

Date: 2013-10-17

Session: Basic Research

Time: 10:30 - 12:00

Room: G.01 & G.02

Abstract no.: 35263

ENHANCEMENT OF OSTEOREGENESIS BY AUTOLOGOUS PLATELET RICH PLASMA IN DELAYED AND NON UNIONS OF LONG BONES

Sudhir KUMAR¹, Ashish TOMAR¹, Anil ARORA², Bharat SINGH³

¹University College of Medical Sciences, New Delhi (INDIA), ²Max Hospital Padpadganj, New Delhi (INDIA), ³GTB Hospital, New Delhi (INDIA)

Introduction: This study aims to assess the clinico-radiological union in patients with delayed and non unions of fractures of long bones by percutaneous infiltration of autologous platelet-rich plasma. **Patients and methods:** 51 ununited long bone fractures (tibia-23, ulna-11, femur-9, radius-5 and humerus-3) between year 1995-2010 with 44 males and 6 females, mean age 34 ± 11 yrs were studied. There were 13 non unions of 10 months-5 years and 38 delayed unions of 4-8 months duration. They were treated by percutaneous infiltration of platelet rich plasma (PRP) which was prepared using standard cell separator after autologous blood collection in triple bag, 10-30ml of PRP was infiltrated in and around the fracture site percutaneously twice at 4 weeks interval under fluoroscopy followed by functional cast or brace immobilisation. Union was assessed at 4 weeks interval clinico-radiologically. **Results:** 33 of 38 delayed unions united with a mean of 17.1 weeks and 8 of 13 non unions united with a mean of 20 weeks. Strong agreement was found between the absence of tenderness at fracture site on palpation and bridging callus in three cortices with kappa value ranging 0.696-0.829. **Conclusion:** Local infiltration of PRP probably activates the growth factors cascade leading to fracture healing in a stable environment.

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THE EFFECT OF THE PLATELET RICH FIBRIN MATRIX ON THE BONE AND TENDON INTEGRATION

Mahmut Nedim AYTEKIN¹, Ismail AGIR², Fatih KUCUKDURMAZ³, Onur BASCI⁴, Baris KOCAOGLU⁵, Hayati AYGUN⁶

¹Department of Orthopedics and Traumatology, Yıldırım Beyazıt University Ankara - Atatürk Training and Research Hospital, Ankara (TURKEY),

²Department of Orthopedics and Traumatology, Adiyaman University,

Adiyaman (TURKEY), ³Department of Orthopedics and Traumatology,

Bezmialem Vakıf University, İstanbul (TURKEY), ⁴Department of

Orthopedics and Traumatology, Marmara University Medicine Faculty,

Istanbul (TURKEY), ⁵Department of Orthopedics and Traumatology,

Acibadem Kadikoy Hospital, İstanbul (TURKEY), ⁶Department of

Orthopedics and Traumatology, Kafkas University Medicine Faculty, Kars (TURKEY)

The purpose of this study is to show the effect of the platelet rich fibrin matrix (PRPM) on the integration of the tendon to bone while healing. Late union of the graft and tunnel expansion due to repeated movement is a significant problem of primer and revision anterior cruciate ligament surgery. In this study we wanted to show the fastening and improving the healing process of the PRP on the bone tendon integration. For this purpose, tendon-bone repair done to 20 rabbits right femur. 10 rabbits were the experimental group, that the tunnel was treated with PRP and the other 10 rabbits used as the control group. After 8 weeks following the surgery, histologic studies were performed. 20 New Zeland rabbits between 3000-3500 gr were used. Achilles for the tendon, femur for the bone was used. Tendon integration was seen on most of the tissues in the histological evaluation of the bone segments. There was no sign of inflammation on bone tissues. We can conclude PRPM is useful to increase the tendon integration to the bone tissue.

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TREATMENT WITH PLATELET RICH PLASMA IS MORE EFFECTIVE THAN PLACEBO FOR KNEE OSTEOARTHRITIS IN A PROSPECTIVE, DOUBLE BLIND, RANDOMIZED TRIAL

Sandeep PATEL, MS DHILLON

PGIMER, Chandigarh (INDIA)

HYPOTHESIS- PRP provides symptomatic relief in early OA of knee. **STUDY DESIGN-** Double blind, placebo controlled RCT **METHOD-** 78 patients (156 knees) with bilateral OA were blinded and divided randomly into 3 groups. Group A (52 knees) which received single injection of PRP, Group B (50 knees) which received two injections of PRP 3 weeks apart and Group C (46 knees) which received single injection of normal saline were available at the time of final follow up. WBC filtered PRP with platelet count 3x baseline (PRP Type 4B) was administered in all. All the groups were homogeneous and comparable in baseline characteristics. Clinical outcome was evaluated using WOMAC questionnaire prior to treatment and at 6 weeks, 3 months and at 6 months. **RESULTS-** Statistically significant improvement in all WOMAC parameters was noted in Group A and Group B within 2- 3 weeks, lasting till last follow-up at 6th month, with slight worsening at 3rd follow-up. All the 3 groups were compared with each other and no improvement was noted in group C as compared to groups A & B ($p<0.001$). There was no difference between single and double injection groups and there was no influence of age, sex, weight or BMI on the outcome. Ahlback's grade 1 knees fared better than grade 2 knees. **CONCLUSION-** Single dose of WBC filtered PRP a in concentrations of 10 times normal is as effective as 2 injections to alleviate symptoms in early Knee OA. The results however deteriorate after 6 months.

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ERYTHROPOIETIN SIGNALING PATHWAYS IN MESENCHYMAL STEM CELLS

Cody BÜNGER, Jan ROELFING, Anette BAATRUP, Jonas JENSEN, Helle LYSDAHL

Orthopaedic Research Laboratory, Aarhus University Hospital, Aarhus (DENMARK)

Introduction: We have previously shown that Erythropoietin (EPO) directly stimulates osteogenesis both in vitro and in vivo. However, the way of action and the intracellular signaling pathways in mesenchymal stem cells (MSCs) in particular, remain yet unknown. The aim of this study was to investigate, if phosphoinositide 3-kinase (PI3K), mTOR and JAK2/STAT signaling pathways are involved in EPO-induced bone formation in human MSCs.

Methods: 13500 cells/cm² human MSC were seeded into 96-well plates. After 24 hours adhesion period 20 IU/ml EPO (epoetin alpha) +/- pathway inhibitors LY294002, wortmannin; rapamycin; and AG490 were added. Osteogenic differentiation was assessed with alkaline phosphatase assay (ALP) at day 2 and 7, and calcium deposition assays (Arsenazo III and alizarin red) at day 10 and 14. One-way ANOVA was used to compare treatment groups.

Results: In line with our previous studies, EPO increased osteogenic differentiation at all time points ($p<0.05$). All four pathway-inhibitors diminished this effect, but none of the inhibitors completely abrogated osteogenesis ($p<0.001$).

Discussion: This study indicates that multiple intracellular signaling pathways, namely PI3K, mTOR and JAK2/STAT, are responsible for the osteogenic effect of EPO on human MSCs. The mTOR inhibitor, rapamycin, had the most predominant inhibitory effect, but was like the other inhibitors not sole responsible for the EPO-induced osteogenic differentiation. In conclusion, EPO-mediated bone formation in hMSCs is induced via PI3K, mTOR and JAK2/STAT signaling.

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COMPARATIVE EVALUATION OF SYNOVIUM- AND BONE MARROW-DERIVED MESENCHYMAL STEM CELLS FROM PATIENTS WITH RHEUMATOID ARTHRITIS AND OSTEOARTHRITIS

Li JIANG¹, Anlun MA², Hufang CHEN², Yonglin YU¹, Jie CHEN¹, Jianyuan JIANG¹

¹Department of Orthopedic Surgery, Huashan Hospital, Fudan University, Shanghai (CHINA), ²Laboratory of Experimental Surgery, Research Centre, Center Hospitalier de l'Université de Montréal (CHUM) Hôpital Notre-Dame, Montreal (CANADA)

Cartilage formation is driven by mesenchymal stem cells (MSCs) that can proliferate, condense and differentiate into chondrocytes. This objective comparative evaluated synovium-derived MCSs (S-MSCs) and bone marrow derived-MSCs (BM-MSCs) from the patients with rheumatoid arthritis (RA) and osteoarthritis (OA) in cell yield, proliferation capacity, phenotypes and growth in acellular dermal matrix (ADM). Chondrogenic differentiation was studied using micromass culture and analyzed by histology, immunohistochemistry and electron-microscopy. This study showed that BM-MSCs and S-MSCs could be differentiated into the chondrogenic lineage under the stimulation of suitable chondrogenic factors. MSC growth kinetics and colony number were higher in S-MSCs than those in BM-MSCs. They expressed mesenchymal markers, and lack the expression of hematopoietic markers. Chondrogenesis study showed that both MSCs to be larger and more cartilage matrix stained, particularly, S-MSCs showed greater ability for chondrogenesis. Both MSCs from RA or OA shared characteristics with those from healthy donor. In vitro studies showed that MSCs inhibit collagen-II-induced cell proliferation in a dose-dependent manner, up-regulate T regulatory cells and secretion of collagen, IL-10 and sICAM, but not pro-inflammatory cytokine IFN-. When MSCs were seed to ADM with transforming growth factor-beta and insulin-like growth factor, S-MSC-ADM constructs showed higher cell numbers and up-regulated expression of collagen proteins compared with that of BM-MSC-ADM constructs, but both numbers were significantly higher than those of initially seeded. In conclusion, these results proved feasibility of MSC therapy, either S-MSCs or BM-MSCs; from either RA or OA, for various degenerative joint diseases including RA, OA and cartilage defect in humans.

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IMMUNOSTIMULATORY EFFECT OF POLYCAPROLACTONE

Halldór Bjarki EINARSSON¹, Anders Frisk MORTENSEN², Babak JALILIAN³, Soeren Roesgaard NIELSEN⁴, Menglin CHEN⁴, David Chr. KRAFT⁵, Helle LYSDAHL¹, Jens Vinge NYGAARD², Morten Schallburg NIELSEN⁶, Cody BÜNGER¹, Thomas VORUP-JENSEN³

¹The Orthopaedic Spinal Research Laboratory, Aarhus University Hospital, Aarhus (DENMARK), ²Department of Engineering, Aarhus University, Aarhus (DENMARK), ³Department of Biomedicine, Aarhus University, Aarhus (DENMARK), ⁴The Interdisciplinary Nanoscience Center, Aarhus University, Aarhus (DENMARK), ⁵School of Dentistry, Aarhus University, Aarhus (DENMARK), ⁶Department of Chemistry, Aarhus University, Aarhus (DENMARK)

Introduction: Exogenous antigens evoke immune response and are of non-self origin. In tissue engineering, polycaprolactone (PCL) is a template for cartilage and bone repairing. The aim of our study is to investigate macrophage, osteoclast (OC) and T cell response upon PCL exposure, complement activation hence opsonization of PCL for phagocytosis and $\beta 2$ -integrin expression. **Methods:** PCL plates were prepared by dissolving 50 KDa PCL granules at 100°C, using borosilicate glass plate and mixed with 1 μ m microspheres at the ratio 1:5. Plates were characterized by scanning electron microscopy. Cells applied were monocytes and T cells at the ratio 1:2 and purity was detected by flow cytometry. Genesis of OC was triggered by OC-inductive cytokines and cell culturing was 7 days. Soluble (s) $\beta 2$ -integrin expression and complement activation was measured by immunofluorimetic assay. We used Cell Tracker Green and Hoechst for viability; tartrate resistant acid phosphatase for phenotyping; and calcitonin receptor RT PCR for genotyping. **Results:** Our data indicate cells of the monocyte-macrophage lineage to mediate degradation of PCL by formation of microscopically visible cavities. This phenomenon is enhanced in the presence of T cells ($p < 0.05$). In addition, PCL induces soluble membrane attack complex activation, and we observe phagocytosis of microspheres within PCL constructs. Compared to dentine, s $\beta 2$ -integrin expression rises at 24 h ($p < 0.05$) suggesting increased activity of macrophages upon PCL exposure. **Conclusions:** Apparently, cells of the monocyte-macrophage lineage are capable of degrading PCL. Such properties are important for successful use of PCL in tissue engineering.

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HYDROGEN SULFIDE IS EXPRESSED IN HUMAN AND RAT CULTURED NUCLEUS PULPOSUS CELLS AND REGULATING APOPTOSIS INDUCED BY HYPOXIA

Cody BÜNGER¹, Haolin SUN², Chunde LI²

¹Department of Orthopaedic Surgery Aarhus University Hospital, Aarhus (DENMARK), ²Orthopedic Department of Peking University First Hospital, Beijing (CHINA)

Our objective was to test the presence of hydrogen sulfide (H₂S) in the nucleus pulposus (NP) cells and its role in the regulation of NP cell apoptosis induced by hypoxia. Immunohistochemistry of cystathionine-β-synthase (CBS) and cystathionine γ-lyase (CSE), endogenous H₂S production rate and apoptosis were tested in human lumbar NP from lumbar disc herniation (LDH) groups and control group. Rat nucleus pulposus cells were cultured and identified. Immunofluorescence were tested for CBS and CSE expression. Different treatments to rat cultured nucleus pulposus cells with exogenous H₂S and/or hypoxia in 4 groups. Cell viability was checked by the Cell Counting Kit-8(CCK-8). Apoptosis was evaluated by Annexin V-FITC staining. Active Caspase-3 was detected by western-blot. Both CBS, CSE expression and endogenous H₂S production were higher in both LDH groups compared to control group. Similarly apoptosis was a significantly frequent phenomenon in the LDH groups compared to the control group. The expression of both CBS and CSE was detected in the cytoplasm of cultured NP cells. Annexin V-FITC staining showed that the apoptotic rate in hypoxia group and hypoxia+NaHS group were higher than in control group and was lower in hypoxia+NaHS group than hypoxia group. Western blot showed that the expression of active Caspase-3 was higher in hypoxia group and hypoxia+NaHS group compared to control group and lower in the hypoxia+NaHS group than in the hypoxia group. Results point to that endogenous H₂S expression in both the human NP and the cultured rat NP cells. Exogenous H₂S could inhibit rat NP cell apoptosis induced by hypoxia.

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LENTIVIRUS-SINGR PROMOTES AXONAL REGENERATION AND FUNCTIONAL RECOVERY IN SPINAL CORD CONTUSION RATS

Chao ZHANG, Heng Xing ZHOU, Shi Qing FENG, Fu Yuan LI, Tian Ci CHU
Tianjin Medical University, Tian Jin (CHINA)

Background: The limited regenerative capability of central neurons and inhibitory factors are main causes of axonal regeneration failure after spinal cord injury (SCI). Nogo receptors (NgR) are a family of receptors shared by three factors that inhibit axon outgrowth. In our previous study, siNgR199, an effective lentiviral siRNA vector of NgR1, was constructed and transfected into cortical neurons in vitro, and it effectively promoted axon outgrowth. This study focused on the therapeutic effect of delivery of the recombinant lentivirus containing siNgR in vivo in SCI rats. **Methods:** Rat models of spinal cord contusion were constructed with NYU system. The animals were randomly divided into three groups: group 1, injected with physiological saline; group 2, injected with empty lentivirus vehicle; and group 3, injected with lentivirus carrying siNgR. The Basso, Beattie, and Bresnahan (BBB) score was used for assessing locomotor function after SCI. The neural tracer biotinylated dextran amine (BDA) and immunohistochemical methods were employed to study axon outgrowth. **Results:** After injection for 8 weeks, BBB scores showed that the motor function of the hindlimb recovered better in animals in group 3 (injected with lentivirus carrying siNgR) than those in groups 1 and 2, which were injected with saline and empty lentivirus vehicle, respectively. In group 3, regenerative nerve fibers were observed at and across the injury site, while very few axonal sprouts were observed in groups 1 and 2. **Conclusions:** Injection with lentivirus carrying siNgR into spinal cord improved axonal regeneration and functional recovery of hindlimb after SCI in rats.

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EXPRESSION OF VEGF, ITS RECEPTORS AND HIF-1 α IN DUPUYTREN'S DISEASE

Lukas HOLZER¹, Andrej CÖR², Gerhard PFANDLSTEINER³, Gerold HOLZER⁴

¹Department of Orthopaedic Surgery, Medical University of Graz, Graz (AUSTRIA), ²Faculty of Health Sciences, University of Primorska, Izola (SLOVENIA), ³Klinikum Klagenfurt am Wörthersee, Klagenfurt (AUSTRIA),

⁴Department of Orthopaedics, Medical University Of Vienna, Vienna (AUSTRIA)

Introduction: Dupuytren's disease (DD) is benign fibroproliferative process affecting the palmar fascia. The pathology of DD shows similarities with wound healing or tumour growth in both of which hypoxia and angiogenesis plays an important role. The aim of this study was to investigate the role of angiogenic proteins in DD. **Methods:** The expression of vascular endothelial growth factor (VEGF), its receptors vascular endothelial growth factor receptor 1 (VEGFR1), vascular endothelial growth factor receptor 2 (VEGFR2), hypoxia-inducible factor alpha (HIF-1 α) and alpha-smooth muscle actin (α -SMA) were immunohistochemically analysed in fragments of excised Dupuytren's tissue from 32 patients and compared to controls. **Results:** 15 out of 32 samples could be attributed to the proliferative phase (α -SMA positive), whereas 17 samples must be considered cords in the residual phase (α -SMA negative). Expression of HIF-1 α and VEGFR2 compared to controls was statistically significant and VEGFR2 expression showed a trend. **Conclusion:** The results of this study show that both receptors, VEGFR1 and VEGFR2, and HIF-1 α are expressed in α -SMA positive myofibroblast rich nodules of DD characteristic for the active proliferative phase. So hypoxia and subsequent angiogenesis might play a role in the pathophysiology of DD.

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PROTEASES GENES EXPRESSION LEVELS CORRELATES BETWEEN SERUM AND SYNOVIA BUT NOT WITH HYALINE CELLS

Adam KWAPISZ, Michał CHOJNACKI, Marcin DOMZALSKI, Marek SYNDER, Andrzej GRZEGORZEWSKI
Medical University of Łódź, Łódź (POLAND)

Introduction: Osteoarthritis is one of the leading disorders of the Western Civilization. It constitutes of continuous cartilage destruction which is regulated by multiple cytokines including interleukins and TNF α . Those factors have great impact on the function of proteases responsible for cartilage turnover. **Aim of the study:** To assess if the expression of particular proteases genes correlates between different tissues. **Material and methods:** 48 patients (22female; 26male; mean age 43,1 years) qualified for knee arthroscopy. Preoperatively blood samples and intraoperatively synovial and chondral samples were collected. mRNA was isolated and Real Time PCR was performed for all of the samples. Expressions of genes for MMP1, MMP2, MMP8, MMP9, MMP13, MMP14, AGG1, AGG2, TIMP1, TIMP2, IL1 and TNF α were assessed. Afterwards statistical analysis was performed. **Results:** We found strong and significant correlation between blood and synovium for all of the samples. (f.ex AGG1 R=0,88, IL1 R=0,87 p<0,05). There was no statistically important relation between chondral cells and serum for all of the samples but IL1 (R=-0,30, p=0,03). The level of statistical significance was reached only for MMP1 (R=0,29, p=0,0447) and TIMP2 (R=-0,31 , p=0,031) when we tested correlation between cartilage and synovium. We also assessed correlations between genes expression and the level of the joint damage. **Conclusions:** There is strong proteases gene expression between serum and synovium, but there is none between them and hyaline cells.

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IN VITRO EXPANSION OF CHONDROCYTES IN A THREE DIMENSIONAL MANNER USING A HYBRID APPROACH; OUR EXPERIENCE WITH HUMAN AND ANIMAL CARTILAGE TISSUES

Bhupesh KARTHIK¹, Arumugam SIVARAMAN¹, Senthilkumar RAJAPPA², Srinivasan THANGAVELU², Samuel JK ABRAHAM²

¹Sri Ramachandra Medical College, Chennai (INDIA), ²Nichi-In Centre for Regenerative Medicine, Chennai (INDIA)

The major hurdles faced with Autologous Chondrocyte Implantation are the de-differentiation of chondrocytes to fibroblasts in vitro and graft failure in vivo. To overcome these, we devised a hybrid approach combining orbital shaker and 3D synthetic scaffolds as reported by Yasuda et al (Tissue Engineering 2006). Herein we report our results of in vitro expansion of human and animal chondrocytes and implantation. After informed consent and ethics committee approvals, cartilage tissue from non-weight bearing area was obtained from human patients for in vitro study and from rabbits for an implantation study. The specimens were digested and cultured in 3D form, embedded in a Thermo-reversible gelation polymer scaffold under a constant motion using orbital shakers. Human chondrocytes were cultured for 16 weeks and then characterized. Animal chondrocytes were cultured for 10 weeks and implanted in the defect at the harvest site of the same animal. Both the human and rabbit chondrocytes were grown without using any growth factors. The chondrocyte morphology was maintained without de-differentiation throughout. The RT PCR study of the human chondrocytes in vitro expanded was positive for TGF beta 3, GR beta, GR alpha, AGGF, VDR (Vitamin D3 Receptor) and Collagen type II. The post-implantation animal tissues showed positivity in H & E staining and for S-100 marker. We could successfully in vitro expand human non weight bearing area chondrocytes using the hybrid method of combining physical forces and chemically synthesized scaffolds thus paving way for developing clinically implantable chondrocytes which are likely to be more efficacious.

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**THE EFFICACY OF AUTOLOGOUS BONE MARROW CELL ARTERIAL
PERFUSION IN THE TREATMENT OF OSTEONECROSIS OF THE
FEMORAL HEAD: FIVE YEAR FOLLOW-UP STUDY**

Peijian TONG, Qiang MAO, Hongting JIN, Luwei XIAO

Department of Orthopaedic Surgery, The First Affiliated Hospital of Zhejiang Chinese Medical University, Hangzhou (CHINA)

Objective: To investigate the efficacy of autologous bone marrow cells (BMCs) perfusion via medial circumflex femoral artery in the treatment of osteonecrosis of the femoral head (ONFH). **Methods:** 62 patients (78 hips) with ONFH were recruited in this study. The BMCs were harvested from anterior iliac crest and then were perfused into femoral head. Ficat stage and Harris hip scores were assessed at onset of treatment and 6, 12, 24, 36, 48 and 60 months after the initial treatment. Total hip arthroplasty (THA) was assessed as an endpoint. **Results:** At five years, 92.31% (72 of 78) of hips achieved a satisfactory clinical result while only 6 hips (7.69%) progressed to clinical failure and required THA; radiological progression was noted in 34 of 78 hips (43.59%); the overall rate of collapse was 38.24% (26 of 68 hips) in stage-I and stage-II hips combination. The mean Harris hip score increased from 59 points at baseline to 75 points at 12 months, 82 points at 24 months, 81 points at 36 months, 79 points at 48 months and 74 points at 60 months. Kaplan-Meier survival analysis showed a significant difference in the time to failure between the pre-collapse hips (Ficat stage-I and II) and the post-collapse hips (Ficat stage-III) at five years follow-up (Log-rank test; $p=0.002$). **Conclusions:** Autologous BMCs perfusion via medial circumflex femoral artery can relieve symptoms, improve hip function and delay the progression of ONFH. The clinical outcome is better when it is applied prior to the collapse.

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EFFECT OF BONE MARROW STROMAL CELLS AND DEMINERALIZED BONE PARTICLE GEL ON LABRAL REPAIR IN RABBIT LABRAL TEAR MODEL

Sunjung YOON, Myung-Sik PARK, Jong-Hyun KO, Seung-Min CHOI

Department of Orthopedic Surgery, Chonbuk National University Hospital,
Jeonju (SOUTH KOREA)

Objectives: The large labrochondral disruption might contribute to the development of osteoarthritis. In this study, we used demineralized bone particles (DBPs) gel and bone marrow mesenchymal cells to manufacture a potential biomaterial-cell complex for repairing labrochondral cleavage disruption. **Materials:** The acetabulum of three-month-old New Zealand white rabbit was exposed and about 8 mm-long of labrum was detached from acetabular rim. The DBP gel with BMSCs (9×10^5 cell/mL) were injected into disrupted space between acetabular rim and labrum. The acetabulum with labrum was taken at 3, 6, 9 weeks after surgery. Using RT-PCR we analyzed biochemical markers of labrum reattached to acetabular rim. The acetabulolabral junction was evaluated by immunohistochemical staining. The surface and cross section morphology of the repaired labrum was observed by scanning electron microscope (SEM) to evaluate the change of fiber arrangement and degeneration compared with control group. **Results:** The osseous-labral integration was successfully healing after 9-week in DBP gel-BMSCs group compared to control group. No repair was recognized in the control group (no implantation group). The repaired labrum was preserved native biomechanical marker (type I, II collagen and sox-9) compared with normal labrum in RT-PCR analysis. In SEM study, the microarchitectures were maintained after reattachment procedure. The labrochondral junction was more preserved in DBP gel-BMSCs group than control group. **Conclusion:** The results of this study show that DBP gels combined with BMSCs, applied locally at the disrupted labrum, may improve the healing of detachment of labrum to acetabular rim and maintain the nature of labrum.

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NOVEL BONE CEMENT MADE OF MINERALIZED SILK FIBROIN (SF)-REINFORCED CALCIUM PHOSPHATE-SF

Chengbin CAO, Hao LI, Huilin YANG, Bin LI

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

Introduction: Vertebral augmentation through minimally invasive surgeries including vertebroplasty and Kyphoplasty has been widely used to treat vertebral compression fractures caused by osteoporosis, multiple myeloma, and osteolytic metastases. As a biodegradable material, calcium phosphate cement (CPC) may achieve orchestrated cement resorption and new bone formation to restore vertebral body without the potential risks of poly(methyl methacrylate) bone cement, the most commonly used filling material in such surgeries. However, the mechanical strength of CPCs is generally insufficient to provide adequate vertebral augmentation. In this study, we aim to develop a novel mechanically adequate CPC using silk fibroin (SF) and self-assembled SF-hydroxyapatite (HAP) complex as reinforcing components. **Results:** Self-assembled SF-HAP complex, i.e., mineralized SF, has been obtained as confirmed by FTIR, XRD, and SEM analyses. When SF and SF-HAP were supplemented into CPC, the microstructure of CPC was markedly altered, including reduction of flake-like crystals and increase of needle-like crystals. Consequently, the compressive strength of CPC was improved. While addition of SF only slightly enhanced CPC, supplementation of 1%-3% SF-HAP to CPC/SF dramatically reinforced CPC, with a strength increase of up to 50%. The reinforcing effect of SF-HAP deteriorated when it exceeded 3%. **Conclusions:** We have successfully developed a new type of CPC derived from a composite of CPC, SF and self-assembled SF-HAP complex whose compressive strength was far higher than the trabecular bone of human vertebral body and close to cortical bone, which is ideal for vertebral augmentation.

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SUSTAINED DRUG DELIVERY DEVICE FOR TREATMENT OF BREAST CANCER BONE METASTASES

Ming SUN¹, Muwan CHEN², Miao WANG¹, Cody BÜNGER¹

¹Orthopaedic Research Lab, Aarhus University Hospital, Aarhus

(DENMARK), ²Interdisciplinary Nanoscience Center (iNANO), Aarhus University Hospital, Aarhus (DENMARK)

Introduction Up to 70% of the breast cancer patients have bone metastases. Progress in cancer treatment has increased the numbers of patients suffer from bone metastases. To effectively prolong the survival period and increase life quality of patients with breast cancer bone metastases, new strategy for treatment is needed. The aim of this study is to analyze the release profile of our patented scaffold (DESCLAYMR) and test the anticancer effect of this scaffold loaded Doxorubicin in vitro. and in vivo. Material and method In vitro cytotoxicity test of doxorubicin released from Desclaymr scaffolds Human breast cancer cell lines: Mda-Mb-231 and MCF-7 were seeded in culture medium. After 2 days culture, 10 µL of doxorubicin released solutions from serious time points was added into the culture medium. After 3 days, cells were collected for viability test determined by MTT assay. In vivo anticancer effect of DESLAYMR loaded with doxorubicin 8-11 week-old Female BALB/cATac-nude mice with breast cancer bone metastases were used to evaluate the anticancer effect. Tumor volumes were analyzed 90 days after treatment. Results and conclusion DESCLAYMR released up to 45% of the drug for up to 2 months. In both cell lines, DESLAYMR loaded with doxorubicin had higher cell inhibitory rate compared with control group and a sustained cell inhibitory ability up to 6 weeks. This sustained drug delivery device had a prolonged anticancer effect in mice with breast cancer bone metastases and has a potential ability to prevent cancer recurrence after tumour resection as well as structure support

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THE EFFECT OF INTRAARTICULAR OLEIC ACID AND OLEUROPEIN IN THE HEALING OF MECHANICAL OSTEOCHONDRAL DEFECTS IN RABBITS

Alis TEHMEZLI¹, Semih AYDOGDU¹, Dilek TASKIRAN², Murat SEZAK³, Cenk CAN⁴

¹Ege University Faculty of Medicine Department of Orthopaedics and Traumatology, Izmir (TURKEY), ²Ege University Faculty of Medicine Department of Physiology, Izmir (TURKEY), ³Ege University Faculty of Medicine, Department of Pathology, Izmir (TURKEY), ⁴Ege University Faculty of Medicine, Department of Pharmacology, Izmir (TURKEY)

Aim: Evaluation of effect of oleic acid and oleuropein, which are components of natural olive oil, on damaged cartilage. They have shown to facilitate cartilage healing when administered orally or intraperitoneally. Their intraarticular application has not been studied before. **Method:** Twenty – five rabbits were included; an osteochondral defect was created on medial femoral condyles of right knees with a standard instrument. They were grouped according to substance injected in their knees thrice at days 14, 21, and 28 postoperatively, while group one received none; being the control group. The other groups were assigned as oleic acid only (group two), oleuropein only (group three), and both (group four). Articular fluids were collected before injections and at day 56 (sacrifice day) for proteoglycan fragments (PF) and matrix metalloproteinase-3 (MMP-3) measurements. Following sacrifice, the knees were resected; examined and scored histologically. The differences between groups, as well as correlation between biochemical and histological evaluations were tested statistically. **Results:** While MMP-3 levels were found to be decreased gradually in groups one and three; increased levels were noted at day 56 in the second and day 28 in the fourth group. PF levels were found to be decreased in all groups but fourth in which an increase was observed at days 21 and 56. Histological examinations showed improvement in all groups with varying degrees at certain criteria. Group four had the best mean score on the histological scale. The difference among groups was not statistically significant; moreover no correlation between tests could be proven.

Date: 2013-10-17

Session: Basic Research - Biomaterials & Scaffolds

Time: 16:30 - 18:00

Room: G.01 & G.02

Abstract no.: 34279

COMPARATIVE STUDY OF DEMINERALIZED BONE MATRIX AUGMENTED BONE-GRAFT WITH CHRONOS INJECTION IN UNICAMERAL BONE CYST OF CALCANEUM

Dheeraj MAKKAR, Hak Jun KIM, Eui DONG

Guro Hospital, Seoul (SOUTH KOREA)

Background: Unicameral bone cysts are fluid filled cystic lesions. The usual treatment modalities are open curettage and bone grafting or percutaneous injection of steroids, demineralized bone matrix, calcium sulfate. These procedures are usually associated with recurrence of cysts. **Purpose :** We hypothesized that DBM along with autogenous bone graft will enhance the rate of bone healing and hence consolidation of UBC as compared with other modalities.**Material and methods:** 21 patients (age range 12 to 47 years) with unicameral cyst located in the anterior aspect of the joint were treated. The mean age of patients was 27.2 years and mean cyst size was 3 cm². The patients were divided into three groups. Group A was treated with conventional open curettage and bone grafting. Group B was treated by percutaneous injection of Chronos while Group C patients by curettage followed by packing bone graft admixed with demineralized bone matrix. **Result :** Group C patients had a complete consolidation after 12 weeks. Group B patients achieved consolidation in 24 weeks with one persistent cyst. Group A had three persistent cysts and 4 consolidated cysts in 24 weeks. **Conclusion:** Curettage and autologous bone graft fortified with DBM is an effective way to achieve consolidation without recurrence in unicameral cyst of calcaneum.

Date: 2013-10-17

Session: Basic Research - Biomaterials & Scaffolds

Time: 16:30 - 18:00

Room: G.01 & G.02

Abstract no.: 34211

SIDE-CHAIN MODIFIABLE POLYURETHANES WITH DIFFERENT ELASTIC MODULUS FOR MODULATION OF DIFFERENTIATION OF STEM CELLS

Caihong ZHU, Bin LI, Huilin YANG

Orthopaedic Institute of Soochow University, Suzhou (CHINA)

The annulus fibrosus tissue engineering is one of the major limiting factors for the treatment strategies of tissue-engineered intervertebral disc. Studies has indicated that the elastic modulus, extracellular matrix and cellular morphology of the annulus fibrosus varied with radial position in the disc. Recently, matrix with tunable mechanical properties has been proved to modulate the differentiation of stem cells. So in this study, we designed a series of biodegradable side-chain modifiable polyurethanes with different elastic modulus for modulation of differentiation of annulus fibrous stem cells. By adjusting the molecular weight of polycarbonates, ratios of hard segment to soft segment, we synthesized a series of polycarbonate-based polyurethanes with allyl-functional side-groups with different elastic modulus (from $\sim 2\text{ MPa}$ to $\sim 13\text{ MPa}$) which is close to the elastic modulus of the annulus fibrosus. The allyl-functional polyurethanes were then able to postpolymerization functionalized with varying thiol-containing molecules such as 2-mercaptopropanoic acid, cysteamine, and RGDC peptide. And the polyurethanes did not show evidence of cytotoxicity and could be appropriate for cell adhesion and growth. Further investigations remain to be done with the polyurethanes, including examining the effect of degradation on mechanical properties, processing the polymers into three-dimensional porous scaffolds, and modulating the differentiation of annulus fibrosus stem cells. The polyurethanes might ultimately be appropriate for develop a tissue-engineered annulus fibrosus.

Date: 2013-10-17

Session: Basic Research - Biomaterials & Scaffolds

Time: 16:30 - 18:00

Room: G.01 & G.02

Abstract no.: 34208

BIOCHEMICAL INDEXES AND CELL IMMUNITY INDEXES IN ELDERLY AND OLD AGE PERSONS IN LONG TERMS AFTER IMPLANTATION OF MAJOR JOINTS

Svetlana LUNEVA, Marina CHEPELEVA, Maksim STOGOV

Russian Ilizarov Scientific Center Restorative Traumatology and Orthopedics, Kurgan (RUSSIA)

Introduction: Annually, according to the data of experts of the WHO, percentage of revision surgeries in USA attains 15% of the total number of prosthetics. Number of revision surgeries in Europe attains 20%. The purpose is to study biochemical and cell immunity indexes in long terms after major joints replacements depending on implantation results. Methods: It was studied 30 patients with good and satisfactory prosthetics results in 12-36 months after surgery and 35 patients with developed during this period aseptic instability of implanted joints. During developing of aseptic instability of endoprosthesis, number of CD8dimCD38+ as well as CD8brightCD38+ was increasing in peripheral blood. It was revealed higher content of regulatory T-lymphocytes than in favorable postoperative course that argued for shift of immunoregulation balance toward immunosuppressive effects. From the whole spectrum of studied biochemical indexes of blood and urine serum of patients, it was revealed small group of indexes which regularly changed due to the development of aseptic instability of implanted joints. It was marked reduction of albumin and lactate level in blood serum and increase of calcium renal excretion in patients with aseptic instability. Results: Received data are recommended to use in long terms after replacement of major joints to predict postoperative course and reveal patients from risk group on development of septic and aseptic implant instability.

Date: 2013-10-17

Session: Basic Research - Biomaterials & Scaffolds

Time: 16:30 - 18:00

Room: G.01 & G.02

Abstract no.: 33992

EVALUATION OF SERUM ALKALINE PHOSPHATASE AS A BIOMARKER OF HEALING PROCESS PROGRESSION OF SIMPLE DIAPHYSEAL FRACTURES IN ADULT PATIENTS

Ajai SINGH, Rn SRIVASTAVA

K.G.Medical University, Lucknow, Lucknow (INDIA)

Clinicians are unable to identify delayed and non-unions early. Changes in serum ALP levels were noted at definitive intervals in 95 adult patients with simple diaphyseal fractures of both bones leg. Patients were followed till either bone union was completed or maximum up to the end of 09 month. The changes in serum ALP levels were recorded and correlated with the clinico-radiological progression of fracture healing. All 95 patients were allocated into 02 groups; Group A: clinico-radiological union achieved before or by the end of 06 months; and Group B: clinico-radiological union not completed by 06 months. The Group B was further subdivided into B1: clinico-radiological healing not completed by 06 months but completed by 09 months; and B2: clinico-radiological healing not achieved even by the end of 09 months (Non-union). At the time of admission, mean serum ALP levels remained within normal limits in all patients. Mean serum ALP levels followed the same pattern in group A and B1, reaching a maximum level at post trauma 3rd week. But the mean levels of serum ALP at every selected interval was significantly higher in group A. In Group A, serum ALP levels returned to normal values by complete union achieved, where as in group B1 values remained elevated even by the end of 06 months. In Group B2, mean serum ALP level remained within normal limits throughout the followup. The serum ALP levels estimation could be additional tool in predicting fractures at risk of delayed / nonunion of diaphyseal fractures.

Date: 2013-10-17

Session: Shoulder Arthroplasty & Arthroscopy

Time: 14:00 - 15:30

Room: G.03 & G.04

Abstract no.: 35970

ARTHROSCOPIC TREATMENT OF CALCIFIC TENDINITIS OF THE SHOULDER: A STUDY OF 68 PATIENTS WITH A 3- TO 22-YEAR FOLLOW-UP

Deepak PATEL¹, Yashika PATEL², Ria PATEL², Apurva CHOKSEY³, Vincent MCINERNEY⁴

¹Seton Hall University and St. Mary's Hospital, Passaic, South Orange, New Jersey (UNITED STATES), ²Market Street Surgical Center, Saddle Brook, New Jersey (UNITED STATES), ³Warwick Hospital - South Warwickshire General Hospitals NHS Trust, Warwick, Warwickshire (UNITED KINGDOM),

⁴Seton Hall University, South Orange and St. Joseph's Hospital, Paterson, New Jersey (UNITED STATES)

Introduction: The purpose of this study was to report the clinical outcome of arthroscopic treatment of calcific tendinitis affecting the supraspinatus tendon. **Methods:** Between 1988 and 2009, a total of 68 patients (76 shoulders) underwent arthroscopic excision of calcific deposits in the supraspinatus tendon. All patients had failed a course of nonoperative management (for a minimum of 3 to 4 months in 38 patients and up to 6 to 9 months in 30 patients) that included NSAIDS, physical therapy, and local steroid injections. The mean age of the patients at the time of operation was 48.6 years (range, 34 to 75 years). In 34 of the 76 shoulders (45%), additional subacromial decompression (SAD) and acromioplasty was performed as these patients had a Type II Neer (curved) and a Type III Neer (hooked) acromion as seen on a sagittal oblique view of a T2-weighted MRI of the shoulder. The decision to undertake concomitant arthroscopic SAD was made based on the preoperative MRI findings suggestive of subacromial impingement and based on intraoperative findings. **Results:** The mean postoperative follow-up was 15.7 years (range, 3 to 22 years). The mean Constant shoulder score improved from 27.6 points (range, 10 to 47 points) preoperatively to 81.5 points (range, 52 to 100 points) postoperatively; this improvement was statistically significant ($P < 0.001$). Overall, 63 of the 68 patients (93%) of the patients were satisfied with the outcome of surgery. **Conclusions:** Our surgical technique is safe and effective and has provided consistent and predictable clinical results.

Date: 2013-10-17

Session: Shoulder Arthroplasty & Arthroscopy

Time: 14:00 - 15:30

Room: G.03 & G.04

Abstract no.: 35978

EVALUATION OF ARTHROSCOPIC STABILISATION OF ACROMIOCLAVICULAR JOINT DISLOCATION USING TIGHTROPE

Vineet JAIN, Deepak JOSHI, Ankit GOYAL, Vibhu BAHL, Prashant MODI, Deepak CHAUDHARY

Sports Injury Centre, Safdarjung Hospital, Delhi (INDIA)

Introduction: Numerous surgical methods have been described for management of Grade IV or V acromioclavicular joint dislocation. We analysed early results of fixation of such dislocation arthroscopically using TightRope (Arthrex, Naples, FL). **Methods:** Prospectively, 11 male patients presenting with acute Grade IV or V acromioclavicular joint dislocation were included in the study. 4 patients had type IV and & 7 had type V acromioclavicular dislocation. Average age of patients was 31 years. All patients were taken up for Arthroscopic acromioclavicular joint stabilisation with TightRope. Patients were followed up 2 weeks, 6 weeks, 3 months, 6 months and 1 year. The shoulders were evaluated radiologically with contra lateral normal side and clinically for pain, activity level, range of movement using Constant score, time taken to return to work and patient's satisfaction with cosmetic appearance was noted. **Results:** 10 patients were available for follow-up at 1 year. 1 patient had fracture of coracoid intraoperatively, necessitating open stabilisation with TightRope. Thus there were 9 patients of arthroscopic acromioclavicular joint stabilisation. There was no loss of fixation or reduction at 1 year in any patient. Constant score improved to a average of 48 at 6 weeks (Range 38-56), to 75 (Range 69-80) at 6 months and 92.2 (Range 85-96) at 1 year follow-up. 8 patients, all of whom were engaged in office work returned to work by 3 months. 1 patient who was engaged in heavy manual labour took 9 months to return to his work. All patients were satisfied with their cosmetic appearance.

Date: 2013-10-17

Session: Shoulder Arthroplasty & Arthroscopy

Time: 14:00 - 15:30

Room: G.03 & G.04

Abstract no.: 34728

ARTHROSCOPY ASSISTED TIGHTROPE INTERNAL FIXATION FOR THE UNSTABLE TYPE DISTAL CLAVICLE FRACTURES

Jianhai CHEN

Department of orthopaedics and Trauma, Peking University People's Hospital, Beijing (CHINA)

Unstable distal clavicle fractures often need operation. We adopt Tightrope system used in acromial-clavicular joint dislocation to treat distal clavicle fractures. This study is aimed to identify the feasibility of this new procedure. Methods: this is a retrospective cohort study. From July 2010 to January 2012, 27 cases of unstable distal clavicle fractures treated with arthroscopy assisted tightrope fixation were enrolled in this study. Gleno-humeral joint was routinely examined using arthroscopy. Anterior working portal and anterior lateral trans-supraspinatus tendon portal were established under direct vision. The scope was transferred to anterior lateral portal to get a good view of sub-coracoid space. The under surface of coracoid was prepared. Under C arm control, a guide wire was drilled from clavicle to coracoid through acl guide device. Then 4.5 mm Canulated drill bit was drilled along guide wire. One set of tightrope implant was used to stabilize the fracture under C arm control. The suture tied after fracture reduction. Constant score, simple shoulder test and visual analogue score for pain were recorded at the last follow up. Result: twenty seven cases were retrospectively studied. The average age was 44 years old. The mean follow up period was 13 months. The average constant score was 90 points, sst score was 11 points. Twenty three patients complained no pain, but 2 patients complained mild pain. Twenty six fractures healed uneventfully, but revision surgery was done for 1 case of implant failure. Conclusion: arthroscopy assisted tightrope fixation is a good choice for unstable distal clavicle fractures.

Date: 2013-10-17

Session: Shoulder Arthroplasty & Arthroscopy

Time: 14:00 - 15:30

Room: G.03 & G.04

Abstract no.: 35655

**FUNCTIONAL RESULTS AFTER ARTHROSCOPIC BANKART REPAIR
COMBINED WITH HILL-SACHS REMPLISSAGE TECHNIQUE**

Hatem SAID, Abdulrahman BABAQI

Assiut Arthroscopy & Sports Injuries Unit, Orthopaedic & Traumatology Department, Assiut University, Assiut (EGYPT)

Background: An engaging Hill-Sachs lesion is a defect of the posterosuperior aspect of the humeral head causing locking of the head against the anterior corner of the glenoid rim when the shoulder is at 90° abduction and more than 30° of external rotation. And this lesion consider as a risk factor for recurrence dislocation after arthroscopic repair in patients with anterior shoulder instability. Arthroscopic Bankart repair combined with the Hill-Sachs remplissage technique can achieve good results without significant impairment of shoulder function. **Purpose:** The purpose of this study is to evaluate the functional outcome of arthroscopic capsulotenodesis of the posterior capsule and infraspinatus tendon (Remplissage technique) to seal a large engaging Hill-Sachs lesion in an unstable shoulder associated with bankart repairs and compare the results and range of motion with a matched group that had only bankart repair. **Study design:** Cohort study; Level of evidence, III. **Methods:** 52 patients undergoing arthroscopic surgery for anterior shoulder instability and large Hill-Sachs defects were included in the study, 26 patients underwent arthroscopic Bankart repair with remplissage and these were compared to 26 patients (there were no sig differences for age, Hill-Sachs size, number of dislocations that had anterior bankart repair). All patients were evaluated, before and after arthroscopic management, at a minimum follow-up of 12 months, using the Oxford Instability and Constant scores, and range of motion was measured using a goniometer. Recurrent subluxation or dislocation was documented. **Results:** The results and comparative scores will be presented.

Date: 2013-10-17

Session: Shoulder Arthroplasty & Arthroscopy

Time: 14:00 - 15:30

Room: G.03 & G.04

Abstract no.: 35489

ARTHROSCOPIC CAPSULAR RELEASE: AN EquALLY EFFECTIVE TREATMENT FOR IDIOPATHIC AND POST-TRAUMATIC FROZEN SHOULDER

Clare MILLER, Scott BARKER, Kapil KUMAR

NHS Grampian, Aberdeen (UNITED KINGDOM)

Introduction: Arthroscopic capsular release is a well recognised treatment for idiopathic frozen shoulder refractory to conservative treatment. The role of arthroscopic capsular release for shoulder stiffness secondary to trauma or surgery is less well established. The aim of this study was to compare the outcomes of arthroscopic capsular release for idiopathic and post-traumatic/surgical frozen shoulder. **Methods:** 32 patients undergoing arthroscopic capsular release were reviewed retrospectively. There were 16 patients in each group. Pre and post-operative range of movement (ROM) and post-operative Oxford Shoulder Scores (OSS) were evaluated. Statistical analysis was performed using the Mann-Whitney U test. **Results:** A significant improvement in post-operative ROM was noted in both groups ($p<0.001$). In the idiopathic group mean improvement in abduction, elevation and external rotation was 87°, 72° and 32° respectively. In the post-trauma/surgery group it was similar with an improvement of abduction by 76°, elevation by 72° and external rotation by 26°. Post-operative OSS also showed good function in both groups (Idiopathic 17.6, Post trauma/surgery 18.4). There was no significant difference between the two groups with respect to either improvement in ROM or post-operative OSS ($p>0.05$). **Conclusion:** Similarly good results can be expected when performing arthroscopic capsular release for both idiopathic and post-traumatic/surgical frozen shoulder.

Date: 2013-10-17

Session: Shoulder Arthroplasty & Arthroscopy

Time: 14:00 - 15:30

Room: G.03 & G.04

Abstract no.: 34820

**SHORT-TERM FUNCTIONAL OUTCOME OF
ARTHROSCOPIC-ASSISTED TREATMENT OF GLENOID FRACTURES**

Ming XIANG, Chen ZHAO

Sichuan Provincial Orthopaedic Hospital, ChengDu (CHINA)

Introduction: to evaluate the early functional outcome of arthroscopic-assisted treatment of glenoid Fractures. Method: We treated 7 cases suffering glenoid fractures with arthroscopic-assisted approach from September 2011 to April 2012. 5 patients were male and 2 patients were female. The average age is 34.6y (18-46y). The etiology included 5 falls and 2 traffic accidents. The interval from injury to surgery is 9.2days (6-17d).According to the Ideberg classification: 4 cases were Type Ia; 1case was Type Ib; 1 case was type II and 1 case was type IV, Constant—Murley shoulder score was used to assess the joint function. Result: The average operation time was 95 minutes (80-135min) and average follow-up time was 5.6 months (3-9m). The step of articular surface was less than 1-2mm in the view of arthroscopy and postoperative CT scan. 3 months postoperatively CT scan showed the fractures had healed. The mean Constant-Murley score was 87.2 points (range,74 to 100 points).There were 4 excellent cases,2 good cases and 1 moderate case. The average forward flexion of the shoulder was 162° (range,130°to 180°) ;The average external rotation was 42.5° (range30°to 80°) ; The average internal rotation were lost 2.8 vertebra segments (range,0 to 6 vertebra segments) . Conclusion It is the new and effective method to treat the intraarticular glenoid fracture, It provides precise reduction and stable fixation through the arthroscopic-assisted approach and have the advantage of rapid recovery and less complication. But the technique is demanding and the surgeons need long learning curve.

Date: 2013-10-17

Session: Shoulder Arthroplasty & Arthroscopy

Time: 14:00 - 15:30

Room: G.03 & G.04

Abstract no.: 35648

**UNCEMENTED ZIMMER® TRABECULAR METAL™ REVERSE
SHOULDER SYSTEM – EARLY RESULTS**

Thomas FINNIGAN¹, Navnit MAKARAM², Fizan YOUNIS¹, Makaram SRINIVASAN¹

¹East Lancashire Hospitals NHS Trust, Blackburn (UNITED KINGDOM),

²Edinburgh University, Edinburgh (UNITED KINGDOM)

The indication for Reverse Shoulder replacements (RSR) is mainly cuff deficient arthritic shoulders, and is expanding due to superior consistent outcome in active elevation and pain relief. There are some technical considerations for successful implantation of the RSR. The Trabecular (tantalum) metal has shown early in-growth of bone within 5 weeks and appears to improve functional outcomes & pain relief in RSR. Our results from a single surgeon series of 43 cases of uncemented Zimmer® Trabecular Metal™ RSR over 3 years and a minimum follow-up of 6 months shows good to excellent outcome. Method: All patients undergoing RSR are assessed in our institution with a pre-operative Constants score & Oxford score by an independent senior physiotherapist, followed by a review at 6 weeks, 3, 6,12 months, & yearly review. All patients with TM RSR, of the senior author, were assessed with primary and secondary outcome measures. RSR following rotator cuff arthritis = 35, post-trauma= 4, revision from hemiarthroplasty = 2, revision from surface replacement = 2. Results: The average outcomes measures improved by 60% in 6 months. Pain relief on the visual analogue scale improved by 90%. Complications: 1 (revision of glenosphere) Conclusion: The early & mid-term results are promising with excellent pain relief & good validated functional outcome measures. Longer- term studies are necessary to confirm its efficacy.

Date: 2013-10-17

Session: Shoulder Arthroplasty & Arthroscopy

Time: 14:00 - 15:30

Room: G.03 & G.04

Abstract no.: 35171

CLINICAL AND RADIOGRAPHIC EVALUATION OF REVERSE SHOULDER ARTHROPLASTY WITH A POLYETHYLENE GLENOSFERE

Carlo Felice DE BIASE¹, Mario BORRONI², Marco DELCOGLIANO¹, Giovanni ZIVERI¹, Francesca DE CARO¹, Alessandro CASTAGNA²

¹Azienda Ospedaliero Universitaria di Parma, Parma (ITALY), ²Istituto Clinico Humanitas, Milano (ITALY)

Introduction: reverse shoulder arthroplasty (RSA) is a reasonable treatment modality in patients with Cuff Tear Arthropathy and massive irreparable cuff tears.RSA has been shown to increase patient function and decrease pain.The aim of this study is to evaluate the clinical and radiographic results of a 44 polyethylene glenosphere. Methods: since 2008 we treated 88 patients with cuff tear arthropathy and irreparable massive cuff tear , using an RSA.We selected 80 patients with minimum FU of 24 months in which we used an implant with polyethylene glenosphere and metal humeral insert.Size of the glenosphere used was 44.All patients were assessed with the Constant score and with VAS.The shoulder ROM was measured preoperatively and postoperatively. Results: average age of the patients was 71 years old.Average duration of FU was 34 months.All measures improved significantly ($p < 0.0001$).The mean Constant improved from 15.6 to 60.2.VAS improved from 6 to 2,5. Forward flexion increased from 40 ° to 126,4 °, abduction from 41 ° to 103 °, external rotation from 15.1 to 17.3 and internal rotation increased by two level.We report 22 cases of scapular notching without clinical influence and without implant mobilization. Conclusion: this is the first report of the use of a polyethylene glenosphere.Data from this study suggest that RSA with a polyethylene glenosphere may be a viable treatment for patients with glenohumeral arthritis and a massive rotator cuff tear.Future studies will be necessary to determine the longevity of the implant and whether it will provide continued improvement in function.

Date: 2013-10-17

Session: Shoulder Arthroplasty & Arthroscopy

Time: 14:00 - 15:30

Room: G.03 & G.04

Abstract no.: 34469

MID-TERM RESULTS OF THE EPOCA RESURFACING TOTAL SHOULDER ARTHROPLASTY

Vijayaraj RAMASAMY, Rupen DATTANI, Gavin BRIGSTOCKE, Ravi MALLINA, V PATEL

Southwest London Elective orthopaedic centre, Epsom (UNITED KINGDOM)

Introduction: Total Shoulder Arthroplasty (TSA) offers patients superior pain relief and post operative function than hemiarthroplasty alone. Resurfacing TSA allows preservation of humeral bone stock and maintains the patient's native humeral offset, inclination and version. In this study we report our mid-term results of the Epoca resurfacing TSA. **Methods:** 60 Epoca resurfacing TSA implanted by single surgeon between 2006 and 2011 were studied. Mean age was 70 (range 36–88) years. The indications for surgery were osteoarthritis (52 patients), rheumatoid arthritis (3), avascular necrosis (2) and post traumatic osteoarthritis (3). The mean follow up was 30 (range 12–72) months. All patients were evaluated preoperatively and post operatively with Oxford Shoulder Score (OSS) and Euroqol EQ-5D questionnaires. Self assessment, Pain scores and Satisfaction scores completed post operatively for each patient. **Results:** The OSS demonstrated significant improvement (paired t-test, $p < 0.01$) from mean of 20 pre-operatively to 39 post-operatively and Euroqol EQ-5D index demonstrated a significant improvement from 0.46 to 0.82. The mean maximal elevation improved from 95° to 157° and the mean maximal external rotation improved from 20° to 45° . The mean patient satisfaction score with their surgery was 95%. The postoperative complications included four rotator cuff failure with two necessitating cuff repair and two revision to reverse TSA, one anterior shoulder instability and one transient brachial plexopathy. **Conclusion:** The mid-term results of the Epoca resurfacing TSA are satisfactory and we experienced no glenoid component complications. This procedure offers reliable pain relief, restoration of function and does not limit revision surgery options.

Date: 2013-10-17

Session: Shoulder Arthroplasty & Arthroscopy

Time: 14:00 - 15:30

Room: G.03 & G.04

Abstract no.: 34035

REVERSE SHOULDER ARTHROPLASTY IN 41 PATIENTS WITH CUFF TEAR ARTHROPATHY WITH A MEAN FOLLOW UP OF 5 YEARS

Ravi PANDIT, Nawfal AL-HADITHY, Peter DOMOS, Mathew SEWELL

Luton District General Hospital, Luton (UNITED KINGDOM)

Reverse shoulder arthroplasty (RSA) is an accepted treatment for patients with pseudoparalysis secondary to cuff tear arthropathy. There have been limited studies with mid-term clinical and radiological results. We present our results by a single surgeon from an independent district general hospital. 41 consecutive Delta 3 RSAs were performed in 37 patients (29 women, 8 men) with pseudoparalysis due to cuff tear arthropathy. Patients were a mean age of 79 years (68-91). Mean follow-up was 5 years. All patients were available for review. Mean age-adjusted Constant and Oxford scores improved from 34.2 to 71 and 15 to 33 respectively. Scapular notching was seen in 68% of patients, with no correlation with function or satisfaction. Stress shielding of the proximal humerus was seen in 10% of patients. One patient was revised to a hemiarthroplasty due to glenoid component failure after a fall. Reverse shoulder arthroplasty for pseudoparalysis secondary to cuff tear arthropathy can provide good functional results at 5 years, however there is a high rate of scapular notching and proximal humeral stress shielding.

Date: 2013-10-17

Session: Symposium Osteotomies Around The Hip In Adolescents

Time: 08:30 - 10:00

Room: G.05 & G.06

Abstract no.: 33951

**INTRAMEDULLARY NAILING IN VALGUS INTERTROCHANTERIC
OSTEOTOMY**

Alexander CHELNOKOV, Artem SHALIN

Ural Scientific Research Institute of Traumatology and Orthopaedics,
Ekaterinburg (RUSSIA)

Nonunions and malunions of the proximal femur can be difficult to manage. Typical varus deformity prevents normal functioning of the affected hip joint. Conventional treatment option is valgus intertrochanteric osteotomy with lateral wedge removal fixed by blade plate. The surgery requires incision up to 20 cm and may be accompanied with significant blood loss. Aim of our study was development of the technique of closed intramedullary nailing in valgus intertrochanteric osteotomy. Material and methods . 34 patients with nonunions or malunions of proximal femur were treated during 2009-2013. The suggested surgical technique included fixator-assisted nailing with the use of joystick into the head-neck segment. The osteotomy was performed percutaneously. Acute correction was possible in 28/34 cases, in 6/34 gradual alignment and lengthening was performed using Ilizarov or hexapod frame. After open wedge correction the final position was fixed by either reconstruction (6/34) or proximal femoral nails (28/34). Results . Varus deformity was corrected in all cases. Low invasiveness and minimal blood loss with high stability of fixation provided rapid functional recovery and short hospital stay. 26/34 patients reached full weight-bearing at 3 month postoperatively. In 30/34 cases union with restoration of length and proper alignment was reached. In 4/34 case total hip replacement was necessary because of avascular necrosis of the femoral head or pre-existed hip arthritis. Conclusion. Mini-access without bone stripping combined with high stability of intramedullary fixation allows use open wedge correction. Percutaneous osteotomy with closed nailing appears to be promising addition to armamentarium of hip surgery.

Date: 2013-10-17

Session: Hip Miscellaneous

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 33791

THE USE OF A MODERN DUAL MOBILITY SYSTEM

Remi PHILIPPOT, Frederic FARIZON, Bertrand BOYER

CHU, Saint Etienne (FRANCE)

We report the results of a 12-year follow-up retrospective series of 100 total hip arthroplasties using cementless, press-fit, dual-mobility acetabular cups. The aim of our study was to evaluate the clinical and radiographic results of this acetabular cup at last follow-up. This continuous and homogeneous series included 100 primary total hip arthroplasties performed during the year 2000. The THA combined a Corail® stem with a stainless steel Novae Sunfit® (SERF) acetabular cup. Fifteen patients died and 2 were lost to follow-up. Two cases of early dislocation were observed, and 3 cases of aseptic loosening of the acetabular component were reported. Radiographic measurements were performed using a specific radiographic analysis software. The mean stem subsidence was 0.71 mm, the mean craniopodal acetabular migration was 1.37 mm, and the mean medio-lateral acetabular migration was 1.52 mm. The 12-year survivorship is comparable to the data from the literature. The low dislocation rate at 12 years confirms the long-term, high stability of dual mobility, which should be recommended in primary THA for patients at risk for postoperative instability. The absence of true intraprosthetic dislocation events at 12-year follow-up provides evidence of the good quality of the latest generation of polyethylene liners and the necessity of combining thin-mirror, polished femoral necks with dual-mobility cups.

Date: 2013-10-17

Session: Hip Miscellaneous

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 33822

THE RISK OF DISLOCATION AFTER TOTAL HIP ARTHROPLASTY FOR FRACTURES IS DECREASED WITH RETENTIVE CUPS

Philippe HERNIGOU, Alexandre POIGNARD, Charles Henri FLOUZAT

LACHANIETTE

University Paris East, Paris (FRANCE)

Introduction: Total hip arthroplasty (THA) is efficacious for hip fractures in healthy older patients. However a variable prevalence of dislocation has been reported. This study was to determine the cumulative risk of dislocation in these patients with fractures and to investigate if retentive cups decrease the risk of dislocation. **Material and methods:** Between 2000 and 2005, 325 patients with neck fracture underwent primary THA using a retentive (325 hips) cup. The results of these 325 acetabular cups were compared with 180 THA without retentive cups performed for neck fractures in the same hospital between 1995 and 2000 by the same surgical team. The mean age of the 505 patients was 75 years (65 to 85). All patients were followed for a minimum of 5 years for radiographic evidence of implant failure. The patients were specifically queried about dislocation. **Results:** For patients without retentive cups, the cumulative risk of a dislocation was 5% at one month and 12% at one year and then rose at a constant rate of approximately 1% every year to 16% at five years. For patients with retentive cups, the cumulative risk of dislocation was 1% at one month, 2% at one year and then did not change at 5 years. **Discussion and Conclusion:** The rate of secondary surgery was highest in the group without retentive (10% for recurrent dislocation) compared with 1% in the group treated with retentive cups.

Date: 2013-10-17

Session: Hip Miscellaneous

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 33819

**IMPACTION BONE GRAFTING FOR ACETABULAR RECONSTRUCTION
IN HIP REVISION SURGERY-LONG TERM RESULTS**

László BUCSI, Ferenc DOBOS, Szabolcs HORVÁTH

Centre for Musculoskeletal Disorders and Trauma, Székesfehérvár
(HUNGARY)

Authors evaluated their long term results of hip revision cases concerning the acetabular reconstruction with using the method of impaction bone grafting. Material and methods: 65 total hip revisions with impaction bone grafting for the acetabular side have been followed, operated on between January 2000 and December 2006. The average age of the patients was 64 (36-91) years, and the average follow up time was 10,4 (7,2-13) 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 cavitary 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, even in the cases of extensive bone loss.

Date: 2013-10-17

Session: Hip Miscellaneous

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 34506

HIP RESURFACING VERSUS 28MM METAL ON METAL TOTAL HIP ARTHROPLASTY: RANDOMISED TRIAL AT 6 TO 9 YEARS FOLLOW-UP

Charles RIVIÈRE¹, Martin LAVIGNE², Alain ROY², Michel RAHMÉ², Pascal André VENDITTOLO²

¹Hôpital Maisonneuve Rosemont, Montreal (CANADA),

²Maisonneuve-Rosemont Hospital, Montreal (CANADA)

Introduction: For young and active patient, metal on metal is considered as a bearing alternative in THA. Questions still remain regarding the clinical value of femoral neck preservation with hip resurfacing (HR) versus total hip arthroplasty (THA). **Methods:** Two hundred and nineteen hips in 192 patients aged 18 to 65 years were randomised to 28-mm metal-on-metal uncemented total hip arthroplasty (THA, 100 hips) or hybrid hip resurfacing (HR, 109 hips). **Results:** Revision (4/99 THA, 6/104 HR, p=0.569) and re-operation rates without revision (5/99 THA, 3/104 HR, p=0.428) were similar at mean 8-year follow-up (range 6.6 to 9.3). One recurrent dislocation, 2 late deep infections and 1 peri-prosthetic fracture required revision in the THA group, whereas 5 patients in the HR group underwent revision for femoral head loosening and 1 for adverse reactions to metal debris. UCLA activity scores were significantly higher in HR (7.5 vs 6.9, p=0.035), but similar WOMAC scores were obtained (5.8 in HR versus 5.1 in THA, p=0.615) at last follow-up. Osteolysis was found in 37% of THA patients, mostly in the proximal femur, compared to 2.4% in HR (p<0.001). At 5 years, mean metal ion levels were below 2.5 µg/l, but chromium and titanium were significantly higher in the HR group (p=0.048 and 0.006, respectively). **Conclusion:** Although revision rates and functional scores were similar at mid-term, long-term survival analysis is necessary to determine whether one procedure is more advantageous than the other.

Date: 2013-10-17

Session: Hip Miscellaneous

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 34520

**TOTAL HIP ARTHROPLASTY WITH SHORTENING
SUBTROCHANTERIC OSTEOTOMY FOR CONGENITAL DISLOCATED
HIP**

Tao LIU, Huilin YANG

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

Abstract Objective : To explore the experiences of total hip arthroplasty with shortening subtrochanteric osteotomy in treating osteoarthritis secondary to congenital dislocation of the hip. Method : From Sep 1 2000 to Sep 1 2008 , 15 patients (25hips) with osteoarthritis secondary to congenital dislocation of the hip undergone total hip replacement were enrolled, including 14 females and 1 male, with the age ranged from 38~65 years (mean 46 years) . The results and complications were evaluated retrospectively. Result : The follow up time ranged from 6 months to 6 years (mean 56 months) . The average Harris score was increased from preoperative 35.73 points to 88.95 points postoperation at the time of final follow($p<0.05$). All the patients could walk independently, take care of themselves and return to previous job in 6 months postoperatively. 1 hips were followed by nonunion. 1 nerve injuries injuries occurred. 1 hip dislocated postoperatively. All components were well fixed at the time of the last radiographic follow up. Conclusion : Total hip arthroplasty with shortening subtrochanteric osteotomy is an effective method in treating osteoarthritis secondary to congenital dislocation of the hip.But it is a challenging work to the orthopaedic surgeon.

Date: 2013-10-17

Session: Hip Miscellaneous

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 35225

SINGLE MAN TECHNIQUE : A NEW TECHNIQUE OF REDUCTION OF PROSTHESIS IN HEMIREPLACEMENT ARTHROPLASTY OF HIP

S. K. VENKATESH GUPTA

Mamata Medical College/ General Hospital, Khammam (INDIA)

Introduction: Hemiarthroplasty is a clinically effective and cost-effective procedure for varied indications of hip pathology. Conventional method of reduction of prosthesis is often a laborious step that needs strict coordination of the assisting staff and is usually associated with high chances of intra-operative periprosthetic fractures. We describe a new technique of reduction of prosthesis in hemiarthroplasty, where in operating surgeon himself alone would reduce the prosthesis, minimising the effort of reduction and eliminating learning curve of assistant surgeon. **Methodology:** A total of 508 patients who underwent hemiarthroplasty with uncemented unipolar or bipolar were included. 242 cases(Group-A) were reduced by the new technique described here and the rest 266(Group-B) by conventional method of reduction. Time taken for reduction, Number of attempts of reduction, periprosthetic fracture assessment(Vancouver classification), stability of hip and functional outcome as measured by Harris-Hip score were the parameters used to analyze the reduction techniques. **RESULTS:** Mean age of study population was 65.4 years(Range:60-89years) and 39 % were males(Group-A:40.4%, n= 98; Group-B:37.7%,n=101). Mean follow up period was 2.4 years. Average time of reduction of prosthesis was 10seconds(5sec-4min) in Group-A versus 2.8minutes(46sec-20min) in conventional method(Group-B). Intraoperative periprosthetic fractures accounted in 1.2% among Group-A(n=3;Vancouver-A) and in 9%(n=24) among Group-B. Reduction was achieved in first attempt among 90.49%(n=219) Group-A as compared to 76%(n=202) in Group-B($p<0.5$). Only 1 posterior dislocation was encountered in Group-A(0.4%) as to 14(5.2%) in Group-B. **CONCLUSION :** "Single man technique" is a faster method of reduction and is technically superior in terms of decreased periprosthetic fractures, achieving reduction in first attempt, less damage to soft-tissues leading to stability.

Date: 2013-10-17

Session: Hip Miscellaneous

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 35665

INFECTION RATES IN REVISION HIP SURGERY. DOES THE USE OF ALLOGRAFTS MAKE A DIFFERENCE? AN ANALYSIS OF 2776 PROCEDURES

Amit SHAH, Daniel COHEN, Hajime NAGAI, Peter KAY, BM WROBLEWSKI
Wrightington Hospital, Wigan (UNITED KINGDOM)

Introduction: Aseptic loosening continues to be one of the major indications for revision hip surgery. The use of allografts to replenish bone stock and deal with defects and deficiencies is an established method in reconstructive surgery. However there is a hypothetical increased risk of infection in using them. We examine the infection rates with or without allograft in hip revision surgery from a single high volume institute. **Method:** Our database prospectively collects data from a group of surgeons who have historically used the trochanteric osteotomy as an approach for their revision hip work. The archives were examined for incidence rates of infection and re-revision procedures. We examined all revision hip replacements that were carried out for aseptic loosening of either one or both components. **Results:** 2776 revision procedures took place between 1966 and 2012. Of these, 1344 procedures took place after 1988 and used allografts for reconstruction. Incidence of early infection in this group was 15 cases, 1.12 % and late infection was 22 cases, 1.64%. Re-revision for infection was 19 cases, 1.41%. The figures for the revision group of 1432 cases without allografts showed early infection in 59 cases, 4.12%; late infection in 31 cases, 2.16% and a re-revision rate of 13 cases, 0.91%. **Discussion:** We present possibly the largest series of revision hip work from a single institution. Our results suggest no significant difference in the risk of infection by choosing to use allografts.

Date: 2013-10-17

Session: Hip Miscellaneous

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 34331

THIGH PAIN IN METAPHYSEAL PRESSFIT CEMENTLESS HYDROXYAPATITE COATED THA STEMS AFTER 20 YEARS

Jens BOLDT

Siloah Clinic, Berne (SWITZERLAND)

Painful femoral stress shielding caused by distally engaging cementless THA stems is a world-wide clinical problem, which often requires any form of pain treatment and/or revision surgery. Although distal press-fit has been the golden standard for cementless primary stem fixation for over three decades, femoral ballooning, hypertrophy, thigh pain and ultimate stem swinging and/or loosening is a well-recognised shortcoming. Methods: This study compares the radiographic and clinical features of 208 consecutive Corial stems after 20 years of implantation. Primary stability of this cementless HA coated stem was achieved by proximal bone impaction and stability rather than distal press-fit. Results: clinical survivorship at 20 years was 97.6%. Thigh pain was recorded annually at follow-up. There were three cases with radiographic diaphyseal femoral hypertrophy due to proximal aseptic loosening, however, thigh pain has not been recorded at any time postoperatively in this group, except in three cases associated with a proximally loose and swinging stem. Conclusion: the longterm data of this study suggest that cementless fixation of hip stems in THA can be achieved by proximal impaction grafting technique combined with an HA coated stems without causing distal stress shielding or thigh pain at any time postoperatively in the first 20 years. A 25 year follow-up study is planned.

