-15 years at time of surgery. Average follow-up was 14.7 years (range 8-26). Range of Motion, Constant score, DASH score and SST were obtained. Scapula placement and arthritis of both AC- and glenohumeral joints were assessed by radiographs. Cavendish grading was used to evaluate cosmetic appearance. **RESULTS:** Average elevation in the scapular plane improved 29° in the first year after surgery, with final improvement of 56° at the last follow-up. In all patients, the Constant score improved. The average score at long-term follow-up was 94 points (range 84-100). The DASH score was 14.59 points (range 6.67-28.33), and SST 9.5 points (range 9-12). All radiographs showed some superior displacement of the scapula with no signs of arthritis of the glenohumeral or AC-joint. Cavendish grade was 1 or 2 at long-term follow up; no short- or long-term complications had occurred. **CONCLUSION:** This long term follow-up shows that the Woodward technique is an effective surgical procedure to improve shoulder function as well as appearance in patients with Sprengel deformity.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Perthes Disease / Limb Lengthening / Spine & Hip / Miscellaneous

Time: 16:00-17:45

Room: F2

Abstract number: 25287

USING LATERAL OSTEOTOMY WITHOUT ANY INTERNAL FIXTION FOR POSTTRAUMATIC CUBITUS VARUS DEFORMITY

Ziming ZHANG, Jing ZHANG

Department of Pediatric Orthopaedics, Xinhua Hospital, Shanghai Jiaotong University School of Medicine, Shanghai (CHINA)

The main indication for operation in children who suffered from posttraumatic cubitus varus is the asymmetric appearance of the affected elbow. Different osteotomies have been described previously to correct the deformity. Most of them need a second operation to remove the internal fixation. Risks for infection and nerve injury should also been avoided during the treatment. Although lateral closing-wedge supracondylar osteotomy could result in a prominent scar, it is still an easy and safe procedure widely used in most patients. The authors used lateral closing-wedge supracondylar osteotomy without any internal fixation but an extension plaster to treat the deformity of cubitus varus in 30 consecutive children (27 boys and 3 girls). The mean follow-up time was 5 (range 1 to 8) years. The pre- and postoperative carrying angles and range of motion of the elbow joint were documented and compared by one of the authors. A questionnaire was also executed to evaluate the satisfaction with the cosmetic appearance at the end of follow-up. Compared with the preoperative condition, all patients and their parents were satisfied with the postoperative result, especially the advantage without any internal fixation. For the sake of the potential bone remodeling capability in children, the present skill without internal fixation was considered a simple, safe, and economic procedure in the treatment of posttraumatic cubitus varus.

Date: 2010-09-02

Session: Paediatrics SICOT / SOF / IFPOS - Perthes Disease / Limb

Lengthening / Spine & Hip / Miscellaneous

Time: 16:00-17:45

Room: F2

Abstract number: 23690

MULTIFOCAL SKELETAL TUBERCULOSIS IN CHILDREN-ANALYSIS OF PATTERN, COURSE AND CLINICAL OUTCOME.

Sunil Gurpur KINI, Aditya N AGGARWAL, Ish K. DHAMMI, Sudhir KUMAR

University College of Medical Sciences, New Delhi (INDIA)

Multifocal skeletal tuberculosis is an uncommonly reported entity, Unanimity on terminology is lacking in the literature. We present a series of 18 such patients encountered in our institution. All the patients were below 15 years of age. Male to female ratio was 13:5. Most of the cases presented with swellings, discharging sinuses and/or ulcers. Appendicular involvement was seen in 17 of these cases. All the cases were diagnosed histopathologically as tuberculosis. All the cases were treated with multi-drug anti-tubercular therapy with additional procedures such as incision and drainage or sinus tract curettage performed in 9 of the patients. All the lesions healed. The follow up period varied from 24 months to 60 months with a mean of 28 months. Common differential diagnosis include Syphilis, Pyogenic osteomyelitis, Osteitis fibrosa cystica, and metastasis. Their clinical behaviour, result and outcome are analysed with available international literature. In conclusion, in developing countries where tuberculosis is endemic and nutritional status is low, multifocal tuberculosis should be kept as one of the strongest differential diagnosis of multiple site involvement of the skeletal system.

Date: 2010-09-02
Session: Trauma Wrist / Nerve Injury
Time: 08:00-09:30
Room: F4

Abstract number: 23093

SURGICAL TREATMENT OF PATIENTS WITH CONGENITAL AND ACQUIRED HAND PATHOLOGY BY ILIZAROV METHOD

Guseynali ISMAYLOV

Milad Hospital, Tehran (IRAN)

Introduction: High frequency of diseases and injuries of hand, difficulty of treatment, considerable percent of non - satisfactory outcomes explain the social and medical significance of the problem. The difficulty of treatment of patients with this pathology is not only restoration of anatomic integrity but also the function of the hand. The methods are based on original techniques of surgical intervention and post - operative treatment using new modifications of apparatuses of external fixation. **Material and Methods:** I have treated 1342 (1594 hands) patients in Russia, Great Britain and Islamic Republic of Iran. The patients' age varied from 1 to 63 years old. Patients suffered both congenital (69 %) and acquired (41%) etiology of pathology. All patients suffered hampered ability to work and self service. **Result:** Follow - ups of 1.5 months to 1 year were traced in all patients, and distant results were followed in 79.3 % of patients. In all cases good anatomic and functional results were obtained. The patients preserved sensitivity and movements in joints, were able to contraposition the fingers with restoration of grip function, thus able to self service in every day routine. **Conclusion:** To summarize the above -said, multi- functionality of apparatus, possibly of gradual correction, sparing of compression - distraction transosseous Osteosynthesis allows for efficient obtaining of the treatment task.

Date: 2010-09-02
Session: Trauma Wrist / Nerve Injury
Time: 08:00-09:30
Room: F4

Abstract number: 25314

MULTI-DETECTOR CT IN THE EARLY DIAGNOSIS OF OCCULT SCAPHOID FRACTURES

Selahattin OZYUREK¹, Ahmet Turan ILICA², Ozkan KOSE³, Murat DURUSU²

¹*Izmir Military Hospital, Department of Orthopaedics and Traumatology, Izmir (TURKEY)*, ²*Gulhane Military Medical Academy Department of Radiology, Ankara (TURKEY)*, ³*Diyarbakir Education and Research Hospital, Department of Orthopaedics and Traumatology, Diyarbakir (TURKEY)*

Purpose: The purpose of this prospective study to evaluate the diagnostic accuracy of MDCT in radiographically detecting occult scaphoid fractures. **Materials and methods:** Fifty-four patients with a clinically suspected scaphoid fracture and negative initial conventional radiographs were evaluated by both MRI and 64-MDCT wrist examinations within one week after trauma. Sensitivity, specificity, positive predictive value and negative predictive value of MDCT and MRI were calculated. **Results:** MRI showed a total of 22 fractures in 20 of 55(36%) wrists. 14 scaphoid fractures were isolated. Two scaphoid fractures were associated with triquetrum and the other with hamate fracture. Other fractures included two isolated trapezoidium, one trapezium and one hamate fracture. All fractures were confirmed at the final radiographic examination at 6 weeks. The sensitivity and specificity of MRI was both 100%. MDCT showed a total of 19 fractures in 17 of 55(30%) wrists. Two isolated scaphoid fractures and one trapezium fracture were missed. Sensitivity and specificity of MDCT was 86% and 100% respectively. **Conclusions:** Although MRI remains as the best diagnostic tool after radiography for detection of occult scaphoid fractures, MDCT offers highly accurate results especially concerning cortical involvement and is a useful alternative in facilities lacking MRI. **Keywords:** Scaphoid bone, Occult fractures, Tomography, Magnetic Resonance Imaging

Date: 2010-09-02
Session: Trauma Wrist / Nerve Injury
Time: 08:00-09:30
Room: F4

Abstract number: 24995

A COMPARATIVE PROSPECTIVE STUDY AND ANALYSIS OF RESULTS OF NON UNION SCAPHOID TREATED BY DIFFERENT FIXATION MODALITIES

Sunil Gurpur KINI¹, P.K. RAJU²

¹University College of Medical Sciences, New-Delhi (INDIA), ²Bangalore Medical College and Research Centre, Bangalore (INDIA)

Scaphoid fractures contributes to a significant percentage of upper limb trauma. Incidence of nonunion is has been attributed to its precarious blood supply and partly because it is frequently underdiagnosed. Our objective was to study the functional outcome of scaphoid nonunion treated by three different fixation modalities Herbert screw fixation, Matte Russe bone grafting and the vascularised muscle pedicle graft procedure. Design-Our study was a Prospective Case Series study. Level of Evidence- 4 Patients- 26 scaphoid fractures, 23 men and 3 women were treated and followed up over 6 yrs. Inclusion criteria-All cases more than 6 mths old and clinicoradiologically showed no signs of union. Results -Herbert screw fixation-8 of 10 cases united with mean duration of 17 weeks. Matte Russe procedure 5 of 7 cases united with mean duration 15.6 weeks. Vascularised muscle pedicle graft 8 of 9 cases united within a mean duration of 14.8 weeks. Duration of follow up 2 yrs. 21 of 26 showed correction of both scapholunate and radiolunate angles. Post op range of movement increased by a mean of 43 degrees. Main Outcome Measurements We have used the Modified scaphoid scoring outcome system. 10 Excellent, 8 good, 5 fair and 3 poor results were obtained. Conclusion All 3 techniques have yielded consistent results with the best results in our series in terms of clinicoradiological and functional outcome have been obtained with the vascularised muscle pedicle graft procedure. Keywords- Nonunion, Herbert, Matte Russe, Vascularised muscle pedicle graft.

Date: 2010-09-02
Session: Trauma Wrist / Nerve Injury
Time: 08:00-09:30
Room: F4

Abstract number: 25732

DOUBLE STAGE TREATMENT OF CHRONIC PERILUNAR WRIST DISLOCATION

Aleh KEZLIA, Ivan CHARHOVICH, Vladislav ERMOLOVICH, Alexander BENKO, Konstantine CHACHELKO

Belarussian Medical Academy of Post-Graduate Education, Minsk (BELARUS)

During the period 2000-2008 18 patients with chronic perilunar wrist dislocation have been treated in clinic of traumatology and Orthopaedics. In 75 per cent of the cases the disease was a result of diagnostic pitfalls, in others unsuccessful attempts of closed reduction. 16 of the patients were male, 2 female. Age of the patients 19 to 48 years. The treatment of chronic perilunar wrist dislocation is conducted in two stages: first stage - extrafocal osteosynthesis with Elizarov apparatus, second stage open reduction. On the first stage wrist was distracted with Elizarov apparatus. In order to eliminate soft tissue contracture and create space for reduction, distraction was conducted daily during the period of 4-6 days. On the second stage open reduction of the wrist with obligatory fixation of the wrist with a pin was conducted. Immobilization period made up 3-4 weeks followed by physiotherapeutic rehabilitation. Remote results were checked during the period of 2-5 years. Good results were registered in 14 cases (72.2 per cent): patients made no complaints, mobility of the wrist is not limited. Satisfactory results were registered in 4 cases (27.8 per cent). At physical activity patients recorded moderate pain in the wrist, decline of motions, X-Ray examination showed indications of deforming arthrosis. Therefore, two-stage treatment of chronic perilunar wrist dislocation allows to achieve positive long-term results.

Date: 2010-09-02
Session: Trauma Wrist / Nerve Injury
Time: 08:00-09:30
Room: F4

Abstract number: 24567

TERIPARATIDE (PTH 1-34) IMPROVES EARLY CALLUS FORMATION IN DISTAL RADIAL FRACTURES

Torsten JOHANSSON, Per ASPENBERG

Division of Orthopaedics, Department of Clinical and Experimental Medicine, Faculty of Health Sciences, Linköping (SWEDEN)

Background: Teriparatide (parathyroid hormone; PTH 1-34) increases skeletal mass in humans and improves fracture healing in animals. A recent randomized multicenter trial of non-operated distal radial fractures showed a moderate shortening of the time till restoration of cortical continuity with 20µg (low dose) teriparatide per day, but not with 40µg (high dose). As radiographic cortical continuity appears late in the healing process, we studied the qualitative appearance of the callus 5 weeks after fracture. Methods: A third of the patients of the international trial were treated at Linköping University Hospital. We made a blinded qualitative scoring of the callus at 5 weeks in our 27 patients. Callus formation was arbitrarily classified as rich, intermediate or poor. Results: 9 patients were classified as rich (0 had received placebo, 3 low dose, 6 high dose). 9 patients were classified as intermediate (1 had received placebo, 5 low dose, 3 high dose). 9 patients were classified as poor (7 had received placebo, 1 low dose, 1 high dose), Chi2 p=0.002. Discussion: In combination with the results of the larger trial, the data suggest that radiographic appearance at an early time point might be a sensitive variable that can be used as a model for evaluation of fracture healing. Moreover, teriparatide appeared to improve early callus formation, but the clinical value of PTH treatment on distal radial fractures is limited. Our data adds to the picture of the possible usefulness of PTH for fracture repair in general.

Date: 2010-09-02
Session: Trauma Wrist / Nerve Injury
Time: 08:00-09:30
Room: F4

Abstract number: 23485

LIMB REPLANTATION WITH TWO ROBOTS: A FEASIBILITY STUDY

Sybille Facca¹, Chihab Taleb¹, Eric Nectoux², Philippe LIVERNEAUX¹

¹*Hand Department - Strasbourg University, Illkirch (FRANCE)*, ²*Paediatric Orthopaedics Department - Lille University, Lille (FRANCE)*

The concept of telesurgery developed in the 1990s is defined as any remote computer-assisted surgical intervention. Telesurgery, which is performed with a surgical robot controlled by the surgeon, has two theoretical advantages: the remote operation on the one hand and a better surgical gesture on the other hand. The second advantage only is currently used in elective surgery in numerous specialties (digestive, urologic, gynecologic, or cardiac surgery...). The feasibility of telesurgery has been demonstrated with experimental microsurgery. In this context, the objective of this work is to demonstrate the feasibility of limb replantation and transplantation by telesurgery. That is, from a qualitative point of view by gearing down movement and, thus, suppressing physiological tremor, but also from a quantitative point of view by using two surgical robots occupying lesser space in the operating field than in conventional microsurgery, thus allowing two microsurgeons to work at a time. The material consisted in a large white pig and two surgical robots (DaVinciS1 telemanipulators). The procedure consisted in a trans-humeral cross-section of the left thoracic limb, which was secondarily replanted. Results showed good vascular permeability, while the operator's physiological tremor was suppressed. Our results seem to demonstrate that telesurgery could improve limb replantation and transplantation management, especially regarding operating gesture precision.

Date: 2010-09-02
Session: Trauma Wrist / Nerve Injury
Time: 08:00-09:30
Room: F4

Abstract number: 25628

RESULTS OF IATROGENIC NERVE REPAIR IN THE UPPER LIMB AND THEIR PREVENTION

Rahul KAKKAR¹, C. OBERLIN²

¹*Northern Deanery, Newcastle (UNITED KINGDOM)*, ²*Hopital Bichat, Paris (FRANCE)*

Introduction: Iatrogenic nerve lesions can be defined as injuries to the peripheral nerves caused by treating medical personnel. Orthopaedic surgery as a specialty is the largest specialty contributing to these injuries. Unfortunately, most of these iatrogenic nerve injuries are Sunderland Grade 4/5 in nature and require open repair. Materials and Methods: We analysed forty one patients with forty two orthopaedic surgically induced nerve lesions from 1996 -2005. The age range of the patients was 18-71 years and corrective surgery (nerve surgery or palliative surgery) was performed in thirty eight cases i.e. thirty nine nerves. The interval between the lesion and the surgery varied from one day to twenty three years. The surgeries performed were nerve grafting in fifteen cases, neurolysis in seven cases, neurectomy or end burial in seven cases, neurotomy in five cases, primary tendon transfers in four cases, secondary tendon transfers in four cases, neurotization in one case and reversed vein grafting in one case. Results: The nerves injured most commonly were - median nerve (13 cases), radial nerve (10 cases), brachial plexus (6 cases), common peroneal nerve (4 cases), femoral nerve (3 cases), Ulnar nerve (3 cases), sural nerve (1 case), tibial nerve (1 case) and the medial plantar nerve (1 case). We had nineteen good results, fifteen fair results and three poor results. Obviously these results cannot be compared to normal because an injured nerve never recovers completely and the best treatment for iatrogenic nerve injuries is prevention and a few strategies are considered.

Date: 2010-09-02
Session: Trauma Wrist / Nerve Injury
Time: 08:00-09:30
Room: F4

Abstract number: 24200

A NEW STRATEGY FOR REPAIR OF A SEGMENTAL PERIPHERAL NERVE GAP: NERVE LENGTHENING METHODS

Yuki HARA¹, Yasumasa NISHIURA¹, Sharula NULL¹, Yoshiko NAKAJIMA¹, Harumitsu ICHIMURA², Takeshi OGAWA³, Toshikazu TANAKA³, Naoyuki OCHIAI¹

¹*Department of Orthopaedic surgery, Graduate School of Comprehensive Human Sciences, University of Tsukuba, Ibaraki (JAPAN)*, ²*Sogo Moriya Daiichi Hospital, Ibaraki (JAPAN)*, ³*Kikkoman General Hospital, Chiba (JAPAN)*

One of the new strategy for repair of a segmental peripheral nerve gap is nerve lengthening. This method does not require the sacrifice of other healthy nerves. Only one anastomosis site is favorable for nerve regeneration. To determine the applicability of this method to humans, we carried out an experiment on primates. Nine cynomolgus monkeys were used. A 20 mm gap was formed in the median nerve at the forearm. In three monkeys, both proximal and distal nerve stumps were simultaneously lengthened at the rate of 1 mm/ day using an original distraction device and end-to-end neuroorrhaphy was carried out. Another three monkeys, 20 mm gap were restored by the autogenous sural nerve cable grafting procedure for the control. At 16 weeks after operation, MCV, SCV, NCV, tetanic contraction force and wet weight of APB muscle, tip pinch movement of thumb and index finger, axon number and mean axon diameter were evaluated. Nerve regeneration was better in the monkeys that underwent nerve lengthening than in the monkey that underwent nerve grafting. Moreover, we succeeded in repairing of the 30 mm gap of the median nerves in three monkeys. Nerve regeneration was equivalent to 20 mm gap model in electrophysiological, histological and functional evaluations. In these studies, none of the animals showed any pain related behavior during and after nerve lengthening. We were convinced that nerve lengthening can be superior treatment method for peripheral nerve gap. So we have set about the clinical research.

Date: 2010-09-02

Session: Trauma - Subtrochanteric fractures

Time: 10:45-12:15

Room: F4

Abstract number: 26825

SUBTROCHANTERIC FRACTURES: NAIL, PLATE AND HUMMINGBIRDS

Andreas H. RUECKER

University Hospital Hamburg-Eppendorf, Hamburg (GERMANY)

Introduction: Subtrochanteric femoral fractures remain technically challenging to reduce and to fix. Biomechanically the subtrochanteric region is an area of high compressive and tensile forces, consisting predominantly of thick cortical bone with decreased vascular perfusion. Furthermore, the muscular attachments tend to dislocate the fragments into flexion, varus and shortening. As a result, it must be treated with a specially designed implant that can withstand significant muscular forces for prolonged periods of healing. With an improved understanding of the fracture patterns and the specific treatment options, successful results can be attained. Extramedullary Implants, Plates: Dynamic Hip Screw (DHS): Dealing with unstable subtrochanteric fractures DHS fixation illustrates crucial disadvantages: The fixation of the proximal fragment is insufficient; the anatomical lever arm is long, combined with a lacking in lateral buttress. Furthermore compression can not be obtained in the subtrochanteric area. Medoff Sliding Plate (MSP): This plate allows dynamic axial sliding and fracture compression along the subtrochanteric cortical region. Angled Blade Plate and Dynamic Condylar Screw (DCS): The advantage of these plates is based on the possibility of a more proximal fixation and a better fixation of the trochanteric region. Intramedullary Nailing (IMN): IMN holds up a shorter lever arm, providing lateral buttress and allowing for proximal fragment fixation. They also provide postoperative fracture compression. As closed reduction tends to be hard to obtain and especially to maintain, additional open procedure and cerclage wiring might be required. Resume: Even though there are numerous choices of subtrochanteric fracture fixation, IMN seems to prevail as the superior method of choice in subtrochanteric fracture treatment due to the special anatomical and biomechanical setup of this area. But the surgical technique can be challenging and several aspects have to be considered to win the race between fracture unions and implant failure.

Date: 2010-09-02
Session: Trauma - Subtrochanteric Fractures
Time: 10:45-12:15
Room: F4

Abstract number: 25428

PLATING FOR COMMUNATED SUBTROCHANTRIC & DISTAL FEMORAL FRACTURES: LET THE BIOLOGY WORK

Puneet MISHRA, Ish K. DHAMMI, Anil K JAIN

University College of Medical Sciences & Gtb Hospital, Delhi (INDIA)

Introduction: Comminuted fractures of proximal & distal femur are difficult to treat and usually repeat surgeries may become necessary for augmentation of union. We hence hypothesized that in periarticular proximal femoral fractures (AO Type B 1-A, Type B 2-C3.3, Type B 2-C3.1) and distal femoral fractures (AO Type A and Type C) associated with diaphyseal or metaphyseal comminution, biological plating would be a simple procedure that would yield excellent results without need of secondary procedures. Materials & Methods: Between Nov 2001 and Dec 2008, we included 22 fresh fractures in 20 cases that met our inclusion criteria (subtrochanteric -15, Distal femoral -7) with a mean age - 37.2 yrs (Range 17-62 yrs). Average duration of injury to surgery was 7.06 days. All patients treated with biological plating under C arm. Cases with open fractures and open physis were excluded. Salient steps involved were close reduction of fracture on radiolucent spica table under IITV followed by insertion of plate (LISS for distal femur, Reverse distal femur LISS for proximal femur; DCS for distal femur, DHS for proximal femur) using minimally invasive techniques without primary bone grafting. Results: The mean follow up was 2.1 yrs (range 6 mo-3 yrs). The mean fracture union time was 4.2 months. The mean duration surgery was 80 min (62-120 min). Final outcome, complications and difficulties encountered are also discussed. Conclusion: Biological plating can be recommended as a simple, feasible and worthwhile option in comminuted proximal and distal femur fractures.

Date: 2010-09-02
Session: Trauma - Subtrochanteric Fractures
Time: 10:45-12:15
Room: F4

Abstract number: 26433

PROJECTED NUMBER OF HIP FRACTURES IN SWEDEN FROM 2010 TO 2050

Bjorn E. ROSENGREN¹, Magnus K. KARLSSON²

¹Clinical and Molecular Osteoporosis Research Unit, Department of Clinical Sciences, Lund (SWEDEN), ²University and Department of Orthopaedics, Malmö University Hospital, Malmö (SWEDEN)

Introduction: Annual number of hip fractures have increased world wide during the past half century and projections based on an increasing hip fracture incidence have inferred vastly increasing annual numbers in the future. However, the past decade trends of a stable or even decreasing hip fracture incidence have been presented without any concomitant new projections for the future. Methods: Earlier presented data for annual hip fracture incidence in Sweden 2002 (B. E. Rosengren et al, Secular Trends in Swedish Hip Fracture Incidence 1987-2002, JBMR 2008 Sep; Suppl (23) 47; ASBMR 2008) in one-year-age and gender specific classes were applied to Swedish population projections for ages ≥ 50 years each year from 2010 to 2050, acquired from Statistics Sweden. Simple time trends were evaluated by linear regression. Since data are approximate no confidence intervals are given. Results: The annual number of hip fractures increased by 350 per year (women 204, men 147), from 2010 to 2050. Compared to 2002, the total number of hip fractures increased with a factor of 1.9 (women 1.7, men 2.3) in 2050 giving about 30 000 hip fractures this year. Conclusions: Due to the expected changes in Swedish demographics the annual number of hip fractures will increase substantially, demanding major resource allocation and advocating a prompt start of an optimization of hip fracture care. Further investigations on secular trends in hip fracture incidence must be done as such trends will have major impact on the future number of hip fractures.

Date: 2010-09-02
Session: Trauma - Subtrochanteric Fractures
Time: 10:45-12:15
Room: F4

Abstract number: 26021

CIRCULAR SUBTROCHANTERIC FEMORAL OSTEOTOMY: TECHNIQUE AND RESULTS OF THE FIRST 9 CASES.