Date: 2013-10-17

Session: THA - Femoral Implant

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 35932

OUTCOME OF AN EXTENSIVELY HA-COATED STEM AT 21-YEAR FOLLOW-UP. A PROSPECTIVE STUDY OF 347 CASES

Laurent JACQUOT, Jens BOLDT, Jean Charles ROLLIER

Clinique d'Argonay, Argonay (FRANCE)

Introduction: Bio-active fixation has increasingly gained acceptance over the last two decades. However extent of the coating is still a subject of debate. Material and methods: Between July 1986 and December 1990, we performed 347 THA (320 patients) using the Corail stem (DePuy). Corail is a straight tapered stem totally coated with a 150 μ thick layer of HA. The mean age at surgery was 64.5 (range 16 to 95). 165 patients are now deceased (52%), 30 patients (9%) are lost to follow-up. The mean follow-up for 125 living patients on file is 20.9 (20-25) years. Results: 62 THA's required component revisions: 48 cups, 12 stems, 8 "cups and stems". 8 cups and 4 stems have been revised for aseptic loosening. Owing to the high incidence of wear-related revision, Kaplan-Meier survivorship at 25-year follow-up, using component revision for any reason as an endpoint, was 82.5 ± 3.3 (95% confidence intervals). In contrast, Corail stem survivorship, using stem removal for any reason as an endpoint, was $96.3\% \pm 3.0$ at 25-year follow-up. Discussion and conclusions: Therefore, despite wear and proximal osteolysis, the fixation achieved with this totally HA-coated stem remained durable through 25-year follow-up. Regarding the periprosthetic remodelling during this period, modifications of the bone pattern have been strictly limited: slight resorption at the calcar level, absence of cortical hypertrophy. The radiological silence is one of the paramount facts demonstrated by this prospective study.

Date: 2013-10-17

Session: THA - Femoral Implant

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 35675

BONE REMODELLING PATTERN AROUND DCPD(DICALCIUM PHOSPHATE DIHYDRATE)-COATED METAPHYSEAL-LOADING CEMENTLESS SHORT STEMS IN ELDERLY PATIENTS

Anshul SOBTI¹, Jae-Hyuk YANG², Amit MISHRA¹, Kwang-Jun OH¹

¹Department of Orthopaedic Surgery, Konkuk University Medical Center, Gwangjin-gu, Seoul (SOUTH KOREA), ²Department of Orthopedic Surgery, Veterans Health Service Medical Center, Seoul (SOUTH KOREA)

There are concerns in using the short stem during total hip arthroplasties in elderly patients. In this report, the sequential bone remodelling findings in metaphyseal loading short stems were assessed using serial radiography. 100 primary hip arthroplasties were performed in patients with average age of 78.3 years using short stem. The presence and patterns of radiolucent lines, radio-opaque lines, calcar rounding, proximal bone resorption, spot welds, cortical hypertrophy, and intramedullary bone formation around the distal tip were assessed using radiography. Study comprised of 92 hips and the mean follow-up was 48 ± 4 months. At the latest follow-up, condensations of spot welds were noted in 84 hips. Spot welds formation occurred in all zones except zones 1 and 4. Calcar rounding was observed in 90 hips. Atrophy of the calcar was noted in 19 hips. Analysis of the proximal zones with DCPD coating stems revealed reactive radiodense lines in zones 1 and 2 in 22 hips. A prominent reactive line around the tip of the stem was recorded in 32 hips at the most recent follow-up. However, there was no increase in space between the tip of the stem and the radiopaque line at the most recent follow-up. No acetabular or femoral component migrated by > 1 mm at final follow-up. No acetabular or femoral osteolysis identified. The radiographic findings of metaphyseal-loading short stems in elderly suggest that 91.3% of implants were osseointegrated. None required stem revision. Metaphyseal-loading short stems in elderly suggest promising and fixation with adaptive bone remodelling.

Date: 2013-10-17

Session: THA - Femoral Implant

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 34223

CEMENTLESS TOTAL HIP ARTHROPLASTY: A BILAYER COATING TO SECURE TERTIARY STABILIZATION

André FERREIRA¹, Thierry ASLANIAN²

¹Clinique du Parc, Lyon (FRANCE), ²Groupe Lépine, Genay (FRANCE)

Introduction: For more than two decades hydroxyapatite has been used to accelerate osteointegration of prosthetic components. To support osseous fixation placement of an under-layer between prosthetic substrate and hydroxyapatite coating makes it possible to obtain a surface landscape that will serve as an “anchoring volume” for newly formed bone. We have defined a coating specification that is composed of a porous titanium layer of decreasing thickness, which is covered with a continuous layer of hydroxyapatite applied by vacuum plasma spraying. **Methods:** First we validated bilayer manufacturing by in vitro tests, which proved that vacuum spraying doesn't affect implants properties. Secondly this was an exploratory cups study with 150 consecutive primary intervention cases from June 2001 to March 2005 and a retrospective stems study with 290 cases from 2002 to 2007. Radiological (cortical modifications, migration, edging and ossification) and clinical endpoints were evaluated. **Results:** With an average follow-up of 65 months (15 to 106), no revision was necessary and no acetabular migration was demonstrated from a clinical standpoint. No cortical bone remodeling was observed. For the stems, the mean Engh score was 23.2. **Conclusion:** Radiological parameters demonstrated the stability of the bone-prosthesis interface. This series proves, in the medium-term, that a bilayer coating is clinically effective at providing reliable and reproducible cementless tertiary fixation that begins when hydroxyapatite is resorbed as well for acetabular cups and for stems.

Date: 2013-10-17

Session: THA - Femoral Implant

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 34128

HAWKINS SIGN IN UNCEMENTED THR?

Vaibhav BAGARIA

Care Hospital & Origyn Clinic, Nagpur (INDIA)

Reaming of femur during total hip arthroplasties is known to disrupt the vascularity in this region. The return of vascularity in the region may be predicted by appearance of radiolucent line at 6-8 weeks at the implant bone interface. This may be explained by the fact that normal disuse osteopenia is possible only in presence of sufficient vascular supply (A phenomenon first observed in talar neck fractures by Hawkins, 1970). Twenty consecutive patients who underwent total hip arthroplasty using an extensively HA coated femoral stem were evaluated at 8 weeks for presence of a radiolucent line between the implant and femoral cortex. 13 of 20 patients (65%) had evidence of this translucency on AP radiographs. At six months the radiographs of 20 patients were evaluated for boney ingrowth by a blinded observer. 84% (11 of 13) patients in the group that had radiolucency at 8 weeks showed evidence of boney ingrowth as compared to only 56.8% (4 of 7) in the other group. We hypothesise that presence of a radiolucent line at 6-8 week postoperative period is a predictor of a good vascularity in the region and this sign may serve as good predictor for future boney ingrowth in the prosthesis

Date: 2013-10-17

Session: THA - Femoral Implant

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 34130

THE MODULAR MP STEM IN HIP REVISION

Francesco BIGGI, Corrado D'ANTIMO, Stefano DI FABIO, Silvia

TREVISANI

S. Martino Hospital, Belluno (ITALY)

MP stem (LINK) is an uncemented modular hip revision stem, titanium conical shaped for distal fixation in intact cortical bone with anti-rotational wings for more primary stability. Proximal modularity is provided by tapered neck segments, proximal spacers, and heads to restore hip rotation center, offset and limb's length. Indications are revision of loosened femoral stem with proximal bone resorption, peri-prosthetic fractures, failure of previous proximal femur fracture treatment, severe proximal femur deformation. A retrospective review of 135 implants was undertaken, performed by the same surgeon in the period 1996-2011. Pre-operative planning, utilizing templates, was mandatory to allow hip reconstruction. Conventional surgical technique indicates a Smith-Pethersen approach, with combined Wagner's trans-femoral approach when necessary; all patients received infection and DVT prophylaxis; early mobilization was encouraged. Evaluation was both clinical (Harris Hip Score and GIR/AIR Score) and radiographical in terms of implants stability, subsidence, presence of radiolucent lines, bone remodelling. The HHS rose from average 55 points pre-operatively(min.36) to 84 post-operatively(max.99); the GIR/AIR scored average 71 points(worse score<20, best 81-112). Radiographically 126 implants have been considered stable at minimum 2 and maximum 15 years, with no radiolucent lines distally, and asymptomatic proximal radiolucent lines around neck segments. Eight stem had a distal migration <10mm, two between 10-20mm. Major complications accounted 4 dislocations with 2 revision. MP stem represents an ideal solution in hip revision surgery, allowing multiple solution, reproducible technique with very simple instrumentation, excellent primary stability with secondary remodelling and osteointegration.

Date: 2013-10-17

Session: THA - Femoral Implant

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 35213

CLINICAL FOLLOW-UP OF 109 PRIMARY UNCEMENTED TOTAL HIP ARTHROPLASTIES: MODULAR VERSUS NON-MODULAR FEMORAL STEMS

Vane ANTOLIC, Matej KERSIC, Drago DOLINAR, Blaz MAVCIC

University Medical Centre Ljubljana, Dept. of Orthopaedic Surgery, Ljubljana (SLOVENIA)

Primary total hip arthroplasties (THA) with modular femoral stems enable independent adjustment of femoral anteversion and inclination, thus implant designers claim they enable better reconstruction of hip geometry. Our aim was to find out whether femoral stems with modular necks enabled better adjustment of postoperative leg length discrepancy and better clinical results after THA in comparison to non-modular implants. The data of 109 patients with unilateral uncemented primary THA without any postoperative complications was reviewed retrospectively (50 patients with modular ProfemurZ-Wright and 59 with non-modular Zweymüller-EndoPlus femoral stem). The two groups were BMI-, age- and gender-matched and there was no statistically significant difference in the mean preoperative leg length discrepancy or the baseline WOMAC score. All patients were operated upon by a single senior surgeon in 2004-2011 through the lateral transgluteal approach. Leg lengths were measured preoperatively and postoperatively with two clinical methods (absolute, relative) and the radiological trochanteric method. One year after THA all patients again reported WOMAC scores and Oxford Hip Score. Results showed patients with modular femoral stems (ProfemurZ-Wright) had significantly larger postoperative trochanteric leg length discrepancy (10 vs. 6 mm; $p=0.02$) and relative leg length discrepancy (12 vs. 8 mm; $p=0.03$) than patients with non-modular implants (Zweymüller-EndoPlus). There was no significant difference in postoperative self-perceived leg length discrepancy, WOMAC or Oxford Hip Score. In conclusion, modular neck implants do not provide any significant clinical advantage over non-modular implants and do not enable better adjustment of leg length discrepancy.

Date: 2013-10-17

Session: THA - Femoral Implant

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 35751

REDUCED POSTOPERATIVE HIP OFFSET MAY INCREASE WEAR IN METAL ON METAL HIP ARTHROPLASTY

Krishna BODDU, Martin SIEBACHMEYER, Sandesh LAKKOL, Aranghan LINGHAM, Mohammed AL-KOOHEJI, Venu KAVARTHAPU, Patrick LI
King's College Hospital, London (UNITED KINGDOM)

Introduction: Hip simulator studies have shown that low hip offset can cause increased wear in hard on hard hip bearings. No clinical studies have been done to evaluate this effect. We intend to assess the effect of postoperative hip offset change on the metal ion levels in metal on metal (MOM) arthroplasty. **Methods:** We included a cohort of patients who underwent unilateral MOM bearing arthroplasty from 2005 to 2009 in a tertiary level teaching hospital. Serum chromium and cobalt levels were obtained. Preoperative and postoperative radiographs were analysed to measure cup and inclinations, neck length and hip offset. **Results:** 192 patients with MOM hip arthroplasty were identified. Six were revised due to metal adverse reaction and six patients were awaiting revision. 60% of ASR (Depuy) hips showed higher metal ions (>7 ppb) whereas only 14% of non-ASR hips had higher ion levels. Patients with reduced hip offset by more than 5 mm showed significantly higher average metal ion levels compared to the rest of the patients (33.6 vs 8.0, $p=0.002$). On subgroup analysis this effect was present in non-ASR hips (25.5 vs 3.3, $p=0.003$) but was not significant in ASR hips (36.9 vs 15.3, $p=0.13$). **Discussion:** Our study showed the possible effect of reduced hip offset in increasing wear after MOM hip arthroplasty. Decreased soft tissue tension leading to microseparation of the articulation and edge loading is theoretical explanation for this effect. These results have potential implications for other hard-on-hard bearings such as ceramic on ceramic as well.

Date: 2013-10-17

Session: THA - Femoral Implant

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 35641

MARS MRI SCANNING FOR METAL-ON-METAL HIP ARTHROPLASTY

Samer Samir Sayed MAHMOUD, Rhodri GWYN, Kathleen LYONS, Alun JOHN, Stephen JONES

University Hospital Wales, Cardiff (UNITED KINGDOM)

Introduction: Cross-sectional imaging is a key investigation in the assessment and surveillance of patients with a metal-on-metal (MoM) hip arthroplasty. We present our extensive experience with MARS MRI. Our aim is to provide longitudinal data that can contribute to an understanding of the natural history and progression of Adverse Reactions to Metallic Debris. **Methods:** 393 MARS MRI scans for 165 patients having more than one MRI scan were reported by a musculoskeletal radiologist and either described as normal or classified according to the Hart et al classification. We then considered patient's progression between groups on serial scans. **Results:** For the group of patients who had a normal first MRI scan, 60% remained normal on follow-up scan with a scanning interval of 14.7 months. The remaining 31 patients who progressed from normal to either Type 1/2/3 did so over a mean scan interval of 13.5 months. Out of 77 patients with a Type 1 lesion 46% progressed during interval scanning and 10% returned to normal. Over half of the patients with abnormal initial scan, either Type 1 or 2 abnormal soft tissue reactions, (52%) had progressed further with a mean interval scan time of 14 months. **Discussion:** A safe interval for a follow-up MRI scan in a patient who has normal initial findings appears to be 12 months. With an abnormal first scan over half of these patients progressed within 12 months. We consider a 6-month scan appropriate for patients who have initial abnormal MARS MRI scan who are under surveillance.

Date: 2013-10-17

Session: THA - Femoral Implant

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 34539

RESULTS AFTER STEM RETENTION IN METAL ON METAL HIP REVISIONS

Raghu RAMAN, Geoffrey JOHNSON, Shiva GOPAL, Christopher SHAW
Hull Royal Infirmary, Hull (UNITED KINGDOM)

INTRODUCTION: The wear of the trunion and trunionitis have been attributed to the increased failure rate of these hip replacements. The issue of stem removal is controversial in these revisions. **OBJECTIVES:** To report the clinical, radiological and functional results of retaining stems in revision of metal on metal hip replacements **METHODS:** We prospectively reviewed 62 consecutive revisions of MOM hip replacements. The femoral component was retained in all cases. The trunion was inspected in all cases and the wear was graded. **RESULTS:** The mean age was 62.3 yrs. Elevated cobalt and chromium levels were seen in 93% of patients. Metal debris related disease was radiologically demonstrated by MRI in 72%. A short taper stem was used in 11 patients and the rest had a standard length 12/14 taper. A neck sleeve was used in 49 patients. Trunion wear was seen in 12 stems. All ceramic heads were 36 or 40mm in diameter. In two patients, the stem had to be revised later due to squeaking and ceramic fracture. Harris hip scores at last follow up was 78(SD=12.9). **CONCLUSION:** Trunion wear certainly contributes to the debris disease in Metal on Metal hip replacements. The lengths of the trunion and head size significantly contribute to this wear. Short tapers perform poorly and neck sleeves do not seem to affect the wear pattern. Stems with a standard taper length can be retained during revisions and caution must be exercised whilst using ceramic heads larger than 36mm in these revisions.

Date: 2013-10-17

Session: THA - Femoral Implant

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 35280

**THE MORPHOLOGY OF PROXIMAL FEMORAL MEDULLARY CANAL:
A 3D COMPUTER TOMOGRAPHY MEASUREMENTS OF SOUTHERN
CHINESE**

Weinan ZENG, Zongke ZHOU, Bin SHEN, Jing YANG, Pengde KANG,
Fuxing PEI

Department of Orthopaedic Surgery, West China Hospital, West China
Medical School, Sichuan University, Chengdu (CHINA)

Introduction: The morphology of proximal femoral medullary canal is of great variation in different regional and ethnic populations. The purpose of this study is to evaluate the morphology of proximal femoral endosteal of Southern Chinese. **Methods:** 170 normal hips were involved in this study, including 39 women and 46 men. A 64 layer spiral CT was used for hips scanning, Siemens syngo images post-processing work station to obtain three-dimensions reconstruction. Measurement parameters include: position of isthmus, medullary canal diameter, canal flare index(CFI), aspect ratio of medullary canal, epiphysis-shaft (ES) angle and so on, then we statistic the relationship between them, classify the medullary canal according to Noble's and compared these data with Westerner's. **Results:** The average isthmus level was 118.6 ± 13.0 mm in males and 117.5 ± 12.8 mm in females ($p=0.646$) below the lesser trochanter (LT) tip. There were significant differences between males and females in most parameters. But no sex difference in aspect ratio and CFI. And Chinese had a smaller and more flat medullary canal compare to Westerner. The CFI was 4.7 ± 0.9 and 4.8 ± 1.0 respectively ($p=0.891$) for males and females. The percentage of stovepipe was 4.1%; normal was 51.8%; and champagne glass was 44.1%. And the diameter of proximal femoral endosteal, ES angle correlated with height, but the CFI and isthmus position has no correlation with height. **Conclusions:** Our Southern Chinese had very different morphology in proximal femoral endosteal from Westerner, it is necessary to design hip prosthesis consistent with the anatomy characteristic of the Chinese.

Date: 2013-10-17

Session: THA - Dysplasia & Acetabular Defect

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 35406

BULK FEMORAL-HEAD AUTOGRAPHING IN UNCEMENTED TOTAL HIP ARTHROPLASTY FOR DEVELOPMENTAL DYSPLASIA OF THE HIP

Huiming PENG¹, Jiliang ZHAI², Xisheng WENG², Jin LIN², Jin JIN², Wenwei QIAN²

¹Department of Orthopedics, Chinese Academy of Medical Science, Beijing (CHINA), ²Peking Union Medical College, Beijing (CHINA)

Abstract: The purpose of the present study was to evaluate the clinical and radiographic results of primary uncemented total hip arthroplasty (THA) with bulk femoral-head autografting for reconstruction of the acetabulum in patients with developmental dysplasia of the hip (DDH). 16 of 86 patients underwent THA for DDH from September 2001 to March 2011 were included in this study. Harris score, stability of the implants, proportion of socket covered by bone graft, bone ingrowth of the autograft and complications were recorded. Three males and 13 females with a mean age at surgery of 52.0 years (range 28-68 years) were included. The mean duration of follow-up was 5.3 years (range 2.5-10.0 years). The severity of subluxation categorized according to Crowe classification was 2 hips in type II, 6 in type III, and 8 in type IV. The Harris hip score improved from 30.2 (range 10-47) before surgery to 87.2 (70-98) at the latest follow-up with a ratio of 87.5% for good and well results. The mean proportion of socket covered by bone graft was 35.7% and the ratio of bone ingrowth of the autograft was 100%. No revision surgery was undertaken during the investigation period for any reason. Complications included limp in 3 patients, dislocation and periprostheses fracture in one patient, respectively. Our preliminary results support the use of bulk femoral-head autografting in patients with acetabular dysplasia, and further follow-up is warranted.

Date: 2013-10-17

Session: THA - Dysplasia & Acetabular Defect

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 34762

TRANSVERSE SUBTROCHANERIC SHORTENING OSTEOTOMY IN CEMENTLESS TOTAL HIP ARTHROPLASTY FOR CROWE IV HIP DYSPLASIA

Myungsik PARK¹, Jonghyun KHO¹, Hongman CHO², Sunjung YOON¹

¹Biomedical Research Institute of Chonbuk National University, Jeonju

(SOUTH KOREA), ²Gwangju Veterans' Hospital, Gwangju (SOUTH KOREA)

Thirty-one total hip arthroplasties (29 patients, 23 female and 6 male) were performed in cases of high hip dislocation dysplasia using subtrochanteric shortening osteotomy with two kinds of cementless femoral stem as a monoblock and modular type (S-ROM, Modular revision femoral stem). All acetabulum components were used with a cementless cup. The average patient age was 51.03(range, 27-69yrs) years, and the average follow-up time was 5.1 years. Acetabular reconstruction was performed using autogenous femoral head in 11 hips. Preoperative greater trochanter distance was 36.64mm (range, 9-89.2mm). Radiologically, hip centers were nearly normalized by vertical heights of 10.6 mm elevation and horizontal lengths of 1.7 mm compared with uninvolved sites. Leg length discrepancies were improved from 4.7 to 1.5 cm. Early postoperative complications included two nonunion at osteotomy site and one dislocation after monoblock stem, one case of peroneal nerve palsy, and one subsidence occurring after modular stem placement. One dislocation was managed with closed reduction and an abduction brace. One peroneal nerve patient was managed with an ankle stop brace. Late complications included cup loosening in two patients, but there was one loosening in the modular femoral stem. Two non-unions in monoblock stem were managed with bone grafts and changed with modular stems. The average Harris hip score was improved from 53.64(29-83) to 76.23(57-91). These data demonstrate that a cementless modular femoral stem is more useful device for treating dysplastic hip patients.

Date: 2013-10-17

Session: THA - Dysplasia & Acetabular Defect

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 33706

TOTAL HIP ARTHROPLASTY IN PATIENTS WITH ACETABULAR FRACTURES

Mohamed ABO ELSOUD, Fouad ZAMEL, Yasser FARID

Kasralainy School of Medicine - Cairo University, Cairo (EGYPT)

THA was done in 44 patients with recent or old acetabular fractures. They had a mean age of 50.8 years (range 19-72) and average follow-up for 3.4 years. Patients were divided into ORIF, non-ORIF and early THA (< 3 months from injury) groups. We had defects in 41 cases ranging between cavitary, segmental, and pelvic discontinuity. Auto- and allografts were used to fill these defects. This was combined with augmentation devices (including meshes and cages) in 6 cases, and reduction and fixation of the fracture in 9 cases. Defects were more common and of larger size among the non-ORIF compared to the ORIF group. Moreover, nonunions were more common among the non-ORIF group. Other pre-operative complications included partial sciatic nerve injury, HO and obstructive hardware. Cementless acetabular fixation was used in half of the patients. Results: The average post-operative Harris hip score was 83.4 (range 35-95) with 75% of the patients having good and excellent scores. Post-operative complications included 6 cases of Infection, 2 cases with recurrent dislocations, one case of aseptic acetabular loosening with a cemented cup, one case of sciatic nerve injury, and one case with fatal pulmonary embolism. 8 patients had revision surgeries mostly because of infection, with overall survivorship of 81.8% at an average of 3.4 years. This improved to 97.7% having aseptic acetabular loosening as the end point. The age of the patients did not affect the outcome. On the contrary, the ORIF group had inferior functional results and a higher incidence of complications.

Date: 2013-10-17

Session: THA - Dysplasia & Acetabular Defect

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 35341

TRABECULAR METAL RECONSTRUCTION OF SEVERE ACETABULAR DEFECTS

Arash AFRAMIAN, Vasileios GOULIDAKIS, Shubhra SINHA, Richard SLACK
QEJM, Kent (UNITED KINGDOM)

Introduction: We present the short-term results of a single-surgeon series of consecutive augmented acetabular reconstruction (Paprosky 3a/3b) with trabecular metal over three years. **Methods:** Forty-eight patients defined as having a Paprosky 3a or 3b defect were retrospectively reviewed over a three year period. All cases were performed for aseptic loosening. Mean follow-up 3 years. The mean age at time of surgery was 74 years (range 54-90 years). There were 12 men and 36 women. Serial standardised pelvic x-rays were used throughout for the purpose of pre-operative and postoperative analysis. The defect was defined by two independent observers. Analysis of inclination angle and migration was used to define stability in the construct. **Results:** All constructs are stable as defined by the criteria. There have been almost no complications to date. No revisions have been required amongst the patients in this series. **Conclusion:** Hemi-spherical trabecular metal shells with augmentation provide a reliable and reproducible construct for the management of severe acetabular bone defects.

Date: 2013-10-17

Session: THA - Dysplasia & Acetabular Defect

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 34417

TOTAL TOTAL HIP REPLACEMENT AFTER ACETABULAR FRACTURES CONCERNING BONY DEFECTS

Ahmed ABDELAZEEM, Hazem ABDELAZEEM

Cairo University, Cairo (EGYPT)

Introduction: THR after acetabular fractures is salvage procedure for pain and instability, if classic treatment fails. It's a technically demanding procedure with the main difficulty in acetabular cup seating; requiring reconstruction of the bony defects, correction of acetabular distortion, and former implants removal. Methods:retrospective study of 42 cases with a mean age of 48 years old, operated upon between January 2001 to December 2004. THR were done in 39 chronic cases and in only three cases after acute fracture of the acetabulum. Different types of bony defects were identified (segmental defects in 19 cases, cavitary defects in 8 cases, combined defects in 8 cases and pelvic discontinuity in 4 cases) and reconstructed by bone grafts (auto and/or allografts) and fixed by screws only, screws and plates and/or metallic rings. Aim of the study was to evaluate the Functional and radiological outcome of this complex procedure Results: Clinical and radiological follow up with a mean of 64 months. Harris hip score revealed excellent results in 8 cases, good in 14 cases, fair in 12 cases and 8 cases had poor results. Radiologically; three cases showed failure of the graft within the first 6 months with cup loosening, two showed cup. loosening with the first three years. Two cases had temporary sciatic nerve palsy. Two cases had deep wound infection responded well to early wash and debridement. Six cases suffered postoperative dislocations (within the first six months) and two of them required open reduction and antiluxation ring for stabilization.

Date: 2013-10-17

Session: THA - Dysplasia & Acetabular Defect

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 33790

STUDY OF ACETABULAR RECONSTRUCTION WITH ANTIROTRUSIO CAGE AND DUAL MOBILITY SOCKET

Remi PHILIPPOT, Bertrand BOYER, Loic SCHNEIDER, Frederic FARIZON
CHU St. Etienne, St. Etienne (FRANCE)

The main causes of total hip arthroplasty (THA) revisions are loosening and instability. Use of a dual mobility cup cemented in a acetabular reconstruction cage device limits the risk of instability and does not hinder the acetabular fixation during THA revisions. The objective of this study was to analyze a retrospective series of 123 THA revisions with antiprotrusio cage and dual mobility socket. Patients and methods: At a mean follow-up of 41 months , we analyzed a continuous series of 123 revisions using a reconstruction device (87 KerboullTM cross-plates, 12 Burch-SchneiderTM antiprotrusio cages, 24 custom-fit Novae ARMTM cages associated in all cases with a Novae Stick dual mobility cup cemented into the cage). Results: PMA score increased from 9.6 ± 3.06 preoperatively to 15.5 ± 2.32 at the follow-up. 9 early dislocations occurred, but there were no intraprosthetic dislocations. At the follow-up, the X-rays showed eight hardware failures, including one cross-plate fracture, one hook fracture, and one flange fracture. Analysis of the radiological position of the cup showed a mean lowering of 12,87 mm and a 7,33 mm lateralization compared to the preoperative position. 2revisions for aseptic loosening and 3 for septic loosening were performed. Discussion. — This study confirms the advantage of dual mobility cups during acetabular reconstruction cemented in antiprotrusio cages as a way to limit, without eliminating, the risk of dislocation. Therefore cemented fixation of dual mobility cups in cages appears to be a reliable short-term option.

Date: 2013-10-17

Session: THA - Dysplasia & Acetabular Defect

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 35460

**TRITANIUM JUMBO CUPS IN REVISION TOTAL HIP ARTHROPLASTY
WITH MAJOR ACETABULAR DEFECTS: A NEW LOOK**

Chitranjan RANAWAT

HSS, New York (UNITED STATES)

The purpose of our study was to 1) assess the safety and efficacy of Titanium jumbo cups in revision total hip arthroplasty in patients with major acetabular defects, especially Paprosky type IIIa and IIIb and 2) analyze the stability and extent of osseointegration with these implants. From February 2007 and August 2010, 28 consecutive hips (26 patients) underwent acetabular revision arthroplasty using Titanium jumbo cups (Stryker, Mahwah, New Jersey). 28 consecutive hips in 26 patients, with mean age of 69 years received jumbo cups larger than 58mm for treatment of Paprosky type IIIa and IIIb acetabular defects. 14% of the hips had pelvic discontinuity. There was no intra-operative fracture and initial stability was achieved in all hips, supplemented by screws. Tantalum augments were not used in any of the cases. At mean follow-up of 4 years, there were no failures due to loosening or cup migration. Radiographic assessment showed osseointegration in all cups, ranging from 30% to 75% of the cup surface area as assessed in both anteroposterior and false profile views in Charnley zones I through VI. Titanium cup/screw construct provided reproducible osseointegration results for significant acetabular bone loss, Paprosky IIIa and IIIb, in revision total hip arthroplasty.

Date: 2013-10-17

Session: THA - Dysplasia & Acetabular Defect

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 35940

THE LOG SPLITTER FRACTURE: MEDICO LEGAL IMPLICATIONS OF PERIPROSTHETIC FRACTURES OF THE PROXIMAL FEMUR POST THR

Manoj PUTHIYA VEETTIL, Douglas DUNLOP

University Hospital Southampton NHS Foundation Trust, Southampton
(UNITED KINGDOM)

Introduction: Periprosthetic fractures of the femur after THR represent a treatment challenge. The original implant stability is the key to understanding a new subgroup of fracture in cemented polished taper stems. Methods: We report a series of six cases of traumatic loosening of femoral stems post THR during 2008 to 2011. The median age was 68years (57years-82years) with three males and three females. All the patients gave a history of trivial fall or a twisting injury and presented to local hospital and assessed by the local orthopaedic team. Even though the fracture was not recognised radiologically, they were managed with protected weight bearing until pain subsided. Subsequent x-rays revealed obvious femoral stem subsidence and a tertiary referral was made. Sepsis as a cause for subsidence was ruled out. All patients ended up having the femoral stem revised with good outcome. Results: The post injury x-rays revealed the following signs, which we believe are tell-tale signs of a log splitter peri prosthetic fracture:1) Loss of the air space in the centraliser shadow. 2) A radiolucent line proximally and laterally at the shoulder of the stem/cement interface.3) Varus displacement of the stem. 4) Delayed presentation may show fracture callus. Conclusion: These injuries can be easily overlooked in a routine clinic even by an experience orthopaedic surgeon or Radiologist. In our series all the x-rays were reported as normal. These cases in our experience always require further surgical intervention. They also carry a high risk of litigation due to medical negligence.

Date: 2013-10-17

Session: THA Cup Position Follow Up & Infection

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 35455

**A NOVEL METHOD FOR ACCURATE AND REPRODUCIBLE
FUNCTIONAL CUP POSITIONING IN TOTAL HIP REPLACEMENT**

Chitranjain RANAWAT

HSS, New York (UNITED STATES)

Introduction: The aim of this study was to describe a reproducible, novel technique for functional cup positioning using internal and external bony landmarks and the transverse acetabular ligament (TAL). **Methods:** The pelvic obliquity and tilt are measured on the pre-operative weight bearing AP and lateral pelvic radiographs. Intra-operatively, the highest point of the iliac crest is identified and a line is drawn to the middle of the greater trochanter with knee flexed to 90 degrees and leg thigh horizontal to the floor, parallel to the APP. The cup is placed parallel to the TAL and inside the anterior acetabular wall notch, and then is adjusted for the femoral anteversion, pelvic tilt and obliquity. The angle between the drawn line and the cup handle is the operative anteversion. 78 consecutive total hip replacements (76 patients) were performed using this technique. The functional cup orientation was measured on post-operative weight bearing pelvic radiographs using EBRA software. **Results:** The mean follow-up was 1.2 ± 0.3 years. There were no fracture, dislocation or infection. The mean functional AV and AA were $17.9^\circ \pm 4.7^\circ$ (7.8 – 28.7) and $41.7^\circ \pm 3.8^\circ$ (33.4 – 50), respectively. The mean pelvic tilt and obliquity were $-3.1^\circ \pm 9.7^\circ$ (-25 – 9) and $-1.5^\circ \pm 3.2^\circ$ (-9.9 – 7.4), respectively. 96% of functional AV and 100% of functional AA measurements were within the safe zone. **Discussion:** This is an easy, accurate, and reproducible technique, which uses bony landmarks.

Date: 2013-10-17

Session: THA Cup Position Follow Up & Infection

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 34334

THE DIFFERENCE OF OPERATIVE VERSUS RADIOGRAPHIC ALIGNMENT. SATISFACTORY ACETABULAR CUP INCLINATION ACHIEVED BY A SIMPLE ROD ATTACHED TO A PINNACLE CUP IMPACTOR TOOL

Jens BOLDT

Klinik Siloah, Guemligen (SWITZERLAND)

Acetabular cup inclination has become exceedingly important not only when using hard on hard bearings in THA. Metal wear issues, ceramic squeak and polyethylene wear were linked increasingly with steep cup placements in the last decade. Whereas cup anteversion alignment parallel to the transverse acetabular ligament (TAL) is relatively straight forward, cup inclinations remain a frustrating challenge in even the big volume surgeon. Recent publications teach us of the important increase of about five degrees of inclination between operative and radiographic angles in THA cups. This is a RCT study on 100 consecutive Pinnacle and Corail THA in which the intraoperative inclination angle was measured and compared to the radiographic inclination angle on postoperative pelvic views. Single surgeon consecutive series using an anterolateral approach in supine with Pinnacle and Corail hip implants. All angles were digitally measured using imageJ-64 software. The cup inclination was on average 5.7 degrees steeper (range: 3.1 to 8.6) when compared to the intraoperative alignment rod angles. The mean radiographic inclination angle in this 100 THA cups was 44 degrees (range: 34 to 59). The data of this simple randomised clinical trial confirms recent "warnings" on the undesired increase of about five degrees of steeper inclination on postoperative THA films as opposed to the operative cup alignment. In conclusion: if we desire 40 degrees of cup inclination on radiographs we must aim for 35 degrees intraoperatively. An advice that any hip surgeon can simply not afford to ignore.

Date: 2013-10-17

Session: THA Cup Position Follow Up & Infection

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 34916

FIFTEEN YEARS FOLLOW UP STUDY OF CEMENTED TOTAL HIP ARTHROPLASTY

Siwach RAM CHANDER SIWACH¹, Rakesh Goel RAKESH GOEL²

¹BPS GMC FOR WOMEN KHANPUR KALAN, Sonepat (INDIA), ²Pt. B D Sharma Postgraduate Institute of Medical Sciences, Rohtak (INDIA)

Background: To evaluate the functional and radiological outcome of primary total hip replacement (THR) using modular total hip system at 4-15 years follows – up. **Materials and Methods:** The cohort comprised 300 operated cases for total hip replacement using modular hip system, with an average follow up of 7.07 years ranging from 4-15 years. In 153 cases cemented THR, in 39 cases hybrid and in 108 cases uncemented THR was done. Harris hip score was used for clinical evaluation. Osteolysis was recorded in three acetabular zones described by DeLee and Charnely and the seven femoral zones described by Gruen et al. **Results:** The average age at operation was 52.46+/- 9.58 years. Twenty one patients died due to causes unrelated to surgery. At the last follow-up mean Harris Hip Score was 83.5. radiolucent lines were present in 99 (33%) acetabular and 81 (27%) femoral component. Twenty hips have been revised, twelve for aseptic loosening as proved by negative culture at revision and eight hips for post traumatic periprosthetic femoral fractures. One girdle stone resection was done for deep infection. Out of 278 hips available for at latest follow-up 255 arthroplasties were intact and functioning well. **Conclusion:** The results of our study support the continued use of the cemented modular hip system. The acetabular loosening was more common than femoral in our study. **Keywords:** Cemented THR, Uncemented THR , Osteolysis

Date: 2013-10-17

Session: THA Cup Position Follow Up & Infection

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 34766

THE CLINICAL RESULTS OF PRIMARY AND REVISION HIP ARTHROPLASTY IN PATIENTS OVER 90 YEARS OF AGE

Amit SHAH, Daniel COHEN, Videsh RAUT

Wrightington Hospital, Wigan (UNITED KINGDOM)

Introduction: Overall results of hip arthroplasty surgery are very good, but certain groups of patients do less well. We present results of the only study looking at patients over 90 years of age to undergo primary or revision hip arthroplasty surgery. **Method:** We reviewed our prospective database to identify patients over 90 years of age who underwent primary or revision hip arthroplasty between 1975 and 2011. **Results:** 59 patients (59 hips) in total were identified. These included 37 primary and 22 revision procedures, 21 males and 38 females, and 35 right and 24 left hips. The mean age at surgery was 91.4 years (range 90-96 years). The mean follow up was 1.5 years (range 0.25-6 years). Complications included one deep infection, three dislocations, one deep vein thrombosis, five patients with delayed wound healing, ten urinary tract infections, five trochanteric non unions and one periprosthetic fracture of the femur. There were no deaths within 30 days of surgery. **Discussion:** Hip arthroplasty surgery is a well recognised procedure to reduce pain and improve function. We present a higher than normal complication rate which is to be expected in this population group. Patients over 90 years of age, and their families, who are considering hip arthroplasty surgery should be advised of the age related increased risks of surgery.

Date: 2013-10-17

Session: THA Cup Position Follow Up & Infection

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 33804

CEMENTED VERSUS UNCEMENTED FIXATION IN TOTAL HIP REPLACEMENT: A SYSTEMATIC REVIEW & META-ANALYSIS

Ali ABDULKARIM¹, P. ELLANTI², N. MOTTERLINI³, T. FAHEY³, J.M. O'BYRNE³

¹Department of Orthopaedic Surgery, Cappagh Orthopaedic Hospital, Dublin (IRELAND), ²AMNECH, Dublin (IRELAND), ³HRB, Royal College of Surgeons in Ireland, Dublin (IRELAND)

Introduction: Controversy exists regarding the optimal method of fixation for primary total hip replacement. **Methods:** We performed a systematic review and meta-analysis of all randomized controlled trials (RCTs) available in the published literatures that compare cemented versus uncemented fixation in THR. **Results:** Our Meta analysis of the included RCTs suggests that there is no significant difference between cemented and cementless hip arthroplasty in term of survival of implant measured by revision rate. However, better short-term clinical outcomes mainly improved pain score can be obtained with cemented fixation than those without cement. On the other hand the results are still unclear for the long-term clinical and functional outcome. No difference was evident in mortality or complications rate between the two fixation methods. On the other hand, radiographic differences are variable and do not seem to correlate with clinical findings. Differences in both cemented and cementless surgical technique combined with nature of the prosthesis might be associated with the incidence of osteolysis . We strongly emphasize the need for more uniform standards in the selection of control groups and better reporting technique in future orthopaedic randomized trials. Further research, improved methods and longer follow up are necessary to better define specific subgroups of patients in which the relative benefits of cemented and uncemented implant fixation can be more clearly demonstrated. **Conclusion:** Cemented hip arthroplasty is similar if not superior to cementless fixation, and provide better short term clinical outcomes. Our findings summarize the best available evidence and provide information for future research.

Date: 2013-10-17

Session: THA Cup Position Follow Up & Infection

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 34514

MID TERM RESULTS OF THE PROXIMA HIP

Nicola SANTORI, Domenico POTESIO, Antonio BERTINO, Francesco

Saverio SANTORI

Rome American Hospital, Rome (ITALY)

In the mid 1990s, an ultra short proximal loading custom-made component with a lateral flare, high femoral neck osteotomy and absence of diaphyseal stem was developed in our institution. In 2005, as a consequence of the good results with this short device, a standard short stem with same biomechanical features was introduced in the market: the Proxima Hip. From 2005 to December 2012, 689 patients (352 men and 337 women) received 879 Proxima stems (190 bilateral). Mean age was 56.8 years (18-94) at the time of surgery. Mean follow-up was 56 months (6-97 months). All patients were followed clinically and radiographically with Harris Hip Score and Womac score. The mean HHS increased from 49 (24-79) preoperatively to 95 (86-100) after an average of 56 months. Average WOMAC score was 95 at last follow up. No patient complained of tight pain. We had major complications in 11 cases (1.25%): 2 sciatic nerve palsies, 2 cup revisions due to loosening, 2 ceramic liner breakage, 2 metallosis requiring cup revision, 2 deep infections and 1 case of early mobilization of the stem. On radiographic evaluation, regular bone ongrowth was present in all cases with the constant finding of a positive periprosthetic bone remodelling and spot welds along both the medial and lateral flares of the stem. No signs of radiographic loosening, severe bone loss or diaphyseal cortical hypertrophy were detected. Our experience with the Proxima stem validates the assumption that a short stem can achieve primary stability and a satisfactory periprosthetic bone remodelling in a large cohort of patients at mid term follow-up. In this series, we were able to reproduce the good long term results achieved with the custom made short stem employed in the past.

Date: 2013-10-17

Session: THA Cup Position Follow Up & Infection

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 34360

ANTIBIOTIC-LOADED CEMENT BEADS WITH RETENTION OF THE PROSTHESIS FOR THE TREATMENT OF INFECTED REVISION TOTAL HIP ARTHROPLASTY

Jun-Dong CHANG, Je-Hyun YOO, Atul BHARDWAJ, Tae-Young KIM, Myeong-Jae SEO

Arthroplasty Center, Department of Orthopaedic Surgery, Dongtan Sacred Heart Hospital, Hallym University, Hwaseong (SOUTH KOREA)

Introduction: The treatment of infected revision total hip arthroplasty (THA) is very difficult due to retained revision prosthesis, poor bone stock and soft tissue condition because of previous surgeries, and other comorbid factors. The purpose of this study is to evaluate the effectiveness of antibiotics loaded cement-bead insertion with retention of the prosthesis for treatment of infected revision THA. **Methods:** Ten patients were treated by antibiotics loaded cement-bead insertion for the infected revision THA. The mean age was 68.1 years. The causes of the last revision surgery were re-infection after 2-stage re-implantation in 6 cases and loosening with osteolysis in 4 cases. The mean interval from insertion of cement beads to removal was 61 days. The antibiotic-loaded cement beads were made by adding vancomycin to the pre-manufactured gentamicin-mixed cement. The mean follow-up period was 46 (12-64) months. **Results:** The mean WBC count (/uL), neutrophil count (%), ESR (mm/hr), and CRP (mg/L) before the antibiotic loaded cement bead insertion were 7000, 60.89, 46.50, and 28.38 respectively, while at the last follow-up they were 6510, 52.8, 28.3, and 6.6 respectively. There was no evidence of reinfection in 9 of 10 patients during follow-up periods. The causative organism in the failed case was Prevotella oralis. **Conclusion:** The antibiotic-loaded cement bead insertion with retention of the prosthesis for the infected revision THA was successful in 9 of 10 cases (90%). This method could be tried as an alternative to the treatment of infected revision THA, when it is difficult to perform another 2-stage re-implantation.

Date: 2013-10-17

Session: THA Cup Position Follow Up & Infection

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 34925

EVALUATION AND MANAGEMENT OF PERIPROSTHETIC HIP INFECTION – WHERE DO WE STAND?

Saseendar SHANMUGASUNDARAM

Indira Gandhi Medical College and Research Institute, Puducherry (INDIA)

The frequency of total hip arthroplasties and hence periprosthetic infections has increased substantially. Several protocols exist for management of such periprosthetic infection. The study analyses the diagnostic methods and treatment protocols used in three leading centres in New York, Zurich and London to assess the efficacy of such protocols. Adults presenting with total hip periprosthetic infection between December 2008 and November 2011 were recruited. There were 60 infected hips in 59 patients; mean age at primary surgery-63 years. Infection presented 4 days to 20 years following primary procedure. There were 19 early infections and 41 late infections. Majority(63.3%) presented within a year of primary surgery. Diagnostic aspiration was performed in 27 hips (45%), of which 12 (44.4%) grew an organism. Only 51 of the 60 hips, grew an organism from tissue samples. Subsequent tissue cultures grew different organisms in 14 hips. 70.4% grew different organisms in aspirate and tissue samples. Debridement alone was performed in 8 hips while 52 hips underwent revision of prosthesis. At last follow-up, 86.7% had healed while 13.3% had persistent infection. Three hips had ended in girdlestone arthroplasty, 4 underwent proximal femoral replacement for osteomyelitis. The initial treatment protocol failed in 27 (45%) of the hips. Total hip arthroplasties with late infection were more prone for revision of prosthesis ($p=0.001$). The high failure of initial treatment even in the best of centers warrants a closer study of such failed revisions, a revival of the protocols used and strict adherence to them.

Date: 2013-10-17

Session: Paediatrics - Growth Modulation & Upper Limb

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 34620

RESULTS OF 8 PLATE EPIPHYSIODESIS FOR LEG LENGTH DISCREPANCY (LLD)

Rohit MAHESHWARI¹, Santosh BALIGA², Simon BARKER², Kirsten ELLIOTT², Tim DOUGALL²

¹NHS Grampian, Edinburgh (UNITED KINGDOM), ²NHS Grampian, Aberdeen (UNITED KINGDOM)

Introduction- The 8-plate (Orthofix, SRL, Verona, Italy) is a titanium extraperiosteal plate with 2 screws which act as a hinge at the outer limits of the physis. To our knowledge this is the first study describing the usage of 8-plates in leg length discrepancy (LLD) correction. The aim of this study was to evaluate outcomes of temporary 8-plate epiphysiodesis in LLD. **Methods-** This retrospective study included 30 patients between 2007 and 2010. Patients in whom the epiphysiodesis was combined with a lengthening or shortening procedure were excluded from the study. Leg length measurements were recorded using correct full leg length scanograms and comparison made between preoperative, interval and final scanograms. Any deviations of the mechanical axis were also recorded. **Results-** During the study period 34 epiphysiodeses were performed on 30 patients. There were 17 males and 14 females. The average age at the time of procedure was 10.7 years (range 3-15). Average time to final follow up was 24 months (range 52-10).The average preoperative LLD was 2.5 cm (range 1.5- 6cm). The mean residual LLD at end of treatment was 1.1cm (range 0- 4.5cm). Two patients experienced genu recurvatum deformity while one patient had cut-out of the screws for which the procedure was repeated. None of our patients experienced any angular deformity, overcorrection or premature fusion postoperatively. **Conclusion-** Based on our experience 8-plates epiphysiodesis is a reversible, minimally invasive procedure with reliable results in length correction, with low morbidity, and an acceptable complication rate.

Date: 2013-10-17

Session: Paediatrics - Growth Modulation & Upper Limb

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 33580

LATE SEQUELAE OF SEPTIC KNEE, ITS MANAGEMENT AND ROLE OF GROWTH MODULATION

Saktiprasad DAS, Ganesh SANKAR, Ramnarayan MOHANTY

SVNIRTAR, Cuttack, Odisha (INDIA)

INTRODUCTION- Much attention has been paid to neonatal septic arthritis of hip, to its complications and management. By contrast there are few reports of managing septic arthritis sequelae of knee. Damage to epiphysis, physis and metaphysis occurs leading to soft tissue contracture, varus , valgus, flexion and extension deformity and limb length discrepancy. Purpose of our study is to classify the pattern of deformity, review our experience with deformity correction and to study the role of growth modulation. **MATERIALS AND METHODS-**We have reviewed 69 cases of knee deformity due to neonatal septic arthritis. Genu valgum is very common followed by varum , flexion and extension respectively. Cases were managed with soft tissue release, osteotomy, limb lengthening and growth modulation. **RESULTS-** By the above procedures we could correct the deformity in most of the cases. Stable, mobile non deformed and painless joint could be achieved. Deformity could be corrected by growth modulation by 8-plate in early detected cases. **CONCLUSION-** Growth modulation is a good technique in early detected cases of septic knee sequelae. However, stable, non deformed painless joint could be achieved in most of the cases.

Date: 2013-10-17

Session: Paediatrics - Growth Modulation & Upper Limb

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 34408

8-PLATE FOR THE CORRECTION OF ANGULAR DEFORMITY ABOUT THE KNEE: DOES THE SDA CORRELATE WITH OTHER RADIOGRAPHIC DETERMINANTS?

Ratna JOHARI, Ashok JOHARI, Rishabh SETHI, Shalin MAHESHWARI
Childrens Orthopedic Center, Mumbai (INDIA)

Introduction: 8-plate guided growth system consists of a nonlocking extraperiosteal plate and two screws, serving as a tension band. Various radiographic deformity determinants like tibio-femoral angle (TFA), mechanical axis deviation (MAD), joint orientation angles and screw divergence angle (SDA) are used to assess the correction. The purpose of our study is to establish the rates of correction for this system and to find out the inter and intra observer variability. **Materials and methods:** Prospective review of 35 patients was done. Standard surgical technique as per Stevens PM. Rates of changes were determined and Pearson's correlation coefficient was calculated between changes in the radiological deformity determinants. **Result:** 17 patients were males and 18 were females. The average age at time of surgery was 11 years. Overall correction rate was 0.5 degrees (TFA) per month. Rate was higher in males, patients of age group 10 and below and when femur was operated upon. The rates of correction were different in different etiological groups, highest in post infective group and lowest in post trauma group. Significant positive correlation was found between SDA change, MAD, TFA, LDFA and MPTA. **Conclusion:** 8 plate construct can be used with minimal complications in patients with angular deformities around the knee. Rates of correction depend on age, sex, deformity, etiological diagnosis and bone to be operated on. We suggest using SDA change for following up patients regularly and to use a full-length standing radiograph for final follow-up before plate removal.

Date: 2013-10-17

Session: Paediatrics - Growth Modulation & Upper Limb

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 33840

**TREATMENT OF A KNEE JOINT VARUS DEFORMITY AT CHILDREN
BY GUIDED GROWTH**

Sergei SERDJUCHENKO, Aleh SAKALOUSKI, Andrei DZEMIANTSOU,
Issam HAMMOUD

State Institution Republican Scientific-Practical Centre of Traumatology and
Orthopedics, Minsk (BELARUS)

Introduction: The “gold standard” treatment angular deformity of a knee is osteotomy. It is can't be replaced at multiplane deformations. To correction simple deformations we use guided growth. Methods: The guided growth method was used in 17 cases (group 1). The placing of fixator was effected on an external part of a femur distal growth plate or proximal tibia growth plate. In control group 2 osteotomy of either femur or tibia were made, in total 20 cases. The following parameters were estimated for analysis of treatment results: aTFA, location of a mechanical axis, relapses, complications. The Mann-Whitney test and Wilcoxon test were used for statistical analysis. Results: The results are followed at all patients. The median of observation term made 9 and 12 years ($p>0,05$). aTFA before operation in group 1 was -14° , in group 2 -18° ($p=0,902$), after the treatment, in group 1 was 5° and in group 2 was 0° ($p=0,003$). In the group 1, the mechanical axis passed through the centre of a knee joint in 82,4 % of cases and in control group in 70 % of cases. In control group 60 % of deformation relapses were observed within the first year after operation. We did not observe growth arrest, growth disturbances and relapses at use of guided growth. We have received excellent and good results in group 1 in 82,4 %, whereas in group 2 only in 35 %. The obtained data testifies that to correction of simple deformations preferably use guided growth than osteotomy.

Date: 2013-10-17

Session: Paediatrics - Growth Modulation & Upper Limb

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 35868

ADULT PROXIMAL HUMERAL LOCKING PLATE FOR FIXATION OF PEDIATRIC SUB-TROCHANTERIC FEMORAL FRACTURES

Mukul MOHINDRA, Dhananjay SABAT

Maulana Azad Medical College, New Delhi (INDIA)

Introduction- Pediatric subtrochanteric femoral fractures being rare have received limited attention in the literature and thereby appropriate fixation methods have remained controversial. A number of options are in practice viz. skin traction, 90/90 skeletal traction, spica casting, internal fixation with Tens nail or locking plates etc. **Methods-** we are presenting our results in 16 children with average age of 9.6 years, in whom subtrochanteric femoral fractures were fixed using adult proximal humeral locking plate. In all cases a single 4.5 mm proximal humeral locking plate of the ipsilateral side was used with length and number of screws used to achieve stable fixation being determined by the nature of fracture. **Results-** Average follow-up was 12 months (range, 10 to 24 months). All fractures united with anatomical alignment within an average of 8 weeks (range 6 to 12 weeks). There were no deep infections and no significant limb length discrepancies. At the latest follow-up, no patient had any restriction of activities. **Discussion-** Internal fixation of subtrochanteric femoral fractures with a proximal humeral locking plate appears as a good treatment option especially for children more than 6 years old where spica application may be cumbersome. It is an especially good option in comminuted and high spiral fractures where elastic nailing may not provide adequate fixation as one may be able to drive almost two rows of long screws up the femoral neck in proximal humeral locking plate which is not even possible with the routine LCPs and reconstruction plates.

Date: 2013-10-17

Session: Paediatrics - Growth Modulation & Upper Limb

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 34985

**MANAGEMENT OF SPRENGEL SHOULDER DEFORMITY BY
MODIFIED WOODWARD'S PROCEDURE**

Bhaskara Kanakeshwar RAJA, Sandeep PATWARDHAN

Sancheti Institute of Orthopaedics and Rehabilitation, Pune (INDIA)

Introduction:-Sprengel's deformity or the congenital elevation of scapula is an anomaly of the shoulder in which the patient's main concerns are cosmesis and function of the affected shoulder. We evaluated our results of Sprengel's shoulder deformity correction with modified Woodward's procedure.
Materials and methods:- We retrospectively studied the patients with congenital elevation of scapula from 2005 to 2012, operated with modified Woodward's procedure. Clinical and radiographic examinations were done in all the patients. Results-We evaluated 49 patients with average follow up of 20 months. Improvement was seen in all the cases. The appearance improved by one grade in 30 children and by two grades in 19 other children, according to Rigault's classification.
Discussion:-surgical procedures for Sprengel may involve release and resection of scapula or release and relocation. We found woodward procedure of release and relocation, to be much easier to execute. The final result in our series was good with acceptable clinical and functional outcome. We found a mean increase in abduction of $34.2^\circ \pm 11.8^\circ$ (15-50) and flexion of $20.6^\circ \pm 9.8^\circ$ (10-25), mean improvement in scapular height of 2.3 ± 1.2 cm (0.5-4.5 cm) and a Cavendish outcome Grade I in 18, grade II in 10. Thus we had 65% satisfactory results in terms of cosmesis and 85% excellent results in terms of function of the affected limb.
Conclusion:-Surgical correction for Sprengel's shoulder deformity warrants good cosmetic correction and improvement in function. We found modified Woodward's procedure gives good clinical and functional outcome in cases of Sprengel shoulder with minimum complications

Date: 2013-10-17

Session: Paediatrics - Growth Modulation & Upper Limb

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 35108

A NEW RADIOLOGICAL SIGN FOR SEPARATIONS OF THE ENTIRE DISTAL HUMERAL PHYSIS – THE ‘HURCO’ SIGN

Siddhartha SHARMA¹, Yuki HARADA², Sarthak SHARMA³, Hiroyuki KATAOKA², Yoshihide TOMODA², Mohammad Farooq BUTT³

¹Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh (INDIA), ²Medical Center for Children, Shiga (JAPAN),

³Government Medical College and Associated Hospitals, Jammu (INDIA)

Background: Separations of the entire distal humeral physis (DHP) are difficult to diagnose on plain radiographs and may mimic humeral lateral condyle (LC) fractures, particularly in the 3 - 7 years age group. Many authors have emphasized the need for arthrography, ultrasonography or Magnetic Resonance Imaging (MRI) for diagnosis of these injuries. The aim of this study was to describe a new radiological sign for DHP separations on antero-posterior (AP) radiographs of the elbow – the ‘HURCO’ sign and determine its accuracy and reproducibility. **Methods:** Retrospective case control study. The presence or absence of our new sign was examined by four independent and blinded assessors. 20 radiographs of confirmed DHP separations were selected as cases. 20 radiographs of confirmed humeral LC fractures and 20 normal elbow radiographs were chosen as controls. The controls were matched for age, sex and side of involvement. **Results:** A positive ‘HURCO’ sign was noted in 19 of the 20 cases of DHP separation. With 95% confidence intervals, the specificity and sensitivity of the ‘HURCO’ sign for DHP separations was 95%, the positive predictive value was 90.5% and the negative predictive value was 97.4%. The inter-observer and intra-observer agreement, as calculated by Cohen’s kappa coefficient was 0.83 and 1.0 respectively (excellent). **Conclusion:** The ‘HURCO’ sign is reliable and reproducible, does not require special positioning or equipment and may obviate the need for MRI, ultrasonography or arthrography for diagnosis of distal humeral physeal separations. **Level of evidence:** Level III (case control study)

Date: 2013-10-17

Session: Paediatrics - Growth Modulation & Upper Limb

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 35031

FUNCTIONAL OUTCOME AFTER CENTRALISATION OF ULNA IN CHILDREN WITH RADIAL CLUB HAND

Shashikanth Shankaranarayana VOKKALERI, Sudesh PEBAM, Sandeep PATEL

PGIMER, Chandigarh (INDIA)

Background: Centralisation of ulna in radial club hand is a well accepted surgical procedure. There is a paucity of literature describing the functional outcome after this procedure.

Methods: Thirty children(40 wrists) with only type III and type IV radial club hand without severe anomalies were included in the study. Centralisation of ulna over the carpus without damaging the physis was done using K-wires. After the procedure children were followed up for minimum of 2 years. **Results:** There was a good improvement in cosmetic appearance of hand of all children except three children who had fair improvement. The range of wrist flexion - extension arc averaged at 45 degrees. Children had minimal pain as measured using Visual Analogue Scale. The average Jebsen-Taylor score was 44 seconds for all activities. Radiographs showed intact ulnar physis in most of the children except in three children who had varying degrees of growth arrest. Ulnar length increased by an average 4.6cm postoperatively at the end of two years. **Conclusion:** We conclude that centralisation of ulna done at appropriate age with minimal fixation without damaging the ulnar physis can lead to better cosmetic and functional outcome in radial club hand. Level of evidence : Therapeutic, level III.

Date: 2013-10-17

Session: Paediatrics - Hip & Knee

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 35766

**EVALUATION OF BLOOD FLOW BY POWER DOPPLER
ULTRASONOGRAPHY OF NORMAL HIPS IN NEONATES**

Rujuta MEHTA¹, Chasanal RATHOD¹, Alka KARNIK², Dominic D'SILVA¹,
Alaric AROOJIS¹

¹Bai Jerbai Wadia Hospital for Children, Mumbai (INDIA), ²Balabhai Nanavati
Hospital, Mumbai (INDIA)

Background: Variations in vascularity of the femoral head has been well studied in the adult skeleton. There are no studies to document and define the normal perfusion in the infant hip . The purpose of our study was to conduct a pilot baseline research with respect to velocity and impedance values in the posterior retinacular artery to define a nomogram of hips of infants.

We aimed to study i) the changes in blood flow in the capsular vessels of the femoral head ii) document velocity and resistance parameters (PDUS) in the capsular vessels Materials and Methods:

The study was performed by a single sonologist on a single machine with a 17Mhz probe. 43 hips in 24 infants were evaluated for Velocity of blood flow in posterior retinacular vessels(PSV- Peak systolic velocity), Impedance Resistance: Resistance Index(RI) and Pulsatility Index(PI); the Ratio of the two: SD ratio. Results: The mean age of infants was 29 days(2-180). The mean PSV values were $5.68 \pm 2.02\text{SD}$, mean RI and PI values were $0.57 \pm 0.12\text{SD}$ and $1.01 \pm 0.28\text{SD}$ respectively and SD ratio was 2.6 ± 0.78 SD. There is no significant correlation of values with the age group. Conclusion: We hence provide normal range of PDUS values of infant hips in a small sample size in the Indian population. These values can serve as a reference for comparison in pathological conditions like septic arthritis and transient synovitis of hip.

Date: 2013-10-17

Session: Paediatrics - Hip & Knee

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 35555

UNIQUE V SHAPED WEDGELESS OSTEOTOMY

Gaurav KAMRA, Vikas GUPTA

Safdarjung Hospital, New Delhi (INDIA)

INTRODUCTION: Angular malalignments such as knock knees and bow legs are common malalignments seen in clinical practice. The goal is restoration of normal mechanical axis alignment and joint orientation so that transverse axis of knee and ankle are parallel to each other. Nothing much is available in the literature about supracondylar V-shaped wedgeless osteotomy in which deformity is corrected by impaction of cancellous bone and no wedges are taken. Advantages of this relatively simple technique include low morbidity, good stability and a short learning curve.

METHODS: The study was conducted at Safdarjung hospital, India from August 2010 to December 2012. A total of 46 V-osteotomies were performed on 30 patients and internal fixation was done with moulded L-buttress plate. The pre-op and post-op deformity correction, range of motion and symptomatic correction along with deformities were noted .Non weight-bearing mobilisation started at 6 weeks post surgery and weight-bearing was allowed at 3 months. Follow up after that were done every 3 months to assess the functional outcome. A knee score for clinical assessment suggested by Bostman et al was used to assess the outcome.

RESULTS: The average pre-operative and the post-operative tibio-femoral angles were 23° and 5°. All had good deformity correction and functional outcome. The results were statistically significant as assessed by paired T test.

CONCLUSIONS: V- shaped wedgeless osteotomy has the advantages of being wedgeless, early union, early mobilisation with achievement of full range of motion without any complications of non-union or opening up of the fracture site.

Date: 2013-10-17

Session: Paediatrics - Hip & Knee

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 34624

HIP JOINT THREE-DIMENSIONAL RECONSTRUCTION IN SEVERE CASES AT PERTHES DISEASE AFTER TRIPLE PELVIC OSTEOTOMY

Alexander BELETSKY, Andrei DZEMIANTSOU, Oleg SAKALOUSKI,

Sergei SERDJUCHENKO, Roman GOLDMAN

State Institution Republican Scientific-Practical Centre of Traumatology and Orthopedics, Minsk (BELARUS)

Already at early stages of Perthes disease's unfavorable course there appear abnormalities in hip anatomic relations which lead to hips subluxation. We performed 41 triple pelvic osteotomy (TPO) for 40 patients (operated patients group) to restorate the anatomy of the hip. We supervised 20 children (control group) with unfavorable signs of disease and who were not involved in operative measures by different reasons. The groups are statistically comparable by key indicators. We have observed patients clinically and with radiological methods, including computer tomography with 3D-reconstruction. Indications of TPO include signs of poor prognosis at stages 2-3. The indication of TPO on residual stages are secondary acetabular dysplasia and decentration. TPO prevented deformation of the head of a hip at stages 2-3 as a result remodeling of femoral caput by spherical acetabulum. At late stages operation is undertaken to avoid hip arthrosis. In all cases the head centration and stability of a joint are restored. The angle of Wiberg has increased from $5,4 \pm 7,87^\circ$ to $37,1 \pm 6,47^\circ$, index acetabular coverage – from $67,8 \pm 9,78\%$ to $99,5 \pm 7,4\%$. TPO - it is a method of choosing the surgical treatment of Perthes disease that leads to hip anatomy restoration.

Date: 2013-10-17

Session: Paediatrics - Hip & Knee

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 35520

PERCUTANEOUS FIXATION OF SUBTROCHANTERIC FEMORAL FRACTURES IN CHILDREN

Sherif GALAL

Cairo University School of Medicine, Cairo (EGYPT)

Subtrochanteric femoral fractures in children are uncommon and have received limited attention in the literature. Its treatment is controversial,different options are available: traction,spica casting,internal fixation and external fixation. The aim of this study is to present our results with external fixation of subtrochanteric femoral fractures in children using a low profile Ilizarov frame.Between 2011 and 2013, ten patients with closed subtrochanteric femoral fractures were treated in Cairo University school of medicine Hospital. The average age at the time of injury was 6.4 years (range 3.8 years to 10.2 years). Pathological fractures and fractures associated with neuromuscular diseases were excluded from this study. Four patients were multiply injured with abdominal injuries (as rupture spleen). In all cases a low profile Ilizarov frame was inserted using tow Schanz screws inserted proximally from greater to lesser trochanters parallel to the hip joint orientation line and secured to an arch, another tow Schanz screws were inserted distally perpendicular to the femoral shaft and secured to an arch that was connected by three rods to the proximal arch.No postoperative spica was used. Average follow-up was 9 months(range, 6 to 15 months).All fractures united with anatomical alignment within an average of 8 weeks (range 6 to 12 weeks). There were no deep infections and no significant limb length discrepancies. At the latest follow-up, no patient had any restriction of activities.External fixation with a low profile Ilizarov frame appears as a good treatment option for subtrochanteric femoral fractures in children.

Date: 2013-10-17

Session: Paediatrics - Hip & Knee

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 35238

**COMPARITIVE STUDY OF DOUBLE C AND CS CONSTRUCT WITH
ENDER'S NAIL IN DIAPHYSEAL FRACTURES OF LONG BONES IN
PEDIATRIC AGE GROUP**

S. K. VENKATESH GUPTA

Mamata Medical College/ General Hospital, Khammam (INDIA)

The need for operative fixation of paediatric diaphyseal fractures is increasingly being recognized in the present decade. 56 paediatric patients in the age group 6-12 years with diaphyseal fractures were stabilized with minimum two Enders nails. Patients were followed up clinically and radiologically for 2 years. The final results were evaluated using the criteria of Flynn et al. Technical problems and complications associated with procedures were also analyzed. Overall results observed were excellent in 46, satisfactory in 10, and no poor results. Hospital averaged 10 days in the series. All fractures healed with an average time to union of 6 weeks. The soft tissue discomfort near the knee joint produced by the nailing was the most common problem encountered. Shortening was observed in 4 cases and restriction of knee flexion in 4 cases. There was no delayed union, infection or refractures. Per operative technical problems included failure of closed reduction in 6 cases. Residual angulation occurred in 4 cases of with the medial C and S construct, versus none with the double C construct. While the C and S construct were superior biomechanically, the double C construct is more reliable and straightforward and remains preferred technique. We believe that with proper operative technique and after care, Enders nail may prove to be one of the best implant for paediatric diaphyseal fracture fixation for Indian scenario. The most common complication associated with the procedure are infact features of improper technique and can be eliminated by strictly adhering to the basic principles and technical aspects.

Date: 2013-10-17

Session: Paediatrics - Hip & Knee

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 34774

**FEMOROACETABULAR IMPINGEMENT PREVENTION AFTER
REDIRECTIONAL PELVIC OSTEOTOMY IN CHILDREN AND
ADOLESCENTS WITH HIP INCONGRUENCY**

Victor FILIPCHUK, Victor TORCHINSKY, Yevhen HOLIUK

Institute of Traumatology and Orthopaedy of Ukrainian Academy of Medical Sciences, Kyiv (UKRAINE)

Pelvic osteotomy in hip incongruence is demanding surgery, with unpredictable results. The most frequent causes of femoroacetabular impingement (FAI) are: iatrogenic acetabular retroversion, aspheric femoral head and the anterior offset deficiency, hyperplastic deformity of spina iliaca ant.inf. and labral ossification. Purpose: to justify the possibility of expanding the indication for reorienting pelvic osteotomy in the presence of an aspherical incongruity of the joint. Methods: 28 patients (29 hips), who underwent pelvic osteotomy between 2005 and 2011 were investigated. The mean age was 12.5 (7-19). Legg-Calve-Perthes disease (LCPD) 9 patients, developmental dysplasia of the hip (DDH) 11, 8 patients DDH with growth disturbance as a result of avascular necrosis (Kalamchi-MacEwen IV). The Ganz periacetabular osteotomy in 10 adolescents (closed triradiate cartilage), 9 Sakalouski single incision triple osteotomy, 10 Salter osteotomy. Intraarticular procedures: rim osteoplasty 6, neck-head junction osteochondroplasty 20, cheilectomy 5 (LCPD with hinged abduction), labral debridement in four and fixation in three cases. 4 occurrences of acetabular reorientation were supplemented with femur osteotomy. Clinical follow up was performed with own questionnaire analogue of 10-question test by Briggs and Philippon. Results: mean preoperative scores improved from 54.15 ($\sigma\pm4.8$) points to 68.8 ($\sigma\pm5.1$), 18-month minimum follow-up. The Wilcoxon signed-rank test results showed statistically significant differences ($p=0.0002$). Complication: asymptomatic calcification 3, delayed pubic union 1, undercorrection 6, lateral femoral cutaneous nerve injury 8, pins migration 6, positive impingement test 6, acetabular fragment displacement 1. Conclusions: early results indicate the possibility of surgery reduce the risk of impingement after redirectional pelvic osteotomy with hip incongruency

Date: 2013-10-17

Session: Paediatrics - Hip & Knee

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Room: Hall 2

Abstract no.: 35059

EVALUATION OF FEMORAL SHORTENING OSTEOTOMY IN CONGENITAL DISLOCATION OF KNEE: OUR MIDTERM RESULTS

Sumit ANAND, Alok SUD, Anil MEHTANI, Nishikant KUMAR

Lady Hardinge Medical College, New Delhi (INDIA)

Introduction : Congenital dislocation of knee (CDK) comprises of a spectrum of deformities ranging from simple hyperextension (Grade I) to subluxation (Grade II) to complete dislocation(Grade III) and has three patterns of involvement – isolated dislocation of knee , multiple joints dislocations and those associated with syndromes. Quadricepsplasty which has been the traditional treatment of choice for Gr II/III CDK, usually leads to extension weakness and lag, especially in patients with Arthrogryposis Multiplex Congenita (AMC). Femoral shortening osteotomy is a better method because it preserves extension ability of the knee and has fewer complications. **Material and Methods:** Six patients with 10 grade III knee dislocations (2 unilateral and 4 bilateral) were treated with femoral shortening (fixed with K-wire) after failure of conservative treatment with corrective cast between 2007 and 2009. Two of them had arthrogryposis with equinovarus deformity and unilateral hip subluxation. The patients were followed up for a minimum period of 3years after operative intervention. The cast and K-wires were removed after 6-9 weeks & night splint was used with knee in 300-450 flexion subsequently. **Results:**All the patients achieved useful & painless range of motion (mean active -0.50 to 1070) and none of the patients had post-operative deformity, recurrence or extension lag. **Conclusion:**Femoral shortening may be a better alternative to Quadricepsplasty in grade III CDK, especially with syndrome associated Congenital dislocation of the knee.**Key words:** femoral shortening,quadricepsplasty,syndrome associated CDK.

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Session: Paediatrics - Hip & Knee

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 34412

TREATMENT OF KNEE FLEXION CONTRACTURES IN PATIENTS WITH ARTHROGRYPOSIS

Denis DEREVIANKO, Ekaterina PETROVA, Dmitry BUCLAEV

The Turner Scientific Research Institute for Children's Orthopedics,
Saint-Petersburg (RUSSIA)

Purpose: Knee flexion contracture is one of the main obstacles to patient's moving activity. The purpose was to analyze results of knee flexion contractures treatment, depending on age when it was started and contracture severity. Methods: 83 children with knee flexion contractures were treated from 2005 to 2012. Age of patients was 1 m -15 y. 31 patients were conservatively treated with serial casting. Posterior knee release with tibia flexors lengthening was performed in 23 children (36 knee) and with additional Ilizarov device - in 36 patients (60 knee). Temporary hemiepiphiodesis of the distal femur growth plates was performed in 2 patients (3 joints). Distal femoral extension osteotomy was performed in 20 children (27 joints) for recurrent deformation. Results: Results were assessed by degree of contractures correction, range of knee motion, neuromuscular system status and child's ability for independent or assisted walking. Mean follow-up was 3.8 years (1-6 years). Contractures were completely eliminated by serial casting in 78.3%. Good and satisfactory results were achieved after posterior knee releases in 95,7% and after release with Ilizarov device – in 97,2%. Good results after extension supracondylar osteotomy were noted in 68.4%, satisfactory in 26.6%. Conclusions: Knee flexion contractures are well-responded to conservative treatment in young children. Posterior knee release could make good long-lasting results if using proper orthosis postoperatively. Extension supracondylar osteotomy is performed in children older than 6 years with recurrent deformation. Significance: Elimination of knee flexion contractures is important in children's verticalisation.

Date: 2013-10-17

Session: Paediatrics - Hip & Knee

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 34892

OSTEOARTICULAR TUBERCULOSIS OF PAEDIATRIC HIP

Anil AGARWAL

Chacha Nehru Bal Chikitsalaya, Delhi (INDIA)

Background: We evaluated the pretreatment radiological presentation, and the clinicoradiological outcome at completion of 1 year chemotherapy in osteoarticular tuberculosis of paediatric hip region to find possible prognosticating correlation between them. **Methods:** We retrospectively analyzed the clinical and plain radiographs findings in 27 children with osteoarticular tuberculosis of hip. The pre and post treatment plain radiographs were evaluated according to a modified Shanmugasundaram radiological classification. The functional outcome at completion of chemotherapy was assessed using modified Moon's criteria. **Results:** The male female ratio was 11: 16. The left hip was involved more frequently than the right (17:10). The average age was 7.37 years (range, 2-12 years). In the pretreatment radiographs, 9 hips were normal, 6 traveling, 4 dislocating, 1 protrusio acetabuli, 3 atrophic and 4 unclassified types. There were no Perthes and mortar pestle at the initial presentation. Post treatment, the types changed to 9 normal, 3 Perthes, 1 protrusio acetabuli, 1 atrophic, 4 mortar pestle and 7 unclassified types. There were 37% excellent, 18.5% good, 26% fair and 18.5% poor results. The prognosis was best with initial 'triradiate' and normal and worst with post treatment atrophic and 'ankylosed'. **Conclusions:** The Shanmugasundaram radiological types accurately predict prognosis only in normal and 'triradiate'. The functional outcome of tubercular hip in smaller children is independent of its radiological morphology.

Date: 2013-10-17

Session: Trauma - Pelvis & Acetabulum

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 33998

PARARECTUS APPROACH FOR THE TREATMENT OF ACETABULAR FRACTURES COMBINED WITH IPSILATERAL TYPE C PELVIC FRACTURES

Shicai FAN

The Third Affiliated Hospital of Southern Medical University, Guangzhou (CHINA)

The purpose of this article is to evaluate the feasibility and outcome of treating acetabular fractures combined with ipsilateral type C pelvic fractures, using the pararectus approach. The surgeon performed the procedure on cadaver specimens before applying to clinical patients, to get familiar with its anatomy. Retrospective analysis was performed on 8 patients of acetabular fractures combined with ipsilateral type C pelvic fractures, underwent between March 2011 and August 2012. There were 6 male patients and 2 female, with a mean age of 44 years (21 to 47). There were 4 cases of anterior column fractures, 2 cases of anterior column and posterior hemitransverse fractures, 2 cases of complete both-column fractures, according to Judet-Letournel classification. There were 3 cases of type B2.1 pelvic fractures, 3 cases of type C1.2, 2 cases of type C1.3, according to Tile classification. The pararectus approach with supine position was used for fractures only involved the anterior portion of the acetabula in 5 cases. Additional Kocher-Langenbeck approach with floppy lateral position was used for the fixation of the posterior wall and posterior column of the acetabular fractures in 3 cases. All surgeries had been completed smoothly. Postoperative X-ray and CT images showed satisfactory reduction of the pelvic and acetabular fractures in all cases. Sciatal nerve injury occurred in 1 case, and resolved fully within 6 weeks. Fat liquefaction of abdominal wound occurred in 1 case, and healed well by dressing changing. The follow-up time was 4 to 15 months. All fractures achieved bony union.

Date: 2013-10-17

Session: Trauma - Pelvis & Acetabulum

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 34155

MINIMAL INVASIVE APPROACH FOR ANTERIOR FIXATION IN ACETABULAR FRACTURES

Sivaprasad KALYANASUNDARAM, Ayman EL SHARAWI

Khouda Hospital, Muscat (OMAN)

Materials and methods: 103 consecutive patients with fracture acetabulum requiring anterior surgery were included in the study. Study period was from Jan 2005 to March 2012. There were 76 males and 27 females. Age varied from 15 to 67 years with a mean of 37.6 years. Fracture acetabulum was accompanied by disruption of the pelvic ring and/or hip dislocation in more than a third of the cases. Incidence of associated long bone and spinal injuries were high. Road traffic accidents accounted for the majority of patients. Right side involvement was marginally higher (55). CT scan with 3D reconstruction was done for all patients along with the routine X rays. All patients were operated in supine position with a small Pfannenstiel's approach and a limited iliac approach. 8 of them also required an additional posterior surgery. NWB ambulation was the rule for 3 months post-operatively. The follow up ranged from 6 months to 8 years with an average of 5 years. 9 patients were lost to follow up. Results: 80 patients have had a satisfactory outcome. 3 patients developed foot drop post-operatively which recovered completely without intervention. 7 patients developed secondary OA of the affected hips which needed joint replacement. 4 patients had pain referred to Sacroiliac joint, managed conservatively. Discussion: The minimal invasive approach is advantageous as it protects the NV structures and the healing is better as it preserves the soft tissues. There has been no incidence of inguinal or abdominal hernia at 8 year follow-up.

Date: 2013-10-17

Session: Trauma - Pelvis & Acetabulum

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 35360

RATIONALE AND UTILITY OF SINGLE APPROACH FOR MANAGEMENT OF COMPLEX ACETABULAR FRACTURES: OUR EXPERIENCE

Puneet MISHRA

University College of Medical Sciences and Gtb Hospital, Delhi (INDIA)

Complex acetabular fractures involve both the columns and frequently may necessitate utilization of more than a single approach for stabilization of both the columns. Dual approach , in addition to increasing the morbidity, may also be difficult fixation of one column may preclude the mobility of the fracture fragment via the second approach. We present our experience in treating 22 cases of complex acetabular fractures from April 2007 to December 2012 by utilizing only a single (extensile or a nonextensile) approach and indirect reduction and stabilization of the opposite column. There were 9 anterior column with posterior hemitransverse fractures, 5 both column, 1 both column with posterior wall, 6 transverse fractures with posterior wall fractures, 1 four month old neglected transverse with malunited posterior wall fracture with AVN of femoral head. The single approaches used were Ilioinguinal approach (11), Kocher Langenbeck approach (4), Trochanteric flip osteotomy (4), extended Iliofemoral approach (3). We discuss the rationale of single extensile / nonextensile approach and discuss the results and complications encountered in these cases. The outcome (Modified Harris Hip score) will be presented. 1 case with intra-articular screw penetration developed degenerative arthritis at 2.5 years and was converted to THR. Thorough preoperative work up and understanding of the fracture personality enables the treating surgeon to treat these "select"complex acetabular fractures by using a single standard approach, which is often possible in majority of these case. Such a fracture amenable to single standardized extensile or nonextensile approach reduces the morbidity and hospital stay.

Date: 2013-10-17

Session: Trauma - Pelvis & Acetabulum

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 34289

MODIFIED KOCHER AND LANGENBECK APPROACH IN THE MANAGEMENT OF TRANSVERSE AND COMPLEX ACETABULAR FRACTURES

Narender MAGU

Pt B D Sharma PGIMS, Rohtak (INDIA)

Recently we published modified Kocher and Langenbeck approach wherein the posterior wall fracture is stabilized with a plate and screws without dividing short external rotators. Fifteen complex fractures of acetabulum, transverse fractures, transverse and posterior wall fractures, neglected transverse fractures and select both column fractures were operated through either the Modified Kocher and Langenbeck approach or combined with either of standard anterior approaches. The innovated KL approach, when combined with an anterior approach makes the surgical procedure less invasive, shortens the operative time, minimises blood loss and overcomes the fatigue of the principle surgeon. Further, the procedure preserves the advantages of combined standard anterior and posterior surgical approaches in achieving direct and indirect fracture reduction, overcomes their increased complication; but also retains the advantages of Modified Kocher and Langenbeck approach in preserving the soft tissue biology, preventing iatrogenic damage to the vascularity of the femoral head and ectopic bone formation. There was superficial infection in two cases and postoperative sciatic nerve palsy in one. We believe, surgeons should prefer to stabilize an acetabular fracture through the modified Kocher and Langenbeck approach as priority; and should combine it with an anterior approach or convert it to standard KL approach in case of difficulty in achieving anatomic reduction only.

Date: 2013-10-17

Session: Trauma - Pelvis & Acetabulum

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 35603

ACETABULAR FRACTURES FIXATION WITH GREATER TROCHANTERIC OSTEOTOMY: OUR EXPERIENCE IN 45 PATIENTS

Sandeep Ramesh BIRARIS¹, Jose Thomas PAPPANACHERRY²

¹Medical Trust Hospital, Kochi (INDIA), ²Kerala Institute of Medical Sciences, Kochi (INDIA)

Introduction: Acetabulum fractures are complex fractures, and achieving optimum results requires experience. Difficulty in understanding the fracture pattern, extensive surgical exposure, difficult reduction and high complication rates make this a challenging topic. Greater trochanteric osteotomy provides proper exposure for these fractures. The present paper is a prospective study acetabulum fracture where greater trochanteric osteotomy was used. **Material and methods:** They were 69 patients who underwent acetabular fixation from December 2001 through December 2007. Out of which 45 required greater trochanteric osteotomy. The inclusion criteria was used for the purpose. They were between the physiological age of 20 to 59 years, which included 40 males and 5 females. Out of 18 simple fracture types posterior wall (8) were majority and out of 27 associated fracture types 'T' type (12) were in majority. Open reduction and internal fixation was done using Kocher-Langenbeck with or without anterior approach 42 patients while extended iliofemoral approach was used in 3 patients. **Results:** Merle D'Aubigne and Postel scoring system were employed to assess the outcome with respect to pain, ambulation and range of movement. Accordingly 22 patients had excellent result, 8 very good, 4 good, 7 fair and 4 poor result and 26 underwent implant removal till final follow-up. Related complications were seen in 10 patients. **Conclusion:** Our results show that trochanteric osteotomy gives good exposure. TBW provides good union rate and avoids splintering of fragments and also helpful for small fragments. Complications can be managed by removal of the implants.

Date: 2013-10-17

Session: Trauma - Pelvis & Acetabulum

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 35018

**EVALUATION OF OUTCOME OPEN REDUCTION INTERNAL FIXATION
OF ACETABULAR FRACTURES: A PROSPECTIVE CLINICAL STUDY**

Amrut BORADE¹, Charansingh CHOUDHARY¹, Rajendra VERMA²

¹S.M.S. Medical College Jaipur, Jaipur (INDIA), ²M.G. Medical College Jaipur, Jaipur (INDIA)

The complexity of acetabular fractures, and also the difficulties in approaching and fixing these injuries, lead many surgeons either to accept inferior surgical results or to insist on conservative treatment. Considering that majority acetabular fractures occurred in young, active people the principles of osteosynthesis of intraarticular fractures are applied. With the intent of exploring into the accountability of the guidelines already laid for operative treatment of these fractures we undertook study to evaluate the functional outcomes of displaced acetabular fracture patients treated surgically by open reduction and internal fixation. 22 males with mean age 39.68 years & 4 females with mean age 33.37 years presenting with acetabular fractures were treated with ORIF with appropriate approach. Regular follow up involved radiographic evaluation, assessment of range of motion with final result measured in terms of Matta score. The average Matta score in our study was 16.92. 16 patients (61.54%) achieved excellent results, 5 patients (19.23%) attained good results. Results correlated well with bone union as earlier the bony union better the results. Complications encountered were sciatic nerve palsy in 3 patients, avascular necrosis with secondary osteoarthritis in 5 patients, heterotrophic ossification in 3 patients and deep infection in 1 case. During this study process of development of the infrastructure at our institution started in view of acetabular fracture surgery. So in later part of study were able to take up complex fractures & achieve good results as experience & learning curve improved. Similar was the experience in the study by J.M.Matta.

Date: 2013-10-17

Session: Trauma - Pelvis & Acetabulum

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 34968

THE MANAGEMENT OF THE DISPLACED MEDIAL WALL IN COMPLEX ACETABULAR FRACTURES USING PLATES AND ADDITIONAL CERCLAGE

Sunjung YOON, Myungsik PARK, Jonghyun KHO

Biomedical Research Institute of Chonbuk National University, Jeonju
(SOUTH KOREA)

Purpose: Reduction for displaced quadrilateral plates in complicated acetabular fractures is very difficult and requires wide exposure. The purpose of this study is to assess the usefulness of the additional cable in this complicated fracture and to evaluate the danger of compressing the superior gluteal artery patency and nerve after applying the cable. Methods :We evaluated 31 hips (these included 25 hips with fractures on both columns, two posterior wall and column fractures, three anterior column and posterior hemitransverse fractures, and one high T-shaped fracture) at an average six-year follow-up. Clinical outcomes were evaluated using a modification of the Matta grading system and radiographic arthritic grades. We assessed the postoperative clinical outcomes in relation with other variables such as anatomical reduction, delayed operation, seagull sign, and femoral head injuries. We determined whether the superior gluteal artery and nerve were compressed by cerclage with the help of femoral angiography and EMG. Results :Clinical outcomes were graded as very good to excellent for 18 patients, good for five, fair for three, and poor for five. Preoperative femoral head injury ($P=0.011$), a seagull sign ($P=0.001$), poor reduction ($P=0.015$), and delayed reduction ($P=0.05$) were found to statistically influence clinical results. We found that there were no injuries to the superior gluteal artery and nerve in spite of using a cable. Conclusions: Cerclage methods can be useful for initial reduction in displaced medial plates of acetabular fractures. These methods reduce operation time and blood loss as compared with other methods.

Date: 2013-10-17

Session: Trauma - Pelvis & Acetabulum

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Room: Hall 3

Abstract no.: 34656

RESTORATION OF HIP JOINT CENTER FOLLOWING SURGICAL MANAGEMENT OF ACETABULAR FRACTURES

Hong-Fei SHI, Jin XIONG, Yi-Xin CHEN

Nanjing Drum Tower Hospital, The Affiliated Hospital of Nanjing University Medical School, Nanjing (CHINA)

Introduction: Unfavorable reduction is considered one of the key factors leading to hip joint degeneration and compromised clinical outcome in acetabular fracture patients. Besides the columns, walls, and superior dome, the postoperative position of hip joint center (HJC), which is reported to affect hip biomechanics, has merely been considered during the assessment of quality of fracture reduction. We aimed to evaluate the radiographic restoration of HJC in acetabular fractures treated with open reduction and internal fixation (ORIF). **Methods:** Patients with acetabular fracture that received ORIF in the authors' institution during the past five years were identified from the trauma database. The horizontal and vertical shifts of HJC were measured in postoperative anteroposterior view radiographs. The radiographic quality of fracture reduction was graded according to Matta's criteria. **Results:** Totally 56 elementary and 71 associated-type acetabular fractures were included, wherein the majority showed a medial and proximal shift of HJC postoperatively. An average of 2.8 mm horizontal and 2.2 mm vertical shift of HJC were observed, which correlated significantly with the quality of fracture reduction ($P = 0.000$ for both). The horizontal shift of HJC correlated with the fracture type ($P = 0.022$). **Conclusion:** The restoration of HJC correlates with the quality of reduction in acetabular fractures following ORIF. Further studies are required to address the effects of HJC shift on the biomechanical changes and clinical outcomes of hip joint, especially in poorly reduced acetabular fractures.

Date: 2013-10-17

Session: Trauma - Pelvis & Acetabulum

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 34286

SURGICAL TREATMENT OF UNSTABLE PELVIC INJURIES

Taras PETRYK, Mykola ANKIN, Lev ANKIN

Kyiv Regional Clinical Hospital, Kyiv (UKRAINE)

Purpose. To analyze the results of the treatment unstable pelvic injuries. Methods. In 2010-2012 we performed osteosynthesis of unstable pelvic injuries on 54 patients with type B fractures (35) and type C (19). Conducting the sacroiliac joint osteosynthesis we used ilioinguinal approach in 2 cases and posterior approach in 52 cases. For sacroiliac joint fixation through a posterior approach cancellous screws were used. In 4 cases of type C1 fractures we secured reconstructive plates in addition to it. In 39 patients osteosynthesis of the anterior part was performed with one (11) or two plates (18). In 15 cases with satisfactory anterior part reduction and pubic bones fractures, anterior fixation was not performed. Disruption of the symphysis pubis was always operated on. There wasn't a lethal outcome. Wound abscesses after open osteosynthesis from the posterior approach were observed in 2 cases and there were redislocations in 2 cases. Three patients had poor results after reduction of sacroiliac joint dislocation more than 1 cm. Results. Using Matta's system good and excellent results in treatment were registered in 72% (39 patients), 25% (13 patients) had satisfactory results, and 3% (2 patients) – poor results. Conclusion. In treatment of patients with complex unstable pelvic injuries we find it binding effect to achieve anatomical reduction and to fix bone fragments. Initially it is necessary to stabilize the posterior part by using iliosacral screws and then follows anterior part fixation with one or two plates.

Date: 2013-10-17

Session: Trauma - Pelvis & Acetabulum

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 35162

DOUBLE PLATING OF TRAUMATIC SYMPHYSIS PUBIS DIASTASIS – RESULTS AND COMPLICATIONS

Kiran Kumar NAIKOTI, Axel SYLVAN, Henry WYNNJONES, Nikhil SHAH, Anthony CLAYSON

Wrightington, Wigan and Leigh NHS Trust, Wigan (UNITED KINGDOM)

Introduction: The reported incidence of revision surgery and / or fixation failure / implant loosening after symphysis plating in traumatic pelvic ring disruptions varies from 17% to 75%. Single plating has higher reported incidence of failure but requires less soft tissue dissection.

Aim: We report the radiological results and implant specific complications of symphyseal double orthogonal plating, from a UK tertiary regional pelvic fracture service. **Methods:** We retrospectively reviewed the records and radiographs of a consecutive series of patients operated for pubic symphysis disruptions over 2 ½ years, classified into Tile types B or C,

comparing recent and immediate post-operative radiographs for recurrent diastasis, implant loosening or breakage. **Results:** There were 38 patients with mean age 45 (18 - 79) years and mean follow up 12.5 (3 - 30) months. There were 13 Type C injuries (requiring additional posterior ring stabilization) and 25 Type B injuries (requiring anterior plating only). 5 patients (13%) had radiological evidence of screw loosening or screw or plate breakage and 2 among them developed recurrent diastasis. One patient (2.6%) with recurrence of diastasis required revision surgery, while the remaining 4 remained asymptomatic. There were no abdominal wall hernias, neurological or visceral complications. **Conclusion:** We believe our lower rate of revision surgery and metal work failure in comparison with literature is attributed to double orthogonal plating as originally described by Tile, which is bio-mechanically superior to single plating and without any obvious additional long term complications or biological disadvantages.

Date: 2013-10-17

Session: Trauma - Pelvis & Acetabulum

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 34248

TRAUMATIC DISLOCATION OF HIP: A RETROSPECTIVE STUDY OF 46 CASES

Sandeep KASHYAP¹, Ramesh SEN²

¹Indira Gandhi Medical College Shimla, Shimla (INDIA), ²PGIMER, Chandigarh (INDIA)

The aim of our study was to assess the final outcome of simple hip dislocation i.e. without any associated femoral head fracture or fracture of acetabulum. The parameters used were Short Form (SF-36) scoring for general health status and Hip Scoring by Merle d'Aubigne. This is a retrospective study of 46 cases between 1994 and 2006 that came for final follow up. The mean follow up period was 3.9 years with 38 males (82.61%). Associated injuries were found in 18 (39.13%) patients. Open reduction was done in 5(10.81%) cases. Hip score was good /excellent in 38(82.61%) cases. The average Physical component summary (PCS) component of SF-36 score was 46.4 in 79.6% patients; the average Mental Component Summary (MCS) component was 46.8 in 77.2% patients. Both these scores were at par with age matched norms in normal population. Patients having PCS scores more than 55 also had hip scores either excellent or good. Complications included avascular necrosis of head of femur in 6 (13.04%), coxarthrosis in 5(10.87%) and sciatic nerve injury in 3(6.52%) patients. PCS score less than 35 was found in patients with avascular necrosis and in 33% of patients with associated injuries. The reduction time was more than 6 hrs in all patients with avascular necrosis of femur head. Traumatic hip dislocation is an orthopaedic emergency. Delay in reduction more than 6 hours is associated with increased incidence of avascular necrosis. Patients with associated injuries have bad outcome. Patients with low hip scores had low SF-36 scores.

Date: 2013-10-17

Session: Cervical Spine

Time: 14:00 - 15:30

Room: Hall 6

Abstract no.: 35496

CT-BASED EVALUATION OF ODONTOID MORPHOLOGY IN INDIAN POPULATION: IMPLICATIONS ON INTERNAL FIXATION OF TYPE II ODONTOID FRACTURES

Abhilash DHRUV, Arvind KULKARNI, Siddharth SHAH, Ruchira MARWAH,

Prasad HANGANDI, Inder TALWAR

Bombay Hospital, Mumbai (INDIA)

Introduction: Anterior screw fixation with two cortical screws (3.5 mm) is the treatment of choice for type II odontoid fractures. Two screws are better than one, however, it is unsuitable in patients with an odontoid diameter of <9.0 mm. We aimed to measure the dimensions of the odontoid process in the Indian population, as there is no data; using CT scan and determine a safe & effective method of fixation of type II odontoid fractures in them.

Material and Methods: CT images of odontoid processes of 100 patients aged between 18 and 90 years were evaluated. The mean age of the population was 51.28 years that included 58 (58%) and 42 (42%) females. Patients with atlanto- axial pathology were excluded from the study.

Antero- posterior (AP) and Transverse (TD) diameters of the odontoid process were taken at 1 mm intervals from the odontoid base till the tip using axial CT images.

Results: The mean AP and TD of the entire population were 11.26 mm and 9.78 mm respectively. 56 (56%) patients had at least one TD < 9.0 mm & 5 (5%) patients had at least one TD < 7.4 mm. None of the patients had TD diameter < 5.5 mm.

Conclusions: More than half of our sample size (56%) is not suitable for two 3.5 mm cortical fixation for type II odontoid fracture. Other biomechanical options need to be explored. A pre- operative CT scan helps determine the choice of procedure, its safety & efficacy.

Date: 2013-10-17

Session: Cervical Spine

Time: 14:00 - 15:30

Room: Hall 6

Abstract no.: 35231

THE FEASIBILITY OF ANTERIOR INSTRUMENTATION IN FIXED ATLANTOAXIAL DISLOCATION

Mansoor Ali JALEEL, Sandeep SONONE

Seth GS Medical College Kem Hospital, Mumbai (INDIA)

Background: Fixed Atlantoaxial Dislocation(AAD) are usually treated by anterior transoral release and posterior instrumentation. Disadvantages include dual approach, change of position, extensive soft tissue dissection. Anterior Transarticular(ATS) fixation is an effective alternative due to single approach and less morbidity. Anatomic and Biomechanical studies for ATS are safe, effective. **Aim:** To study the feasibility of anterior instrumentation in fixed AAD using clinicoradiological outcome measures. **Materials and Methods:** 8 patients(3 males 5 females) with fixedAAD operated in our tertiary care centre between feb 2011 to jan 2012. Preoperative Nurick myelopathy grading was Grade 1-1pt Grade 2-4pts Grade 3-3pts. Through anterior retropharyngeal approach opening of facet jts alignment in hyperextension tricortical graft in jt. anterior transarticular fixation(2 pts screws 6 pts plating) done. **Results:** Radiological- Reduction of basilar invagination 6/8 pts. Cervicomедullary angle correction was from mean (105*) to mean (128*/ ct). 1 TA Screw – medial cortical breach at C1 – asymptomatic. Follow-up CT scan at 6 months – 6/8 pts. 3 pts – good union on both sides. 2 pts – union only on one side / visible gap on other side. 1 pt – gap seen on both sides. 1 pts – failure radiologically -immediately postop (revised). **Clinical-** 6 patients recovered 2 functional grades. Earlier recovery in young pt and with less duration of symptoms. 1 pt – expired postop 1 pt (9/m) – postop neurological deterioration reexploration – implant /graft removal posterior fusion. **FAILURE PERCENTAGE – 25%.** **Conclusion:** Anterior instrumentation in fixed AAD, although technically challenging can be an effective alternative to posterior instrumentation due to lesser perioperative morbidity and single approach.

Date: 2013-10-17

Session: Cervical Spine

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Room: Hall 6

Abstract no.: 34283

MORPHOMETRIC ANALYSIS OF THE LATERAL MASSES OF THE SUB-AXIAL CERVICAL SPINE IN THE INDIAN POPULATION AND ITS CORRELATION WITH LATERAL MASS SCREW PLACEMENT

Uvaraj NALLI, Aju BOSCO

Madras Medical College, Chennai (INDIA)

Lateral mass screw fixation is a well-known technique for stabilization and fusion of the cervical spine. The lateral masses of the subaxial cervical spine differ in anatomic dimensions from one another. These morphologic differences have implications for placing lateral mass screws safely and effectively. This morphometric analysis on CT scans of the lateral masses of the sub-axial cervical spine in the Indian population, a first of its kind, has been performed to study the differences as compared to the western race and to analyze any modifications of the known surgical techniques. A morphometric analysis of the lateral masses of the subaxial cervical spine was performed in 39 male and 21 female patients. Our study involved an extensive analysis of 600 lateral masses in 60 adult patients involving 4800 morphometric measurements involving around 7640 CT films. All measurements were done on CT films with resolution of 2mm or less. Morphometric analysis was performed using multislice helical CT scans and included multiple measurements. The measurements that were determined include axial anteroposterior and lateral, sagittal width, height and diagonal measurements, coronal width and height and facet angularity. Statistical analysis was performed using SPSS. Descriptive statistics were computed for all measurements, and probability values were calculated using the Student t-test. This morphometric analysis of the lateral masses of the subaxial cervical spine in the Indian population, showed sex differences and also significant variations when compared with the western race. The ideal screw length and the trajectories for the screw insertion have been redefined.

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Abstract no.: 34633

A NOVEL METHOD OF CERVICAL PEDICLE SCREW PLACEMENT FROM C3 TO C5 AND ITS CLINICAL APPLICATIONS

Qingsan ZHU, Jingchen LIU, Ye LI

Department of Spine Surgery, The First Hospital of Jilin University, Changchun (CHINA)

Objective: To design the method of cervical pedicle screw placement for cervical vertebrae C3-C5, and test it in clinical applications. **Methods:** Bilateral pedicle screws were manually inserted for C3-C5. The intersection of the horizontal line through the midpoint of the transverse process root and the vertical line through the mediolateral third of the superior articular process was used as the entry point. The specimens were truncated along the horizontal or sagittal plane of the pedicle, and a variety of measurements were made to determine appropriate screw type and placement. Finally, this screw fixation technique was applied in clinical situations with the placement of twenty-six C3 screws, twenty-six C4 screws and thirty-eight C5 screws. **Results:** The transverse angles of C3-C5 segments displayed a decreasing trend while the vertical angles did not. In all clinical cases, all screws were properly within the pedicles examined using postoperative computed tomography (CT) scan. Only one C3 screw penetrated the medial cortex and slightly entered the spinal canal, but no clinical symptoms occurred. **Conclusions:** The intersection of the horizontal line through the midpoint of the transverse process root and the vertical line through the mediolateral third of the superior articular process represents a superior frame of reference for the entry point for C3-C5 pedicle screw fixation. We recommend the transverse angles to be 90° for C3 and 80° for C4 and C5, and the vertical angles to be 70° for C3-C5.

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Abstract no.: 35558

ANTERIOR FUSION WITH TITANIUM CAGES -ALLOGRAFT GIVES SATISFACTORY CLINICAL AND RADIOLOGICAL RESULTS IN CERVICAL DEGENERATIVE DISC DISEASE

Kamil Cagri KOSE, Mustafa Erkan INANMAZ, Hakan BASAR, Emre BAL, Islam CALISKAN

Sakarya University Faculty of Medicine, Sakarya (TURKEY)

Introduction: To evaluate the clinical and radiological results after treatment with three-level anterior cervical discectomy and fusion (ACDF) with titanium cages-allograft. **Methods:** We retrospectively analyzed the efficacy and outcomes of 11 consecutive patients treated with a 3-level anterior cervical fusion using titanium cages packed with allograft and anterior plate fixation. Patients were evaluated preoperatively and postoperatively using the visual analog pain scale (VAS), neck disability index (NDI) and radiographs. **Results:** There were 4 men and 7 women with a mean age of 58.6(47-70)with a mean follow-up of 13.9 months (12-21). The mean VAS score improved significantly from 7.3 points to 2.8points ($p < 0.05$) at the final follow-and the mean preoperative/postoperative NDI was 32.6 (7-42)/6.2 (0-24) ($p < 0.05$) at the final follow-up. Eleven patients achieved a radiographic fusion, after an average time of 6.7 months. The fusion rate of this procedure was 100%. Of 20 cages inserted, three (15%) cages in three patients were found to have subsided and were radiolucent lines around cages. 3 patients had dysphagia lasting for more than 3 days. The cervical lordosis in cobb angles were 8.7/16.9 in the preoperative and postoperative periods respectively. ($p < 0.05$) **Conclusion:** This procedure can effectively restore cervical lordosis, achieve high fusion rates and lead to clinically satisfactory outcomes with a low complication rate.

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Room: Hall 6

Abstract no.: 35783

THE ROLE FOR CERVICAL DISC REPLACEMENT IN MANAGEMENT OF PATIENTS WITH CERVICAL SPONDYLOTIC MYELOPATHY? - RESULTS OF SYSTEMATIC REVIEW

Sandeshkumar LAKKOL¹, Krishna BODDU¹, Reddy GURU², Bhatia CHANDRA², Friesem TAI²

¹Kings College Hospital, London (UNITED KINGDOM), ²University Hospital NorthTees, Stockton on Tees (UNITED KINGDOM)

Aim: The purpose of this study is to review efficacy of cervical disc replacement (CDR) in patients with cervical spondylotic myelopathy (CSM). **Background:** Theoretically CDR in myelopathy can lead to progression of myelopathy by allowing micro trauma in a narrow spinal canal and by lacking the advantages of cervical fusion such as late osteophyte remodelling and correction of kyphotic deformity. However, clinical studies showed conflicting results. There has not been any review of literature evaluating the clinical effectiveness and safety of CDR in CSM. **Methods:** Literature search included both electronic and hand search. A detailed electronic search using Ovid SP and EBSCO host online gateway in databases including MEDLINE, CINAHL, AMED, SPORTDiscus, EMBASE, Cochrane Library and Journals @ Ovid was performed. Hand search included grey literature and reference checking. The quality of studies was assessed using McMaster University critical assessment form. **Results:** Five quantitative studies were included reporting outcome of 233 CSM patients. Two were randomised control trials were of moderate quality and three were cohort studies were of poor quality. Pooled data revealed statistically significant improvement in Neck Disability Index scores and lower adverse events in CDR group. There were 11 adverse events. **Discussion:** Our systematic review showed that there is no strong evidence to favour CDR to fusion in CSM; however the reported clinical results of CDR in myelopathy are satisfactory. All the evidence was in small patient groups with medium term follow-up of less than 36 months. We recommend clinicians to be aware of this evidence.

Date: 2013-10-17

Session: Cervical Spine

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Room: Hall 6

Abstract no.: 34804

OUTCOMES OF THREE AND FOUR LEVEL CERVICAL DISC ARTHROPLASTY: 18 MONTHS AVERAGE FOLLOW-UP

Andrew BERG, Balaji PURUSHOTHAMAN, Cyrus JENSEN, Guru REDDY, Tai FRIESEM

Spinal Unit, North Tees and Hartlepool NHS Foundation Trust, Stockton on Tees (UNITED KINGDOM)

Introduction: Cervical disc arthroplasty (CDA) is emerging as an alternative to fusion in order to preserve motion thereby reducing the incidence of symptomatic adjacent segment disease. We report outcome data for three and four level cervical disc arthroplasty. **Materials and Methods:** Patient demographics, indications for surgery, implant and pre and post-operative Neck Disability Index (NDI), Mental/Physical component of SF36 (MCS/PCS) and Visual Analogue Scale (VAS) for neck and arm pain were reviewed. t-test was used to assess statistical significance ($p<0.05$). **Results:** 25 patients (14 males, 11 females). Age 53 (range 38-80) years. 22 three level and 3 four level CDA performed. 78 implants: 51 NuNec™ (Pioneer Surgical Technology. USA) (16 patients) and 27 Prestige LP™ (Medtronic Ltd. UK) (9 patients). **Indication:** radiculopathy - 15 patients, radiculopathy and myelopathy - 8 patients and neck pain - 2 patients. Symptom duration 56 (4-275) months. Follow-up 78 (35-117) weeks. Statistically significant improvements observed in NDI ($p=0.0002$), PCS ($p=0.005$), MCS ($p=0.023$), VAS neck ($p=0.0001$) and arm ($p=0.00003$) pain. There was no statistically significant difference in outcomes between implants. **Conclusion:** CDA has immediate benefits over fusion such as negating the need for collars and a single transverse rather than vertical incision. Our series shows statistically significant improvements past this immediate period with average follow-up of 78 weeks. Application of data from fusions infers substantial clinical benefit in the change in NDI and PCS and minimally clinically important change in VAS neck pain arm pain. Longer-term follow-up is required to confirm if these benefits are sustainable.

Date: 2013-10-17

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Room: Hall 6

Abstract no.: 34911

PROSPECTIVE EVALUATION OF FUNCTIONAL AND RADIOLOGICAL OUTCOME OF SURGICAL DECOMPRESSION OF ENDEMIC SKELETAL FLUOROSIS WITH CERVICAL MYELOPATHY

J NARESH BABU, Ch SURESH, Vv NARAYANA RAO

Mallika Spine Center, Hyderabad (INDIA)

Introduction: Skeletal Fluorosis due to drinking water with high fluoride content causes ossification and thickening of ligaments results in progressive spinal cord compression. There are no set guidelines for management basically because of the rarity of the disease in the non-endemic part of the world. Present study prospectively evaluates the role of surgical decompression in cervical Fluorotic myelopathy by functional and radiological criteria and also evaluates the factors prognosticating the outcome. **Methods:** 21 patients with fluorotic myelopathy were prospectively followed-up for 2 years. Average age was 41 ± 6.4 years. Eight patients had ligamentum flavum ossification along with ossification of PLL and ALL. Average delay in presentation was 9 ± 2.2 months. Six patients had concomitant involvement of thoracic spine. 17 patients underwent laminoplasty, three underwent laminectomy. **Results:** The mJOA score improved to 15.1 ± 1.6 from 8.1 ± 2.9 . Average recovery rate was $79 \pm 18\%$. Six with <3months duration had better recovery ($88 \pm 6\%$) than those presented late ($76 \pm 5\%$). Patients with isolated involvement of cervical spine had functional recovery of $82 \pm 8\%$ compared to $78 \pm 4\%$ in patients with thoracic involvement as well (Paired t-test $p=0.001$). The mean magnitude of postoperative shifting of spinal cord was 0.56 ± 0.11 . Average increase space available for the cord was 7.2 mm. Preoperative mJOA score was the important predictor of surgical outcome ($p = 0.0022$, $r = 0.60628$). **Conclusions:** Cervical decompression in fluorotic myelopathy assures good functional and radiological improvement. Duration of the disease and involvement of thoracic spine significantly influence the functional outcome. Pre-operative mJOA score is an important predictor of recovery rate.

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Room: Hall 6

Abstract no.: 34095

THE USE OF ANTERIOR CERVICAL DISCOTOMY AND FUSION WITH SELF-LOCKING CAGES TO TREAT MULTI-SEGMENTAL CERVICAL MYELOPATHY

Dadi JIN, Qingchu LI, Zhongmin ZHANG, Huibo YAN

Department of orthopaedics, The Third Affiliated Hospital of Southern Medical University, Guangzhou (CHINA)

To investigate the feasibility and clinical effectiveness of self-locking stand-alone polyetheretherketone cages (MC +) used in the ACDF for cervical myelopathy. The short form-36 physical component summary (SF-36) and VAS score was evaluated preoperatively and 3 days, 3 months, 6 months and 1 year after surgery the recovery of neurofunctional condition and clinical effectiveness . Antero-posterior and flexion-extension position radiography was taken to survey the interspinal height and range of motion of operated levels. Anterior cervical discotomy and fusion with self-locking cages were performed on 62 Patients who suffered from multi-segmental cervical myelopathy. Recording the JOA and SF-36 scores in the protocol time point, in order to investigate the clinical outcome, meanwhile, accumulating the preoperation and postoperation X-ray films of cervical spine for measuring the height of intervertebral space, whole curvature of cervical spine and the rate of fusion. The mean follow-up time was 18.4 months. JOA scores ascended from preoperative 6.3 ± 3.2 to postoperative 13.7 ± 1.6 ($P < 0.05$), the 7 scores of SF-36 improved significantly after operation, but Mental health not. The fineness rate was 94%. Height of disc space ascended from preoperative (5.9 ± 1.9) mm to postoperative (8.4 ± 0.7) mm, globle curvature of cervical spine ascended from preoperative $4.9^\circ \pm 7.3^\circ$ to postoperative $9.6^\circ \pm 14.2^\circ$, the change of the two index is significantly, respectively. All of the 62 cases achieved bone fusion. The use of anterior cervical discotomy and fusion with self-locking cages to treat multi-segmental cervical myelopathy posses many advantages as follows: satisfactory clinical outcome, minimally invasive, higher fusion rate, higher orthopaedic ability.

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Room: Hall 6

Abstract no.: 33848

ASSESSING QUICKNESS OF UPPER LIMB AND HAND FUNCTION FOR PATIENTS WITH CERVICAL SPINAL CORD INJURY WITHOUT BONE INJURY USING SIMPLE TEST FOR EVALUATING HAND FUNCTION

Hiroaki SAMEDA¹, Jun SHINBO², Sumio IKENOUE², Kan TAKASE², Eiko HASHIMOTO², Takahiro ENOMOTO², Aya KANAZUKA³, Masaya MIMURA²

¹Orthopedic Department, Funabashi Municipal Medical Center, Fuanbashi (JAPAN)

Introduction: It has been reported that in assessing tools for evaluating spinal cord injury (SCI) outcomes, further validation studies are required to identify the most appropriate tools for specific targets in a human SCI study. Simple test for evaluating hand function (STEF) is designed to objectively evaluate the speed of carrying objects to an arranged area and inserting sticks into holes. The aim was to evaluate quickness of upper limb and hand function for patients with cervical spinal cord injury without bone injury (CSCIWBI) utilizing STEF.

Methods: 23 patients with CSCIWBI were enrolled. Ability of manipulating was assessed using STEF (The maximum score is 100 points.) at each hand at 2, 4, 6, 8, 12, 24 and 24 weeks. Laminoplasty was performed 3 weeks after injury in cases with delayed neurological recovery. At 2 weeks after injury, all the upper arms were categorized based on treatment and STEF score (border point: 60) into four groups: Conservative-Low STEF group (CL), High STEF group (CH), Operative-Low STEF group (OL) and Operative-High STEF group (OH). The rate of improvement was calculated as the amount of STEF score improvement or deterioration per week. Data analyses were performed using Mann-Whitney U-test. **Results:** The average rate of improvement from 2 to 8 weeks in CL and OL were 5.5 and 6.4 respectively and no statistical difference was found between them. Whereas, the average rate from 8 to 48 weeks in the CL and OL were 0.07 and 0.129 respectively and statistical difference was observed between them.

Date: 2013-10-17

Session: Spine Deformities

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 35946

SUCCESS OF RISSE CASTING IN THE TREATMENT OF SCHEUERMANN'S KYPHOSIS

George THOMPSON, Christina HARDESTY, Connie POE-KOCHERT, Raj GALA

Rainbow Babies and Children's Hospital, Cleveland (UNITED STATES)

Purpose: Assess demographic differences between patients who were treated with Risser casting for Scheuermann's kyphosis and those treated surgically. We also sought to demonstrate that Risser casting successfully decreased and maintained kyphosis. Methods: We reviewed records from 1992 to 2012 for Scheuermann's kyphosis treated with surgery, casting, or bracing. We collected demographic data, measurements of thoracic kyphosis and lumbar lordosis before and during treatment, and final follow up. Results: The casting group included 18 patients compared to 17 patients who were initially treated with surgery. The casting group had a pretreatment mean Risser sign of 2.3 ± 1.6 (range 0-4) and age of 13.4 (range 11-15), while the surgery group had 4.88 ± 0.34 (range 4-5) and 16.6 (range 15-21), respectively. The mean pretreatment kyphosis was 79.3 ± 10.6 (range 60-100) in the casting group and 91.0 ± 13.5 (range 70-118) for the surgery group. Casting reduced the mean kyphosis to 48 ± 11.3 (range 40-56) while surgery decreased it to 51.3 ± 6.7 (range 42-65). At final follow up, the mean thoracic kyphosis of casted patients was 59.1 ± 9.1 (range 43-71) and 60.7 ± 9.1 (range 44-77) for surgery patients. Complications were higher in the surgery group. Conclusions: Risser casting is an effective method to decrease thoracic kyphosis in patients with Scheuermann's kyphosis, which can be maintained with continued casting or bracing as successfully as surgery. Patients who were treated with surgery initially had higher Risser signs and were generally older. Patients treated with surgery had more complications.

Date: 2013-10-17

Session: Spine Deformities

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 33989

EFFECT OF PREOPERATIVE BRACE TREATMENT ON THE MENTAL HEALTH SCORES OF SRS-22 AND SF-36 QUESTIONNAIRE IN ADOLESCENT IDIOPATHIC SCOLIOSIS PATIENTS

Bin YU, Yipeng WANG, Guixing QIU

Peking Union Medical College Hospital, Beijing (CHINA)

Objectives: To analyze whether there were differences of mental health scores of Scoliosis Research Society-22(SRS-22) questionnaire and Short Form-36(SF-36) questionnaire between adolescent idiopathic scoliosis (AIS) patients with/without preoperative brace treatment. Methods: The SRS-22 and SF-36 questionnaires of 147 AIS patients who underwent posterior correction surgery were retrospectively reviewed. The patients were classified into 2 groups: with preoperative brace treatment (group BS-27 cases) and without preoperative brace treatment (group S-120 cases). Compare the radiographic data and mental health scores of SRS-22 and SF-36 questionnaires between the 2 groups. Results: There was no significant difference in terms of height, rib hump, the mean preoperative coronal Cobb angle or apical vertebral translation of the major curve, sagittal thoracic kyphosis or coronal trunk balance of group BS and group S (all $P>0.05$). The average score and total scores of mental health of SRS-22 were 3.6 ± 0.8 and 3.8 ± 0.6 , and 18.0 ± 3.9 and 18.8 ± 2.9 , respectively. The total scores of mental health of SF-36 between group BS and group S were 72.4 ± 8.7 and 70.8 ± 12.2 , respectively. There was none significant difference of the scores between group BS and group S in terms of mental health scores of SRS-22 and SF-36 questionnaires (all $P>0.05$). Conclusions: Preoperative brace treatment didn't have obvious influence on the mental health scores of SRS-22 and SF-36 questionnaires in AIS patients.

Date: 2013-10-17

Session: Spine Deformities

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 35883

**SURGICAL TREATMENT OF SEVERE INFANTIL SCOLIOSIS (> 100°) -
RETROSPECTIVE STUDY**

Raquel CARVALHO, Joaquim BRITO, António TIRADO, Pedro
FERNANDES

Hospital Santa Maria, Lisboa (PORTUGAL)

The treatment of severe spinal deformities in children remains a challenge for orthopedic surgery. The initial treatment involves an application of a plaster followed by orthoses, being the surgery indicated in scoliosis greater than 60/70 °. However, these cases are of particular importance, given the risk of an early fusion in children, which may compromise the thoracic spinal growth and pulmonary insufficiency. This retrospective study aims to show the results achieved by surgical correction of severe spinal deformities in immature children, with an average of 9 years and 120.5 ° (min-110;136-max) of Cobb angle. The treatment method consisted of initial halo-gravitational traction during a variable period with an average correction of 50.2%, followed by the placement of double growing rods and serial distractions applications until reaching the maturity to perform the posterior spinal fusion. A total of 16 stretches, four were unplanned by implant failure. The ideal treatment of these deformities should allow effective deformity control, with the improvement in the development of the thoracic cage, leading a reduced number of surgeries and least number of complications. Although still far from the ideal method, the use of double growing rods has demonstrated acceptable results when compared with single growing rods. On the other hand, it gradually allows the correction of the curve, leading to an adaptation and expansion of the thoracic cage, and a much more normal spinal growth, when compared with anterior approaches.

Date: 2013-10-17

Session: Spine Deformities

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 35920

COMPARISON OF DISTRACTIVE VERSUS SEGMENTAL CORRECTIVE METHODS IN SURGICAL TREATMENT OF JUVENILE SCOLIOTIC DEFORMITIES

Martin REPKO, Milan FILIPOVIC

Orthopaedic Department University Hospital Brno, Brno (CZECH REPUBLIC)

Introduction: Progressive scoliotic deformities in juvenile age (4-11 y.) are designated for surgical correction with postponed fusion. Distractive method with repetitive re-distraction up to mature age was popular since 60's and it is still used in some cases. Segmental method of correction is very popular in last 5 years. Material and Methods: The total number of 189 patients (175 treated by using distractive method and 14 treated by using segmental technique with self-growing rods) have been treated in period 1981-2012. Comparation of X-ray parameters, rate of complications as well as number of repetitive surgeries between mentioned surgical methods was used. An average Cobb angle was 70 degrees in group of distractive method and 78 degrees in the group of segmental correction before surgery. Results: The rate of operative correction was 47% in group of distractive method while 67% in group of segmental method. The rate of complications was 35% in group of distractions while only 3% in group of segmental method. The average number of re-distractions was 8 in distractive group while the segmental method was used as single-stage surgery. Conclusion: Single-stage growing rod implantation using segmental method gives better correction results with significant lower rate of complications. Possibility of early orthosis leave and repetitive distraction surgeries exclusion are also very important advantageous points and benefits of segmental methods. Anyhow long-term result of self growing rods assessment is necessary to be done.

Date: 2013-10-17

Session: Spine Deformities

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 35012

COMPARISON THE RADIOGRAPHIC OUTCOMES OF TWO DEROTATION METHODS IN SURGICAL TREATMENT OF ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS): CDH LEGACY VERTEBRAL COLUMN MANIPULATION (VCM) VERSUS UNIVERSAL SPINE SYSTEM-II (USS-II)

Huiming PENG, Jianxiong SHEN, Gui-Xing QIU

Department of Orthopedics, Peking Union Medical Collage Hospital , Peking Union Medical Collage, Chinese Academy of Medical Science, Beijing (CHINA)

PURPOSE:Comparison of two different instrumentation techniques for axial vertebral rotation correction of adolescent idiopathic scoliosis(AIS). **METHODS:** From Apr 2008 to Feb 2010, retrospective study of 33 consecutive AIS patients comparing 2 techniques: Group A (16 patients), direct vertebral rotation with CDH Legacy VCM instrumentation vs Group B (17 patients)direct vertebral rotation with USS-II instrumentation. Preoperative、postoperative and follow-up(12-17months) long standing AP and lateral films and recumbent side bending films were evaluated. Apical curve rotation was measured by the Pedriolle method. Implant density, fixed segments and neurologic complications were recorded.**RESULTS:** The two groups were well matched. The majority were girls (31 girls vs 2 boys) and the average age of the patients was 14.8 ± 3.2 years of group A and was 15.0 ± 3.2 years of group B. There was no differ significantly between the two groups of implant density($74.3\% \pm 15.8\%$ vs $77.8\% \pm 14.2\%$),fixed segment (9.6 ± 2.3 vs 8.2 ± 2.9),preoperative major Cobb angle($51.7 \pm 12.0^\circ$ vs $46.4 \pm 7.8^\circ$),average major curve flexibility($55.5\% \pm 17.2\%$ vs $62.3\% \pm 19.4\%$),preoperative apical vertebral rotation (AVR)($21.5 \pm 4.7^\circ$ vs $20.9 \pm 6.2^\circ$),preoperative apical vertebral translation (34.8 ± 12.1 mmvs 25.8 ± 10.3 mm),preoperative thoracic sagittal Cobb angle (T5-T12)($20.8 \pm 7.2^\circ$ vs $23.6 \pm 7.4^\circ$),preoperative LIV angle($21.7 \pm 4.4^\circ$ vs $22.1 \pm 5.1^\circ$). There was statistically significant difference of postoperative AVR correction($75 \pm 8.3\%$ vs $44 \pm 22\%$, $P=0.000$) and AVR correction of latest follow-up($72 \pm 7.2\%$ vs $39 \pm 17\%$, $P=0.001$).There was no differ significantly of average postoperative major curve correction(87.2% vs 84.3%),average major curve correction of latest follow-up(84.1% vs 82%).

Date: 2013-10-17

Session: Spine Deformities

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 34695

**RADIOLOGICAL ANALYSIS OF PEDICLE SUBTRACTION
OSTEOTOMIES IN CHILDREN: WHERE DOES THE CORRECTION
OCCUR?**

J NARESHBABU¹, Ch SURESH¹, G NEELIMA², Vv NARAYANA RAO¹

¹Mallika SpineCenter, Hyderabad (INDIA), ²Osmania Medical College, Hyderabad (INDIA)

Introduction: Spinal cord-level osteotomies are increasingly used for posterior-only kyphosis correction in children. The segmental distribution of correction after pedicle subtraction osteotomies (PSO) in children remains unclear. This is the first study to outline the distribution of kyphosis correction after cord-level PSO in children. **Methods:** 15 severe thoracic kyphosis patients with normal pre-operative neurology undergoing PSO above L1 were included. Average age was 12.3 years (range 7 to 14). Relative sagittal angle correction at the osteotomy and at the adjacent segments, sagittal vertical axis (SVA) and angle of osteotomy was measured utilizing pre & post-operative standing AP & lateral radiographs and measurement software. **Results:** There were no post-operative neurological deficits. Mean pre-op kyphosis was 107.3 degrees (range 93-133) and mean post-op kyphosis was 53.7 degrees. Mean percentage correction of kyphosis was 45.7% (SD=6.6). The proportion of sagittal plane correction contributed directly by the osteotomy was 49.3 degrees (range 42-55), whereas the adjacent segments cephalad and caudad contributed a total of 450 of correction (Apex+1=4.50, Apex+2=2.30, Apex+3=1.30, Apex+4=10 and Apex-1=5.50, Apex-2=7.80, Apex-3=8.50, Apex-4=7.50, Apex-5=6.80). Mean relative shift in the SVA was 17.1mm (pre-op 26.2 to post-op 9.1mm). **Conclusion:** Pedicle subtraction osteotomies in children are effective in obtaining sagittal plane correction by focal correction at the level of the PSO and also at adjacent segments above and below osteotomy. Adjacent segments contribute an additional and nearly equal amount of sagittal plane correction to that achieved by osteotomy. Surgeons can take advantage of flexibility of pediatric spine in severe kyphotic deformity correction.

Date: 2013-10-17

Session: Spine Deformities

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 34297

CLINICAL AND FUNCTIONAL OUTCOME AFTER DIRECT VERTEBRAL ROTATION IN IDIOPATHIC THORACO-LUMBAR SCOLIOSIS

Hrutvij BHATT, Ketan KHURJEKAR, Shailesh HADGAONKAR, Rajiv GOYAL, Parag SANCHETI
SANCHETI HOSPITAL PUNE, PUNE (INDIA)

Introduction: Adolescent idiopathic scoliosis being the 3 dimensional deformity. The rib prominence produced from the axial rotation of scoliotic curve is one of the most cosmetically dissatisfaction attributes. Traditional spinal instrumentation do not provide significant correction of axial rotation and adjuvant thoracoplasty was required. DIRECT VERTEBRAL ROTATION, enable satisfactory rotational correction and cosmetic outcome.

Material & Methods: From 2007 to 2011, 110 cases included in the study who were operated for deformity correction and DVR technique was used. Neuromuscular scoliosis, revision surgery and curves greater than 100 degree were excluded. In all these patients deformity assessment was performed using Lenke's Classification. Pre-operative and post-operative Cobb's angle measurement was performed. Also loss of correction was assessed at six months interval. Functional outcome was evaluated by SRS 24 questionnaire.

Results: Deformity correction performed by DVR technique in 110 patients, of which 92 patients were females and 18 were males. Average age was 14 years. The deformity correction achieved and maintained at the end of 1 year was excellent. Average correction achieved was 78 %. Direct Vertebral Rotation gave promising result in Cobb's angle correction and also rib hump reduction. There was also significant improvement in general functional activity and self image scores post operative.

Conclusion: Technique of D VR has given near anatomical radiological correction and very good cosmetic correction because of derotation at the apex. Also it is observed that there is less stress on implants. This technique has obviated the need of costoplasty.

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Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 35221

ANTIMICROBIAL PROPHYLAXIS TO PREVENT SURGICAL SITE INFECTION IN ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS) PATIENTS UNDERGOING POSTERIOR SPINAL FUSION (PSF) – 2 DOSES VS ANTIBIOTICS TILL DRAIN REMOVAL

Vijay KAMATH, Jason PUI YIN CHEUNG, Kin Cheung MAK, Keith DIP KEI LUK, Kenneth MAN CHEE CHEUNG

Department of Orthopaedics and Traumatology, Duchess of Kent Children's Hospital, University of Hong Kong (HONG KONG)

Introduction: Peri-operative antimicrobial prophylaxis (AMP) reduces incidence of surgical site infection (SSI). Lack of consensus regarding the ideal drug, dosage and duration of prophylaxis exists. "CDC guideline for the prevention of SSI" has made recommendations regarding AMP, however paucity of literature regarding application of this guideline exists.

Aim: Document efficacy of preventing SSI of our present AMP protocol (2 doses only) based on CDC guideline, and compare it to our previous protocol of antimicrobials till drain removal.

Evaluate if Cephazolin, was safe, efficacious in preventing SSI and identify risk factors for SSI.

Method: 226 AIS patients who had a PSF reviewed. Patient characteristics, pre-operative, intra and post operative risk factors for infection, drug name, number of doses administered, superficial or deep SSI and wound healing aberrations noted.

Results: Cephazolin administered in 224 patients, vancomycin in two; no adverse drug reactions. 155 patients (Group-A) received 2 doses of AMP and 71 patients (Group-B) till drain removal (range 3-5 days).

Overall spine wound SSI 1.7%. Three (1.9%) group-A and one (1.4%) group-B patient had spine wound SSI, no SD ($p=1.0$). Two (1.2%) iliac wound SSI in group-A and one (1.4%) in group-B, No SD ($p=1.0$).

9 (5.8%) group-A and 7 (9.8%) group-B patients had spine wound healing aberrations ($p=0.48$). One (0.6%) group-A and four (5.6%) group-B patients had iliac crest wound healing aberrations ($p=0.05$). No SD observed.

Conclusions: First study on the AMP protocol in scoliosis surgery. Two doses of AMP as effective as continued antimicrobial use until drain removal. Incidence of SSI comparable to literature.

Cephazolin effective and safe for AMP.

Date: 2013-10-17

Session: Spine Deformities

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 34660

**HOW WELL DO RADIOLOGICAL ASSESSMENTS OF TRUNCAL AND
SHOULDER BALANCE CORRELATE WITH COSMETIC ASSESSMENT
INDICES IN LENKE 1C ADOLESCENT IDIOPATHIC SCOLIOSIS?**

Shallu SHARMA, Cody ERIC BUNGER, Thomas ANDERSEN, Ebbe STENDER HANSEN

Orthopaedic Spine Research Laboratory, Aarhus University Hospital, Aarhus (DENMARK)

Evaluation of cosmetic outcome is mainly based on radiographic measurements, with little if any significance attributed to patients' clinical appearance; our primary objective was to measure the degree of association between two of the most important patient-perceived cosmetic parameters (trunk- shoulder balance) with pre-postoperative radiologic trunk and shoulder balance. Additionally, assess the predictive power of preoperative radiographic indices in determining cosmetic changes. 33 Lenke 1C patients with complete pre- and postoperative radiographic and cosmetic images were included. Relevant radiographic-cosmetic indices and posterior trunk symmetry index (POTSI), were measured preoperatively and three months postoperatively. Pearson's correlation analysis was performed and significant correlations were used in multiple linear regressions to explain variability in cosmetic shoulder area ratio (SAR), trunk area ratio (TAR) and POTSI. Predictive modeling was performed to identify radiological predictors of cosmetic changes. Correlation coefficients ranged between (-0.63-0.70), with highest correlation first thoracic vertebra tilt (T1 tilt) and thoracic apical vertebra horizontal translation from central sacral vertical line (AV-CSVL). Multiple linear regression with T1 tilt, thoracic AV-CSVL, and thoracic apical vertebra-T1 horizontal distance (AV-T1) showed over 42% variability in SAR, TAR and POTSI. Preoperative thoracic AV-CSVL has 26% explanatory power for explaining the changes in TAR. AV-T1 and thoracic AV-CSVL have 39% and 29% explanatory power respectively for POTSI changes. Conclusion: Radiographic parameters only minisculely ($r<0.7$) reflect cosmetic deformity in Lenke 1C scoliosis. In particular, cosmetic shoulder height and angle are not represented by any radiographic indices. Preoperative T1 tilt, thoracic AV-CSVL, and thoracic AV-T1 possess substantial predictive abilities

Date: 2013-10-17

Session: Spine Deformities

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 34994

USE OF BIPOLAR SEALER DEVICE REDUCES BLOOD LOSS AND TRANSFUSIONS IN POSTERIOR SPINAL FUSION FOR NEUROMUSCULAR SCOLIOSIS

George THOMPSON, Christina HARDESTY, Zachary GORDON, Connie POE-KOCHERT, Jochen SON-HING

Rainbow Babies & Children's Hospital, Cleveland (UNITED STATES)

Reducing perioperative blood loss and transfusions in patients undergoing spinal surgery is especially important in those with neuromuscular disorders. We are using a bipolar sealer device (Aquamantys, Salient Surgical Technologies) as an adjunct to electrocautery. In a review of our Pediatric Spine Surgery database, we examined our first 64 neuromuscular patients since instituting the bipolar sealer device and compared these to a control group of the preceding 65 patients in whom the device was not used. Baseline characteristics between the two groups were similar except for the number of patients having an all-screw construct (31% in the study group vs. 12%, p=0.011). There were no significant differences in operative time or hospital stay. Intraoperative blood loss was lower in the study group vs. the control group (871mL vs. 588mL, p=0.003). Total perioperative blood loss, however, showed no significant difference. Thirty-four (53%) patients in the study group and 49 (75%) patients in the control group required additional perioperative transfusions (p=0.01). The number of packed RBC units transfused per patient was 0.81 in the study group vs. 1.57 in the control group (p=0.001). Although intraoperative cell saver transfusions were the same, the total blood volume transfused, including cell saver and any other transfusions, was significantly lower in the study group (425mL vs. 671mL, p=0.002). The use of a bipolar sealer device in posterior spinal fusion for neuromuscular scoliosis significantly reduced intraoperative blood loss and transfusion rates compared to a control group in this series.

Date: 2013-10-17

Session: Knee - Osteotomy & Cartilage defects

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 33532

RETROSPECTIVE ANALYSIS AND RESULTS AFTER OPEN WEDGE HIGH TIBIAL OSTEOTOMY FOR MEDIAL OSTEOARTHRITIS OF THE KNEE

Serban DRAGOSLOVEANU¹, Stefan CRISTEA²

¹Spitalul Foisor, Bucharest (ROMANIA), ²Spitalul Sf.Pantelimon, Bucharest (ROMANIA)

Retrospective analysis and results after open wedge high tibial osteotomy for medial osteoarthritis of the knee Abstract: We reviewed retrospectively the results after OWHTO performed on 315 patients with medial osteoarthritis of the knee. The operation were all performed between 1995 and 2003. We reviewed 315 patients and 370 osteotomies. 21 patients died, 23 couldn't be contacted, 45 benefited of TKA after an average time of 5.3 years after the first intervention. For evaluation we used the Knee Society Score. We used an RX autocalibration method which has eliminated the error factor as much as possible. 210 patients(aprox.93%) had very good results with high Knee Society Score, and a pain free period between 8-9 years. 10 patients had poor results mainly due to accuracy of surgical technique, obesity and triarticular arthrosis. 6 patients need a later intervention due to non-compliance and failure of mechanical fixation! Best results were noticed at a after correction angle(femuro-tibial)between 185-188°. 45 patients needed TKA because of pain after 5.3years(average). Open wedge high tibial osteotomy is a very good choice for relieving pain caused by arthrosis of the medial compartment of the knee in carefully selected patients.

Date: 2013-10-17

Session: Knee - Osteotomy & Cartilage defects

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 34952

**STUDY OF HIGH TIBIAL OSTEOTOMY IN UNICCOMPARTMENTAL
OSTEOARTHRITIS OF KNEE USING RIGID STEPPED PLATE**

Sushrut Rajan SUSRUT RAJAN, Pradeep Baruah PRADEEP BARUAH,
Bhattacharyya T D

GAUHATI MEDICAL COLLEGE AND HOSPITAL, GUWAHATI (INDIA),

Introduction: High tibial osteotomy (HTO) has been recognized as a beneficial treatment for unicompartmental osteoarthritis of the knee. The purpose of this prospective study was to assess the short-term results of closing wedge high tibial osteotomies with a novel rigid stepped plate fixation. This plate has been used for the first time in India and is custom made depending upon the degrees of valgus required. **Methods:** Thirty consecutive closing-wedge high tibial osteotomies were performed. The preoperative and postoperative factors analyzed included the Ahlbäck grade of arthritis, the tibiofemoral angle, Oxford and Knee society score, range of motion, radiological evidence of healing of the osteotomy site and alignment of the extremity. The aim was to achieve a valgus overcorrection of 2° to 10°. **Results:** The mean preoperative Tibio-Femoral angle (mechanical) was 7 degrees varus and mean postoperative Tibio-Femoral angle was 7.2° valgus. The mean preoperative oxford knee score was 44 and postoperative score was 24. There were 17 excellent, 10 good, two fair and one poor result according to the Oxford knee score with no correlation between age and final score. The knee score improved from the preoperative mean of 36 to postoperative mean of 78 points. Postoperatively 1 superficial wound infection occurred. Twenty-nine of the thirty osteotomies healed after an average period of 11 weeks. The desired alignment was attained in 26(86%) knees. **Conclusions:** Our results suggest that closed-wedge HTO with rigid stepped plate fixation allows desired valgus angle to be achieved with good short-term results and is relatively free of serious complications. Longer-term follow-up is needed to establish its effectiveness in deferring joint replacement surgery.

Date: 2013-10-17

Session: Knee - Osteotomy & Cartilage defects

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 34675

HIGH TIBIAL OSTEOTOMY

Hariram JHUNJHUNWALA

Post Graduate Institute of Medical Sciences of Bombay Hospital, Mumbai
(INDIA)

Unloading of medial compartment by correcting the mal-alignment and redistribution of stresses on lateral compartment Ideal candidate for HTO • active patient in his 50s/early 60s • mild to moderate medial compartment changes • varus deformity less than 12 degrees • FFD less than 10 degrees • ROM more than 90 degrees • minimal synovitis • no rest pain • no internal derangement • no ligament laxity Biological effects of HTO • venous pressure is restored • increased intra-osseous oxygen pressure • increased intra-osseous blood supply • pain conducting fibers are interrupted Contraindications • Valgus deformity • Varus deformity greater than 12 degrees • bi/Tri compartment arthritis • FFD > 10 degrees • ROM less than 70 degrees • Age>60 yrs • Large medial cyst • Marked ligamentous laxity Result High tibial osteotomy gives very good pain relief and regeneration of medial compartment articular cartilage and long term follow up of at least 10-15 years. 300 HTO given very good results. 25% of cases developed tri-compartmental arthritis and can be converted to Total Knee Replacement. Dome osteotomy below tibial tubercle with valgus shift and fixation with locking plate can be done to mobilize knee joint early. We have done 10 cases and we found fusion of osteotomy takes more than 12 to 14 weeks. HTO can be done by Ilizarov's technique by osteotomy below tibial tubercle which takes 12 weeks to heal but advantage is that patient can walk with partial weight bearing. With ilizarov's technique lateral ligament can be stretched by transporting head of fibula distally and varus more than 12 degrees can be corrected.

Date: 2013-10-17

Session: Knee - Osteotomy & Cartilage defects

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 34032

**HIGH TIBIAL OSTEOTOMY A SIMPLE AND RELIABLE PROCEDURE
REVIEW OF KHADRA HOSPITAL TRIPOLI- LIBYA**

Mohamed RASHED

Khadra Hospital, TRIPOLI (LIBYA)

Closing-wedge high tibial osteotomy (HTO) is successful for the treatment of medial osteoarthritis with varus malalignment. The aim of this study was to elucidate the outcome and assess the influence of risk factors on long term HTO survival. Out of 289 cases operated upon in Khadra Hospital-Tripoli, 214 patients with 288 HTO (74 had both knees operated) were retrospectively studied from Jan 1996 till Dec.2010 with a mean follow-up period of 8 years after closing wedge HTO. HTO failure was defined as the need for revision of the surgery or conversion to TKA. Survival was analyzed with the Kaplan-Meier method. Knee function was evaluated by the Hospital for Special Surgery (HSS) score. HTO-associated complications such as non-union, DVT , extension lag were also assessed. The influence of age, gender, and varus angle on HTO failure. 15 complications were recorded. Thus far,2 cases has to be re-operated with rigid fixation and bone grafting for non union, 3 cases had DVT, extension lag in 4 cases and 6 HTOs were converted to TKA. The survival of HTO was 88% after 8 years. Knee function was considered excellent or good in 60% of patients. A significant preoperative risk factor for HTO failure was multi compartment osteoarthritis, over weight. HTO provides good clinical results in long-term follow-up. Preoperative multi compartment osteoarthritis is a significant predictive risk factor for HTO failure. Results of HTO may be improved by careful patient selection. Complications associated with HTO should not be underestimated

Date: 2013-10-17

Session: Knee - Osteotomy & Cartilage defects

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 33566

UNI-COMPARTMENTAL OSTEOARTHROSIS OF THE KNEE: LONG TERM RESULTS OF HIGH TIBIAL OSTEOTOMY USING FIXATOR-CUM-DISTRACTOR

Reetadyuti MUKHOPADHYAY, Zile Singh KUNDU, Paritosh GOGNA

Pt. B.D.S. PGIMS, Rohtak (INDIA)

Introduction: Knee is the commonest joint to undergo degenerative changes and the medial compartment is most commonly affected. High Tibial osteotomy (HTO) is a widely performed procedure to treat medial knee arthrosis, by realigning the axis of a varus knee laterally to unload the medial compartment and allow some cartilage regeneration and pain relief. This study was done to evaluate the outcome of Uni-Compartmental Osteoarthritis of the knee, managed with High Tibial osteotomy by our innovative fixator-cum-distractor. **Material and methods:** This retrospective study included 152 patients with isolated medial knee arthrosis, which were managed with HTO using the method of hemicallotasis by our innovative simple fixator-cum-distractor. The mean follow up of the patients was 8.2 years. The time required for bone union was evaluated according to Apley and Solomon's criteria. The results were evaluated at final follow up using Oxford knee score. **Results:** There was bone union in all patients within 8–10 weeks. Five patients had under correction and 15 patients developed pin tract infection. At final follow-up, mean Oxford Knee Score was 38.2. **Conclusion:** Medial opening wedge osteotomy with hemicallotasis using our simple fixator distractor with controlled distraction is a relatively simple procedure that involves a single osteotomy and little dissection. The technique does not necessitate either fibular osteotomy or bone resection of the lateral tibia. There is no need of plaster and no need of anaesthesia for the implant removal and early weight bearing.