Sherif EL GHAZALY

Ain Shams University, Cairo (EGYPT)

Background: Hip joint malorientation as a sequel of coxa vara deformity can eventually lead to osteoarthritis of the hip. Pauwels' intertrochanteric valgus osteotomy produces correction of the deformity. Lateral wedge resection causes shortening of proximal femoral segment, increasing limb length discrepancy in unilateral cases. Circular osteotomy causes no shortening, is versatile, stable and no bone is removed. Materials & Methods: Nine cases of coxa vara underwent acute deformity correction using the circular osteotomy in the subtrochanteric region, fixed by plate and screws. Mean age was 26.5 years while average follow up was 22 months. The plate was pre-contoured to the desired degree of correction. Merle d'Aubigné hip score was used for functional assessment. Autogenous bone grafting was not used. Results: Complete correction was achieved in 66.6%, under correction in 22.2% (2 cases) and failure of correction in 11.1 % (1 case). Osteotomy site union occurred in all cases. mLPFA improved from 114.6° to 97.6°. Average length gain was 12 mm (range 5-17 mm). All patients were satisfied with the technique. Complications included misplaced screws in one case and limb over-lengthening in a bilateral case. Conclusion: Although circular osteotomy of the femur is a demanding technique, it may be executed safely. Union occurs despite the subtrochanteric location. Short arc of the osteotomy avoids secondary femoral deformity. Correction of proximal femoral deformity is efficiently done with satisfactory clinical and radiographic results. Keywords: circular osteotomy, femoral osteotomy, subtrochanteric osteotomy, coxa vara.

Date: 2010-09-02
Session: Trauma - Subtrochanteric Fractures
Time: 10:45-12:15
Room: F4

Abstract number: 25528

SUBTROCHANTERIC FRACTURE. MANAGEMENT WITH ORIF DYNAMIC COMPRESSION PLATE.

Sanjib kumar BEHERA¹, Satyanarayana D. SREENIVAS²

¹*Yashoda Hospital, Secundrabad (INDIA),* ²*Central Railway Hospital, Secunderabad (INDIA)*

Subtrochanteric fracture has a significant place because of their known extraordinary complications with their surgical management. Multiple implants have been used with varying rates of success. Difficulties are encountered in their treatment because of unique area of anatomical location and biomechanically. The goal of the fracture fixation in this area is to restore length, axial rotation and normal angular alignment, union and finally the best possible functional outcome. Method: During the year April2001-July2009, between the age range of 35 -70yrs, a total of 54 limbs of Subtrochanteric fracture was treated. 40 were male 8 female.42 were unilateral and 6 were bilateral. 6 of them were associated with multiple fractures. All surgeries were performed by a fully trained surgeon. This method was performed using a broad 4.5 DCP plate and with open reduction technique using reduction clamp, which gave very good near hairline reduction. Results, All fractures united radiographically within 12-16 weeks (mean of 13.2 weeks) and there were no complications, Nonunion or infection. None had trochanteric pain, abductor lurch and no hardware failure. Conclusion, No classifications was followed for this study as similar implant and same technique was used for all subjects. Advantage being cost was impeccably low in comparision to other hardware and the familiarity to curve the plate. However, this method does offer a technical challenge to obtain an accurate reduction and restoration of normal anatomy and function, but with final outcome, it is appreciable in term of no complication and cost incurred.

Date: 2010-09-02
Session: Trauma - Subtrochanteric Fractures
Time: 10:45-12:15
Room: F4

Abstract number: 25321

TREATMENT OF SUBTROCHANTERIC NONUNIONS WITH THE 95-DEGREE BLADE PLATE

Seung-Jae LIM, Jeong-Hoon HAN, Youn-Soo PARK
Samsung Medical Center, Seoul (KOREA)

Although a relatively high incidence of fixation failure and nonunions of subtrochanteric fracture has been well described, few studies have focused on the treatment of subtrochanteric nonunions. The purpose of this study was to evaluate the clinical and radiographic results of treating subtrochanteric nonunions with a blade plate. Between April 1997 and June 2008, a total of 16 patients with subtrochanteric nonunions were treated with use of the 95-degree blade plate. There were 8 men and 8 women with a mean age of 58 years (42 to 77). Outcome measures were the time to union, postoperative complications, Harris hip score and functional rating scale of Sanders. The average follow-up period was 26 months (12 to 63). Union was achieved in 15 (94%) of the 16 patients. The average time to union was 7 months (4 to 11). One patient did not reach union and was ultimately treated by total hip arthroplasty. Complications were seen in two patients; one was bursitis around the greater trochanter and the other was avascular necrosis of the femoral head. At the time of latest follow-up, the mean Harris hip score was 88 points (36 to 100) and functional rating scale of Sanders was good or excellent in 14 (88%) of the 16 patients. Surgical treatment of subtrochanteric nonunions with use of the 95-degree blade plate resulted in a high rate of union and excellent functional outcomes.

Date: 2010-09-02
Session: Trauma - Subtrochanteric Fractures
Time: 10:45-12:15
Room: F4

Abstract number: 24900

MUSCULOSKELETAL FUNCTION AND QUALITY OF LIFE IN ELDERLY PATIENTS AFTER A SUBTROCHANTERIC FEMORAL FRACTURE TREATED WITH A CEPHALOMEDULLARY NAIL

Ricard MIEDEL, Hans TÖRNKVIST, Sari PONZER, Anita SÖDERQVIST, Jan TIDERMARK

Karoliska Institutet, Department of Clinical Science and Education, Section of Orthopaedics, Stockholm Söder Hospital, Stockholm (SWEDEN)

Objectives: To report the musculoskeletal function and health-related quality of life (HRQoL) in elderly patients after a subtrochanteric fracture treated with a cephalomedullary nail. **Design:** Prospective cohort study. 1-year follow-up. **Setting:** University hospital. **Patients:** 53 patients, mean age 82 (range 61-94) years, with a subtrochanteric fracture of the femur. **Intervention:** Fixation with a cephalomedullary nail. **Main Outcome Measurements:** Reoperation rate, musculoskeletal function (SMFA) and HRQoL (EQ-5D). **Results:** Six patients (11%) were reoperated upon, five due to technical failures and one due to an ipsilateral fracture of the distal femur. The SMFA Dysfunction Index increased from 18 before the fracture to 46 at 4 months and 43 at 12 months. The corresponding values for the SMFA Bother Index were 10 before the fracture and 43 and 40 at 4 and 12 months ($p < 0.001$ between follow-ups and before fracture for both indices). The EQ-5D index score decreased from 0.85 to 0.49 at 4 months and remained at almost the same level at 12 months, 0.52 ($p < 0.001$ between follow-ups and before fracture). **Conclusions:** A subtrochanteric fracture treated with a cephalomedullary nail had a substantial negative impact on the patient's musculoskeletal function according to the SMFA, as well as on the patient's HRQoL. However, the need for revision surgery was comparatively low, which confirmed that the cephalomedullary nail constitutes a reliable treatment for patients with subtrochanteric fractures. The data obtained in this study can be used for future pooling of SMFA data.

Date: 2010-09-02
Session: Trauma - Subtrochanteric Fractures
Time: 10:45-12:15
Room: F4

Abstract number: 25780

SAHLGRENSKA UNIVERSITY HOSPITAL HIP SCORE - LEVEL OF ACTIVITY FOR PATIENTS OPERATED FOR A HIP FRACTURE IN THE ACUTE POSTOPERATIVE PHASE. A RELIABILITY AND VALIDITY STUDY.

Maria EDVINSSON¹, Ulla SVANTESSON², Hans GRANHED³

¹*Sahlgrenska University Hospital, Mölndal (SWEDEN)*, ²*University of Gothenburg, Göteborg (SWEDEN)*, ³*Sahlgrenska University Hospital, Mölndal (SWEDEN)*

Background: Only a few studies describe the functional level in patients with hip fracture in the acute phase. We have developed a document called Sahlgrenska University Hospital Hip score (SUHS). It consists of items describing walking ability with increasing difficulty and a separate part describing the ambulation. The document is easy to administrate and could be used for journals or in research, by all professional healthcares. Patients and methods: 60 patients with a hip fracture were included in the study. Interraterreliability was tested at different levels. The validity was tested by using Timed Up and Go (TUG) and Fall Efficacy Scale (FES) in three different levels. Results: SUHS has a good interraterreliability ($p < 0.05$). The validity was found to be significant in all three levels both to TUG and FES ($p < 0.01$). We also found a correlation between levels and the total length of stay (LOS) ($p < 0.01$). Interpretation: SUHS can be used for future pain- and rehabilitation studies on hip fractures in the acute phase. By using SUHS in patients with hip fracture in the postoperative acute phase for a general description of the activity levels could for exemple lead to identify riskpatients early and optimize the care for the individual. This will be important in respect for the increasing number of patients in the future. SUHS can also predict LOS and probably future functional level.

Date: 2010-09-02
Session: Trauma - Subtrochanteric Fractures
Time: 10:45-12:15
Room: F4

Abstract number: 26205

GUIDELINES TO PERFORM CHEST X RAY IN PATIENTS WITH FRACTURE NECK OF FEMURS

Muhammad SAEED¹, Bushra SAEED², David FARRAR³, A PRAZEDLACKA³, R ARDLEY³, Aroonkumar CHOUHAN³

¹*Royal Free Hospital NHS Trust, London (UNITED KINGDOM)*, ²*Barnet and Chasefarm Hospital NHS Trust, London (UNITED KINGDOM)*, ³*BSUH NHS Trust, Brighton (UNITED KINGDOM)*

Introduction: We conducted a prospective study in our department to develop the Guidelines to perform chest x ray in patients with Fracture neck of femurs. The best practice was established according to National Institute for clinical excellence (NICE) UK guidelines. **Materials and Methods:** We prospectively looked at Patients records who were operated on fracture neck of femur fractures. The best practice was established according to (NICE) guidelines. **Results:** 62% of the patients had chest X-ray performed before operation. Most common indication for performing the chest x-ray was "Routine investigation". According to NICE Guidelines 84% of the x-rays were unnecessarily performed. **Discussion.** The cost due to chest x-rays are important. One chest x ray cost £18.00. The total number of Fracture neck of femur per year in UK are approximately 66000. By avoiding unnecessary X rays we could save up to £1188000.00 per annum. The chest x-ray is one of the lowest radiation exposure medical examinations performed today. The effective radiation dose from x-ray is 0.1 millisievert which is about the same as the average person receives from background radiation in 10 days. There is always a slight chance of cancer from radiation. Delay in surgery due to delayed chest x ray causes extra financial burden on NHS. The daily charges of inpatient care are estimated to be £300-£350. **Conclusion:** Chest x-rays should be performed with a reason or it can lead to false positive results leading to costly treatments and anxiety to patient.

Date: 2010-09-02
Session: Trauma - Subtrochanteric Fractures
Time: 10:45-12:15
Room: F4

Abstract number: 26213

SECOND HIP FRAGILITY FRACTURES

Okechukwu OKONKWO, Cyrus JENSEN, Pavel AKIMAU, Jim HOLLAND
Newcastle-upon-tyne NHS Hospitals Trust, Newcastle Upon Tyne (UNITED KINGDOM)

AIM: To investigate the rate of second fragility hip fractures and the impact of secondary prevention.**METHOD:** We performed a retrospective case-note analysis of patients presenting to an urban trauma unit with a second fragility hip fracture from 2003 - 2008. The management of these patients was audited against the standards set out in the British Orthopaedic Association (BOA) and British Geriatric Society (BGS) 2007 Blue Book. **RESULTS:** During the 5 year period 74 patients presented a second time with a fragility fracture of the other hip. 40 case notes were available for review. Average age of cohort was 78 years. The commonest cause of both the first and second fractures was a simple mechanical fall (63% and 52% respectively.) In this cohort 84% of patients had not received all of the recommended secondary prevention measures prior to their second hip fracture. **CONCLUSION:** 4% of patients treated for hip fracture represented with a fracture of their other hip in the last 5 years, despite varying degrees of secondary prevention. Secondary prevention methods described in the BOA/BGS 2007 Blue Book were incomplete in nearly all the patients who went on to fracture a second hip. This group of patients suffered predictable and potentially avoidable fractures, highlighting the importance of diligent secondary prevention in the after care of hip fracture patients. We would advocate the use of a comprehensive 12-point checklist of secondary prevention methods requiring completion by all relevant healthcare professionals before discharge of fragility hip fracture patients is permitted.

Date: 2010-09-02
Session: Infections
Time: 13:30-15:00
Room: F4

Abstract number: 26135

EVALUATION OF ADEQUACY OF SHORT-COURSE CHEMOTHERAPY IN EXTRASPINAL TUBERCULOSIS USING TECHNETIUM 99M CIPROFLOXACIN LABELED BONE SCAN

Vikas BHARDWAJ

Maulana Azad Medical College, Lok Nayak Hospital, New Delhi (INDIA)

Osteoarticular tuberculosis is an important cause of mortality and morbidity in developing countries. Whereas pulmonary tuberculosis has objective criteria for initiating and stopping the treatment like sputum microscopy, same is not possible in skeletal tuberculosis (a paucibacillary disease). Imaging modalities like MRI and radionuclide scans are used in monitoring the disease status but there is no modality that has been able to exactly pinpoint the time of cessation of pathological process in skeletal tuberculosis. Ciprofloxacin labelled with 99mTc has been used to study the course of disease after starting chemotherapy and to assess the adequacy of short term regimen by monitoring the disease. All suspected cases were evaluated clinically and radiologically. Histopathology and PCR analysis was done in selected cases. All the patients were given standard six month short course chemotherapy as per WHO guidelines. Diagnosed cases underwent Tc99m Ciprofloxacin labeled scan. During every visit patients were enquired and examined following parameters for comparisons during the study: weight, ESR, pain, tenderness and presence of fever & anorexia. 5 out of 25 previously positive scans became negative within 3 months of starting the chemotherapy. At completion of chemotherapy, all the patients had a negative scan. All patients showed progressive improvement in clinical parameters and by the end of study all patients had marked improvement. We concluded that the short course chemotherapy of six months is adequate in most of the cases of osteoarticular tuberculosis and that Tc99m Ciprofloxacin bone scan can be used to monitor the disease activity during the course of treatment.

Date: 2010-09-02
Session: Infections
Time: 13:30-15:00
Room: F4

Abstract number: 25820

**POSTSURGICAL INFECTION INCIDENCE IN ORTHOPAEDIC SURGERY.
PROSPECTIVE STUDY 1996-2008.**

Ignacio GARCÍA-FORCADA, Jaume CALMET-GARCÍA, Eduardo GONZÁLEZ-PEDROUZO, Carlos ESTEVE-BALZOLA, Petrea IFTIMIE, José GINÉ-GOMÀ
Hospital Universitari de Tarragona Joan XXIII, Tarragona (SPAIN)

Introduction: We report post surgical infection incidence rates and distribution profiles in a prospective surveillance study in our orthopaedic department. Methods: We prospectively (1/1996-12/2008) monitored 17.156 patients undergoing surgery, collecting epidemiological, clinical, surgical and microbiological data. Results: The real bone and joint infection incidence rate was 1.69% and the real non-bone and joint infection incidence rate was 1.35%. In scheduled surgery, the infection incidence rate was 2.42% including the bone and joint infection rate (1.69%) and the non-bone and joint infection rate (0.73%). In emergency surgery the infection incidence rate was 4.65% (bone and joint rate (2.32%) and the non-bone and joint infection rate (2.33%). We found 0.9% non-bone and joint infections in scheduled surgery and 2.25% non bone and joint infections in emergency surgery ($p < 0.05$) during the studied interval. Discussion/Conclusion: The bone and joint infection rate is higher in emergency surgery comparing with the correspondent scheduled surgery rate even without statistical significance. The non bone and joint infection rate in emergency surgery is significantly higher comparing with correspondent rate in scheduled surgery. These results are comparable with data reported before and help us to control and treat our patients.

Date: 2010-09-02
Session: Infections
Time: 13:30-15:00
Room: F4

Abstract number: 25725

TREATMENT OF DEEP ENDOPROSTHETIC INFECTION OF THE HIP JOINT

Victor VOLOSHIN, Anatoliy EREMIN, Dmitriy MARTYNNENKO, Saravanan ARUMUGAM

M.F. Vladimirskiy Moscow Regional Clinical Research Institute, Moscow (RUSSIA)

Aim: To improve the treatment results in patients with chronic purulent infection of the hip joint after total hip arthroplasty. **Materials and methods:** Data of 68 patients with deep endoprosthetic bed infection after total hip arthroplasty were analyzed. The treatment methods we performed were following: Surgical sanitation with revision and drainage in 7 patients (infection observed at early postoperative period, stable components), Resection arthroplasty in 42 patients with septic loosening of the components, one setting revisional total hip arthroplasty in 2 patients with low-grade infection and two stage total hip arthroplasty with cement spacer in 17 patients. Removal of spacer with endoprosthetic replacement was performed after 3-7 months, if the following criteria were present: 1. absence of clinical and laboratory signs of infection, 2. microbiologically negative culture results from the hip joint which was confirmed by immuno-serological data. **Results:** The outcome of resection arthroplasty was characterized by remission of purulent infection and partial or full weight bearing of limbs with the formation of neoarthrosis. We observed that implantation of spacer reduces the reoccurrence of infection, improves rehabilitation and prevents muscle atrophy possibly because of the mobile joints. During follow-up, we did not observe residue of infection up to 5 years after two stage hip arthroplasty in 15 cases.

Date: 2010-09-02
Session: Infections
Time: 13:30-15:00
Room: F4

Abstract number: 23411

**CLINICORADIOLOGICAL PRESENTATION OF TUBERCULOSIS OF THE ELBOW
– AN ANALYSIS OF 58 CASES**

Sunil Gurpur KINI, Aditya N. AGGARWAL, Ish K. DHAMMI, Sudhir KUMAR
University College of Medical Sciences, New Delhi (INDIA)

The diagnosis of tuberculosis of the elbow is often missed in the early stages, so that irreversible osteoarticular destruction may occur. We describe our experience with 58 elbows in 56 patients. Most patients were in the first three decades of life. All patients presented with pain, swelling and loss of motion. Eighteen elbows had discharging sinuses. Eleven elbows had a palpable supratrochlear lymph node. Nine were completely ankylosed in flexion, at an angle of 73.8° on average; the other elbows had a mean range of motion from 32.8° to 107.6°. Plain radiographs showed periosteal reaction in 8 elbows without discharging sinus and thus free of superinfection and para-articular round to oval lytic lesions in 34. According to the radiological classification of Martini, 7 elbows were in stage 1, 16 in stage 2, 24 in stage 3 and 11 in stage 4. All the patients were treated conservatively with antituberculous drugs for a minimum period of 9 months. The mean duration of follow up was 15 months. The functional results were related to the radiological stage at presentation, not to the duration of symptoms or to the initial loss of range of motion.
Keywords: tuberculosis; elbow.

Date: 2010-09-02
Session: Infections
Time: 13:30-15:00
Room: F4

Abstract number: 22932

THE ROLE OF AMPLIFIED MYCOBACTERIUM TUBERCULOSIS DIRECT TEST (AMTDT) GEN-PROBE (INC SAN DIEGO, CA) IN THE EARLY DIAGNOSIS OF CLINICALLY SUSPECTED CASES OF TUBERCULOUS ARTHRITIS OF KNEE JOINT

Sumit BATRA, Vinay AGGARWAL, Vinod SHARMA, Geetika KHANNA
Central Institute of Orthopaedics, Vmmc and Safdarjung Hospital, Delhi (INDIA)

Background: The early diagnosis of tuberculous arthritis has always been difficult despite the numerous array of tests available as no single test claims of high specificity & sensitivity with a rapid diagnosis. With the advent of molecular diagnostic methods & their proven utility in pulmonary TB, a new hope has arisen for early diagnosis of cases of osteo-articular TB. Material & Methods: Forty patients of suspected knee joint TB (Based on clinical profile , Mantoux test & elevated ESR) were subjected to diagnostic arthroscopy & synovial biopsy (from October,2007 to July 2009). The tissue sample & synovial fluid was subjected to standard mycobacterial culture, histopathology & Gen -probe. A comparative analysis of the diagnostic potential & time to diagnosis was done for the three major modalities using Mc Nemar test. Results: Out of 40 tissue samples, 10 were found to be positive with mycobacterial culture (LJ/Bactec), 15 were positive with Histopathology & only 7 were found to positive with Gen-probe. The sensitivity of Gen-probe was found to be 70% & specificity of 100% taking culture as gold standard. The average time taken for Gen-probe reporting was 1.5 days while histopathology diagnosis took an average of 7days. Conclusion: Gen Probe is a rapid diagnostic test for early diagnosis of Tuberculous arthritis but it cannot be relied on a sole basis due to its low sensitivity, Therefore, as of now, diagnosis of Tuberculous arthritis should be based on arthroscopic biopsy as far as possible & tissue be subjected to both culture, histopathology & molecular diagnostic methods.

Date: 2010-09-02
Session: Infections
Time: 13:30-15:00
Room: F4

Abstract number: 22843

PELVIC SUPPORTS – POTENTIAL SOURCE OF CROSS-INFECTION IN HIP SURGERY

Gautam TALAWADEKAR, S. SATHYAMURTHY
QEQM Hospital, Margate (UNITED KINGDOM)

Introduction: Anterior & posterior hip supports are employed in hip surgery with their surfaces in direct contact with patient's groin & buttock areas. Repeated use of same supports could cause cross-infection. We examined their contamination in our institution. Materials & Methods: We swabbed 6 anterior & posterior hip supports (total 12), employed interchangeably for both elective & trauma surgery. Swabs were obtained from 2 sites on each support & were cultured & incubated at 37 0 C in Columbia Blood Agar. 2 random supports were cleaned using Sani Cloth Detergent non-alcoholic wipes & samples were obtained, 5 min later. Results: 71% supports were contaminated with Coagulase-negative Staphylococcus (Staph Epidermidis, being the most commonly grown organism) with average of 5.3 CFU's (0-38) per swab. 5 min after cleaning there was 100% reduction in contamination with no growth from 4 swabs. Discussion: Coagulase -ve Staphylococci, including Staph epidermidis, the most predominant infecting organisms in total hip replacement, are grown from surface of hip supports. Trauma patients are not necessarily subjected to groin MRSA swabs pre-operatively in contrast to patients undergoing elective hip surgery, who are. Interchangeable use of hip supports defeats the purpose of this practice. Hip supports could be a source of surgical site infection, considering their proximity to the operative site & ability of bacteria to penetrate certain surgical drapes in presence of wetness. We recommend strict cleaning of these supports for 5 min with the detergent wipes before & between every orthopaedic hip case. Where feasible, separate supports should be used for elective and trauma cases.

Date: 2010-09-02
Session: Infections
Time: 13:30-15:00
Room: F4

Abstract number: 26183

ANTIMICROBIAL PEPTIDES AS POTENTIAL ANTI-INFECTIVE AGENTS IN THE PREVENTION OF ORTHOPAEDIC INFECTIONS

Stephanie SANDIFORD¹, Peter KAY², Mathew UPTON¹

¹*The University of Manchester, Manchester (UNITED KINGDOM)*, ²*Wigan and Leigh NHS Trust, Wigan (UNITED KINGDOM)*

Objectives: Staphylococcus epidermidis is a major cause of prosthetic joint infections. The resistant nature of this organism makes it extremely difficult to treat using conventional therapies. Antimicrobial peptides represent a group of agents that show good activity against S. epidermidis. The aim of the current study was to determine the ability of antimicrobial peptide gallidermin and novel antimicrobial peptide NI01 to prevent the growth of S. epidermidis when incorporated into polymethylmethacrylate (PMMA) bone cement using a microplate proliferation assay. **Methods:** Gallidermin (MBC 125µg/ml) with an inhibitory activity of >5120 AU/ml and NI01 (MBC 4.37mg/ml) with an inhibitory activity of 2560 AU/ml were incorporated into PMMA bone cement. Columns of bone cement with a diameter of 4mm and height of 7mm were attached to the lid of a 96 well microtitre plate. The cement columns were then incubated with 10⁶ cfu/ml clinical biofilm forming S. epidermidis strain 156. Growth of adhered bacteria was then monitored in real time using a kinetic plate reader over 48 hours, producing a time proliferation curve for each well. **Results:** Incorporation of gallidermin (125µg/ml) and NI01 (4.37mg/ml) into cement columns of PMMA cement caused a significant decrease in the growth of clinical S. epidermidis isolate 156 (p = 0.001). **Conclusion:** This study identifies the ability of antimicrobial peptides gallidermin and NI01 to significantly reduce the growth of S. epidermidis therefore indicating the potential role of antimicrobial peptides in the prevention of orthopaedic infection.