Date: 2013-10-17

Session: Knee - Osteotomy & Cartilage defects

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 33558

ARTHROSCOPY, A COMPLEMENTARY INTERVENTION FOR OPEN WEDGE HIGH TIBIAL OSTEOTOMY

Serban DRAGOSLOVEANU¹, Stefan CRISTEA², Calin DRAGOSLOVEANU¹

¹Spitalul Foisor, Bucharest (ROMANIA), ²Spitalul Sf.Pantelimon, Bucharest (ROMANIA)

Introduction: In our clinic for young patients with medial unicompartmental gonarthrosis we perform an open wedge high tibial osteotomy. Some patients underwent an arthroscopy before or in the same session with the osteotomy. **Purpose:** We want to analyze the benefits of arthroscopy, before or in the same session with the HTO, for the young patient, advantages which tend to complement the already known results of HTO. **Material and Method:** We analyzed 63 patients, with an average age of 53, with clear indications for open wedge HTO. 21 patients underwent an arthroscopy before HTO, 24 patients in the same session and 18 with only HTO. All patients presented medial meniscus lesions clinically or MRI suspected. **Study period:** 4.5 years. **Conclusion:** We found no difference statistically important between the two groups on which we performed arthroscopy, except the degree of comfort of the patients who underwent two surgery sessions! The most frequent lesion was the tear of the posterior horn of the medial meniscus. In the group which underwent also arthroscopy the degree of satisfaction was high, with a total pain free knee at 4.5y for over 95% of the patients. In the group without arthroscopy 13 patients were pain free at 4.5y; the others accused moderate pain and signs of meniscal pathology at the start of normal activity!

Date: 2013-10-17

Session: Knee - Osteotomy & Cartilage defects

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 34499

TREATMENT OF ACUTE FULL-THICKNESS CHONDRAL DEFECTS WITH HIGH MOLECULAR WEIGHT HYALURONIC ACID: AN EXPERIMENTAL MODEL

David FIGUEROA¹, Rafael CALVO¹, Maximiliano ESPINOSA¹, Maximiliano SCHEU¹, Juan José VALDERRAMA², Marcela GALLEGOS¹, Paulette CONGET³

¹Clinica Alemana Santiago, Santiago (CHILE), ²Mutual de Seguridad C.Ch.C, Santiago (CHILE), ³Facultad de Medicina Clinica Alemana-Universidad del Desarrollo, Santiago (CHILE)

Background: Intraarticular injection of hyaluronic acid (HA) has been shown to be effective in osteoarthritic symptoms. However, its effect in acute chondral lesions is not well established. The aim of this study was to evaluate the contribution to cartilage regeneration of two dosing regimens of intraarticular high molecular weight HA (hylan G-F 20) in acute full-thickness chondral defects. **Methods:** Full-thickness chondral defects of 3x6 mm were performed in lateral femoral condyles in New Zealand rabbits and then treated with single or three doses of intraarticular hylan G-F 20. After 12 weeks the regenerated tissue was evaluated through direct observation and histological staining using the International Cartilage Repair Society (ICRS) visual histological scale. **Results:** Macroscopic findings showed that in the groups treated with a single or three doses of hylan G-F 20, the defects were filled with an irregular and rough tissue without differences between them. The histological analysis showed no changes in the groups treated with a single dose or three doses of hylan G-F 20 compared to the control group. In ICRS score, no statistical differences in ICRS scores between control, single dose and three doses of hylan G-F 20 groups were observed. **Conclusions:** These results provide evidence that the use of hylan G-F 20 has no beneficial effect on the hyaline cartilage regeneration in acute chondral defects. This applies for both single and three doses regimens.

Date: 2013-10-17

Session: Knee - Osteotomy & Cartilage defects

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 34970

TWO-YEAR RESULTS OF ARTHROSCOPIC TREATMENT FOR CARTILAGE DEFECTS IN THE KNEE USING MICROFRACTURE AND APPLICATION OF CONCENTRATED BONE MARROW ASPIRATE CELLS WITH FIBRIN GEL AS A SINGLE STAGE PROCEDURE

Vishvas SHETTY¹, Asode Ananthram SHETTY¹, Seok-Jung KIM², Praveen BILAGI³

¹Canterbury Christ Church University, Chatham (UNITED KINGDOM),

²Catholic University of Korea, Seoul (SOUTH KOREA), ³Kent Knee Unit, Spire Alexandra Hospital, Chatham (UNITED KINGDOM)

Introduction: We describe a single stage arthroscopic procedure for the treatment of articular cartilage defects in the knee. The novel procedure involves microfracture and application of concentrated bone marrow aspirate cells (BMAC) with fibrin gel. The aim of the study was to evaluate the clinical and radiological outcomes (using morphological and quantitative MRI) at 2 years. **Materials and Methods:** A prospective study of 30 patients with symptomatic ICRS grade III/IV chondral defects which were assessed clinically and radiologically. The lesions were located on the MFC, LFC, trochlea or patella, ranging from 2-8cm². The surgical procedure involved debridement of the lesion, microfracture and application of concentrated BMAC with fibrin gel under CO₂ insufflation. All patients underwent morphological MRI, quantitative T2*-mapping and d-GEMRIC scan; radiological assessment used the MOCART score. Patients were clinically assessed using the Lysholm, IKDC and KOOS scores. **Results:** At 2 year follow-up, Lysholm score was 80.1±22.4, as compared to 50.8±26.9 pre-operatively ($p < 0.05$). KOOS (symptomatic) was 92.1, as compared to 65.7 pre-operatively. IKDC (subjective) was 83, up from 39 preoperatively. The mean T2* relaxation-times for the repair tissue and native cartilage were 29.1 and 29.9 respectively. Average MOCART score for all lesions was 72±21.3. Patellar lesions also had similar scores. **Conclusion:** Our technique shows encouraging clinical results at 2 year follow-up. The morphological MRI shows good cartilage defect filling and the biochemical MRI (T2*-mapping) suggests hyaline like repair tissue.

Date: 2013-10-17

Session: Knee - Osteotomy & Cartilage defects

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 35310

ASSESSMENT OF DIAGNOSTIC POTENTIALS OF CARTILAGE OLIGOMERIC MATRIX PROTEIN (COMP) AND HYALURONIC ACID (HA) IN KNEE OSTEOARTHRITIS

Utkarsh SHAHI¹, Neha Tiwari SHAHI², Sudhir SINGH¹, Jayant BAJPAYI¹, Aashish GUPTA¹, Dharmendra KUMAR¹, Nishant RAJ¹

¹Era's Lucknow Medical College and Hospital, Lucknow (INDIA), ²Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow (INDIA)

Purpose: The early detection of osteoarthritis is very favourable in planning of future treatment. To meet this goal, there are researches going on over several biomarkers and genetic markers to detect the disease in sub clinical stages or even identify the genetically predisposed cases. COMP and HA are most widely used biomarkers in clinical set up. The purpose of this study is to compare the sensitivity and specificity of diagnostic potentials of COMP and HA in knee osteoarthritis. **Method:** This is a prospective randomized control trial. A total of 360 cases were enrolled in the study. They were equally divided into two groups by a randomization. In both the groups, severity assessment was done according to WOMAC Score and KL Grading System. Then they were tested for serum levels of COMP or HA by ELISA. **Results:** In both the groups, the biomarkers selected show considerably high values. In COMP group increase in values with increasing severity is more consistent as compared to that in HA group. However in HA group, the difference between the normal and disease values were far more significant than COMP group. **Conclusion:** In present study we recommend the use of serum HA estimation for early detection of knee osteoarthritis. However if the sample has to be drawn at a remote location and the time gap between collection and processing is more than three hours, is it better to test serum COMP instead, as in such cases serum HA estimation might show a false negative value.

Date: 2013-10-17

Session: Knee - Osteotomy & Cartilage defects

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 34260

**KNEE LAXITY AFTER STAIRCASE EXERCISE PREDICTS
RADIOGRAPHIC DISEASE PROGRESSION IN MEDIAL COMPARTMENT
KNEE OSTEOARTHRITIS: AN EIGHT-YEAR PROSPECTIVE
OBSERVATION**

Tsuyoshi MIYAZAKI, Kenzo UCHIDA, Yasuo KOKUBO, Shuji WATANABE,
Takumi SAKAMOTO, Atsushi YAMAGISHI, Takafumi YAYAMA, Hisatoshi
BABA

University of Fukui, Fukui (JAPAN)

Objective: To evaluate whether the increased laxity of the knee during daily physical activities such as stair climbing is associated with progression of knee joint OA. **Methods:** During 2001-2003, 136 patients with primary bilateral medial compartment knee joint OA managed at our hospital were enrolled in this prospective study. Baseline data collected were BMI, muscle power, radiographic joint space width, mechanical axis on a standing radiograph, and antero-posterior (A-P) knee laxity before and after physical exercise. At 8-year follow-up, 84 patients were re-examined to assess radiographic changes. Radiographic disease progression was defined as more than one grade progression on the Kellgren and Lawrence scale. **Results:** A-P knee laxity increased significantly after staircase climbing. Patients with OA progression and without progression did not differ significantly in age, gender, baseline quadriceps muscle strength, mechanical axis, joint space width, and A-P knee laxity before exercise. The two groups of patients did however differ significantly in baseline BMI and change in A-P knee laxity due to exercise. The risk of progression of knee OA increased 4.15 times with each extra mm of changes in A-P knee laxity due to exercise, and 1.24 times with each point increases in BMI. **Conclusions:** Our results indicate that patients with OA progression have significantly larger changes in knee joint laxity during physical activities and a larger BMI than patients without OA progression. Our results suggest larger changes in knee laxity during repetitive physical activities and a higher BMI play a significant role in the progression of knee OA.

Date: 2013-10-17

Session: Computer Assisted Techniques

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 33640

**ARTIFICIAL INTELLIGENCE AND ORTHOPEDICS: IS THE FUTURE
TOO FUZZY!**

Vaibhav BAGARIA

CARE HOSPITAL & ORIGYN CLINIC, NAGPUR (INDIA)

Artificial Intelligence (AI) is the skill and engineering which includes several scientific mathematical function to formulate a system that can conceive, conceptualise and execute work like human beings. Three concepts that are core to successful use of AI in various spheres include -Fuzzy Logic, Genetic algorithm and chaotic model. AI can be grouped in three major areas Cognitive science, robotics and natural Interfaces. All three areas are being actively being utilised in the field of orthopaedics to certain extent. This paper describes the foray of AI into field of complex fracture surgical planning (Cognitive science); Executing routine and complex methodical surgeries (Robotics) and preventing road traffic accidents and injuries. Various case scenarios of each of these applications is described. AI has great potential in improving all spheres of orthopaedic practices especially, prevention, meticulous surgical execution and also preoperative planning. There are gaps in knowledge and lack of adequate research into certain grey areas that need to be explored.

Date: 2013-10-17

Session: Computer Assisted Techniques

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 34926

ROBOTIC HIP ARTHROSCOPY; A CADAVERIC FEASIBILITY STUDY

Osman TECIMEL¹, Cetin ISIK¹, Nihal APAYDIN², Halil Ibrahim ACAR², Nurdan CAY³, Ahmet FIRAT¹, Murat BOZKURT¹

¹Ataturk Research and Education Hospital Orthopaedics and Traumatology Clinic, Ankara (TURKEY), ²Ankara University Faculty of Medicine, Department of Anatomy, Ankara (TURKEY), ³Ataturk Research and Education Hospital, Radiology Clinic, Ankara (TURKEY)

Introduction: Hip arthroscopy has become an increasingly popular and more frequently performed procedure with indications that are continually being increased. Advances in robotic technology offers technical advantages over standard approaches. The aim of the present study is to test whether robotic surgery can be used while performing hip arthroscopy or not. **Methods:** Hip arthroscopy was performed on two hip joints of a male fresh-frozen human cadaver. The arthroscopic control of the femoral head and neck and acetabular labrum were evaluated using the da Vinci surgical system. **Results:** Docking of the robotic system and manipulation of the instruments were successful. Although most of the regions which can be reached by standard arthroscopy were also reached with this robotic setting, the 5 mm instruments were limited in movement due to its long articulation section. The 8 mm instrument had shorter articulation section and it exhibited a full range of motion inside the joints. The posterior part of the femoral head and the posteroinferior portion of the acetabular labrum could not be observed because of the rigidity of the equipments. **Conclusion:** Robotic hip arthroscopy seems feasible in a cadaveric model but has some significant limitations. The robotic technology has the potential to revolutionize. After developing of special instrumentations, arthroscopy of the big or small joints may be possible with robotic surgery. The major advantages of the robotic surgery may also enable the surgeon to perform more complex and precise tasks in restricted spaces.

Date: 2013-10-17

Session: Computer Assisted Techniques

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 35323

EVALUATION OF ACCURACY OF ANTERIOR PELVIC PLANE IN COMPUTER NAVIGATED TOTAL HIP ARTHROPLASTY

Mohammad Shahnawaz KHAN, Stuart GOUDIE, Kamal DEEP

Golden Jubilee National Hospital, Glasgow (UNITED KINGDOM)

Introduction: Anterior pelvic plane (APP) is almost used universally by all computer navigation systems for total hip arthroplasty (THA). Its reliability is questioned because of the need to register bony landmarks which may be obscured because of fatty tissue. The purpose of this study was to assess the accuracy of APP in predicting cup placement in computer navigated THA.

Methods: An analysis of 288 consecutive patients who had THA performed with imageless computer navigation system was carried out. Acetabular cup abduction and anteversion were compared between navigation measurements and follow-up radiographs. Patients were divided into two groups based on BMI (obese >30 and non-obese <30). Precision, accuracy, sensitivity and specificity were calculated to assess APP for cup orientation and student t-test used for evaluation in obese and non-obese groups.

Results: Mean cup abduction and anteversion was 40.43° (SD,5.93) and 18.65° (SD,6.95) in postop radiographs compared to 41.06° (SD,4.93) and 15° (SD,6.14) for navigation measurements. Intraoperative APP navigation measurements had high precision and specificity for determining cup abduction and anteversion (precision $>95\%$, specificity $>90\%$). Accuracy for determining cup abduction was 98.26% compared to 75% for cup anteversion. Postoperatively mean abduction and anteversion in non-obese group was 39.87° and 18.31° respectively, compared to 41.24° and 19.12° in obese group. There was no significant difference in both modalities in the two groups ($p >0.05$).

Discussion: We found that APP is a reliable plane for predicting correct placement of acetabular cup irrespective of BMI of patient. To conclude, computer navigation can serve as an excellent tool for appropriate placement of implants.

Date: 2013-10-17

Session: Computer Assisted Techniques

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 34363

REVISION TOTAL HIP ARTHROPLASTY USING IMAGELESS NAVIGATION WITH THE CONCEPT OF COMBINED ANTEVERSION

Jun-Dong CHANG, In-Sung KIM, Atul BHARDWAJ, Kashayi Chowdoji SREEKANTH

Arthroplasty Center, Department of Orthopaedic Surgery, Dongtan Sacred Heart Hospital, Hallym University, Hwaseong (SOUTH KOREA)

Introduction: The purpose of the study is to evaluate the implant positions and clinical results in revision total hip arthroplasty (THA) using imageless navigation with the concept of combined anteversion. **Methods:** We evaluated the implant positions and clinical results of 40 patients (24 men and 16 women) who underwent a cementless revision THA using an imageless navigation with the concept of combined anteversion based on Widmer's equation. The mean follow-up was 50.7 months. Post-operatively, the inclination of the cup was evaluated on the standard AP view of radiograph and the anteversion of the cup and femoral stem was evaluated on the CT scan. $40^\circ \pm 10^\circ$ in inclination and $37^\circ \pm 5^\circ$ in combined anteversion based on Widmer's equation were regarded as the safe zone. The Harris Hip Score and the complications were evaluated. **Results:** The average inclination and anteversion of the cup were $42.3^\circ \pm 3.1^\circ$ and $20.8^\circ \pm 4.9^\circ$, respectively. The average anteversion of the femoral stem was $15.3^\circ \pm 2.9^\circ$. The average combined anteversion was $36.1^\circ \pm 2.4^\circ$. There were no outliers in the inclination and the combined anteversion of the cup. The mean post-operative Harris Hip Score was 90.7. There was no case with dislocation, component migration, or other major complication. **Conclusion:** The imageless navigation is useful for applying the concept of combined anteversion in revision THA. This study demonstrated that the results of revision THA using imageless navigation with the concept of combined anteversion are favorable.

Date: 2013-10-17

Session: Computer Assisted Techniques

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 34434

COMPARISON OF ACCURACY OF TRANSEPICONDYLAR AXIS AS A MEASURE FOR FEMORAL COMPONENT ROTATION IN COMPUTER NAVIGATED AND NON NAVIGATED TOTAL KNEE ARTHROPLASTY IN SEVERELY DEFORMED KNEES

Saurabh GUPTA, Shantharam SHETTY, Ajith KUMAR

Tejasvini Hospital and Shantharam Shetty Institute of Orthopaedics and Traumatology, Mangalore (INDIA)

Purpose: To compare accuracy of transepicondylar axis as a reference for femoral component rotation in primary navigated versus non navigated total knee arthroplasty in severely deformed knees. Methods : A prospective study done from dec 2009 to dec 2011 at tertiary centre. 180 knees were included (124 females and 56 males). All cases were randomly allocated into 2 groups: navigated and non navigated. All surgeries were carried out by two senior arthroplasty surgeons. All patients undergoing primary total knee replacement were included and all revision cases were excluded. Intraoperative assessment of TEA was done by palpating most prominent point on lateral epicondyle and sulcus on medial epicondyle and passing a k wire through it. Confirmation is done under image intensifier C arm with epicondylar view in Non navigated knees. Postoperative TEA was assessed by taking CT scan, measuring condylar twist angle and posterior condylar angle (PCA). Results : The mean PCA was around 4° with TEA as reference in Navigated and 6° in Non navigated knees and only 7% patients required an additional lateral release of which 2% patient had preoperative patellar maltracking. No postoperative patellar maltracking was seen. Anterior knee pain was present in 10% patients. Alignment ranging from 4° to 8° external rotation. Conclusion: Navigation is most accurate measure for TEA as reference, as compared to non navigated TKA, which can lead to excessive external rotation especially in severely deformed knees.

Date: 2013-10-17

Session: Computer Assisted Techniques

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 34324

SELECTIVE FEMORAL NAVIGATION FOR TOTAL KNEE ARTHROPLASTY: A COMPARATIVE STUDY OF 200 CASES

Amol DHAWALE, Nilen SHAH, Bipin KHEDKAR

Bombay Hospital, Mumbai (INDIA)

Introduction: It is well established that tibio-femoral computer navigation can improve the coronal alignment following a Total Knee Arthroplasty. However, traditional tibio-femoral navigation adds to surgical time and has the potential risk of a fracture through pin site. In Selective femoral navigation only distal femoral cut was navigated with a navigation unit called Articular Surface Mounted navigation(ASM). Except femoral head all other bony landmarks are subcutaneous and easily palpable so navigation was not purposely used for rest of the bony cuts other than distal femoral cut. **Aims and objectives:** To study and analyse use of selective femoral navigation, with respect to its accuracy & to compare results with other studies. **Materials and methods:** We performed a study of 200 knee arthroplasties, 100 performed by conventional method at various centres' and 100 with selective femoral navigation at the centre where ASM navigation technique was available, between January 2006 -January 2010. **Results:** Our data of selective femoral navigation technique suggest that navigated group showed less outliers of the mechanical axis than the Non-Navigated group. The mechanical Axis of the leg was within 30° of neutral alignment in 90% of the patients in navigated group and 74 % in non-navigated group. **Conclusion:** Selective femoral navigation can thus be a useful during TKA as it provides reproducible and reliable results concerning correct axis alignment. In addition, a significant reduction of outliers and scattering can be achieved using selective femoral Navigation technique. The drawbacks with traditional navigation including length of surgery, incidence of fractures can be overcome.

Date: 2013-10-17

Session: Computer Assisted Techniques

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 33917

COMPARISON OF PERI-OPERATIVE OUTCOMES OF TKRS DONE USING COMPUTER NAVIGATION AND PATIENT SPECIFIC INSTRUMENTATION

Shreedhar ARANGANATHAN, Thati SRINIVAS, Hirehal KIRAN, Ganapathi MUTHU

Ysbyty Gwynedd, Bangor (UNITED KINGDOM)

Introduction: Computer navigation and Patient Specific Instrumentation (PSI) are two types of computer-associated techniques for performing knee replacements. We compared early peri-operative indicators between consecutive series of Total Knee Replacements (TKRs) done using these techniques. **Methods:** Navigated TKRs were performed using Stryker® OrthoMap Articular Surface Mounted (ASM) in 63 patients (25 males, 41 females). Mean demographic values include an age of 71 years, BMI of 33.7 and an ASA grade of 2. The average operative time was 1 hr: 14 minutes. Postoperative haemoglobin drop was 2.4 gm/dL. The average length of stay was 4 days. For PSI technique, we used the Zimmer PSI® system in 77 patients (29 men and 45 women) with 3 simultaneous bilateral TKRs. Mean demographic values include an age of 71 years, BMI of 34 with an ASA grade of 2. Average operative time was 43 minutes. Post-operative haemoglobin drop was 2.1 gm/dL. Average length of stay was 2.2 days with 9 same-day discharged patients. **Results:** Both cohorts had similar patient demographics. No patients from either groups required blood transfusion. While both cohorts had good early peri-operative outcome, patients in the PSI® cohort showed a significantly reduced haemoglobin drop, operative time and shorter length of stay.

Date: 2013-10-17

Session: Computer Assisted Techniques

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 34509

**CORRECTION OF FEMORAL DEFORMITY IN ADULTS USING
ORTHO-SUV FRAME: REVIEW OF 50 CASES**

Elena SHCHEPKINA, Leonid SOLOMIN, Pjotr SKOMOROSHKO, Viktor VILENSKY

R.R.Vreden Research Institute of Traumatology and Orthopedics,
Saint-Petersburg (RUSSIA)

Objective: The Ortho-SUV Frame (ortho-suv.org) is a new computer-assisted external fixator. It allows a precise simultaneous correction of complex deformities to be performed without significant changes to the system during the correction. We report on our experience of using that device in treating 47 adult patients (50 limbs) with femoral deformities. **Methods:** We retrospectively reviewed the clinical and radiographic records of the patients underwent SUV femoral deformity correction. Rate of lengthening, time in frame, external fixation index, accuracy of correction and complication rate were measured. **Results:** All patients successfully completed treatment with radiographic evidence of consolidation. Etiology included 11 congenital and 39 acquired deformities. Median age was 35.4 year (range, 17-76). The mean time in frame was 200.6 days (range, 116–339 days). Frontal and sagittal plane deformities were corrected to within normal values in 44 cases (88%). A mean limb lengthening was 3.7 cm (range, 1.5–9 cm). External fixation index was 56.9 days/cm(range, 29.3-94). The 37 complications included pin tract infection, acute-on-chronic osteomyelitis, knee stiffness, posterior knee subluxation, half-pin and wire breakage, delayed union and nonunion. Only 15 complications required additional surgery, other complications were managed conservatively. All complications were typical for external fixation. There were no complications specific to a computer-assisted external fixator. **Conclusion.** Femoral deformity correction with the computer-assisted SUV is a precise and safe technique.

Date: 2013-10-18
Session: Tumours I
Time: 10:30 - 12:00
Room: G.01 & G.02

Abstract no.: 35756

**MUSCULOSKELETAL TUMOURS PRESENTING TO A KNEE SERVICE
OVER 10 YEARS: A RETROSPECTIVE REVIEW OF PRACTICE**

Samer Ss MAHMOUD¹, Michael J McNICHOLAS²

¹University Hospital Wales, Cardiff (UNITED KINGDOM), ²University Hospital Aintree, Liverpool (UNITED KINGDOM)

Introduction: This is a 10 year retrospective review of our practice dealing with musculoskeletal tumours presenting to a district general hospital knee service referred onto the Birmingham Tumour Centre (BTC). We are presenting our experience with such rare and serious conditions aiming at creating new guidelines raising awareness to avoid missing them. **Methods:** Tumour service correspondence and local patients' case notes were identified and reviewed. Then we contacted the local tumour center in order to obtain further information about case progression and prognosis. **Results:** In this time 35,409 patients were seen in this knee unit (9,565 new patients and 25,844 follow up patients). 20 patients (14 females, 6 males) with average age of 36.4 years (13-67 years) were referred from our service. Referral sources to our service were from: GP 12 (60 %), Accident and Emergency 4 (20%) and other consultants (other speciality or subspecialty) 4 (20%). All were referred onto BTC and upon further investigation 11 patients had malignant conditions and 9 were benign. 9 malignant conditions had urgent major operative intervention. Radiotherapy and chemotherapy was used in 2 patients. 5 of the benign cases required surgery while conservative treatment was used in 4 patients. **Conclusion:** Musculoskeletal tumours are rare. We could not detect national (UK) or international (Europe) guidelines for DGHs dealing with those cases. Thus, constant vigilance is required to enable early detection & urgent referral to specialist tumour centres which has been shown repeatedly to be the best option for survival and functional outcomes.

Date: 2013-10-18
Session: Tumours I
Time: 10:30 - 12:00
Room: G.01 & G.02

Abstract no.: 35222

**COMPARATIVE SHORT TERM AND LONG TERM FOLLOW UP STUDY
OF CLINICAL AND FUNCTIONAL OUTCOMES IN ARTHRODESIS OF
KNEE VERSUS ARthroPLASTY FOLLOWING EXCISION OF
MALIGNANT AND AGGRESSIVE BENIGN BONE TUMORS**

Shishir RASTOGI, Abhinav AGARWAL

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

With improvements in imaging technology, neoadjuvant chemotherapy, surgical techniques and implant designs, limb salvage surgery is indicated in majority of patients with musculoskeletal malignancies with excellent limb salvage rates being reported. Arthrodesis of the knee or arthroplasty using endoprosthesis are used as common reconstructive modalities following oncological resection of the tumor; the choice being based on several considerations with no specific recommendations regarding the indications for either procedure. The aim of this study was to report and compare clinical profile of the patients which included their demographics, preoperative tumor characteristics, postoperative complications and limb salvage rates, along with clinician and patient based objective and subjective functional outcomes based on impairment, disability, and a generic health status measure, following arthrodesis or endoprosthetic reconstruction after resection of malignant and aggressive benign bone tumors around knee, carried out at a single tertiary care referral center, in order to determine the specific indications for carrying out either procedure in given conditions. 49 patients undergoing endoprosthetic reconstruction and 60 patients with arthrodesis were included in this study with a minimum follow up duration of 12 months. The scores obtained on the 1993 Musculoskeletal Tumour Society Rating Scales (MSTS), Toronto Extremity Salvage Score (TESS), Short Form 36 version 2 (SF-36v2) and European Organization for Research and Treatment of Cancer 30-item core quality of life questionnaire (EORTC QLQ C-30) are compared and correlated thus trying to find out the best outcome scale suited for this specific patient population.

Date: 2013-10-18
Session: Tumours I
Time: 10:30 - 12:00
Room: G.01 & G.02

Abstract no.: 34551

CLINICAL OUTCOME OF AGED PATIENTS WITH PRIMARY MALIGNANT BONE AND SOFT TISSUE TUMORS OVER 75 YEARS OLD

Tadashi IWAI

Department of Orthopedic Surgery, Osaka City University Hospital, Osaka (JAPAN)

BACKGROUND: The number of cases with primary malignant bone and soft tissue tumors in aged patients has been increasing. It is necessary to select suitable therapy for aged people according to the general condition of each patient, concerning his/her decreasing physical and physiological functions.
PATIENTS AND METHODS: We reviewed the clinical data of 23 aged patients (age 75-91, age average 79.5, 11.3 older or younger) diagnosed with primary malignant bone and soft tissue tumors, who were treated from January 2007 to November 2012 in our hospital. The average follow-up duration was 33 months. We examined tissue types, the original sites, complications, surgical margin and prognosis.
RESULTS: Tissue types were liposarcoma (14 cases), leiomyosarcoma (3 cases), and MFH, osteosarcoma, chondrosarcoma, myxofibrosarcoma and plasma cell tumor (1 case each). Original sites were femur (12 cases), trunk (5 cases), upper limb (3 cases), and leg (3 cases). Complications were multiple cancer (5 cases), severe dementia (1 case), cardiovascular (10 cases), and stroke (2 cases). The surgical margin was wide in 14, marginal in 6, and intralesional in 2 cases. Prognoses were CDF (12 cases), NED (3 cases), AWD (4 cases), DOD (2 cases), and DOAD (1 case). The 1-year overall survival rate of all these patients was 87.0%. Chemotherapy was carried out for one of the patients.
CONCLUSION: As aged patients suffer from several comorbidities besides the tumor, we usually have difficulty in selecting the proper therapy. According to the result of our study, however, we can expect comparatively well and long prognosis in aged patients. Even if they have rather many complications, we should select positive therapy depending on the general condition of each of the patients.

Date: 2013-10-18
Session: Tumours I
Time: 10:30 - 12:00
Room: G.01 & G.02

Abstract no.: 34474

**CLINICAL ANALYSIS ON 103 CASES OF OSTEOSARCOMA IN LIMBS
SALVAGED WITH MASSIVE FROZEN ALLOGRAFTS
TRANSPLANTATION**

Fan TANG, Yi LUO, Jing PENG, Yi WEN, Chongqi TU

West China Hospital of Sichuan University, Chengdu (CHINA)

Objective: To observe the clinical effect of massive frozen allografts transplantation treating osteosarcoma for limb salvage. Methods: From June 1997 to July 2012 , 103 patients with osteosarcoma in limbs underwent wide local resections of tumor and massive frozen allograft reconstructions for bone defect, 79 femurs , 21 tibias and 3 humeri of total. 67 patients received preoperative chemotherapy and postoperative chemotherapy, 30 received single medicine chemotherapy and 6 did not receive chemotherapy. Results: Ninety-nine of 103 patients were followed up from 1 to 8 years with an average of 5 years and 5 months. Thirty-nine cases are continuously disease free, local recurrence was found in 9 cases, 51 cases had pulmonary metastatic lesions or other location , 40 cases died. Healing was got between allograft and host bone except for 9 patients, the rate of bone healing was 90.9 % and the time of bone healing was 5 to 24 months with an average of 7.8 months. Fracture occurred in 6 osteoarticular allografts and fracture rate was 6.1%. According to the Mankin scale, 71.2 % of all were rated good or excellent. Conclusion: Total survival of massive frozen allograft is difficult , but healing is easily gotten between allograft and host bone to obtain permanent biological connection, so massive frozen allografts transplantation is still a fairly ideal method for salvage of osteosarcoma in limbs.

Date: 2013-10-18
Session: Tumours I
Time: 10:30 - 12:00
Room: G.01 & G.02

Abstract no.: 34793

SURVIVAL AFTER METASTATIC SPINAL DISEASE. SURVIVAL OF COMMON TUMOURS BASED ON OSWESTRY RISK INDEX

Anuj JAISWAL¹, Birender BALAIN¹, Jayesh TRIVEDI¹, Stephen EISENSTEIN¹, Jan-Herman KUIPER², David JAFFRAY¹

¹RJAH Orthopaedic Hospital, Oswestry (UNITED KINGDOM), ²Keele University, Oswestry (UNITED KINGDOM),

Introduction: We have described Oswestry risk index (OSRI) to predict the survival of patients with metastatic spinal disease. OSRI is based on primary tumour and general condition (Karnofsky score) of the patient, and has a value from 1-7. Survival in groups 2 and 3, and, 4 and 5 are grouped together. Purpose of this study is to present survival of patients with spinal metastases of common tumours according to risk index over a 23 years period at a tertiary spinal service. **Methods:** A total of 200 patients referred between February 1987 and February 2010 for metastatic spinal disease were retrospectively reviewed. Survival of patients with following common primary tumours: lung(20), breast(35), renal(18), prostate(31), unknown(20), multiple myeloma(19) and lymphoma(13) was evaluated. **Results:** Median survival for lung primary with OSRI 6 was 1.5 months and with 7 was 1 month. Survival of breast primary with OSRI 1 was 16, and with 2 or 3 was 9.5 months. Survival of renal cancer with OSRI 2 or 3 was 6.5 months and with 4 was 0.75 months. For prostate primary survival with OSRI 1 was 16 months and with 2 or 3 was 4 months. Survival for unknown primary with OSRI 4 or 5 was 8 months. Survival for multiple myeloma with OSRI 1 was 47.5 months and with 2 or 3 was 30 months. Survival for lymphoma with OSRI 1 was 14.5 months and with 2 or 3 was 2 months. **Conclusions:** We believe this information will help surgeons in decision-making regarding management of these patients.

Date: 2013-10-18
Session: Tumours I
Time: 10:30 - 12:00
Room: G.01 & G.02

Abstract no.: 34178

**PELVIC SARCOMAS SURGICAL TREATMENT AND PROGNOSIS
ABOUT 08 CASES**

Mourad HAMIDANI¹, Mohamed MEDJDOUB², Fouzia TOUATI¹, Nassima BELHABIB¹

¹CHU BLIDA, BLIDA (ALGERIA), ²CAC BLIDA, BLIDA (ALGERIA)

Introduction the illiac bone malignant tumors represent 10% of the total malignant tumors of the bone we treated enormous tumors of the zone I and III posing problems of resection the main trouble is the neighbourhood with the abdominal organs ,the thick vessels and nerves Matériels and methods between 2004/ 2013 eight patients have been treated male 05 female 03 age average 32 years location of tumors zone I 05 zone II+IV 01zone III 02 Assessment of tumor resectability was accomplished with three dimensional CTscan and MRI for all patients We counted tumors without disrupting the pelvic ring in one case others in seven cases a previous biopsy have found Chondrosarcomas 05 GCTumor 01 Ewing sarcoma 01 Osteosarcma 01 02 patients benefitted from chemotherapy I approach is conformed with the topography, and size of resection as well as the presence of scars from previous interventions. We used ilio unguinal and posterior iliac approachs we have kept the hip joint in 07 cases and for 01case we made a closed arthrectomy by resections in zone II and III the lack left by the resection has been bridged by a plate,in02 cases reinforced By cement to fill the defect. In 03 cases By the Dacron plate to avoid eventration in 06cases Autografts + ileo-lumbar osteosynthesis 01 case Résults The follow up from 2004 to 20013 from 03 months to 99 months Average 39 months Results : Assessments follow up according. ISOLS score Pain Mobilite Load bearing Ambulation Claudicating Subjective assessment

Date: 2013-10-18
Session: Tumours I
Time: 10:30 - 12:00
Room: G.01 & G.02

Abstract no.: 33721

CAN CLINICAL ASSESSMENT PREDICT THE HISTOLOGICAL RESPONSE OF MALIGNANT BONE TUMORS TO PREOPERATIVE CHEMOTHERAPY?

Amit PRIYADARSHI
JIPMER, Pondicherry (INDIA)

Introduction: Nowadays, preoperative chemotherapy plays a key role in the management of malignant bone tumors. Response to it is best assessed with evaluation of tumor necrosis postoperatively. This study was done to evaluate the efficacy of clinical parameters in preoperative assessment of tumor response. **Methods:** Our study included 14 patients (12 osteosarcomas and two malignant fibrous histiocytomas) with mean age of 21.8 years, treated with preoperative chemotherapy followed by surgical resection of the tumor. They were evaluated clinically thrice, before, after one month, and after completion of chemotherapy. Clinical parameters, i.e., pain, tumor girth, tumor diameter, surface temperature, and consistency were correlated with histological response (percentage of necrosis) using Pearson and Spearman correlation test. **Results:** Significant correlation with histological necrosis was seen in change in pain, tumor girth, maximum tumor diameter, and surface temperature ($P<0.05$). Change in consistency did not show significant correlation ($P>0.05$). Complete relieve of pain with reduction of >4 grades, $\geq 5\%$ reduction in tumor girth, $\geq 8\%$ reduction in tumor diameter, and attainment of normal body temperature or decrease of $\geq 2^{\circ}\text{F}$ temperature proved to be indicator of good histological response. **Conclusion:** Clinical evaluation is a reliable method of assessment of response of the bone tumors to preoperative chemotherapy.

Date: 2013-10-18
Session: Tumours I
Time: 10:30 - 12:00
Room: G.01 & G.02

Abstract no.: 34775

THE PREDICTIVE VALUE OF SUBTYPES OF HORMONE RECEPTOR AND HER-2 FOR PATIENTS UNDERGOING SPINAL SURGERY FOR METASTATIC BREAST CANCER

Miao WANG¹, Anders Bonde JENSEN², Chunsen WU³, Søren Schmidt MØRGEN⁴, Ming SUN⁵, Haisheng LI⁵, Benny DAHL⁴, Cody Eric BÜNGER⁵

¹Spine department of Aarhus University Hospital, Aarhus (DENMARK),

²Department of Oncology, Aarhus University Hospital NBG, Aarhus (DENMARK), ³3. Department of Epidemiology, School of Public Health, Aarhus University, Aarhus (DENMARK), ⁴Spine Unit, Rigshospitalet, Copenhagen, Denmark, Copenhagen (DENMARK), ⁵Department of Orthopaedic E, Aarhus University Hospital NBG, Aarhus, Denmark, Aarhus (DENMARK)

Introduction. Preoperative evaluation of prognosis among patients with spinal metastases is a challenge for the spine surgeon to choose optimal treatments. Widely used scoring systems (such as Tokuhashi score) are only focusing on the primary site. Breast cancer is one of the most common tumors that involve the spine. The breast cancer patients with positive hormone receptor status showed better survival. Aim of this study was to investigate the influence of breast cancer subtypes on survival of breast cancer patients with spinal metastases. **Patients and Methods** The 151 patients from Aarhus University Hospital and Rigshospitalet Copenhagen since 1997 to 2011. The ER, PgR and Her-2 status data were retrieved from the Danish Breast Cancer Group. We used survival analysis, A Cox's proportional regression analysis was used to compute mortality rate ratios (MRR). Results ER receptor, 91pt (+), 16pt (-). The median survival time of ER (+) and ER (-) were 23.1 and 10.6m. The Hazard ratio showed the difference of mortality rates was 0.72. PgR receptor, 29pt (+), 21pt (-). The median survival time of PgR(+) and PgR(-) were 40.8 and 14.7 months. MRR was 0.63. HR group, 109pt HR(+), 17 pt HR(-). The median survival time of HR(+) and HR(-) were 23.1 and 10.6m. MRR was 0.67. Her-2 receptor, 21pt (+). Nineteen patients were negative. The median survival period of Her-2 (+),Her-2(-) was 25.1 and 13.9 months. MRR was 0.70. **Conclusion** Positive subtype have longer survival time. Surgeons could perform more aggressive surgery when these positive biomarkers are found.

Date: 2013-10-18
Session: Tumours I
Time: 10:30 - 12:00
Room: G.01 & G.02

Abstract no.: 35470

**A-CENTER EXPERIENCE OF INTERSTITIAL PERMANENT I125
BRACHYTHERAPY FOR EXTREMITY SOFT TISSUE SARCOMAS**

Cheng REN¹, Hong DUAN²

¹West China Hospital, Chengdu (CHINA), ²Department of Orthopaedics,
West China Hospital, Sichuan University, Chengdu (CHINA)

Background: The goal of this study was to evaluate the efficacy of interstitial permanent brachytherapy (BRT) using I125 seeds for patients undergoing combined modality management of soft tissue sarcomas (STS) in our institution. **Methods:** From January 2007 to January 2012, 110 adults 18–86 years of age (median =44 years) with extremity STS who underwent interstitial permanent brachytherapy using I125 seeds as part of loco-regional treatment were included in this review. The median number of I125 seeds implants is 30. Complications were assessed in terms of wound complication, and peripheral nerve damage. **Results:** After a median follow up of 43.7 months, the local-control (LC), disease-free survival (DFS), and overall-survival (OS) for the entire cohort was 74%, 54%, and 77% respectively. The actuarial rates of wound complications requiring reoperation, and nerve damage were 4.5%, and 1.8%, respectively. **Conclusions:** Interstitial permanent brachytherapy with I125 after function-preserving surgery results in satisfactory outcome in patients with extremity STS, and the complication rate is low that compares favorably with data reported for external beam radiation and brachytherapy in other modality.

Date: 2013-10-18
Session: Tumours II
Time: 16:30 - 18:00
Room: G.01 & G.02

Abstract no.: 35845

EWING'S SARCOMA OF THE PELVIS – A SINGLE CENTRE EXPERIENCE IN 48 PATIENTS

Philipp FUNOVICS, Madeleine WILLEGER, Joannis PANOTOPOULOS, Reinhard WINDHAGER

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

Aim of this study was to report our single-center experience with surgical resection of pelvic Ewing's sarcoma within a multimodality treatment approach. Out of the Vienna Bone and Soft Tissue Tumor Registry we have identified 48 patients (25 females and 23 males) with a Ewing's sarcoma of the pelvic or sacral region treated between 1973 and 2012. Mean age at time of surgery was 19 years (median, 17; range 2-51). All but 3 sacral tumors and 3 gluteal soft tissue lesions occurred in the bony pelvic ring. After resection, surgery comprised additional reconstruction by endoprostheses in 15 patients and by biological means in 13 patients. Adjuvant treatment included chemotherapy in 46 patients, radiation in 32 and 31 patients received both. Overall mean follow-up was 54 months (median, 37; range 1-245). Surgical complications occurred in 19 patients including infection in 7, mechanical disorders in 5, neurological deficits in 4 and thrombo-embolism in 3, one of them ended lethal. Three patients had to undergo secondary hemipelvectomy. Local tumor recurrence appeared in five patients, but all of them were observed before 1985. Nine patients presented with primary metastatic disease, 17 patients developed metastases throughout follow-up. Alltogether, 26 patients died of disease, resulting in a median overall survival of 45 months. The respective 5-year overall survival was 42%. The surgical treatment of pelvic Ewing' sarcoma remains challenging with a relatively high complication rate and moderate overall outcome, local tumor control rates are highly satisfying given an aggressive surgical approach.

Date: 2013-10-18

Session: Tumours II

Time: 16:30 - 18:00

Room: G.01 & G.02

Abstract no.: 34758

THE RESEARCH OF BIOMECHANICAL STABILITY OF PELVIS AFTER SUBDIVIDED SACRECTOMY

Yi LUO¹, Yong ZHOU¹, Jing PENG¹, Fan TANG¹, Bo QU², Chongqi TU¹

¹West China Hospital of Sichuan University, Chengdu (CHINA), ²Chengdu Military General Hospital, Chengdu (CHINA)

Objective: Through the biomechanical testing of intact pelvis and models of pelvis after subdivided sacrectomy, to provide a credible theoretic basis about which level of sacrectomy reconstruction is necessary for pelvic stability. **Methods:** Choose six normal adult human fresh cadaveric L5-pelvis specimens. Compressive stress loaded on the specimens was increased by 200N, until 1000N, at the speed of 1.4mm/min. The change of the maximum main stress, shear stress, displacement, and rigidity of the pelvis were measured in all groups. When the specimens were resected by 1/2 S1, the maximum load of pelvic ring was measured. **Results:** With the growth of the sacrum resection plane, the maximum main stress, shear stress, displacement, and rigidity of the pelvis had different degree increases. Rigidity of the pelvis decreases continuously. When the sacrum resected by S1, the change was obvious, especially resected by 1/4S1 to 1/2S1. After resection by 1/2 S1, the maximum load of pelvic ring was 2375.97 ± 162.41 N, factures were occurred through sacroiliac joints or residuary sacrum. **Conclusion:** The extent of sacrectomy is closely related with pelvic stability. With the growth of the sacrum resection plane, all kinds of stress at residual sacroiliac joints will sharply rise, the stability of the whole pelvis will drop obviously. When the sacrum resected by 1/4S1 or 1/2S1, stress excessively concentrates at the sacroiliac joint, the stability of the whole pelvis will drop quickly, fracture easily happens. Therefore, reconstruction is needed to enhance the stability of the sacroiliac joint when the sacrum resected by S1.

Date: 2013-10-18
Session: Tumours II
Time: 16:30 - 18:00
Room: G.01 & G.02

Abstract no.: 34258

**A SINGLE POSTERIOR APPROACH AND SPINAL RECONSTRUCTION
FOR INTRADURAL TUMORS OF THE CERVICOTHORACIC SPINE**

Hua JIANG, Zengming XIAO

Department of Spinal Surgery, the First Affiliated Hospital of Guangxi
Medical University, Nanning (CHINA)

Introduction: To assess the surgical, clinical, and radiographic outcomes of using a single posterior approach to resect intradural extramedullary tumors of the cervicothoracic spine.

Methods: Fifteen patients with occipitocervical intraspinal extramedullary tumors were reviewed retrospectively. There were 7 males and 8 females with a mean age of 44.6 years (range from 21 to 72 years). Imaging findings demonstrated intradural tumors in all the cases, including 7 cases in dorsolateral spinal cord, 5 cases in lateral side, and 3 cases in ventral side. All patients underwent single-stage removal of tumors by a posterior approach followed by laminectomy combined with instrumentation. Radiographic and clinical outcomes were assessed with an average follow-up of 31 months (range, 24-53 months). **Results:** All patients had tumors successfully removed with no neurological deterioration. Of the 15 patients, the Frankel grade before surgery was C in four, D in eight and E in three. At the latest follow-up, two patients with a Frankel grade of C improved to D, two patients with a Frankel grade of C, six patients with a Frankel grade of C improved to E, and five patients remained asymptomatic. Spinal deformities were not observed in any patients during the follow-up. **Conclusion:** Intraspinal tumors resection and spinal reconstruction can be safely performed through a single posterior approach combined with appropriate instrumentation.

Date: 2013-10-18

Session: Tumours II

Time: 16:30 - 18:00

Room: G.01 & G.02

Abstract no.: 35844

WIDE RESECTION AND CENTRALIZATION OF FIBULA FOR DISTAL TIBIAL TUMORS

Sukhbir Singh SANGWAN, Zile Singh KUNDU

PGIMS, Rohtak (INDIA)

Background: Management of distal tibial tumors with limb salvage surgery poses a challenge for the orthopaedic surgeons. Tumors involving distal tibia were managed by wide resection of the tumor with ankle arthrodesis with centralisation of ipsilateral fibula. **Patients and methods:** Nine patients with a mean age of 22 years (17 to 34) with diagnosis as osteosarcoma (n=4), Ewing's sarcoma (n=2), GCT (n=2), and chondrosarcoma (n=1) underwent surgical treatment for the tumors of the distal tibia. Resection of the tumor and ankle arthrodesis with centralisation of fibula was performed in all these patients. The final functional outcome was estimated according to MSTS functional scores **Results:** The mean age at the time of surgery was 23.2 years (17-34). There were five females and four males. The mean follow-up was 37 months (28 to 54 months). One of the patients with osteosarcoma had a recurrence after one year of limb salvage surgery and underwent above knee amputation and died at 18 months following surgery due to metastasis. Two patients developed a leg length discrepancy and one patient had superficial skin infection. Residual limb function was estimated at 2 years and the mean Musculoskeletal Tumor Society score was 22.7 (17-27). **Conclusion:** Fibular centralisation is a durable reconstruction for defects of the distal tibial metaphysis with an acceptable functional outcome. It is a useful tool in the limb salvage procedure. It is a short procedure, inexpensive, with low rate of late complications.

Date: 2013-10-18

Session: Tumours II

Time: 16:30 - 18:00

Room: G.01 & G.02

Abstract no.: 35831

IPSILATERAL NON-VASCULARIZED FIBULAR TRANSPLANT IN RECONSTRUCTION OF DISTAL RADIUS GCT

Abhinav SINHA¹, Ajoy MANAV², Rakesh KUMAR²

¹Lady Hardinge Medical College, New Delhi (INDIA), ²PATNA MEDICAL COLLEGE AND HOSPITAL, PATNA (INDIA)

Distal radius is the third commonest site of giant cell tumour. At the time of presentation, most of the cases are in grade II and III. Wide excision and reconstruction is the treatment of choice. Between Jan. 2001 to Dec. 2012, fifty six cases of GCT at distal radius, Grade II & III were treated by wide excision and reconstruction using non-vascularized ipsilateral fibula in the same setup. The graft was initially fixed with K-wire but later on rigid fixation with plate (dcp/lcp) was done. The fibular graft was stabilized to the distal ulna with a transverse K wire for 6 weeks. The minimum follow up was two years. The average time of union was twenty two (22) weeks. Union occurred in 70% cases in the first attempt. Bone grafting was required in 22% cases. Tumor recurrence was found in 8% of cases where the graft was destroyed. Revision with contra lateral fibula after en block excision was successful in 30% of failed cases. In rest of the cases, patient was offered amputation/referred to higher centre. The overall result was excellent in 50% cases (hand function>60% as compared to the opposite side), Good in 30% cases (hand function<60% and stiffness), and poor in 20% cases (non-union, recurrence, amputation). The process is safe, cost-effective and long lasting. Frozen section facility, and routine CT and MRI can further improve the results.

Date: 2013-10-18
Session: Tumours II
Time: 16:30 - 18:00
Room: G.01 & G.02

Abstract no.: 34780

SURGICAL TECHNIQUE AND CLINICAL RESULTS FOR SCAPULAR ALLOGRAFT RECONSTRUCTION FOLLOWING RESECTION OF SCAPULAR TUMORS

Yi LUO, Chang ZOU, Yong ZHOU, Li MIN, Jing PENG, Chongqi TU
West China Hospital of Sichuan University, Chengdu (CHINA)

BACKGROUND: Progress in developing effective surgical techniques, such as scapular allograft reconstruction, enhance shoulder stability and extremity function, in patients following scapular tumor resection. **METHODS:** Case details from seven patients who underwent scapular allograft reconstruction following scapular tumor resection were reviewed. The glenoid-resected and glenoid-saved reconstructions were performed in three and four patients, respectively. The residual host scapula were fixed to the size-matched scapular allografts with plates and screws. The rotator cuff was affected frequently and was mostly resected. The deltoid and articular capsule were infrequently involved, but reconstructed preferentially. The remaining muscles were reattached to the allografts. **RESULTS:** The median follow-up was 26 months (range, 14-50 months). The average function scores were 24 points (80%) according to the International Society of Limb Salvage criteria. There was no difference between the glenoid-saved and glenoid-resected reconstructions in the total scores (mean, 24.5 points/81% versus 24 points/79%), but the glenoid-saved procedure was superior to the later in terms of abduction/flexion motion (mean, 72 degrees /61 degrees versus 55 degrees /43 degrees). During the study follow-up period, one patient died following a relapse, one patient lived despite of local recurrence, and five patients survived with no evidence of recurrence of the original cancer. **CONCLUSION:** Scapular allograft reconstruction had a satisfactory functional, cosmetic, and oncological outcome in this case series. Preservation and reconstruction of the articular capsule and deltoid are proposed to be a prerequisite for using scapular allografts and rotator cuff reconstruction is recommended, although technically challenging to perform.

Date: 2013-10-18
Session: Tumours II
Time: 16:30 - 18:00
Room: G.01 & G.02

Abstract no.: 34415

NON METASTATIC OSTEO ARTICULAR COMPLICATIONS OF MALIGNANCY

Vijay Kumar KHARIWAL¹, Sadhna GARG², Mohit SETHI³

¹Artemis Hospitals Gurgaon & Delhi, Delhi (INDIA), ²Mewat Medical College, Nuh (INDIA), ³Sunshine Hospital, Hyderabad (INDIA)

In malignancy usually one sees metastatic disease especially in lung, thyroid, breast, kidney, prostate and from any other organ of the body. But non metastatic complications are equally important and can affect any system like CVS, Brain, GIT, Bone marrow etc. But osteoarticular complications are not as common, but when they occur they can vary from simple metabolic disorder to life threatening complications and other complications which leaves the person with great morbidity if not costing the life. Osteoarticular complications can be treatment related of malignancy and because of effect of malignancy itself on the immune system of the body. A study 250 cases is being done mostly these are metabolic disorder from mild osteopenia to severe osteoporosis and osteomalacia. But infective disorders like pyogenic, tubercular and fungal infections can be life threatening and they demand aggressive treatment otherwise one will be left with permanent deformities and person may not come out of septicemia and may die. Multiple joints can be involved. Other complication can be radiation induced like AVN in the hip region and growth disturbances in children and fibrous contractures LIKE FIBROUS ANKYLOSIS OF JAW ETC

Date: 2013-10-18

Session: Tumours II

Time: 16:30 - 18:00

Room: G.01 & G.02

Abstract no.: 34752

CLINICAL OBSERVATION OF SURGICAL MANAGEMENT FOR RECURRENT GIANT CELL TUMOR OF BONE

Yi LUO, Yong ZHOU, Chang ZOU, Yi WEN, Chongqi TU

West China Hospital of Sichuan University, Chengdu (CHINA)

OBJECTIVE: To discuss the surgical selection and effectiveness for patients with recurrent giant cell tumor of bone. **METHODS:** Between February 2003 and June 2012, 85 patients with recurrent giant cell tumor of bone were treated. In primary surgery, 82 patients underwent intralesional curettage, and the other 3 patients underwent resection, the recurrence time was 2-116 months after primary surgery. The locations of tumor were upper extremities in 21 cases and lower extremities in 64 cases. According to Companacci grade, 2 case was at grade I, 44 cases at grade II, and 39 cases at grade III before primary surgery. In secondary operation, 46 patients underwent intralesional curettage and bone grafting combined with adjuvant inactivated, and 39 patients underwent wide resection. **RESULTS:** Bone allograft immune rejection occurred in 3 cases, which led to poor healing; primary healing of incision was obtained in the other patients. The patients were followed up 68 months on average (range, 18-221 months). Recurrence occurred in 9 patients at 6-32 months after operation. There was significant difference in the re-recurrence rate between the intralesional curettage and the wide resection ($\chi^2 = 4.508$, $P = 0.034$). No recurrence was observed during 3-year follow-up among re-recurrence patients. **CONCLUSION:** For benign recurrent giant cell tumor of bone, intralesional curettage and bone grafting combined with adjunctive therapy could get an acceptable effectiveness, however, it has higher local recurrence than wide resection. For large tumor and recurrent malignant giant cell tumor of bone, wide resection is recommended.

Date: 2013-10-18
Session: Tumours II
Time: 16:30 - 18:00
Room: G.01 & G.02

Abstract no.: 34342

**THREE-DIMENSIONAL VIRTUAL REALITY SIMULATION OF
PERIARTICULAR TUMORS USING DEXTROSCOPE
RECONSTRUCTION AND SIMULATED SURGERY: A PRELIMINARY 10
CASE STUDY**

Jingsheng SHI, Jun XIA, Siqun WANG, Yibing WEI, Feiyan CHEN,
Gangyong HUANG, Jie CHEN

Department of Orthopaedics, Huashan Hospital of Fudan University,
Shanghai (CHINA)

Background: Dextroscope® three-dimensional (3D) imaging has been extensively applied for generation of virtual reality (VR) workspaces for in neurosurgery and laparoscopy, though few applications in orthopedic surgery have been reported.
Objective: Orthopedic periarticular tumor surgery planning and anatomical characteristics using Dextroscope were investigated.
Methods: Patients undergoing surgery for periarticular tumors ($n = 10$) were enrolled and presurgically subjected to computed tomography (CT), magnetic resonance imaging (MRI), and MRI angiography (MRI-A). Imaging data was transferred and integrated in Dextroscope, producing a VR simulation. Resultant presurgical 3D anatomical reconstructions and intraoperative anatomical characteristics (virtual vs. actual data) and surgical approach (virtual vs. actual situation) measurement and subjective appearance were compared.
Results: Anatomical characteristics in the area of interest and tumor diameters were consistent between virtual and actual data. However, the virtual surgical situations remained inconsistent with the actual intraoperative situation in many cases, leading to complications. The resolution of original CT, MRI, and MRI-A images directly correlated with the quality of 3D simulations, with soft tissues most poorly represented. Tumor tissue imaging quality in 3D varied extensively by tumor type.
Conclusions: Anatomical structures of periarticular tumors can be reconstructed using the Dextroscope system with good accuracy in the case of simple fenestration, increasing individualization of treatment, surgical competence level, and potentially reducing intraoperative complications. However, further specialization of VR tools for use in orthopedic applications that involve specialized tools and procedures, such as drilling and implant placement, are urgently required.

Date: 2013-10-18

Session: Symposium Injury Prevention

Time: 10:30 - 12:00

Room: G.03 & G.04

Abstract no.: 34330

POLYTRAUMA AT VICTIMS OF TRAFFIC ACCIDENT

Sergiy GURYREV¹, Sergiy STRAFUN², Sergiy SATCYK¹, Stepan CHUNDAK¹

¹CENTER OF DISASTER MEDICINE, KIEV (UKRAINE), ²Institute of Traumatology and Orthopedia, KIEV (UKRAINE)

Problem.Road traffic injuries are one of the main types of injuries in the modern world. The relevance of this problem is determined by its social aspects associated with high rates of mortality and disability of injured in the traffic accident.We have studied and analyzed 163 cases of combined injuries of the abdomen at victims of road accidents. For the purpose of comparison, array of research was divided on the basis of traumatic process results.Some clinical-epidemiological characteristics, such as age, sex, participation in road traffic were studied. Results and discussion Analysis and calculations were carried out according to the criteria and requirements of evidence-based medicine by computer technology.The results of research determined that abdominal trauma at victims of road accidents is an essential component of multicomponent polysystem injury and is more common at persons of working age.There was also determined, that signs of sex and age authentically have influence on the course of the traumatic process of victims of traffic accident which form certain risk groups of fatal outcome, such as age of 60 or more years for men (3.33 - catastrophic risk) and 40-49 years for women (1.0 - catastrophic risk). The most injuries of the abdomen due to the road accident occur among pedestrians (51.53%), in the same category of victims there was observed the highest risk of fatal outcome - 1.71 (catastrophic risk).

Date: 2013-10-18

Session: Symposium Injury Prevention

Time: 10:30 - 12:00

Room: G.03 & G.04

Abstract no.: 33851

TAMILNADU TRAUMA CARE PROJECT WITH SICOT'S ASSISTANCE

Venkatesh Babu SUBBIAH

Trauma Committee of Tamilnadu, Tirunelveli (INDIA)

The International Trauma Anaesthesia and Critical Care Society- ITACCS, Tirunelveli was started with the intention to reduce the trauma related deaths in Tirunelveli District of Tamilnadu State in Southern India. The objective was to integrate specialists for training medical and non-medical personnel in Trauma Care and create awareness of Golden Hour Trauma Care in and around Tirunelveli District. Following its inception of three years this model had created significant awareness in care for patients of road traffic crashes and also contributed to improvement of Trauma Care in Tirunelveli District. This model was extended to the entire state of Tamilnadu with a view to reduce the Trauma related deaths and also to develop Trauma Care systems in the State with assistance of SICOT. This presentation explains the history behind the formulation of this Trauma Committee and the journey of evolving the Tamilnadu Trauma Care Project.

Date: 2013-10-18

Session: Severe Injuries - Spinal Cord, Extremities, War & Natural Disaster

Time: 16:30 - 18:00

Room: G.03 & G.04

Abstract no.: 35137

HANDLING EXTREMITY INJURIES IN 26YRS COUNTER-TERRORIST WAR: A SRI LANKAN CIVIL WAR EXPERIENCE

Kalana RATHNAYAKE, Loku Kankanamge Don Chandana Rathna

KARUNATHILAKA, Narendra PINTO, Chandima NANAYAKKARA

The National Hospital Of Sri Lanka, Colombo (SRI LANKA)

Sri Lankan civil war extended for a 30 yrs. It caused for 80 000 to 100 000 deaths among Sri Lankans. Human casualties started with cut injuries, blunt trauma, shot gun injuries and developed into extensive soft tissue and bone injuries due to advanced weapons. Objective: Identify different types of extremity injuries resulted from different weapons during the various phases of the war. Evaluate the principles we adhere in the management of the extremity injuries with our failures and successes. Data was collected retrospectively. Results: Non ballistic injuries reduced over the years from 66% to 17%, and ballistic injuries increased 44% to 83%. In last 2yrs figures increased as: death rate 300%, 968% rise in antipersonnel mine injuries, 731% rise in bullet injuries and 624% rise in shrapnel injuries. 70% had extremity injuries and it is remarkably high compared to world figures (Vietnam- 36%, Afghanistan-Russian- 34.9%, Chechnya- 35.8%). The increase of extremity injuries was 606%. 68% of extremity injuries ended up with an amputation and 70% had opposite limb injuries. In the last years injury patterns was changed to malunion and non-union (92%), deformities of limbs, soft tissue defects and complications (56%). Conclusion: War Casualty management strategies changed and improved with each phase. We were successful in savings many lives and limbs. A large influx of casualties with overwhelming our resources was the reality. Management of extremity injuries in a war situation is a real challenge between evidence based orthopaedics and experience based orthopaedics.

Date: 2013-10-18

Session: Severe Injuries - Spinal Cord, Extremities, War & Natural Disaster

Time: 16:30 - 18:00

Room: G.03 & G.04

Abstract no.: 34894

FRACTURE NON UNION TREATMENT OF THE LIBYAN WAR VICTIMS

Domenico POTESIO, Nicola SANTORI, Antonio BERTINO

Rome American Hospital, Rome (ITALY)

16 victims of the Libyan revolution, affected from lower limb trauma and treated in their country have been treated for septic or aseptic bone non union. In 12 cases we performed removal of the external fixator positioned in emergency and then applied a dynamized external fixator. In some of these cases bone graft was performed. In one case we removed endo-medullary nail and performed a vascularized fibula graft, taken from the other leg and applied a dynamized external fixator to treat a septic non union. In one case we removed a broken tibial plate and performed a muscular flap and applied a dynamized external fixator to treat a bone gap and a chronic infection. In one case we removed a femoral nail and performed a proximal lengthening and distal compression for late union by applying an external fixator. In one case we removed a broken plate and applied a dynamized external fixator. For every patient blood tests and swaps to detect bone infection were performed. 2 of the 16 patients are still receiving treatment; for the other 14 patients healing was achieved between 3 and 12 months. Treatment of war injury patients is challenging. Patient compliance has not always been good and this might have delayed the healing process. Removal of the hardware applied in camp hospitals is, in our opinion, mandatory. Compression and dynamic load transfer through the fracture is of upmost importance for fracture healing.

Date: 2013-10-18

Session: Severe Injuries - Spinal Cord, Extremities, War & Natural Disaster

Time: 16:30 - 18:00

Room: G.03 & G.04

Abstract no.: 34767

MILITARY SURGICAL TEAMS – IS THERE A NEED FOR ORTHOPAEDIC SURGEONS?

Martin Kresimir PERNAR

Kongsvinger Hospital/Norwegian Armed Forces, OSLO (NORWAY)

Background: Since 2008, Norway has had a field hospital in the Faryab province, Afghanistan. It was a Role 2 installation where DCS/DCR was performed by two surgical teams, both with a general and an orthopaedic surgeon. **Material and methods:** Patient records from trauma patients received at the Norwegian surgical unit in Meymaneh, June 2011 -December 2011, were reviewed retrospectively. The mechanisms of injury, the surgical procedures performed and levels of treatment on secondary/follow-up treatment, were registered. **Results:** In 6 months, the two trauma teams cared for 88 patients. 43 (33%) of these had extremity and/or spinal column injuries. The most common mechanisms of injury were GSW (15), MVA (12) and IED (11). The procedures performed were Irrigation/Debridement (16) and external fixation (13), ORIF (4), amputation (2 double) and closed reduction with K-wires (3). **Discussion:** The composition of a surgical team varies. The results from our facility might suggest that there is no need for a specialist in orthopaedic surgery, since the procedures performed may seem simple. The involvement of an orthopaedic surgeon at the start of treatment, will facilitate further surgical treatment and is essential for a positive impact on the outcome. **Conclusion:** The incidence of extremity injuries in armed conflicts is high, (40-50%). The familiarity and experience of orthopaedic surgeons in treating extremity injuries is therefore a key factor to achieve the best possible outcome.

Date: 2013-10-18

Session: Severe Injuries - Spinal Cord, Extremities, War & Natural Disaster

Time: 16:30 - 18:00

Room: G.03 & G.04

Abstract no.: 35717

DECISION MAKING IN MANGLED EXTREMITY

Pratheek CM

Safdarjung Hospital, New Delhi (INDIA)

Introduction :The extremity is the most commonly injured body part.This study was done to assess the relevance and suitability of MESS and GHS.**Material:**Study conducted between August 2009 and June 2011.A prospective study of 51 lower limbs with type III Gustilo-Anderon open injury of who presented within 24 hours were taken into study.The injury was jointly assessed by team of emergency,orthopaedic,plastic surgery and vascular surgery team and a decision was taken regarding further management of patient.For each patient a MESS score and GHS was done.The patient was further followed up for a period of 6 months to assess the outcome of limb.**Result:**Study had 50 patients with 51 limb injury.In MESS category of 12 limbs that underwent amputation MESS score predicted amputation in 7 limbs(sensitivity 58.3%),i.e a score above 7.In salvaged limbs 35 out of 39 were salvagable according to MESS giving a specificity of 89.7%.In GHS all 12 limbs that underwent amputation were correctly predicted by GHS giving a sensitivity of 100%,i.e a score above 14, and 32 limbs of 39 salvaged were correctly predicted for salvage with specificity of 82%.The P value was found to be <0.005 .**Conclusion:**MESS score had a high specificity indicating that it showed more accurately the limbs to be salvaged,GHS had high specificity and good sensitivity with better accuracy than MESS.In conclusion ganga hospital score appears to be better than Mangled extremity severity scoring in making decision for mangled extremity and an integrated trauma team approach is required to improve outcome of mangled limbs.

Date: 2013-10-18

Session: Severe Injuries - Spinal Cord, Extremities, War & Natural Disaster

Time: 16:30 - 18:00

Room: G.03 & G.04

Abstract no.: 34886

EVALUATION OF THE RESULTS OF SURGICAL AND CONSERVATIVE TREATMENT OF SPINAL INJURIES IN 2008 TO 2011: ANALYSIS OF 318 PATIENTS.

Martin REPKO¹, Pavel ZENCICA², Jan CIENCIALA², Filip NEMEC², Robert ZITKA²

¹Orthopaedic Department University Hospital Brno, Brno (CZECH REPUBLIC), ²Department of Orthopaedic Surgery, Faculty of Medicine,

Masaryk University Brno, Brno, 625 00 (CZECH REPUBLIC)

Introduction. Spinal injuries account for about 3 to 6 % of all injuries, with an increasing incidence. About 20 % of them are associated with varying degrees of damage to the spinal cord or nerve roots. Material and Methods. Between 2008 and 2011, 374 spinal fractures in 318 patients were treated. Unstable fractures and/or those accompanied by neurological symptoms, spinal cord compression or segmental kyphosis \geq 20 degree and multilevel injuries were indicated for surgery. Patients with stable fractures without neurological lesions (type A) and Chance fractures were treated conservatively, as well as some polytraumatized patients. Results. A total of 256 patients were treated surgically and 62 conservatively. Falls (166), traffic accidents (113) and other causes (39) were responsible for injuries. T12 and L1 (30, 46) levels were most frequently involved. Surgery was done in 184 men and 72 women with an average age of 41.6 years (13-80). The 104/81/71 patients with C/Th/L spinal injuries had 134/135/105 spinal fractures at C/Th/L levels. Type A/B/C fractures were 172/98/23; C0-C2 fractures were in 25. Polytrauma was diagnosed in 69 (27%) and neurological deficit in 91 (36 %) patients; anterior/posterior/ combined approaches were indicated in 60/181/15 patients. Frankel grade A/E neurological deficit was recorded preoperatively in 51/158 and at the final follow-up in 32/172 patients. Conclusions: If the spinal cord or nerve roots are damaged, the patient's quality of life can be greatly affected. Therefore, such patients should be treated at trauma centers or specialized institutions providing multidisciplinary care.

Date: 2013-10-18

Session: Severe Injuries - Spinal Cord, Extremities, War & Natural Disaster

Time: 16:30 - 18:00

Room: G.03 & G.04

Abstract no.: 34735

PROFILE OF PATIENTS WITH FATAL POST-TRAUMATIC SPINAL INJURIES AT LEVEL 1 TRAUMA CARE CENTRE IN INDIA

Vivek SINGH, Sanjeev LALWANI, Vivek TRIKHA

All India Institute of Medical Sciences New Delhi (INDIA)

Background: The purpose of this study is to describe the mortality patterns of the patients sustaining spinal injuries. **Methods:** Retrospective data were collected from autopsy reports maintained in the department of Forensic Medicine. Only those fatal post-traumatic cases were reviewed who were having isolated spinal injury or as part of poly-trauma. A total of 341 such cases were identified between January 2008 to December 2011. The demographic data, type of trauma, duration of survival, body areas involved , level of spinal injury and associated injuries if any were recorded. **Results:** There were 84.45% males and 15.55% females. Male: female ratio was 5.4:1. Injury to the cervical spine occurred in 259 (75.95%) patients, thoracic spine in 56(16.42%) and thoraco-lumbar spine in 26 (7.62%) patients. The commonest cause of injury was high energy falls (44.28%), followed by road traffic accidents (41.93%). 152 cases (44.57%) had associated injuries to other organ systems out of which head injury was present in maximum cases (63.1%). The majority of deaths (51.6%) occurred in the phase-IV (secondary to tertiary complications of trauma i.e >1 week). 40 patients died in phase I(brought dead or surviving <3 hrs). Out of 95 cases (27.86%) who survived less than 24 hours, 86.3% had some associated injury while it was present in only 28.5% of cases who survived more than 24 hours. **Conclusion:** There is an urgent need to take steps to prevent spinal injury, strengthen the pre-hospital care, transportation network, treatment in specialized spinal trauma units and to improve injury surveillance.

Date: 2013-10-18

Session: Severe Injuries - Spinal Cord, Extremities, War & Natural Disaster

Time: 16:30 - 18:00

Room: G.03 & G.04

Abstract no.: 34119

THE ROLE OF DOCUMENTATION IN DISASTER MANAGEMENT

Beate HANSON¹, David HELFET², Diarmuid DE FAOITE¹

¹AO Foundation, Davos (SWITZERLAND), ²Hospital for Special Surgery, New York (UNITED STATES)

Introduction: the importance of documentation in a medical setting is obvious. However, in a disaster situation, even simple documentation may not be possible due to the chaotic environment. Lack of supplies, security, exhaustion and the sheer numbers of patients presenting may well be much more pressing concerns for the medical team. Conducting research is also much more problematic than in a controlled setting, with the performance of randomized controlled studies almost impossible (and ethically questionable) under disaster conditions. Current status: the current suboptimal documentation during disaster situations means that learning from previous mistakes is difficult. This is compounded by the presence of different actors in the field, some of whom are only active for a very short time. There is a definite need for pre-disaster training in documentation and suitable information systems are also required. Clear guidelines on what information is to be collected in a disaster situation should be formulated. Current position papers include elements such as surgical records, minimum datasets to allow for statistical analysis, and outcomes. A particular need is for adaptable documentation solutions which can operate in a variety of settings – e.g. with or without power, forms tailored to the disaster in question and so on. Outlook: while awareness of the problem of documentation during disaster management is improving, more specific tools and training programs to counter poor documentation need to be developed. The authors have developed a prototype for documentation of a “surgical disaster” like an earthquake which will help in such disaster situations.

Date: 2013-10-18

Session: Severe Injuries - Spinal Cord, Extremities, War & Natural Disaster

Time: 16:30 - 18:00

Room: G.03 & G.04

Abstract no.: 33927

IS INHALATIONAL CICLESONIDE A SAFE AND EFFECTIVE PROPHYLACTIC DRUG FOR FAT EMBOLISM SYNDROME? : A PROSPECTIVE NONRANDOMIZED CLINICAL TRIAL

Sujit Kumar TRIPATHY¹, Ramesh Kumar SEN², Shiva PRAKASH²

¹AIIMS, Bhubaneswar, Bhubaneswar (INDIA), ²Postgraduate Institute of Medical Education and Research, Chandigarh, Chandigarh (INDIA)

Background: Although intravenous corticosteroid is an effective prophylactic therapy in fat embolism syndrome (FES), it is associated with numerous complications and side effects. However, inhalational steroid has never been tried. **Methods:** A prospective nonrandomized control trial was designed where all patients (18 to 40 years) attending our emergency services within 8 hours with isolated skeletal injury were allocated to one of the two treatment groups. Group I received 640mcg of inhalational Ciclesonide at the time of admission, and at 24 hours. Group II patients did not receive any prophylactic treatment. Both groups were observed clinically, and evaluated for development of hypoxemia ($\text{PaO}_2 < 70 \text{ mmHg}$) and FES (Gurd's criteria) for 72 hours. **Results:** There were 35 patients in each group and there were no significant differences between the groups in regards to age, sex, pre-hospital care and injury severity. Two patients of group I and 9 patients of group II developed FES (Chi-square test, $P=0.022$). In group I, 2 patients had hypoxemia and in group II, a total of 12 patients had hypoxemia. A significant improvement in hypoxemia and a significant decrease in the incidence of FES was observed in Ciclesonide receiving group ($P<0.05$) compared to control group. No adverse effects of steroid were noted in Group I patients. **Conclusion:** This pilot study established the efficacy and safety of inhalational Ciclesonide in FES as a prophylactic measure.

Date: 2013-10-18

Session: Severe Injuries - Spinal Cord, Extremities, War & Natural Disaster

Time: 16:30 - 18:00

Room: G.03 & G.04

Abstract no.: 33740

INDIGENOUS NEGATIVE PRESSURE WOUND THERAPY (INPWT): A LOW COST BID FOR CONTAMINATED SOFT TISSUE INJURIES IN HIGH ENERGY TRAUMA

Dewart KAUSHIK, Narendra JOSHI, Kamlesh JHAJHARIA, Rahul SAPRA
SMS Medical college, Jaipur (INDIA)

Background: High energy trauma is frequently associated with soft tissue injuries that have devitalized and contaminated soft tissue with high risk of infection and wound complication. Negative pressure wound therapy (NPWT) has been proved to be reducing significantly the hospitalization duration and rate of infection, in such patients. However high costs restrict the use of NPWT to only small group of patients. A novel Indigenous NPWT (iNPWT) designed from recycled foam and ordinary suction machine has been developed to cut down cost while retaining efficacy. **Method:** study conducted at our institution. 20 subjects with contaminated high energy trauma (that hindered primary coverage), were treated with primary fracture fixation, thorough debridement, irrigation and iNPWT. Dressing checked at 48 hrs. Definitive coverage by primary closure/SSG/Flap was done, when wound had abundant granulation tissue, else a repeat iNPWT + debridement was applied. **Results:** Definitive procedure achieved after single iNPWT (48 hrs) in 16 (i.e.80%). In 4 repeat iNPWT was applied followed by definitive procedure after 96 hrs. Infection occurred in none of the subjects (n=0). One case of SSG rejection occurred that was treated with repeat SSG. Mean time to definitive wound coverage from first iNPWT was 2.4 days. Cost of single iNPWT was ~Rs300(~\$6) compared to commercial NPWT cost ~Rs3000(~\$80). **Conclusion:** considering small number of subjects, it would be too early for a verdict, but initial results are promising, suggesting iNPWT as an effective but low cost alternative for contaminated soft tissue injuries especially in developing nations.

Date: 2013-10-18

Session: THA Dual Mobility & Hemiarthroplasty

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 34485

**PRIMARY TOTAL HIP ARTHROPLASTY USING DUAL MOBILITY:
RESULTS AT 10 YEARS FOLLOW-UP**

Olivier TAYOT¹, Jean Luc DELALANDE², Vincent PIBAROT³, Olivier GUYEN³, Hervé CHAVANE³

¹Dept.of Orthop.Surg, clinique du Parc Lyon, 69006 Lyon (FRANCE), ²Dept of orthop surg, Clinique de la Presentation, 64 rue des fosses, 45400 Fleury les Aubrais (FRANCE), ³Dept of orthop surg, Hopital Ed Herriot, 5 place d'Arsonval, 69437 Lyon France (FRANCE)

Primary total hip arthroplasty (THA) is a successful procedure in modern orthopaedic surgery. However, dislocation remains a troublesome complication with a reported prevalence ranging from 1% and 5% in literature. In order to prevent such a complication both at short and long terms we have been using dual mobility for more than 10 years. The two goals of this study are to assess the effectiveness of the dual mobility to prevent dislocation and to analyze the long term clinical and radiological results. Materials and methods : we report a retrospective study of a continuous series of 230 primary THA in 218 unselected patients performed at 2 institutions between January 2000 and December 2002, using a single design of dual mobility implant (Saturne® cup, from AMPLITUDE© company, France). At latest follow-up, 108 patients died of unrelated causes, 21 patients were lost to follow-up, leaving 89 patients (100 THA) available for the study. Clinical evaluation was performed using POSTEL-MERLE-D'AUBIGNE (PMA) and HARRIS hip scores. Radiological evaluation was performed by two senior surgeons. Results : at a minimum 10 years follow-up, PMA and HARRIS hip scores significantly improved. Only one late dislocation was reported (successfully managed by closed reduction), 2 revisions for deep infection have been performed. Conclusion: These long term results with the use of a dual mobility implant for primary THA in our practice demonstrate the reliability of the dual mobility concept. We therefore advocate the use of dual mobility for primary THA, especially for patients at risk for dislocation.

Date: 2013-10-18

Session: THA Dual Mobility & Hemiarthroplasty

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 34244

IS THE DISLOCATION RISK DECREASE WITH DUAL MOBILITY CUP TYPE AFTER CHARNLEY THA ?

Jacques CATON¹, Jean Louis PRUDHON², André FERREIRA³

¹Clinique Emilie de Vialar, Lyon (FRANCE), ²Clinique des Cèdres, Echirolles (FRANCE), ³Clinique du Parc, Lyon (FRANCE)

Introduction Primary or recurrent dislocation is one of the most important complications after THA with an increasing cumulative risk with time between 1 to 2% at 1 year to 6 to 10 % at 25 years according to different authors. **Material and method** To evaluate this risk with a dual-mobility cup, we have conducted a retrospective review. 363 patients are operated on for osteoarthritis, osteonecrosis or fracture of the hip. All patients received a cemented femoral stem Charnley's type with a 22,2 mm head: 105 Dual Mobility Cup with a metallic head, 182 friction torque metal on polyethylene with a metallic head, 76 friction torque zirconium/polyethylene with a ceramic head. The mean follow-up of these patients was 10 years and the operations were conducted by only a single senior surgeon. **Results** The overall results on dislocations and revision for dislocation was 8,5 % for THA Charnley type without Dual Mobility Cup and only 1% for the THA Charnley type with Dual Mobility Cup with a statistically significant difference (P value : 0,02). **Discussion** In France, the rate of revision for dislocation is 10,4 % (SOFCOT Symposium 2010-2011),, 15 % for England and Wales and 30,6 % for the New Zealand Joint Registry. In our series, there is low revision rate with Dual Mobility Cup than with conventional THA. It is a very secure and effective technique in THA Charnley.

Date: 2013-10-18

Session: THA Dual Mobility & Hemiarthroplasty

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 34229

A FRENCH STANDARD : DUAL MOBILITY IN PRIMARY HIP ARTHROPLASTY. RESULTS AT 9 YEARS OF FOLLOW UP

Jean Louis PRUDHON¹, André FERREIRA²

¹Clinique des Cèdres, Echirolles (FRANCE), ²Clinique du Parc, Lyon (FRANCE)

Introduction : Dual mobility cup was developed in the late 1970s with a dual purpose : to provide prosthetic stability and to reduce wear. Various publications have confirmed the achievement of the first goal (dislocation rate < 2%). In addition, results from the French Orthopaedic Society Symposium concluded in 2009 to the equivalent survivorship for 1st generation dual mobility and benchmarked cups. The aim of this study was to assess reliability of mid-term fixation of this cup as well as the dislocation rate for 2nd generation dual mobility cups. Material and methods : a retrospective mono center study involving 104 consecutive primary hip arthroplasties in 102 patients was carried out (arthritis (93%), fracture (4%) osteonecrosis of the femoral head (3%) ; 78 years old +/- 5). All stems were Charnley's, cemented with a 22 mm head. The primary outcome was the survival probability. Dislocation rate and radiological assessment were the secondary criteria. Results At the mean follow-up of 110 months (12 to 143) survival probability was 93.7% and dislocation rate was 0.9 % (1 case at 1 month FU treated by closed reduction with no recurrence). Two complications requiring revision occurred at 9 year of follow-up (1 septic loosening and 1 aseptic loosening following trauma). No significant migration of the cup or radiolucencies were observed. Conclusion : the technical specifications of the second generation dual-mobility cup has proved to improve the primary stability of the implant, to improve bone fixation and to lead to a painless hip.

Date: 2013-10-18

Session: THA Dual Mobility & Hemiarthroplasty

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 34182

THE USE OF DUAL MOBILITY THR FOR FRACTURED NECK OF FEMUR REDUCES THE INCIDENCE OF DISLOCATION

Manoj PUTHIYA VEETTIL, James FLETCHER, Douglas DUNLOP, Jeremy LATHAM

University Hospital Southampton NHS Foundation Trust, Southampton
(UNITED KINGDOM)

Background: Trimodular (dual mobility) hip replacements have an increasing body of evidence supporting their low dislocation rate when used in elective surgery. There are minimal data available regarding the use of these implants for acute fractured neck of femur replacement arthroplasty. **Methods:** A series of dual mobility THR for acute femoral neck fractures were analysed with a minimum six months radio-clinical follow-up. 121 patients were identified. 9 patients had died, and 5 were lost to follow-up. Survivorship was determined as no dislocation, nor periprosthetic fracture. **Results:** Of the 107 patients analysed, 1 patient had dislocated at 2 months requiring open relocation and 1 periprosthetic fracture occurred. The survivorship was 98%, with a mean follow up of 15 months (range 6-28 months). **Conclusion:** Although the follow up period is currently short, the low rate of dislocation, in what has previously been thought to be a high risk group for post operative dislocation, adds further evidence to the use of dual mobility cups in patients with femoral neck fractures. Whilst many aspects regarding the patient must be considered when deciding on the appropriate management of such patients, this study demonstrates that the risk of dislocation is not as high as previously thought. Further analysis will be undertaken at a longer follow up interval.

Date: 2013-10-18

Session: THA Dual Mobility & Hemiarthroplasty

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 34618

A COMPARISON BETWEEN UNIPOLAR -MONOBLOCK PROSTHESISFOR HIP HEMIARTHROPLASTY AND BIPOLEAR HIP HEMIARTHROPLASTY , WHICH ONE IS CHOICE IN DEVELOPING COUNTRIES?

Dariush SAVADKOOHI, Babak SIAVASHI

Tehran university of medical sciences, Tehran (IRAN)

Introduction: Unipolar –monoblock prosthesis (Moore, Thompson) had been used for treatment of fractures of femoral neck in elderly in the past. With innovation of bipolar prosthesis and because of its advantages, in developed countries with good insurance support services, it is the choice. But, in developing countries , because of the cost, unipolar-monoblock prosthesis is used in many hospitals. The aim of this study is to compare the functional and economic results of these prosthesis. **Materials and methods:** In 30 years period, every patient with fracture of neck of femur who admitted in our hospital for hip hemiarthroplasty is studied. Depending to the type of prosthesis , with a minimum follow up of 60 months , two groups were compared. Leg length discrepancy, Harris hip score, dislocation, infection, revision to Total hip arthroplasty and cost are variables.**Results:** In unipolar monoblock group, there were average 1.5 cm LLD, HHS average was 84 and 4% dislocated, 5.5 % need revision to THA with average cost of prosthesis 150 \$. In bipolar group, there were average 1 cm LLD, HHS average was 90 and 1% dislocated, 3 % need revision to THA with average cost of prosthesis 1500 \$. **Discussion:** Although it is clear that regard to dislocation rate and LLD and HHS and need for revision surgery bipolar prosthesis has better results, but because of economical problems in developing countries and because the results of unipolar monoblock are not very poor, it seems that they are very cost effective .

Date: 2013-10-18

Session: THA Dual Mobility & Hemiarthroplasty

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 35692

PROSPECTIVE STUDY OF HEMIREPLACEMENT ARTHROPLASTY FOR UNSTABLE INTERTROCHANERIC FRACTURES OF FEMUR IN ELDERLY PATIENTS

Kumar SANJIV, Kumar ASHISH

Era Lucknow Medical College & Hospital, Lucknow (INDIA)

Background- Treatment for unstable inter-trochanteric fractures in elderly is still controversial due to comminution and poor quality of bone available for fixation due to osteoporosis. Osteosynthesis requires prolonged non-weight bearing leading to lots of complications ie complications of recumbency, non union, implant failure etc. Prosthetic replacement will allow patient to bear weight on the affected limb as early as possible may be on the same day as tolerated and avoid the possible complications. **Method-** A Longitudinal Prospective Study was conducted on 25 Elderly patients who presented with unstable inter-trochanteric fractures of femur (according to Evan's Classification & Boyd & Griffin's Classification), without associated co-morbidities. These patients were treated with cemented bipolar hemi-replacement arthroplasty, and were allowed full weight bearing on the 1st post-op day if tolerated. Functional outcome was assessed using Harris Hip Score, Lower Extremity Functional Scale and Visual Analogue Scales post-operatively and on each follow-up, at 2nd, 6th & 12th week.**Results-** Functional outcome of all the elderly patients with unstable inter-trochanteric fracture (after careful selection), in the immediate post-op period was satisfactory, but in the follow-up period was fairly good and excellent, gradually. Prosthetic replacement for unstable inter-trochanteric fractures in elderly patients may benefit in cases of osteoporosis and will reduce complications of recumbency and has the advantage of decreased hospital stay, good pain relief and resuming of daily activities at the earliest and the chances of second surgeries due to problems associated with osteosynthesis are also negligible.

Date: 2013-10-18

Session: THA Dual Mobility & Hemiarthroplasty

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 35396

MORTALITY AND MORBIDITY ANALYSIS FOLLOWED CEMENTED AND CEMENTLESS BIPOLEAR HEMI-ARTHROPLASTY IN A CASE-MATCHED SERIES OF 120 ELDERLY PATIENTS WITH FRACTURE NECK FEMUR

Rajiv THUKRAL, Sks MARYA

Max Super Specialty Hospital, New Delhi (INDIA)

Background: The aim of treatment of femoral neck fractures in the elderly is minimizing mortality and morbidity while permitting early mobilization. Surgeons equally favor cemented and cementless techniques of bipolar hip arthroplasty. We report a comparative analysis of the mortality, morbidity and mid-term results of cemented and cementless bipolar hip arthroplasty in 120 such fractures. **Methods:** 150 patients (mean age 81 years) with femoral neck fractures were operated from Jan 2006 to Dec 2012. All had multiple co-existent medical comorbidity. Sixty-one underwent cementless (group A), and 69, cemented (group B) bipolar hip arthroplasty. Both treatment groups were compared for peri-operative events, clinical scores and radiological findings over an average 48 month follow-up. **Results:** Both groups showed comparable operative times, blood loss and requirements. Three patients from group A, and 12 from group B suffered fatal medical complications within 4 weeks of surgery. 120 patients were available at last follow-up. Minor medical complications occurred in 20 patients in group A, and 15 in group B. 104 (out of 140) patients were able to partially bear weight (walker support) at discharge. There were 4 dislocations in group B, without any other major intra- or post-operative surgical complications. Stem subsidence was seen in 4 cases in group A. **Discussion:** In our series, peri-operative mortality, and post-operative dislocation (with higher revision rates) was higher with cemented stems, while minor surgical complications were more common with cementless stems. Both treatment methods work, both needing strict attention to technique to prevent morbidity.

Date: 2013-10-18

Session: THA Dual Mobility & Hemiarthroplasty

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 35594

A COMPARISON OF THE JRI HAC COATED UNCEMENTED HEMIARTHROPLASTY TO THE JRI CEMENTED HEMIARTHROPLASTY

Nayef ASLAM-PERVEZ, Mohamed Altayeb MUSSA, Jan MARCINIAK, Shivkumar GOPAL

Hull Royal Infirmary, Hull (UNITED KINGDOM)

The JRI Furlong un-cemented hemiarthroplasty (JUH) has been associated with a high rate of intra operative fractures (IOF) when compared to JRI cemented hemiarthroplasty (JCH). Chana et al demonstrated that the Metaphyseal Diaphyseal Index (MDI) score (to determine the morphology of the proximal femur) of <21 and Canal bone ratio (CBR) of >0.7 is associated with an increase in the risk IOF with JUH. Method: We calculated MDI and CBR scores for 550 JUH's from 2007 to 2013 and retrospectively looked at their radiographs and notes for IOF's, dislocations, subsidence, age, sex, operator experience, 30 and 90 day mortality and revisions. We also compared these variables in the JUH to the JCH ($n=300$). Results: 5% ($n=23$) of patients with JUH's suffered an IOF compared to 2.9% ($n=9$) of JCH's. ROC curve showed area under curve for MDI 0.50 and CBR 0.52, therefore neither of these scores were good predictors of IOF's with JUH. Multivariate regression confirmed that confounding factors such as age and sex were not significant risks for IOF. Senior operator experience was correlated with a decrease in incidence of IOF. Outcomes significantly affected by IOF included revision and subsidence Conclusion: This study showed that there is a slightly higher risk of IOF's with the use of the JUH compared with the JCH. Osteoporosis is thought to increase the risk of these fractures but unlike Chana et al, we did not find that the MDI/CBR scores help predict which patients are at higher risk of IOF's. Therefore in our study osteoporotic proximal femoral anatomy does not correlate to the occurrence of IOF's. We would recommend the use of HA coated JRI Furlong Hemiarthroplasty as an alternative to cemented hemiarthroplasties that are known to

Date: 2013-10-18

Session: THA Dual Mobility & Hemiarthroplasty

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 35039

IS HARRIS HIP SCORE A VALID INDICATOR OF HIP FUNCTION IN INDIAN POPULATION?

Sujit Kumar TRIPATHY¹, Vanyambadi JAGADEESH², Ramesh Kumar SEN²

¹AIIMS, Bhubaneswar, Bhubaneswar (INDIA), ²Postgraduate Institute of Medical Education and Research, Chandigarh, Chandigarh (INDIA)

Background: The Harris Hip Score (HHS) is used worldwide to assess the hip functional status, but it has never been validated in Indian population. This study was designed (1) to assess if the hip function parameters of HHS is adequate to pick up differences in hip function for activities of normal living in Indians and, (2) to test HHS for the validity, reliability and responsiveness. **Methods:** 310 patients (432 hips) with different hip pathologies were evaluated prospectively by two observers using HHS as the joint-specific outcome measure and Medical Outcomes Study 12-Item Short-Form Health Survey (SF-12v1) as generic-health measure. The HHS was tested against SF-12v1 for content validity, construct validity, criterion validity and reliability. **Results:** (1) HHS lacks content validity as it doesn't consider squatting, cross-leg sitting and sitting on the floor which are essential activities on a daily basis for an average Indian. Several domains of HHS (total score, pain, function, gait, activities of daily living and deformity) showed ceiling effects. (2) The SF-12v1 and HHS showed an acceptable level of construct validity and criterion validity (for total scores and function domain). The test and retest reliability and interobserver reliability were excellent (Goodman-Kruskal Gamma nearly one). The internal consistency was also excellent (Cronbach's- α coefficient 0.743). **Conclusion:** Although HHS is reliable, responsive and shows acceptable construct and criterion validity, it shows high ceiling effects and lacks content validity for daily activities of normal living. It cannot be used for research purpose in Indian population for hip outcome evaluation.

Date: 2013-10-18

Session: Symposium Tribology

Time: 14:00 - 15:30

Room: G.05 & G.06

Abstract no.: 34540

REVISION OF METAL ON METAL HIP REPLACEMENTS USING CERAMIC BEARINGS: IS THIS THE RIGHT CHOICE TO RESTORE FUNCTION

Raghu RAMAN

Hull Royal Infirmary, Hull (UNITED KINGDOM)

INTRODUCTION: The choice of bearings in revision has always been a concern especially with metal debris disease. Furthermore in these relatively young patients, stability, return to sport and heavy activity remains principal goals during recovery. **OBJECTIVES:** We evaluate the performance ceramic on ceramic bearing couple used in MOM revisions for metal debris related disease **METHODS:** We prospectively evaluated 142 consecutive MOM revision arthroplasties in our arthroplasty unit. All hips were revised to a ceramic on ceramic bearing hip replacement. A Biolox-Delta ceramic liner with an 18 deg taper and Biolox-Delta ceramic head (36mm and 40mm) were used in all cases. **RESULTS:** The mean time to revision was 2.7 years for MOM and 5.2 years for the rest. Uncemented acetabular and femoral components were used in all patients. Re revisions were performed in 2 patients for infection. The mean Harris hip score was 74.3 (44-94). Thirty-one patients returned to the previous levels of activity within 26 weeks. Median UCLA activity scores in these patients was 7. There were no ceramic fractures or dislocations or squeaking. 68% returned to their hobbies and recreational sport. **CONCLUSION:** The functional outcome of MOM revisions is poor as they are associated with severe soft tissue injury. In these high demand patients, stability and early return to function is achieved using ceramic bearing couples. This allows for a larger head to be used with minimal wear for stability. This hard bearing couple is an effective solution for revision of failed metal on metal arthroplasties

Date: 2013-10-18

Session: Symposium Tribology

Time: 14:00 - 15:30

Room: G.05 & G.06

Abstract no.: 34513

COMPARISON OF WHOLE BLOOD METAL ION LEVELS IN FOUR TYPES OF METAL-ON-METAL LARGE HEAD TOTAL HIP ARTHROPLASTY AND ITS CLINICAL CONSEQUENCES.

Charles RIVIÈRE, Pascal André VENDITTOLI, Alain ROY, Michel RAHMÉ,
Martin LAVIGNE

Maisonneuve-Rosemont Hospital, Montréal (CANADA)

Introduction: Metal-on-metal bearings used in large diameter head total hip arthroplasty (LDH THA) are an option in young and active patients with hip degeneration. High metal ion release and secondary adverse reaction to metal debris (ARMD) have been reported with some LDH THA designs. **Methods:** From 173 eligible patients, 144 underwent unilateral MoM LDH THA. We compared the 5 years clinical results and metal ion release (chromium (Cr), cobalt (Co) and titanium (Ti)) from 4 different implant manufacturers including Biomet, Depuy, Smith&Nephew and Zimmer. **Results:** The highest mean Co levels at all follow ups were observed with Zimmer and the lowest with Biomet LDH THA. Ti ion levels were highest in Zimmer group at all time, whereas no difference was found for Cr. We performed 5 revision surgeries for ARMD (4 Zimmer group, 1 Smith&Nephew), and found in all cases a severe fretting-corrosion wear at sleeve/neck modular junction. There were 6 moderate proximal femoral osteolysis (1 zimmer, 4 Depuy, 2 biomet), but no implants loosening. **Conclusion:** Metal ion release differs between LDH THA systems. Wear and corrosion at the sleeve/stem junction seem to cause elevated Co ion levels in the Zimmer group. Current design of some LDH THA systems may not allow using modular large heads with MoM joints, especially in active young males. Further research is needed to better understand the favourable design characteristics of modular junctions in MoM LDH THA.

Date: 2013-10-18

Session: Symposium Tribology

Time: 14:00 - 15:30

Room: G.05 & G.06

Abstract no.: 33823

**MATCHED CERAMIC-CERAMIC VERSUS CERAMIC-POLYETHYLENE
ON THE CONTRALATERAL HIP**

Philippe HERNIGOU, Alexandre POIGNARD, Charles Henri FLOUZAT

LACHANIETTE

University Paris East, Paris (FRANCE)

Introduction: Reports with total hip arthroplasty (THA) with alumina-on-alumina ceramic bearings in patients with 30 years followup are limited. **Methods:** 126 patients (252 hips) with bilateral THA (32 mm ceramic-ceramic AL/AL and the contralateral 32 mm ceramic-polyethylene AL/PE, same manufacturer) performed between from 1978 to 1985 for osteonecrosis were evaluated for long-term clinical and radiographic results, rates of revision, reason of revision, osteolysis, and survival of the THA. **Results:** At the most recent followup in the AL/AL group 35 among 126 hips (28%) had revision, and in the PE group, 47 among 126 hips (37%) had revision. Among the 35 hips with revision in AL group no re-revision was necessary; among the 47 hips with revision in PE group 10 re-revisions necessary. Three allografts used in AL group, and 35 necessary in the 57 revisions or re-revisions in the PE group. With PE liners, the cumulative risk of dislocation was 13% at 30 years for patients who were alive and had not had a revision by that time, versus 2% at 30 years for AL cups (no late dislocation). On PE hips, 100% of osteolytic lesions on acetabulum and femur radiographs, versus 5% for AL hips at final FU. There were only 2 stem revisions among 252 hips at 30 years follow-up. **Discussion and conclusion:** with the first generation of alumina, better survivorship without osteolysis, easier revision, no re-revision, and no late dislocation were the advantages of AL/AL bearing surfaces at 30 years follow-up.

Date: 2013-10-18

Session: Symposium Tribology

Time: 14:00 - 15:30

Room: G.05 & G.06

Abstract no.: 33595

**POLYETHYLENE WEAR AND OSTEOLYSIS AFTER CEMENTLESS
TOTAL HIP ARTHROPLASTY WITH
ALUMINA-ON-HIGHLY-CROSS-LINKED POLYETHYLENE IN PATIENTS
YOUNGER THAN THIRTY YEARS OF AGE**

Chirag PATEL, Young Hoo KIM, Jang Won PARK, Dae Youn KIM

Ewha Woman's University School of Medicine, Seoul (SOUTH KOREA)

Introduction: We asked whether cementless total hip arthroplasties using alumina-on-highly cross-linked polyethylene bearings would improve hip score, functional activity and reduce the incidence of polyethylene wear, osteolysis and aseptic loosening. **Methods:** Consecutive primary total hip arthroplasties were performed in fifty patients (sixty hips) younger than thirty years of age, comprising thirty-four men and sixteen women. The average age at the time of the index arthroplasty was 28.3 years (range, twenty-one to twenty-nine years). The average follow-up was 10.8 years (range, ten to twelve years). Osteolysis and polyethylene wear rates were evaluated using radiography and computed tomography. **Results:** The mean preoperative Harris hip score was 38 points (range, 6 to 45 points), which was improved to 95 points (range, 85 to 100 points) at the 10.8 years. The mean penetration of the polyethylene liner was 0.031 mm per year (95% confidence interval, ± 0.004 mm per year). No hip had osteolysis or aseptic loosening. **Conclusions:** The current generation of cementless acetabular and femoral components with alumina-on-highly cross-linked polyethylene bearing has been functioning well without osteolysis at a ten-year minimum and an average of 10.8 years follow-up in patients younger than thirty years old. While the long-term prevalence of polyethylene wear and osteolysis remains unknown, the mid-term data are promising. **Level of Evidence:** Therapeutic Level IV

Date: 2013-10-18

Session: Knee Arthroscopy & Sports Medicine

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 34659

COMPARISON BETWEEN FUNCTIONAL OUTCOMES OF QUADRUPLE BUNDLE SEMI TENDINOSUS GRAFT VS DOUBLE BUNDLE SEMITENDINOSUS – GRACILIS GRAFT IN ARTHROSCOPIC ACL RECONSTRUCTION OF THE KNEE

Mandar RAILKAR¹, Prateek GOYAL², Rahul SAPRA¹, R K VERMA³

¹SMS Medical College, Jaipur (INDIA), ²SDM Hospital, Jaipur (INDIA), ³MGM Hospital, Jaipur (INDIA)

With the BTB graft being phased out of ACL reconstruction procedures because of its high morbidity, the graft choice options have shifted to a single tendon quadrupled semitendinosus (ST) graft and a combined semitendinosus –gracilis (STG) graft. Considering certain disadvantages in the STG graft like loss of deep knee flexion, and loss of internal rotation, our study aims to analyse whether there are significant advantages of a single tendon ST graft in ACL reconstruction. 40 patients of unilateral instability of the knee were prospectively randomised to arthroscopic reconstruction with either a single tendon(ST) quadruple bundle block (20 patients), and STG graft in (20) patients. All patients were subjected to the same post operative rehabilitation protocol and were followed up for a period of 2 years. On comparing the two groups we did not find statistically significant differences on the basis of IKDC 2000 score, and flexion –extension isokinetic strength tests, but found that the internal rotation torque deficit, and also the external to internal rotation ratio were significantly higher in the STG group than the ST group. Furthermore more patients in the STG group showed a decrease in deep flexion on the Nakamura deep knee flexion test showing the importance of preserving the gracilis tendon. Thus our study concluding that the single ST tendon technique in ACL reconstruction leads to less loss of deep knee flexion, less loss of internal rotation at the same time giving a thicker graft with a good pull out strength and less graft site morbidity.

Date: 2013-10-18

Session: Knee Arthroscopy & Sports Medicine

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 34401

ANATOMICAL VS TRANSTIBIAL TUNNELING TECHNIQUES FOR ARTHROSCOPIC ACL RECONSTRUCTION- A STUDY IN INDIAN POPULATION

Electricwala ALI¹, Electricwala JAFFER²

¹BHARATI VIDYAPEETH UNIVERSITY AND BHARATI HOSPITAL, PUNE., PUNE (INDIA), ²SANCHETI INSTITUTE OF ORTHOPAEDICS AND REHABILITATION, PUNE (INDIA)

INTRODUCTION: Transtibial tunneling technique has been the gold standard for arthroscopic ACL reconstruction for many years. Despite this high level of success, a growing body of literature has questioned whether this technique sufficiently re-creates the anatomy and function of the native ACL. This created a vogue amongst the arthoscopists for anatomical ACL reconstruction using the anteromedial portal. The purpose of this study was to compare the stability and functional outcome using both the techniques. **AIM:** To prospectively compare the clinical outcome following arthroscopic ACL reconstruction using ANATOMICAL and TRANSTIBIAL drilling techniques. **OBJECTIVES:** To compare the functional outcome in daily activities and to assess the stability achieved with each technique. **METHODOLOGY:** 50 patients with ACL deficient knees underwent ACL reconstruction, 25 by transtibial and 25 by anteromedial technique. Patients from both the groups were evaluated on the basis on tourniquet time, stability using Lachman's and Slocum's tests and functional outcome using Lysholm knee score. The duration of study was 3 years. All patients underwent a vigorous physiotherapy protocol. **RESULTS:** In our study, statistical analysis showed that there was no significant difference in the stability and functional outcome in the 2 techniques. **CONCLUSION:** Transtibial and anteromedial tunneling techniques of ACL reconstruction are both equally good in terms of stability and functional outcome in Indian population.

Date: 2013-10-18

Session: Knee Arthroscopy & Sports Medicine

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 35155

COMBINED ANTERIOR CRUCIATE LIGAMENT, POSTERIOR CRUCIATE LIGAMENT, AND POSTEROLATERAL CORNER/ MEDIAL COLLATERAL LIGAMENT RECONSTRUCTION WITH AUTOGENOUS HAMSTRINGS GRAFTS IN CHRONIC MULTILIGAMENTOUS INJURED KNEE

Amrut BORADE¹, Rajiv GUPTA²

¹S.M.S. MEDICAL COLLEGE, JAIPUR, JAIPUR (INDIA), ²ESIS HOSPITAL, JAIPUR, JAIPUR (INDIA)

Introduction: The purpose of this study was to evaluate the clinical outcome after 1-stage reconstruction of the anterior and posterior cruciate ligaments with reconstruction of the posterolateral corner or MCL structures using autogenous hamstring grafts in chronic knee injuries. **Methods:** We reviewed 15 patients (all male) with chronic multiligamentous injuries after a minimum follow-up of 2 years. Arthroscopically assisted combined ACL/PCL reconstructions with autogenous semitendinosus-gracilis tendon grafts were performed using the transportal ACL/PCL reconstruction technique. The PLC was reconstructed with a free autogenous semitendinosus tendon graft and MCL reconstruction was done with ipsilateral semitendinosus graft. Post-operative rehabilitation protocol was similar in all patients. **Results:** The mean time from injury to reconstructive procedure was 21 months. The mean postoperative subjective IKDC score was 72.86 ± 18.6 points and mean postoperative Lysholm knee score was 82 points. 2 patients showed persistent laxity postoperatively and were considered failures. At final IKDC evaluation, 3 patients (20%) were graded level A (normal), 5 patients (33.33%) level B (nearly normal), 5 patients (33.33%) level C (abnormal), and 2 patients (13.33%) level D (grossly abnormal). According to Lysholm score 2(13.33%) patients had excellent, 7(46.66%) good, 4 (26.66%) fair and 2 (13.33%) poor results. **Conclusion:** Combined chronic ACL/PLC/MCL instabilities can be successfully treated with 1-stage arthroscopic cruciate ligament reconstruction combined with PLC/MCL reconstruction using autogenous hamstring grafts. Although current reconstruction techniques are not able to restore normal tibiofemoral kinematics, most patients recover a functionally stable knee and have considerably improved knee function compared with their preoperative status.

Date: 2013-10-18

Session: Knee Arthroscopy & Sports Medicine

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 33932

THE SINGLE-TUNNEL SUTURE FIXATION OF POSTERIOR CRUCIATE LIGAMENT AVULSION FRACTURE

Atul JAIN, Navneet GOEL, Dhananjaya SABAT

SHUSRUTA TRAUMA CENTRE AND MAULANA AZAD MEDICAL COLLEGE, DELHI (INDIA)

Various PCL tibial bony avulsion arthroscopic fixation techniques have been reported in the last decade. Open reduction is difficult in small and comminuted fragment. Arthroscopy adds advantages of avoiding the risk to the popliteal vessels and can treat coexisting pathology. We evaluate the clinical results of arthroscopic treatment of tibial avulsion fracture of the posterior cruciate ligament (PCL) by pull through suture fixation technique through a single bone tunnel. METHODS: We arthroscopically treated 10 patients (mean age, 32 years) with PCL avulsion fractures using 2 posteromedial portals (high and low), standard anterolateral portal and a high anteromedial portal. The bony fragment was pulled by use of a suture loop (Arthrex Fiberwire No. 2) and then reduced into the top of the tibial bone tunnel (4.5mm) created from the anterior tibial cortex to the bottom of the fracture bed, using a PCL tibial guide and suture tied anteriorly on tibia with metal washer. RESULTS: The fracture usually healed at 6 to 12 weeks (mean, 2.8 months) after surgery. At the last follow-up, all patients achieved normal range of motion of the knees, except for 2 patients who had 5° and 10° terminal flexion limitations of the involved knees, respectively. CONCLUSION: The single-tibial tunnel technique seemed not only to simplify the procedure but also to facilitate slight depression of the bony fragment, which have been useful to restore normal tension of the PCL. Clinically, this technique was reproducible and effective. This technique is advantageous in cases with small and comminuted fragments where open procedure with screw fixation is difficult.

Date: 2013-10-18

Session: Knee Arthroscopy & Sports Medicine

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 33962

**AUTOLOGOUS IL1-RA AND SEVERAL GROWTH FACTORS
INFLUENCE ON RESULT AFTER DOUBLE BUNDLE ACL SURGERY**

Nikica DARABOS¹, Miroslav HASPL², Denis TRSEK², Esmat ELABJER¹,
Carsten MOSER³, Aljosa MATEJCIC¹

¹UNIVERSITY CLINIC OF TRAUMATOLOGY, CLINICAL HOSPITAL
CENTER SISTERS OF CHARITY, ZAGREB (CROATIA), ²SPECIAL
HOSPITAL AKROMION, KRAPINSKE TOPLICE (CROATIA), ³INSTITUT
FOR MICROTHERAPY, BOCHUM (GERMANY)

Bone tunnel widening (BTW) appear after knee anterior cruciate ligament (ACL) single bundle technique (SB) reconstruction and could result in ligament laxity or lead to increased failure rates. It could be affected on biomechanical and biomolecular base. Our aim was to establish whether double bundle technique (DB) in combination with biologic treatment of intra-articular application of Autologous Conditioned Serum (ACS) containing endogenous anti-inflammatory cytokines including IL-1Ra and several growth factors, could enhance result of ACL surgery. In prospective, randomized, double-blind trial with four parallel groups, 124 patients were treated. We compared tibial BTW measured by CT-scans in three different post-operative periods. The clinical efficacy was assessed by patient administered outcome instruments (IKDC 2000, LYS HOLM, TEGNER) up to two years following ACL-reconstruction in 4 groups of patients regarding different combination of treatment: A)SB + Placebo, B)SB + ACS, C)DB + Placebo, D)DB + ACS. Postoperative tibial tunnel diameters in all groups were significantly larger than they were directly after surgery. BTW was significantly less in Group D than in other groups ($p<0.005$). Clinical outcomes were consistently better in patients treated with DB technique, especially in group D, at all data points and for all outcome parameters. Combination of biologic ACS treatment and DB ACL reconstruction give the best postoperative knee stability and influence function recovery and clinical result by affecting BTW. The cause and prevention of BTW must be understood by surgeon to improve surgical technique, choice of graft methods and postoperative treatment regimens.

Date: 2013-10-18

Session: Knee Arthroscopy & Sports Medicine

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 34313

EFFECT OF LESION SIZE ON CLINICAL OUTCOMES AFTER MICROFRACTURE: A 2 TO 8 YEAR FOLLOW-UP STUDY

William RODKEY¹, Karen BRIGGS¹, Richard STEADMAN²

¹Steadman Philippon Research Institute, Vail, Colorado (UNITED STATES),

²The Steadman Clinic, Vail, Colorado (UNITED STATES)

Introduction: Some authors state microfracture is suitable only for lesions up to 400 mm². We determined relationships between lesion size treated with microfracture and patient-centered outcomes. We hypothesized that >2 years post-microfracture patient-reported function, activity level, and satisfaction would be similar regardless of original lesion size. **Methods:** Our clinical data registry was queried for knees with contained focal chondral lesions treated with microfracture by one surgeon. 692 knees met inclusion criteria. Lesions were on femoral condyles, tibial plateaus, or patellofemoral joints. Lesion size was measured and documented at index surgery. Group assignments were based on lesion size: Group I <100 mm², Group II 100-300 mm², Group III 301-400 mm², and Group IV >400mm². Average follow-up was 4 years (range, 2-8 years). Patient-centered outcomes were Lysholm score, Tegner activity level, and patient satisfaction (0=totally dissatisfied, 10=totally satisfied). **Results:** At latest follow-up, data were available as follows: Group I=123 patients, Group II=138, Group III=161, Group IV=138 patients. At average 4 years after microfracture with 81% (560 of 692) follow-up, there were no significant differences between groups for Lysholm (86.5-87.5), Tegner (4.6-5.0), or patient satisfaction (7.9-8.2). Findings were the same regardless of lesion location (femur, tibia, or patellofemoral joint). **Conclusions:** At average 4-year follow-up, original lesion size had no effect on patient-reported function, activity level, or patient satisfaction. Lesion location had no effect. We confirm that patient-centered outcomes are the same for contained knee chondral lesions regardless of lesion size. With proper technique, lesion size is not a limitation for microfracture.

Date: 2013-10-18

Session: Knee Arthroscopy & Sports Medicine

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 34554

FEMORAL RADIOGRAPHIC LANDMARKS FOR POPLITEUS TENDON RECONSTRUCTION AND REPAIR- A NEW METHOD OF REFERENCE

Wai Pan YAU

Department of Orthopaedics and Traumatology, The University of Hong Kong, Hong Kong (HONG KONG)

Introduction: Though popliteus muscle-tendon complex is one of the most important structures in controlling the posterolateral rotatory stability of the knee, little work has been done concerning the use of femoral radiographic landmarks in repair and reconstruction. The objective of our study is to identify the femoral insertion of the popliteus tendon (PLT) reconstruction by using standardized radiographic imaging. **Methods:** Ten fresh-frozen human knees were dissected, and the PLT was exposed. After identification of the femoral PLT insertion site, the insertion centre was marked with a radiographic marker. True lateral radiographs of the distal femur were taken, and the digital radiographic images were analyzed by 2 independent observers. **Results:** The PLT was found to be 47.5% (+/-5.2%) across the width of the femoral condyle and 8.1mm (+/-1.8mm) distal to the Blumensaat line. In all specimens, the anatomical PLT origin was found to have less than 4mm variance from the mean. Overall intraclass correlation coefficients for intraobserver reproducibility and interobserver reliability were 0.987 and 0.983 respectively. **Conclusion:** A reproducible anatomical and radiographic reference point for PLT insertion was described. This radiographic information can serve as a valuable reference for preoperative, intraoperative, and postoperative assessments of surgical repair and reconstructions.

Date: 2013-10-18

Session: Knee Arthroscopy & Sports Medicine

Time: 14:00 - 15:30

Room: Hall 1

Abstract no.: 35536

RESULTS OF ARTHROSCOPIC INTERNAL DRAINAGE OF POPLITEAL CYST IN ADULT PATIENTS

Shiv CHOUKSEY¹, Parag GARG²

¹SV medical College, Baroda (INDIA), ²IPGMER, Kolkata (INDIA)

Background: Popliteal cysts in adults usually have an intra articular pathology . It is postulated that their opening of the joint blocked by a ball valve mechanism, leading to accumulation of fluid in the cyst. In this study, we evaluate the results of arthroscopic treatment for popliteal cysts that results in the elimination of the associated intra-articular pathology and the correction of the valvular mechanism responsible for the persistence of the cyst. **Materials and methods:** 46 knees (30 adult patients) with symptomatic popliteal cyst and confirmed by MRI studies were chosen for our study. 3-5 ml methylene blue dye was injected percutaneously in the cyst. To localise the intra articulate opening we observed for the dye inflow inside the joint. This opening was then increased to a minimum of 2 cm diameter to disrupt the valve and to allow free internal drainage of the cyst. **Results:** The average follow up duration for the 46 knees is 3 years. All patients had full decompression of the cyst with no reoccurrence. Rauschning and Lindgren grading was before operation, 3 months post op and then every 6 months. The grading increased by at least 2 grades in 26 out of 30 patients while by one grade in 4 patients. **Conclusion:** arthroscopic internal drainage of the cyst along with correction of the internal pathology served as a long lasting solution for popliteal cyst with excellent patient satisfaction and minimum complications.

Date: 2013-10-18

Session: Arthroscopy & Sports Medicine General

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 33617

HIP ARTHROSCOPIC SURGERY FOR IMPINGEMENT

Satish SONAR

Orange City Hospital, Nagpur (INDIA)

Introduction: Hip Impingement is one of the very common Hip condition in young athletes and Old age people, disabling the patient in performing his day to day activities. There are different types of Hip Impingements from Cad-Cam, Pincer to mixed types. Internal impingement is another entity in which Ligamentum Teres impinges in Flexion,Adduction and IR position. Most of the cases in young patients are due to Sports and trauma. But case of Older age group Degeneration is the main cause. In patients not responding to conservative line of treatment arthroscopic Decompression shows promising results. Methods 19 cases (13 Male, 6 female) case of Hip Impingement, in the age group ranging from 21-66 years with symptoms ranging from 6-20 months, were treated with Arthroscopic decompression followed by physiotherapy, Rehabilitation and Sports specific training. . Results: All the patients were assessed on Haris Hip Score. 15 patients had excellent to good results, 2 Fair and 2 Poor Results. All patients were followed for 3 years from 2009-12. Younger age group and Male patients fare better than counterparts. Conclusions: Arthroscopic decompression for Hip Impingement gives good pain relief and mobility of the Hip. At the same time allow us to treat Labral and chondral pathologies in far better ways. It avoids complications associated with open surgery and patient can go home same or at the most next day. Dr. Satish B Sonar Consultant Sports Orthopaedic Surgeon Orange City Hospital and Global Sports Orthopaedic Clinic, Nagpur, India. www.sportsdocnagpur.com

Date: 2013-10-18

Session: Arthroscopy & Sports Medicine General

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 35607

**DOES HIP MOTION RANGE AFTER ARTHROSCOPIC SURGERY
DEPEND ON THE EXTENT OF CAM IMPINGEMENT RESECTION?**

Jong-Hyun KO, Myung-Sik PARK, Sun-Jung YOON

Chonbuk National University Hospital, Jeonju (SOUTH KOREA)

Introduction: In this study, we measure the α -angle to assess pre- and postoperative conditions using the three views. We also assess whether these variables affected clinical scores more than two years later. **Methods:** We assessed 115 hips and classified the clinical improvements after femoroplasty using a Non-Arthritic Hip Score, VAS, and Satisfaction Score. The changes with respect to range of motion were measured pre- and postoperatively. And the α -angle was measured using pelvis AP, frog-leg, cross-table lateral views, and MRA. The acetabular cartilage changes were recorded and assessed according to clinical symptoms. **Results:** The mean age was 46.6 years. The NAHS improved on average from 72.27 to 82.74. The mean α -angle changed from 56.58° to 55.81° in pelvis AP, 53.07° to 48.25° in frog-leg AP, and 53.90° to 53.13° in cross-table lateral view in a paired t-test. The α -angle was significant in frog-leg AP view ($p=0.000$). Generally, changes of the α -angle and the range of motion have statistical less significance. The articular cartilage grades were as follows: Grade 0;40, Grade 1;43, Grade 2;26, and Grade 3;6 hips. Articular cartilage changes showed more significance with respect to internal ($p=0.000$). **Conclusion:** The α -angle in the frog-leg AP view showed effective preoperative to postoperative change, while the AP and CTL views did not. Clinical improvements showed no linear correlation to increased cam resections. The degree of articular cartilage change of the acetabulum influences hip internal and external rotation more significantly than the extent of the cam resection.

Date: 2013-10-18

Session: Arthroscopy & Sports Medicine General

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 34890

**ARTHROSCOPIC TREATMENT OF FEMORO ACETABULAR
IMPINGEMENT: 5 TO 8 YEARS FOLLOW-UP**

Nicola SANTORI, Antonio BERTINO, Domenico POTESIO

Rome American Hospital, Rome (ITALY)

Arthroscopic FAI decompression is expanding rapidly. The purpose of this study was to evaluate the mid term results of this operation and to investigate on the relationship between sub optimal radiographic correction and clinical outcomes. Clinical and radiological results of our first 77 consecutive hip arthroscopic osteoplasty for FAI, 49 cam, 8 pincer, and 20 combined lesions performed between January 2006 and December 2008 were retrospectively reviewed. Mean age was 33 years (18 to 49). Patients were evaluated pre and post operatively with the Modified Harris Hip Score (mHHS) and the Non Arthritic Hip Score (NAHS). Amount and quality of the osteoplasty was assessed on conventional x-rays by 3 independent observers unaware of the clinical outcome and classified in 3 groups: excellent, acceptable and poor. In 65 cases there was an associated chondral lesion and in 55 cases a labral tear. Two patients were converted to THR and 3 patients lost at follow up. Average pre-op mHHS of the remaining 72 patients was 73 and 92 in the post-op. Average pre-op NAHS was 72.4 and 90.5 in the post-op. Radiographic correction of FAI was judged excellent in 4 hips, acceptable in 38 hips and poor in 30. No direct relationship between clinical outcome and quality of the osteoplasty was found. At the beginning of our learning curve we were frequently unable to achieve an adequate radiographic correction of FAI deformities. However, femoroacetabular impingement surgery is an effective procedure at mid term, independently from the quality of postoperative radiographic correction.

Date: 2013-10-18

Session: Arthroscopy & Sports Medicine General

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 34973

**THE ENDOSCOPIC MANAGEMENT OF THE SCIATIC NERVE
COMPRESSION SYNDROME**

Jonghyun KHO, Myungsik PARK, Sunjung YOON

Biomedical Research Institute of Chonbuk National University, jeonju
(SOUTH KOREA)

Purpose: We introduce the definition of the deep gluteal syndrome and show the technique of the endoscopic release of the compression around the sciatic nerve Materials and Methods: The posterior hip pain related sciatic nerve compression syndrome was 13 patients, but 11 patients had taken an endoscopic sciatic nerve release. We evaluated the clinical result and endoscopic findings of the compression structure around the sciatic nerve. Results: The mean patient age was 50.80 years old (range, 37-70 years). The mean preoperative Vas score 7.0(range, 6-8) as improved to 2.25 (0-4) . The mean Harris hip score was improved to postoperative 87(76-94) from preoperative 64.50(56-77). We released one vascular beds, one bifurcated piriformis tendon and others were thickened some external rotator muscles groups Conclusion: Endoscopic release of the sciatic nerve compression is an useful method for diminishing hip pain and improving function of the hip

Date: 2013-10-18

Session: Arthroscopy & Sports Medicine General

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 35332

CLINICAL OUTCOME OF ARTHROSCOPIC OUTSIDE-IN REPAIR OF TRAUMATIC PERIPHERAL TFCC TEARS

Hesham ELKADY¹, Hatem G.SAID², Amr ALSYD ALI², Maysra BAYOUMY²

¹Assiut Arthroscopy & Sports Injury Unit, Assiut University, Assiut (EGYPT),

²Assiut University Hospitals, Assiut (EGYPT)

Background: Injuries to the TFCC have become more frequently recognized as attention to the cause of ulnar wrist pain has increased. Several authors advocated debridement or excision for most lesions of the TFCC, especially degenerative tears. However, the importance of the peripheral attachments of the TFCC in stabilizing the distal radioulnar joint and providing support for the ulnocarpal joint has led several investigators to recommend repair of certain peripheral TFCC tears to preserve these functions. Various techniques for reattachment of tears of the TFCC from its ulnar insertion (class IB) have been described using both open and arthroscopic methods. Whipple and Geissler Initially described an outside- in technique. Trumble et al. advocated an inside-out technique using 2-0 meniscal repair sutures. **Patients and methods:** our study included 35 patients with MRI Surgical technique: In All Patients diagnostic arthroscopy has been done. After Palmer1B tear identification, it is debrided by shaver to stimulate angiogenesis at the repair site. Arthroscopic repair was performed using an outside-in technique, In This technique we will repair the peripheral margin of the avulsed Articular disc back to the capsule and the extensor carpi-ulnaris sub sheath using 2 No.2-0 PDS sutures placed under arthroscopic visualization. **Post operative rehabilitation:** The patient was placed in volar splint for 4 weeks. Intermittent bracing with a plastic brace for another 4 weeks, with progressive gentle active motion of the wrist .**Results:** by DASH score the outcome was very good in (77%), good in (14%), and poor in (9%) of the 35 patients.

Date: 2013-10-18

Session: Arthroscopy & Sports Medicine General

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 35397

EFFECTIVENESS OF PLATELET RICH PLASMA INJECTIONS COMPARED WITH STEROID INJECTION IN TREATMENT OF LATERAL EPICONDYLITIS (TENNIS ELBOW)

Ramakanth RAJAGOPALAKRISHNAN, Prasad SORAGANVI, Narayan GOWDA BS

PESIMSR, KUPPAM,CHITTOOR (DT) (INDIA)

Introduction: Autologous injection of platelet rich plasma (PRP) stimulates healing process in degenerated tendons. The purpose of this study is to compare the functional outcome of lateral epicondylitis treated with PRP and Steroid injection. **Methods:** Tennis elbow patients who failed conservative medical therapy were included and were allocated randomly steroid group (n=70)and PRPgroup (n=63). Data were collected before procedure, at 4,8,12 weeks, 1year and two year after procedure. The main outcome measures were Visual analogue score, mayo elbow performance score, DASH score and hand grip strength. **Results:** successful treatment was defined as more than a 25% reduction in visual analogue score or DASH score and more than 75 score in mayo elbow performance score. We observed that 35 of the 70 patients (50%) in corticosteroid group and 47 of the 63 patients (75%) in PRP group were successful, which was significantly different ($p<.001$), according to DASH score 37 of the 70 patients (53%) and 47 of the 63 patients (75%) in the PRP group were successful which was also significantly different ($P = .005$), mayo elbow performance score was successful in 36 of the 70 patients (51%) in corticosteroid group and 49 of the 63 patients (78%) in PRP group. The improvement in hand grip strength of hand from 24.7kgs (mean) 26 kgs in corticosteroid group and 23.5kgs (mean) to 32.9kgs (mean) in PRP group. **Conclusion:** PRP injection for chronic lateral epicondylitis reduces pain, improve functionality and hand grip strength when compared to steroid injection.

Date: 2013-10-18

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Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 34017

A RANDOMIZED CONTROL TRIAL EVALUATING THE EFFICACY OF A SINGLE ULTRASOUND GUIDED INJECTION OF PRP- 4B IN RESISTANT LATERAL EPICONDYLAR TENDINOPATHY

Prateek BEHERA, Mandeep DHILLON, Sameer AGGARWAL

Post Graduate Institute of Medical Education and Research, Chandigarh
(INDIA)

Introduction; Lateral epicondylar tendinopathy (LET) patients who have failed conservative treatment are usually managed by surgery. Local injection of platelet rich plasma (PRP) in resistant LET patients has been researched as non operative treatment modality. Studies conducted till now have used Type 1 PRP. We conducted this study to evaluate the efficacy of Type 4 PRP in such patients. **Methods;** Study was conducted as a RCT. Patients satisfying inclusion and exclusion criteria were randomized into two groups – group1 (n=15) and group2 (n=10). They received ultrasound guided injections by a musculoskeletal radiologist. Group 1 patients received autologous PRP and group 2 bupivacaine. Visual analogue scores (VAS), modified Mayo clinic performance index for elbow (MMCPIE) and Nirschl scores were analyzed. Follow up was at 1, 3 and 6 months. Results were analyzed using SPSS 20. **Results;** Group 1 patients showed a gradual, progressively increasing, sustained improvement in VAS, MMCPIE and Nirschl scores at each follow up. 6 months post injection, group1 patients had 67.25% improvement in mean VAS compared with 20.06% in group2. Improvement in MMCPIE scores was 40.64% compared to 16.29% and in Nirschl scores was 71.35% compared to 31.14%. **Conclusions;** The results of type 4B PRP injection are similar to results of previously published studies using type 1 PRP in terms of improvement in pain and functional outcomes. We did not find any increased post injection pain with 4B PRP which two earlier investigators reported using type 1 PRP. Ultrasound guidance for injections provided no added advantage.

Date: 2013-10-18

Session: Arthroscopy & Sports Medicine General

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 34150

MA & GRIFFITH PERCUTANEOUS SUTURE OF ACUTE ACHILLE TENDON RUPTURE WITH EARLY WEIGHT BEARING. A STUDY OF 60 CASES

Jean Louis ROUVILLAIN¹, Thomas NAVARRE², Octavio LABRADA BLANCO¹, Emmanuel GARRON¹, Chafiq ZEKHNINI¹, Charles SENLECQ¹
¹CHU LA MEYNARD, FORT DE FRANCE (MARTINIQUE), ²CHU, FORT DE FRANCE (MARTINIQUE)

Introduction. Several percutaneous techniques have been used (Tenolig®, Achillon®) but these techniques are costly and may be marred by wound healing problems. Ma and Griffith described a technique for percutaneous repair which left the suture and the knot under the skin, thus reducing the risk for infection. **Material and Methods.** From 2001 to 2006, we used this percutaneous treatment for 60 acute ruptures of Achille tendon. Postoperative care was 3 weeks immobilisation in a cast, followed by another 3 weeks in a cast with the ankle at 90° with weight bearing. **Results.** Mean follow-up was 19 months. There was no sural nerve lesion. Mean time to return to working activities was 85 days and mean time to return to sports activities was 5 months. Clinical results were good with no loss in range of motion. **Discussion.** The technique does not leave any foreign body in contact with the skin, which could be a source of local inflammation, or necrosis. This is particularly important for countries with a hot climate. The technique used is reliable, reproducible and easily taught. In this series, it was performed by a number of operators with various levels of training. **Conclusion.** Percutaneous suture of the Achilles tendon appears as a simple, rapid, effective, reproducible and inexpensive technique. It combines the advantages of open surgery with a low risk of re-rupture and those of functional treatment with a low risk of infection.

Date: 2013-10-18

Session: Arthroscopy & Sports Medicine General

Time: 16:30 - 18:00

Room: Hall 1

Abstract no.: 34888

DOES HYALURONIC ACID HAVE AN ADDITIONAL EFFECT ON FUNCTIONAL SCORES AT TALUS OSTEochondRAL LESIONS AFTER MICROFRACTURE METHOD?

Osman TECIMEL¹, Ahmet FIRAT¹, Cetin ISIK¹, Ramazan AKMESE², Alper DEVECI³, Ismail DEMIRKALE⁴, Murat BOZKURT¹

¹Ataturk Research and Education Hospital Orthopaedics and Traumatology Clinic, Ankara (TURKEY), ²Ankara University Faculty of Medicine, Department of Orthopaedics and Traumatology, Ankara (TURKEY),

³Numune Research and Education Hospital Orthopaedics and Traumatology Clinic, Ankara (TURKEY), ⁴Kecioren Research and Education Hospital Orthopaedics and Traumatology Clinic, Ankara (TURKEY)

Introduction: Osteochondral lesions at talar dome are managed with debridement, curettage, subchondral drilling, microfracture, osteochondral grafting and chondrocyte transplantation beside conservative methods. Hyaluronic acid is a shock absorbent as an intense liquid, which affects to the structural character of the chondral matrix and modulates inflammatory process. In this study, the effect of microfracture method on functional results of talar osteochondral lesion treatment and contribution of HA injection to these functional outcomes is explored. **Methods:** Forty-eight patients (33 men, 15 women), with Ferkel Stage 2 or 3 talus osteochondral lesions, operated arthroscopically between 2007 and 2010 were reviewed retrospectively. Twenty-eight patients in Group 1 were managed with microfracture method alone, and 20 patients in Group 2 were managed with Hyaluronic acid injection after microfracture. The patients were evaluated with AOFAS scores and range of motions(ROM) clinically together with magnetic resonance(MR) images at their final visit. **Results:** AOFAS scores of the patients were improved with 42 and 43 points in both groups respectively. There were no significant increase in HA injected patients' clinical scores when compared to microfracture alone performed patients. ROM improvements were the same in both groups with no additive increase in HA group compared to microfracture alone group. **Conclusion:** Arthroscopic debridement with microfracture is still one of the most-widely used and proven method for treatment of talus osteochondral lesions. Although contribution of HA injection to microfracture does not affect to clinical outcomes in short term results, future prospective studies are needed for long term results.

Date: 2013-10-18

Session: TKA I

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 35802

STREAMLINING TOTAL KNEE ARTHROPLASTY USING COMPUTER-ASSISTED SURGERY

David LIONBERGER

Southwest Orthopedic Group, L.L.P., Houston (UNITED STATES)

Introduction: Time is the most common complaint regarding the use of computer-assisted surgery (CAS) in total knee arthroplasty (TKR). While the enhancement of accuracy can be justified by slight increases in cost, the additional burden of adding 10-15 minutes of navigation time is unacceptable to many surgeons. **Materials and Methods:** Fifteen patients were randomly assigned to two cohorts: TKA SMART or traditional TKA-CAS. Time was kept among six different phases of the procedure starting with insertion of trackers and waypoint acquisitions, femoral preparation, tibial preparation, trial insertion implantation, and closure. Two timekeepers were utilized to minimize any errors in recording timed events. **Results:** TKA SMART was 5.1 minutes faster than TKA-CAS which resulted in a 9.7% improvement in time reduction. The majority of the time improvement was noted in the instrument tracker insertion and waypoint acquisition representing a 3.4 minute improvement over TKA-CAS. The next phase of improvement occurred in the tibial preparation, navigation and resection execution with a reduction of 1.7 minutes. There was minimal improvement in the femoral preparation phase at 0.6 minutes. No accuracy difference was noted between the two software designs despite elimination of opponents. **Conclusions:** TKA SMART represents an improvement in the placement of trackers and acquisition of waypoints in addition to the improvement in the interpretation and acquisition of data. However, it did not have any improvement in the cognitive correction measure in time. The 9.7% time improvement in data acquisition represents a significant enhancement of TKA-CAS efficiency without reducing accuracy.

Date: 2013-10-18

Session: TKA I

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 35329

AXIS FOR TIBIAL COMPONENT ALIGNMENT IN TOTAL KNEE ARTHROPLASTY

Mohammad Shahnawaz KHAN¹, Jong Keun SEON², Eun Kyoo SONG²

¹Golden Jubilee National Hospital, Glasgow (UNITED KINGDOM),

²Chonnam National University Hwasun Hospital, Gwangju, South Korea, Gwangju (SOUTH KOREA)

Introduction: Rotational alignment of femoral and tibial component is an important factor for longevity and success of total knee arthroplasty (TKA). The purposes of this study were to describe the changes in tibial torsion and knee rotation in varus osteoarthritic knees and to check the reliability of reference axis, for tibial component placement, based on femoral transepicondylar axis (TEA) in these patients. A secondary goal was to determine which reference axis based on proximal tibia is most accurate for determining tibial component rotation. **Methods:** Fifty-two varus osteoarthritic knees and 20 normal knees were analyzed using computed tomographic scan. **Results:** Tibial torsion was significantly reduced in OA patients (mean, 19.5°) compared with healthy individuals (mean, 23.51°; $p = .017$). Mean knee rotation in healthy individuals was 5.6°, whereas in OA patients, it was reduced to 3.0°; this difference was significant ($p = .035$). Reference axis based on posterior tibial condyles was most accurate and least variable for tibial component alignment. A significant negative correlation was found between varus deformity and tibial torsion ($r = -0.54$, $p < .02$). Significant negative correlation was also present between knee rotation and TEA ($r = -0.485$, $p < .001$). **Discussion:** Posterior tibial condylar axis is a more reliable and more accurate reference axis for tibial component placement than femoral TEA in varus OA knees. Rotational profile of lower limb, especially tibial torsion and knee rotation, should be assessed and accounted during TKA to prevent rotational malalignment of tibial component.

Date: 2013-10-18

Session: TKA I

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 34421

THE EFFECTS OF TIBIO-FEMORAL COMPONENTS IN HYPEREXTENSION ON KINEMATICS OF TKA

Zhiwei WANG¹, Chengkung CHENG², Tiebing QU¹

¹Beijing Chaoyang Hospital, Beijing (CHINA), ²National Yangming University, Taipei (TAIWAN)

Purpose: Implantation of prosthetic tibio-femoral components in hyperextension is a well-established and effective procedure, but whether prosthetic orientation in the sagittal plane has any effects on the postoperative kinematics remains unclear. The purpose of this study is to explore how the aforementioned hyperextension affects knee kinematics. **Methods:** Validated computational dynamic TKA models were established. Based on representative literatures and actual operation specifications, femoral and tibial components were assembled with 0° or 5° of hyperextension. Dynamic data, including the timing of cam-post engagement, anteroposterior femoral translation and tibial axial rotation coupling with knee flexion, were recorded for analysis. **Results:** 5° of femoral component hyperextension delayed cam-post engagement by an angle of 2°. Nevertheless, a 5° posterior slope of the tibial component resulted in a 38° delay in engagement. Comparing this with the femoral component at the same angle of hyperextension, the tibial component could more evidently assist in the prevention of paradoxical femoral anterior translation and the promotion of tibial internal rotation through early flexion. **Conclusion:** Tibio-femoral components in hyperextension did significantly alter postoperative kinematics, especially for the tibial component. These results suggest that the degree of tibial posterior slope cutting should be more highly scrutinized intraoperatively.

Date: 2013-10-18

Session: TKA I

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 35377

LONG TERME CLINICAL RESULTS OF AN ORIGINAL MOBILE BEARING KNEE WITH FULL CONTACT AND MOBILITY

Laurent SEDEL, Steeve SULIMOVIC

Hospital Lariboisiere (APHP) and University of Paris Denis Diderot, Paris (FRANCE)

Mobile bearing knees are well known. This current study deals with a special design with fully constraint contact and full mobility of the bearing. 89 prostheses were introduced prospectively and consecutively in 81 patients, 70 females and 11 in males. Mean age was 74 years. 7 knees has been already operated (5 osteotomies and one unicondylar). Patients were followed from periods from 75 days to 15 years (median 8,4 years). Results were evaluated by an independent observer. Clinical evaluation, X-rays in patients that did show up and satisfaction. Twenty three patients deceased with their prosthesis. There was 21 revisions: five for traumatic fracture, one for sepsis after a haematoma, and 9 for loosening (5 tibias, 2 femur, and 2 patella). Survivorship taking revision of total joint related to loosening or pain as event was 81% @ten years. Survivorship taking full revision (excluding patella) as an event was 91%. Among the revision, 2 concerned knees already operated (one osteotomy and one unicondylar prosthesis). Pain improved markedly, mean range of flexion was 117°. Mean oxford score was 22, 52; mean HSS score was 87; mean KS score was 196. No or very limited positive drawing test were recorded. Although this is not a randomized controlled study, this fully constrained prosthesis with mobile bearing knee is interesting: range of motion is important and revision events were not superior to other designs. Limitation of polyethylene wear debris related to the fully conforming design could possibly allow a better long term survival.

Date: 2013-10-18

Session: TKA I

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 34372

**IN VIVO FUNCTION OF POSTERIOR CRUCIATE LIGAMENT (PCL)
BEFORE AND AFTER PCL-RETAINING TOTAL KNEE ARTHROPLASTY**

Bing YUE¹, Li GUOAN²

¹Shanghai Key Laboratory of Orthopaedic Implant, Department of Orthopaedic Surgery, Shanghai Ninth People's Hospital, Shanghai Jiaotong University School of Medicine, Shanghai (CHINA), ²Bioengineering Laboratory, Department of Orthopaedic Surgery, Massachusetts General Hospital and Harvard Medical School, Boston (UNITED STATES)

Purpose The objective of this study was to investigate the in-vivo function of the posterior cruciate ligament (PCL) in patients before and after a posterior cruciate retaining total knee arthroplasty (TKA). **Methods** Eleven patients with advanced osteoarthritis (OA) of knee were recruited. Magnetic resonance scans of each OA knee were obtained and 3-dimensional computer models, including the femoral and tibial insertion areas of the anterolateral and posteromedial bundles of the PCL, were created. Before and after PCL-retaining TKA respectively, the dual fluoroscopic images of each subject's knee were acquired during weight-bearing knee flexion. The images and computer models were used to reproduce the in vivo motion of the knee. The function of the PCL bundles was described in terms of elongation, elevation and deviation. Twenty-two healthy control subjects were also included as normal references. **Results** The PCL bundles of the OA knees were over-stretched during the late knee flexion and oriented more medially throughout the flexion, compared to the normal knees. After PCL-retaining TKA, the PCL bundles were further over-stretched during the late flexion and changed from medially-directed in the normal and OA knees to be almost 'sagittally-directed', which may compromise its function in controlling the knee rotation. **Conclusions** The current PCL-retaining TKA systems and surgical techniques may hardly reestablish the normal biomechanics of the PCL bundles after PCL-retaining TKA.

Date: 2013-10-18

Session: TKA I

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 35857

**PATIENT SATISFACTION AND OUTCOME AFTER SEPTIC VERSUS
ASEPTIC REVISION TOTAL KNEE ARTHROPLASTY –COMPARATIVE
STUDY AT A MEAN FOLLOW UP OF 8.5 YEARS**

Deepak THAKUR, Simon THOMAS, Shekhar SHRIVASTAV, Shekhar AGARWAL

Sant Parmanand Hospital, New Delhi (INDIA)

INTRODUCTION: Revision total knee arthroplasty is now a common and proven surgical procedure. Recent series report excellent to good clinical results of between 73% and 87% at four to eight years. The goal of our study was to compare the patient satisfaction and clinical outcome of revision total knee arthroplasty performed for aseptic and septic causes.

METHODS: Between 2002 and 2010, 27 revision tkr's were performed by a single surgeon. Group 1 included 15 patients in whom the revision was done for aseptic causes and group 2 included 12 patients in whom the revision was done for septic cause. A pre-operative Knee Society (KSS) and WOMAC score was obtained for all patients. The final KKS and WOMAC score was recorded at mean follow-up of 8.5 yrs. **RESULTS:** Overall, the mean KSS score increased from 50.94(21-72) to 70.37(38-90). The mean WOMAC score increased from 55.57(36.4-62.9) to 72.86(56.5-84.1). At final follow, the outcome was good to excellent in 22(81.48%). In aseptic subgroup 86.66% had a good to excellent result as compared to the septic group which had 75% as good to excellent.
CONCLUSION: Reproducible clinical success and longevity at the time of intermediate-term follow-up can be achieved with revision total knee arthroplasty for both aseptic and septic causes with significant improvement in quality of life. Revision done for septic loosening has comparatively inferior results as compared to revisions done for aseptic causes.