Date: 2010-09-02
Session: Infections
Time: 13:30-15:00
Room: F4

Abstract number: 25759

ONE-STAGE REVISION FOR INFECTED REVERSE TOTAL SHOULDER ARTHROPLASTY

Pieter BEEKMAN, Luk VERHELST, Lieven DE WILDE

Ghent University Hospital, Department of Orthopaedic Surgery and Traumatology, Ghent (BELGIUM)

Infection after reversed shoulder arthroplasty (RSA) has an incidence of 5%. Two-stage revision is most frequently used to control infection. We investigated the results after one-stage revision for infected RSA. Fourteen consecutive patients were retrospectively followed. Patients were assessed clinically, radiographically and laboratory tests were carried out. An acute infection was seen in 5 cases, subacute in 7 and late in 2 cases. The removal of the prosthesis was performed by a superior extended deltoideopectoral, clavicular osteotomy approach. A gentamycine membrane was interpositioned between baseplate and glenosphere. Postoperatively patients were treated with IV Cefazoline 3 x 2 g/d for minimum 3 days and PO antibiotic therapy was given for at least 3 months. Eleven patients had an infection accompanied by a draining sinus. Eight of these patients had no pain or limitation of function. The mean preoperative adjusted Constant-Murley score (aCS) was 45% (3%-75%). All but one patient were free of infection and sinus at mean follow-up of 24 months (9m-41m) and without antibiotic treatment for minimum 6 months. The mean postoperative aCS was 66% (15%-111%) at latest follow-up. Four early complications were seen (posterior dislocation (2), postoperative haematoma and clavicle fracture). Peroperative samples showed *Propionibacterium acnes* (8), coagulase-negative *Staphylococcus* (6), MRSA (1), *Staphylococcus aureus* (1) and *E. Coli* (1). Three multibacterial and eleven monobacterial infections were seen. The recurrence rate of infection is comparable to two-stage revision, it preserves good function and establishes pain relief. One-stage revision arthroplasty is an attractive alternative treatment for infected RSA.

Date: 2010-09-02
Session: Infections
Time: 13:30-15:00
Room: F4

Abstract number: 25731

SURGICAL MANAGEMENT OF INFECTED TIBIAL INTRAMEDULLARY NAILS

Asif A. H. PARKAR, Naveen ABHISHETTY, Om LAHOTI, Sarah PHILLIPS, G. GROOM

King's College Hospital, London (UNITED KINGDOM)

MATERIALS AND METHODS: We present a series of 11 patients with infected tibial intramedullary nails which were treated at our tertiary referral centre from January 2000 to November 2009. All of them were males and the mean age was 36 years (26 to 47 years). All the patients had sustained post traumatic fractures which were treated with intramedullary nail. Four patients (36%) had sustained open fractures in whom adequate soft tissue cover was provided by plastic surgeons. Five of them (45%) were smokers. All of them underwent surgical debridement. Nine out of 11 patients had removal of metal work followed by one or more of the following procedures such as reaming, exchange nailing, excision of sequestrum, application of antibiotic beads and stabilisation with a frame with or without several bone grafts at a later date. **RESULTS:** Out of 11 patients six (55%) had no further episodes of infection, three (27%) still need short courses of antibiotics when the disease flares up and two (18%) underwent amputation. Causative organisms were isolated in all the patients. Commonest organism was MRSA. Overall, most of the organisms were sensitive to Vancomycin and resistant to Penicillin. **DISCUSSION:** Despite exploring most of the surgical procedures described for infected tibial intramedullary nails we have potentially eradicated infection only in about half of our patients. Hence we would like to emphasise that this condition still remains a serious problem and demands further insight in its management.

Date: 2010-09-02
Session: Infections
Time: 13:30-15:00
Room: F4

Abstract number: 24979

INTRASPINAL TUBERCULOMA: AN UNCOMMON PRESENTATION OF POTT'S SPINE

Mayank AGRAWAL

University College of Medical Sciences Delhi, Mathura (INDIA)

Introduction: Neurological manifestations in Pott's spine are often secondary to vertebral affection but at times may also be caused by neural/ perineural tissue granulomata (epidural /subdural space, meninges, cord tissue). It has been reported very infrequently as isolated case reports in literature. Materials and Methods: 27 patients of compressive myelopathy (intraspinal tuberculoma) were evaluated retrospectively. All were younger than 40 yrs except 1. Diagnosis was made on clinical and radiographic findings. There was Extradural granuloma in 19 patients while Intramedullary tubercular granuloma (in spinal cord) in remaining 8 patients. The course and outcome of treatment was followed for a minimum of 36 months with follow up varying from 40-98months. Results: There was complete neural recovery 13 patients while incomplete recovery in 1 and no recovery in 5 (postop myelogram-no block) amongst the 19patients of extradural granuloma while all patients of intramedullary granuloma were managed with ATT alone with neurological recovery. Discussion: Intraspinal tuberculoma can be a cause of neurological involvement in a patient with suspected Pott's Spine with apparently normal plain radiographs. MRI can be of diagnostic value in such cases. Patients with isolated intramedullary (spinal cord) granuloma can be managed conservatively with ATT alone with good neurological outcome while those with extradural granuloma should also be decompressed surgically for optimal outcome.

Date: 2010-09-02
Session: Arthroplasty Knee
Time: 16:00-17:45
Room: F4

Abstract number: 26839

BLOOD MANAGEMENT IN HIP AND KNEE ARTHROPLASTY

Rob NELISSEN¹, Cynthia SO-OSMAN², Ronald BRAND³, Ankie KOOPMAN VAN HEMERT⁴, Anneke BRAND³

¹*Leiden University Medical Center, Leiden (NETHERLANDS)*, ²*Sanquin, Leiden (NETHERLANDS)*, ³*LUMC, Leiden (NETHERLANDS)*, ⁴*Dordrecht (NETHERLANDS)*

The use of alternatives for red blood cell transfusions in orthopaedic surgery is widely accepted. However, no sufficiently powered data are available in which several strategies are compared with a control group. **METHODS** A prospective, double randomized, multicenter study is performed to investigate whether the use of several transfusion alternatives (erythropoietin (Epo), the cell-saver or postoperative drainage and reinfusion systems) in patients undergoing elective total knee or hip replacement surgery can lead to allogeneic red blood cell (RBC) saving if a restrictive transfusion policy is used. All patients were randomized for cell saver, used intra- and postoperatively or a postoperative autologous reinfusion system. The control group had a restrictive transfusion trigger only. Patients were stratified according to their preoperative hemoglobin (Hb) level: stratum I= Hb between 10 and 13 g/dL. These patients were randomized for Epo or no Epo. Stratum II= Hb of 10 g/dL and lower or 13 g/dL and higher, were not eligible for Epo and thus were carried on as a non-Epo (non-randomized) stratum. Primary outcome was the number of allogeneic red blood cell (RBC) transfusions. **RESULTS** Of 2442 patients, 12% were transfused. Overall mean blood use was 0.3 (SD 1.2) RBC/patient. Use of Epo resulted in a 43% RBC reduction when analysed as-treated (p=0.10). However, Epo resulted in a significant reduction in the proportion transfused patients of 67% in the as-treated analysis. Epo resulted in reduction of 67% patients transfused. Autologous blood re-infusion devices did not result in a RBC reduction. **CONCLUSIONS** A restrictive transfusion trigger is sufficient as a blood saving modality with regard to peri-operative blood recovery. Use of Epo shows a significant benefit as a blood-avoiding rather than a blood-saving strategy. Use of cell saver or postoperative drainage and re-infusion device has no added benefit.

Date: 2010-09-02
Session: Arthroplasty Knee
Time: 16:00-17:45
Room: F4

Abstract number: 25700

REVISION RATE FOR WEAR IN TKA WITH THIN PE INSERTS

Rob NELISSEN, Bart PIJLS, Enrike VAN DER LINDEN-VAN DER ZWAAG
Leiden University Medical Center (LUMC), Leiden (NETHERLANDS)

INTRODUCTION: Thin Poly-Ethylene (PE) inserts have been associated with unfavourable wear characteristics which may lead to higher revision rates in Total Knee Arthroplasty (TKA). The purpose of this study is to compare the revision rates because of PE-wear for thin and thick PE-inserts. **MATERIALS AND METHODS:** A cohort of 57 patients (84 TKA's) was prospectively followed for an average 8 years (range 1 to 15). All patients received the Interax prosthesis with halfbearings: separate PE-inserts medially and laterally. Kaplan Meier survival analyses were carried out with revision due to wear as endpoint. The long rank test was used to compare revision rates between thin PE-inserts (6 mm) and thick PE-inserts (> 6 mm). The influence of possible confounders was studied. **RESULTS:** A total of 8 revisions were done after an average 8.5 years. In 6 cases wear of the lateral insert was the primary indication (all 6 mm) and in 2 cases wear of the medial insert (6 and 8 mm). For the lateral inserts the cumulative revision rate for the thin PE-inserts was 40% at 15 years compared to 0% for the thick PE-inserts; $p = 0.005$. For the medial inserts the cumulative revision rate for the thin PE-inserts was 6% at 15 years compared to 5% for the thick PE-inserts; $p = 0.55$. **CONCLUSION:** Concerning the lateral inserts there were significantly more revisions for wear in the thin PE group compared to thick PE group. These results indicate that thin PE inserts should be used with caution.

Date: 2010-09-02
Session: Arthroplasty Knee
Time: 16:00-17:45
Room: F4

Abstract number: 25736

HOW MUCH TIBIAL RESECTION IS NEEDED IN TOTAL KNEE ARTHROPLASTY?

Christoph SCHNURR¹, György CSÉCSEI¹, Peer EYSEL², Dietmar Pierre KÖNIG¹

¹*LVR Klinik für Orthopädie Viersen, Viersen (GERMANY)*, ²*Clinic of orthopaedic surgery and traumatology, University of Cologne, Köln (GERMANY)*

It is a general principle in primary total knee arthroplasty to beware of unnecessary bone loss. However, so far no data about the required amount of tibial resection in primary total knee arthroplasty exists. Therefore it has been purpose of our study to calculate the required tibial resection in total knee arthroplasty. Methods: The data of 464 ongoing navigated primary total knee arthroplasties have been retrospectively analyzed. The PFC implant with a minimum insert thickness of 8mm has been used. Data concerning leg axis, joint line, insert size and tibial resection were recorded by the navigation device. An algorithm has been developed to calculate the required tibial resection by use of those data. The required resection has been referenced to the higher side of the tibial plateau. Results: The required tibial resection significantly correlates with the leg axis ($p < 0.001$): In valgus deformities the required resection depth averaged 5.1mm and was significantly reduced comparing knees with a neutral leg axis (6.8mm, $p < 0.001$) and varus deformities (8.0, $p < 0.001$). In all three groups the joint line was reconstructed with an average inaccuracy below 1mm. Conclusions: The manufactures recommend a tibial resection just below the worn out plateau or an insert thickness below the intact tibial plateau. However, our study demonstrates that this is only correct if a varus deformity exists. Especially in valgus deformities mostly a reduced tibial resection depth is required. Hence unnecessary bone loss and consecutively higher insert sizes can be avoided.

Date: 2010-09-02
Session: Arthroplasty Knee
Time: 16:00-17:45
Room: F4

Abstract number: 23228

**CORRECTING VARUS DEFORMITY DURING TOTAL KNEE ARTHROPLASTY:
THE “INSIDE-OUT” TECHNIQUE**

Chitranjan RANAWAT

Hospital for Special Surgery, New York (UNITED STATES)

INTRODUCTION: In 1979, our senior author described his technique for correcting a flexion contracture during total knee arthroplasty (TKA) by additional resection of the distal femur and posterior capsular release; he also described his method of correction of a varus deformity by raising a subperiosteal sleeve from the proximal tibia. Due to concerns related to elevation of the joint line as well as flexion/extension gap asymmetry and instability, our technique has evolved into a methodical soft tissue release at the level of the joint line. Our hypothesis is that this technique effectively corrects both deformities, while reducing the complications related to the more traditional techniques. We describe this technique and assess its effectiveness in a series of 31 consecutive patients. **TECHNIQUE:** Highlights of this technique are as follows: 1. An osseous resections of 10mm from the level of the uninvolved surfaces of the femur and tibia. 2. A transverse release of the contracted posterior capsule is performed with electrocautery at the level of the tibial resection from the posterior margin of the superficial medial collateral ligament (MCL) to the posterolateral corner of the tibia. 3. A controlled lengthening of the superficial MCL by pie-crusting. **RESULTS:** Over a 12 month span, we have corrected these biplanar deformities in 31 knees without residual instability. There were no residual flexion contractures greater than 5 degrees. The maximum varus corrected was 30 degrees, and the maximum flexion contracture corrected was 20 degrees. The mean coronal plane correction was to 5.5 degrees of valgus (range: 1 to 9 degrees). **DISCUSSION:** In a series of 31 consecutive patients, this technique was effective in correcting both deformities. We achieved a mean range of motion of 115 degrees, while avoiding elevation of the joint line or instability. While we report good early results, further studies are needed to better evaluate this technique.

Date: 2010-09-02
Session: Arthroplasty Knee
Time: 16:00-17:45
Room: F4

Abstract number: 25423

RESULTS OF A TKA AFTER KNEE ARTHRODESIS

Enrike VAN DER LINDEN, Rob NELISSEN
Leiden University Medical Center, Leiden (NETHERLANDS)

Introduction: A knee-fusion is often complicated surgery and fortunately not common. However the end-stage is in most cases a painless knee and good Knee Society Scores. The disabilities in daily life because of the inability to flex the knee, are underestimated. Patients are more and more asking for restoration of the function after a fusion. We evaluated the results of a knee-arthroplasty after a knee-fusion, especially concerning daily life. Patients and methods: From 1996 to 2007, at the Leiden University Medical Center 8 patients had a knee-arthroplasty after a knee fusion. In all cases the indication for operation was restoring as much flexion as possible. The skin condition, extension muscles and patellar tendon were evaluated before surgery. MRI was used for the pre-operative screening. Five patients had the knee-fusion because of an earlier infection, two because of rheumatoid arthritis. In two cases an allograft of patellar tendon or achillestendon was used. One of them had a postoperative woundproblem which in the end healed. Results: The average time between fusion and arthroplasty was 26 years. Postoperatively the mean flexion was 67 degrees, range 50-90 degrees. The extension lag was 0 to 10 degrees. In one knee a re-fusion was performed because of infection. The others had no complications and all patients were very satisfied. Conclusion: Restoring the flexion after a knee-fusion by a knee-arthroplasty is contributing a significant better ability in daily life. Pre-operative screening, planning and evaluating the risks are essential.

Date: 2010-09-02
Session: Arthroplasty Knee
Time: 16:00-17:45
Room: F4

Abstract number: 23382

MID-TERM CLINICAL & RADIOLOGICAL RESULTS OF A HYBRID REVISION KNEE PROSTHESIS WITH UNCEMENTED STEM FIXATION

Gordon HIGGINS, Paul KUZYK, Michael OLSEN, Emil SCHEMITSCH, James WADDELL

St Michaels Hospital, University of Toronto, Torbay (UNITED KINGDOM)

The aim of this study was to determine mid-term survival and functional outcomes of the Scorpio Total Stabilised Revision Knee prosthesis. Sixty seven prostheses were implanted into 65 patients between November 2001 and April 2008. The average age was 67.9(37-89). Outcomes were assessed with radiographs, WOMAC, Knee Society Scores, Short Form-8 scores and patient satisfaction. The average follow-up was over 3 years (8-93mths) with 95% follow-up. 65% (42 patients) of patients had a Body Mass Index higher than 30. 48 patients were ASA grade 3 or higher. Arthroplasties were performed for infection (13), aseptic loosening (27), stiffness (8), polyethylene wear (9), instability (6), periprosthetic fractures (2) and previously treated tibial plateau fractures (2). The average KSS increased from 49 pre-operatively to 72 at one year, and declined to 64 at 7 years. The average KS function score increased from 21 to 53 at 1 year, and declined to 45 at 7 years. The average SF-8 scores improved from 48 to 61 at 12 months and the average WOMAC score improved from 50 to 63 at 12 months. 68% (44) of patients had other significant joint involvement which affected daily function. 24% of patients were unsatisfied with the outcome. Twenty seven (51%) femoral stems and twenty one (36%) tibial stems had evidence of radiosclerotic lines on radiographs. The survival rate, using revision of the prosthesis as an end point, was 87% at 7.5 years and 90% excluding infection. Success of revision arthroplasty after treatment of infection was 92%.

Date: 2010-09-02
Session: Arthroplasty Knee
Time: 16:00-17:45
Room: F4

Abstract number: 23153

RADIOGRAPHIC AND CLINICAL PERFORMANCE OF HIGHLY CROSS-LINKED POLYETHYLENE IN YOUNG ACTIVE PATIENTS: EIGHT YEARS FOLLOW-UP

Chitranjan RANAWAT, Morteza MEFTAH

Hospital for Special Surgery, New York (UNITED STATES)

Introduction: First generation highly cross-linked polyethylene (HXLP) has been shown to have better wear rates than standard polyethylene in laboratory settings. The purpose of this study is to find whether the first generation HXLP has higher wear performance and is associated with better clinical results. Computer-based wear analysis is currently the most accurate method of determining the in vivo wear of the polyethylene liner of a total hip arthroplasty. Methods: 91 patients (112 hips) who underwent total hip replacement with the first generation HXLP insert at a single center were reviewed. The mean age of the patients was 52.2 (range 21-66) years. Femoral head penetration of the liner was analyzed with the Martell Hip Analysis and ROMAN software. Results: Five-year Martell analysis of the first generation HXLP liner showed that after the settling period of one year, yearly wear was 0.014 +/- 0.05mm/yr when including all values and 0.04 +/- 0.028mm/yr when excluding negative values. At 5-years, post-operative clinical data showed an increase in the mean HSS score from 22.9 (range 13-32) preoperatively to 39.1 (range 32-40). All implants appeared well osteointegrated with no osteolysis. Discussions and Conclusions: First generation HXLP acetabular liners demonstrate a low wear rate over five years, and the clinical findings have shown good to excellent results for this active patient population. This study is a baseline for five-year studies of other acetabular implants as well as for longer term studies of first generation HXLP inserts.

Date: 2010-09-02
Session: Arthroplasty Knee
Time: 16:00-17:45
Room: F4

Abstract number: 24571

KNEE ARTHROPLASTY AFTER HIGH TIBIAL OSTEOTOMY IN SWEDEN 1998-2007

Annette W-DAHL, Otto ROBERTSSON, Stefan LOHMANDER
Department of Orthopaedics, Lund (SWEDEN)

Knowledge of the outcome of high tibial osteotomy (HTO) as a treatment for knee osteoarthritis (OA) is insufficient. The aim of the study was to evaluate the outcome of HTO performed in Sweden 1998-2007, expressed as rate of revision to knee arthroplasty. We searched the in- and out-patient care registers from the Swedish National Board of Health and Welfare for patients 30 years or older operated on for knee OA (M17) by HTO (NGK59). This way we identified 3246 HTO in 2879 patients (69% men). Revisions were identified through the Swedish knee arthroplasty Register. 446/3246 HTO were found to have had an arthroplasty. In 42/446 cases it was unknown what side the HTO had been performed on and thus if the arthroplasty had been on the same knee. We assumed a worst case scenario of all these 42 having been on the same side as the HTO. A 10-year survival analysis was performed using revision to an arthroplasty as the end point. The mean age at HTO was 52 years (range 30-80) with 97% of the patients younger than 65 years. The CRR at 10 years was 16% (95% CI 14-24). The risk of revision after adjusting for age was significantly higher in women than men (RR 1.45 (95% CI 1.14-1.83), $p=0.002$). The rate of revision to a knee arthroplasty after HTO was relatively low and similar to what has been found for uni-compartmental knee arthroplasty in younger patients.

Date: 2010-09-02
Session: Arthroplasty Knee
Time: 16:00-17:45
Room: F4

Abstract number: 25399

TRABECULAR METAL TIBIA IN YOUNGER PATIENTS. A FIVE-YEAR RSA STUDY

Anders HENRICSON, Kjell G. NILSSON
Dept Orthopaedic Surgery, Falun (SWEDEN)

Trabecular Metal Tibia in younger patients. A five-year RSA study. Anders Henricson and Kjell G Nilsson
Background: Numerous RSA studies have shown continuous migration of cemented total knee replacements. This is a concern especially in younger patients, who are expected to have the prosthesis in situ for a longer period of time. Uncemented tibial components coated with trabecular metal have shown early stabilization in two-year follow-ups. Material and methods: Twenty-six knees in patients younger than 60 years were operated with total knee replacement and received a Trabecular Metal Tibia. One patient was revised due to probable infection, one patient deceased 4 years postoperatively, one patient had moved abroad and one patient could not attend the five-year follow-up, leaving 22 knees to evaluate. Results: The tibial components which were stable at the two-year follow-up were still stable at five years. There were no statistical differences between the two-year and the five-year results regarding any of the rotational or translational migrations nor regarding MTPM. Neither was there any difference of the The Knee Society Score. Conclusion: Trabecular Metal Tibia seems to remain stable over time even in younger patients indicating a good long-term prognosis of fixation.

Date: 2010-09-02
Session: Arthroplasty Knee
Time: 16:00-17:45
Room: F4

Abstract number: 25553

UNCEMENTED POSTERIOR STABILIZED TRABECULAR METAL TIBIA IN HIGH-FLEX KNEES IN YOUNGER PATIENTS. A TWO-YEAR RSA STUDY

Kjell G. NILSSON¹, Anders HENRICSON²

¹*Dept of Orthopaedics, Umeå (SWEDEN)*, ²*Department of Orthopaedics, Falun (SWEDEN)*

Background: Posterior Stabilized (PS) tibial components are often used in high flex knees. PS knees are usually inserted cemented because of perceived higher stresses at the interface. Trabecular metal (TM) has been shown to work excellent in uncemented cruciate retaining (CR) knees. This study evaluates uncemented PS TM tibiae in high flex TKA in patients younger than 60 using RSA. Material and methods: Forty-nine knees in 40 patients (20 men, 20 women) mean age 55 (41-60) operated with uncemented NexGen LPS HighFlex TKA with PS TM tibia. Follow-up was with radiostereometry (RSA) at 6 weeks, 3, 12 and 24 months. Results: The results are compared to CR TM tibia presented in JBJS-B 2008 p 1585. Similar to CR TM there is an initial bedding-in during the initial 3 months. Thereafter the implants stabilize with no further migration up to 2 years. In contrast to CR TM, the PS TM subsided less (0.75 mm vs 1.0 mm), whereas the magnitudes of tilting in the frontal and sagittal planes were similar. Lift off in both groups was negligible. Conclusion: Uncemented PS Trabecular Metal tibia displays similar or even lower magnitudes of migration than CR TM tibia. In contrast to what has been thought previously, the stresses between the PS tibia and bone seems to be lower than for CR as indicated by the lower migration. Uncemented PS Trabecular Metal tibia can safely be used in high flex knees in younger patients.

Date: 2010-09-03
Session: Osteoporosis
Time: 08:00-09:30
Room: H1

Abstract number: 23487

A descriptive report of DXA results and demographics in subjects referred for DXA testing in Brazil

Fabio RAVAGLIA¹, Maria Gorete LEITE¹, Tiago BARCELLOS¹, Alberto CLIQUET JR²

¹*Instituto de Ortopedia e Saude, São Paulo (BRAZIL)*, ²*FCM UNICAMP, São Paulo (BRAZIL)*

Osteoporosis and osteoporosis-related fractures are not uncommon in males. Our primary objectives were (1) to compare the rates of osteoporosis and osteopenia in adult males versus females, 65 years old and over and presenting for bone mineral densitometry (BMD); and (2) to compare males and females as to evidence of prior osteoporosis awareness. We prospectively recruited and surveyed 353 males and 501 females, all at least 65 years of age, who had presented for BMD testing. There was no difference in the rates of prior fracture, spinal fracture or long-bone fracture between the sexes, though women were significantly more likely to have osteoporosis in the spine and femur, and had significantly higher estimated risks of future osteoporotic fracture (all $p < 0.001$). Women also were significantly more likely to have received hormone treatment for their osteoporosis (7.9 vs. 3.1%, $p = 0.004$) and to have had prior BMD testing (80.7 vs. 16.2%, $p < 0.001$). Overall, 83.0% of women versus just 18.7% of men had received either BMD or treatment for osteoporosis. FRAX test results indicated 10-year probabilities of hip fracture of 4.8% in males and 5.2% in females; while the 10-year risks of a major osteoporotic fracture were 5.6% and 24.3%, respectively ($p < 0.001$). Age, gender and spinal osteoporosis predicted prior hormonal treatment; but gender was the only predictor of prior BMD, with males 95% less likely to have undergone prior testing than females.

Date: 2010-09-03
Session: Osteoporosis
Time: 08:00-09:30
Room: H1

Abstract number: 25045

THE EXPERIENCE OF THE MANAGEMENT FOR THE RADIAL END FRACTURE BY DORSAL PLATE IN OSTEOPOROTIC CASES

Kimiaki YOKOSUKA¹, Katsuya KANESAKI¹, Yasuhiro MITSUI¹, Takateru KAIEDA¹, Kensei NAGATA²

¹*Nagata Orthopaedic Hospital, Omuta (JAPAN)*, ²*Kurume University, Kurume (JAPAN)*

Introduction - The unstable radial end / intra-articular fracture was managed by the dorsal rocking plate for the effects of battles and spike in osteoporotic cases and the excursion training was started early. The results of the status of after operation and the problems of this method were examined. Materials and methods - It was assumed that it passed in more than 50 years old for an object more than a half year in postoperative progress. 51 cases (male 4 female 47) were examined. The average age at the operation was 71.6 (range from 52 to 89). The fracture classification was used AO and the functional test was Cooney. As evaluation of the X-rays studies, radial inclination (RI), volar tilt (VT) and ulnar variance (UV) were measured at just after injury and after operation, at three months and six months. 21 of 51 cases were received the removal of metals. As the most important evaluation, the function of extensor pollicis longus was assumed postoperative observation. Results - All cases got fusion of fracture and also good valuation in Cooney method. RI, VT and UV were kept throughout follow up periods. In follow up periods, a few patients felt pain in the abduction of thumb. EPL was torn in one case. But in removal of metals, two rocking screws of distal row were loosed and impinge to EPL. This was the reason of EPL torn. Other cases without loosed locking screws had intact EPL tendon covered by adhesional tendon sheath.

Date: 2010-09-03
Session: Osteoporosis
Time: 08:00-09:30
Room: H1

Abstract number: 23482

**CEMENT ADDING IN VOLAR LOCKING PLATE FOR THE TREATMENT
OSTEOPOROTIC DISTAL RADIUS FRACTURES**

Sybille FACCA, Chihab TALEB, Stéphanie GOUZOU, Philippe LIVERNEAUX
Hand Department - Strasbourg University, Illkirch (FRANCE)

Volar locking plate appears to be well known for the fixation of distal radius fractures. This is because of its very good stability which avoids secondary malunions. Nevertheless, some authors have shown few borderlines of the technique. They have notably demonstrated displacements when patients have huge osteoporosis. It seems to be bound to the inefficient stability of the screws in osteoporotic bone. That is why we proposed to add calcium phosphate cement around the screws. We operated 62 patients during seven months. The average of age was 73 year-old (62 to 91). The surgical technique was the fixation by a volar locking plate. Two groups were created, the first one without cement and the second one with cement added in screws' holes. The results were evaluated thanks to clinical (grip, VAS, DASH) and radiological benchmarks (radio-ulnar index, radial pitch). Finally the clinical and radiological results were most of them similar between the two groups. Nevertheless, the secondary displacement was lower in the group where cement was added and the pain lighter too. Thus, our results suggest that cement added in screws' holes can be useful in the treatment of osteoporotic distal radius fractures.

Date: 2010-09-03
Session: Osteoporosis
Time: 08:00-09:30
Room: H1

Abstract number: 26134

PERCUTANEOUS VERTEBROPLASTY FOR PAINFUL OSTEOPOROTIC FRACTURES VERSUS CONSERVATIVE TREATMENT. A RANDOMIZED CONTROL TRIAL

Efe Levent ARAS¹, Leif SØRENSEN², Peter VESTERGAARD³, Leif MOSEKILDE³

¹*Aarhus University Hospital Orthopaedic Spinal Research Lab, Aarhus (DENMARK),*

²*Aarhus University Hospital Dept. of Neuroradiology, Aarhus (DENMARK),* ³*Aarhus University Hospital Dept. of Endocrinology, Aarhus (DENMARK)*

Background and purpose: The burden of osteoporotic vertebral compression fractures (OVCF) is very high to society, but the management of the fractures still remains controversial. In this trial we compared the pain relief and functional outcomes after percutaneous vertebroplasty (PVP) and conservative treatment (CT). **Materials and Methods:** From January 2004 to November 2006, 33 consecutive patients (25 women) (mean age 74.6) with painful OVCFs were included in the study. 16 patients were randomized to CT (optimal pain medication), 17 patients to PVP. The following parameters were registered: Pain status (VAS), functional outcomes (Barthel Index and Nottingham Health Profile) on baseline, day 3 and at 1, 3, 6, 12 months. **Results:** At day three a significant difference was found in VAS (mean PVP: 34.5, mean CT: 66.38; $p < 0.01$). Otherwise no differences were found during the entire observation period. Functional outcomes assessed by NHP and BI did not change significantly over time and no difference was present between PVP and CT. For analgesic medication, a non-significant increase in morphine dose was found in the CT group while no change occurred in the PVP group. There was a significant difference at 3 month ($p < 0.01$) with a higher dose in the CT group than in the PVP group. **Conclusion:** PVP is superior to conservative therapy resulting in immediate pain relief, which is an important factor in the life quality and health of elderly people.

Date: 2010-09-03

Session: Natural Disasters & Orthopaedic Surgery

Time: 10:45-12:15

Room: H1

Abstract number: 26797

MISSION DE HAITI: A MSF-BE / SICOT COLLABORATIVE EFFORTS AT CHOSCAL HOSPITAL, PORT-AU-PRINCE

Nanjundappa S HARSHAVARDHANA¹, John P LAWRENCE², John P DORMANS³

¹*Ninewells University Hospital, Dundee (UNITED KINGDOM)*, ²*Swedish Paediatric Specialty Car, Seattle (UNITED STATES)*, ³*The Children's Hospital of Philadelphia, Philadelphia (UNITED STATES)*

Injury is one of the leading causes of death and 2/3rds of world population lack adequate orthopaedic care. As majority of burden is borne by low to middle-income countries(LMIC), a natural disaster in such LMIC would be disastrous. The 12/01/2010 earthquake in Haiti is considered to be world's 6th deadliest that killed 230,000 and affected 300,000 more. Treating victims with musculo-skeletal pathologies despite sustained international humanitarian relief efforts was challenging with skeletal infra-structure/facilities. The security issues/concerns further added to the misery compounding the problem manifold. First-hand experience of MSF-Be / SICOT expatriates as a part of multi-disciplinary team based at Choscal hospital, Cite Soleil - one of the most impoverished regions in Americas is being presented. The skills required / expected from an orthopaedic surgeon undertaking such a mission would be: - Team working, awareness of limitations, empathy, commitment and tolerance / patience. Basic fracture immobilization, splintage, skeletal traction. Closed reduction, manipulation and casting using locally available gauze bandages and POP powder. Recognition and surgical treatment of compartment syndrome and septic arthritis - External fixator application with wound toilet for lower extremity compound fractures - Evaluation and incision / drainage of hand infections. - Assessment and evaluation / management of spinal injury. - Internal fixation (nailing / plating) of extremity fractures - subject to theatre sterility / equipments & radiography. Education is the most effective method of providing long-term sustained solution by training local healthcare providers utilising resources that will remain available locally and are culturally acceptable. Sustained and continued efforts with emphasis on rehabilitation is equally important for long-term gains in disability adjusted life years (DALY). Given MSF's grassroot penetrance coupled with SICOT's commitment to providing quality musculoskeletal care in LMIC, this collaborative efforts between the two bodies gave authors an opportunity to learn more than what they had to offer.

Date: 2010-09-03

Session: Natural Disasters & Orthopaedic Surgery

Time: 10:45-12:15

Room: H1

Abstract number: 26860

**MANAGEMENT OF THE EARTHQUAKE RELATED ORTHOPAEDIC INJURIES:
MY HAITI EXPERIENCE**

Nikolaj WOLFSON

University of Southern California, Keck School of Medicine, San Francisco (UNITED STATES)

Management of the orthopaedic injuries in the mass casualty situation due to the earthquake is not a common in the Western society. The recent earthquake in Haiti presented some challenges and revealed some difficulties that we face when treating patients in suboptimal medical facilities and conditions. It also points out at some deficiencies in the level of knowledge in this rather uncommon but potentially possible field of orthopaedic trauma. I outline my experience based on a small portion of patients population injured during January 12 2010 Haiti earthquake treated on the ground and on the board of the US Navy ship – Comfort. Treatment modalities used were: external fixations, amputation, open reduction and internal fixation, irrigation and debridement. Small number of patients and short length of follow up cannot be analyzed at this stage for statistical significance. The observation of the patients - injuries, short term results and treatment problems encountered during treatment are presented. High percentages of treated patients were presented with and others developed wound infection. Majority of the primary closed wounds became infected and required more extensive surgical intervention. Many casualties were due to the crush mechanism of trauma. Conclusion: management of orthopaedic injuries due to the earthquake is in many ways unique and different from other types of trauma. Staged approach with delayed wound closure is the safest and minimizes the postoperative rate of infection that often leads to more extensive surgical intervention and amputation. Treatment algorithm is multifactorial: 1. Mechanism of the trauma, often a crush type; 2. Time of the presentation, often late; 3. Local population factors: a. Associated co-morbidities, b. Culture, c. Country's infrastructure. There is an obvious need in educating orthopaedic community how to manage patients with injuries resulted from the earthquake.

Date: 2010-09-03

Session: Natural Disasters & Orthopaedic Surgery

Time: 10:45-12:15

Room: H1

Abstract number: 26838

ACCESS TO SURGICAL CARE IN DISASTERS IS CRUCIAL

Meena CHERIAN

World Health Organization, Geneva (SWITZERLAND)

Background: The need of surgical services in disasters situation cannot be ignored. Reports from previous disaster situations mention that life saving surgical services were urgently required but often lacked coordination and pre-existing local surgical capacities in developing countries. Disaster handling includes trained health providers to meet emergency surgical and anaesthesia skills to manage injuries (burns, violence) and other life-threatening surgical conditions in childbirth complications and acute abdomen. This created the recent interest in 'emergency preparedness' programs, but often 'surgical preparedness' component is not emphasized much. Discussion: The WHO established the Emergency & Essential Surgical Care program and a global network of stakeholders, the Global Initiative for Emergency & Essential Surgical Care (GIEESC), which include health authorities, academia, professional societies, NGOs, and experts in the field of disaster management. Surgical service delivery during disasters and continuity of care in post- disaster situation reflect the health systems of the country. In collaboration with the GIEESC, a comprehensive Integrated Management for Emergency & Essential Surgical Care (IMEESC) toolkit was developed for capacity building skills in life-saving and disability-preventive emergency (surgical, orthopaedics, obstetrics, anaesthesia) skills and equipment. This toolkit containing the best practice guidelines in emergency surgical care in disaster situation, and is part of many disaster management guideline links, including various WHO depts. (Health Action in Crises) and countries (www.who.int/surgery/publications/Disastermanagguide.pdf) Conclusion: An integrated approach to manage surgical care in disaster situation is required, through incorporation of standard WHO IMEESC toolkit for capacity building in emergency preparedness and strengthening health systems. There is value of disseminating basic expertise in countries through international cooperation and WHO coordination.

Date: 2010-09-03

Session: Spine - Cervical / Lumbar Spinal Stenosis

Time: 08:00-09:30

Room: G4

Abstract number: 26819

ANTERIOR CERVICAL DISCECTOMY USING CAGES OR ARTHROPLASTY - MINIMAL INVASIVE TECHNIQUE

Kandiah RAVEENDRAN

Fatimah Hospital, Ipoh Perak (MALAYSIA)

There has from the outset of cervical surgery, been little consensus on the most appropriate method of surgical treatment. A universal principle of decompressing the neural elements in the unresolving symptomatic patient is appropriate with the need to preserve height and motion less clearly defined. The choice of anterior or posterior approaches would depend on the surgeon's training and experience. Cages have been used as an adjunct because they increase cervical foramina height and correct cervical kyphosis. The cage also reduces the complication rate in comparison to AICG (autogenous iliac crest graft) fusion. The use of stand alone cage has made possible minimally invasive surgery in contrast to the use of anterior cervical plates. This lecture will describe the minimally invasive surgical technique for the use of single level Solis cage and our experience from 2004 to 2009. I will discuss measures to prevent subsidence in the use of stand alone cages. The surgical technique is a modification of the original technique which uses a distractor. However, I use halo traction to achieve distraction for disectomy and insertion of the Solis cage since it is not possible to use the distractor with a minimally invasive approach. Comparisons will also be made between titanium, carbon fibre and PEEK cages. The Solis Peek cage with the incorporated titanium spikes appears to be most suitable cage at present. We have also used the minimal invasive technique for cervical disc arthroplasty in selected cases. Anterior cervical fusion with the Solis cage and cervical disc arthroplasty can be done easily for one level surgery using a minimally invasive approach. It can also be done for multiple levels.

Date: 2010-09-03

Session: Spine - Cervical / Lumbar Spinal Stenosis

Time: 08:00-09:30

Room: G4

Abstract number: 25391

BIOMECHANICAL COMPARISON OF ANTERIOR SCREW FIXATION TECHNIQUES FOR TYPE II ODONTOID FRACTURES: 1 VERSUS 2 SCREW TECHNIQUE

Arndt P. SCHULZ¹, Feng GANG², Robert WENDLANDT³, Gerhard HEINRICHS¹, Sebastian SPUCK¹

¹University Hospital Lübeck, Lübeck (GERMANY), ²2nd Affiliated Hospital of Zhejiang University College of Medicine, Hangzhou, Zhejiang Province (CHINA), ³University Lübeck, Dept. Biomechanics, Lübeck (GERMANY)

The type II odontoid fracture is the most common type of odontoid fracture, it is inherently unstable. Anterior screw fixation is the best treatment for type II odontoid fracture. Both one- and two-screw techniques have their own merits and demerits. The objective the study is to compare the stability between 1+2-screw fixation. 14 fresh cadaver axes were randomly divided into two groups and fixed with one- or two-screw respectively. The stiffness of intact specimens and after screw fixation in six directions was tested on the universal mechanical testing machine and the corresponding data compared with each other. The results showed that the torque load transmitted to the odontoid by ligaments is around 1/3 ($0.53 \pm 0.38 \text{Nm}$) of the maximum physiological load (1.5Nm) in axial rotation. The torque acting on the occipito-axial complexes is dominated by the odontoid at smaller rotational angles. At larger rotational angles, the other ligaments that do not attach to the odontoid will join in and react against the torque more. The bone mineral density has statistical significant correlation with shear stiffness loading from anterior and posterior, torsional stiffness loading from left and right of intact specimen. Both one- and two-screw fixation can gain the same shear and torsional stiffness. The result indicates that anterior odontoid fixation with one- or two-screw offers similar stability. Both the techniques cannot restore the normal shear and torsional stiffness. The stiffness of the odontoid after one- or two-FCS fixation is much less than that of normal.

Date: 2010-09-03

Session: Spine - Cervical / Lumbar Spinal Stenosis

Time: 08:00-09:30

Room: G4

Abstract number: 24417

THE FLAVUM'S, DISC'S AND EPIDURAL FAT'S CONTRIBUTION TO THE LOAD AND POSITION INDUCED CONSTRICTION OF THE CAUDA EQUINA

Nobuyuki SUZUKI¹, Takanobu OTSUKA², Tommy HANSSON³

¹*Nagoya City University Department of Orthopaedics, Nagoya (JAPAN)*, ²*Nagoya City University Department of Orthopaedics Surgery, Nagoya (JAPAN)*, ³*Sahlgrenska Academy Department of Orthopaedics, Göteborg (SWEDEN)*

INTRODUCTION: Neurogenic claudication during walking or in certain postures is typical for spinal stenosis. It is likely that load induced volume changes of the structures within the spinal canal cause the neurogenic claudication through direct mechanical compression of the nerve roots. The aims of this study were to evaluate quantitatively the load induced volume changes within the spinal canal. **METHODS:** The lumbar spines in 24 men and women with non specific LBP were examined with MRI; first in a supine position and then during axial loading (50% bodyweight) using a nonmagnetic loading device. The changes in the cross sectional area (CSA) of the flavum, epidural fat and the thecal sac in the unloaded and the loaded spines were then determined. **RESULTS:** In comparison to the unloaded spine the thecal sac CSA in the loaded spines decreased an average 25.7 mm² while the flavum and the epidural fat CSA increased an average 13.0 mm² and 6.3 mm² respectively. Consequently the flavum's and the epidural fat's contributions to the reduction of the thecal sac CSA was 50.5% and 24.6% respectively. The remaining thecal sac reduction, 24.9% was largely due to the bulging disc. **DISCUSSION:** The flavum expands in the loaded spine. Although without correlations between the expansions of the flavum and epidural fat the expanding flavums seemed to push the fat to become another external compressor of the thecal sac. Interspinous devices might reverse the expansion of both the flavum and the epidural fat.

Date: 2010-09-03

Session: Spine - Cervical / Lumbar Spinal Stenosis

Time: 08:00-09:30

Room: G4

Abstract number: 25745

DURAL TEAR CAUSE OF DISABILITY

Anders OLAI¹, Annica ÖHRN², Hans RUTBERG², Hans TROPP¹

¹*Dept Orthop Surgery, Linköping (SWEDEN)*, ²*Patient Safety Unit, Linköping (SWEDEN)*

Sweden has a national patient insurance system where injuries associated with orthopaedic surgery results in the highest proportion of paid claims (28%) and spinal surgery causes the most severe degree of disability. The aim of this study was to analyze the mechanism of injury as well as clinical outcome through the national spine registry. Methods: All registered data in Swespine (n=8466) and all insurance data (n=184) following spine surgery during the period 2003-2005 were included. The medical records of patients filing claims were reviewed. Results: 77 % (n=141) of patient claims resulted in economic compensation. 16 % of the patient injuries (n=23) caused disability more than 15 %. The most common cause for injuries was a dural tear (23 %) followed by wound infections (16%). Seventy-two percent (n=132) of all 184 patients filing claims were registered in the National Swedish Spine Register. Of these 132 patients the review identified 38 dural tears and 27 wound infections. Only 22/38 of these dural tears had been recorded in Swespine and none of the wound infections were recorded. Clinical outcome did not differ between the injured patients compared to other registered patients with similar diagnosis. Conclusion: Swespine covers a majority of patients with economical claims due to adverse events but clinical outcome is not impaired. Dural tears seem to be an important reason for problems and should be more thoroughly noted. Wound infections must be identified by another method.

Date: 2010-09-03

Session: Spine - Cervical / Lumbar Spinal Stenosis

Time: 08:00-09:30

Room: G4

Abstract number: 26162

ACUTE CRANIOCERVICAL LIGAMENT INJURIES AFTER MAJOR TRAUMA DESCRIBED WITH HIGH RESOLUTION MRI

Mari HÄNNI¹, Claes OLERUD²

¹*Dept Diagnostic Radiology, Uppsala (SWEDEN)*, ²*Dept Orthopaedics, Uppsala (SWEDEN)*

Severe ligament injuries of the craniocervical junction, CCJ, may occur in high energy trauma. We present a MRI protocol for evaluation of these. 14 consecutive MVA victims with suspected injuries to the CCJ, were examined with the suggested protocol: Overview of cervical spine including, sag T1 and T2, axial T2/grad echo. In cases of suspected cranial nerve injury also MRI of the brain. Due to the dimensions of its ligaments the examination of the CCJ consists of proton weighted sequences with a small field of view, FoV 130mm and slice thickness of 2 mm with preserved resolution including T1 and fat suppressed T2. We propose a high resolution protocol tailored for detecting partial and total ruptures of the alar ligaments, effusions in condylar and atlantoaxial joints, distensions of the joint capsules as well as tears of the tectorial membrane. Injuries of the apical dental ligament and anterior and posterior atlanto-occipital membranes may not always be detected but indirect findings may indicate injuries of these structures. Injuries of various severities were detected in 10 of the patients. Combination injuries of the CCJ were common but no patient had rupture of all structures. Injury to the abducens nerve was detected in two patients with strabismus. Three patients with extensive injuries were treated with fusion of the CCJ whereas the rest of the injured patients were treated in braces. The high resolution MRI protocol has been of great value in diagnosing these injuries in our patients.

Date: 2010-09-03

Session: Spine - Cervical / Lumbar Spinal Stenosis

Time: 08:00-09:30

Room: G4

Abstract number: 24897

CLINICAL OUTCOMES AND RADIOGRAPHIC ASSESSMENT OF MICROENDOSCOPIC LAMINOTOMY FOR CERVICAL DISC HERNIATION WITH MYELOPATHY

Takuya MISHIRO, Shoji YAGI, Yoichiro TAKATA

Takamatsu Redcross Hospital, Kagawa (JAPAN)

PURPOSE: To evaluate the clinical results of microendoscopic laminotomy for cervical disc herniation with myelopathy. **MATERIALS:** From April 2002, we had performed 101 cases of cervical microendoscopic surgery. And thirty patients with myelopathy underwent microendoscopic laminotomy. Seventeen patients were CSM, two were OYL and 11 were cervical disc herniation (CDH). These 11 patients with CDH were included in this study. The average age was 50.5 years old. The surgical level was C4/5 in 2 patients, C5/6 in 8 patients and C4/5, 5/6 in 1 patient. Preoperative JOA score was 13.5 ± 1.9 . **METHODS:** Clinical outcomes were evaluated by JOA score. MR images were obtained approximately 3 months after the surgery. The changes in herniated disc size were evaluated by comparing the pre-operative and the post-operative MR images. Decompression was performed until dural pulsation was observed and herniotomy was not tried to avoid bleeding. **RESULTS:** Average operative time was 110 min and EBL was little. In this series, some of spontaneous resorption of CDH was observed on postoperative MRI at 3 months or more after the surgery. Average recovery rate of JOA score was $71 \pm 20\%$. There were no surgery-related complications. In six patients, herniation decreased between 0 and 33%; in 3, it decreased between 34% and 66%; and in 2, it decreased between 67% and 100% on MRI. **CONCLUSIONS:** Microendoscopic laminotomy was a useful surgery for cervical herniation with myelopathy. Only posterior decompression should be one of the good options for patients with CDH.

Date: 2010-09-03

Session: Spine - Cervical / Lumbar Spinal Stenosis

Time: 08:00-09:30

Room: G4

Abstract number: 26562

A CLINICAL AND RADIOGRAPHIC ANALYSIS OF CERVICAL MOTION PRESERVATION BY PEEK ON PEEK CERVICAL DISC REPLACEMENT (POPCDR) SYSTEM

Sandesh LAKKOL, Sharad BHATNAGAR, Obaidullah ZAFAR, Guru REDDY, Tai FRIESEM

University Hospital North Tees, Stockton-on-Tees (UNITED KINGDOM)

Aim: To assess the clinical and radiological outcome of single and multiple level Anterior Cervical Disc Replacement (ACDR) using NuNec -Cervical Arthroplasty System. **Methods:** Thirty-one patients with radiculopathy and/or myelopathy caused by disc generation who did not respond to conservative treatments were included. Pain and function were evaluated by VAS (Visual Analogue Score) for neck (VAS-NP) and arm pain (VAS-AP). Neck disability index (NDI) and SF-36 questionnaires were completed. Disc height and segmental angular correction (SAC) were measured on radiographs pre- and postoperatively. **Results:** Seven patients had one-level, fifteen had two-level, seven had three-level and two had four-level ACDR. Sixty-six discs were replaced. Average follow-up was six months. Mean VAS-NP improved from 7.27 to 3.93 and VAS-AP from 7.27 to 3.4. Mean SF-36 improved from 32.21 to 40.22. There was functional improvement for NDI in all patients. There was an improvement in SAC from 5.4° to 8.0° for one-level, 3.1° to 7.5° for two level, 8.4° to 9.4° for three-level and 5.8° to 26.7° for four-level ACDR. Post-operative anterior disc height increased by 152% for lower and 55% for higher levels. Similar improvements were noted for posterior disc heights. **Conclusion:** The clinical and radiological outcomes are similar to other types of ACDR reported in literature. Early results show that POPCDR is safe and effective for treatment of symptomatic cervical disc disease.

Date: 2010-09-03

Session: Spine - Cervical / Lumbar Spinal Stenosis

Time: 08:00-09:30

Room: G4

Abstract number: 26247

CERVICAL PEDICLE SCREW PLACEMENT USING O-ARM BASED NAVIGATION SYSTEM

Yoshimoto ISHIKAWA, Tokumi KANEMURA, Go YOSHIDA
Konan Kosei Hospital Spine Center, Konan City (JAPAN)

Introduction: Cervical pedicle screw (CPS) fixation offers greater biomechanical stability and increases fusion rates, but carries the risk of serious neurovascular injury. The O-arm is a new computer-assisted surgical device that allows CPS navigation and placement with full 3D images in high definition. The aim of this study was to retrospectively evaluate the reliability and accuracy of CPS placement using navigation with O-arm. **Methods:** The study involved 24 consecutive patients undergoing posterior stabilization of the cervical spine between April 2009 and December 2009. The 24 patients (122 screws) were treated using CPS placement based on intraoperative 3D images and navigation with the O-arm system. All screw positions were classified into 4 grades with regard to pedicle wall perforations using postoperative CT. **Results:** No neurovascular complications occurred as a result of screw placement. Of the 122 CPSs, 107 screws (87.7%) were classified as Grade 0 (no perforation), 10 (8.2%) were classified as Grade 1, perforations less than 1 mm (CPS was exposed and <50% of the screw diameter was outside the pedicle), and 5 (4.0%) were classified as Grade 2, perforations more than 2mm and less than 4mm (CPS breached and >50% of the screw diameter was outside the pedicle). No screw was classified as Grade 4, perforation more than 4mm (complete perforation). **Conclusion:** CPS placement with O-arm based navigation can offer high reliability and accuracy, and therefore, could reduce the risk of complications related to CPS malplacement.