Date: 2013-10-18

Session: TKA I

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 35861

THE ROLE OF TRANEXAMIC ACID IN REDUCING POSTOPERATIVE BLOOD LOSS IN PATIENTS UNDERGOING STAGED BILATERAL TOTAL KNEE REPLACEMENT

Kalaivanan KANNIYAN¹, Anshul DAHUJA², Jaswinder Pal Singh WALIA²

¹Saveetha Medical College and Hospitals, Tamil Nadu, Chennai (INDIA),

²GMC Patiala / Rajindra Hospital, Patiala (INDIA)

Aim : The primary aim of our study was to assess the role of tranexamic acid in reducing postoperative blood loss in total knee replacement. **Methods:** We studied 60 patients with primary osteoarthritis both knees undergoing staged bilateral TKA at an interval of 3 weeks who had been administered TEA as per our protocol in their first knee replacement and they were as control in their second knee replacement. Our protocol included administration of one intraoperative dose of 15mg/kg of TEA (given as infusion over 15 min) just before inflation of tourniquet and the subsequent 15mg/kg dose. **Results :** Mean age of the patients undergoing TKA was 61.5 yrs. The mean preoperative Hb and pre and postoperative Hct values were found to be similar in both the groups. Postoperative Hb was found to be significantly lower in the control group as compared to the TEA group (p value=0.001). The total postoperative drain output was found to be lower in patients who received TEA(352-412ml) as compared to control group (804-878ml) and this relation was found to be significant with high power concluding a decrease in total blood loss in patients who were administered TEA during TKA. Above results showed a direct effect on blood transfusion requirement i.e TEA: control = 1:2.3. **Conclusion :** So we conclude that TEA is effective in reducing blood loss and transfusion needs. Inflation of the tourniquet after administration of a bolus dose of TEA does not augment the risk of thrombogenesis.

Date: 2013-10-18

Session: TKA II

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 34773

RESULTS OF 447 MOBILE WEIGHT-BEARING TKA, WITH A FOLLOW UP FROM 5 TO 9.5 YEARS

Frederic CHÂTAIN¹, Thierry GAILLARD², Stephane DENJEAN³, Group SCOR⁴

¹CLINIQUE DES ALPES - CLINIQUE BELLEDONNE, GRENOBLE (FRANCE), ²CLINIQUE DU BEAUJOLAIS, VILLEFRANCHE (FRANCE),

³CLINIQUE DU VAL FLEURY, MACON (FRANCE), ⁴CLINIQUE DU PARC, LYON (FRANCE)

Introduction: The purpose of this study is to present the long-term results of the full congruency mobile weight-bearing TKA SCORE® (Amplitude, France) and to determine whether patella replacement and / or the use of the navigation technique are predictive factors of good results. **Method:** 447 TKA were evaluated with the International Knee Society score at a minimum follow up of 5 years and with X-rays. 237 (53%) were computer assisted (Amplivision®, CT-free module, bone morphing). 254 (57%) had the patella resurfaced. A statistical multi-varied analysis was carried out. **Results:** Medium follow up was 6,5 years, maximum 9.7 years. 98% were satisfied or very satisfied. IKS knee score was 89 points and IKS function score was 86 points. Clinical results were similar whether the TKA had been computer assisted or not and whether the patella had been replaced or not. Radiological evaluation showed that in cases where TKA had been computer assisted the greater the preoperative deformity, the better the postoperative X-rays. There were 6 reoperations (1 femoral fracture, 2 for stiffness, 4 for sepsis, 1 for pain, and 1 unknown). There was no patellofemoral failure, no dislocation of the mobile weight bearing and no aseptic loosening. **Conclusion:** The results of the TKA SCORE® are very satisfying; there is no real benefit in replacing the patella. The Amplivision® prosthesis navigation system gives better radiological results that do not influence clinical results at 5 to 9.5 years of follow up.

Date: 2013-10-18

Session: TKA II

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 34169

**NEW TECHNOLOGIES IN TOTAL KNEE REPLACEMENT:
PROSPECTIVE STUDY OF 20 PRENAVIGATED TOTAL KNEE
REPLACEMENT WITH MEDIUM FOLLOW UP OF 18 MONTHS**

Cesare CHEMELLO, Giovanni COSTACURTA, Nicola CALZAVARA, Enrico SCALCO

Asiago Hospital, Vicenza (ITALY)

Introduction: Custom Made Surgery seems to be the future of total knee replacement (TKR). Based on our experience, "patients specific instrument" (PSI) helps to perform a real tissue sparing surgery (TSS) and it allows to customize technique and to standardize results.

Methods: 20 patients, affected by knee advance osteoarthritis (13 varus, 7 valgus) and by axial deviation exceeding 3°, underwent to TKR. In pre-operative examination a TC was performed following strict protocols. The study included: at the baseline and after 2 years a lower limb teleradiography and a staging according to the Knee Society Score (KSS). Post operative axes were compared to the planned ones: between anatomical and mechanical femoral axis (α AAM), femoral flexion shield (FSF), tibial slope (ST) and frontal angle of the tibial component (α CT). Negative outcome was considered as axial deviations \pm 2 for FSF, ST and \pm 3 for α CT e α AAM. Results: patients achieved an excellent clinical and functional results according to KSS. In 3 cases a higher tibial insert was implanted. Final knee flexion was always more than 105° and in 84% cases higher than 110°. 3 errors of ST, 2 of α AAM, 5 of femoral component flexion, 3 of α CT were observed. Mal position of both components was detected in 2 cases. No patellar resurfacing and recuts were performed. Conclusion: technique allows to perform a TSS, to reduce surgical time, to obtain optimal and reproducible alignments. Technique requires an adequate learning curve as it can lead to significant positioning errors.

Date: 2013-10-18

Session: TKA II

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 33563

TOTAL KNEE ARTHROPLASTY IN SEVERE FIXED FLEXION DEFORMITY

Saurabh AGARWAL, Rajeev Kumar SHARMA

Indraprastha Apollo Hospital, New Delhi (INDIA)

Background: The purpose of this study was to prospectively analyze the result of TKA in patients with severe flexion contracture (>300). An attempt to achieve maximal correction of flexion deformity was made at time of initial arthroplasty by adopting standardized surgical protocol and post-operative management. **Material and Methods:** Total knee arthroplasty was done on 90 knees in 55 patients with severe flexion deformity. The mean age at operation was 62 years (42 to 88yrs). The selected patients for this study had a minimum pre-operative flexion deformity of > 30 degree . Sixteen total knee arthroplasties were done in 8 patients with flexion contracture of more than 60 degrees (average 77 degrees). **Results:** Significant improvements occurred after average 24 months follow-up. Complications occurred in three patients: two had transient peroneal-nerve palsy, and one had cutaneous necrosis of skin on both sides, the wound healed well. Staged bone resection and thorough soft-tissue release of the posterior capsule and collateral ligament balance were the critical procedures used. TC 3 implant with extension stem was used in 7 patients. If necessary, additional distal femoral condyle resection was done. **Conclusion:** Results have shown that TKA can achieve correction of severe flexion deformity of the knee with marked improvement in the function and quality of life. Severe flexion contracture of more than 60 degrees is not a contraindication for single stage TKR.

Date: 2013-10-18

Session: TKA II

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 34026

RESULTS OF A RANDOMISED CONTROLLED TRIAL COMPARING THE PITHING TECHNIQUE FOR MEDIAL COLLATERAL LIGAMENT BALANCING WITH THE SUBPERIOSTEAL RELEASE IN TOTAL KNEE REPLACEMENT

Mrinal SHARMA¹, Yatinder KHARBANDA²

¹Indraprastha Apollo hospital, new delhi (INDIA), ²indraprastha Apollo hospital, new delhi (INDIA)

Introduction: We compared the pithing technique of MCL balancing in TKR with the traditional subperiosteal technique for MCL release using a periosteum. **Methods:** twenty five patients (age 48-68yrs) who underwent a bilateral sequential tkr (same surgeon) included. All had bilaterally same degree of varus in both knees(average varus 22 degree).The joint gap was measured using special lamina spreaders with mm scale.The pithing technique (18 gauge needle)was used in all patients on one knee and the subperiosteal release in other knee(randomised) .The medial joint space opened av 20mm(16-20mm) compared to lateral av 24 mm (20-28 mm). The pre-op and post op Knee society scores and womac scores and ROM were recorded. All were followed for one year post surgery. **results:**intra-operatively the pithing technique allowed fine balancing of the MCL (1 mm accuracy) without the chances of over release (as sometimes happens with subperiosteal release).The maximum release achieved with pithing technique was 6mm.In two patients(with severe noncorrectable varus) the gap could not be balanced with pithing and additional subperiosteal release was needed. overrelease of mcl with subperiosteal release occurred in two. Post-op echymoses and discoloration of leg was seen in six patients in whom subperiosteal release was done. There were no intra-op or late post op ruptures/laxity of mcl in any group. All patients at one year had identical rom in both knees and KSS and womac scores.**conclusion:**pithing technique allows fine balancing but may not suffice in severe fixed varus. no difference in outcome at one year.

Date: 2013-10-18

Session: TKA II

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 34249

WHETHER GRADES OF DEGENERATIVE CARTILAGE AFFECTS THE CLINICAL OUTCOMES AFTER TKA WITHOUT PATELLAR RESURFACING

Guo-Chun ZHA¹, Jun-Ying SUN²

¹Orthopaedics Department, The First Affiliated Hospital of Soochow University, Suzhou (CHINA), ² Orthopaedics Department, The First Affiliated Hospital of Soochow University, Suzhou (CHINA)

University, Suzhou (CHINA), ² Orthopaedics Department, The First Affiliated Hospital of Soochow University, Suzhou (CHINA)

Objective: To determine whether different grades of degenerative cartilage influence on the clinical and functional outcomes after the patellar nonresurfacing in total knee arthroplasty (TKA). **Methods:** We performed a retrospective study of 151 TKAs without patellar resurfacing in 151 patients (male 65; female 86) from February 2007 to January 2010. Mean age of 65 ± 5.0 56~82years. Mean follow-up was 3.5 2~5 years. Intraoperatively, we classified the grades of degenerative cartilage according to Outerbridge Classification. The degree of patients satisfaction was graded very satisfied, satisfied, unsure or dissatisfied. The incidence of anterior knee pain (AKP) was assessed using visual analogue scale (VAS). If VAS > 3 points, patient was defined suffered AKP. Compare KSS and patella score of patients with grades of degenerative cartilage at the final follow-up. **Results:** The articular cartilage of the patella was graded according to Outerbridge: grade I in 18 patients, grade II in 36 patients, grade III in 62 patients, and grade IV in 35 patients. At the final follow-up, the incidence of patients satisfaction and AKP was 96.7% (146/151) and 4.0% (6/151), respectively. An analysis of these results according to the grade of chondromalacia shown that the patient satisfaction rate ($H=5.54, P=0.14$), AKP rate ($H=0.56, P=0.91$), KSS (knee score: $F=1.95, P=0.12$; function Score: $F=2.11, P=0.10$) and patella score ($F=1.35, P=0.26$) were not found to be significantly difference. **Conclusion:** The different grades of chondromalacia may not affect the clinical outcomes of TKA. TKA without patella resurfacing appears to be a reasonable option for degenerative osteoarthritis.

Date: 2013-10-18

Session: TKA II

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 35217

PATELLA MANAGEMENT IN REVISION KNEE ARTHROPLASTY

Maik HOBERG, Felix MASSIG, Stefanie BRIESKE, Arno FRANZ, Frank HAHN, Maximilian RUDERT

Orthopaedic clinic Koenig-Ludwig-Haus, Wuerzburg (GERMANY)

Introduction: The management of the patella during revision total knee arthroplasty (TKA) depends on the indication and availability of bone stock. But the clinical outcome is very controversial. Our aim of this investigation was the analysis of the mid-term clinical outcome after revision-TKA with different patella managements. **Methods:** In this retrospective study we reviewed 118 patients. Patients were divided into five groups (patellar resurfacing, removal of patella-button, patella button retaining, change of button, no resurfacing in index and revision-TKA). The average follow-up was 29.8 months. For clinical evaluation we used the Oxford Knee score, the Knee Society score, the Turba score, and the Kujala score. The health-related quality of life was determined with the SF-36 score and persistant pain were analysed by the visual analogue scale (VAS). **Results:** The revisions were performed 79 (min 2, max. 212) months after index-TKA. Sixty-nine percent of the patients were female. The main reasons for revision were instability and aseptic loosening. No different results were achieved in Turba score and VAS. Four groups of patients revealed same levels in the Kujala score, the Oxford Knee score, the Knee Society score, and the SF-36 score. But only the group where the patella button was removed has significantly lower outcome parameters compared to all other groups and the re-revision rate was significantly increased. **Conclusion:** The clinical outcome after revision-TKA focused on the patella revealed lower clinical results when the patella button is removed. Results give strong evidence for retaining or exchange the button during revision-TKA.

Date: 2013-10-18
Session: TKA II
Time: 14:00 - 15:30
Room: Hall 2

Abstract no.: 35183

BONE DEFECT TREATMENT IN REVISION KNEE ARTHROPLASTY

Miroslav HASPL, Denis TRSEK

AKROMION, Special Hospital for Orthopaedic Surgery, Zagreb (CROATIA)

INTRODUCTION: During knee endoprothesis loosening there is a progressive bone tissue loss. Bone tissue defects can be compensated with bone cement, bone grafting, with a large set of metal augmentation components, and most recently with metal sleeves. **AIM:** To investigate the need of bone defect reconstruction in our patients treated with modular revision knee arthroplasties. **MATERIALS AND METHODS:** In a period from 2008 to 2012, we have implanted 26 revision modular knee endoprostheses type Sigma (DePuy). Male 20, female 5, age 68 (54-79). At 3 patients the femoral component was loosened, in 4 patients both components were loosened, and in 20 patients only the tibial component was unstable. We used uncemented tibial and femoral stems. In 21 patients (80,7%) bone defect reconstruction was done using metal augments. The tibial component was augmented with plane blocks in 12 patients (46,2%) and in 5 patients (19, 2%), special sleeve was used on the tibial component. In 4 patients (15, 4%) augmentation was done on the femoral and the tibial component. There was no need for additional bone grafting. **RESULTS:** Follow-up was 32, 1 (6-56) month. All of our patients were full weight bearing at first 6 weeks and the wounds have healed normally. We haven't noted any septic or aseptic endoprosthesis loosening so far. **CONCLUSIONS:** With contemporary modular revision knee endoprostheses it is possible to compensate bone tissue defects, even without bone transplant usage, with the prerequisite of early loosening detection and early knee arthroplasty procedure.

Date: 2013-10-18

Session: TKA II

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 34154

FAILED TKA IN RELATION TO METAL IONS ALLERGY: REVISION WITH A SURFACE-COATED TKA

Patrice MERTL, Jerome TAVIAUX, Jean François LARDANCHET, Benoit BRUNSCHWEILER, Antoine GABRION, Eric HAVET
university hospital, amiens (FRANCE)

Prevalence of allergic reactions after TKA is unknown. Several reports associate complications as pain, swelling and stiffness with allergy. Metal ions can interact with the immune system inducing a delayed -type hypersensitivity reaction. Cobalt, Nickel and Chromium are the main haptens but unfortunately there is no standard diagnosis procedure. From 2010 to 2012, 8 TKA were revised for failure due to metal allergy. 2 cases were bilateral. The first prosthesis implanted was cemented. Components were made of Cr-Co alloy. 2 patients had previous TKR revision. Patients had permanent pain and stiffness. None eczematous reactions were observed. Anamnesis demonstrated pre-existing contact metal allergy. X-rays did not reveal malposition, but loosening in 3 cases. C-reactive protein and bacteriological tests after joint aspiration excluded an infection. Cutaneous patch-tests were positive for Chromium, Cobalt or Nickel except in one case. Implants were replaced with revision TKA covered with an anti-allergic ZrN multilayer coating (AS Solution™, B-Braun®) on the standard Cr-Co implant. Histological specimen showed lymphocytic infiltration with peripheral blood mononuclear cells. Pain and knee swelling disappeared after surgery. Average follow-up was 18 months. At maximal FU results remained excellent: KSS clinical score improved from 42 to 84 and KSS functional score from 34 to 69. X-rays demonstrated no signs of loosening or osteolysis. Multilayer-coated implants has shown excellent results but further studies are necessary to prove the clinical outcome on a larger scale with a longer follow-up.

Date: 2013-10-18

Session: TKA II

Time: 14:00 - 15:30

Room: Hall 2

Abstract no.: 34568

A BIMODAL APPROACH TO BLOOD MANAGEMENT DECREASES THE RISK OF TRANSFUSION AFTER TOTAL KNEE REPLACEMENT

Zachary POST¹, Fabio OROZCO¹, Victoria YOUNGER¹, Omkar BAXI², Alvin ONG¹

¹Thomas Jefferson University, Philadelphia (UNITED STATES), ²Temple University, Philadelphia (UNITED STATES)

Introduction: The risk of transfusion after total knee arthroplasty (TKA) is substantial. IV tranexamic acid (TEA) has been shown to decrease this risk. Our institution utilizes a blood conservation program (BCP) where erythropoietin, iron or dietary recommendations are used to further minimize the risk. We hypothesized that a combination of these approaches would synergistically decrease the risk of transfusion. **Methods:** We identified 449 consecutive TKA patients (479 knees) treated during 2012. 416 patients were treated with tranexamic acid. 171 patients participated in the BCP. Patients were stratified according to which interventions they received. Group 1 consisted of 158 patients who participated in BCP and received TEA. Group 2 had 13 patients that participated in BCP but did not get TEA. Group 3 was 258 patients that got TEA, but no BCP. Group 4 was 20 patients that had no BCP and no TEA. Transfusion rates were assessed for all groups. **Results:** There were a total of 21 transfusions (4.7%), 10 of which were in bilateral TKA patients (33.0%). The incidence of transfusion in group 1 was 1.3%, group 2 was 15.4%, group 3 was 5.4%, and group 4 was 15.0%. Bilateral patients who received TEA but not BCP had a transfusion rate of 36.8%. Bilateral patients who got TEA and BCP had a transfusion rate of 20%. **Discussion:** Overall the combination of BCP and TEA produced the lowest incidence of transfusion. We found a dramatic decrease in transfusion when TEA and BCP were combined, especially in patients undergoing bilateral TKA.

Date: 2013-10-18
Session: TKA III
Time: 16:30 - 18:00
Room: Hall 2

Abstract no.: 35804

IS COMPUTER-ASSISTED SURGERY WORTH USING IN REVISION TOTAL KNEE ARTHROPLASTY?

David LIONBERGER¹, Payal PANDIT TALATI²

¹Southwest Orthopedic Group, L.L.P, Houston (UNITED STATES),

²Foundation for Southwest Orthopedic Research, Houston (UNITED STATES)

INTRODUCTION: Approximately 14% of all primary total knee replacements (TKRs) will undergo revision surgery at some time in their use life. Twenty-five to 35% of these cases have been reportedly due to inaccuracies of alignment. Although computer assisted surgery (CAS) has proven to improve accuracy in primary TKRs, the merits of the same technology for revision TKRs are unknown. **METHODS:** This study was a prospective sequential review of the results of revision TKR using CAS for primary guidance without soft tissue balance software. Accuracy was the primary endpoint while secondary endpoints included operative time, complications, functional outcome, and estimated cost analysis. Patients were prospectively enrolled and intraoperative CAS measurements were obtained. These were then compared to a historical cohort of traditionally performed revision TKR patients without CAS. **RESULTS:** Stem preparation and blind reaming using real time guidance proved to be the most valuable aspect with no violations in the cortices when using CAS compared to the traditional instrumentation where cortical penetration was the result in two recorded cases in a the traditional cohort. Total operative time was significantly longer for the CAS group compared to the traditional by 29 minutes (SD 5.8). **CONCLUSIONS:** Navigation revision TKR appears to have a benefit in enhancing accuracy in individualized component placement. Secondary benefits included the use of blind reaming for accurate stem placement followed by compensatory tray bed preparation without jig placement navigation. This minimized complications associated with cortical penetration by inaccurate reaming angulation and lessened overall CAS time.

Date: 2013-10-18

Session: TKA III

Time: 16:30 - 18:00

Room: Hall 2

Abstract no.: 34106

**IN VIVO GAP ANALYSIS OF THREE DIFFERENT PATELLA POSITIONS
DURING NAVIGATION-ASSISTED TOTAL KNEE ARTHROPLASTY**

Jae-Hyuk YANG, Jung-Ro YOON, Woo-Seung LEE, Gi-Won CHOI

Department of Orthopedic Surgery, Veterans Health Service Medical Center,
Seoul, Korea, Seoul (SOUTH KOREA)

Purpose: Assessment of gaps during TKA are commonly performed in either patella everted or dislocated position. In this series, in vivo comparative gap measurements was performed in 3 different patella position(reduced,everted and dislocated) using offset-type-force-controlled-spreader-system. Methods: Prospectively, 50 knees were operated by TKA using a navigation-assisted gap balancing technique. The offset-type-force-controlled-spreader-system was used for gap measurements. This commercially-available instrument allows controllable tension in patella reduced position. The mediolateral gaps of patella reduced, everted and dislocated position in knee extension(0°) and flexion(90°) angle were recorded. Any gap differences of more than 3mm were considered significant. Correlation between the difference with the demographic data, preoperative radiologic alignment and intraoperative data was analyzed. For statistical analysis, ANOVA and Pearson correlation test was used. Results: All 50 cases were managed to have rectangular gap intraoperatively. In comparing 3 difference patella positions, there was no significant difference of mediolateral gaps in extension position(0°)($p>0.05$). In flexion(90°) position, there were 5(10%)cases of increased and 7(14%)cases of decreased gaps in patella everted position compared to the patella reduction gaps. In patella dislocated group, there were 13(26%)cases of increased gaps and 20(40%)cases of decreased gaps. Overall, the gaps in patellar dislocated position were less uniform. Correlation between the incidence of difference with demographic data, preoperative deformity and intraoperative obtained data was not found. Conclusion: Significant proportion(24% in patella everted group and 66% in patella dislocation group) demonstrated different gaps compared to the patella reduction position. Therefore, gap measurement in patella reduction position is important during TKA.

Date: 2013-10-18
Session: TKA III
Time: 16:30 - 18:00
Room: Hall 2

Abstract no.: 34667

SHORT- VERSUS LONG-DURATION TOURNIQUET USE DURING TOTAL KNEE REPLACEMENT (TKR) A RANDOMIZED CONTROLLED STUDY

Santoshkumar HAKKALAMANI¹, Nikhil PRADHAN², Vicky CLARKE²

¹Wirral University Teaching Hospitals, Wirral (UNITED KINGDOM),

²Warrington District General Hospital, Warrington (UNITED KINGDOM)

Background: Use of tourniquet in total knee replacement (TKR) is controversial, though it is commonly used to provide a bloodless field, to improve visualization and dry bone preparation. Tourniquet use is associated with pain, stiffness, soft tissue complications and increased thromboembolism. Early release of tourniquet has shown reduced the regional complications. We performed a prospective, randomized, controlled trial to know whether short duration tourniquet (only while cementing) has better pain relief and faster early rehabilitation compared to long duration tourniquet. **Methods:** Sixty patients undergoing TKR were randomized to a long duration tourniquet or short duration tourniquet group. Leg swelling and pain were measured post-operatively. The straight leg raise, time to achieve 90-degree flexion and length of hospital stay were measured to compare the rehabilitation progress between the groups. **Results:** Patients in the short duration tourniquet group had significantly less thigh swelling (3.7 ± 1.6 versus 4.8 ± 2.35 $p < 0.01$). They were also one day earlier in the straight leg raise; 90-degree flexion achieved and went home a day earlier. No difference in the pain experienced between the two groups. Soft tissue complication such as blisters and wound oozing were higher in long duration group. **Conclusion:** The use of short duration tourniquet gives the same advantages of dry field during cementation of the prosthesis and reduced the complications related to the tourniquet use. It also helps in early rehabilitation of patients. The short tourniquet provides both advantages of no tourniquet use and early release of tourniquet in TKR.

Date: 2013-10-18
Session: TKA III
Time: 16:30 - 18:00
Room: Hall 2

Abstract no.: 34116

ROLE OF TRANEXAMIC ACID IN REDUCING BLOOD LOSS IN TOTAL KNEE ARTHROPLASTY: A PROSPECTIVE, RANDOMIZED, DOUBLE-BLIND STUDY ON PERFECTLY MATCHED GROUPS

Rahul KHANNA

WELCARE HOSPITAL, BARODA (INDIA)

Introduction: The study analyses the efficacy of tranexamic Acid (TA) to reduce blood loss by comparing difference in hemoglobin (Hb %), hematocrit (HCT) value and the drain output. The perfectly matched groups were created by selecting patient's one limb as study and the other limb as control group. **Methods:** 60 patients undergoing primary sequential bilateral TKR at an interval of one day were enrolled. A dose of 10 mg/kg of body weight of TA or equivalent volume of normal saline (NS) was infused towards the end of surgery, 15 minutes prior to deflation of the tourniquet for either limb. The same dose was repeated after three hours of the primary dose. The two groups were compared for differences in post-operative 24 hrs blood losses. **Results:** Mean blood loss as calculated from drain collection was 210 +/- 99.10 ml, mean difference in Hb was 0.53 +/- 1.27 gm% and mean difference in HCT was 1.3 +/- 3.591% for the limb side receiving TA. For the limb side receiving NS the values for drain was 342 +/- 151.42, Hb difference was -0.95+/-1.02 gm% and HCT difference was -2.39 +/- 2.895%. Differences between the TA and the NS groups were significant on statistical analysis. **Conclusion:** The same patient's different limbs in study and control group eliminates patient related confounding factors and provides a more precise and controlled comparison. TA decreases blood loss up to 38.5% within 24 hrs of TKR. Routine use of TA as a therapeutic prophylactic measure is definitely recommended

Date: 2013-10-18

Session: TKA III

Time: 16:30 - 18:00

Room: Hall 2

Abstract no.: 33832

COMPARATIVE ANALYSIS OF CONTINUOUS INTRAARTICULAR INFUSION ANALGESIA VS EPIDURAL ANALGESIA FOR IMMEDIATE POSTOPERATIVE PAIN AFTER TOTAL KNEE REPLACEMENT.

Hrushikesh SARAF, Sarang KASTURE

Peridot Superspeciality Hospital, Pune (INDIA)

This study compared the efficacy and complications of intraarticular infusion and epidural analgesia in immediate postoperative period after unilateral primary total knee replacement surgery. 75 patients undergoing primary unilateral total knee replacement were randomized to receive either an epidural catheter (SE group) or intraarticular infusion (IA group) catheter for immediate postoperative analgesia and assessed for pain, complications and rehabilitation in the immediate postoperative period. There was no significant difference in the VAS scores in the first 48 hours postoperatively. Also the complication of hypotension, paraesthesia and abdominal distension was significantly more in SE group as compared to IA group. Similarly, time to stand with support was earlier in IA group as compared to SE group. This study suggests that intraarticular infusion has comparable analgesic efficacy when compared to epidural infusion in immediate postoperative period. Also, intraarticular infusion analgesia has less complications and aids in early mobilization after unilateral primary total knee replacement surgery when compared to epidural analgesia.

Date: 2013-10-18

Session: Trauma - Proximal Femur I

Time: 10:30 - 12:00

Room: Hall 3

Abstract no.: 33715

TREATMENT STRATEGY FOR FEMORAL NECK FRACTURES BASED ON FEMORAL HEAD PERfusion ESTIMATED BY USING DYNAMIC MRI POSITIVE ENHANCEMENT INTEGRAL COLOR MAPPING

Yoshinori TAKAHASHI, Akihiro NAGAMACHI, Masatoshi MORIMOTO, Hiroshi YONEZU, Keisuke ADACHI, Kazumasa INOUE, Toshihito TAKAGI, Toru ENDO, Mitoyo General Hospital, Kanonji, Kagawa (JAPAN)

Introduction: One of the most important factors that affects the outcome of osteosynthesis is femoral head perfusion after femoral neck fractures. We have preoperatively estimated the femoral head perfusion by using dynamic MRI positive enhancement integral color mapping (PEICM). The purpose of this study is to verify treatment strategy based on PEICM results in femoral neck fractures. **Methods:** One hundred seventy-two elder patients participated in this prospective study. All patients underwent PEICM with a 1.5-T MRI unit before surgery. The examination protocol included coronal fast spoiled gradient echo imaging of the femoral head after intravenous gadopentetate dimeglumine application. The integral signal intensity value of each pixel was displayed as color mapping. High flow was displayed as red and no flow was displayed as black. The color mapping was classified into three types according to the shade of the color. For type A, the color is as same as unaffected side. For type B, the color is darker than unaffected side. For type C, the color is black. Patients of type A and B underwent osteosynthesis with three cannulated screws. Patients of type C underwent primary hemiarthroplasty. Union rate of each type was calculated. **Results:** Twenty-six patients were classified into type A and 74 patients were classified into type B. The union rates of type A and B were 81% and 59%, respectively. **Conclusion:** Indication of osteosynthesis in femoral neck fracture is limited because the low union rate of type B. Osteosynthesis should be indicated for type A patient.

Date: 2013-10-18

Session: Trauma - Proximal Femur I

Time: 10:30 - 12:00

Room: Hall 3

Abstract no.: 33879

**COMPARATIVE STUDY OF MULTIPLE CANCELLOUS SCREWS
VERSUS SLIDING HIP SCREWS IN FRACTURES NECK OF FEMUR IN
ADULTS AGED 16-60 YEARS**

Mayank GUPTA, Rajendra ARYA

pgimer dr rml hospital, delhi (INDIA)

Introduction: Fracture neck femur is the ‘unsolved fracture’. The optimal approach for internal fixation has been confusing yet. Fixation with both cannulated cancellous screws (CCS) and sliding hip screw (SHS) has achieved good results, which method is superior is yet to be determined. Very few studies are available in literature comparing these two methods.

Methods: We conducted a prospective randomized trial for one year, including 45 subjects (aged 16-60 years) with fracture neck femur and evaluated early mid-term results of internal fixation with either SHS (Group 1, n=20) or CCS (Group 2, n=25). At 6 weeks, 3 months, 6 months and 1 year after operation pain relief & functional recovery was assessed using the Harris Hip Score (HHS) and union using plain radiographs. **Results:** Mean HHS at 1 year was 82.8 and 81.5 in SHS and CCS groups respectively. Radiological union was achieved at mean of 7.6 months in Group 1 and 7.1 months in Group 2. Nonunion rate was 15% in SHS, and 20.83% in CCS group ($p>0.05$). With SHS all subcapital fractures united but with CCS 57.14% showed nonunion. Transcervical fractures union rate was 76.9% with SHS and 93.33% with CCS ($p>0.05$). 100% union was achieved in both groups for basicervical as well as for undisplaced fractures (Garden 1 and 2). Nonunion rate for displaced fractures (Garden 3 and 4) was 15.79% in Group 1 and 31.25% in Group 2 ($p>0.05$). **Conclusion:** No statistical difference between the two implants in nonunion rates, time for union and functional outcome.

Date: 2013-10-18

Session: Trauma - Proximal Femur I

Time: 10:30 - 12:00

Room: Hall 3

Abstract no.: 35696

ROLE OF PROXIMAL FEMORAL NAILING IN INTRACAPSULAR FRACTURE NECK OF FEMUR

Chandra Prakash PAL

s.n.medical college agra, agra (INDIA)

Abstract- Fracture neck of femur have always presented great challenges to orthopaedic surgeons and remain unsolved fracture as far as treatment and results are concerned. Our study was done to evaluate role of proximal femoral nailing in intracapsular fracture neck of femur; to assess the effect of early weight bearing after stabilization with proximal femoral nailing and to asses complications in fracture neck of femur treated with proximal femoral nailing. 23 young adults (below 65 year) with average age 42 years with 24 fracture neck of femur (one patient had bilateral fracture) were operated with proximal femoral nailing. In pure fracture neck of femur we used short proximal femoral nail while in fracture with associated subtrochantric fracture or ipsilateral shaft femur fracture we used long proximal femoral nail. Union was achieved in total eight cases only rest of cases did not united. Out of 16 cases of pure transcervical type only 2 cases united, all 3 basal type fracture were united, and 3 all fractures with associated subtrochantric/shaft fractures were united well. On Larsen's method of functional assessment 5 cases (27.24%) showed good score (91-100), 2 cases fair score(71-90) and 14 cases showed poor score(<70). complications included superficial infection implant failure in one case each , in 4 cases cut through , 14 cases nonunion. Proximal femoral nailing is useful in fracture neck of femur with associated ipsilateralsubtrochantric/ shaft of femur fracture ,basal type neck fracture. Proximal femoral nailing must be avoided in pure transcervical fracture neck of femur.

Date: 2013-10-18

Session: Trauma - Proximal Femur I

Time: 10:30 - 12:00

Room: Hall 3

Abstract no.: 35483

**ADVANTAGE OF USING A CEMENTLESS REVISION STEM AND
TRANSTROCHANTERIC APPROACH IN THE TREATMENT OF
UNSTABLE PROXIMAL FEMUR FRACTURES**

François STEFFANN, Jean Louis PRUDHON

Clinique des Cèdres, Echirolles (FRANCE)

Introduction During the 2010 SOFCOT meeting, the French Hip and Knee Society proposed use of a total hip arthroplasty as an acceptable alternative treatment for selected proximal femoral fractures. Materials and Methods For more than 10 years, we have been implanting an appropriate stem for treating unstable intertrochanteric fractures in a high risk population . The revision stem was chosen based on the need to achieve primary stability, and mid term fixation due to the hydroxyapatite coating. A straight, cylindrical, locking stem is used in combination with a dual-mobility cup. Fixation of the greater trochanter is performed with stainless steel wires. Results Short-term functional results can be assessed through pain relief and return to early deambulation. No fracture or subsidence were observed. Only one case of recurrent dislocation occurred in the serie. Blood transfusion was required in 30% cases . The six month survival rate was 83%.Discussion Transtrochanteric approach and secure bone fixation protect the abductor mechanism, and avoid dislocation risk . The “finger” approach does not induce further damage to the joint and helps to keep the femur and acetabulum in a neutral position during the procedure. Conclusion Implantation of a long, cementless, locking stem using the transtrochanteric approach appears to be a reliable treatment option for selected unstable proximal femoral fractures. This procedure requires precise planning and meticulous surgical technique .

Date: 2013-10-18

Session: Trauma - Proximal Femur I

Time: 10:30 - 12:00

Room: Hall 3

Abstract no.: 35450

AUGMENTATION OF PROXIMAL FEMORAL FIXATION NAIL IN TROCHANTERIC FRACTURES - STUDY ON BIOMECHANICAL FORCES

Vijayanand LOKHANDE, Wasudeo GADEGONE

CHANDRAPUR MULTISPECIALTY HOSPITAL, CHANDRAPUR (INDIA)

Biomechanically PFN is better choice of implant for fixation of proximal femoral fractures. It has less morbidity, provides more stability proximally as well as distally and is a load sharing device. Nail itself gives support as lateral trochanteric wall and itself resist collapse. Less intraop bleed, less operative time less intraop muscle damage, immediate postop mobilization are key points that supports superiority of PFN over DHS. Purpose of this study is to evaluate biomechanical factors working around hip which leads to implant failure. Knowledge of these biomechanical forces may helps in some modification in implant design .To avoid damage or to strengthen protecting forces working on implant augmentation of pfn by additional screw from trochanter to inferior quadrant of femoral head is needed. This is a prospective of 31 cases with proximal femoral fractures[# IT & S/T included] fixed with PFN from june 2010 to dec 2012 with good anatomical and functional outcome. There is strong correlation in fracture type and type of implant failure. Sub/T # are more associated with nail breakage and IT # are more associated with screw breakage and cut thru of screw through head and neck part. Unstable type # had more incidence of implant failure. It has also been observed that supportive family members, educated & cooperative nature of patient, and good rehabilitation protocol also reduces chances of implant failure. We suggest additional screw and small sized pfn for fixation of trochanteric fracture in Indian population.

Date: 2013-10-18

Session: Trauma - Proximal Femur I

Time: 10:30 - 12:00

Room: Hall 3

Abstract no.: 35449

PFN IN THE MANAGEMENT OF REVERSE TROCHANTERIC FRACTURES-A PANACEA?

Yogesh SALPHALE

CHANDRAPUR MULTISPECIALTY HOSPITAL, CHANDRAPUR (INDIA)

Abstract PURPOSE: To investigate the results of treatment of unstable reverse oblique intertrochanteric fractures[A3] with proximal femoral nail (PFN). **MATERIALS AND METHODS:** We reviewed the results of 46 cases of AO 31-A3. intertrochanteric fracture treated with PFN from September 2004 to February 20011 which could be followed up for more than1yr months and untill bone union. The mean age was 60.2 years old. All the fractures are treated with standard PFN. Additional Use Of Circlase Wire And Poller Screws Were Used In 11 Cases. We investigated the union time and amount of sliding of two screws (neck screw and anti-rotational hip pin) and complications such as fixation failure and nonunion. Functional results were evaluated by the Parker and Palmer mobility score and Jensen social-function score. **RESULTS:** 44 fractures were united and the mean union time were 6.9 months. Fixation failure and excessive migration of the screws occurred in two cases which required revision surgery; In one case Z effect early removal of screw was required but fracture united in varus., There was one femoral shaft fracture at the nail tip successfully revised with Long PFN..33 cases and 38 cases were fully recovered according to Parker and Palmer score. **CONCLUSION** PFN demonstrated better results biomechanically in terms of less sliding of lag screw, less change of neck-shaft angle, and less complications for the treatment of reverse obliquity intertrochanteric fractures.We consider that PFN is a suitable implant for treatment of unstable reverse oblique intertrochanteric fractures.

Date: 2013-10-18

Session: Trauma - Proximal Femur I

Time: 10:30 - 12:00

Room: Hall 3

Abstract no.: 35392

UNSTABLE PROXIMAL FEMORAL FRACTURES BY PF- LCP

Manoj MITTAL

Mittal nursing home, Aligarh (INDIA)

For stable trochanteric fractures DHS is the Gold standard but for unstable inter or sub trochanteric fractures with extension in to piriformis fossa, or reverse oblique ie AO 31-A3 are challenging injuries to treat in elderly osteoporotic bones. Most investigators include all types of fractures so it was not possible to find out the best method of fixation. Aim of this study was to determine the effect of fixation technique on the outcome. 28 patients were treated from 2008 to 2010 of 31-A3 . 13 were males and 15 females with average age of 68 years (55 – 87 years) all patients were treated by PF- LCP . DHS and PFN have greater complications rate 3-17% in terms of implant failure and non union in 31-A3 fractures, while condylar blade plate is a good option, but this technique gives very little chance of surgical error. PF-LCP offer great degree of adjustment and fulfils the role of fixed angle device. It can achieve greater degree of variability sought with the DCP while avoiding the need of excessive bone removal from head. It also provide higher axial stiffness and less torsional stiffness. Operation time was 40 -90 minutes. Fracture healing time 10-12wksExcellent results was in 22 patients and poor in 4 patientsPF-LCP is an innovative and viable option for unstable complex trochanteric fractures

Date: 2013-10-18

Session: Trauma - Proximal Femur I

Time: 10:30 - 12:00

Room: Hall 3

Abstract no.: 34880

**OUTCOME OF PROXIMAL FEMORAL NAIL ANTIROTATION™ (PFNA)
IN THE MANAGEMENT OF PROXIMAL FEMORAL (HIP) FRACTURES.
EXPERIENCE FROM A BUSY DISTRICT GENERAL HOSPITAL.**

Karadi SUNIL KUMAR, Eoin TWOHIG, Sabina BARBUR, Harvey SANDHU
Royal United Hospital, Bath (UNITED KINGDOM)

Introduction: The incidence of proximal femur fractures has been on the rise recently. Subtrochanteric fractures or comminuted inter/petrochanteric fractures present a difficult problem to an orthopaedic surgeon to stabilise the fracture and promote healing. Proximal Femoral Nail Antirotation (PFNA) from AO/Synthes has been in use for a few years and is known to provide good results. The aim of this project was to assess the outcome of PFNA in the treatment of hip fractures. **Methods:** Between November 2009 to November 2012 76 patients underwent PFNA for subtrochanteric or comminuted intertrochanteric fractures. These patients were identified from the local hip fracture database which is prospectively collected. The patients notes were reviewed. **Results:** The mean age of the patients was 80.11 years (range of 26.83 to 98.53). 27 were male and 49 female. Right hip was involved in 36 cases and left hip in 40. 9 patients required revision surgery due to failure of the primary surgery. 2 patients died due to other causes. 5 out of the 9 patient who underwent revision surgery had their primary surgery performed by a trainee under consultant supervision. The other 4 were performed by a consultant surgeon. There was a 11.8% failure of the PFNA in our series. 55% of these surgeries were performed by a trainee under consultant supervision. **Conclusion:** We conclude that PFNA is an excellent device to fix subtrochanteric or comminuted intertrochanteric fractures of the proximal femur but one needs to be cautious and follow the correct operative technique to avoid failures.

Date: 2013-10-18

Session: Trauma - Proximal Femur I

Time: 10:30 - 12:00

Room: Hall 3

Abstract no.: 34686

**SINGLE STAGE TWO PRONG SURGERY FOR DELAYED
INTRACAPSULAR FRACTURE NECK OF THE FEMUR IN YOUNG
PATIENTS**

Arindam BANERJEE, Rajiv CHATTERJEE

Westbank Hospital, Kolkata (INDIA)

Delayed presentation of Intracapsular fracture neck of the femur in a young patient is not an uncommon condition. Results of current treatment options are inconsistent and the outcome unsatisfactory. Fixation with multiple AO screws usually frequently results either in a painful AVN or non union requiring further surgery. Since 2003 we have been performing a single stage two prong surgery on these patients (age 18-40, all male). The patient is put on a fracture table and under C-arm guidance the intracapular fracture reduced by closed manipulation. Two or three AO screws with washers are used to achieve stable fixation. The patient is then taken off the table and put on a normal table in the three quarter prone position making sure that strict asepsis is observed. The incision is then converted into a classical posterior approach to the hip. A muscle pedicle graft is then chiseled from the quadrates femoris insertion. The posterior capsule of the hip joint is then opened up and the tamponade released. The muscle pedicle is then buried underneath and secured with a stay suture. The patient is immobilized with a derotation shoe for six weeks. All ten patients who were operated on made a full uneventful recovery. They have achieved fracture union and returned to normal painless activity with a full range of hip movement. However stage I and II AVN are present radiologically without any associated collapse. We think this is a promising procedure and long term studies of our patients are awaited.

Date: 2013-10-18

Session: Trauma - Proximal Femur I

Time: 10:30 - 12:00

Room: Hall 3

Abstract no.: 33728

COMPARISON BETWEEN EXTERNAL FIXATION AND DYNAMIC HIP SCREW IN THE MANAGEMENT OF STABLE TROCHANTERIC FRACTURES.

Mohamed Altayeb MUSSA¹, Adel Refaat AHMED², Mostafa Elsayed EL-HEFNAWEY², Mohamed Adel WANAS²

¹Hull Royal Infirmary, Hull (UNITED KINGDOM), ²Alexandria University Hospital, Alexandria (EGYPT)

Introduction: Dynamic hip screw is widely considered as 'gold standard' in management of trochanteric fractures, despite substantial rates of fixation failure and associated morbidity. Recently, there has been increasing interest in external fixation as an alternative modality. We conducted a prospective randomized comparative study between external fixation and DHS and report our results. **Methods:** 60 patients with intertrochanteric fractures admitted to our trauma centre were randomized to be treated with DHS or newly developed external fixator AlexFix®. Only stable fractures were included owing to relatively poor outcomes of DHS in unstable fractures. Patients were followed up for an average of 12 months. **Results:** Results were evaluated using Foster Rating system giving 80% excellent anatomical and 56.7% excellent functional results in fixator group, while in DHS group there was 90% and 43.3% excellent anatomical and functional respectively. None of fixator group required blood transfusion, compared to 76.7% in DHS. Operative time and intra-operative radiation were significantly lower in fixator group. Superficial wound infection was present in 60% of fixator group and only in 20% of the DHS group. These were controlled with antibiotics with no implant failure. Spinal anaesthesia was used in 96.7% of DHS group whereas local anaesthesia was used in 76.7% of the fixator group. **Conclusion:** Although there was not a significant difference in final functional outcomes between two treatment modalities, we proved with great certainty the superiority of external fixation. It offers a simple technique with shorter hospital stay, shorter operative time with low morbidity and mortality.

Date: 2013-10-18

Session: Trauma - Proximal Femur I

Time: 10:30 - 12:00

Room: Hall 3

Abstract no.: 35077

**USE OF SMP (SANCHETI MODULAR PROSTHESIS) IN DISPLACED
TRANSCERVICAL NECK FEMORAL FRACTURES IN LOW DEMAND
ELDERLY PATIENTS**

Parag SANCHETI

Sancheti Institute for Orthopaedics and Rehabilitation, Pune (INDIA)

Introduction: Fracture neck of femur is fracture of necessity requiring surgical management. Treatment varies from internal fixation with or without osteotomy, hemiarthroplasty and total hip replacement. Hemiarthroplasty is preferred in older population; however literature is unclear on use of bipolar vs. unipolar prosthesis. We here present our series of patients treated with unipolar Sancheti Modular prosthesis (SMP) with minimum 2 years follow-up.

Materials and method: retrospective analysis of consecutive cases between Feb 2006 to Dec 2009 done. We included 81 patients with Garden type 3 and 4 fractures operated with partial hip replacement with SMP prosthesis. Patients were followed at 6 week, 3 month, 6 month, 1 year interval and at yearly interval. **Results:** Full weight bearing started within 2.98 days. Average length of hospital stay was 12.48 days [6-45]. Average Harris hip score [HHS] was 88.65 at 2 year. Subgroup analysis concluded that age, gender, fracture class did not significantly affect outcome in these low demand cases. Final functional outcome was graded according to Harris hip score into poor <70[n=2], fair 70-80[n=5], good 80-90[n=46], excellent 90-100[n=28]. There were 10 complications -2 periprosthetic fractures, 3 posterior dislocations, 1 sciatic nerve palsy, one femoral stem subsidence, one intestinal obstruction, one pneumonia, one superficial wound infection. Most patients had good functional outcome and were able to achieve their preinjury activity status. **Conclusion:** Use of SMP prosthesis in transcervical neck femur fractures in low demand elderly is associated with favorable functional outcome in terms of pain relief, improved range of motion, improved quality of life.

Date: 2013-10-18

Session: Trauma - Proximal Femur II

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 34938

COMPUTED TOMOGRAPHIC EVALUATION OF PROXIMAL FEMUR: A PREDICTIVE CLASSIFICATION IN DISPLACED FEMORAL NECK FRACTURE MANAGEMENT

Amit BATRA, Narender MAGU

PGIMS, Rohtak (INDIA)

Introduction: The study aims to define the term " small head or inadequate size femoral head" objectively for its prognostic significance. Material and methods : 70 cases of displaced femoral neck fractures underwent CT scan preoperatively for proximal femoral geometric measurements of both hips. DEXA scan was done in all. Patients were treated with either of intertrochanteric osteotomy or lag screw osteosynthesis based on size of head fragment on plain radiographs. Results :Average femoral head fragment volume was 57cu cm (range, 28.3 to 84.91 cu cm; SD 14 cu cm. Proximal fragment volume of > 43 cu cm was termed adequate size (type I) and of < 43 cu cm as small femoral head (type II). Fractures which united (i.e. 54 cases) had a relatively large average head size (59 cu cm) as compared to fractures that did not (i.e. 16 cases), which had a small average head size (49 cu cm) and this difference was statistically significant. In type I fractures union rate was comparable in both osteotomy and lag screw groups (p value >0.05). Lag screw fixation failed invariably while osteotomy showed good results in type II fractures (p value <0.05). Conclusion: CT scan of proximal femur is advisable for measuring true size of head fragment. An objective classification based on femoral head size, type I and type II is proposed. Osteosynthesis should be the preferred method of treatment in type I; and osteotomy or prosthetic replacement be the method of choice for type-II femoral neck fractures.

Date: 2013-10-18

Session: Trauma - Proximal Femur II

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 35788

INTERNAL FIXATION OF UNDISPLACED INTRA CAPSULAR HIP FRACTURE; WHAT IS THE RIGHT CHOICE OF IMPLANT?

Sandeshkumar LAKKOL, Chris BUCKLE, Cripps HELEN, Godavitarne CHARLES, Boddu KRISHNA, Patrick LI

Kings College Hospital, London (UNITED KINGDOM)

Background: The aim of this retrospective study was to evaluate the failure rate among different fixation devices for undisplaced fracture neck of femur and to identify the risk factors for failure. **Method:** All 52 patients with Garden I and II hip fractures who underwent internal fixation in a tertiary level teaching hospital in London from January 2007 to June 2012 were included. Electronic patient records were accessed to collect the data. **Results:** There were 52% females with mean age of 70 years. Thirty patients had cannulated screws, 18 patients received dynamic hip screw (DHS) with de-rotation screw and 4 had DHS alone. Initial results showed that 36% patients had re-operation. 7(77.78 %)had total hip replacement and 1(11.11%) had metal work removal. The reason for revision was failure of fixation in 8 (88.89%) and avascular necrosis in 1 (11.11%). There was significantly higher failure rate in the DHS with derotation screw group (50%) compared to the cannulated screw group (35%) and the DHS alone group (0%). Tip apex distance and the degree of deviation from parallel screw position affected the failure rate. **Discussion:** Biomechanically DHS with de-rotation screw achieves better rotational and axial stability compared to other fixation devices. However, our study showed a higher failure rate in this group. Inability to achieve a perfectly parallel screw position seems to be a significant factor responsible for high failure. Moreover, higher failure rates with fixation may boost the role of replacement arthroplasty as one off surgical treatment in elderly patients.

Date: 2013-10-18

Session: Trauma - Proximal Femur II

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 33836

COMPARISON OF OSTEOSYNTHESIS OF INTRACAPSULAR FEMORAL NECK FRACTURES BY DYNAMIC HIP SCREW (DHS) FIXATION AND MULTIPLE CANNULATED SCREWS

Dariush SAVADKOOHI, Babak SIAVASHI

tehran university of medical sciences, tehran (IRAN)

PURPOSE OF THE STUDY: The aim of this randomized clinical trial study was to evaluate patients treated by osteo-synthesis for intra-capsular femoral neck fractures with Dynamic Hip Screw and Multiple cannulated screws .**MATERIAL and Methods:**From 2006-2011 , 114 patients with femoral neck fractures were operated. 64 by dynamic hip screw and 50 patients with multiple cannulated screws.The average follow-up was 3.5 years. Evaluation regard to the occurrence of late complications in relation to the length of time between injury and surgery, quality of fracture reduction, reduction failure and implant failure and nonunion of neck of femur and reoperation .**RESULTS:** In DHS group, Bone union without complications was achieved in 73.4 % of the patients within 12 months of surgery. Late complications were found in 26%.In the screw group, fixation failure were seen in 40% and late complications were seen in 52%. The difference between two groups seems to be statistically important.**DISCUSSION:** The quality of reduction had a greater effect on union than comparing with femoral head necrosis. The DHS is economic and available, with sufficient results whose comparisons with the literature data show that results are good . In overall , results of screw fixation is lower than DHS fixation.

Date: 2013-10-18

Session: Trauma - Proximal Femur II

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 35732

TREATMENT OF COMMUNITED TROCHANTERIC FRACTURE WITH PROXIMAL FEMORAL LOCKING COMPRESSION PLATE

Dayanand MANJUNATH, Deepak SHIVANNA

bangalore medical college and research institute, bangalore (INDIA)

Introduction: The trochanteric femur fracture are relatively common injuries in elderly. Osteoporosis and severe comminution makes fixation difficult with conventional methods and common complications are varus malunion, implant failure and shortening. **Materials:** This is a prospective study of 40 cases of intertrochanteric and subtrochanteric fracture from 2009 and 2011 treated with proximal femoral locking compression plate(pflp). Patients were followed up at 1mth,2mth, 3 mth, 6mth, 1yr and 2 yr, results were based on Harris Hip Score and radiological union. **Results:** In our study of 40 cases, cases 23 cases were intertrochanteric fracture and remaining 17 cases were subtrochanteric fracture with the mean age was 51.47 years. The average follow up was 18 months [11 to 24 months]. according To Harris hip score 48% patients were excellent , 38% patients were good , 10% patients were poor results, and 1 patient died. all showed union within 20 weeks with only one case in varus malunion, 1 case with superficial infection and 1 case of plate backing out. **Conclusion:** In conclusion the potentiality of the proximal femoral locking compression plate(pflp) in varied indications, shows its versatility. Although not free of complications our study has demonstrated excellent results. The procedure offers , faster mobilization, rapid return to activities of daily living, improves the quality of life and gave a long term solution in patients with extracapsular fracture neck of femur. Larger studies with longer follow up will further validate the procedure.

Date: 2013-10-18

Session: Trauma - Proximal Femur II

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 35678

**MANAGEMENT OF UNSTABLE INTERTROCHANTERIC FRACTURES
TREATED WITH SHORT PROXIMAL FEMORAL NAIL IN ASIANS**

Ahmed Rayan JELANI, Vishwas MUNDEWADI, Mohammed Ismail

HATHIWALE

AI Ameen Medical College, bijapur (INDIA)

INTRODUCTION: To clinically and radiologically assess the effectiveness and drawbacks of Short Proximal Femoral Nail in the management of unstable intertrochanteric fractures.

METHODS: This prospective study was conducted during July 2010 to June 2012 in AI-Ameen medical college, Bijapur. 35 patients (26 males and 9 females) aged 41 to 80 (mean 65.9) years with unstable intertrochanteric fracture (31 had type IV and 4 had type III fractures according to Boyd & Griffin classification) were operated with the Short PFN. All patients were followed up for a minimum period of 6 months and evaluated radiologically and clinically by Kyle's criteria. **RESULTS:** Anatomical reduction was achieved in 25 patients. 21 patients (60%) had no complications. Postoperative complications included, one case of Avascular necrosis and screw cut out, one case of delayed union, one case of Z effect and four cases of varus malunion, and three cases with lateral thigh discomfort. 25 patients had no shortening. The average shortening was 0.34 cm. The average time of union was 19.26 (range 15 to 30) weeks in 34 cases. At end of 6 months, Good to excellent results were seen in 71.5 % of the cases. 57% patients had returned to their pre injury functional level. **CONCLUSION:** Short Proximal Femoral Nail provides good fixation for unstable intertrochanteric fractures, if proper preoperative planning, good reduction and surgical technique are followed, leading to high rate of bone union and minimal soft tissue damage especially for asian patients with relatively small femora.

Date: 2013-10-18

Session: Trauma - Proximal Femur II

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 35635

PROXIMAL FEMORAL LOCKING PLATE V/S 135° DYNAMIC HIP SCREW SYSTEM IN THE TREATMENT OF UNSTABLE INTERTROCHANTERIC FRACTURE FEMUR

Anoop DHAMANGAONKAR, Arvind GOREGAONKAR, Deepak JOSHI,
Akhil TAWARI

LTMCC and LTMGH, Mumbai (INDIA)

The common complications with DHS in unstable IT fractures are shortening, medialization of distal fragment, implant cutouts, uncontrolled lateralization of proximal fragment and varus collapse due to broken lateral wall and posteromedial void. We have used a new implant in this study called the Proximal Femoral Locking Plate (PFLP) to address them. 44 patients with unstable intertrochanteric fractures were included in this prospective study. They were randomized into two treatment groups - group one; treated with the new proximal femoral locking plate and group two; treated with the conventional 135° DHS. The mean time to union was 14.63 weeks among Locking plate group which was less as compared to 16.53 weeks among DHS group. The mean shortening at union was 0.30cm among Locking plate group as compared to 1.4 cm among DHS group. No patient among locking plate group showed medialisation of shaft which was statistically significant than 25.0% of cases among DHS group who did show medialisation. The varus collapse was observed among 10.0% cases in Locking Plate group which was less than 25.0% cases among DHS group. 90% of the total cases in the locking plate group had Excellent to Good functional hip score which was more as compared to 55% of cases among DHS. Thus, using an implant with the trochanteric flange, decreases lateralization of greater trochanter and medialisation of shaft thereby improving the abductor lever arm. A non-collapsing locking implant helps to attain predictable outcome at union with lesser chances of shortening or varus collapse.

Date: 2013-10-18

Session: Trauma - Proximal Femur II

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 34176

**EVALUATION OF OPERATIVE TREATMENT OF
INTERTROCHANTERIC FRACTURE OF FEMUR: A COMPARATIVE
STUDY**

Chintan HEGDE¹, Riyaz NN², Vijay SHETTY¹

¹Dr. L H Hiranandani Hospital, Mumbai (INDIA), ²Pariyaram Medical College, Kannur (INDIA)

The goal of treatment of an intertrochanteric fracture is restoration of the patient to his or her pre-injury status as early as possible which led to internal fixation of these fractures. The greatest problems for surgeons are unstable fractures, unstable patients and complications of fixation that result from instability. Recently, metallurgy and implants have evolved to improve the functional outcome. The purpose of our present study is to identify the choice of internal fixation of the existing device and evaluate the outcome of operative treatment of intertrochanteric fracture of femur with the cephalomedullary nail (CMN) and dynamic hip screw device (DHS). We conducted a prospective comparative study of 64 patients with intertrochanteric fractures of femur treated with DHS and CMN, of which 35 were treated with DHS and 29 with CMN. The length of the incision, duration of surgery, fluoroscopy time, duration of hospital stay, fracture union and complications were the variables recorded. After analysis, in CMN group among 15 stable fractures, 80% had good to excellent results, in DHS group among 16 stable fractures, 87.5% had good to excellent results, in CMN group among 10 unstable fractures, 80% had good to excellent results and in DHS group among 9 unstable fractures, 33% had good to excellent results. We conclude that in stable intertrochanteric fractures, both the CMN and DHS have similar outcome but for unstable intertrochanteric fractures, CMN have shown better functional outcome when compared to DHS.

Date: 2013-10-18

Session: Trauma - Proximal Femur II

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 35877

COMPARATIVE STUDY IN THE MANAGEMENT OF SINSHEIMER TYPE IIB AND TYPE IIIA SUBTROCHANTERIC FRACTURE WITH PROXIMAL FEMORAL NAIL (PFN) VERSUS LOCKING COMPRESSION PLATE –PROXIMAL FEMUR (LCP-PF).

Vigneshwaran PRAGADEESWARAN, Mohsin SYED, Basavaraju GANIGER
jjm medical college, davangere (INDIA)

Introduction: Subtrochanteric fractures are devastating injuries that most commonly affect the elderly population. Conservative methods of treatment results in malunion with shortening and limitation of hip movements as well as complications of prolonged immobilization like bed sores, DVT and hypostatic pneumonia. Hence the treatments of these fractures are challenging and the goal is to achieve anatomic reduction with stable fracture fixation to allow early functional rehabilitation. Comparison study was done for these fractures with proximal femoral nailing with locking compression plate for proximal femur. **Material and Methods:** A prospective comparative study was done in the period of 2 years of 20 cases of subtrochanteric fractures each treated with PFN and LCP-PF randomly, for patient above 50 years. Patient with pathological fracture, type II and type III open fractures, active malignant, medically unfit for surgery were excluded from the study. **Results:** In this study, 20 cases underwent PFN out of which 11 were Sinsheimer type IIIA and 9 were type IIB with outcome being Good to excellent results in 88% of subtrochanteric fractures. Out of other 20 cases treated with LCP-PF, 12 were Sinsheimer type IIIA and 8 were type IIB fracture with outcome being 60% good results, according to modified harris hip score, with most common complications being implant cut through and implant failure. **Conclusion:** From the above study it was concluded that Proximal Femoral Nail for subtrochanteric fractures had better results compared to PF-LCP with less failure rates and restoring better hip biomechanics .

Date: 2013-10-18

Session: Trauma - Proximal Femur II

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 35478

PROXIMAL FEMUR LOCKING COMPRESSION PLATE: A VIABLE OPTION FOR COMPLEX PROXIMAL FEMUR FRACTURES

Dinesh KALE¹, Nikhil KHADABADI¹, Babu PUTTI², Ravi JATTI³, Siddharth BAHETI¹

¹Jawahar Lal Nehru Medical College , KLE University, Belgaum (INDIA),

²JNMC Belgaum , KLE University, belgaum (INDIA), ³JNMC Belgaum, KLE University, belgaum (INDIA)

Background: Stable and unstable trochanteric fractures have traditionally been treated successfully with conventional implants, such as sliding hip screws, cephalomedullary nails, trochanteric stabilizing plates and angular blade plates, and rarely by a primary hip arthroplasty. However, comminuted and unstable inter- or subtrochanteric fractures, fractures with extension into the piriformis fossa, fractures with a comminuted Greater trochanter and combined intracapsular and extracapsular fractures are challenging injuries that are prone to complications ranging from 3-17%. Locking compression plates have been used widely and successfully in a variety of anatomic regions. We thereby decided to study the results of fractures treated with PF-LCP. **Materials and methods:** From March 2009 to June 2011, 18 patients with unstable proximal femur fractures were included in the study with 8 males and 10 females. 8 patients had a simple fall, while 10 had met with a RTA. Five patients had additional fractures elsewhere while two had fracture in ipsilateral shaft of femur, one patient had a type II open injury. Functional assessment was done with the Harris Hip Score. **Results:** 4 patients (22.2%) had an Excellent result while 8 patients had good results 3 had poor results while 3 fared poorly. No evidence of complications like screw cut-out, screw breakage or other implant failure. **Conclusion:** The PF-LCP represents a feasible alternative for the treatment of unstable inter- and subtrochanteric fractures.

Date: 2013-10-18

Session: Trauma - Proximal Femur II

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 35445

VALGUS OSTEOTOMY COMBINED WITH FIBULAR GRAFT IN NEGLECTED FRACTURE NECK FEMUR

Vijayanand LOKHANDE, Wasudeo GADEGONE

CHANDRAPUR MULTISPECIALTY HOSPITAL, CHANDRAPUR (INDIA)

A prospective study of neglected femoral neck fracture in mostly young patients was conducted to evaluate whether our technique of valgus intertrochanteric osteotomy with fibular strut grafting and osteosynthesis with dynamic hip screw and double angle side plate can facilitate union with consistent satisfactory clinical outcomes. Forty one consecutive patients (27 males, 14 females) of neglected femoral neck fractures treated between April 2002 and December 2009 were studied. The average age of patients was 45.41 years (\pm 11.67, range 20 - 62 years). The average interval since injury was 14 weeks (\pm 10.21, range 4 – 44 weeks). The cases were evaluated radiographically and clinically. Average follow up period was 32.5 months (\pm 8, range 24 – 54 months). Radiographically union was seen in 39 patients at the non union site. The average time to radiographic union was 16.82 weeks (\pm 3 weeks, range 12 to 24 weeks). Average HHS was 19.9 (\pm 7.9, range 10 – 35) preoperatively and 90.9 (\pm 10.35, range 62 – 100) at the latest followup. At latest followup clinical outcomes were excellent in 31, good in 4, fair in 3 and poor in 3 patients. Our mechano-biological surgical technique is reproducible with radiographically union achieved in 95.12% cases (39 patients) at the non union site and consistent excellent or good functional outcome in 85% of patients over 32 month average followup. We recommend this procedure for neglected femoral neck fractures.

Date: 2013-10-18

Session: Trauma - Proximal Femur II

Time: 14:00 - 15:30

Room: Hall 3

Abstract no.: 33812

NAILING WITH STEM LENGTHENING IN PERIPROSTHETIC FEMORAL SHAFT FRACTURES

Alexander CHELNOKOV¹, Igor PIVEN¹, Alexey SEMENISTY²

¹Ural Scientific Research Institute of Traumatology and Orthopaedics,
Ekaterinburg (RUSSIA), ²Hospital N13, Moscow (RUSSIA)

Aim of our study was to design a technique of less invasive fixation in periprosthetic fractures of the femoral shaft to provide primary stability of the stem and the femur. Material and methods. We designed and used a modification of an industrial solid titanium femoral locked nail. Its design provides tight fit of the distal part of the femoral stem. 30 patients were treated in 2007-2013 with the technique, 5 of them with nonunions after other treatment modalities. There were 25/30 Vancouver B and 5/30 Vancouver C. The nails were individually custom-made to fit the particular stem design and size. Results. Immediate weight-bearing as tolerated was recommended in most cases. Unassisted walking occurred at 2 month in 18/30 patients, and at 3 month in 26/30. 22/30 patients were available for follow-up in 1 year - all fractures healed. Major complications (3/30) include one case of deep infection resulted with two stage revision to a standard uncemented stem 1,5 year after the surgery, and two cases of stem breakage at the level of junction. Conclusion. Since 1998 few publications appeared presenting similar approach with good results in series of 1-25 cases. We conclude that the technique can be an effective solution in problematic cases of failed plating after periprosthetic fractures. For elderly patients with severe comorbidities the technique provides less invasive treatment option with quick recovery. Some aspects of the technique concerning indications, possible stress-shielding, need of nail dynamization, implant removal require further research.

Date: 2013-10-18

Session: Spine Lumbar Degenerative

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 35409

THE ANATOMY OF FAILURE IN LUMBAR DISC HERNIATION.AN IN-VIVO, MULTI-MODAL, PROSPECTIVE STUDY OF 181 SUBJECTS

Rajasekaran S¹, Bajaj NIPUN², Tubaki VIJAY¹, Kanna RISHI M², Shetty AJOY P²

¹GANGA HOSPITAL, COIMBATORE (INDIA), ²Ganga Hospital, Coimbatore (INDIA)

Study Design: A prospective multimodal study including clinical, radiological, serial post contrast MRI, intraoperative findings and histopathological study. **Background of the Study:** Although in-vitro mechanical disruption studies have implicated both the end plate junction and the annulus fibrosus as the site of failure in LDH, there are no in-vivo human studies to document the exact anatomy of failure. **Methods:** 181 consecutive patients requiring microdiscectomy at a single level formed the study group. The status of the end plate and annulus fibrosus in the operated level (study discs) and the other discs (control) were evaluated by plain radiograph, thin slice CT, plain and contrast MRI, intraoperative examination and histopathological analysis. **Results:** LDH due to End plate Junction Failure (EPJF- Type I herniation) was more common (117; 65%) than annulus fibrosis rupture. Herniated discs had a significantly higher incidence of EPJF than control discs($p <0.0001$) The EPJF was evident radiologically as vertebral corner defect in 30 patients, rim avulsion in 46, frank bony avulsions in 24 and avulsion at both upper and lower EP in four. 13 discs with normal EP radiologically had cartilage or bone avulsion intraoperatively. 64 discs (35%) had intact EP of which annular HIZ was found in 21(11%) suggesting a disruption of AF (Type II herniation). **Conclusion:** Our study provides the first evidence that LDH in humans is the result of EPJF than AF rupture. Future research must focus on the EPJ as a primary area of interest in LDH.

Date: 2013-10-18

Session: Spine Lumbar Degenerative

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 35112

THE BAND-AID LUMBAR DISCECTOMY: TECHNIQUE & RESULTS OF 188 CASES

Anupreet BASSI, Shashidhar KANTHARAJANNA, Abhilash DHRUV, Arvind KULKARNI

Bombay Hospital & Medical Research Centre, Mumbai, Mumbai (INDIA)

BACKGROUND: We evaluate the outcome of micro-endoscopic discectomy in terms of safety and efficacy of technique. **MATERIALS AND METHODS:** The study period was from April 2007 - April 2012. The first consecutive patients who underwent surgery for herniated disc using the tubular retractor are reported. All patients had a preoperative MRI (Magnetic Resonance Imaging) and were operated by a single surgeon with the METRx™ system (Medtronics) using the 18 & 16 mm ports. Patients were evaluated for technical problems, complications, and overall results by VAS (Visual Analogue Scale [0-5]) for back and leg pain and ODI (Oswestry Disability Index) at specific intervals. **RESULTS:** A total of one hundred and eighty eight patients underwent Microendoscopic-discectomy. These patients ranged from 16-78 years (average 46 years) and the sex ratio was M: F: 1.5: 1. The mean follow-up was 22 months (8– 69 months). The mean VAS scale for leg pain improved from 4.14 to 0.76 ($p<0.05$) and mean VAS scale for back pain from 4.1 to 0.9 ($p<0.05$). The mean ODI changed from 59.5 to 22.6 ($p<0.05$). The mean operative time per level was about 50 minutes (20 - 90 minutes per level). Dural punctures occurred in 11 (5%) cases. Average blood loss was 30 ml (min – 500 ml). **CONCLUSION:** Microendoscopic surgery for herniated discs effectively achieves the goals of surgery with minimal access. The advantages of the procedure are evident in the appealing cosmesis, early post-operative recovery and minimal post-operative morbidity. Level of evidence - level-IV

Date: 2013-10-18

Session: Spine Lumbar Degenerative

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 35358

COMPLICATIONS OF INTERSPINOUS IMPLANTS FOR DEGENERATIVE LUMBAR DISEASE

Haolin SUN¹, Chunde LI², Cody BÜNGER³

¹Orthopedic Department of Peking University First Hospital;Department of Orthopaedic Surgery Aarhus University Hospital, Beijing;Aarhus (CHINA),

²Orthopedic Department of Peking University First Hospital, Beijing (CHINA),

³Department of Orthopaedic Surgery Aarhus University Hospital, Aarhus (DENMARK)

Objective: To summarize and analyze the complications of interspinous implants for degenerative lumbar disease. Methods: From September 2007 to September 2011, 177 cases with degenerative lumbar diseases were treated with interspinous implants. There were 99 male patients and 78 female patients, the average age was 44.5 years(26-71 years). According to the application interspinous implants type were divided into the Wallis group and Coflex group .The clinical results were assessed by visual analog scale (VAS), lumbar Japanese Orthopedic Association (JOA) score and Prolo functional score. Summarize and analyze the complications. Results: In the final follow up, lumbar pain VAS, lower limber pain VAS, lumbar JOA score and Prolo functional score were better than pre-operation ($t=10.7, 7.9, 13.4$ and $8.8, P<0.01$). Complication rate was 9.6% (18/177) ,which of Wallis group was 5.9%(8/136) and Coflex group was 24.4% (10/41) ($\chi^2=11.8, P<0.01$) . In Wallis group, there are 3 cases with dura tear and cerebrospinal fluid leakage, 1 case with nerve root injury and foot drop, 2 cases with spacer breakage when implantation and change the implants and 2 cases with recurrence of lumbar disc herniation. In Coflex group, there was 1 case with dura tear and cerebrospinal fluid leakage, 2 cases with mild displacement post operation, 1 case with debridement for aseptic wound exudates, 1 case with implant removal for breakage 1 week post operation, 4 cases with recurrence of lumbar disc herniation and 1 case with lumbar disc herniation 6 months post operation of lumbar stenosis. Conclusions: The application of interspinous implants for degenerative lumbar diseases is effective and relative safe, but would suffer from the risk of complications.