Date: 2010-09-03

Session: Spine - Cervical / Lumbar Spinal Stenosis

Time: 08:00-09:30

Room: G4

Abstract number: 25984

DYSPHAGIA IN ANTERIOR CERVICAL DISK SURGERY

Martin SKEPPHOLM¹, Claes OLERUD²

¹*Stockholm Spine Center, Upplands Väsby (SWEDEN)*, ²*Dept Orthopaedics, Uppsala (SWEDEN)*

Dysphagia is common after anterior cervical spine surgery, however usually with a favorable prognosis. The objectives of this study were to establish the time course of dysphagia and to evaluate any difference between total disk replacement and fusion. 122 patients (63 women; age $46,7 \pm 7,0$ years, from an ongoing RCT comparing TDR (n=70) and fusion (n=52) completed the Dysphagia Short Questionnaire, DSQ, preoperatively, and at 4 weeks, 3 months and one year after the operation. The DSQ is validated. It measures dysphagia qualitatively and quantitatively, and correlates to EQ-5D. Preoperative 50% of the patients reported some dysphagia symptoms, but the DSQ showed a very low value of $1,5 \pm 2$ points. At four weeks dysphagia was present in 85% with an average DSQ value of $3,1 \pm 2,4$. At three months 60% still had some symptoms, but the magnitude was mild and the average DSQ value was $1,7 \pm 2$. At one year 46% had some, but very mild symptoms with a DSQ of $1,3 \pm 1,6$. There were no differences in incidence or severity of dysphagia at any time between TDR and fusion. Dysphagia is common in patients with cervical disk herniation already before surgery, however at low levels. After surgery almost all patients develop some but still relatively mild dysphagia. Already at three months the dysphagia approaches preoperative levels which are reached by one year. No difference can be detected with regard to reconstruction method, TDR or fusion.

Date: 2010-09-03

Session: Spine - Cervical / Lumbar Spinal Stenosis

Time: 08:00-09:30

Room: G4

Abstract number: 23078

A COMPARISON BETWEEN THE CARBON FIBER CAGE AND THE CLOWARD PROCEDURE IN CERVICAL SPINE SURGERY: A 10-13 YEAR FOLLOW-UP OF A PROSPECTIVE RANDOMIZED STUDY

Anneli PEOLSSON¹, Anna HERMANSEN¹, Ludek VAVRUCH², Rune HEDLUND³

¹*Medical and Health Sciences, physiotherapy, Linköping (SWEDEN),*

²*NeuroOrthopaedic Surgery, Jönköping (SWEDEN),* ³*Orthopaedics, Gothenburg (SWEDEN)*

Study design. 10-13 year follow-up of a prospective randomized study. Objectives. To compare the 10-13 year outcomes of anterior cervical decompression and fusion (ACDF) with a cervical intervertebral fusion cage (CIFC), and the Cloward procedure (CP) using a broad clinical and patient-centric assessment. Summary of Background Data. There are few prospective studies and none with a follow-up of 10 years or more. Methods. Patient questionnaires completed 10 years or more following ACDF. Seventy-three patients (77%) responded. Radiographs were obtained at 2 years. Results. Apart from greater fulfillment of preoperative expectation ($p=0.01$) and less headache ($p=0.005$) in the CIFC group compared to the CP group, there were no significant differences in the outcomes of the two surgical methods. Pain intensity improved in comparison to preoperative levels in both the CIFC and CP groups ($p<0.0001$), but the Neck Disability Index (NDI) only improved in the CIFC group ($p=0.04$). Only those with a healed fusion benefited from an improved NDI ($p=0.02$). There was no deterioration in pain intensity or NDI after the 2-year follow-up. Conclusions. The outcomes of the two surgical methods, with a few exceptions, were equal at 10-13 year follow-up, and there was no deterioration in outcome after the 2-year follow-up. Pain intensity improved more than disability, which may indicate that further improvement of physical function requires early postoperative rehabilitation. Despite persisting disability, repeat surgery was relatively uncommon. Key words: cervical spine, disc, cage, Cloward, outcome.

Date: 2010-09-03

Session: Spine - Cervical / Lumbar Spinal Stenosis

Time: 08:00-09:30

Room: G4

Abstract number: 23136

MRI VS CT IN DIAGNOSING LUMBAR STENOSIS

Sang Soo EUN, Ho-Yeon LEE, Sang-Ho LEE, Kyeong Hwan KIM, Wei Chiang LIU
Wooridul Spine Hospital, Seoul (KOREA)

The purpose of this study is to compare the effectiveness of computerized tomography (CT) and magnetic resonance imaging (MRI) in visualizing soft tissues in lumbar spinal stenosis with correlation of preoperative symptoms. We retrospectively analyzed 163 patients who had undergone unilateral laminotomy for bilateral decompression for the treatment of lumbar spinal stenosis at L4-5 from January 2002 to June 2006. We measured the compromised spinal canal area and compared the acquired dimensions with preoperative Visual Analogue Scale (VAS) and Oswestry Disability Index (ODI) scores. The mean compromised spinal canal areas were 75.08 mm² in MRI and 63.13 mm² in CT, showing significant difference. Spinal canal area was more compromised by increasing age. Mean VAS for back pain was 5.37 and for leg pain was 7.94. Mean ODI was 55.17%. There was no significant correlation noted between the clinical parameters with compromised canal area. The results indicate that a technically adequate CT examination is superior to MRI in diagnosing lumbar spinal stenosis, with better visualization of ligamentum flavum. This finding can be explained by MRI's inability to discriminate cortical bone from soft tissue. Our study accentuates the power of CT examination in combination with MRI before lumbar spinal stenosis surgery.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 10:45-12:15
Room: G4

Abstract number: 26865

MASSIVE KNEE ARTHROPLASTY SURROUNDED WITH ALLOGRAFTS

Dominique POITOUT, R. VOLPI, P. MAMAN, A. MERGER

University Hospital Center Marseille North, MARSEILLE (FRANCE)

The massive metallic prosthesis used after exeresis of the lower part of the femur has numerous complications due to high arm level inducing loosening or fracture of the stem It is the reason why we propose to use massive metallic intramedullary stem surrounded by massive cortical allograft The peripheral muscles can fix themselves directly on the allograft through a new periosteum and vascularises the upper part of the bone which permit a good healing of the grafted bone with the recipient one

Material and Method The optimal shape of the prosthesis has to be anatomical with a curved intramedullary stem fixed with cement inside the graft and the recipient bone. The LINK, GUEPAR, or ZIMMER Prosthesis can be used in those cases The allograft has to be protected with DMSO in deep frozen Nitrogen and stored without new sterilization not to become breakable. To avoid rotation of the graft, we have used most of the time a small (4 or 6) hole plate fixed at the junction allograft-recipient bone. This method authorizes a compression and gives an excellent contact between the two parts. Between 1983 and 2009 we have used 791 Massive allograft among of them 168 Knee reconstructions - Tumoral Cases: 119 cases-Numerous operation's : 21 cases - Traumatology: 28 cases Results: Follow up Maximum: 26 Years - Meanwhile: 18 ans In 86% of the cases we have had a good integration of the graft. With an excellent or good function (0 - 90°) in more than 78% of the cases We have had a limitation of the function (0 - 50°) due to fixation of the quadriceps muscles on the graft only in 22 % of the cases. Most of the time this limitation of the knee flexion was due to insufficiency of rehabilitation of the knee immediately post-operatively* 2 sepsis of the graft- 1 after 5 years without any problem in a young patient (Osteosarcoma) having had an infection of his foot and having needed a resection of the graft (perfectly integrated !) and of the metal prosthesis with reoperation using a new allograft surrounding a new metal prosthesis- 1 in a case of massive sepsis of the femur reoperated many times before grafting* 2 Pseudarthrosis at the junction Allograft. Recipient bone: Autograft* 1 case of partial lysis of the Allograft 25 Years after the reconstruction (Osteosarcoma) which could be changed for a new reconstruction with a total Femoral Allograft and a Link knee prosthesis* 1 aseptic loosening of the stem* No fracture of the Allograft* No immunological response * No Fracture of the stem. Discussion / Conclusion: Massive metallic prosthesis surrounded by allograft gives good functional results and good function with a refixation of the muscles on the graft and a diminution of the lever arm protecting the junction allograft recipient bone.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 10:45-12:15
Room: G4

Abstract number: 24893

TITLE: PSEUDO-PATELLA BAJA AFTER TOTAL KNEE ARTHROPLASTY

Seyyed Morteza KAZEMI, Alireza EAJAZI, Laleh DAFTARI BESHELI

Akhtar Orthopaedic Hospital Research Center, Tehran (IRAN)

Introduction: One of the complications of total knee arthroplasty which has not been addressed directly yet is pseudo-patella baja (PPB). True patella baja (PB) is present when the length of the patellar tendon becomes shorter. PPB is when the patella tendon is not shortened but the level of the joint line is elevated. This study was conducted to assess PPB in TKA. **Materials and methods:** Sixty patients who had had a primary TKA at our center between 1995 and 2005 were invited. The average follow-up was 27.5 months. The Knee Society Scoring (KSS), a lateral knee x-rays and the Blackburne Peel index were used for assessments. **Results:** Out of the 60 patients, 43 (72%) demonstrated no joint line elevation or patellar tendon shortening (group A). Fifteen patients (25%) had joint line elevation (group B) and both PB and PPB were present in 2 (3%) patients (group C). KSS was lower in groups B and C comparing with group A, but this difference was not statistically significant. The average range of motion (ROM) in group A was significantly higher comparing with either group B or C and patients in groups B and C showed a meaningful more severe pain compared with group A ($P < 0.001$). **Conclusion:** PPB is not an uncommon finding after TKA and is associated with a statistically significant decrease in ROM and an increase in pain. Furthermore, KSS in the PPB group was less than in patients without PPB, although the difference was not statistically meaningful.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 10:45-12:15
Room: G4

Abstract number: 25454

INTRODUCTION OF TOTAL KNEE ARTHROPLASTY IN LITHUANIA. RESULTS FROM THE FIRST 10 YEARS

Sarunas TARASEVICIUS¹, Justinas STUCINSKAS¹, Robertsson OTTO², Hans WINGSTRAND²

¹*Kaunas Medical University Clinics, Kaunas (LITHUANIA)*, ²*Lund University Hospital, Lund (SWEDEN)*

Background: We have previously reported that the first 10 years of hip arthroplasty in Lithuania resulted in a higher cumulative revision rate than that observed in Sweden. We thus compared the corresponding results after introduction of total knee replacement in Lithuania. Methods: The 10-year revision rate for the first 595 primary Scan Knee arthroplasties inserted in Klaipeda, Lithuania, was compared to that for the first 1,280 ScanKnee primary arthroplasties inserted in Sweden. As in the hip replacement study, only patients with osteoarthritis (OA) were included. Primary knee arthroplasties without patellar resurfacing were included, and the endpoint was revision for any reason other than addition of a patellar component. Results: We found that the cumulative revision rate was not statistically significantly different between the groups. The revision pattern was different, however, and we observed 24 isolated patellar component additions in Sweden, but none in Klaipeda. Interpretation Contrary to the results of our previous hip arthroplasty study, the cumulative revision rate after total knee arthroplasty was similar in the two groups. This suggests that compared to hip arthroplasty, the outcome of total knee arthroplasty was less dependent on surgical experience. The large difference regarding isolated patellar component additions may be explained by long-term accumulation of severe OA cases in Lithuania. For patients subject to a newly introduced surgical treatment offering great improvement in quality of life, patellofemoral pain may be a minor problem. Furthermore, patellar problems may not have seemed particularly relevant for the surgeons, considering the disability of other patients.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 10:45-12:15
Room: G4

Abstract number: 23151

TOTAL KNEE ARTHROPLASTY FOR SEVERE VALGUS DEFORMITY

Chitranjan RANAWAT, Morteza MEFTAH

Hospital for Special Surgery, New York (UNITED STATES)

Background: In 1985, the senior author (CSR) developed a soft tissue release technique to balance severe valgus knees to reduce instability and the need for primary constrained implants. This report describes the soft-tissue release technique and its long-term results. Methods: Four hundred and ninety consecutive total knee arthroplasties were performed by one surgeon between January 1988 and December 1992. In this group, seventy-one patients (eighty-five knees) had a valgus deformity of > 10 degree. Thirty-five patients (forty-two knees) followed for a minimum of five years. These twenty-seven women and eight men had a mean age of sixty-seven years. The technique included an inside-out soft-tissue release of the posterolateral aspect of the capsule with pie-crusting of the iliotibial band and resection of the proximal part of the tibia and distal part of the femur to provide a balanced, rectangular space. Cemented, posterior-stabilized implants were used in all knees. Clinical and radiographic evaluations were performed at one, five, and ten years postoperatively. Results: The mean modified Knee Society clinical score improved from 30 points preoperatively to 93 points postoperatively, and the mean functional score improved from 34 to 81. The mean coronal alignment was corrected from 15 to 5 degree postoperatively. Three patients underwent revision surgery for delayed infection, premature polyethylene wear, and patellar loosening in one patient each. There were no cases of delayed instability. Conclusions: The inside-out release technique to correct a fixed valgus deformity in patients undergoing primary total knee arthroplasty is reproducible and provides excellent long-term results.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 10:45-12:15
Room: G4

Abstract number: 25503

IS BILATERAL SEQUENTIAL TOTAL KNEE ARTHROPLASTY THE NEED OF THE HOUR? OUR SERIES OF 60 CASES AT HOSMAT HOSPITAL, BANGALORE

Prakash L.G. BANGALORE, Thomas CHANDY
Hosmat Hospital, Bangalore (INDIA)

Aim: a) Evaluate the mortality & morbidity of one stage sequential bilateral TKRb) compare the data with previous literature. **Materials & Methods:** Inclusion Criteria: - Both Knee involvement - Clinically and Radiologically significant degenerative or inflammatory osteoarthritis - Severe pain unrelieved by conventional therapy Exclusion Criteria: - History of previous knee infection -Trauma requiring surgeryWe conducted a retrospective review of 60 consecutive cases of bilateral sequential total knee replacement at Hosmat hospital, Bangalore done between July 2007 to June 2009. **Results:**The mean age of patients in our series was 66 years, ranging from 42 to 86. Eighteen of the bilateral knee replacements were male and forty two female. The follow up of our patients ranged from 6mnths to 18mnths. **Discussion:** In patients with staged TKR they may not have the second stage, based on the level of pain and disability during the first stage. If the patient's health were to fail after the first stage, they may no longer represent a reasonable surgical risk to undertake the second surgery and the final outcome in patients with an uncompleted two stage procedure would be expected to be far inferior to the patients who have had both knees successfully replaced. **Conclusion:**We continue to perform simultaneous bilateral TKA at our institution but we warn older patients (those older than 70 years) and those with significant co morbidities about the risk and in such patients a staged procedure would be ideal. **Key words:** Bilateral sequential TKR, morbidity

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 10:45-12:15
Room: G4

Abstract number: 23173

"MORBIDITY AND MORTALITY OF SINGLE STAGE BILAT TKR: PROSPECTIVE STUDY OF 654 CASES"

Rajesh RAJULE, Sinu BHASKARAN, Hemant WAKANKAR
Deenanath Mangeshkar Hospital, Pune (INDIA)

METHODS: -A computerized database was maintained of all the patients who underwent single stage bilateral TKR during the period January 2006 to February 2009. All the surgeries were done by same surgeon (senior surgeon) and the decision to proceed with the second side surgery was taken after the release of tourniquet of the first side, in consultation with anaesthetist. On admission, apart from routine preoperative information, data regarding associated medical comorbidities were collected and physician's clearance obtained. Post operative parameters such as vital signs, drainage, drop in haemoglobin, transfusion requirement and mobilization and discharge date were recorded. **RESULTS:-**The average age of patients was 69.2 years. The average duration of both surgeries together was 142 minutes and the average tourniquet time was 56 minutes for each side. Patients were made to stand on 3rd day and average time to discharge was day 9. The average total blood loss was 350 cc and the mean drop in haemoglobin was 3.9 %. About 19 % of the patients required transfusion. 20 patients (4.8 %) developed post operative complications such as pulmonary (1.8 %), neurological (1.07 %), cardiac (1.43 %) and renal or metabolic (1.4 %) and required ICU monitoring. There were 3 mortalities (0.72 %) reported in 30 days post operative period **CONCLUSION:-**The single stage bilateral TKR is a reasonably safe option with cautious selection and when done by an experienced high volume surgeon and in a centre with a backup of well equipped ICU.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 10:45-12:15
Room: G4

Abstract number: 23705

BILATERAL SIMULTANEOUS TOTAL KNEE ARTHROPLASTY IN SEVERELY DEFORMED KNEES: USE OF AN EVIDENCE BASED REHABILITATION PROGRAMME.

Vijay SHETTY

Hiranandani Orthopaedic Medical Education, Mumbai (INDIA)

Post-operative rehabilitation after staged total knee arthroplasty (TKA) in severely deformed bilateral knee disease can be a very difficult task. At the same time, the safety of simultaneous (one stage) bilateral TKA remains controversial and highly debatable. We wish to report our experience with simultaneous bilateral conventional TKAs for all severely deformed knees, followed by a carefully planned evidence based rehabilitation programme. Simultaneous bilateral TKA in severely deformed knees is safe and very effective, provided attention to details of rehabilitation and overall multidisciplinary medical care is exercised.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 10:45-12:15
Room: G4

Abstract number: 24165

EVALUATION OF CLINICO-RADIOGRAPHIC AND FUNCTIONAL RESULTS IN RELATION TO ALIGNMENT AND ORIENTATION OF THE COMPONENTS OF TOTAL KNEE REPLACEMENT- A PROSPECTIVE STUDY

Chandra YADAV, Ashok KUMAR, Backia Raj D, Vijay KUMAR, Sanjay THULKAR, Shivananda GAMANAGATTI, Shah KHAN, Shishir RASTOGI

All India Institute of Medical Sciences, Delhi (INDIA)

Background: Prospective study to evaluate the effects of malpositioned implants components on clinico-radiographic and functional results after Total Knee Replacement (TKR). Materials & Methods: Forty four patients undergoing cruciate substituting TKR for osteoarthritis or rheumatoid arthritis of knee were included in the study. Patients with flexion contracture of $>30^{\circ}$, varus deformity of $>20^{\circ}$ and with past history of tibia or femur fracture with deformity were excluded from the study. Patients were divided into two groups (well aligned & badly aligned) based on the components alignment by measuring the 7 radiological parameters on CT scan and radiographs. Each radiological parameter was correlated with the four clinical parameters (range of motion, pain, knee score & functional score) in the patients of both groups. Results: A total of 80 TKR (16 bilateral, 28 unilateral) were performed in 44 patients. There were 24 male; 20 female patients of average age of 60.24 years. All the four clinical variables were better in well aligned group in comparison to badly aligned group. But this correlation was found statistically significant only in relation to the frontal tibial angle (FTA) and mechanical axis. Conclusion: Short term results suggest that well aligned mechanical axis and frontal tibial angle are associated with significantly better function. Sagittal alignment & rotation of femoral or tibial components did not have statistically significant bearing on the overall clinical & functional results in both the groups. However a long term follows up is required to see the actual trend of clinical results with the time.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 10:45-12:15
Room: G4

Abstract number: 26221

FEMORAL ROTATION ACCURACY IN TOTAL KNEE ARTHROPLASTY

Emmanuel THIENPONT¹, Leo BECKERS²

¹*Saint Luc University Hospital, Asse (BELGIUM)*, ²*Imelda, Bonheiden (BELGIUM)*

Different types of rotational alignment are being used in total knee arthroplasty. The epicondylar axis, Whiteside's line, the 3° posterior condylar axis or soft tissue balancers can be used to balance the flexion gap and decide for femoral rotation. Usually postoperative results on femoral rotation have to be analysed with a postoperative CT scan with metal interference. Abstract Methods: We used bony alignment references or a balancer for femoral rotation and analysed medial and lateral compartment pressures with a patella in place dynamic knee balancer (E-Libra, Synvasive). This technique allows a peroperative analysis of rotational flexion gap balancing. Abstract Results: Symmetrical compartment pressures were measured with the electronic system when the amount of femoral external rotation was set with the balancer (bilateral pressures of 6 mmHg). The closest result to this symmetrical pressure was obtained when using the epicondylar axis, followed by the soft tissue balancer. Whiteside's line and the posterior condylar axis as a reference gave variable results depending on the posterior condylar wear, but was especially not valuable in valgus knees. Balancer systems trend to too much external rotation. Abstract Discussion and Conclusion: Use of this electronic balancer, E-Libra, allowed us to check peroperatively medial and lateral compartment pressures after using bony alignment references. The epicondylar axis and the balancer gave most symmetric pressures. Whiteside's line and Posterior condylar axis result is variable and not usefull in valgus knees. E-Libra System allows a peroperative quantitative analysis of femoral rotation and flexion gap ligament balancing.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 10:45-12:15
Room: G4

Abstract number: 23970

COMPARISON OF THE MOBILE-BEARING AND FIXED-BEARING DESIGNS OF HIGH FLEXION TOTAL KNEE ARTHROPLASTY

Tae Wan KIM, Jeung Tak SUH

Department of Orthopaedic Surgery, Pusan National University School of Medicine, Pusan (KOREA)

Purpose: We compared and analyzed the follow-up results of high flexion total knee arthroplasty with mobile-bearing (PFC Sigma RP-F-) and fixed bearing (LPS-Flex') designs. **Materials and Methods :** We studied 130 patients who were undergone total knee arthroplasty between December 2003 and December 2007, and were followed up for at least 2 year. PFC Sigma RP-F- was used in 65 patients and LPS-Flex- was used in 65 patients. Mean follow up duration was 27.4 (24 - 31) months. **Results:** Mean KSS and KSFS of the mobile-bearing group were 95.6 and 96.1 points, which were 53.2 and 49.7 points preoperatively, and those of the fixed-bearing group were 94.5 and 95.1 points, which were 54.1 and 50.9 points preoperatively. Mean ROM and maximal flexion angle of knee joint of the mobile-bearing group were 129.1° and 131.4°, which were 122.3° and 125.8° preoperatively, and those of the fixed-bearing group were 128° and 129.3°, which were 122.2° and 123.9° preoperatively. There were no significant differences between two groups. The possibility of crossed-legged sitting and kneeling position also showed no significant differences between two groups, but mobile-bearing group felt more comfortable than fixed bearing group in crossed-legged sitting position. **Conclusion:** Clinical parameters, ROM and maximal flexion angle of knee joint showed no significant differences in both groups, but mobile-bearing group felt more comfortable than fixed bearing group in crossed-legged sitting position in daily living.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 10:45-12:15
Room: G4

Abstract number: 25326

TOTAL KNEE REPLACEMENT UNDER LIGAMENTOUS INSTABILITY OF THE KNEE

Alexandre SITNIK, Alexandre BELETSKY, Pavel SKAKUN, Oleg EISMONT, Andrey PERESADA

Republican Scientific Practical Centre of Traumatology and Orthopaedic Surgery, Minsk (BELARUS)

The aims of the investigation were the study of means and the evaluation of the results of implanting various designs of total knee endoprosthesis. We performed 498 primary total knee replacements from 1996 to 2003. In 425 cases no-hinged bicondylar models and in 73 hinged devices were used with the cemented fixation in 94.2%, the cementless fixation of the femoral component in 5.8% cases. The results 5 to 11 years after the operation were evaluated according to the Knee Society Scores. In all the cases a substantial joint destruction preceded the operation, sometimes combined with marked axial deformities and ligamentous imbalance. The choice of implant was based mainly on the grade of axial deformity. No-hinged models were used in knees with valgus less than 20 degrees or varus less than 25 degrees, otherwise hinged models were used. Long-term results appeared to be good in 80.5%, satisfactory in 12.5%, unsatisfactory in 7.0% cases. The causes of failures were septic (47.1%) and aseptic (35.3%) instability of the endoprosthesis, ligamentous joint instability (5.9%), anterior cruciate dislocation (11.8%). Septic instability demanded two-stage operative treatment with a minimal interval of 3 months. In cases of aseptic instability one-stage revision knee replacement was performed. Ligamentous instability demanded operations on ligaments, sometimes with replacement of the insert for a thicker one. Thus, the choice of appropriate prosthetic design after the preoperative planning with evaluation of the degree of axial deformity allows achieving good results in most of cases.

Date: 2010-09-03

Session: SYMPOSIUM - ORTHOPAEDIC SURGICAL OSSEOINTEGRATION SOCIETY (OSOS) - BONE ANCHORED AMPUTATION PROSTHESES

Time: 10:45-12:15

Room: F1

Abstract number: 26882

CLINICAL EXPERIENCE WITH ENDO-EXO-PROSTHESES

Thomas HOFFMEISTER

Sana Clinics Luebeck (GERMANY)

The bone anchored Endo-Exo-Femurprosthesis (EEFP) for above knee amputees has been implanted in Luebeck since 1999. Meanwhile 47 patients have been treated with EEFP in Luebeck, most of them within the last 5 years. Actually we run a retrospective study including 27 patients that were provided with EEFP for at least one year. We asked for data about general prosthetic use, complications, pain, mobility and quality of life. After treatment with EEFP we found significant increase of patients' mobility concerning various life situations. The everyday use as well as satisfaction with the prosthesis and subjective rating of flexibility, activity, walking ability, expenditure of energy, sense of balance, self respect and life quality improved. Pain frequency and intensity decreased. The study continues as a prospective study with preferably all upcoming patients provided with EEFP to reach a higher evidence level of results.

Date: 2010-09-03

Session: SYMPOSIUM - ORTHOPAEDIC SURGICAL OSSEOINTEGRATION SOCIETY (OSOS) - BONE ANCHORED AMPUTATION PROSTHESES

Time: 10:45-12:15

Room: F1

Abstract number: 26884

DIFFERENCES BETWEEN BONE ANCHORED AND TRADITIONAL SOCKET PROSTHESES FOR TRANSFEMORAL AMPUTEES

Eva HÄGGSTRÖM

(SWEDEN)

Since 1990 the Sahlgrenska University Hospital in Gothenburg, Sweden has been the centre for prosthetic rehabilitation for patients treated with upper or lower extremity bone-anchored (osseointegrated) amputation prostheses. Today more than 100 patients with transfemoral amputation have been treated. The aim of this presentation is to illustrate differences between bone anchored and traditional socket prostheses for patients with transfemoral amputation. In traditional prosthetic rehabilitation a prosthetic socket is made from a cast of the residual limb. In the normal case a new socket has to be produced every second or third year for the rest of the patient's lifetime. Our treatment for a bone anchored prostheses is a two stage surgery procedure (S1 and S2) using the method of osseointegration. A titanium implant is used and after the surgeries an abutment will protrude through the skin out of the residual limb. Four to six weeks after surgery S2 the patient will start to load and strengthen the skeleton by using a short training prosthesis. The full length prosthesis (osseointegrated prosthesis) is supplied about 3 months after S2. The OI-prosthesis is easily attached to the abutment. The most obvious difference between the two prostheses is the lack of a prosthetic socket. All problems regarding suspension of a prosthetic socket are solved. Other advantages are free hip range of motion and comfortable sitting. Data also indicate that patients using OI-prostheses have improved sensation through the prosthesis (osseoperception).

Date: 2010-09-03

Session: SYMPOSIUM - ORTHOPAEDIC SURGICAL OSSEOINTEGRATION SOCIETY (OSOS): BONE ANCHORED AMPUTATION PROSTHESES

Time: 10:45-12:15

Room: F1

Abstract number: 26883

PROSTHETIC USE AND MOBILITY WITH TRANSFEMORAL OSSEOINTEGRATED AMPUTATION PROSTHESIS – RESULTS FROM THE OPRA STUDY

Kerstin HAGBERG

(SWEDEN)

Treatment with osseointegrated transfemoral amputation prostheses (OI-prostheses) has been performed in Sweden since 1990. It comprises two surgeries and rehabilitation with a total treatment period of 12-18 months. In 1999 a prospective study named OPRA (Osseointegrated Prostheses for the Rehabilitation of Amputees) was started with the aim to report outcome at 2-years following the second surgery. Among the rehabilitation details prosthetic mobility and health related quality of life (HRQL) are assessed. The study includes 55 implants on 51 patients, with 4 patients treated bilaterally. Some preliminary results have previously been reported on subsets of the material. Those include statistically significant improved general and specific HRQL among the first 18 consecutive treated patients and decreased walking energy cost and increased walking habits among 20 patients with unilateral transfemoral amputation. In June 2010 all included patients will have been followed for 2 years and analyses of definitive results can be started. In January 2010 a total of 42 patients with 46 implants (50% male, 50% female, mean age 44 years (Sd 12,9), cause of amputation; 62% trauma, 29% tumour, 9% other) had passed the 2-year follow-up. Preoperatively 17% did not use any prosthesis and 60% reported daily prosthetic use. At 2-years follow-up 7% did not use prostheses at all and 87% reported to use the OI-prosthesis daily. Final outcome from the OPRA study will be reported during 2010. Preliminary results indicate that treatment with transfemoral OI-prosthesis improve prosthetic mobility and HRQL.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: F2

Abstract number: 26802

HIGH TIBIAL OSTEOTOMY FOR MEDIAL KNEE ARTHRITIS

Thami BENZAKOUR, Ahmed BENZAKOUR, Abderrazak HEFTI, Mohamed LEMSEFFER

Zerkouni Orthopaedic Clinic, Casablanca (MOROCCO)

We reviewed 192 patients (224 knees) to assess the results of HTO in gonarthrosis during the period 1982 - 2008. Median follow up was about 15 years for 134 females and 58 males. Among the knees, 118 had an average opening wedge for varus angle of 13° and 106 had closing wedges of 11°. Knee Society scoring before osteotomies was 68/200 for opening wedge and 81/200 for closing wedge. Modified Ahlback classification showed preoperative grades I: (n = 44), II (78), III (83) and IV (19). Healing delay was 55 days for closing and 70 for opening osteotomy. Twenty nine knees were still painful. Twenty eight patients were revised and 19 others had complications. After opening wedge osteotomy, scoring was 101/200 and valgus angle was 2°. After closing wedge osteotomy, scoring was 94/200 and valgus angle was 4°. Global results were as follows: very good, 12 %; good, 30%; fair, 31%; and poor, 27%. H.T.O. decreases stresses on medial compartment and widens joint space. The average of 5° mechanical valgus at the time of osteotomy seems to be quite effective at the follow-up for at least 10 years. Our indications are opening wedge for grades 1-3 and wide varus angle, until the age of between 65-70. Closing wedge is indicated for medium varus in younger patients.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: F2

Abstract number: 23006

LATERAL UNICOMPARTMENTAL KNEE ARTHROPLASTY: INFLUENCE OF ALIGNMENT ON WEAR AND LOOSENING.

Philippe HERNIGOU, Alexandre POIGNARD, Charle Henri FLOUZAT LACHIANETTE

Hopital Henri Mondor, Creteil (FRANCE)

This report analyzes the risk of loosening, recurrence of the deformity and progressive osteoarthritis in the opposite compartment after lateral unicompartmental arthroplasty. Between 1981 and 1995, 123 lateral cemented unicompartmental arthroplasties were performed. Alignment was measured post-operatively as the hip-knee-ankle (H.K.A.) angle on radiographs of the whole limb. 101 knees retained the original implants until the patient died or until the most recent follow-up examination, 12 were lost to follow-up and revision was performed in 10 knees. Clinical, radiographic changes and limb alignment were evaluated at the most recent follow-up (range, 10 to 25 years). An overcorrection in valgus (H.K.A. angle less than 180 degrees) was associated with a risk of degenerative changes in the opposite compartment (3 revisions among these 12 knees). Severe undercorrection in varus (H.K.A. angle more than 190 degrees) was associated with a risk a loosening of the tibial component in the long term: (6 revisions among 30 knees).The best results were obtained in the 91 implants that were implanted in moderate valgus with a H.K.A. angle of 181 to 189 degrees (one loosening among 91 implants). However the valgus deformity of these successful implants tended to recur at the latest follow-up (ten to twenty five years); this change in alignment was indicative of polyethylene wear and/or minor subsidence of the tibial component.Overcorrection increased the risk of disease progression in the contralateral compartment. Severe undercorrection increased the risk of loosening of the tibial component.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: F2

Abstract number: 25161

MEDIUM TERM RESULTS OF MEDIAL COMPARTMENT KNEE REPLACEMENT

Anupkumar SHETTY, Praveen SHARDA, S. MAHESWARAN

University Hospital of Northtees, Ashton-Under-Lyne (UNITED KINGDOM)

Introduction: Medial compartment knee arthroplasty in its own right has become an alternative treatment for osteoarthritis of the medial compartment of the knee. Excellent intermediate to long term results have been reported with the Miller-Galante implant. Indications have been expanded to older age groups with medial compartment Arthritis. Methods: We report an average four year follow up (range 2-8 years) of medial compartment knee replacement carried out in our centre. This operation was commenced in our centre in 2001 using Miller-Gallante implant. We retrospectively analysed 133 consecutive medial compartment Knee arthroplasty done in 125 patients. 10 patients were lost to follow up, They were all analysed clinically and radiologically till the last follow up. Knee society score and knee functional score was used to assess the knee status. Results: Average Age of patients was 62 (range 44-81), Average Pre operative Knee Society score was 51,(range from 20-84)post operative average Knee society score was 92(range from 63-10). pre operative average knee functional score was 49 (Range 21-89). Average post operative Knee functional score was 88 (range 42-100). None of the patients had blood transfusion.4 patients had revision to total knee replacement 1 due to development of lateral compartment arthritis, 3 due to persistent pain.3 had superficial infection settled with antibiotics, More than 90% of them were pleased with the operation.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: F2

Abstract number: 24421

THE EFFECT OF DISTAL FEMORAL BONE CUT ON FLEXION GAP IN TOTAL KNEE ARTHROPLASTY USING A GAP BALANCING TECHNIQUE

Masahiro NOZAKI, Masaaki KOBAYASHI, Yuko NAGAYA, Hideyuki GOTO, Hirotaka IGUCHI, Nobuyuki WATANABE, Hideki OKAMOTO, Takanobu OTSUKA

Department of Orthopaedic Surgery, Nagoya City University, Nagoya (JAPAN)

A gap balancing technique is commonly used in total knee arthroplasty (TKA) to create an equal extension and flexion gap. However, obtaining a flexion gap sufficiently large for the extension gap in cruciate retaining TKA is sometimes difficult. The purpose of the present study was to evaluate the effect of the size of the distal femoral bone cut on the flexion gap when using the gap balancing technique in TKA. Patients and Methods: Data were obtained from 40 consecutive TKA patients who agreed to participate in this institutional review board approved. Patients were divided into a less cut group (Less group) and a large cut group (Large group). The Less group had a distal femur bone cut less than 9mm, the thickness of the femoral implant of TKA. The Large group had a distal femur bone cut larger than 9mm. The extension gap was measured after cutting the proximal tibia at knee extension and the flexion gap was measured at 90 degrees knee flexion. Results: The Less group comprised 29 patients and the Large group 11. In the Less group, 21 of 29 (72.4%) had a flexion gap equal to or larger than the extension gap, while in the Large group, 4 of 11 (36.4%) had a flexion gap equal to or larger than the extension gap. Conclusion: Our result indicates that a smaller distal femur bone cut may help achieve a sufficiently large flexion gap, equal to the extension gap, in TKA.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: F2

Abstract number: 23331

UNICOMPARTMENTAL KNEE REPLACEMENT, CEMENTED VS. CEMENTLESS

Gustav BONTEMPS¹, Klaus SCHLÜTER-BRUST²

¹*Fabricius Klinik - Orthopaedic Department, Remscheid (GERMANY)*, ²*Universität zu Köln - Orthopädie, Köln (GERMANY)*

Introduction: This prospective study focuses on the issue of a reliable prosthesis/bone fixation and compares the clinical and radiological outcome of the cemented and uncemented version of the prosthesis. Methods: The prosthesis ensures congruent area contact with physiological kinematics resulting from imitation of the morphology of the femoral condyle and unrestricted movement of the bearing. From 1991 to 2007 we performed 624 medial implantations with cement (mean age 71 years) and 185 cementless (mean 65 years). The follow up is (1.6-17) mean 9 years and seized 93% of the cases. Assessment according to KSRS and radiologically (F. C. Ewald). Results: Knee Score (pre/post) cemented 41/93, cementless 39/95. Function Score (pre/post) cemented 56/90, cementless 59/94. ROM increased for the cemented group Flex/Ex 107°/5° to 121°/2°, for the cementless Flex/Ex 107°/4° to 124°/1°. Loosening needing revision: 15 times (2.5%) in the cemented group and 3 times (1.7%) in the cementless group. The survival rate (endpoint revision) is at 10 years: cemented 93.7%, cementless 94.5%. The radiological investigation showed less radiolucent lines in the cementless cases in comparison to the cemented. Conclusion: The prosthesis gives excellent results in both applications. The knee and function scores show similar improvements. The loosening rate of the cementless cases is even lower despite the higher physical demands of this 6 year younger group. The cementless fixation is attractive for younger patients and is pre-eminent for the mini-invasive implantation technique.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: F2

Abstract number: 25653

KINEMATIC ANALYSIS OF MOBILE MENISCAL BEARING OF OXFORD MEDIAL UNICOMPARTIMENTAL KNEE ARTHROPLASTY USING EOS IMAGING ACQUISITION SYSTEM: A FEASIBILITY STUDY.

Ahmed ZEMIRLINE¹, Eric STINDEL¹, Abdelhamid ZEMIRLINE², Julien LE BOUCHER³, Joël SAVÉAN³, Frédéric DUBRANA¹

¹*Orthopaedic Surgery Service / University Hospital Centre of Brest, BREST (FRANCE)*, ²*Paris (FRANCE)*, ³*Laboratory of Medical Information Processing LATIM (INSERM U650) / Brest (FRANCE)*

The designers of Oxford medial unicompartmental Knee arthroplasty reported a high cumulative survival rate. This survivorship is accredited to the congruency and mobility of the meniscal bearing. The objective of our study is to measure the mobility of the congruent meniscal bearing during knee flexion. We also investigate the feasibility of assessing, in vivo, the three dimensional position of the prosthetic components using EOS stereoradiographs. We included 10 knees of 10 patients with an Oxford medial unicompartmental Knee arthroplasty. Owing to the new EOS imaging acquisition system, we obtained three pairs of stereoradiographs of the operated knee which, for each patient, were in extension, semi-flexion and flexion states. The acquired images were analysed with a specifically designed software to determine the three dimensional position of the component models on each step of the knee flexion. The reproducibility and accuracy of the results were verified. The outcome of this study gives us a better understanding of the kinematics of mobile bearing of unicompartmental Knee arthroplasty. The EOS stereoradiographs are very accurate. They are useful to study the relative position of the prosthetic components and thereof, the prosthetic biomechanics notably on a loaded lower limb.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: F2

Abstract number: 23506

A NOVEL FREE-FLOATING POLYCARBONATE-URETHANE MENISCAL IMPLANT: FROM BENCH TO CLINICAL PRACTICE

Jonathan ELSNER¹, Gal ZUR¹, Eran LINDER-GANZ¹, Vincenzo CONDELLO², Elliott HERSHMAN³, Claudio ZORZI², Farshid GUILAK⁴, Avi SHTERLING¹

¹*Active Implants Corporation, Netanya (ISRAEL)*, ²*Sacro Cuore Don Calabria Hospital, Negrar, Verona (ITALY)*, ³*Lenox Hill Hospital, New York (UNITED STATES)*, ⁴*Duke University Medical Center, Durham (UNITED STATES)*

Meniscus replacement still represents an unsolved problem in Orthopaedics. Allografts remain limited due to their availability, size-matching, cost and risk of disease transmission. Artificial prostheses offered thus far are based principally on tissue engineering concepts, which have been found to lack durability under loads and exhibit variability in the quality of tissue formation. Therefore, our goal was to develop a bio-stable synthetic meniscal implant which combines durability with dependable biomechanical performance resembling that of the natural meniscus. We propose a composite self-centering, non-fixed discoid configuration composed of Polycarbonate-Urethane (PCU), a compliant yet durable polymer, reinforced circumferentially with UHMWPE-fibers. Biomechanical evaluation of the implant was focused on measurements of contact pressure distributions under the implant during in-vitro cadaver compression tests and computational finite element (FE) analyses. Additionally, dynamic 15-million cycles fatigue tests were conducted to evaluate long-term stability under cyclic loading. Contact pressure distributions on the tibial plateau, were in very good agreement to those measured under the intact natural meniscus prior to meniscectomy. The integrity of the implants undergoing 15-million fatigue cycles was not adversely affected in terms of form, component bonding and structure-function relationship. Outputs of the FE model confirmed that internal strains/stresses within the device components remain within the material's allowed limits. First clinical results for the implant, with up to 1.5 years follow-up, demonstrate encouraging prospects for this concept in terms of pain relief. Initial results suggest that the current device can relieve pain post-injury and delay the need of more aggressive surgical procedures.

Date: 2010-09-03
Session: Arthroplasty Knee
Time: 08:00-09:30
Room: F2

Abstract number: 23332

MINI-INVASIVE UNICOMPARTMENTAL KNEE ARTHROPLASTY

Gustav BONTEMPS¹, Klaus SCHLÜTER-BRUST²

¹*Fabricius Klinik - Orthopaedic Department, Remscheid (GERMANY)*, ²*Universität zu Köln - Orthopädie, Köln (GERMANY)*

Introduction: Mini-invasive implantation of unicompartmental knee replacement became widely applied in the past decade. Is precise component placement reliable possible with this technique. Also without navigation. Are the mid-term results comparable good as with the earlier open technique. Method: In 1999 a prospective study was performed comparing 30 medial replacements in standard-open and mini-invasive technique without navigation. The precision of component placement was analyzed by x-ray. The differences in rehabilitation were documented clinically. The early and mid-term results were evaluated according to KSRS. In addition to compare larger groups randomized 150 patients from 1996-1998 (standard-open) and 150 patients from 2000-2002 (mini-invasive) were also evaluated according to KSRS. Results: The x-ray analysis showed a similar good precision of component placement. Of max. 30 possible points the standard-open group reached 29.2, the mini-invasive collective 29.1 points. The rehabilitation (straight leg raising, flexion 90°, stair climbing) was accelerated about 30% with mini-invasive technique. The knee- and function scores were similar good after 6 months and 6 years in both groups. Although the comparison of both implantation techniques with each 150 cases showed at mid-term follow up (9 resp. - 7 years) similar good results. Standard-open: Knee Score 34/94, Function Score 54/90 (prae/post) Mini-invasive: Knee Score 43/94, Function Score 54/92 (prae/post) Conclusion: The mini-invasive implantation of medial unicompartmental knee replacement without navigation does not impair the precision of component placement, accelerates the rehabilitation and has similar excellent results at mid-term follow up of 7-9 years.

Date: 2010-09-03
Session: Trauma Foot / ankle
Time: 10:45-12:00
Room: F2

Abstract number: 25951

INDICATIONS FOR OPEN REDUCTION AND INTERNAL FIXATION IN INTRAARTICULAR CALCANEAL FRACTURES.

Alexandre BELETSKY, Oleg KORZUN, Alexandre SITNIK, Alexandre LINOV
*Belarus Republic Scientific and Practical center for Traumatology and Orthopaedics,
Minsk (BELARUS)*

Sixty patients with eighty seven intraarticular calcaneal fractures were managed in our clinic between March 2005 and December 2009. The mean age was 37,5. There were 51 men and 9 women. Joint depression type - 49, tongue type - 38. According to Sanders: type1 - 5 cases, 2 - 3 cases, 2 - 15 cases, 2 - 5 cases, 3 - 26 cases, 3 - 23 cases, 3 - 5 cases, type 4- 5 cases. Methods of treatment were divided on five groups: 1) cast immobilization - 25; 2) closed reduction using pin and clamp, percutaneous pinning - 9; 3) closed reduction using Shanz screw, percutaneous pins or screw fixation; 4) ORIF using plates and screws - 35; 5) External fixation - 2; Assessed quality of reduction using degree of reconstruction of the Bohler angle, posterior facet, calcaneus width and length. Conclusions: On the basis of the received data the follow indications for ORIF were determined: 1) posterior joint facet impression; 2) step or gap in posterior joint facet more than 2-3 mm; 3) decrease Bohler angle to 0°; 4) broadening or shortening to 1/3; 5) varus >5°, valgus >10°; 6) failed closed reduction; 7) soft tissue compromising by the bone fragments; 8) tongue type, if reposition delayed 3 weeks or more.

Date: 2010-09-03
Session: Trauma Ankle / Foot
Time: 10:45-12:15
Room: F2

Abstract number: 26215

FIXATION OF ANKLE SYNDESMOSIS BY ANTIBIOTIC RELEASING BIOABSORBABLE SCREW: A RANDOMIZED RSA TRIAL

Hannu ARO¹, Tatu MÄKINEN¹, Tatu IMMONEN¹, Satu TIMLIN¹, Niko MORITZ¹, Minna VEIRANTO², Pertti TÖRMÄLÄ²

¹Turku University Hospital, Turku (FINLAND), ²Bioretec Ltd, Tampere (FINLAND)

In prevention of implant-related infections, local antimicrobial prophylaxis may provide effective means to avoid bacterial colonization of the implant surface and still carry a diminished risk for inducing bacterial resistance. We have evaluated the mechanical efficacy and safety of an antibiotic releasing bioabsorbable screw. The primary objective was to show that the antibiotic releasing screw is at least as good as the routinely used metal screw in prevention of syndesmosis widening measured by means of RSA (radiostereometric analysis). The trial group size was based on non-inferiority power analysis. Seventeen patients with an acute, closed Weber C type ankle fracture were randomized into two treatment groups. The syndesmosis injury was fixed with a ciprofloxacin releasing PLGA screw or with a metal screw (removed at 8 weeks). RSA was performed at 0, 2, 6, and 12 weeks. The width of the ankle mortise was also measured by CT and plain radiography. Clinical outcome was evaluated using standardized outcome questionnaires and VAS scale. The follow-up time was 52 weeks. The width of the syndesmosis remained unchanged in both treatment groups during the first 12 weeks after surgery based on RSA and CT measurements and during the follow-up of 52 weeks based on measurements from plain radiographs. The clinical outcome and safety profiles of the two treatment groups were also similar. In conclusion, both fixation methods secured anatomic restoration of the ankle mortise. The use of antibiotic releasing bioabsorbable screws may be an option in high-risk patients for postoperative infections.

Date: 2010-09-03
Session: Trauma Ankle / Foot
Time: 10:45-12:15
Room: F2

Abstract number: 25816

ANKLE FRACTURES: IMPACT OF SWELLING ON TIMING OF SURGERY, LENGTH OF HOSPITAL STAY AND THE ECONOMIC BURDEN

Mohamed SUKEIK, Qaffaf MOHAMED, Gail FERRIER
Cumberland Infirmary, Carlisle (UNITED KINGDOM)

Background: Delays in operative fixation of ankle fractures beyond 24 hours from injury are associated with lengthening of hospital stay and are often due to ankle swelling. On the other hand, the cost per patient per day of an acute trauma bed is estimated at £225. Objectives: To estimate the length of delay in surgery and subsequent prolonged length of hospital stay and economic burden due to ankle swelling associated with ankle fractures. Patients and Methods: A retrospective study of 145 consecutive patients treated for ankle fractures over a period of 12 months in 2008. Results: In total, 117 (80%) patients were operated on within 24 hours of presentation (early group). 28 patients' surgery was delayed beyond 24 hours (delayed group). Of the 117 patients the mean inpatient stay was 3.79 days (± 2.39) whereas in the delayed group the mean stay was 8.57 days (± 6.54). Of the delayed group, 57% of the cases had swelling as the cause of a postponed operation, whereas other causes included lack of theatre time and fitness for surgery. Conclusion: We recommend implementation of policies which provide early operative intervention of ankles fractures as this would result in improved patient outcome and significant financial savings. If an operation is not feasible within 24 hours of admission and the ankle becomes swollen, it may be worth considering sending the patients home for a period of 5-7 days with advice on RICE and anticoagulation which would both permit surgery and cut down costs.

Date: 2010-09-03
Session: Trauma Ankle / Foot
Time: 10:45-12:15
Room: F2

Abstract number: 23996

TREATMENT OF PENETRATING FOOT INJURIES

Gershon VOLPIN, Emanuel SACAGIO, Albert GORSKI, Norman LOBERANT, Moshe DANIEL, Jack STOLERO, Haim SHTARKER
Western Galilee Hospital, Naharia (ISRAEL)

Introduction: We present our experience in evaluation and with penetrating injuries of the foot. Patients: 63 patients (57 M, 6 F; 8-64Y old; mean 38Y; follow-up:2-5Y mean 2.5Y) were treated for penetrating foot injuries. Each patient had a routine x-ray and foot sonography. Most common injuries were through the shoes (45/63 pts) by nails (39/45) and wood pieces (6/45), - or through bare feet (18/63 Pts) -nails (10/18), glass (5/18), wood pieces (2/18) and 1 seashells. Medical files of these patients were searched for relevant parameters. Results: Foot penetrating foreign bodies were detected in 58/63 Pts (92%) and they were operated upon by meticulous debriedment and removal of FB. Penetrating foreign bodies were detected on arrival in 47/58 Pts (81%) by sonography. The false negative rate of sonography was 19% and the presence of FB was detected only by a second sonography. In the remaining 5 pts, foreign bodies were not detected even in the second sonography, but found only during surgery. Complete healing was observed in 62/63 (98%) of patients, although 6/63 (9%) underwent secondary debriedment. One patient (diabetic) developed chronic osteomyelitis of the second metatarsal bone and needed repeated surgical interventions. Conclusions: Excellent results are observed after meticulous foot debriedment combined with systemic antibiotics. The main purpose is to identify foreign bodies by sonography or x-rays. Injury through a shoe may result secondary either to the penetrating object and other additional fiber, rubber or leather.