Date: 2013-10-18

Session: Spine Lumbar Degenerative

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 35359

CLINICAL CHARACTERISTICS AND REOPERATION OF SYMPTOMATIC ADJACENT SEGMENT DEGENERATION POST-OPERATION OF LUMBAR FUSION

Haolin SUN¹, Chunde LI², Cody BÜNGER³

¹Orthopedic Department of Peking University First Hospital;Department of Orthopaedic Surgery Aarhus University Hospital, Beijing;Aarhus (CHINA),

²Orthopedic Department of Peking University First Hospital, Beijing (CHINA),

³Department of Orthopaedic Surgery Aarhus University Hospita, Aarhus (DENMARK)

Objective: To evaluate the clinical characteristics and reoperation of symptomatic adjacent segment degeneration post-operation of lumbar fusion. **Methods:** 28 cases with symptomatic adjacent segment degeneration post-operation of lumbar fusion were retrospective reviewed. The mean period between reoperation and primary fusion surgery was (47.5 ± 30.8) months. Symptomatic adjacent segment degeneration located in cephalic segments in 12 cases, in caudal segments in 14 cases and in both segments in 2 cases. 12cases suffered from lumbar stenosis, other 13 cases suffered from lumbar disc herniation and still other 3 cases suffered from both lumbar stenosis and disc herniation. Cases were divided into adjacent degenerative segment nonfusion group ($n=8$) and adjacent degenerative segment fusion group($n=20$). The clinical results were assessed by VAS, JOA and Prolo functional score when pre-operation and final follow up. **Result:** In adjacent degenerative segment nonfusion group, the average operation time was (86.3 ± 17.1) min, average blood volume was (125.0 ± 37.8) mL of reoperation and 1 case with dural injury. In adjacent degenerative segment fusion group, the average operation time was (201.6 ± 71.0) min ,average blood volume was (313.6 ± 218.9) mL of revision surgery and 4 cases with dural injury. In the final follow up, lumbar pain VAS, lower limber pain VAS, lumbar JOA score and Prolo functional score of adjacent degenerative segment of two groups were all better than pre-operation($P < 0.001$) . lumbar pain VAS of adjacent degenerative segment nonfusion group was better than adjacent degenerative segment fusion group ($P = 0.028$) . **Conclusion:** Symptomatic adjacent segment degeneration post-operation of lumbar fusion is difficult for treatment, appropriate reoperation could get the good results.

Date: 2013-10-18

Session: Spine Lumbar Degenerative

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 35279

**INFLUENCES OF THE POSTERIOR LUMBAR INTERBODY FUSION AND
POSTEROLATERAL FUSION ON THE SPINO-PELVIC SAGITTAL
BALANCE IN L5-S1 Isthmic Spondylolisthesis**

Yu FENG¹, Liang CHEN¹, Yong GU², Hui-Lin YANG¹

¹Department of Orthopedic Surgery, the First Affiliated Hospital of Soochow University, Suzhou (CHINA), ²Department of Orthopedic Surgery, the First Affiliated Hospital of Soochow University, Suzhou (CHILE)

Objective: To compare the influences of the posterior lumbar interbody fusion(PLIF) and posterolateral fusion(PLF) on the spino-pelvic sagittal balance in L5-S1 spondylolisthesis.

Methods: 36 patients had PLIF operation, and 33 patients had PLF operation. 60 healthy volunteers were chosen as the control group. Each subject had a radiograph before and after operation. The follow up duration was at least 2 years. **Result:** The pre-operative parameters showed no difference between the operation groups($P>0.05$). The pre-operative parameters except for the height of the intervertebral disc(HOD) in both operation groups were significantly higher than the control($P<0.01$). There were no significant difference in Pelvic tilt(PT) between PLIF, PLF and control group($P>0.05$) after the operation. Post-operative lumbar lordosis(LL) in PLIF group was still different from the control($P<0.01$). No more difference in LL could be found between PLF group and control group($P>0.05$). After the reduction, there were no significant difference in slip degree(SD) between the PLIF and PLF group($P=0.383$). In the PLIF and PLF group, the correction of SD were correlated with the change of LL ($r=-0.483$, $P=0.003$; $r=0.365$, $P=0.022$). The restoration of HOD in PLIF group correlated with the change of LL ($r=0.365$, $P=0.010$). **Conclusion:** The two different operation would change the spino-pelvic parameters significantly. Postoperative PT of PLIF group and PLF group had no difference with control. PLIF would increase LL, while PLF would decrease LL. SD and HOD had significant correlation with LL, which indicated the important role of the reduction. The reduction had a great impact on spino-pelvic parameters.

Date: 2013-10-18

Session: Spine Lumbar Degenerative

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 34452

THE COMPARISONS BETWEEN THE CLINICAL OUTCOMES OF PRECISE DECOMPRESSION WITH NONFUSION OPERATION AND TRADITIONAL FUSION OPERATION FOR SINGLE-SEGMENTAL SPINAL STENOSIS IN THE AGED

Ji WU

Department of Orthopedics, Chinese PLA Air Force General Hospital, Beijing (CHINA)

[Abstract] Objective :The aim of this study was to evaluate the short-term clinical outcomes of lumbar spinal canal precise decompression and Wallis interspinous dynamic stabilization for single-segmental lumbar spinal stenosis in the aged, Methods : 25 patients received spinal canal precise decompression and Wallis interspinous dynamic stabilization operationin General Hospital during January 2008 to December 2010,and the 21 ones received the traditional decompression and fusion operation.Measured the height of intervertebral spaces and intervertebral foramina of the operative segment (L4-5) and the adjacent segment (L3-4 and L5-S1) in the radiograph images of every patient in the precise decompression and nonfusion group.Recorded the ODI scores and VAS scores of all patients preoperatively , at 3 days, 1 months and 6 months postoperatively; the length of incision, the duration of surgery, the intraoperative blood loss and the time to leave a sickbed of all patients and compared between the groups.Recorded all the intraoperative and postoperative complications.Result:The Wallis systems were all successfully implanted after spinal canal precise decompression in total 25 cases in the precise decompression and nonfusion group.No operation-related complications happened..There was a similar relief-rate between the two groups ($P>0.05$) . Compared with the traditional general decompression and fusion operation, the precise decompression and nonfusion operation had advantages of smaller incisions, shorter surgery time, less intraoperative blood loss, less days to leave a sickbed and less operation-related complicatioes ($P<0.01$) .Conclusion:The precise spinal canal decompression and Wallis interspinous dynamic stabilization was an effective and safe technique for degenerative segmental spinal stenosis in the aged.

Date: 2013-10-18

Session: Spine Lumbar Degenerative

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 34097

TREATMENT OF DEGENERATIVE LUMBAR SPINE STENOSIS BY MODIFIED UNILATERAL APPROACH FOR BILATERAL DECOMPRESSION UNDER MICROENDOSCOPE

Dadi JIN, Qingchu LI, Huibo YAN, Zezheng LIU

Department of orthopaedics, The Third Affiliated Hospital of Southern Medical University, Guangzhou (CHINA)

To evaluate the feasibility and clinical efficacy of the treatment of lumbar spine stenosis by modified unilateral approach for bilateral decompression under micro endoscope. Dating from 2003.3 to 2011.3 ,modified unilateral approach for bilateral decompression of central spinal canal and nerve root canal under microendoscope performed on 296 cases who suffering from degenerative lumbar spine stenosis. Among of them laminectomy of one segment was done in 215cases, two segments were done in 81 cases. Postoperatively, the CT/MRI /radiograph were carried out on the protocol time, the VAS /Nakai criterion was used to evaluate the clinical outcome.The mean operative time was 51 min,the average blood loss was 41 ml,the average skin incision length was 2.3 cm.7 cases with dural matter tearing healed 2 weeks. Mislocation was noted in 1 case. No nerve injury and postoperative infection occurred. Postoperative CT/MRI scan demonstrated that central spinal canal and nerve root canal was decompressed satisfactorily. All patients were followed-up for an average of 60 months . At final followed-up, radiograph examination showed that no instability of lumbar spine was found in all of patients. There were significant difference on the average low back pain/ leg pain VAS between preoperative and postoperative ($P<0.01$) . According to the Nakai criterion ,at final follow-up ,the excellent and good rate is 88.3%. Treatment of degenerative lumbar spine stenosis by modified unilateral approach for bilateral decompression under microendoscope has the advantages,including minimal invasive, less complications and reliable therapeutical effect.

Date: 2013-10-18

Session: Spine Lumbar Degenerative

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 34831

**COMPARISON OF PERCUTANEOUS AND CONVENTIONAL OPEN
PEDICLE SCREW FIXATION IN LUMBAR SPINAL CANAL STENOSIS**

Masatoshi MORIMOTO, Akihiro NAGAMACHI, Yoshinori TAKAHASHI,
Akihiro NITTA, Toru ENDO

Mitoyo General Hospital, Kagawa (JAPAN)

Introduction: Minimally invasive technique including percutaneous pedicle screw fixation (PPSF) are becoming widespread in spine surgeries. The purpose of this study is to evaluate usefulness of PPSF in lumbar spinal disorders. **Materials and Methods:** Twenty patients underwent one or two levels PPSF and twenty patients underwent one or two levels conventional open pedicle screw fixation (OPSF) participated in this study. Posterior facet fusion was performed by one trained spine surgeon in both groups. PPSF was performed under fluoroscopic assistance and OPSF was performed without any assistance. Operative time, amount of blood loss, amount of C reacted protein (CRP) measured at 7 days after the surgery, amount of postoperative analgetica use, accuracy of pedicle screw placement assessed by computed tomography and complications were compared in both groups. **Results:** Operative time of PPSF was significantly shorter than that of OPSF. Amount of bleeding of OPSF was two times larger than that of PPSF. Amount of CRP and postoperative analgetica use of PPSF was significantly smaller than that of OPSF. Accuracy of screw placement of PPSF and OPSF was 96.2% and 90.0%, respectively. One patient who underwent OPSF had fifth lumber nerve radiculopathy caused by misplaced pedicle screw needed removal of the screw. Postoperative surgical site infection was not observed in both groups. **Discussion and Conclusion:** This study clearly demonstrated that PPSF was less invasive technique compared with OPSF. Although radiation exposure on surgeons and patients is still unresolved problem in fluoroscopic-assisted technique, PPSF was preferable technique for lumbar spinal fusion surgery.

Date: 2013-10-18

Session: Spine Lumbar Degenerative

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 34975

A PROSPECTIVE RANDOMIZED COMPARITIVE STUDY OF PLIF VS TLIF IN THE MANAGEMENT OF Spondylolisthesis

Dinesh CHOURDARY, Pandian SELVARAJ

Abirami Hospitals, Chennai (INDIA)

Background: Severe low back pain due to spondylolisthesis of lumbar vertebra is a commonly encountered problem which is usually treated by spinal fusion with rigid instrumentation. Several fusion methods have been reported namely posterolateral fusion, posterior lumbar interbody fusion, transforaminal lumbar interbody fusion, and anterior lumbar interbody fusion. The purpose of this study was to evaluate the results obtained in patients undergoing PLIF compared with TLIF with pedicle screw fixation for the treatment of spondylolisthesis.

Patients and methods: We conducted a single center prospective randomized study on eighty patients admitted with spondylolisthesis who were managed with either PLIF(Group 1) or TLIF (Group 2)with pedicle screw fixation between the period of Jan 2009 and Jan 2012. Patients have been followed up clinically and radiologically for a period ranged from 12-48 months.

Results: No significant differences were found between the PLIF and TLIF groups regarding the operation time, blood loss and hospital stay. The mean VAS for back pain and leg pain decreased significantly in both the groups and the average pre-operative disc and foramen height improved considerably post operatively in both the groups. There were no complications in the TLIF group whereas the PLIF group had three cases of dural tear with CSF leakage.

Conclusions: Interbody fusion in both groups achieve statistically significant difference in restoration of disc and foramen height from the pre-operative and post-operative period but PLIF has a slightly higher rate of complications. The TLIF is a safe procedure providing us with an useful alternative to the traditional PLIF.

Date: 2013-10-18

Session: Spine Lumbar Degenerative

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 35288

DURAL TEARS: DOES RIGID PRIMARY CLOSURE MANDATORY IN ALL CASES?

Janardhana Parampalli AITHALA

Kasturba Medical College, Manipal, Udupi (INDIA)

Our aim of the study was to compare the results and complications of dural tears closed by rigid primary closure with or without fascial patch with those who did not have rigid closure.

Methods: We included all patients who underwent lumbar spine surgery (discectomy/decompression) from 2004 to 2011. Upto 2009 we were closing all tears by rigid closure with or without fascial patch and these patients formed first group. Patients who had dural tears after 2009 were included in second group and had simple coverage of the dural tear with gelfoam/fascial patch. Results: There were 15 patients(9 small central tears, 6 larger peripheral tears) in first group and 17 patients in second group(14 small tears, 3 large tears). Risk factors for dural tears included old age, multiple level surgeries and gross stenosis. Microscope decreased the number of larger tears significantly (4% to 1.6%). Mean operative time was less by 44 minutes for the second group, but 88% patients in the second group had giddiness in early mobilization period, most of them settling in 2 weeks. In the first group one patient and in the second group 2 patients needed reoperation. Long term outcome remains same between two groups (improvement of ODI showed a mean score of 22.77 in first group, 20.45 in second group). Conclusions: Primary repair is the best option, but in minimally invasive surgeries, covering the tear with gelfoam and or facial patch along with smooth reversal, can save time and need for extension of surgical incision.

Date: 2013-10-18

Session: Spine Degenerative

Time: 14:00 - 15:30

Room: Hall 6

Abstract no.: 35614

MICRO-ENDOSCOPIC DECOMPRESSION: A MODIFICATION OF THE STANDARD TECHNIQUE IN THE TREATMENT OF LUMBAR CANAL STENOSIS

Abhilash DHRUV, Anupreet BASSI, Shashidhar BK, Arvind KULKARNI
Bombay Hospital, Mumbai (INDIA)

INTRODUCTION: We present a modification in the technique of Micro-Endoscopic Decompression (MED) and evaluate our experience in the treatment of lumbar canal stenosis.
MATERIALS AND METHODS: All consecutive patients undergoing MED using the MetrX system (Medtronics) using the 18mm port from April 2007 to April 2012 were reviewed prospectively. The tubular retractor was introduced from one side. The ipsilateral ligamentum flavum was kept intact, while burring beneath the spinous process to access the contralateral side. The contralateral lateral recess was decompressed first followed by the ipsilateral recess. Patients were evaluated for overall results by VAS (Visual Analogue Scale [0-5]) for leg pain, back pain, ODI (Oswestry Disability Index) and complications. Patients were followed up periodically.
RESULTS: A total of 138 patients underwent MED. The age distribution ranged from 34 to 85 years and the sex ratio was M: F :: 1.15:1. The average follow-up was 14 months (1.5 months to 24 months). The mean VAS for leg pain changed from 4 to 1, VAS for back pain changed from 5 to 1 and the mean ODI improved from 72.75 to 24. The mean operative time per level was about 90 minutes (60-140 minutes). The average blood loss was 75 ml. The post-operative MRI showed inadequate decompression in one out of the 25 cases. In 5 cases with stable degenerative spondylolisthesis, the procedure caused no iatrogenic instability in 4 cases.
CONCLUSIONS: Micro-endoscopic decompression using this modified technique is a viable alternative to an established procedure with theoretical advantage of reducing the incidence of dural injury without compromising the adequacy of decompression.

Date: 2013-10-18

Session: Spine Degenerative

Time: 14:00 - 15:30

Room: Hall 6

Abstract no.: 34657

UNCONVENTIONAL POSITIONING IN MICRO ENDOSCOPIC DECOMPRESSION FOR LUMBAR CANAL STENOSIS AND ITS IMPACT ON PATIENT SATISFACTION

Shashidhar BANGALORE KANTHARAJANNA¹, Arvind GOPALRAO

KULKARNI¹, Abhilash DHRUV¹, Anupreet BASSI²

¹Bombay Hospital, Mumbai (INDIA), ²Bombay hospital, Mumbai (INDIA)

Summary: Studies that examine decompression for lumbar canal stenosis have all employed conventional flexion positioning. We tried lordotic positioning, in an attempt to clear misconceptions of limitations of extension. **Methods:** All consecutive patients of lumbar canal stenosis operated by a single surgeon with MetrX system (Medtronics) using 18mm port, were reviewed prospectively. Patients were evaluated by Visual Analogue Scale [0-5] for leg pain and back pain, Oswestry Disability Index at 1 week, 6 weeks, 3 months, 6months, 12 months and 2 years. **Results:** 138 patients with age ranging from 34 to 85 years and sex ratio of M: F: 1.15:1 were operated with single level decompression in 105cases, two levels in 31 cases and three levels in 2 cases. The levels decompressed were L4-L5 in 120 cases, L3-4 in 27 cases, L5-S1 in 22 cases, L2-3 in 3 cases and L1-2 in 1 case. The average follow-up was 14 months. The mean VAS for leg pain changed from 4 to 1, mean VAS for back pain changed from 5 to 1 and mean ODI improved from 72.75 to 24 at last follow-up. Mean operative time per level was 90 minutes with average blood loss of 40 ml. Minor dural tears were seen in 9 patients. Two patients had large dural tears, with one of them needing open repair. **Conclusion:** Micorendoscopic decompression in extension for lumbar canal stenosis effectively achieves the goals with more than 90 percent good results, compared to 64 to 90 percent as per present literature.

Date: 2013-10-18

Session: Spine Degenerative

Time: 14:00 - 15:30

Room: Hall 6

Abstract no.: 34639

INDICATION OF REMOVING THE POSTERIOR LONGITUDINAL LIGAMENT IN ANTERIOR DECOMPRESSION FOR CERVICAL SPONDYLOTIC MYELOPATHY

Qingsan ZHU, Fei YIN, Dongxu ZHAO

Department of Spine Surgery, the First Hospital of Jilin University,
changchun (CHINA)

Objectives: To discuss the indication of removing the posterior longitudinal ligament (PLL) during the anterior decompression for cervical spondylotic myelopathy. Methods: 500 patients with cervical spondylotic myelopathy treated by anterior cervical operation were retrospectively reviewed. The PLL was removed in 213 cases. Clinical data were analyzed. Results: Among the 213 cases, calcification of the posterior longitudinal ligament or disc was found in the CT or MRI images in 178 cases. The PLL lose its elasticity and was felt hard during the operation in 30 cases. The disc was found herniated into the dual in 1 case, for there is cerebrospinal fluid signal around it. The disc was found herniated behind the PLL but in front of the dual in 4 cases, for the breakage of the PLL was found during the operation. 3 cases of the postoperative cerebrospinal fluid leakage were cured by conservative treatment. 2 cases of epidural hematoma which lead to neural symptom worsen were taken immediate surgery and recovered in 1 month. 2 cases esophageal injury were cured by conservative treatment in 4-6 weeks. JOA score improved from 8.71 ± 3.36 (ranged from 4 to 14 months) to 13.50 ± 3.50 (ranged from 5 to 17 months). Conclusions: Whether remove the PLL or not could be decided by its image outcome before the operation and its elasticity and hardness when detecting during the operation. For there are some complications occurred after the PLL was removed, care should be taken to decide removing it or not and the surgery require more cautious.

Date: 2013-10-18

Session: Spine Degenerative

Time: 14:00 - 15:30

Room: Hall 6

Abstract no.: 34259

ANTERIOR CERVICAL SURGERY: FUSION OR NON-FUSION? A META-ANALYSIS OF CERVICAL DISC REPLACEMENT VERSUS FUSION FOR SINGLE-LEVEL CERVICAL DEGENERATIVE DISC DISEASE

Hua JIANG, Zengming XIAO

Department of Spinal Surgery, the First Affiliated Hospital of Guangxi Medical University, Nanning (CHINA)

Introduction: To evaluate the safety and effectiveness of cervical disc arthroplasty (CDA) versus anterior cervical discectomy and fusion (ACDF) for single-level symptomatic cervical disc disease. **Methods:** We identified eligible randomized controlled trials (RCTs) in PubMed (April 2012), EMBASE (April 2012). Data were collected and extracted by two reviewers independently. The methodological quality and clinical relevance of the included studies were assessed. Data analysis was conducted with RevMan 5.0. **Results:** Six RCTs involving 1745 patients were included. The pooled analysis showed a higher prevalence of neurological and overall success [($P=0.004$, RR =1.06, 95% CI = 1.02-1.10), ($P=0.0005$, RR=1.14, 95% CI=1.06-1.22)], and a lower incidence of dysphagia and reoperation related to adjacent-segment degeneration [($P=0.04$, RR=0.30, 95%CI= 0.09-0.97), ($P=0.03$, RR =0.46, 95%CI= 0.23-0.91)] with CDA compared to ACDF. However, there was no statistical difference in neck disability index ($P=0.92$, SMD =0.01, 95% CI=-0.25-0.27), neck and arm pain scores[($P=0.33$, SMD= -0.12, 95%CI= -0.37-0.13), ($P=0.54$, SMD=0.17, 95%CI= -0.36-0.70)], incidence of complications related to the implant or surgical procedure and reoperation related to primary surgery [($P=0.32$, RR= 0.76, 95% CI=0.45-1.30), ($P= 0.09$, RR =0.48, 95% CI = 0.20-1.12)]. **Conclusion:** Compared with ACDF, CDA carry a lower incidence of dysphagia complications and reoperation related to adjacent-segment degeneration, and a higher prevalence of neurological and overall success at two years postoperatively. As the poor quality of the included studies, it is still uncertain whether CDR is more effective and safer than ACDF treating single-level symptomatic cervical disc disease.

Date: 2013-10-18

Session: Spine Degenerative

Time: 14:00 - 15:30

Room: Hall 6

Abstract no.: 34711

SURGICAL RESULTS FOR THORACIC MYELOPATHY CAUSED BY SEVERE OSSIFICATION OF THE POSTERIOR LONGITUDINAL LIGAMENT

Jie ZHAO, Wei SUN, Youzhuan XIE, Changqing ZHAO, Hua LI, Kai ZHANG, Wei DING

Department of Orthopaedic Surgery, Shanghai Ninth People's Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai (CHINA)

Objective: To investigate the clinical results of anterior or posterior decompression via a single posterior approach for the treatment of severe ossification of the posterior longitudinal ligament(OPLL) of the thoracic spine. **Methods:** Between 2010 and 2013, a total of 4 patients (3 men and 1 woman, average age: 55.7 years, range: 42–78 years) with severe thoracic OPLL (occupying ratio \geq 40%) were included in this study. 2 patients (2 men) underwent anterior decompression through the posterior approach, and 2 patients (1 man and 1 woman) underwent laminectomy with posterior instrumented fusion. Mean duration of follow-up was 1.4 years (range, 1–3 years). The spinal canal diameter, occupying ratio, type and extent of OPLL, and clinical results evaluated using JOA scoring system were compared between two groups. **Results:** There is no statistical difference in the spinal canal diameter, occupying ratio, and preoperative JOA score between two groups. Mean recovery rate at final follow-up was 60.3% in anterior decompression group, and 48.1% in posterior decompression group($P<0.05$). Leakage of cerebrospinal fluid occurred in 1 patient in anterior decompression group. There were no cases of postoperative paralysis or late neurologic deterioration in both groups. **Conclusions:** Although anterior decompression is technically demanding and has higher complications, it yielded a better neurologic outcome than posterior decompression for patients with severe thoracic OPLL.

Date: 2013-10-18

Session: Spine Degenerative

Time: 14:00 - 15:30

Room: Hall 6

Abstract no.: 33825

**ASSESSING FUSION STATUS AFTER POSTERIOR LUMBAR
INTERBODY FUSION BY COMPUTED TOMOGRAPHY-SCAN IN
EXTENSION POSITION**

Keisuke TOMITA, Yasutsugu YUKAWA, Keigo ITO, Masaaki MACHINO,
Akinori KOBAYAKAWA, Taro MATSUMOTO, Jun OUCHIDA, Fumihiko
KATO

Chubu Rosai Hospital, Nagoya (JAPAN)

Posterior lumbar interbody fusion (PLIF) is a popular procedure for treating lumbar canal stenosis with spinal instability. Some authors reported several methods assessing fusion status. However, there are no definitive criteria for diagnosing interbody fusion after operation. We demonstrated that computed tomography (CT) in extension position is useful for evaluating fusion status precisely after PLIF. The purpose of this study was to evaluate its usefulness for determining fusion status after PLIF. A total of 265 patients who underwent one-level PLIF were enrolled. They included 166 men and 99 women (mean age, 56.5 years; range, 15–88 years). All of them were followed up for more than 12 months after surgery. The mean follow-up period was 32.4 months (range, 12–71 months). Fusion status was evaluated by flexion-extension radiographs (functional-Xp) and CT images in flexion-extension position. In the functional-Xp, mobility of more than 3 degrees, remaining clear zone, or an uncertain bone connection constituted are considered as non-union. For CT images, a remaining clear zone or an uncertain bone connection constituted are considered as non-union. The fusion rate on functional-Xp was 43.7% and on extension CT was 31.6% at 12 months postoperatively. The fusion rate on functional-Xp was 77.3% and on extension CT was 69.8% at 24 months postoperatively. The non-fusion rate on extension CT was significantly higher than that on functional-Xp. Thus Extension CT could detect non-fusion more accurately than functional-Xp.

Date: 2013-10-18

Session: Spine Degenerative

Time: 14:00 - 15:30

Room: Hall 6

Abstract no.: 34969

**POSTERIOR DISC HEIGHT AND FORAMINAL DIMENSIONS
FOLLOWING INSWING® INTERSPINOUS SPACER INSERTIONU**

Cristian NITA, Cyrus Dokhanian JENSEN, Andrew James BERG, Tamir ALI, Guru REDDY, Tai FRIESEM, Raju PEDDADA

North Tees and Hartlepool Trust, Stockton on Tees (UNITED KINGDOM)

Introduction and Aim: Interspinous devices are of benefit in treating spinal stenosis and neural compression. They increase the interspinous distance and posterior disc height which tensions the posterior ligamentous structures increasing the canal cross-sectional area and increase the foraminal dimensions. We examine, for the first time, the radiological changes in the spines of 85 patients following insertion of the InSwing® interspinous devices. **Method:** Eighty-five patients with one and two level InSwing® interspinous implants inserted 2010-2012 were reviewed. Standardized EOS® Lumbar spine radiographs taken preoperative, immediate postoperative, 3 months, and 1 year were examined by a senior radiologist. The posterior disc height and foraminal dimensions (anterior-posterior/superior-inferior) of each operated level were measured. **Results:** Preliminary results from 33 patients (43 implants). Results are given as a percentage of implants with increased dimensions compared to pre-operative radiographs. Immediately postoperative increase: posterior disc height- 90%; foraminal height- 70%; foraminal width- 55%. Three months: posterior disc - 46%; foraminal height - 46%; foraminal width - 40%. One year: posterior disc height - 16%, foraminal height - 21% and foraminal width - 26%. **Conclusions:** InSwing® interspinous devices have been shown to reliably increase the posterior disc height and foraminal dimensions immediately post-operative. These changes persist in some patients beyond 1 year. We hypothesis that the radiological findings in this study will correlate with clinical outcomes as increased foraminal dimensions lead to decompression of nerve roots and the increased disc height correlates with reduction in central stenosis. Further prospective clinical studies are planned to correlate clinical and radiological findings.

Date: 2013-10-18

Session: Spine Degenerative

Time: 14:00 - 15:30

Room: Hall 6

Abstract no.: 34690

**BIOMECHANICAL ANALYSIS FOR USING A
NANO-HYDROXYAPATITE/POLYAMIDE-66 (N-HA/PA66)
INTERVERTEBRAL CAGE IN TRANSFORAMINAL LUMBAR
INTERBODY FUSION (TLIF)**

Liang WANG, Yueming SONG

Department of Orthopaedics, West China Hospital, Sichuan University,
Chengdu (CHINA)

Objective: To investigate the effect of nano-hydroxyapatite/ polyamide 66 (n-HA/PA66) cage stiffness on the biomechanics of the fused region in TLIF using finite element analysis, and evaluate the effect of different location of the cage on the result.
Methods: A previously validated 3-dimensional, nonlinear finite element model of an intact L4–L5 segment was modified to simulate fusiform interbody fusion cage made of n-HA/PA66 ("E" = 5.6 GPa) at the L4/5 disc with posterior instrumentation. Bone graft ("E" = 12 GPa) packed in and around the cage in the intervertebral space was also simulated. The posterior lumbar interbody fusion cage with strumentation and graft represented a simulation of the condition present immediately after TLIF. The included angles of the placed cage's long axis and body coronal plane were divided into 0°, 45°, and 90°.
Results: The peak centroidal Von Mises stresses in the cage was less as compared to graft bone, and higher stresses were observed in the L4 bottom endplate interfaced with the graft bone in flexion, extension, bending, and rotation. Furthermore, the differences of the stress distribution in sports were more obvious when the included angles of the cage's long axis and body coronal plane were less.
Conclusion: The n-HA/PA66 interbody cage could provide initial stability and might minimize the chances of subsidence, leading to higher stresses in the bone graft itself. The less included angles of the cage's long axis and body coronal plane might be beneficial for stress distributed on bone graft in sports.

Date: 2013-10-18

Session: Spine Degenerative

Time: 14:00 - 15:30

Room: Hall 6

Abstract no.: 34682

**ANALYSIS OF ADJACENT SEGMENT STABILITY AFTER RESTORED
DISC HEIGHT SPACE USING UNILATERAL TLIF**

Jie ZHAO, Liang XUAN, Kai ZHANG, Changqing ZHAO

Ninth People's Hospital, Shanghai Jiaotong University School of Medicine;
Shanghai Key Laboratory of Orthopaedic Implants, Shanghai (CHINA)

Objective: To investigate the relationship between proximal adjacent segment stability after restored disc height space using single-segment instrumented fusion and its clinical results.

Methods: This study included a total of 45 patients (mean age 59.4years) presenting with acquired lumbar stenosis, signs of segmental instability, and degenerative disc disease underwent TLIF using one diagonal fusion cage with unilateral pedicle screw fixation at the L4/5 from 2009 to 2011. Measure preoperative and postoperative vertebral disc height space (L4/5 and L3/4), dynamic intervertebral angle, lumbar lordosis angle, fusion rate using 3D-CT ,and assess clinical results by using Visual Analog Scale(VAS), JOA score and Oswestry dysfunction index (ODI) . **Results:** The mean follow-up was 24.6months, no neurologic deterioration were found. At final follow-up, the disc height of L4/5 was 11.8mm, the mean VAS score was 2.3, mean ODI was 24.6%, average ROM of L3/4 was 7.8°and solid fusion rate was 88%. The return to previous work rate was 87.8%, and the functional results were good or excellent in 93.3% of patients. **Conclusions:** Restored disc height space using single-segment instrumented fusion is a valid and safe treatment of lumbar instability and degenerative disc diseases, it can improve the adjacent stability.

Date: 2013-10-18

Session: Spine Infections

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 34238

**STUDY OF CRANIOVERTEBRAL JUNCTION TUBERCULOSIS
THROUGH ITS NATURAL HISTORY AND A PROPOSED MODIFICATION
IN LIFESOS CLASSIFICATION.**

Mohamed A SHAFIQ, Mihir BAPAT, Kiran PAKNIKAR, Viral PAPAIYA,
Musale VILAS

Kokilaben Dhirubhai Ambani Hospital, Mumbai (INDIA)

Introduction: Treatment of craniovertebral tuberculosis (CVJ TB) is controversial, due to poor understanding of its natural history. **Objectives:** 1) Elucidate pathogenesis of CVJ TB 2) Correlate severity of bone destruction with clinical symptoms 3) Propose modification in Lifeso classification. **Methods:** Retrospective review of records of 52 cases of CVJ TB treated between 1996 to 2008. Neurology assessed using Frankel grade. Dynamic radiographs, CT and MRI. Lesions classified as - Type 2: breakdown of structural integrity of area Type 1: Areas with erosions or signal change but preservation of structure. Instability classified as anterior-posterior (AP), rotatory and vertical (basilar impression). Lifeso stages modified. Stage 1 (n=18)- No bone destruction, no instability, Stage 2 (n=15) - AP instability with or without rotatory instability due to ligament disruption, without significant bone destruction (Type 1 lesions), Stage 3 (n=19) - AP or vertical Instability with or without rotatory instability, due to severe bone destruction (Type 2 lesions). **Results:** Type 1 , Type 2 lesions 254 (32%) and 67 (8.6%) respectively. No abscess found in retropharyngeal space. Myelopathy seen in 0, 8(53%), 11(57%) patients in Stage 1,2 , 3 respectively. **Conclusion:** Infection does not start in retropharyngeal space, but synovial joints of CVJ. Cause of neurological deficit instability rather than epidural granulation tissue. Ligament destruction precedes bone destruction. Destruction of lateral weight bearing column of CVJ results in vertical instability. Destruction of odontoid process leads to incompetence of atlantodental joint resulting in AP instability. The modified classification useful in decision making in CVJ TB.

Date: 2013-10-18

Session: Spine Infections

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 35027

CRANIOVERTEBRAL TUBERCULOSIS – REVIEW OF 34 CASES IN THE PAEDIATRIC AGE GROUP

Somnath MUKHERJEE¹, Sandip CHATTERJEE²

¹BORRC, Kolkata (INDIA), ²Park Clinic, Kolkata (INDIA)

Introduction : Craniovertebral tuberculosis constitutes a small percentage of caries spine. We report on our series of 34 paediatric patients whom we treated with this condition in the last 8 years(2003-2010). **Methods:** Of these 34 children 4 had tuberculous affection of the atlanto-occipital joint. All the children were treated initially with antitubercular drug and had their neck immobilized using Philadelphia collars. Xray (open-mouth and lateral flexion/extension views) MRScans if needed CTScan were done. The clinical presentations varied from neck pain with hypoglossal nerve palsy to frank spastic quadripareisis. **Results :** We graded the children with this condition into 3 groups 1)Those with instability and gross neurodeficit who required early operative intervention (10 patients) 2)Those who had severe torticollis and large cold abscesses who were treated with trans-oral aspiration of cold abscess followed by neck immobiliosation(9/34) and 3)Those who did not have significant neck muscle spasm or torticollis and who were treated with immobilization alone(15/34). Only 1 child in group 3 required delayed intervention for instability which developed after completion of the course of antitubercular medication. We propose that this is classification of atlantoaxial tuberculosis in children into three categories: those with instability, those with severe neck muscle spasm and cold abscess without any instability, and those without either as a good classification system to treat this condition.

Date: 2013-10-18

Session: Spine Infections

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 34392

SURGICAL MANAGEMENT OF POTT'S PARAPLEGIA

Sudhir Kumar MAHAPATRA¹, Madan Mohan SAHOO¹, Gopal Chandra SETHI², Sunil Kumar DASH³

¹SCB Medical College, Cuttack (INDIA), ²VSS Medical College, Burla (INDIA), ³Hi-Tech Medical College, Bhubaneswar (INDIA)

Introduction: Conservative management is the mainstay in treatment of Pott's paraplegia. Surgery is needed when the paraplegia is severe or non-responsive to chemotherapy. Traditional surgical modalities have been anterolateral and anterior decompression. Recently the posterior decompression and stabilization methods have shown excellent results.

Methods: A total of 34 patients between 27-70 years with Pott's paraplegia were operated. Group 1 (n=21) had ≤ 2 level involvement with < 50% destruction of affected vertebra and $< 30^\circ$ kyphosis. 15 had complete and 6 incomplete paraplegia. They were treated with posterolateral decompression and pedicular screw fixation. Group 2 (n=13) had ≥ 2 level involvement, $> 30^\circ$ kyphosis and/or >50% destruction and were treated by anterior decompression and fixation. 6 had complete and 7 incomplete paraplegia. **Results:** In group 1 surgery improved the kyphosis 17.6° to 10.2° . At 41.3 months of mean follow up the kyphosis was 12.7° , 11 patients had complete, 9 partial and 1 no recovery. There was no implant failure or complication related to surgery. In group 2 the kyphosis improved from 24.2° to 14.5° postsurgically. At 43.7 months of mean follow up the kyphosis was 18.0° . 9 patients had complete and 4 patients had partial recovery. There was no perioperative complication. In group 2, 3 patients had implant breakages at the head of caudal screw. **Conclusion:** Posterolateral decompression with fixation is safe and equally effective in early active Pott's paraplegia with lesser vertebral destruction. Anterior decompression offers better initial kyphosis correction, but risks of implant failure and progression of kyphosis are higher.

Date: 2013-10-18

Session: Spine Infections

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 34850

TUBERCULOSIS OF THE LUMBOSACRAL JUNCTION – A PROPOSED NOVEL CLASSIFICATION BASED ON SURGICAL TREATMENT STRATEGIES.

Aju BOSCO¹, Nalli UVARAJ²

¹DEPARTMENT OF ORTHOPAEDICS AND TRAUMATOLOGY, GOVERNMENT MEDICAL COLLEGE HOSPITAL, SALEM, SALEM (INDIA), ²SPINE UNIT , INSTITUTE OF ORTHOPAEDICS AND TRAUMATOLOGY, MADRAS MEDICAL COLLEGE & GOVERNMENT GENERAL HOSPITAL, CHENNAI, CHENNAI (INDIA)

Tuberculosis of the lumbosacral junction is rare(2-3%).The treatment of lumbosacral tuberculosis remains difficult and controversial. Early cases with lesser destruction of vertebrae can be managed successfully with conservative management. There are no defined guidelines on the surgical treatment of advanced tuberculosis with extensive destruction of the lumbosacral junction. Instrumentation at the lumbosacral junction is technically demanding due to the complex local anatomy, the unique biomechanics and difficult fixation in the surrounding diseased bone. In a study of 61 patients with spinal tuberculosis treated surgically, we have reviewed 21(11 males, 10 females) patients with lumbar and lumbosacral tuberculosis and analyzed the technical difficulties in restoring the normal lumbosacral angle and global sagittal stability in cases with extensive destruction of the lumbosacral junction. The mean age at presentation was 39 years(12-63 years). The average follow-up was 3 years(2.5 –5.5 years). Treatment was individualized and consisted of posterior stabilization, with or without anterior debridement and fusion. Patients with L5 tuberculous spondylitis alone, were managed successfully by circumferential fusion with posterior spinal instrumentation involving L3, L4, S1 and S2. In L5-S1 tuberculous spondylodiscitis with extensive destruction of sacral promontory, with disease free ala, sagittal stability can be restored by spinopelvic stabilization using alar screws with supplemental iliac screws. In extensive L5-S1 spondylodiscitis with destruction of the sacral promontory as well as the ala, the only option to achieve stability is spinopelvic stabilization by applying iliac screws. Anterior column reconstruction with a strut graft lessens and prevents the progression of kyphosis. Spinopelvic stabilization is biomechanically stable and is a necessity in managing advanced tuberculosis of the lumbosacral spine.

Date: 2013-10-18

Session: Spine Infections

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 34606

TREATMENT OF INTRASPINAL TUBERCULOMA.

Anil JAIN, Ish Kumar DHAMMI, Sudhir KUMAR

University College of Medical Sciences, Delhi (INDIA)

Introduction : Neurological manifestations in spinal tuberculosis often occur secondary to vertebral involvement. However, tuberculoma of the spinal cord or extradural granuloma without radiological evidence of vertebral involvement may also produce neurological complications. we report a retrospective analysis of 25 cases. **Materials and Methods:** we treated 70 patients of spinal tumor syndrome during last 22 years. Out of which 25 patients , age ranged 17 to 70 years were confirmed as intraspinal tuberculoma (22 extradural, three intramedullary). Three patients had a history of paraplegia of acute onset (complete paraplegia within 12 hours) while remaining had neural deficit of gradual onset.. Only six demonstrated spinal tenderness. The bone involvement could be observed on plain radiographs in four patients. Of the 18 extradural tuberculoma patients who had a CT scan and/or MRI, only five had no osseous involvement. **Results :** Laminectomy and surgical decompression was performed in all 22 patients with extradural granuloma. Sixteen patients showed complete neural recovery within 2 years, while one didnot recover and 2 had partial recovery. Of the three patients with intramedullary involvement, one underwent myelotomy and decompression and died within 2 months of surgery. The other two patients were treated nonoperatively with antitubercular therapy and showed complete neural recovery. All patients received ATT for a minimum of 1 year. **Conclusion :** Extradural tubercular granuloma without vertebral involvement is uncommon bus show good neural recovery . Intraspinal tubercular granuloma is important differential diagnosis of spinal tumor syndrome in an endemic zone of tuberculosis.

Date: 2013-10-18

Session: Spine Infections

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 33904

POSTERIOR HEMI VERTEBRECTOMY IN POST TUBERCULAR SPINAL INFECTION

Gaurav SANJAY, B K S SANJAY, Hema BAFILE, Hema BAFILE

Sanjay Orthopaedic, Spine & maternity Centre, Dehradun (INDIA)

All tubercular spine infection heals invariably with kyphotic deformity which causes early or late onset of variable degree of neurological claudication and/or deficit in these patients. This deformity can be prevented with surgical intervention during healing process. The authors are sharing their experience of preventing the deformity in 13 cases. There were 8 male and 5 female with age ranging from 25 to 43 years. All patients were presented with varying degree of neurological deficit. Posterior half of most affected vertebra was removed. Affected spinal segment was fixed with the transpedicular screws. Transpedicular and posterolateral bone grafting was done. All patients were given bed rest for 6 weeks and anti tubercular treatment (ATT) for one year. All patients recovered neurologically. Infection healed in all cases. Loss of correction was observed in 4 patients varying from 3 to 5 degrees. It is attributed to local osteopenia due to infection. All tubercular spine infection heals invariably with kyphotic deformity. There are mainly two ways to deal with these above mentioned problems. Either lengthen the anterior segment or shorten the posterior segment are the only solutions to correct the deformity and to maintain the corrected deformity. Posterior hemi vertebrectomy can be done to correct post tubercular kyphosis to avoid early and late onset deformity and to prevent pressure on cord and resultant neurological claudication and/or deficit.

Date: 2013-10-18

Session: Spine Infections

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 35144

**WOUND COMPLICATIONS OF SPINAL IMPLANTS IN TUBERCULOSIS
OF THE SPINE**

Fred Mathew Toboso OTSYENO¹, John Ernest Oluoch ATING'A², Vincent Muoki MUTISO²

¹kenyatta national hospital, nairobi (KENYA), ²university of nairobi, nairobi (KENYA)

Nowadays the use of instrumentation in the management of Tuberculosis of the spine is common. The various advantages including immediate stability and correction of Kyphosis to the spine has been described extensively in literature. However the technique is not without complications. Among all these complications infection is one of the commonest. In a period of five years, 2006 and 2010, we performed 302 cases of spinal instrumentation for patients with Tuberculosis of the spine. Our study was to evaluate the clinical outcome of this cases with special attention to the infection rate and our experience in managing the infected cases. There were 13 (4.3%) cases of infection among these 302 patients. The patterns of infection was mixed flora with the commonest organism being staphylococcus in 10(80%) out of 13 and Propionibacteria in 6 (46%) out 13. Patients were treated by antibiotics and wound care with eventually removal of implants. Five patients (38.4%) had a stable spine at the end of treatment. 8 (61.5%) patients had continued active infection on subsequent removal of implants despite repeated debridement and long term use of antibiotics. Wound infection following implants in patients with tuberculosis of spine is commonly due to mixed flora and successful eradication of infection cannot be reliably achieved with wound debridement and antibiotics alone.

Date: 2013-10-18

Session: Spine Infections

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 34475

**EVALUATION OF SOURCE OF CONTAMINATION IN PRESSURE
ULCERS AND ROLE OF PLATE RICH PLASMA IN CONTROLLING
INFECTIONS**

Roop SINGH

Pt. B.D. Sharma Postgraduate Institute of Medical Sciences, ROHTAK
(INDIA)

Introduction: Exposure of pressure ulcers, particularly to urine and feces, leads to increased colonization of wounds and is associated with slower rate of healing. **Aim:** To evaluate the source of contamination in pressure ulcers and the role of local applications of autologous platelet rich plasma in controlling such infections. **Methods:** 25 patients with at least two pressure ulcers were taken up for the study. Local application of autologous PRP on one PrUs (case) and was compared with saline dressing on the other (control) in the same patient. PrUs, urine, urethral meatus and perineal swabs were taken at weekly interval and sent for culture and sensitivity examination to know the site of infection from where PrUs were infected and to see antimicrobial action of PRP. **Results:** Infection rate of PrUs (case) decreased from 92% at enrollment to 24% at 5th week, but did not significantly decreased in PrUs (control) from enrollment (84%) to 5th week (76%). Concordance between PrU (case) and perineal cultures was observed for Staph. aureus at enrollment 41% ($\chi^2 = 6.76$, $p < 0.01$) and at 2nd week 47% ($\chi^2 = 5.83$, $p < 0.05$). 47% concordance between PrU (control) and perineal cultures at enrollment ($\chi^2 = 4.11$, $p < 0.05$) and 29% concordance at 2nd week ($\chi^2 = 8.41$, $p < 0.01$) was observed for Staph. aureus. Thereafter concordance between urethral and PrUs (control) cultures appeared for E. coli. **Conclusions:** PRP possess antimicrobial properties that change the local 'biological milieu' of wound not only in the favor of enhanced healing, but also in bacterial control.

Date: 2013-10-18

Session: Spine Infections

Time: 16:30 - 18:00

Room: Hall 6

Abstract no.: 33539

PERCUTANEOUS DRAINAGE COMBINED WITH HYPERBARIC OXYGEN THERAPY FOR PYOGENIC SPONDYLITIS WITH ILIOPSOAS ABSCESS

Katsuhiro TOFUKU¹, Koga HIROAKI², Setsuro KOMIYA³

¹Kirishima Medical Center, Kirishima (JAPAN), ²Imakiire General Hospital, Kagoshima (JAPAN), ³Kagoshima Graduate School of Medical and Dental Sciences, Kagoshima (JAPAN)

The purpose of this study was to evaluate outcomes in patients with pyogenic spondylitis accompanied by iliopsoas abscess who were treated by percutaneous drainage combined with hyperbaric oxygen (HBO) therapy. Twenty-three patients were treated with percutaneous drainage combined with HBO therapy in addition to common conservative therapy. There were 13 males and 10 females, with a mean age of 69.0 years. The mean duration of follow-up was 27.7 months. Clinical outcome and imaging examinations were retrospectively investigated. Symptoms such as low back pain, radicular pain, and hip pain were relieved in all patients immediately after treatment. The mean time from the start of treatment to the return of CRP levels to normal or baseline values recorded before the onset of spondylitis was 28.3 days. In the final set of follow-up radiographic studies, all patients were free from progressive destructive changes. Follow-up MRI or CT with contrast enhancement confirmed disappearance or near-total resolution of the iliopsoas abscess cavity with healing of pyogenic spondylitis in all 23 patients. No recurrence was observed in any patient during follow-up. The present study suggests that patients with mild to moderate pyogenic spondylitis accompanied by iliopsoas abscess can be cured without a prolonged period of therapy or recurrence using this treatment. This treatment is less invasive and it is not technically demanding, and it was very effective in patients with pyogenic spondylitis complicated by iliopsoas abscess.

Date: 2013-10-18

Session: Foot & Ankle Reconstruction

Time: 10:30 - 12:00

Room: MR1.01 & MR1.02

Abstract no.: 35890

ANTHROPOMETRY OF THE BOTH MALLEOLI

Shamikh Muneer Ghaus-Ul RAZA, H.K.T. RAZA

NSCB MEDICAL COLLEGE, JABALPUR (INDIA)

INTRODUCTION: The internal architecture of bones gives an idea of the stresses to which a particular bone is subjected to and the direction of these stresses. The following study was carried out on cadaveric tibia.
AIMS OF THE STUDY: To ascertain the trabecular pattern of the proximal end of Tibia in a three-dimensional perspective.
MATERIAL & METHODS: The proximal ends of 12 Tibia (Six of each side) were divided into three groups of four each. 5mm Sections of each group of four were obtained in one of three planes: Transverse, coronal, saggital. All sections were studied by naked eye observation, under a magnifying glass and after obtaining radiographs.
OBSERVATIONS: The most important features discovered were: (a)An arcuate arrangement of trabeculae in the saggital sections only, representing stresses of movements of flexion-extension at Knee in saggital plane. (b)Thick concentration of vertically aligned trabeculae in coronal sections under centre of medial/lateral condyles of tibia merging into medial and lateral cortex of proximal tibia. (c)These vertically placed trabeculae were found to be maximally concentrated in centre of condyles in transverse sections.
DISCUSSION & CONCLUSION : The concentration of trabeculae along Central Zone of condyles and the arcuate arrangement seen in saggital planes will help in designing of tibial components for knee arthroplasty. It will also help in explaining fracture patterns around the proximal end of Tibia.

Date: 2013-10-18

Session: Foot & Ankle Reconstruction

Time: 10:30 - 12:00

Room: MR1.01 & MR1.02

Abstract no.: 35799

ARTHROSCOPIC ANKLE ARTHRODESIS. A CASE SERIES

Maheswara AKULA, Nikolaos GOUGOULIAS

Frimley Park Hospital, Frimley (UNITED KINGDOM)

Background: Publication Gouglias and Parsons in Foot Ankle Int 2007 (reviewing the senior author's series) showed that the deformity can be corrected with the arthroscopic technique, with equally good results and no more complications compared to neutrally aligned ankles. We are presenting our case series which were operated between 2009- 12, including 22 consecutive patients (14 male, 8 female) , including 23 ankles. The mean age of population is 59.9 years (44-90 years). **Results:**All ankles were fused in optimal alignment in all planes and patients were able to walk unaided with a plantigrade foot. Deformed ankles were reduced to neutral alignment. Time to radiological union: 8-24 weeks, mean 12.3 weeks. Of the 10 patients who worked before the surgery, all returned to work at a mean of 4.7 months (range 3.5 to 8 months). Two patients (8.7%) had residual pain from the surrounding joints (one from the subtalar joint, one from the knee). One had a stress fracture at the most proximal screw head region (screw removed, stress fracture healed eventually). Three patients required a reoperation (two removal of one of the screws, one revision to open fusion because of deep infection).Nineteen out of 22 patients rated their outcome as excellent (86.5%), 2 out of 22 as good (9%) and one (4.5%) as poor.**Conclusions:** Deformity correction is possible with the arthroscopic technique. High union rates are achieved, with high patients' satisfaction rates and relatively quick recovery and return to work.

Date: 2013-10-18

Session: Foot & Ankle Reconstruction

Time: 10:30 - 12:00

Room: MR1.01 & MR1.02

Abstract no.: 34077

**REVISION OF FAILED SCANDINAVIAN TOTAL ANKLE REPLACEMENT
(STAR)**

Dakshinamurthy SUNDERAMOORTHY, Haroon MAJEED, Sunil DHAR
Nottingham University Hospitals NHS Trust, Nottingham (UNITED
KINGDOM)

Introduction We wish to present the results of the revision procedures for failed Scandinavian total ankle replacements. Patients and Methods We retrospectively reviewed all the Scandinavian TAR done by the senior author from March 1999 till Jan 2006. Patients who underwent revision surgery were identified and their data was collected. Results 25 patients underwent revision of Scandinavian TARs between April 2000 and April 2012 out off a total of 213 primary STARs (11%). Average age was 68 years (45 to 82), with male to female ratio of 4:1. The causes of failure were broken polyethylene inserts in 12 patients, aseptic loosening in 6 and ankle instability in 7 patients. Revision procedures which were performed in these patients included exchange of inserts in 13 patients, revision of all components in 2, revision of tibial component in 3, talar component in 2 and ankle arthrodesis with hindfoot nail in 4 and with ilizarov frame in 1 patient. The average time from the primary procedure to revision surgery was 78 months (12 to 156). The average follow up after revision surgery was 26.5 months (2 to 57). Four patients have died. Two patients were symptomatic with mild pain and stiffness while the rest are asymptomatic after their revision surgery. Conclusion In our study the mechanical failure was found to be the most common cause of failure of Scandinavian TARs. The outcome of revision surgery has been found to be satisfactory and comparable to other series that is reported in the literature.

Date: 2013-10-18

Session: Foot & Ankle Reconstruction

Time: 10:30 - 12:00

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Abstract no.: 33780

RESULTS OF ANKLE AND HIND FOOT ARTHRODESIS IN NEUROPATHIC DISORDERS

Balvinder RANA, Rajgopal ASHOK

Medanta Bone and Joint Institute, Medanta-The Medicity, Gurgaon (INDIA)

Introduction: Acquired Neuropathic disorders of the Foot and Ankle cause significant morbidity and often lead to amputations. This study was carried out to document the success/failure and complication rates of Ankle and Hind foot arthrodesis in non braceable Neuropathic deformities in carefully selected patients.

Patients and Methods: From November 2009 to January 2013, 18 cases of non braceable Neuropathic deformities of Foot and Ankle were treated by Tibiotalocalcaneal fusion (6 cases), Ankle fusion (6 cases), Triple Arthrodesis (4 cases) and Pantalar arthrodesis (2 cases).The disorders treated included Diabetic Charcot arthropathy (11 cases), iatrogenic Sciatic palsy (3 cases), stroke (2 cases), Leprosy (1 case) and traumatic palsy of the tibial and peroneal nerves (1 case). The results were analyzed with regard to wound healing and its complications, progress of union/non union rates and functional scores.

Results: There were three superficial and two deep infections in diabetic patients, one of these patients eventually had a below knee amputation. There was one non union in TTC fusions cases. Two ankle fusions had to be revised, one by repeat ankle fusion and one by TTC fusion. The AOFAS score was good in 7 cases, fair in 8 cases and poor in 3 cases.

Conclusion: Ankle and Hind foot arthrodesis in Neuropathic disorders has a high complication rate, especially in diabetics. However, it is a viable treatment option which can benefit patients who have a non braceable/ irreducible deformity of the Foot and Ankle, where the eventual non operative outcome is dismal.

Date: 2013-10-18

Session: Foot & Ankle Reconstruction

Time: 10:30 - 12:00

Room: MR1.01 & MR1.02

Abstract no.: 35938

COMPLEX MIDFOOT ARTHRODESIS

Maheswara AKULA, Nikolaos GOUGOULIAS

Frimley Park Hospital, Frimley (UNITED KINGDOM)

Midfoot arthritis involving tarsometatarsal and midtarsal joints presenting with chronic foot pain is a complex problem to treat. Patients-Methods: We are presenting single Surgeon's experience of 19 midfoot fusions between 2009-2012. Patients' mean age was 56.7 years (range 42-69). Three post-traumatic, one rheumatoid and 15 cases of primary osteoarthritis were included in this group. Additional procedures included hallux valgus deformity correction in four cases and hindfoot valgus correction in 5cases (two subtalar fusions , one triple fusion , two calcaneal osteotomies , one FDL transfer to augment tibialis posterior reconstruction). Results: Seventeen cases united successfully, and two non unions (10.5%) were revised including one in a chronic smoker. No infections occurred. Four patients (21%) had residual pain in different joints. Four of the six patients who were working at functionally demanding jobs returned to work at a mean of 5 months and two retired. Nine out 19 patients rated their outcome as excellent (47.5%), 8 out of 19 as good (42%) and 2 out of 19 (10.5%) as fair. Conclusions: Planovalgus or forefoot valgus deformities are often present in patients with tarsometatarsal joint osteoarthritis. Additional procedures are needed for foot re-alignment. Surgery is complex and a 10% nonunion rate is expected (consistent with the literature). Although 90% of patients rated their outcome as good or excellent, residual pain from the adjacent joints, due to overloading of other parts of the foot, was sometimes an issue.

Date: 2013-10-18

Session: Foot & Ankle Reconstruction

Time: 10:30 - 12:00

Room: MR1.01 & MR1.02

Abstract no.: 35063

SURGICAL MANAGEMENT OF SECONDARY SKEWFOOT AFTER PRIMARY TREATMENT OF CLUBFOOT IN CHILDREN

Irina KLYCHKOVA, Vladimir KENIS, Nadezda KOVALENKO-KLYCHKOVA
The Turner Scientific and Research Institute for Children's Orthopedics,
Saint-Petersburg (RUSSIA)

Introduction. Secondary skewfoot after primary treatment of clubfoot in children is quite common complication of extensive soft-tissue releases, especially carried out in elder children (after walking age). Mild deformities are well tolerable and do not need any special treatment. For severe deformities salvage procedures (corrective arthrodeses) can be done after skeletal maturity. In some cases of severe deformities correction is necessary before puberty, because of intolerance to normal footwear, pain and functional disturbances. Aim. To optimize surgical management of secondary skewfoot in children before skeletal maturity. Material and method. In 29 children (42 feet) with secondary skewfoot after primary treatment of clubfoot by extensive soft-tissue releases surgical management was carried out. Forefoot adduction was corrected by reconstruction of medial column with first cuneiform realignment, added by subtalar arthroereisis with titanium implant (19 feet) and bone graft (23 feet) for hindfoot valgus. Results. Extraarticular hindfoot stabilization is effective method of correction for hindfoot valgus in secondary skewfoot in children before skeletal maturity. Subtalar arthroereisis with titanium implant is sufficient in flexible deformities. Additional lateral release and extraarticular bone graft are necessary for rigid deformities. Reconstruction of medial column with first cuneiform realignment, intercuneiform and intermetatarsal release is sufficient for correction of residual forefoot adduction. Stable correction during 3 to 7 years follow up was observed in 86% of the cases. Conclusion. Combined method of surgical correction of secondary skewfoot after primary treatment of clubfoot helps to avoid extensive surgery and can be used for children before skeletal maturity.

Date: 2013-10-18

Session: Foot & Ankle Reconstruction

Time: 10:30 - 12:00

Room: MR1.01 & MR1.02

Abstract no.: 35096

SURGICAL CORRECTION OF CONGENITAL FIRST METATARSAL DEFORMITIES IN CHILDREN

Irina KLYCHKOVA, Nadezda KOVALENKO-KLYCHKOVA, Mihail KONYUKHOV, Vladimir KENIS

The Turner Scientific and Research Institute for Children's Orthopedics, Saint-Petersburg (RUSSIA)

Introduction: Congenital first metatarsal deformities lead to deterioration of weight bearing, inadequate distribution of load on the sole of the foot, disturbances during stance phase of walking cycle. Patients experience difficulties with wearing shoes, complain of pain after standing and walking. **Purpose:** Restoration of forefoot alignment, Lilevra's parabola, and improvement of biomechanics of the foot. **Materials and Methods:** 19 patients aged from 6 months to 17 years with congenital deformities of the first metatarsal were included in the study. Polydactyly of the first ray with deformity of the first metatarsal was revealed in 12 children, isolated metatarsal deformity – in 4 patients, polysyndactyly with deformity of the first metatarsal in 3 patients. Radiological investigation included plain radiographs and computed tomography with 3-dimensional reconstruction. All patients were divided into groups according to type, severity and age. **Results:** First stage of surgical correction was aimed to restoration of alignment in order to provide linear growth of the first metatarsal. Restoration of the length was carried out (fully or partially - depending on the type and degree of deformity) using autologous bone graft. The second stage was aimed to correction of the residual shortening after the age of skeletal maturity. **Conclusion:** Surgical correction of the first metatarsal abnormalities in children should be address both to angular deformities and length of the bone.

Date: 2013-10-18

Session: Foot & Ankle Reconstruction

Time: 10:30 - 12:00

Room: MR1.01 & MR1.02

Abstract no.: 33922

SHORT SCARF OSTEOTOMY FOR HALLUX VALGUS - MEDIUM TERM RESULTS

Rajesh RACHHA¹, Rakesh DALAL¹, Saqib JAVED¹, Zuned HAKIM¹, Ajay CHOURASIA²

¹STOCKPORT NHS FOUNDATION TRUST, STOCKPORT (UNITED KINGDOM), ²stockport NHS foundation trust,, Stockport (UNITED KINGDOM)

Introduction: The scarf osteotomy as described by Barouk is a universal procedure for moderate and severe hallux valgus. The technique requires extensive exposure, fixation and increased operative time. We present a 'short' scarf osteotomy, which retains all the cuts, but requires a reduced exposure, less metalwork, less operating time and is more economical.

Materials and Methods: 53 patients and 60 feet were included in the study. There were 15 males and 38 females. Age range was 32-76 with an average age of 59. Minimum follow-up was 12 months. Standardised pre-operative and post-operative radiographs were taken. Intra-operative parameters used were length of surgical incision, length of bone exposure, fixation used and operating time. Radiological assessment of films measuring sesamoid coverage and its improvement post-operatively was made. Patient satisfaction was performed by questionnaire and review of post-operative clinical notes.

Results :Good to excellent results were noted in 48 patients (52 feet). There were four radiological over corrections not requiring any further surgery. Two patients had persistent pain due to arthritic change with a further two patients having superficial wound infections not requiring any surgical intervention.

Conclusion: We believe that this osteotomy offers good to excellent results in most cases of hallux valgus and is stable. Biologically, the decreased exposure should improve healing and reduce chances of avascular necrosis. The cost per case and theatre turnaround time was also favourably affected in our series. We strongly recommend this osteotomy for most cases of hallux valgus surgery.

Date: 2013-10-18

Session: Foot & Ankle Reconstruction

Time: 10:30 - 12:00

Room: MR1.01 & MR1.02

Abstract no.: 34159

RESULTS OF A SURGICAL STRATEGY FOR SALVAGE OF FAILED SILASTIC JOINT REPLACEMENTS

Rajesh RACHHA, Omar ALASAWAF, Gerard LATTOUF, Saqib JAVED, Amer SHOAIB

STOCKPORT NHS FOUNDATION TRUST, STOCKPORT (UNITED KINGDOM)

Background: Salvage of failed silastic hallux metatarso phallenageal joint replacement presents a surgical challenge. Options include removal alone, revision arthroplasty and fusion. The largest published series of salvage procedures is only 14, and describes the procedure as technically demanding. In this study, we describe a novel technique of bony distraction arthrodesis with satisfactory results. **Methods:** Patients symptomatic following silastic joint replacements were treated surgically. Iliac crest graft was used to produce a geometrically congruent bone block. The bone block was secured with memory staples and the patient was mobilized in a heel weight bearing shoe. The patients were allowed to return to normal foot wear at six weeks. They were evaluated with radiographs at six and twelve weeks, and with the AOFAS score at twelve weeks. **Results:** 10 patients underwent surgery. All had painful joints and 8 had transfer metatarsalgia. Significant bony lysis was seen in 7 of these patients. After 6 weeks, 9 were almost pain free. One patient had continued pain and was diagnosed with complex regional pain syndrome. All had achieved union. AOFAS scores went up from a mean of 48 to 69 ($p<0.05$). Two patients had harvest site discomfort. **Conclusions:** Our technique was reliable in achieving bony union in all patients in this series, and the mean improvement in AOFAS score was statistically significant. There may be a role for silastic joints in the treatment of hallux rigidus, but failure can result in prolonged pain and challenging revision surgery.

Date: 2013-10-18

Session: Foot & Ankle Reconstruction

Time: 10:30 - 12:00

Room: MR1.01 & MR1.02

Abstract no.: 34241

FUNCTIONAL OUTCOME AFTER OPEN REPAIR OF TENDO ACHILLES RUPTURE –A PROSPECTIVE STUDY OF 16 CASES

Sandeep KASHYAP, Mukand LAL

Indira Gandhi Medical College Shimla, Shimla (INDIA)

BACKGROUND: Rupture of tendoachilles is one of the common tendon injuries that causes serious morbidity owing to its chief role in ambulation. The purpose of our study was to evaluate the functional status after open repair of Tendo Achilles rupture in 16 cases of non sports related injuries.

MATERIAL AND METHODS: 16 patients were prospectively followed between 2001-2011. The mean age was 39.3 years with 6 females. Traumatic cuts were found in 5, Post Steroid Injection tears in 2 and 9 patients had degenerative ruptures.

RESULTS: The mean follow up was 2.9 years (1-11.3 yrs) and mean duration between injury and surgery was 16 days (20hrs-60 days). The mean time to return for activities of daily living was 10.3 weeks (9-12 weeks). 11 patients returned to pre injury Level of activity after mean time of 24.5 weeks (21-28 weeks). The active range of Motion difference between ankles was less than 6 degree in 10 patients. The Standing time on Tip Toes in 9 patients was more than 30 seconds. Rupp Score as modified by Kerkhoffs et al was good to excellent in 13 patients.

Superficial skin infection was seen in 4 patients that subsided with antibiotics. 1 patient had deep vein thrombosis and subsequent re rupture and none had skin necrosis.

CONCLUSIONS: Operative treatment is effective with good functional outcome and minimal complications. Our study is different as majority of patients had degenerative rupture and none had sports related injury. Reinforcement with plantaris/fascia should be done in degenerative/ post injection tears.

Date: 2013-10-18

Session: Foot & Ankle Reconstruction

Time: 10:30 - 12:00

Room: MR1.01 & MR1.02

Abstract no.: 34165

DO OLDER PATIENTS BENEFIT DISPROPORTIONATELY MORE FROM ACHILLES TENDON REPAIR?

Rajesh RACHHA¹, Zuned HAKIM², Cezary KOCIAŁKOWSKI¹, Amer SHOAIB¹

¹STOCKPORT NHS FOUNDATION TRUST, STOCKPORT (UNITED KINGDOM), ²Stockport NHS foundation trust, Stockport (UNITED KINGDOM)

Introduction: The limited literature on recurrence of Achilles Tendon rupture in the elderly suggests that they function better with surgery. Younger patients are often treated operatively but older patients are treated conservatively in plaster. The reason for non-operative management is the risk of wound breakdown in the older patient. New minimally invasive techniques involve a much smaller wound and results in a biomechanically strong repair. The use of this technique in older people has not yet been evaluated. **Method:** 15 patients over the age of 50 who would normally have been treated conservatively were treated with the Achillon device. The incision was 3 cm long. Patients were managed postoperatively in air cell boot fully weight bearing with heel wedges. They returned to normal shoes after seven weeks. They were followed up for a minimum of six months. **Results:** The average age in 15 patients was 58 years. All patients were allowed fully weight bearing after the surgery. There were no wound breakdowns. There was one superficial wound infection. There were no re-ruptures. The patients all had grade 5 power at seven weeks. **Discussion:** The treatment of Achilles tendon ruptures in older patients is controversial. The reasons for avoiding surgery are no longer valid as there exists a minimally invasive option with minimal risk of complications. The reasons for surgical treatment of younger patients are valid for older patients and we should reconsider our surgical choices in the light of these findings as they could be viewed as ageist.

Date: 2013-10-18

Session: Foot & Ankle - Trauma & Reconstruction

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 35958

**SOFT TISSUE SWELLING AFTER ANKLE FRACTURES: AN AUDIT ON
TIMING OF SURGERY, LENGTH OF HOSPITAL STAY AND THE
ECONOMIC BURDEN**

Ali NAJEFI, Mohamed SUKEIK, Pranab SINHA, Krishna VEMULAPALLI
Queens Hospital, London (UNITED KINGDOM)

Delays in ankle fracture fixation are often due to accompanying swelling. On the other hand, the delay in operative fixation beyond 24 h from injury is associated with lengthening of hospital stay and increased economic burden on healthcare systems. The aim of this study was to analyse the relationship between the delay in surgical fixation of ankle fractures from presentation due to ankle swelling, and the resultant length of hospital stay and postoperative complications. A retrospective study of 68 consecutive patients treated for ankle fractures was conducted over a period of 6 months between April and October 2012. Results were collated excluding talar and pilon fractures. Notes were reviewed for inpatient stay and postoperative complications. There were 34 male and 34 female patients with a mean age of 43 years. In total, 44 (65%) patients were operated on within 24 hours of presentation (early group) and 24 patients' surgery was delayed beyond 24 hours (delayed group). Of the delayed group, 58% of the cases had swelling as the cause of a postponed operation, whereas other causes included lack of theatre time and lack of fitness for surgery. In the early group, two patients (4%) had wound infections whereas four patients from the delayed group developed wound infections all of whom were from patients with ankle swelling (29%). We therefore recommend a policy to provide early operative intervention for patients with fractured ankles prior to the development of swelling as this would result in improved patient outcome and significant financial savings.

Date: 2013-10-18

Session: Foot & Ankle - Trauma & Reconstruction

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 35925

THE “SAGITTAL SHIFT” TEST IS NOT MORE RELIABLE THAN THE STANDARD HOOK TEST IN DIAGNOSING TIBIOFIBULAR SYNDESMOTIC INSTABILITY.