Date: 2010-09-03
Session: Trauma Ankle / Foot
Time: 10:45-12:15
Room: F2

Abstract number: 23849

EVALUATION OF THE SYNDESMOTIC-ONLY FIXATION FOR WEBER-C ANKLE FRACTURES ASSOCIATED WITH SYNDESMOTIC INJURY

Riazuddin MOHAMMED¹, Shakir SYED², Asghar ALI²

¹*Hywel Dda NHS Trust, Carmarthen (UNITED KINGDOM)*, ²*University Hospital Birmingham NHS Trust, Birmingham (UNITED KINGDOM)*

A retrospective observational study was performed to determine the functional and radiographic outcome of supra-syndesmotic fibular fractures associated with syndesmotic disruption treated with syndesmosis-only fixation. With the length of the fibula restored and the syndesmosis reduced anatomically, internal fixation using a plating device may not necessary for fibular fractures combined with diastasis of inferior tibio-fibular joint. Twelve patients had fracture patterns amenable to syndesmosis-only fixation of whom majority were due to pronation external rotation injury. Through a percutaneous or mini-open reduction and clamp stabilization of the syndesmosis, all but one patient each had a single tricortical cortical screw fixation across the syndesmosis. Patients were mobilised non-weight bearing for six weeks followed by screw removal at an average of eight weeks. Outcomes were assessed using an objective (Olerud and Molander Scale) ankle scoring system. Ankle mortise was reduced in all cases and all but one fibular fracture united without loss of fixation. At a mean follow up of 13 months, functional outcome score was 75. Six patients had more than one malleolar injury needing either screw or anchor fixations. One patient with trimalleolar fracture had residual ankle stiffness which responded to intensive physiotherapy. One patient had late diastasis, probably due to early screw removal before union of the fibular fracture and required revision surgery. Essential to this method of treatment are restoration of the fibular length, anatomical reduction of the syndesmosis and delaying screw removal till the fibular fracture heals.

Date: 2010-09-03
Session: Trauma Ankle / Foot
Time: 10:45-12:15
Room: F2

Abstract number: 24459

RESULTS OF A CONSECUTIVE SERIES OF MORE THAN 70 CASES OF EXTENSOR DIGITORUM BREVIS FLAP FOR ANKLE AND FOOT RECONSTRUCTION.

Christophe GAILLARD¹, André-Mathieu GAY², Natacha BERENI², didier GUINARD², Régis LEGRE²

¹*HIA Ste ANNE, Toulon (FRANCE)*, ²*APHM, Marseille (FRANCE)*

Introduction: We report our experience about seventy six cases of ankle and foot skin defects reconstruction with an extensor digitorum brevis (EDB) island flap. **Material and Methods:** seventy six patients underwent a reconstruction with an EDB flap skin grafted. The series includes fifty six men and twenty women with a 43.3 years mean age. Reconstruction involved post-traumatic septic sequels of the distal part of the leg or ankle, Achille tendon repair or hallux metatarso-phalangeal joint wounds. In most cases, the flap was elevated on the tibial artery pedicle in an orthograde way while the pedicle was based on the dorsalis pedis artery in a reverse flow way to treat fore-foot problems. **Results:** Reconstructed site healing was uneventful for all cases with notably the definite cure of septic problems. Several cases presented with donor site skin healing impairment which resolved favorably and no patient complained with secondary trophic problems. **Discussion:** The EDB flap is a reliable technique for foot and ankle reconstruction that challenges distant or free flaps. Depending on wether the pedicle pivot point is placed proximally or distally, the rotation arc allows to reach the distal leg, the ankle and the fore-foot. In septic bone problems, the muscle flap small size allows to first; act as a vascular sponge and secondly; can be easily inserted inside bones cavities. **Conclusion:** This useful method is worth to be (re)considered face to other techniques to treat ankle, foot and fore-foot skin defects up to 25 cm² or bone septic problems.

Date: 2010-09-03
Session: Trauma Ankle / Foot
Time: 10:45-12:15
Room: F2

Abstract number: 25603

JONES' FRACTURE OF THE FIFTH METATARSAL BASE OR AN AVULSION FRACTURE- DO WE REALLY NEED TO DISTINGUISH BETWEEN THEM?

Rahul KAKKAR, Pavel AKIMAU, Paul FEARON
Northern Deanery, Newcastle (UNITED KINGDOM)

Torg described three types of Jones' fractures and the emphasis for treatment has been either plaster cast and non weightbearing for at least 6 weeks for type 1 and 2 fractures and surgery for type 3 fractures. We conducted a study to determine whether treatment was actually required for type 1 fractures, whether patients needed to be weight bearing and if so for how long, time to fracture union and whether it is actually worthwhile distinguishing a Jones' fracture from a styloid avulsion fracture. We had 43 patients. All of these fractures involved the meta- diaphyseal junction and were transverse in orientation involving the 4th- 5th metatarsal articulation. 21 patients were treated with a below knee cast and kept non weightbearing for at least 6 weeks. 22 patients had walking boot provided and allowed to weight bear as comfortable and progress to full weight bearing as soon as possible. All fractures in the plaster cast group united by 8 weeks while one patient in the walking boot group went into delayed union and united at 16 weeks. All other patients in this group had achieved union by 7 weeks on average. Thus, our results demonstrate that for type 1 Torg (acute) fractures, a plaster cast is not necessary, weight bearing can be allowed immediately rather than keep NWB for 6 weeks and this apparently seems to result in a slightly quicker union time (7 vs 8 weeks) and that actually we do not need to distinguish a Jones fracture from an avulsion fracture.

Date: 2010-09-03
Session: Trauma Ankle / Foot
Time: 10:45-12:15
Room: F2

Abstract number: 23330

RESULTS OF CLOSED REDUCTION AND PERCUTANEUS KIRSHNER WIRE FIXATION FOR THE TREATMENT OF INTRA-ARTICULAR CALCANEAL FRACTURES

Jean MICHEL¹, Charles COURT¹, Alain ASSELINEAU²

¹*C.H.U du Kremlin Bicêtre, Le Kremlin Bicêtre (FRANCE)*, ²*Hôpital de Villeneuve Saint-Georges, Villeneuve Saint Georges (FRANCE)*

Introduction- A minimally invasive technique for the treatment of intra articular fractures of the calcaneus was used. The original technique was described by Westhues. Materials and methods- Forty eight intra articular calcaneus fractures were treated in 41 patients (thirty males, eleven females). The mean age was 45 years (range, 17-74 years). Plains radiographs and CT scans were obtained for radiographic evaluation. Using Utheza classification, 30% of fractures were classified as vertical, 20% as horizontal and 50% as combined. The Maryland foot score was used for clinical evaluation. Mean Böhler angle before the surgery 2°. The back foot is corrected by external manipulation. With the use of the X-ray image, the reduction is obtained with a steimann pin introducing into the dorso lateral calcaneus beneath the posterior facet. Kirshner wires assure the stabilization of the reduction. At the last follow-up patient were evaluated using plain radiographs and the functional Maryland foot score.

Date: 2010-09-03
Session: Trauma Ankle / Foot
Time: 10:45-12:15
Room: F2

Abstract number: 23313

THE AUGMENTATION USING POROUS HYDROXYAPATITE FOR INTRAARTICULAR CALCANEAL FRACTURES OF JOINT DEPRESSION TYPE

Jun-il YOO, Byung-Ki CHO, Yong-Min KIM, Seung-Whan BAE
Chungbuk National University Hospital, Cheongju (KOREA)

Purpose: To evaluate the clinical outcomes of operative treatment using porous hydroxyapatite for intraarticular calcaneal fracture of joint depression type. **Materials and Methods:** Twenty patients with intraarticular calcaneal fracture were followed up for more than 2 year after operation. The period to union of fracture was calculated to evaluate the osteoconductivity of porous hydroxyapatite used as a bone graft substitute. The measurement of Böhler angle, Gissane angle and the degree of articular surface depression was performed through radiographs. The clinical evaluation was performed according to the AOFAS score and the grading system of Creighton-Nebraska health foundation. **Results:** Böhler angle and Gissane angle had improved significantly from preoperative average 10.4°, 117.8° to average 22.6°, 113.5° immediate postoperatively. At the last follow-up, the Böhler angle and Gissane angle had maintained to average 21.2° and 114.4°. The degree of articular surface depression had improved significantly from preoperative average 4.8mm to 1.5mm at last follow-up. All cases achieved bone union, and the period to union was average 12.8 weeks. AOFAS score was average 85.2 points at last follow-up. There were 7 excellent, 9 good, and 4 fair results according to the CNHF grade. Therefore, 16 cases (80%) achieved satisfactory results. **Conclusion:** Plate fixation using porous hydroxyapatite seems to be one of effective treatment methods for joint-depression type calcaneal fracture, because of supporting the reduction of subtalar articulation by augmenting bony defect and facilitating the bone formation.

Date: 2010-09-03
Session: Trauma Ankle / Foot
Time: 10:45-12:15
Room: F2

Abstract number: 26447

THE FIBULAR NAIL: A BIOMECHANICAL STUDY

George SMITH¹, Robert WALLACE², Gordon FINDLATER², Timothy WHITE¹

¹*Royal Infirmary, Edinburgh (UNITED KINGDOM)*, ²*Dept. Orthopaedic Engineering, Edinburgh University, Edinburgh (UNITED KINGDOM)*

Introduction: Ankle fracture fixation in the elderly can result in complications related to both vulnerable soft tissues, and to loss of fixation in osteoporotic bone, with published complication rates of up to 40%. An intramedullary nail for the fibula is available commercially and is being evaluated in clinical trials. Although there is a clear theoretical biomechanical advantage in using a fibular nail, this has not been confirmed scientifically. Methods: Eight pairs of matched fresh frozen cadaveric lower legs were used. A supination-external rotation (Weber B) ankle fracture was created by dividing the fibula obliquely with a saw and sectioning the anterior and posterior tibiofibular ligaments. The deltoid ligament was preserved to represent fixation of the medial side. For each pair, one limb was randomised to fixation with a standard AO plate and lag-screw construct, the other was stabilised with a locked fibular nail. The limb was mounted on a Zwick tensile biomechanical testing apparatus and stressed to failure using an external rotation force. Results: There was a higher load to failure for the limbs stabilised with a fibular nail when compared to a standard AO lag-screw and plate construct. Conclusions: There are a number of potential advantages to the use of the fibular nail in treating ankle fractures in the elderly, and an improved biomechanical hold on osteoporotic bone may result in a reduction in the rate of technical failure of fixation in this vulnerable group.

Date: 2010-09-03
Session: Trauma Ankle / Foot
Time: 10:45-12:15
Room: F2

Abstract number: 25684

COMPRESSION ARTHRODESIS OF ANKLE JOINT AFTER SEVERE INJURIES

Victor VOLOSHIN, Gennadiy ONOPRIENKO, Vladimir ZUBIKOV, Anatoliy EREMIN,
Saravanan ARUMUGAM

M.F. Vladimirovskiy Moscow Regional Clinical Research Institute, Moscow (RUSSIA)

Aim: to optimize the technique of arthrodesis after severe injuries of the ankle joint.
Materials and methods: From 1990, data of 250 patients who underwent arthrodesis of the ankle joint were analyzed. In this, 170 surgeries were performed for post-traumatic arthrosis, in 58 cases we performed arthrodesis for purulent infection of ankle joint after surgical sanitation and in 22 patients calcaneotibial arthrodesis was performed. Several types of surgical procedures were performed depending on the severity of the destruction of the talus. If the talus is viable, we performed economical resection of joint surface. When infection of talus is followed by necrosis, we performed necrectomy and adaptation of tibio-calcaneal joint surfaces. The viable head and neck of talus were adapted with anterior surface of the tibia. Fixation was achieved by the Ilizarov's apparatus. In some occasions, we lengthened the tibia by osteotomy in one setting or after the infection got treated. The fixation was applied for 4-5 months, followed by Orthopaedic foot wear. **Results:** Residual inflammatory process was observed in 2 patients, which was corrected by long application of antibiotics and fixation. In 2 patients we performed revisional arthrodesis. Auto bone graft was used in one patient during calcaneo-tibiofibular arthrodesis. **Summary:** Stable fixation with compression at one setting followed by stepped compression in the post-operative period gives the favorable condition for ankylosis of the injured joint and it helps to treat inflammatory process also.

Date: 2010-09-03
Session: Trauma Ankle / Foot
Time: 10:45-12:15
Room: F2

Abstract number: 26137

EPIDEMIOLOGY OF ANKLE FRACTURES IN SWEDEN 1987-2004

Charlotte KARLSSON-THUR¹, Gustav EDGREN², Tore DALEN³, Per WRETENBERG¹

¹*Department of Orthopaedic Surgery, Stockholm (SWEDEN)*, ²*Department of Epidemiology, Stockholm (SWEDEN)*, ³*Department of Orthopaedic Surgery, Umeå (SWEDEN)*

Objectives: To analyse changes in incidence, length of hospital stay, gender and age of ankle fractures between 1987 and 2004 in Sweden. **Methods:** Data for all ankle fracture patients admitted to hospital between 1987 and 2004 were obtained from the Swedish National Hospital Discharge Register (SNHDR). The SNHDR uses the codes for diagnosis at discharge according to the Swedish version of the International Classification of Diseases. The SNHDR covers more than 98% of all hospital admissions. **Results:** In all, 108 660 patients were identified. 96.8% (105 170) closed fractures, 3.2% (3 490) open fractures. The closed fractures mean length of stay decreased by over the period, while mean length of stay for open fractures remained the same. Incidence of ankle fractures admitted to hospital did not increase over the studied period. For women highest incidence according to age was seen in the age group 65-74 (136/100 000/year), and for men 15-24 (84 /100 000/year). **Conclusions:** Incidence of hospital admissions for ankle fractures did not increase significantly over the studied period. There is though a significant difference in incidence correlated to gender and age.Length of stay did decrease for the closed fractures, but not for the open fractures.

Date: 2010-09-03
Session: Trauma Pelvic Fractures
Time: 08:00-09:30
Room: F4

Abstract number: 25173

SURGICAL TREATMENT OF DELAYED VERTICALLY UNSTABLE PELVIS FRACTURES

Andrey KAZANTCEV¹, Maxim ENIKEEV², Sergey PUTYATIN¹, Atom TER-GRIGORYAN¹

¹*City hospital 15, Moscow (RUSSIA)*, ²*Russian Postgraduate Medical Academy, Moscow (RUSSIA)*

From 2002 to 2009, 25 patients with delayed ununited vertically unstable pelvis fractures (type C by Tile classification) were operated on in our clinic by using single-stage osteosynthesis. All of them were treated previously conservatively in other clinics from 4 months to 2 years after injury. The most significant problem was simultaneous surgical exposure to both pelvis semicircles which is especially important in old fractures. Another problem is serious shortening of lower limb due to upward hemipelvis fracture-dislocations. To solve such problems we used modified ilioinguinal approach with iliac wing osteotomy and following refixation, which allowed us to expose anterior and posterior semicircles and achieve appropriate reposition of bone fragments. In the cases of upward hemipelvis fractures-dislocations with significant limb reduction, iliac wing osteotomy was performed to stop abdominal muscle traction, to move the right hemipelvis down to repair anatomy and length of the lower extremity. As complications of operative treatment we consider superficial infection in 3 cases and peroneal neuropathy in 2 patients. In both cases of neuropathy patients had significant limb shortening and were operated on more than 8 months after injury. In 2 patients the partial removal of fixators was performed after first signs of consolidation because of prolonged wound healing and fistula formation. In one case it led to insignificant displacement. The follow-up of 18 observed patients from 6 months up to 3 years showed complete union of fractures in all cases. 12 results were considered as good and 6 as satisfied.

Date: 2010-09-03
Session: Trauma Pelvic Fractures
Time: 08:00-09:30
Room: F4

Abstract number: 23946

PERCUTANEOUS ILIOSACRAL SCREW FIXATION FOR UNSTABLE POSTERIOR PELVIC FRACTURES: A SERIES OF 32 CASES

Sherif KHALED

Cairo University, Giza (EGYPT)

Introduction: This series of patients was studied prospectively to evaluate the functional score after percutaneous iliosacral screw for unstable posterior pelvic fractures to explore if minimally invasive techniques would provide early, rapid, definitive stabilization with minimal blood loss, less infection, wound complications, and relatively early ambulation, better results in union rates, and maintenance of the reduction and rigidity of fixation. Materials and methods: Series includes 32 patients, 18 to 60 years (average 39) who suffered 37 unstable posterior pelvic fractures (5 bilateral). Thirty-one were Tile type-C and 1 Tile type-B. Preoperative delay averaged 6 days. Patients underwent closed reduction and 36 fractures were fixed using percutaneous iliosacral screws in the supine position. Postoperatively 2 patients were lost to follow up and 30 patients (35 posterior fractures) followed up for a mean of 17 months and evaluated using the Majeed score. Results: clinically ambulation was started at a mean of 2.8 weeks. There were no neurologic injuries, no posterior wound complications and union occurred in all the patients. Radiologically; excellent reduction was achieved in 69%, good 28%, and poor in 3%. Functionally; The score ranged from 53 to 99 points; 87% scored 85 points to 99 points considered excellent, 10% scored 77-80 (good), and 3% scored 53 (poor) result. Conclusion: The iliosacral screws for posterior unstable pelvic injuries is a simple, safe and adequate for definitive stabilization of these injuries that allows early weight bearing, minimizes complications and yields good to excellent functional results. Level of evidence: Level IV- case series.

Date: 2010-09-03
Session: Trauma Pelvic Fractures
Time: 08:00-09:30
Room: F4

Abstract number: 26381

THE EFFECT OF SIMULATED POSTERIOR WALL ACETABULAR FRACTURES ON HIP STABILITY DURING SINGLE LEG STANCE AND SIT-TO-STAND MANEUVERS

Amir MATITYAHU, Erik MCDONALD, Jennifer BUCKLEY, Meir MARMOR
Orthopaedic Trauma Institute, San Francisco (UNITED STATES)

Posterior wall fractures of the acetabulum can lead to hip joint instability and arthritis. The surgical indication for fixation of posterior wall acetabular fractures have been tested using a single leg stance (SLS) biomechanical model of hip instability. However, 40% of the day is spent in the sitting position in the United States. We compared hip joint stability during single leg stance (SLS) and sit to stand (STS) maneuvers using a posterior wall acetabular fracture model. **Methods:** Seven side-randomized fresh frozen cadaveric hemi-pelvic specimens with proximal femurs were dissected of all soft tissues except for the acetabular labrum. Posterior wall acetabular fractures were created in 5 mm increments. The percentage of posterior wall resection (PWR) was calculated. A 1200 N load was applied to the acetabulum simulating the STS cycle (15° abduction, 90° flexion) and SLS (15° abduction, 0° flexion). **Results:** The average PWR needed to dislocate the hip was significantly less ($p=0.005$) for the STS group (45.4%) than the SLS group (82.4%). **Conclusions:** There is a higher likelihood of hip dislocation with STS than SLS in simulated posterior wall acetabular fractures. Patients with posterior wall fractures affecting more than 45.4% of the articular surface may be susceptible to instability during the sit-to-stand maneuver.

Date: 2010-09-03
Session: Trauma Pelvic Fractures
Time: 08:00-09:30
Room: F4

Abstract number: 26437

SURGICAL TREATMENT FOR ACETABULAR FRACTURES

Victor VOLOSHIN, Anatoliy GALKIN, Saravanan ARUMUGAM

M.F. Vladimirskiy Moscow Regional Clinical Research Institute, Moscow (RUSSIA)

Aim: to determine criteria for selecting surgical treatment for acetabular fractures.
Materials & methods: From 2004-2009, mid-term results of 38 patients who underwent surgical treatment for acetabular fractures were analyzed. The variations in time interval after injury are the following: less than 3 weeks - 15(39.5%) patients, 3 weeks to 6 months – 21 (55.3%) patients, more than 6 months – 2 (5.2%) patients. In 22(57.9%) cases, we performed reposition of fragments with osteosynthesis of acetabulum. Primary total hip arthroplasty along with osteosynthesis of one or more acetabular walls and auto bone grafting of the acetabular defects was performed in 16 (42.1%) cases. The criteria for surgical treatment were following: 1. Condition of the femoral head, 2. Possibility of acetabular fragment reposition, 3. Preference of patients to the selective surgical method. Reconstruction of acetabulum was performed in 15 patients with large acetabular fragments and in 7 patients for comminuted acetabular fractures with possible normal anatomical restoration. In 7 patients, primary total hip arthroplasty was performed for comminuted acetabular fractures which had no possibility for reposition and in 5 patients with nonviable femoral head. **Results:** In the latest follow-up (up to 5 years), functional assessment by Harris scale exceeds over 80 points in all patients. No signs of endoprosthetic instability and coxarthrosis are observed. **Summary:** Primary total hip arthroplasty is an optimal treatment choice during severe comminuted fractures with large number of minor acetabular fragments which are having no possibility of reposition.

Date: 2010-09-03
Session: Trauma Pelvic Fractures
Time: 08:00-09:30
Room: F4

Abstract number: 26276

CONSERVATIVE TREATMENT OF ACETABULAR FRACTURES

Narender MAGU, Rajesh ROHILLA, Sanjay ARORA
Pt B D Sharma PGIMS Rohtak, Rohtak (INDIA)

Acetabular fractures continue to be treated conservatively in majority of the centers universally. Sixty patients admitted to our institution and discharged on traction for reasons not in our hands between 1973 and 2004 were studied retrospectively for functional outcome. Twenty three percent of the patients sustained both column fractures, 18% had transverse fracture and 15% sustained posterior wall fractures with dislocation of the hip. Excellent to good functional results were observed in 72% of the patients of both column fractures, in 54.5% of the patients with transverse fractures and in 90% of the patients with posterior wall fractures. Focal concentration of stresses on the head of the femur was an important cause of poor prognosis in patients with transverse fractures. The presence of cap sign with a congruent joint favored traction as the method of choice for treatment of posterior wall fractures. Displaced fractures traversing roof of the acetabulum resulted in poor prognosis. Loose bony fragments in the non weight bearing area but with a congruous joint did not seem to adversely affect the functional outcome of the patients.

Date: 2010-09-03
Session: Trauma Pelvic Fractures
Time: 08:00-09:30
Room: F4

Abstract number: 26294

PATIENT-SPECIFIC BONE FIXATION PLATES FOR COMPLEX FRAGMENT REDUCTION

Tim CLIJMANS¹, Frederik GELAUDE¹, Johan ABELOOS², Filip STOCKMANS³
¹Mobelife, Leuven (BELGIUM), ²Division of Cranio-Maxillofacial Surgery, General Hospital St.-Jan Bruges, Bruges (BELGIUM), ³Department of Orthopaedics, AZ Groeninge, Kortrijk (BELGIUM)

Introduction: The complexity of multiple fragment pelvic fractures induces a difficult intra-operative puzzling and reduction procedure, often performed and decided upon intra-operatively only, which implies manual plate shaping and positioning onto the bone. Such plate will be locally weakened and determine the shape of the bone. However, a custom plate will guarantee correct reduction and eliminate any bending alteration. Studies show the beneficial effect of early fixation in high-energy trauma applications. Therefore, any patient-specific pre-operative procedure should overcome the challenging emergency issues by a short throughput time. **Materials and methods:** Methodology was developed for CT-based virtual bone fragment reduction in close collaboration with the surgeon. Efficiently, a fixation plate can be designed by the use of this semi-automated planning software. Optimal fit, stress distribution and fixation is attained by customization of parameters such as shape, hole spacing, screw holes, thickness and dimensions can be customized. Screw lengths and directions are planned preoperatively based on a bone quality analysis. Certified rapid manufacturing in Ti6Al4V allows for efficient and limited throughput time. **Results:** Retrospective and clinical cases prove the optimal plate characteristics and point out an estimated reduction of surgery time of 30 to 90 minutes. **Conclusion:** Fragment repositioning guidance and accurate stable fixation is provided by a completely pre-operatively planned and patient-specific pre-shaped fixation plate.

Date: 2010-09-03
Session: Trauma Pelvic Fractures
Time: 08:00-09:30
Room: F4

Abstract number: 24457

EXTENDED ILIOFEMORAL APPROACH FOR COMPLEX ACETABULAR FRACTURES: OUR EXPERIENCE

Puneet MISHRA

University College of Medical Sciences and Gtb Hospital, Delhi (INDIA)

Introduction: Extended iliofemoral approach has been described as an extensile single approach though gives an excellent exposure of fracture for which it is intended but involves significant stripping of the bone and is fraught with dangerous complications reported in literature. Material and Methods: We treated surgically 25 cases of acetabular fractures between Jan 2007 and Dec 2009, operated within 3 weeks post injury, out of which 3 cases necessitated exposure utilizing extended iliofemoral (EIF) approach . These 3 cases of complex both column acetabular fractures were segmental iliac wing fracture with sacroiliac disruption, comminuted anterior column with iliac wing fracture with displaced posterior hemitansverse fracture, a both column fracture with posterior wall fracture in two males aged 19 and 28 yrs and one female aged 21 yrs respectively. Results: A single approach afforded excellent exposure of all the major fracture fragments allowing excellent reduction of the femoral head and the acetabular articular surface in each case. We present our midterm follow up results and complications observed in these cases and highlight the window for this approach. Conclusion: This approach should only be used when reductions through other approaches (single or dual) seems too difficult or impossible and especially in the presence of iliac wing fractures associated with complex articular fractures wherein excellent reduction of the extraarticular fracture component only allows good to excellent reduction of the intraarticular fracture component. It requires a rigorous preoperative planning, careful surgical execution and a watchful postoperative care to decrease the postoperative morbidity.

Date: 2010-09-03
Session: Trauma Pelvic Fractures
Time: 10:45-12:15
Room: F4

Abstract number: 23191

DYNAMIC PELVIC OSTEOSYNTHESIS

Sergey SERGEEV¹, Oleg GRISHANIN², Vladimir MATVEEV², Dmitry GRECHUKHIN¹

¹*Peoples' Friendship University of Russia, Moscow (RUSSIA)*, ²*Moscow City Hospital 20, Moscow (RUSSIA)*

Static fixation of the pubic symphysis in the cases of type B1 and C1 fractures with partially or total vertical and rotation instability causes dynamic biomechanical disorders, overstrain of the sacroiliac joint ipsilateral to the damaged one, as well as loosening of the implants and its migration. In this regard we have developed a unique pelvic plate with dynamic behavior, which provides pubic symphysis micromobility and early restoration of the symmetry in the load on pelvic structures. Plate consists of two parts, which are connected with each other in situ during the operation according to the principle of coupling sleeve. Implant is made from CoCrMo alloy, which provides durability of the friction assembly. Plate has sexual and topologic definitions with radial range from 88 to 100 degrees, planar flexion. Operative interventions were made in 10 cases with pelvic fractures type B1 (6) and C1 (4). Primary fixation of these fractures was made with ExFix apparatus according to damage control. Fixation of pubic symphysis with dynamic plate and transcutaneous fixation of sacroiliac joint with cannulated screws were made after 2-3 weeks when state of health allowed to make terminal reconstruction of the pelvic ring. In the post-operation period free movement with crutches was recommended. Case follow-up during 1 year allowed to make conclusions: 1) recovery of the symmetric manner of walking occurred within 3-4 months; 2) loosening and migration of the implants was not manifested; 3) biomechanical testing showed recovery ambulation characteristics close to the normal ones.

Date: 2010-09-03
Session: Trauma Pelvic Fractures
Time: 08:00-09:30
Room: F4

Abstract number: 24243

TREATMENT OF COMMINUTED ACETABULAR FRACTURES USING ILIZAROV LIGAMENTOTAXIS, MINIMAL INVASIVE FIXATION AND EARLY TREATMENT OF AVASCULAR NECROSIS

Nuno CRAVEIRO LOPES, Carolina ESCALDA, Carlo VILLACRESES
Orthopaedic Department, Garcia de Orta Hospital, Almada (PORTUGAL)

The purpose of this study was to compare the clinical and radiological outcome between balanced traction and Ilizarov ligamentotaxis, for the treatment of comminuted, displaced acetabular fractures. We reviewed 56 cases of associated comminuted acetabular fractures treated between 1996 and 2007, with 3 different procedures: A- prolonged balanced skeletal traction (20 cases), B- ligamentotaxis with Ilizarov frame (10 cases) and C- open reduction, minimal internal fixation with olive wires, early treatment of avascular necrosis with drilling and ligamentotaxis (24 cases). Mean follow up was respectively 10, 9 and 4 years. The final outcome evaluated with the Harris Hip Score was excellent in 18, 40 and 50% for groups A, B and C respectively, good and fair in 18, 20 and 12,4% and bad in 64, 40 and 37,5%. The rate of advanced arthrosis was 40%, in all groups, but avascular necrosis was lower on the group B and very low on the C (8,3%, $p=0,014$). The rate of late total hip arthroplasty was respectively 64, 40 and 33%. Two patients with ligamentotaxis had deep infection, needing early removal of the frame. Loss of reduction occurred in 6 cases. The authors conclude that this procedure showed to be a better treatment option than skeletal traction for the comminuted and complex acetabular fractures, allowing an anatomic reduction and hip protection, permitting early weight bearing. It has also simplified the approach to this pathology, without the need of blood transfusion.

Date: 2010-09-03
Session: Biomaterials / Cartilage Repair
Time: 10:45-12:15
Room: F4

Abstract number: 23978

NANOSIZED HYDROXYAPATITE AND STEM CELL COMPOSITE IN REPAIR OF RADIAL FRACTURE GAP IN RABBITS

Safoora GHADIRIAN¹, Seifollah DEHGHANI NAZHVANI¹, MA BAHROLOLUM², GA GHADERI³, Iman MOSTAFA⁴

¹*Department of Veterinary Surgery, Shiraz (IRAN)*, ²*College of Engineering, Shiraz (IRAN)*, ³*Cancer Research Institute, Shiraz (IRAN)*, ⁴*Department of Surgery, Shiraz (IRAN)*

The purpose of study was to investigate effect of stem cells and its composite with hydroxyapatite in repair of radial bone fracture in rabbits. Twenty mature rabbits used in 4 groups. Under anesthesia 2cm of bone of right forelimb was removed by osteotome. The first group served as control. In second group the gap was filled by pellet of hydroxyapatite fixed by two sutures. Third group were treated similar to second group but they received one ml solution containing 500,000 stem cells. In fourth group gap was filled up by one ml solution containing 500,000 stem cells derived from rabbit subcutaneous adipose tissue. Radiographic evaluation of operated limbs performed every 21 days. Then rabbits were euthanized, respected bones were tested by biomechanical testing instrument. Results indicated: The bone formation activity score on 21 days post op was estimated as 1.4 ± 0.4 , 2.5 ± 1.00 , 2.00 ± 0.1 and 2.00 ± 0.2 for group 1, 2, 3 and 4 respectively. Bone formation activity score on 42 post op day was 2.2 ± 0.84 , 3.5 ± 0.75 , 4.00 ± 0.3 and 4.00 ± 0.25 for group 1, 2, 3 and 4 respectively. Results of biomechanical load test on 63rd post operative day showed no significant differences between the hydroxyapatit, hydroxyapatite and stem cell, stem cell and the normal intact bone, but they were significantly better compared to the control group.

Date: 2010-09-03
Session: Biomaterials / Cartilage Repair
Time: 10:45-12:15
Room: F4

Abstract number: 25598

EFFECT OF HYPERBARIC OXYGEN AND COMPRESSION ON CHONDROCYTE PROLIFERATION

Birte SIEVERS¹, Nadine HOECHSMANN¹, Frank DUEREN², Susanne MAYER¹, Peter MUELLER¹

¹*Orthopaedic Department, Großhadern Medical Center, Ludwig-Maximilians-University, Munich (GERMANY),* ²*Medical Park Chiemsee, Bernau-Felden (GERMANY)*

Hyperbaric Oxygen (HBO) has been recognized as an appropriate treatment modality for more than a dozen clinical conditions. In in vivo examinations the administration of HBO has been shown to have a protective effect on chondrocytes in cartilage regeneration. However, the protective in vivo effect of HBO treatment on chondrocytes has not been examined in vitro. The aim of this study was to examine the effect of HBO treatment on chondrocytes in an in vitro cell culture model concerning growth and gene expression pattern. Chondrocytes were transferred to a HBO chamber and exposed daily to 100% oxygen for 7 consecutive days. Compressions of 1 and 2atm were used. A WST-1 assay was used at 1, 3, 5, and 7 days. Gene expression of apoptosis markers as well as cartilage specific proteins were detected by real-time-PCR. In vitro administration of HBO inhibited growth of chondrocytes. When the applied compression was increased up to 2atm the amount of chondrocytes was reduced by half at days 3 and 7. In association an up regulation of apoptosis markers was observed and an increase of cartilage specific Proteins Collagen II and COMP was detected. In this study the growth of chondrocytes was inhibited in vitro by HBO treatment. This inhibitory effect was increased by elevating the applied compression. The molecular results showed that the administration of HBO may lead to reduced chondrocytes` growth due to apoptosis. However the increased compression induced the expression of cartilage specific proteins, which might cause a redifferentiation of chondrocytes.

Date: 2010-09-03
Session: Biomaterials / Cartilage Repair
Time: 10:45-12:15
Room: F4

Abstract number: 26764

EFFECTS OF COMBINED 3D- AND HYPOXIC CULTURING ON CARTILAGE-SPECIFIC GENE EXPRESSION IN HUMAN CHONDROCYTES

Casper FOLDAGER, Samir MUNIR, Michael ULRICH-VINTHER, Kjeld SØBALLE, Cody BÜNGER, Martin LIND

Aarhus University Hospital, Aarhus (DENMARK)

INTRODUCTION: In vitro expansion of autologous chondrocytes is an essential part of many clinically used cartilage repair treatments. Native chondrocytes reside in a 3-dimensional (3D) network and are exposed to low levels of oxygen. The aim of this study was to investigate conventional monolayer culturing compared to combined 3D and hypoxic culturing using quantitative gene expression analysis. **METHODS:** Cartilage biopsies were collected from the intercondylar groove in the distal femur from 12 patients with healthy cartilage. Cells were divided to either monolayer or scaffold culture. The scaffold was a clinically available MPEG-PLGA scaffold (ASEED). After harvesting cells for baseline investigation, the remainders were divided into three groups for incubation in normoxia (21% oxygen), hypoxia (5% oxygen) or severe hypoxia (1% oxygen). RNA extractions were performed 1, 2 and 6 days after the baseline time-point respectively. Quantitative RT-PCR was performed using assays for collagen type 1 and 2, aggrecan, sox9, ankyrin repeat domain-37, and glyceraldehyd-3-phosphate dehydrogenase relative to two hypoxia stable house keeping genes. **RESULTS:** Sox9, aggrecan and collagen type 2 expression increased significantly with lowered oxygen. The expression of collagen type 2 was higher after 6 days in 3D compared to monolayer at all levels of oxygen. **CONCLUSIONS:** These new results suggest a combined positive effect of 3D and hypoxic culturing on cartilage-specific gene expression. The positive effects of 3D culture alone were not present until day 6, suggesting a benefit of long-term scaffold culturing for matrix-assisted chondrocyte implantation.

Date: 2010-09-03
Session: Biomaterials / Cartilage Repair
Time: 10:45-12:15
Room: F4

Abstract number: 23450

BIOLOGICAL THERAPY OF BONE DEFECTS: THE IMMUNOLOGY OF BONE ALLO-TRANSPLANTATION.

Simon GRAHAM

Leeds General Infirmary, Academic Orthopaedic Unit, Leeds (UNITED KINGDOM)

Background: Bone is one of the most transplanted tissue worldwide. Autograft is the ideal bone graft but is not widely used because of donor site morbidity and restricted availability. Allograft is easily accessible but can transmit infections and elicit an immune response. Objective: To poster/presentation to summarize the complex biological processes related to bone immunogenicity. Methods: In vitro and in vivo evidence was systematically collected using primary medical search engines MEDLINE/OVID (1950 to March 2008) and EMBASE (1980 to March 2008) databases. Results/conclusion: In humans, the presence of anti-HLA specific antibodies against freeze-dried and fresh-frozen bone allografts has been demonstrated. Fresh-frozen bone allograft can still generate immune reactions whilst freeze-dried bone allografts present with less immunogenicity but poses less structural integrity. This immune response can have an adverse effect on the graft's incorporation and increase the incidence of rejection. Decreasing the immune reaction against the allograft, either by lowering the immunogenic load of the graft or by lowering the host immune response, would result in improved bone incorporation. It is therefore of crucial importance that the complex biological processes related to bone immunogenicity are understood, since this may allow the development of safer and more successful ways of controlling the outcome of bone allografting.

Date: 2010-09-03

Session: Biomaterials / Cartilage Repair

Time: 10:45-12:15

Room: F4

Abstract number: 26105

A BIOMIMETIC BONE SCAFFOLD FOR TISSUE ENGINEERING

Prakash JAYAKUMAR, Amir BABAEI-MAHANI, B BURANAWAT, Sanjukta DEB, Lucy DISILVIO

Biomaterials, Biomimetics, and Biophotonics Group, King's College London, London (UNITED KINGDOM)

Introduction: Tissue engineering aims to create replacement tissues in situations where the body no longer has the potential to do so. Tissues are organized into three-dimensional structures and scaffolds have to be designed to mimic natural tissues, facilitate cell distribution and guide tissue regeneration. Scaffolds act as templates, and carriers incorporating biological molecules known to promote signaling pathways that influence key cell functions such as migration, proliferation and differentiation. Calcium phosphates materials are known to interact strongly with bone, due to their similarity to bone mineral. In this study, a porous -metacalcium phosphate scaffold material was developed, and optimized by incorporation of bone stimulating factors BMP-7 (a pleiotrophic morphogen) and PDGF (pro-osteogenic factor) both of which, play critical roles in regulation of cell migration, proliferation and differentiation. Results/ Discussion: Microporosity (80µm up to 400µm) was observed in the porous -calcium metaphosphate. Human osteoblasts were observed on the surface and extending within the macropores. Incorporation of growth factors enhanced cellular response. Specificity of cell response was observed with PDGF enhancing proliferation and BMP osteogenic induction. This biomimetic porous scaffold has potential for tissue engineering, allowing cellular ingrowth and differentiation. Ongoing studies are based on vascularization potential of the graft, hence facilitating the formation of functional tissue and integration with host bone.

Date: 2010-09-03
Session: Biomaterials / Cartilage Repair
Time: 10:45-12:15
Room: F4

Abstract number: 26041

SURFACE ENHANCED POLYETHERETHERKETONE MATERIALS FOR ORTHOPAEDIC IMPLANTATION

Kelvin YEUNG¹, So Ching LIU¹, Paul CHU², Keith LUK¹, Kenneth CHEUNG¹

¹*The University of Hong Kong, Hong Kong (HONG KONG)*, ²*City University of Hong Kong, Hong Kong (HONG KONG)*

Polyetheretherketone (PEEK) has been widely applied as bone substitute in various orthopaedic implantations. However, its bioinertness associates with the unsatisfactory bone-implant integration. Although its bioactivity can be improved by incorporating additional bioactive substance into PEEK matrix, alternation of its original mechanical properties is concerned. Alternatively, surface modification using plasma implantation has been developed in order to incorporate new biofunctional groups onto PEEK surface. This study aims at investigating the feasibility of ammonia and water plasma treatment in enhancing the surface bioactivity of PEEK. The samples measured 5mm in diameter and 3 mm thick were prepared. Water and Ammonia plasma treatments were applied at implantation energy of 10kV, 20kV and 30kV for 2 hours. Surface bioactivity assessments including cell adhesion and proliferation were conducted by using SaOs-2 cells. Alkaline phosphatase (ALP) expression and mineralization assay were applied. The minerals formed on the surfaces were qualified by energy-dispersive X-ray spectroscopy (EDX). The result of cell adhesion testing revealed that more cells attached to all the samples except NH₃ 10kV as compared with the untreated ($p < 0.05$). The ALP expression of all 30kV samples was higher at Day 7 ($p < 0.05$). However, the ALP expression and mineralization of the 30kV treated samples were not significantly different from the untreated. Apatite-like structure found on the NH₃ treated surface was Ca and P rich substances. Our biological testing results suggested that the bioactivity of PEEK could be enhanced by water and ammonia plasma treatments in particular to the initial cell attachment and proliferation.

Date: 2010-09-03
Session: Biomaterials / Cartilage Repair
Time: 10:45-12:15
Room: F4

Abstract number: 26639

A NOVEL, ABSORBABLE BONE HEMOSTAT MATRIX DOES NOT IMPAIR BONE HEALING IN A RABBIT STERNOTOMY MODEL

Yuehwei AN¹, Qian KANG², Peng CHEN¹, Jordan KATZ³, Ankur GANDHI³
¹Medical University of South Carolina, Charleston (UNITED STATES), ²Clemson University, Charleston (UNITED STATES), ³Orthocon, Inc, Newark (UNITED STATES)

Absorbable hemostats often provide unsatisfactory hemostasis for bleeding bone due to poor adherence to bone tissue and subsequent rebleeding. Non-absorbable bone waxes, on the other hand, while effective, are associated with chronic inflammation and compromised bone healing. A novel, absorbable bone hemostat, Orthostat (comprising an organic solid, a liquid surfactant and an oil based vitamin) has been evaluated in a rabbit midline sternotomy model. The cut sternal surfaces of forty-five NZW rabbits were treated with either Orthostat, bone wax, or left untreated. Intraoperatively, Orthostat offered better handling and bone adherence with comparable hemostatic efficacy compared to Bone Wax. At 42 days postoperatively, no significant differences were observed either radiographically, histologically or mechanically (tested using an indentation test) between Orthostat and the untreated control group. In contrast, Bone Wax aggregates, fibrotic tissue, little new bone formation, and significantly reduced mechanical strength were observed in the Bone Wax group. These results demonstrate that Orthostat absorbable hemostatic matrix provides effective bone hemostasis, does not inhibit healing in the sternotomy model, and may prevent the complications associated with non-absorbable bone waxes (e.g. chronic inflammation and/or non-union).

Date: 2010-09-03

Session: Biomaterials / Cartilage Repair

Time: 10:45-12:15

Room: F4

Abstract number: 24484

THE ROLE OF PLURIPOTENTIAL STEM CELLS IN THE REPAIR OF CARTILAGE DEFECTS OF MUSCULOSKELETAL SYSTEM (AN INTERVENTIONAL STUDY)

Dariush GOURAN SAVADKOOHI¹, Mohammad Javad ZEHTAB¹, Babak SIAVASHI¹, Mohammad MOAZZAMI¹, Mohammad Reza BAGHBAN ESLAMINEJAD², Leila TAGHIYAR²

¹*Sina Hospital, Tehran University of Medical Sciences, Tehran (IRAN)*, ²*Stem Cell Research Center, Tehran University of Medical Sciences, Tehran (IRAN)*

Background: Cartilage has no reparative capacity so managing cartilage defects is a challenge. Nowadays, treatment options include debridement, drilling (which produces fibrocartilage only) and osteochondral transfer with special advantages and disadvantages. Recently, for production of hyaline cartilage, scientists have tried to stimulate stem cells or autologous chondrocytes. **Methods:** We conducted this study to evaluate the role of pluripotent stem cells in the repair of cartilage defects in the knee joint. Five motivated and less than 40 years of age patients with aligned and balanced knee were included. MRI and arthroscopic examination was used to prove the presence of the cartilage defects. Stem cells of bone marrow aspirate from iliac crest were cultured and replaced in the defects covered by periosteal patch. After 6 months, the joints were examined arthroscopically and the rate of cartilage repair was assessed clinically and histologically. **Results:** After 6 months, by probing the repaired cartilage and by direct visualization of it by arthroscope, the gross appearance of it was the same of hyaline cartilage of the rest of knee and in histopathologic biopsy, there was a hyalin-like cartilage (70 -80%). **Discussion:** Reaching to hyaline cartilage is the final goal of all studies and in this way, 70-80% resemblance with hyaline cartilage is satisfactory. It is desired that in future, instead of periosteal patch, collagen patch will be used and it is tried to shift to one stage surgery. **Key words:** cartilage defect, knee, stem cell.

Date: 2010-09-03
Session: Biomaterials / Cartilage Repair
Time: 10:45-12:15
Room: F4

Abstract number: 25977

SMALL METALLIC JOINT IMPLANTS MAY GIVE NEGLIGIBLE DAMAGE TO OPPOSING CARTILAGE SURFACE

Nicolas MARTINEZ-CARRANZA¹, Hilkka NURMI-SANDH², Ann-Sofie LAGERSTEDT², Hans BERG¹, Kjell HULTENBY¹, Leif RYD¹

¹*Karolinska Institute, Stockholm (SWEDEN)*, ²*Swedish University of Agricultural Sciences, Uppsala (SWEDEN)*

Torn cartilage (osteochondral fractures) and very early stages of worn cartilage (OA) are characterized by focal lesions in otherwise healthy cartilage. We investigated the response of the opposing tibial cartilage to a metallic implant inserted into surgically created defects in the femoral condyle. Methods. The medial femoral condyle of both knees of 6 sheep, 70-90 kg, age 2 years, were operated. A metallic implant with an articulating surface of 316L stainless steel, diameter 10 mm and a symmetric articulating surface (radius 17 mm) was introduced on the apex of the condyle with the knee in the weight-bearing position (approx. 45 degrees of flexion). The animals were stabled indoor, moved about freely without apparent pain and were euthanised after 6 and 12 weeks. After decalcification, slices were prepared for microscopic evaluation and electron microscopy. Implant fit was analysed from close-up photographs using an arbitrary Likert scale. Cartilage damage was assessed blinded from implant data modified according to Mankin. Results. 12 tibial condyles showed a variety of cartilage damage ranging from severe damage down to subchondral bone to an almost pristine condition. There was a strong correlation between implant fit and damage of the opposing cartilage surface (regression analysis, $r^2 = 0.74$, $p < 0.001$). The regression line passed very close to the origin of the matrix. There was no difference between 6-week and 3-month knees. Conclusion. These results suggest that further studies of a metallic implant, inserted into cartilage defects with the utmost precision regarding the surrounding cartilage, may be warranted.

Date: 2010-09-03
Session: Biomaterials / Cartilage Repair
Time: 10:45-12:15
Room: F4

Abstract number: 26595

OSTEOPONTIN FUNCTIONALIZATION OF HA/PDLLA COMPOSITE PROMOTES BONE FORMATION

Thomas JENSEN

Orthopaedic Research Lab, Aarhus (DENMARK)

Here is presented the development and in vivo testing of a material designed to degrade while conducting formation of new bone tissue. The major design challenge is the coupling of material degradation to new bone formation - taking inspiration from the physiological remodeling process may prove a useful design approach. The material concept is based on the effect of osteopontin - a hydroxyapatite (HA) binding protein known to play a key role in the bone remodelling process. When adsorbed on the surface of HA, the protein recruits bone cells and activates the resorption/deposition sequence of remodeling. This study attempts to adopt this effect to a material. The basic material structure consists of HA nanoparticles (HAN) dispersed in a biodegradable polymer (PDLLA) in a 50/50 vol% composite. Two groups were compared: i) The basic material and ii) the same with osteopontin preadsorbed on the HAN. The two groups were compared as coatings on small titanium implants in a canine bone gap model. The performance of the coatings was evaluated as the amount of bone formed on the implants. The osteopontin containing material performed significantly better in that twice the amount of mineralized bone was formed on the implant surfaces (30 ± 7 vs 14.7 ± 8). Furthermore, a tendency towards less formation of fibrous tissue and stronger implant fixation was observed. Although genuine templating of mineralized bone tissue remains futuristic, this study provides evidence, that the concept of making a material susceptible to the remodelling process may be important.

Date: 2010-09-03

Session: Biomaterials / Cartilage Repair

Time: 10:45-12:15

Room: F4

Abstract number: 25526

BIOMIMETICS BONE CONTAINED COLLAGEN TYPE I BEADS, PLATELET RICH PLASMA AND BONE MARROW MESENCHYMAL STEM CELLS PROMOTING BONE REGENERATION

Chien-Hao CHEN¹, Chih-Hwa CHEN¹, Shu-Wen WHU¹, Chun-I SU¹, Hsien-Tao LIU¹, Fu-Yin HSU², Bo-Nian LIN¹, Hsiang-Jou SUN¹, Chung-Ming YU¹

¹*Chang Gung Memorial Hospital - Keelung, Keelung (TAIWAN)*, ²*Department of Life Sciences, National Taiwan Ocean University, Taipei, Taiwan, Keelung (TAIWAN)*

Introduction: Bone tissue engineering has been heralded as the alternative strategy to regenerate bone. Platelet rich plasma (PRP) contains many bone formation growth factors and can improve bone reconstruction. But PRP will degrade fast. Bone-like beads can supply good biocompatibility and serve as scaffold in PRP. Collagen type I beads(CIB), PRP and rabbit bone marrow mesenchymal stem cells (BMSC) were mixed to form a biomimetics bone for bone regeneration in vivo. Materials and Methods: CIB can be formed by extruding collagen solution into chondroitin sulfate A solution, and soaked in simulated body fluid solution to fabricate bone-like beads. PRP and BMSC were isolated from rabbit blood and bone marrow. In vivo, there were five groups (Defect, PRP, CIB+PRP, PRP+BMSC, CIB+PRP+BMSC) implanted into bone defect(diameter 6 mm, depth 10 mm)at rabbit femur epicondyles for 4 and 8 weeks. Bone regeneration was assessed by histology and immunohistochemistry assay. Results and Discussion: Defect group was filled with fibrous tissue in 4 and 8 week. PRP and CIB+PRP groups didn't recover the dents of surface on epicondyles and residual CIB still existed at defect at 8 week. PRP +BMSC and CIB+PRP+BMSC groups could express more obvious bone specific proteins and help bone regeneration after surgery for 4 weeks. CIB+PRP+BMSC group could form more new bone tissue than in PRP +BMSC group. The biomimetics bone enhanced bone regeneration. It could be utilized as a new material for large bone defects reconstruction.