Prasad ELLANTI¹, Nikos DAVARINOS¹, Mary CONNOLLY¹, Priyanka ELLANTI², Seamus MORRIS¹

¹AMNC Hospital, Dublin (IRELAND), ²Waterford Regional Hospital, Waterford (IRELAND)

Background: Syndesmotic instability is assessed intraoperatively with the hook test as described by Cotton. A bone hook is used to apply a lateral force on the fibula and widening of the syndesmosis is diagnostic for syndesmosis disruption. Recent cadaveric studies have suggested that displacement of the fibula in the sagittal plane on lateral stress views is greater and therefore more reliable. To the best of our knowledge there are no clinical studies verifying these cadaveric study findings.
Methods: All Danis-Weber-C ankle fractures over a six month period were enrolled. A further 5 Danis-Weber-B ankle fractures were enrolled as controls. The standard hook test was employed to confirm syndesmotic instability. The hook test was once again performed on the sagittal plane, i.e the “sagittal shift test”, with the hook displacing the fibula anteriorly and posteriorly. Radiographs before and during the stress tests were analysed for the extent of displacement of the fibula.
Results: 20 Danis-Weber type-C ankle fractures were included in the study. The majority were male(80%) with a mean age of 35.5years. The mean displacement of the fibulae in the Danis-Weber-C ankles in the sagittal plane was 4.2mm compared to the coronal plane 3.9 mm.
Conclusion: The sagittal shift test demonstrated greater displacement of the fibula however, the hook test was just as reliable in detecting syndesmotic instability. The additional radiograph required to perform the sagittal shift test meant more radiation exposure for the patient. We concluded that the hook test is just as reliable and advocate its continued use.

Date: 2013-10-18

Session: Foot & Ankle - Trauma & Reconstruction

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 34546

A RETROSPECTIVE STUDY OF 13 MISDIAGNOSED POSTERIOR PILON FRACTURE TREATED AS TRIMALLEOLAR FRACTURE

Li CHEN, Xin MA, Xu WANG, Jia-Zhang HUANG, Chao ZHANG

Department of Orthopaedics, Huashan Hospital of Fudan University,
Shanghai (CHINA)

Objective: Posterior pilon fractures with the involvement of the entire posterior tibial plafond have been reported recently. This special type of trimalleolar fracture is subtle to detect because of the low incidence. Management of the posteromedial tibial fragment has not been consistent. **Methods:** In a 5-year period, 256 patients with operative ankle fractures who were evaluated with both x-ray and CT were included. 24 posterior pilon fractures were identified. 13 patients' posteromedial fractures were not initially recognized and they had a standard lateral fracture repair (A group); 11 patients were treated with open anatomic reduction of the posteromedial fragments with screw or buttress plates (B group). **Results:** All of the 24 patients returned at an average of 23 months' follow-up. Of the 13 patients who were in the A group, 9 (69%) had more than 2 mm of joint incongruity at the posterior articular fracture edge as compared with no patients in B group as measured on postoperative computed tomography scans. At latest follow-up, 2 (15%) patients in the A group had radiographic evidence of subluxation of talus compared with no patients in the B group. AOFAS score for the A group was 72.4 compared with 88.2 for the B group ($P<0.05$). **Conclusion:** Failure to identify the posterior pilon fracture leads to poor outcomes. The result was good in patients with anatomic reduction and stable fixation of posteromedial fragment.

Date: 2013-10-18

Session: Foot & Ankle - Trauma & Reconstruction

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 34459

**NEW TECHNIQUE OF PERCUTANEOUS FIXATION OF DISPLACED
INTRA-ARTICULAR CALCANEAL FRACTURE**

Anjan PAN

CMRI Hospital, Kolkata (INDIA)

Operative treatment modalities of calcaneal fracture are still controversial. The outcome of intra-articular calcaneal fracture is mainly influenced by the soft tissue and subtalar joint. Percutaneous method of internal fixation has been attempted to avoid these problems. Patients with displaced intra-articular calcaneal fracture types IIA, IIB, IIC and selective cases of type III were treated by initial distraction of subtalar joint, restoration of length of calcaneum and restoration of height of calcaneum with joystick manipulation, Reduction of lateral expansion was done with lateral compression by vice and finally fixed with full threaded cannulated screws percutaneously . Twenty-eight patients with thirty-one calcaneal fractures were included. After a mean follow up of 21/2 tears and with American Orthopaedic Foot and Ankle Society hind foot score 82 points out of 100. Percutaneous fixation of calcaneal fracture is safe and good alternative method in type IIA, IIB, IIC and selective cases of type III fracture.

Date: 2013-10-18

Session: Foot & Ankle - Trauma & Reconstruction

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 34999

LONG-TERM FOLLOW-UP AFTER OPEN REDUCTION CALCANEAL FRACTURES: COHORT STUDY OF THE 48 CASES

Aleh KORZUN, Alexander BELETSKIY, Alexandre SITNIK, Alexander LINOV

Republic Scientific Practical Center of Traumatology and Orthopedics, Minsk (BELARUS)

Background: Open reduction is a good standard option in intraarticular calcaneal fractures, but long-term results is quite different. The value of the prognostic factors influencing and predicting the outcome having been debated till recently. **Materials & Methods:** we retrospectively analyzed forty five patients with forty eight intraarticular calcaneal fractures in whom ORIF was performed in our hospital between March 2005 and September 2011. The mean age was $34,8 \pm 4,67$ years. According to Sanders there were type 2 – 15; type 3 – 32 and type 4 – 1 cases. The mean time of the follow up was $5,6 \pm 3,1$ years (2-8 years). **Main outcome measurements includes:** Maryland foot score, arthrosis degree, secondary surgery rate. **Results and conclusions:** the main prognostic factors associated with excellent or poor result after ORIF of the calcaneal fracture are: surgeon's experience, timing of the surgery, quality of the open reduction and patients age. So the best long-term results were achieved in relatively young patients, operated during 14 days after accident by experienced surgeon provided that good quality of the reduction achieved.

Date: 2013-10-18

Session: Foot & Ankle - Trauma & Reconstruction

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 34881

**CLINICAL OUTCOMES OF ANTERIOR OPEN REDUCTION AND
POSTERIOR PERCUTANEOUS SCREW FIXATION FOR DISPLACED
TALAR NECK FRACTURES**

Su-Ri CHONG, Byung-Ki CHO, Yong-Min KIM, Eun-Myoung LEE

Chungbuk National University Hospital, Cheongju (SOUTH KOREA)

Introduction: Anteroposterior screw fixation is known to be biomechanically stronger than posteroanterior screw fixation. However, there are few literature about the correlation between clinical results and more strength by posteroanterior fixation. This study was performed to evaluate clinical outcomes of posterior percutaneous screw fixation for displaced talar neck fractures. **Methods:** Fifteen cases were followed up for more than 2 years after posteroanterior fixation using headless compression screw. All patients underwent an accelerated rehabilitation including ROM(range of motion) exercise at one week postoperatively, the partial weight bearing at six weeks. Clinical evaluation was performed according to American Orthopaedic Foot and Ankle Society(AOFAS) score and Hawkins criteria. As radiographic evaluation, the degree of articular surface depression, the period to union, and the occurrence rate of complications such as avascular necrosis through MRI were measured. **Results:** AOFAS score was average 90.2 points at final follow-up. 14 cases(93%) achieved satisfactory results according to Hawkins criteria. The degree of articular surface depression had improved significantly from preoperative average 5.4mm to 1.1mm at final follow-up. All cases achieved bone union, and the period to union was average 12.5 weeks. There were 3 cases of avascular necrosis and 2 cases of post-traumatic arthritis. However, there was no case of subsequent fusion or additional operation. **Conclusion:** Anterior open reduction and posterior percutaneous headless screw fixation seems to be an effective surgical method for displaced talar neck fractures, because of the possibility of accurate articular restoration, the fixation strength enough to early rehabilitation, and the needlessness of hardware removal.

Date: 2013-10-18

Session: Foot & Ankle - Trauma & Reconstruction

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 34247

FUNCTIONAL OUTCOME AFTER EARLY OPEN REDUCTION AND FIXATION OF TARSOMETATARSAL (LISFRANCS) INJURIES - A PROSPECTIVE STUDY OF 52 CASES

Sandeep KASHYAP

Indira Gandhi Medical College Shimla, Shimla (INDIA)

Tarsometatarsal (Lisfrancs) fracture dislocations require a high index of suspicion as approximately 20 percent of the injuries are missed. We report outcome in 52 patients treated with early open reduction and fixation. We have also proposed a new classification based on comprehensive inclusion of both ligamentous and bony injuries with treatment and prognosis in each subgroup. This is a prospective study of 52 patients operated between 2007 and 2011. The mean time between injury and surgery was 1.7 days. 15 patients had open fracture dislocations. Kirschner wires were used in 24 cases and screw fixation in 28 cases. At final follow up functional status was evaluated by Maryland Foot score, American orthopaedic foot and ankle society mid foot score and SF-36 scoring for general health status. The mean follow up was 1.9 years (11-55 months).The mean age was 35.2 years (19-62 years) with 32 males. The mean Maryland Foot score was 84.1 and American orthopaedic foot and ankle society mid foot score was 82.2. Physical component and Mental component score more than 45 on Short form-36 scale was seen in 44 (84.61%) patients. Superficial skin infection was seen in 11 patients that subsided with antibiotics. 5 patients had deep infection and four needed surgical debridement. Skin necrosis occurred in 5 patients with open fractures that required split skin grafting.Early reduction leads to promising results with minimum complications. We believe our classification is comprehensive and covers all injuries including occult ligamentous injuries requiring fixation. .

Date: 2013-10-18

Session: Foot & Ankle - Trauma & Reconstruction

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 34751

A COMPARISON STUDY OF TWO DIFFERENT SCREWS UTILIZED IN ARTHRODESIS OF FIRST METATARSOPHALANGEAL JOINT.

Ashwanth RAMESH¹, Farschid MALEKI¹, Johnny MCKENNA¹, Kate HUNTER²

¹St James Hospital, Dublin (IRELAND), ²Trinity College Dublin, Dublin (IRELAND)

Introduction: First metatarsophalangeal joint arthrodesis is carried out for a variety of pathologies including hallux valgus, hallux rigidus and rheumatoid arthritis. We performed a retrospective analysis of first MTPJ arthrodeses using two different cannulated compression screws with differential pitch design. Objective was to compare the fusion rates of first MTP joint and evaluate functional outcomes. **Methods:** 200 fusions were carried out between September 2008 and December 2012. The total of 156 patients (200 feet) was made up of 145 female and eleven male included in the study. Mean age was 62.4 years. 92 of 156 patients had surgery using two crossed Acutrack screws and the 64 with two crossed bold screws. Patients were evaluated clinically and by X-rays at 6 weeks and three months. Functional outcome scores were also carried out using Manchester-Oxford Foot Questionnaire. **Results:** The failure rate for the Acutrack screws was 4.1% and 9.4% for the Bold screws. Acutrack screws have shown a much higher fusion rate and lower failure rate than the bold screws. The MOFQ results have also shown significant improvement in all three domains in patients with Accutrack screws.

Date: 2013-10-18

Session: Foot & Ankle - Trauma & Reconstruction

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 34673

META ANALYSIS OF TREATMENT OF ACHILLES TENDON RUPTURE WITH SUB-GROUP ANALYSIS OF ACCELERATED REHABILITATION STUDIES

Umar ABDULMAJID¹, Sanjeeve SABHARWAL², Nirav PATEL³, Ivor VANHEGAN⁴, Mathew BALDWIN⁵, Davinder Paul BAGHLA⁵

¹Leicester Royal Infirmary, Leicester (UNITED KINGDOM), ²Imperial College Department of Surgery, London (UNITED KINGDOM), ³Hillingdon Hospital, London (UNITED KINGDOM), ⁴UCL Institute of Orthopaedics, London (UNITED KINGDOM), ⁵Ealing Hospital, London (UNITED KINGDOM)

Introduction: The aim of this meta-analysis is to compare surgical and non-operative management of acute achilles tendon rupture. Sub-group analysis of the most recent randomized evidence is used investigate the impact of early ankle movement on the relative efficacy of surgical and non-surgical management. **Methods:** A systematic review of the literature was performed according to published guidelines. Embase, Medline, Google Scholar and the Cochrane Library were searched for randomized studies published between 1966 and December 2012 comparing re-rupture, infection and other complication rates following surgical and non-operative management of Achilles tendon rupture. **Results:** Ten studies which included 810 patients were identified: 400 patients were managed surgically and 410 patients were managed non operatively. Meta-analysis showed a significant increase in re-ruptures in patients managed non-operatively (OR 0.38, 95% CI 0.20-0.71). Sub-group analysis of studies where ankle movement was commenced early did not show a significant difference in re-ruptures between both groups (OR 0.56, 95% CI 0.22-1.44). Patients who were managed surgically had a higher risk of other complications (OR 4.20, 95% CI 0.93-18.99). **Conclusions:** Surgical treatment of acute achilles tendon rupture significantly reduces the risk of re-rupture compared to non operative management, however there is no significant difference in the risk of re-rupture if early mobilisation or accelerated rehabilitation pathways are adopted. Operative intervention is also associated with a significantly higher risk of infection. When informed consent is sought patients should be informed of the risks of surgery and the equivocal benefit when best-practice surgical and non-operative management is compared.

Date: 2013-10-18

Session: Foot & Ankle - Trauma & Reconstruction

Time: 14:00 - 15:30

Room: MR1.01 & MR1.02

Abstract no.: 34282

EFFECTIVENESS OF STEROID INJECTION IN MORTONS NEUROMA.

Dheeraj MAKKAR, Hak Jun KIM

guro hospital, seoul (SOUTH KOREA)

Objective:Mortons neuroma is a compressive neuropathy of interdigital nerve. The exact cause of formation of this condition is still unknown. It commonly presents as pain and paresthesia in second or the third web space and is clinically diagnosed by Mulders sign. Ultrasonography is commonly used to confirm the diagnosis. **Materials and methods:**From 2008 to 2012 we diagnosed and treated 30 individuals within the age group of...36-72 years.They were administered local steroid injections under sonographic guidance. All the patients were followed up at 1,3,6,9 and 12 months. They were asked to answer the questions on Johnson's scale and grade pain on VAS scale at each follow up. **Results:**Out of 30 patients treated with steroid injections in this study 9(30%) had absolute pain relief, 3(1%) had partial relief 18(60%) had no relief, or aggravation of pain. The results remained the same at 12 months follow-up.the mean pre injection and post injection VAS scores were 5 and 2.The mean size of neuroma was $0.83 \pm 0.42\text{cm} \times 0.54 \pm 0.14\text{cm}$. There was a significant difference in VAS and patient satisfaction in case longitudinal and horizontal length was smaller than 0.5cm and 0.4cm. ($P<0.05$).**Conclusion :**The patients presenting with complaints in second web space in comparison with third webspace, a neuroma size of 5mm x 4mm, age <60 years hold a good prognosis with local steroid injections.

Date: 2013-10-18

Session: Osteoarticular Infections

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 33722

SERUM PROCALCITONIN MEASUREMENT IN THE EARLY DIAGNOSIS OF ACUTE OSTEOMYELITIS AND SEPTIC ARTHRITIS – A PROSPECTIVE STUDY

Karthikeyan MAHARAJAN

Sri Manakulla Vinayagar Medical College and Hospital, Puducherry (INDIA)

Introduction: Early diagnosis of acute osteomyelitis and septic arthritis is of vital importance to avoid complications. Pus culture and sensitivity which is considered as a gold standard is not truly a gold standard due to its varied positivity rates. Serum Procalcitonin has been found to be an accurate marker in differentiating pyogenic infection from non pyogenic causes of inflammation.

Objectives: To show Serum Procalcitonin is an accurate marker in diagnosing Acute Osteomyelitis and Septic Arthritis; To evaluate Sensitivity, Specificity and Predictive values of Serum Procalcitonin for identifying acute bone and joint infections.

Patients and methods: Patients of all age groups (n=82) with suspected acute osteomyelitis and septic arthritis were prospectively included. Total count, CRP, serum Procalcitonin, IgM ELISA Dengue and Chikungunya were estimated and bacteriological samples for pus and blood C/S were collected. At the end of the study, patients were classified into: Group 1 - Confirmed Pyogenic (n=27); Group 2 - Presumed Pyogenic (n=21); Group 3- Non – Pyogenic inflammatory/viral (n=34). The details of the study design and analysis will be discussed.

Results: Serum Procalcitonin was found to have statistically significant higher mean values in Confirmed Pyogenic group. At a cut – off of 0.4ng/ml, Serum Procalcitonin was found to be 85.2% sensitive and 87.3% specific in the diagnosis of Septic Arthritis and Acute Osteomyelitis with a Positive and Negative Predictive Value of 77% and 92% respectively.

Conclusion: Serum Procalcitonin is a sensitive and specific marker in the diagnosis of Septic Arthritis and Acute Osteomyelitis.

Date: 2013-10-18

Session: Osteoarticular Infections

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 35834

DITHIOTHREITOL TO IMPROVE THE DIAGNOSIS OF PROSTHETIC JOINT INFECTIONS

Carlo ROMANO, Nicola LOGOLUSO, Delia ROMANO, Lorenzo DRAGO
ISTITUTO ORTOPEDICO IRCCS GALEAZZI, MILANO (ITALY)

Introduction: Diagnosis of biofilm related prosthetic joints infection (PJI) remains a challenge, despite in recent years new techniques for identification of bacteria involved in this pathology were developed. In this study we evaluated the ability of a sulfhydryl compound which is routinely used in microbiology laboratories, dithiothreitol (DTT), to dislodge bacteria from biofilm, keeping them alive and cultivable, also for antibiotic susceptibility testing. We compared DTT treatment against sonication and periprosthetic tissue culture, in order to establish if it could be introduced in routine microbiological analysis on PJs. **Methods:** The prospective study was conducted on prosthetic material explanted form 76 patients, 34 with aseptic loosening of their prosthesis and 42 with PJI. **Results:** Sonication provided a higher sensitivity (71.4%) and specificity (94.1%) respect to periprosthetic tissue culture, while DTT treatment showed the same specificity value of sonication but a better sensitivity (85.7%), especially when the causative microorganism was *Staphylococcus epidermidis*. **Discussion and Conclusion:** This study shows that DTT gives similar results to sonication in terms of bacterial yielding and specificity, with better sensitivity. DTT treatment can be used for PJs diagnosis, thanks to its ease of use, low-cost and high sensitivity and specificity.

Date: 2013-10-18

Session: Osteoarticular Infections

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 35754

**DISPOSABLE ANTI-BACTERIAL COATING FOR PREVENTION OF
IMPLANT-RELATED INFECTIONS IN ORTHOPAEDICS**

Carlo Luca ROMANO¹, Lorenzo DRAGO¹, Maria HAENSCH², Lieve VAN MELLAERT³, Konstantinos MALIZOS⁴, Milena FINI⁵, Enzo MEANI⁶

¹ISTITUTO ORTOPEDICO IRCCS GALEAZZI, MILANO (ITALY),

²UNIVERSITAETSKLINIKUM HEIDELBERG, HEIDELBERG (GERMANY),

³KATHOLIEKE UNIVERSITEIT, LEUVEN (BELGIUM), ⁴Institute for Research and Technology Thessaly/CERETETH, LARISSA (GREECE),

⁵ISTITUTO ORTOPEDICO IRCCS RIZZOLI, BOLOGNA (ITALY),

⁶ISTITUTO ORTOPEDICO G. PINI, MILANO (ITALY)

Introduction: Implant-related infection remains among the main reasons for failure of joint prosthesis with high associated social and economical costs. Here we report the results of a study performed under the European 7th Framework Programme (collaborative research project number 277988), concerning the efficacy in reducing bacterial colonization of an implant through a fully resorbable hydrogel antibacterial coating (Disposable Antibacterial Coating, DAC). The patented tested hydrogel, a co-polymer comprising hyaluronic acid and poly-lactic acid, can be mixed just before its use with various antibacterial agents. **Methods:** In vitro studies were conducted using DAC coating on different biomaterials, including titanium, chrome-cobalt and polyethylene discs. In vivo studies were performed on 35 rabbits divided in 7 groups. Animals were implanted with an intramedullary titanium rod in their femur, with a known inoculum of methicillin-resistant Staph. aureus. 2% and 5% vancomycin-loaded DAC was used and compared to controls. **Results:** In vitro studies showed the ability of the hydrogel to be loaded and to sustain release for up to 96 hours of the following antibacterial/antibiofilm compounds: vancomycin, ciprofloxacin, meropenem, gentamycin, amikacin, tobramycin, clindamycin, doxycyclin, linezolid, NAsalycilate, N-acetylcisteine. In vivo studies showed a bacterial load reduction ranging from 94% to 99.9% using vancomycin-loaded DAC, compared to controls. **Discussion:** DAC, a fast-resorbable antibacterial carrier, showed the ability to be loaded with various antibacterial compounds and a highly significant reduction of bacterial colonization of implanted biomaterials in an animal model, opening a new pathway to local prevention and treatment of biofilm-/implant-related infections.

Date: 2013-10-18

Session: Osteoarticular Infections

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 35656

ANTIBIOTIC IMPREGNATED CEMENTED INTRA-MEDULLARY NAIL

Mayank BANSAL

MLB Medical College, Jhansi (INDIA)

Introduction: In infected non-union, eradication of the infection is most crucial step. Antibiotic Impregnated Cemented Intra-medullary Nail (AICIN) locally releases a higher concentration of antibiotics n help eradicating the infection. Also it act as an internal splint n reduces the need of an External Fixator. **Materials and Methods:** We prospectively studied 36 cases of infected non-union (23 Tibia, 10 Femur and 3 Humerus). AICIN was used in all cases after adequate debridement. Infection control was evaluated Clinically, Radiologically n Hematologically. An average follow-up time was 8 months. The mean duration of retention of AICIN was 8 weeks. **Results:** 19 patients achieved good infection control after AICIN. 8 cases underwent 2nd AICIN after another debridement. 5 patients were lost in followup. 8 patients (4 after primary AICIN and 4 after 2nd AICIN) did not respond to the procedure. 5 patients achieved bony union without any need of 2nd procedure. 18 cases required a secondary procedure in the form Interlocking nailing +/- bone grafting or Ilizarov / LRS to achieve union. **Conclusion:** AICINs are useful for infection control in cases of infected non-union.

Date: 2013-10-18

Session: Osteoarticular Infections

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 33641

**SAFE DUALCORE UNIVERSAL NAIL ® (PAT.PEND.).
INTRAMEDULLARY FIXATION DEVICE TO PREVENT AND TREAT
PATIENTS WITH HIGH RISK OF INFECTION.**

Nuno CRAVEIRO-LOPES

Orthopedic Department., Garcia de Orta Hospital, Almada (PORTUGAL)

The SAFE DualCore Universal nail is a device with the interior filled with PMMA with antibiotics, which are released gradually through holes. It is intended to be used in open fractures, bone lengthening or conversion of exfix and in bone infection. The antibiotic release was tested by titration of antibiotic concentration on a elution liquid. For testing flexural strength, nails were used with and without cement and with a metal reinforcing rod inside the cement. We reviewed the results of the first 12 patients treated with this new nail, including 2 cases of open fracture, 4 of lengthening with ExFix, 2 of knee arthrodesis after infected TKR, 2 ankle after open fracture and 2 cases of osteomyelitis. This new nail filled with cement has twice the resistance of the standard Grosse Nail and with the DualCore technology, with a metal rod reinforcing the cement, the resistance was more than three times the standard Grosse nail. With respect to the release of antibiotic we observed release levels greater than 14 micrograms per milliliter when using 2 grams of Vancomycin. In the 12 patients operated with this type of device, it was possible to control bone infection and obtain the consolidation of the lesions in all cases. This device may represent an added value to treat this pathologies because it is a simpler and quicker procedure, provide superior resistance than normal nails, allows appropriate antibiotic selection with local administration of high and prolonged doses, thus avoiding propagation and recurrence of infection.

Date: 2013-10-18

Session: Osteoarticular Infections

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 34874

SKELETAL TUBERCULOSIS FOLLOWING FRACTURE FIXATION

Sudhir KUMAR¹, Ashish RUSTAGI¹, Anil ARORA²

¹University College of Medical Sciences & GTB Hospital, Delhi, INDIA, delhi (INDIA), ²Max Super-Speciality Hospital, Patparganj, delhi, delhi (INDIA)

Prosthetic joint infections due to *Mycobacterium.tb* have been reported; however, it is extremely rare to find tuberculosis causing deep infection around fracture-fixation implants. We report the clinical presentations and outcomes of seven cases treated at our hospital. Methods: There were 5 males & 2 females with mean age of 41 years. Femur was fractured in five cases, while tibia and ulna in one each. Internal fixation was done in 6 cases, while external fixation in one. Wound healed uneventfully after first surgery in all cases. These patients developed chronic discharge at the local site after a mean period of 6.4 months (range 3-12 months). Debridement was carried out and material was subjected to Gram & AFB staining, culture, histopathology & PCR for *Mycobacterium.tb*. Two patients showed granuloma histopathologically while 5 were positive for PCR for *Mycobacterium.tb*. Multidrug ATT was given to all for a period of 9-12 months. Infection subsided and wound healed after a mean period of 11.4 months in all. All patients were symptom-free at a mean follow-up of 6.7 years. Discussion: Tubercular bacteria can involve an implant site by hematogenous spread from activation of a latent distant focus or local reactivation of dormant bacteria. Major trauma can cause lowering of immunity in its initial stages. The treatment is based on the same principles as are used for the treatment of any deep SSI with ATT. We believe that tuberculosis should be kept in mind as a possible cause of deep infection in zones endemic for tuberculosis.

Date: 2013-10-18

Session: Osteoarticular Infections

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 33657

TUBERCULOSIS OF CALCANEUM IN CHILDREN: A SERIES OF 11 CASES

Kumar Shashi KANT, Anil AGARWAL

Chacha Nehru Bal Chikitsalaya, New Delhi (INDIA)

Abstract Background: The purpose of our study was to examine the presentation, healing response, and functional outcome of calcaneal tuberculosis in paediatric patients. **Material and methods:** We retrospectively reviewed 11 cases in 10 children. There was one patient with bilateral involvement. All patients had received multidrug antitubercular treatment. Serial plain radiographs were obtained to see evidence of remineralisations, obliteration of cavities and subtalar configuration. At follow up, passive subtalar movement , Subtalar configuration and calcaneal deformation was assessed. **Results:** Average follow up post completion of treatment was 17 months (range, 8-60 months). The mean age was 9.8 years with 7 male and 3 female patients. One patient was multifocal tuberculosis with involvement of bilateral calcaneum. 'Heel-up' sign was present in all patients. Radiologically, in 7 cases there were single lytic lesion and in 4 cases, there were multiple lytic lesions with diffuse involvement. At final follow up no pain was reported on level walking when weight bearing was full. Resolution of larger cavities was delayed radiologically. Residual subtalar changes with affection of range of motion were seen in these 3 cases with subtalar arthrodesis in one case. **Conclusions:** 'Heel up' sign is particularly suspicious and should be investigated for tubercular calcaneal infection in endemic regions. Central granuloma presentation is common. Pathological fractures and involvement of subtalar joint are less common. The lytic lesion in bone persists for several years without innocuous consequences. **Key words:** calcaneum; osteoarticular tuberculosis; child; osteomyelitis

Date: 2013-10-18

Session: Osteoarticular Infections

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 35548

PHTHISIS (TUBERCULOSIS) OF THE FOOT – A REVIEW OF 30 CASES

Vipul VIJAY, Vineet TYAGI, Alok SUD, Anil MEHTANI

Lady Hardinge Medical College, New Delhi (INDIA)

Introduction - Isolated tuberculosis of the foot is an extremely rare entity present in less than 3% of cases. Tuberculosis has been described as a great imitator and in the foot, it can mimic a pyogenic osteomyelitis, tumour or madura foot. Knowledge of different presentations of tuberculosis in the foot is important to help reach the diagnosis. Early diagnosis & treatment is important to prevent the spread of disease in the foot and can lead to excellent healing and good functional results. There have few series reporting the incidence and follow up of isolated foot tuberculosis excluding the ankle. Materials - We present a series of 30 cases with varied presentations of tuberculosis of the foot. MRI and CT scans help in early diagnosis before the plain radiography features set in. The lesions were localized to the inter-tarsal joints (11), TN joint (2), calcaneo-cuboid joint (2), calcaneum (9), isolated navicular (1), metatarsal (4) and talus (1). When involving the tarsal region, a diffuse involvement is most common, presenting as osteoporosis and coalescence of the tarsal bones as seen in rheumatoid. Results - Since the lesion in the foot is paucibacillary, isolation of AFB is rarely positive. Diagnosis is mostly confirmed on histopathology showing a granulomatous lesion. Medical treatment in the form of anti-tubercular therapy and immobilization in the acute phase results in fair function in the foot. None of the 30 cases required any secondary procedure for instability or residual pain in the foot.

Date: 2013-10-18

Session: Osteoarticular Infections

Time: 14:00 - 15:30

Room: MR1.05 & MR1.06

Abstract no.: 33631

MRI BASED EVALUATION OF EFFICACY OF DOTS REGIMEN IN TUBERCULOSIS OF SPINE

Amit SRIVASTAVA¹, Anil K JAIN²

¹University college of Medical Sciences, Delhi (INDIA), ²University college of medical sciences, Delhi (INDIA)

Objective: The objective of the study was to evaluate the efficacy of extended DOTS regimen (2 months of intensive phase and 6 months of continuation phase) as recommended by WHO , by using MRI as the diagnostic marker.**Material and method:** 51 patients of spine TB with mean age of 26.8 years diagnosed clinico-radiologically , histopathology or by PCR were enrolled for the study. They were treated by extended DOTS regimen (2 HRZE , 6 HR) alternate day. Patients were followed for the period of 8 months and routine investigations were done. Contrast MRI was done at the end of 8 months and healing changes were recorded.**Results :** All patients have completed 8 months of extended DOTS regimen, n= 18 achieved healed status and duration of treatment was increased in rest n=33 (persistent active lesion on contrast MRI). N=10 achieved healed status after 12 months , n=14 after 18 months and n=1 after 24 months of treatment, thus n=43 were declared healed at varying periods..Thus after 8 months 35% achieved healed status , at 12 months 59.5%, , 18 months 91.3% and after 24 months 100% . **Criteria of healed status on MRI :** complete resolution of pre and para vertebral collections , resolution of marrow edema of vertebral body, replacement of marrow edema by fat or by calcification.**Conclusion:** It is concluded that MRI evaluation of patients is required after 8 months of ATT and subsequently to decide for the continuation or stoppage of treatment.

Date: 2013-10-19

Session: Shoulder & Elbow - Soft Tissue Reconstruction

Time: 10:30 - 12:00

Room: G.01 & G.02

Abstract no.: 35950

THE MANAGEMENT OF STERNO-CLAVICULAR DISRUPTIONS

Angus WALLACE, David THYAGARAJAN, Vinod KUMAR

Nottingham Shoulder & Elbow Unit, Nottingham (UNITED KINGDOM)

Introduction: Injuries in the region of the Sterno-Clavicular Joint(SCJ) are either epiphyseal injuries – the epiphysis does not close till age 25 to 26, or a shearing injury through the fused physis, or a fracture of the medial end of the clavicle in older patients. SCJ subluxation is uncommon but can limit sporting activities but true dislocation of the SCJ is rare. **Methods:** The senior author's 10 year experience of 25 Sterno-Clavicular disruptions is reported. These include ORIF for medial clavicular fractures(x2); closed manipulation of posterior dislocation (x2); open reduction of epiphyseal injuries(x1) and stabilisation of Sterno-Clavicular disruptions with either a soft tissue repair(x4), a sterno-mastoid sling(x3), a GraftJacket sling(x2) or by reconstructing the Costo-Clavicular Ligament(CCL) with a polyester LockDown device(x11). **Results:** Sterno-clavicular disruptions are caused by either a complete disruption of the costo-clavicular ligament or by the clavicle separating from its periosteal sleeve. Reconstruction focuses on either returning the clavicle into its periosteal sleeve (in younger patients) or recreating the costo-clavicular ligament (in older patients). The CCL is best recreated by using the LockDown device to encircle the first rib anteriorly and then anchoring it onto the clavicle supero-medially using one 3.5 mm screw. The results of these surgical interventions will be reported. **Conclusions:** Sterno-Clavicular disruptions have been poorly understood in the past. CT and MR imaging is now allowing us to better understand the pathology and new surgical techniques are allowing us to return patients, who previously had a significant permanent disability, to normal function.

Date: 2013-10-19

Session: Shoulder & Elbow - Soft Tissue Reconstruction

Time: 10:30 - 12:00

Room: G.01 & G.02

Abstract no.: 35887

LONG TERM OUTCOME OF ACROMIOCLAVICULAR JOINT RECONSTRUCTION USING HAMSTRING TENDON

Mayur PURANDARE, Ashish BABHULKAR

deenanath mangeshkar hospital, pune (INDIA)

There are many methods described for AC joint reconstruction viz. Bosworth screw, Tension band wiring, coracoclavicular ligament reconstruction. We believe that biological fixation of acromioclavicular joint is superior than fixation using metallic implants as long term cyclical loading will be facilitated & biology recreated. Materials & methods -: this is retrospective study of 36 patients of mean age 30.26 yrs done between 2002 to 2012. Mean follow up of 42 months ranging from 12 months to 118 months. All patients were operated using semitendinosus tendon graft for coracoclavicular ligament reconstruction. We used a single hole in Clavicle but alateral vector to restore both conoid & Trapezoid components with a doubled graft. All patients were assessed clinically for overt deformity, radiographic restoration and scoring was done using UCLA scores. Return to preinjury status was considered as end point. Results -: 30 out of 36 patients had excellent to good outcome at the time of last follow-up. 4 patients had speriior migration but they are asymptomatic. 1 patient had post operative pain at donor site settled with rehab. No patient had worsening of activites. There were no failures, No fractures of coracoid or clavicle. Conclusion -: acromioclavicular joint reconstruction using semitendinosus graft is better method of treatment which provides biological fixation, better tolerance to cyclical loading, avoids complication of implant breakage, Coracoid fracture and migration.

Date: 2013-10-19

Session: Shoulder & Elbow - Soft Tissue Reconstruction

Time: 10:30 - 12:00

Room: G.01 & G.02

Abstract no.: 35400

ARTHROSCOPIC SINGLE ROW VS DOUBLE ROW ROTATOR CUFF REPAIR -A COMPARATIVE STUDY

Jayaprasad PEDDABHEMANNAVARISAVARANNA, Kamaraj CHENNAPAN, Sai Phani BALIJEPALLI, Sridhar Reddy RAKASI, Chirag RASIKLAL PATEL
kamineni hospital, hyderabad (INDIA)

PURPOSE Aim of our study to compare the clinical outcome and healing of rotator cuff in double row versus single row Arthroscopic ROTATOR cuff repair **METHODS** A prospective ,nonrandamised study done in 30 patients arthroscopic rotator cuff repair ,14 of single row ,16 of Double row patients,cuff tear was small to medium size, patients were assessed with ASES Score,VAS,University of california,Losanges score,active range of motion ,scores measured and obtained preoperatively and at 3,6,12,24 months post operatively, MRI was taken at preoperatively and postoperatively at 24 months ,(all the anchors are from smith and nephew),study period between 2010to2012 **RESULTS** High outcome scores present with double row patients.Patient satisfaction rate were 98% in single row patients,and 90% in double row patients. MRI showed statistically significant improved healinig rate with siingle row patients **CONCLUSIONS** Our results suggests that single row repair(SR) produces comparable clinical results to double row repair(DR). MRI results shows improved healing rates in single row repair.

Date: 2013-10-19

Session: Shoulder & Elbow - Soft Tissue Reconstruction

Time: 10:30 - 12:00

Room: G.01 & G.02

Abstract no.: 34827

COMPARISON OF EARLY VS DELAYED REPAIR OF ACUTE ROTATOR CUFF TEARS IN ADULTS < 70 YRS OF AGE.

Deepthi Nandan ADLA, Vishal PATEL, Ryan CHAU, Saurab METHA, Alison ARMSTRONG

University Hospitals Leicester, Leicsester (UNITED KINGDOM)

Operative treatment of full thickness rotator cuff tears as a result from trauma has a favourable outcome (Bassett and Cofield). However the timing of operative repair of traumatic rotator cuff tears is still controversial as are the treatment options for chronic tears with acute symptoms. STUDY DESIGN: Prospective comparative outcome Study (Level 3) AIM: Compare outcome (Oxford shoulder score +EuroQOL) of traumatic rotator cuff tears managed with early operative (< 3 months) versus delayed repair (>3 months) in adults less than 70 years old. METHODS:A prospective database of patients admitted for acute repair of traumatic rotator cuff tears following a confirmatory USS from Jan 2008 to Jan 2012 has been maintained. Consecutive patients who had delayed repair of either a traumatic/atraumatic rotator cuff tear were identified using theatre logbooks and pre-operative clinic letters to confirm the history. PATIENT DATA/ OUTCOME SCORES 1) Age, 2) gender, 3) date of injury, 4) mechanism of injury, 5) Size of tear from USS report, 6) Date of operation, 7) Size of tear from operative note 8) any complications 9) Length of symptoms for atraumatic tears. Pre-operative Oxford shoulder scores were available for all patients. Patients were divided into 3 cohorts: 1) Traumatic tear-acute repair 2) delayed repair 3) Control Atraumatic tear Patients were followed up in clinic at minimum 6 months post -op. RESULTS: Patients are currently being recalled into clinic for assesment of outcome. There are a minimum of 20 patients in each cohort.

Date: 2013-10-19

Session: Shoulder & Elbow - Soft Tissue Reconstruction

Time: 10:30 - 12:00

Room: G.01 & G.02

Abstract no.: 34065

OUTCOME OF SURGICAL REPAIR OF PECTORALIS MAJOR TENDON RUPTURE

Amirreza FARHOUD¹, Mohammadreza GUIY², Arash SHARAFATVAZIRI²

¹BUSHEHR UNIVERSITY OF MEDICAL SCIENCES, BUSHEHR (IRAN),

²TEHRAN UNIVERSITY OF MEDICAL SCIENCES, TEHRAN (IRAN)

Background: Rupture of pectoralis major tendon encountered more frequently these days is a very rare and almost always athletic injury. **Method:** 33 cases of unilateral pectoralis major rupture, all in young males (age average: 26.9 (range: 22-36) years) were repaired by the same surgical technique, 1 day to 1 year after rupture (mean 3 months). 25 cases were followed up to 2 years (at least 1 year) after surgical repair. **Results:** 77.8% (26) of cases occurred during bench pressing of heavy (>140kg) weights. Weakness and decrease of athlete's function, and defect in the site of rupture, were the most common complaints before repair, respectively. Only 6 of 25 athletes could have the pre-rupture level of functional ability. Limitation of extreme of external rotation was the most common objective complication, postoperatively. Two cases of rerupture during 3 months of repair occurred. **Conclusion:** Rupture of pectoralis major tendon can be repaired successfully in most cases but functional ability of the patient may not return to primary level, especially in high demands young athletes. **Keywords:** Pectoralis major muscle, bench pressing, eccentric contraction.

Date: 2013-10-19

Session: Shoulder & Elbow - Soft Tissue Reconstruction

Time: 10:30 - 12:00

Room: G.01 & G.02

Abstract no.: 34612

**HOW TO ASSESS SCAPULAR DYSKINESIS PRECISELY :
THREE-DIMENSIONAL WING CT, A NEW DIAGNOSTIC MODALITY**

Dheeraj MAKKAR, Jin Young PARK, Kwang Mo KIM

KONKUK UNIVERSITY, seoul (SOUTH KOREA)

Background : Aberrations in the scapular movement patterns are associated with the presence of shoulder or elbow pathologies. There are many methods to evaluate scapular kinematics, but they are intrigued by limitations. **Purpose :** The study was done to (1) assess the inter-rater reliability of observational method of categorizing scapular dyskinesis into 4 types; (2) quantify the abnormal position of scapula in the resting position with 3D Wing CT; (3) compare the 3D Wing CT analysis with that of the observational assessment. **Methods :** 89 athletes were videotaped and seven blinded observers categorized scapular dyskinesis into 4 types, which was followed by 3D Wing CT. Four blinded examiners evaluated 5 angles [upward rotation (UR), superior translation (ST), anterior tilting (AT), protraction (PRO), and internal rotation (IR)] on the 3D Wing CT. CT scan measurements were compared with the observational types. **Results :** The inter-rater reliability with observational assessment was, 0.780 while that of 3D Wing CT was 0.972. This was a statistically significant correlation. The UR angle as well as the ST angle in type 3 scapular dyskinesis, and the AT angle in type 1 scapular dyskinesis were increased as compared with other types. The PRO angle in type 1 and IR angle in type 2 were increased as compared with that in type 4 scapular. All these differences were statistically significant ($p <0.001$). All these measurements were made in the resting position of the scapula. **Conclusions :** The 3D Wing CT analysis allows precise quantification of scapular dyskinesis with high inter-rater reliability.

Date: 2013-10-19

Session: Shoulder & Elbow - Soft Tissue Reconstruction

Time: 10:30 - 12:00

Room: G.01 & G.02

Abstract no.: 34057

RESULTS AND OUTCOMES OF LIGAMENT RECONSTRUCTION FOR THE TREATMENT OF CHRONIC POSTEROLATERAL INSTABILITY OF THE ELBOW

Abhijeet WAHEGAONKAR, Ajeet TIWARI, Chetan NERPAGAR, Prashanth SHESHAPPA

Hand & Upper Limb Center-Apollo-Jehangir Hospital, Pune (INDIA)

Objective Since its original description by O'Driscoll in 1991, posterolateral rotatory instability is becoming increasingly recognized as a significant cause of elbow pathology. The primary lesion in PLRI is injury or attenuation of the lateral ulnar collateral ligament. Posterolateral rotatory instability is diagnosed on the basis of careful history taking and specific physical examination techniques. Reconstruction of the lateral ulnar collateral ligament with repair of the surrounding soft tissue structures is recommended in patients who have symptoms of recurrent lateral instability.

Method We reviewed the results of 12 patients (12 elbows) who underwent surgical reconstruction for clinically symptomatic posterolateral rotatory instability of the elbow over a 2 year period from July2007-August2009. The symptoms resulted from previous dislocation or a hyperextension & varus stress injury of the elbow. Surgical reconstruction was performed with a free palmaris longus/ plantaris tendon graft in all 12 elbows.

Result Postoperatively, no patient had residual instability or a positive pivot shift test in the elbow. Results were graded as excellent or good in 9 and fair in 3. Subjective assessment revealed that all 12 patients were satisfied with the outcome of the surgery.

Conclusion Accurate recognition of posterolateral rotatory instability of the elbow is important for appropriate management. Surgical ligament reconstruction or repair is the most favorable treatment option for restoration of normal elbow function. In our series reconstruction of the lateral ulnar collateral ligament with a tendon graft restored stability in all cases & produced excellent to good results in 75% of cases.

Date: 2013-10-19

Session: Shoulder & Elbow - Soft Tissue Reconstruction

Time: 10:30 - 12:00

Room: G.01 & G.02

Abstract no.: 34043

ARTHROSCOPIC ELBOW SYNOVECTOMY IN RHEUMATOID ARTHRITIS: COMPARISON WITH INTRA-ARTICULAR STEROID INJECTION

Ravi MITTAL¹, Hira Lal NAG², Vivek SHANKAR³, Pankaj SHARMA³

¹All India Institute of Medical sciences, New Delhi (INDIA), ²All India institute of Medical Sciences, New Delhi (INDIA), ³AIIMS, New Delhi (INDIA)

Back ground: Arthroscopic synovectomy and intra-articular steroid injection are the two modalities used in patients of rheumatoid elbow arthritis when optimal drug treatment fails.
Method: Arthroscopic elbow synovectomy was performed on 15 elbows (Group A) and intra-articular steroid injection(40 mg of methyl prednisolone acetate) was given in 15 elbows (Group B) with radiological change < 3 Larsen grade. Though we did not randomise these patients, the two groups were comparable. These were followed up at 6 months and then at 24 months of intervention. Assessment was done on Visual Analogue Scale (VAS) for pain, Mayo Elbow Performance Score and Arc of flexion.
Results: VAS for pain – In arthroscopy group it was 6.4, 0.5 and 1.3 at 0, 6 and 24 months respectively. In injection group it was 5.4, 4.0 and 5.0 at 0, 6 and 24 months respectively. MEPS – In arthroscopy group it was 53, 90 and 80 at 0, 6 and 24 months respectively. In injection group it was 65, 70 and 65 at 0, 6 and 24 months respectively . Arc of flexion – In arthroscopy group, it was 60, 90 and 80 degrees at 0, 6 and 24 months respectively. In injection group, it was 80, 89 and 77 degrees at 0, 6 and 24 months respectively.
Conclusion: At the end of 24 months, pain relief, improvement in elbow function and arc of flexion of elbow joint are better achieved by arthroscopic synovectomy as compared to intra-articular injection in rheumatoid arthritis

Date: 2013-10-19

Session: Shoulder & Elbow - Soft Tissue Reconstruction

Time: 10:30 - 12:00

Room: G.01 & G.02

Abstract no.: 35763

**FUNCTIONAL OUTCOMES OF PRIMARY TOTAL ELBOW
REPLACEMENTS COMPARING TWO SURGICAL APPROACHES**

Srinath KAMINENI¹, Harikrishna ANKEM²

¹University of Kentucky, Lexington (UNITED STATES), ²Sports and Upper limb, Hyderabad (INDIA)

Background: One aspect of total elbow replacement implant survival is muscular balance, which is hypothesised to be deficient when utilising a 'triceps off' approach. We compared a traditional triceps off (Bryan-Morrey) to a new 'Triple Window' approach. **Methods:** Ten consecutive total elbow replacements were performed with either a Bryan-Morrey (Group 1) or a triple window (Group 2) approach, randomly grouped between the techniques. The triple window technique is a triceps split approach, which does not detach the medial and lateral triceps muscular attachments, and only partially elevates the central tendinous insertion. All patients had a Coonrad-Morrey prosthesis. Patients were evaluated both clinically (Mayo Elbow Performance Score) and radiologically at 12months post-surgery. A further clinical test was anti-gravity extension of the elbow. **Results:** After a mean follow-up of 12 months, there were no loosening or infection noted in any patient. 80% of patients had satisfactory results according to the Mayo Elbow Performance Score. Two patients in Group 1 complained of lack of 'control' of the elbow. There was no difference between the two groups with respect to the MEPS. Anti-gravity power was 3/5 in Group 1, and 4-5/5 in Group 2 were statistically significantly less in Group 1 than Group 2 **Conclusion:** The triple window posterior triceps surgical approach has the distinct advantage of improving triceps function, when compared to a traditional "triceps off" approach. This can be postulated to a long-term improved function and longevity of the implant, with further studies needed to evaluate this hypothesis.

Date: 2013-10-19

Session: Quality of Life

Time: 13:30 - 15:00

Room: G.01 & G.02

Abstract no.: 35727

QUALITY OF LIFE IN POST-TRAUMATIC ORTHOPAEDICALLY HANDICAPPED PATIENTS

Anil Kumar GULIA¹, Prerna MALIK², R.C. SIWACH¹

¹BPS Government Medical College for Women, Khanpur Kalan, Sonepat (INDIA), ²PGIMS, Rohtak (INDIA)

Introduction: The study was planned to assess quality of life and factors affecting it in post-traumatic orthopaedically handicapped patients. **Methods:** This is a hospital based cross sectional study which involves 68 patients with traumatic orthopaedic handicapped injury. Details of injury were taken on semi-structured proforma. All patients underwent detailed psychiatric assessment using International Classification of Disease-10 (ICD-10) and divided into two groups. Group A contains handicapped patients with psychiatric morbidity and remaining patients without psychiatric morbidity were included in Group B. Further, both groups were subjected to Quality Of Life Scale (QOLS) to assess quality of life. **Results:** In the Group with psychiatric morbidity (group A) quality of life was found to have a mean value of 62.11 ranging from 32-74 while in Group B, mean value was found to be 76.46 ranging from 46-98. Almost every item of quality of life scale in group A was lower than group B. In group A, the items with the lowest rate of satisfaction were "Relationships with parents, siblings and other relatives, Socializing with others, Work - job or in home and Independence, doing for yourself". Quality of life was poor in handicapped patients and was affected by severity of injury. Temporal association was seen between psychiatric morbidity and quality of life in handicapped patients. **Conclusion:** The quality of life must be assessed at every stage of treatment for better adjustment of handicapped patients.

Date: 2013-10-19
Session: Quality of Life
Time: 13:30 - 15:00
Room: G.01 & G.02

Abstract no.: 35513

**FALLS AND FRACTURES PREVENTION WORK IN OUR HOSPITAL:
MOST RECENT RESULTS**

Masanori IMABAYASHI

IMABAYASHI Hospital for Orthopaedic Surgery, Ibusuki City (JAPAN)

Introduction: The effectiveness of our inpatient fall-related fractures prevention strategy has been assessed. Methods: A total of 88 cases of inpatient falls in 2010 are analyzed in terms of underlying disease or injury, past disease history, impaired mental status, time of the day, location, injury type, timing in the course of original treatment, and consequence of fall. The number of falls and fall-related fractures in 2011 and 2012 are also evaluated to identify lowered incidence rate after more nurses' rounds in ward in the night time have been adopted as a result of the former analysis. Results: There was not remarkable difference among the numbers of falls in 2010, 2011 and 2012 but the incidence rate of the number of fall-related fractures out of that of total falls declined. Conclusion: Besides the improvement of inpatient's surrounding environment, raising awareness of patients at high risk of fall, and increasing the number of nurses and their rounds at night are all considered to contribute to developing better system in which falls prediction can be achieved more promptly.

Date: 2013-10-19
Session: Quality of Life
Time: 13:30 - 15:00
Room: G.01 & G.02

Abstract no.: 35170

**CRITICAL APPRAISAL OF AMERICAN KNEE SOCIETY SCORE,
OXFORD KNEE SCORING AND WOMAC FOR PATIENTS WITH KNEE
ARTHRITIS AND FOLLOWING TOTAL KNEE REPLACEMENT**

Ravi MALLINA¹, Vijayaraj RAMASAMY², Kumaraguru ARUNACHALAM², B. ILANGO³

¹Epsom & St. Helier's University Hospital NHS Trust, London (UNITED KINGDOM), ²Wrightington Hospital, UK, Wigan (UNITED KINGDOM),

³Fairfield Hospital, Bury (UNITED KINGDOM)

INTRODUCTION: The method of measuring the outcome of Total Knee Replacement is normally derived from clinical and radiological data and depends on the judgement of surgery. The difficulty lies in attempting to quantify a surgical result, which from the patient's viewpoint, is best expressed in subjective terms. It is increasingly recognized that a technical success from the surgeon's standpoint may not necessarily have had a significant impact on a patient's quality of life and thus from his or her perspective is a failure. The concerns and priorities of patient and surgeon may differ and research in many areas of medicine has shown that then patient can provide reliable and valid judgement of health status and of the benefit of treatment. **OBJECTIVES:** The assessment of OA patients after total Joint Arthroplasty of Knee requires the use of high performance outcome instrument to demonstrate validity, reliability and responsiveness. It is important to establish a universally acceptable method of measuring the outcome of different surgical procedures used in the treatment of arthritis of the knee. **METHODS:** Three outcome measures American Knee Society Score, Oxford knee scoring and The Western Ontario and Mc Master Universities osteoarthritis index (WOMAC) were critically appraised to assess which one will be better than others to assess patients with knee arthritis and following the TKR. **RESULTS:** WOMAC has good responsiveness, reliability and validity in all three domains. **CONCLUSION:** To assess the outcome in relation to patients with Knee arthritis and following TKR. WOMAC is an ideal outcome measure.

Date: 2013-10-19

Session: Quality of Life

Time: 13:30 - 15:00

Room: G.01 & G.02

Abstract no.: 35134

INFLUENCE OF PHYSICAL, STRUCTURAL, AND BIOLOGICAL FACTORS TO THE MID-TERM OUTCOME AND QUALITY OF LIFE IN FRACTURE NECK OF FEMUR PATIENTS - A SRI LANKAN STUDY COMPARED TO A COHORT IN ENGLAND

Kalana RATHNAYAKE¹, Loku Kankanamge Don Chandana Rathna KARUNATHILAKA², Narendra PINTO¹, Ramesh THALAVA², Sanjay DEO², Arulchelvi NALLAINATHAN¹

¹The National Hospital of Sri Lanka, Colombo (SRI LANKA), ²Tameside General Hospital, Manchester (UNITED KINGDOM)

Introduction: Fracture neck of femur (FNF) is a global orthopedic problem. Pathophysiology related to friability of body and fragility of bones. Incidence, mortality, morbidity depend on biological factors, living and health care standards of the individuals. **Objective:** Analyze the influence of biological, structural and physical variables to the post-operative mid-term morbidity and quality of life in fracture neck of femur patients; compare the results with global data. **Methodology:** Prospective cohort study (N=200). Variables studied are, Bone mineral density (BMD), Body Mass Index (BMI), corrected serum calcium, serum phosphate, hemoglobin level, blood urea, serum creatinine, level of social care, type of surgery, age and sex. The mid-term outcome and quality of life (QOL) assessed according to the Harris Hip Score and EuroQOL. Data analysis done with logistic regression and stepwise forward selection procedure. **Results:** Serum albumin, hemoglobin, BMI and blood urea are the most significant biological factors to describe the severity of pain and mobility. Femur neck BMD is the structural component which describes the degree of pain and mobility. Physical variable analysis revealed age, surgery and levels, social care determine the level of mobility. **Conclusions:** Serum albumin, blood urea, hemoglobin, BMI, femur neck BMD, age and level of social care are the important variables that determine the quality of life in fracture neck of femur patients. Static factors are not correctable in acute patient care. Correction of serum albumin and hemoglobin, lowering of blood urea and improving the quality of postoperative social care will improve the outcome.

Date: 2013-10-19

Session: Quality of Life

Time: 13:30 - 15:00

Room: G.01 & G.02

Abstract no.: 33627

ABBREVIATED MENTAL TEST SCORE AS A GUIDE FOR PATIENT CONSENTING AND PREDICTING MORTALITY AFTER ORTHOPAEDIC SURGERY - A NEED FOR RE-LOOK

Arash AFRAMIAN¹, Gautam Deepak TALAWADEKAR², Pouya AKHBARI², M. QURESHI², Sathya MURTHY²

¹QEQM Hospital, Margate (UNITED KINGDOM), ²East Kent Hospitals NHS Trust, Kent (UNITED KINGDOM)

Introduction: Abbreviated Mini-mental test score (AMTS) has been used unchanged in the UK since 1972: 1. for predicting mortality after hip fracture surgery in elderly; 2. to determine the type of consenting for hip fracture surgery. Mortality is said to be higher if score is below 6/10 and patients are unable to consent for themselves for the operation with score below 7/10. We attempted to determine the relevance of this test in present times. **Methods:** We performed AMTS on 58 volunteers, in hospital settings, from 14 nationalities with average age 29 years (19 to 82). 30 volunteers were Undergraduate, 20 Graduate and 8 had post-graduate educational backgrounds. **Results:** Average AMTS was only 6.27/10 (5/10 to 10/10). The question which was mostly wrongly answered was to test the long term memory where the date of start of First World War was questioned. 45/58 volunteers (78%) answered it incorrectly. The second most incorrectly answered question was based on testing the immediate short term memory where volunteers were asked to reproduce a random address mentioned to them at the start of the questionnaire. 28/58 (50%) got this incorrect. **Conclusion:** AMTS as a tool to assess patient's suitability for consenting of patients for orthopaedic surgeries and to predict mortality of elderly patients with neck femur fractures is inaccurate in its present form. This could result in inappropriate consenting of patients and its associated implications and also influence research observations on mortality rates following orthopaedic surgeries, especially hip fracture surgeries, where used as predictor of mortality.

Date: 2013-10-19

Session: Quality of Life

Time: 13:30 - 15:00

Room: G.01 & G.02

Abstract no.: 34683

**ORTHOGERIATRIC MODEL FOR HIP FRACTURE MANAGEMENT –
THE SINGAPORE EXPERIENCE**

Hitendra DOSHI, Josephine AZZELARASI, Wendy KOO, Serena CHUA,
William CHAN, Rani RAMASON, Ganesan NAIDU

Tan Tock Seng Hospital, National Health Group, Singapore (SINGAPORE)

Introduction: The aging population is growing rapidly in Asia. Geriatric fractures remain a challenge with regards to optimization, timing of surgery and potential complication. Most important is to restore the premorbid functional status. An intergrated approach management would be ideal. **Methods:** An Integrated Clinical Pathway (ICP) was introduced as an orthogeriatric co-management model. A cohort of 200 patients over a period of 5 months was followed up from time to presentation at the emergency department after the fall till 1 year post-operatively. Premorbid medical condition and function was recorded using the Charlsons comorbidity score and Modified Barthel Index (MBI) Score. **Results:** The introduction of ICP was resourceful and valuable in following up patients as all patients were successfully traced and evaluated till 1 year. The most significant influence was noted in a relatively low mortality rate and a high functional score. The MBI scores were markedly improved to 85% of premorbid scores and 90% of premorbid scores at 6 months and 1 year respectively. **Conclusion:** A Model which intergrates co-management for geriatric hip fractures is a useful initiative for achieving promising functional outcomes in the elderly population.

Date: 2013-10-19

Session: Quality of Life

Time: 13:30 - 15:00

Room: G.01 & G.02

Abstract no.: 34270

MANAGEMENT OF NECK OF FEMUR FRACTURES - BASED ON NATIONAL INSTITUTE OF CLINICAL EXCELLENCE GUIDELINES

Syed Shaheem AHMED¹, Saqib JAHANGIRI¹, Aisha RAZIK², Ravi KOKA¹

¹East Sussex Hospitals NHS trust, Eastbourne (UNITED KINGDOM), ²St. Georges University Hospital, London (UNITED KINGDOM)

Hip fractures are associated with a high rate of mortality. Approximately 10% of patients with a neck of femur fracture die within 1 month and 1/3 within the year. Hence making their management of high priority. The NATIONAL INSTITUTE OF CLINICAL EXCELLENCE in England has issued guidelines on the management of hip fractures. We audited our cohort of 691 patients over a duration of 21 months against these guidelines. Results: We found that the mean age of our patient group was 85 years. 71% of our patients had their operation (hemiarthroplasty/dynamic hip screw fixation) within 36hrs of admission (as recommended by NICE). 29% patients had their operation beyond 36hrs. The primary reasons for the delay being - 'lack of theatre time' and 'medically unfit for surgery'. After presenting this data - we re-audited over the next 6 months and the time to surgery improved with 90% patients being operated within 36hrs. Discussion: The audit certainly improved the time in which hip fractures received their definitive management. Therefore, improving adherence to the NICE guidelines. This also improved post operative multi-disciplinary management and patients were seen by a ortho-geriatrician and physiotherapist following their procedure. The aim was early mobilization and return to normal residence. Conclusion: the audit improved efficiency and patient care. The importance of the NICE guidelines was reiterated. Short hospital stay, early mobilization and discharges also meant best practice tariff improved for the trust.

Date: 2013-10-19

Session: Quality of Life

Time: 13:30 - 15:00

Room: G.01 & G.02

Abstract no.: 34108

ENHANCED RECOVERY PROGRAMME IN PRIMARY HIP AND KNEE ARTHROPLASTY! DOES IT REALLY WORK FROM INCEPTION?

Biyyam RAO, Adhish AVASTHI, Richard HILL, Cathryn EITEL

St. Richard's Hospital, Western Sussex Hospitals NHS Trust, Chichester
(UNITED KINGDOM)

Introduction: Enhanced recovery programme (ERP) has been believed to be an innovation and has improved patient outcomes while saving money for both hospitals and patients.

Objectives: To assess the outcomes following the implementation of ERP for Primary Hip and Knee Arthroplasty at a District General Hospital (DGH) and compare it with pre-ERP results along with cost effectiveness using the same resources.

Methods: We analysed the data of 217 pre-ERP and 280 post-ERP implementation patients looking at their length of stay, blood transfusion rates, urinary catheterisation rates, surgical site drains, vomiting and day of mobilisation.

Results: Prior to ERP our average length of stay was 5.86 days compared to 3.86 days since implementation of ERP. The blood transfusion rates were reduced from 12.03% to 1.7%, urinary catheterisation was reduced 12.4% from 44.4%. There were no surgical site drains used as opposed to 42.38% usage previously. Postoperative hypotensive episodes (Systolic below 80 mm Hg) were not recorded since ERP and postoperative nausea and vomiting were down to 15% since ERP from 28%. Consequently, 12% patients were mobilised on Day 0 and 76.26% on day one, compared to 0.9% and 65% in pre-ERP regime.

Conclusion: Multidisciplinary approach of ERP using pre-existing resources has allowed the patients to be mobilised early and shortened their hospital stay while improving the clinical outcomes. The crude cost analysis using NHS tariffs and payment by results (2011 HRG's, ICD-10 and OPCS-4.6 coding) have shown significant cost savings with successful implementation of the ERP in a DGH.

Date: 2013-10-19

Session: Quality of Life

Time: 13:30 - 15:00

Room: G.01 & G.02

Abstract no.: 34651

ASSESSMENT OF QUALITY OF LIFE AFTER REVISION TOTAL HIP ARTHROPLASTY

Amol NARKHEDE

Sancheti Institute, Pune (INDIA)

The aim of this study is to evaluate the relief of pain, improvement in range of motion, ambulatory status, ability to carry out activities of daily living, structural and functional outcome, along with the associated complication rates in patients undergoing revision total hip surgery for any reason. From January 2005 to January 2011, 32 patients who required conversion of a symptomatic partial hip replacement or total hip replacement to a revision total hip replacement, were included in the study using the specific inclusion and exclusion criteria. There is significant difference between pre-revision (7.87 ± 0.76) and post-revision surgery (2.52 ± 0.81) with respect to VAS score. There is significant difference between pre-primary surgery (70.06 ± 16.04) and pre-revision surgery (47.66 ± 10.75) with respect to HHS and there is significant difference between pre-revision (47.66 ± 10.75) and post-revision surgery (83.94 ± 8.24) with respect to HHS. Also, there is significant difference between pre-primary surgery 58.84 ± 39.35 and pre-revision surgery 127.94 ± 10.55 with respect to WOMAC, and between pre-revision 127.94 ± 10.55 and post-revision surgery 38.35 ± 9.45 with respect to WOMAC score. The quality of life with respect to post-operative surgical and functional outcome were significantly better in patients with age <55 years, as compared to elderly patients. However it was not affected by the gender, side, height, weight, existing comorbidities, and addictions. Revision total hip replacement gives patients a good quality of life in terms of pain relief and increased range of motions and mobility.

Date: 2013-10-19

Session: Quality of Life

Time: 13:30 - 15:00

Room: G.01 & G.02

Abstract no.: 34292

INEVITABLE SECOND SURGERY

Rajendra CHANDAK

Chandak Orhtopedic Hospital, Nagpur (INDIA)

Introduction: Many a times, in clinical orthopedic practice, we come across difficult situations, cases, or injuries which have no solution in one go and have many alternative routes of management. In selecting a procedure to be adopted, the need for inevitable 2nd surgery exists at the back of the mind. My main aim in this presentation is to bring into focus this aspect of dilemma. **Method:** Out of 10,500 surgical procedures of trauma, an inevitable second surgery was required for 9%. This data was analyzed and various difficult cases from 2005-2009 & the inevitable 2nd surgery requirement at various clinical situations. Certain representative cases are discussed in this presentation. I also propose to remove certain words from our day to day use like – failed surgery, implant failure & rather use the word advised inevitable 2nd surgery in spite of nicely done 1st surgery, which obviously has accomplished certain of the goals intended. There is an inevitable second surgery for 9% cases. **Conclusion:** At the time of decision making for treating difficult cases a list of situations requiring inevitable 2nd surgery should be made available in orthopedic literature. The changing trends of trauma every one of us is facing and seeing more and more comminuted fractures, the types of which we did not see 20 years back and which are more severe than what our textbooks describe, need further elaboration and prognostication as far as further required inevitable surgical steps.

Date: 2013-10-19

Session: Minimal Invasive Trauma

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 33830

**TREATMENT OF DISPLACED MID-CLAVICLE FRACTURES BY
CLOSED TITANIUM ELASTIC NAIL**

Hrushikesh SARAF, Sarang KASTURE

Peridot Superspeciality Hospital, Pune (INDIA)

Recently, intramedullary nailing for displaced middle third fractures of clavicle has received wide attention. Though open nailing has been widely described, closed nailing finds less mention. This paper therefore aimed to study the outcome of closed titanium elastic nailing for displaced mid-clavicular fractures. 25 patients with displaced middle third clavicle fracture who underwent closed intramedullary nailing with titanium elastic nail were included in the study. The operative time, blood loss, time for clinical and radiological union and functional outcome at union was noted. The mean operative time was 37.3 min. The mean time of discharge was 2.1 days. The average time of union was 8.5 weeks. All the patients achieved full painless range of motion at ipsilateral shoulder. The average Constant-Murley score at union was 94.4 indicating excellent result. No major intra-operative or post-operative complications were noted. Therefore, we believe closed titanium elastic nailing offers a very safe and minimally invasive method of fixation for fractures of middle-third clavicle. Early discharge, faster rehabilitation and cosmetic scar make it a better alternative to plate fixation.

Date: 2013-10-19

Session: Minimal Invasive Trauma

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 35965

MINIMALLY INVASIVE DHS: IS IT WORTH THE HASSLE? A PROSPECTIVE RANDOMISED STUDY

Avinash MISHRA, Sudarshan REDDY, Praveen MEREDDY, Anand

NARAGANI, Narayana Prasad B.

Care Hospital Banjara Hills, Hyderabad (INDIA)

Introduction: Dynamic hip screw fixation (DHS) is a well established method of fixation for trochanteric fractures. Internal fixation of these fractures in the elderly is to enhance recovery with early mobilisation. Conventional DHS is gold standard method of treatment. Minimally invasive DHS has certain advantages. **Aim:** To evaluate the effectiveness of minimally invasive DHS over conventional method. **Methods:** This Prospective randomised study was conducted at a teaching hospital between June 2011 and July 2012. Forty patients were randomised into the minimally invasive (Group A: 20 patients) and the conventional (Group B: 20 patients) groups. Standard peri-operative care was provided for all the patients. **Results:** the age range was from 60 to 99 with a mean age of 73.5. The mean hospital stay was 5.4 days in Group A and 8.5 days in Group B. Mean drain output was 76.5 ml in group A and 200 ml in group B. The mean drop in haemoglobin was 1.2 in Group A and 2.02 in Group B. The mean blood transfusion rate was noted to be 0.8 in group A and 1.15 in Group B. The mean post-operative Harris hip score was 80.2 in Group A and 68.05 in Group B. There was no complication in group A and 1 wound infection and screw cutout were noted in Group B. **Discussion:** Minimally invasive DHS appears to be a safe and effective method with reduced blood loss and hospital stay.

Date: 2013-10-19

Session: Minimal Invasive Trauma

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 34316

DISTAL TIBIA FRACTURES - WHICH IS BETTER: INTRAMEDULLARY NAILING OR MIPPO?

Abhijit KAWALKAR, Chandrashekher BADOLE

Mahatma Gandhi Institute of Medical Sciences, Sewagram (INDIA)

Background: Tibia fractures are the most common long bone fractures encountered by the orthopedic surgeons and distal tibia fractures have the second highest incidence of all tibia fractures after the middle third of tibia. The distal tibial fractures are unique and are considered as most challenging fractures to treat due to its proximity to the ankle joint and its superficial nature. The objective of this study is to compare two osteosynthesis systems developed for surgical treatment of distal tibia fractures: the intramedullary nailing and the MIPPO technique. **Materials and Methods:** The study was conducted between Jan 2011 to Dec 2012. 63 patients with extra-articular distal tibia fracture treated with intramedullary nailing and MIPPO technique were reviewed retrospectively and clinical outcome was evaluated according to American Orthopaedic Foot and Ankle Score. **Results:** 31 patients were treated with intramedullay nail & 32 with MIPPO technique. Fibular fixation was done in cases where fibular fracture was at or below the level of tibial fractures. We found no difference in terms of time for fracture union, mal-union, non-union, duration of surgery and amount of blood loss. But there was significant difference in terms of infection and duration of hospital stay. Also weight bearing was possible much earlier in intramedullary group as compared to the MIPPO group. **Conclusion:** Thus we conclude that intramedullary nailing is better choice of implant in patients with extra-articular distal tibia fractures and helps in early weight bearing and ambulation of patient with fewer complications.

Date: 2013-10-19

Session: Minimal Invasive Trauma

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 34577

**MANAGEMENT OF FRACTURES OF THE DISTAL THIRD TIBIA BY
MINIMALLY INVASIVE PLATE OSTEOSYNTHESIS**

Siddhartha PALUVADI VENKATA, Hitesh LAL, Deepak MITTAL, Rahul KHARE, Vinod Kumar SABHARWAL

PGIMER Dr. Ram Manohar Lohia Hospital, New Delhi (INDIA)

Background: Minimally invasive plate osteosynthesis (MIPO) is a newer technique of biological plating that addresses several negative issues associated with open reduction and plate osteosynthesis while amalgamating all biological benefits of closed reduction and fixation. Our study aimed to manage intra-articular and extra-articular fractures of the distal third tibia by the minimally invasive plate osteosynthesis technique. Clinical and radiological outcomes were studied and clinical indications, efficacy and complications of the procedure evaluated. **Methods:** From May 2010 to March 2013, 50 patients with closed distal tibial fractures were operated with MIPO technique with a distal tibial anatomical locking plate (stainless steel 316L) with 4.5/5 proximal and 3.5/4 distal screw holes. The plate was fixed on the antero-medial surface of the tibia under fluoroscopic control. The follow-up duration was for 1 year. **Results:** The mean fracture healing time was 21.4 weeks (range 16-32 weeks) and average AOFAS score 95.06 out of a total possible 100 points. At last follow-up, superficial infection occurred in 3 patients (6%); deep infection, implant failure and malunion in 1 patient each (2%). **Conclusion:** MIPO technique provides good bone healing because stresses were distributed over a longer segment of bone and decreases incidence of delayed union, nonunion and need for bone grafting. This technique can be used in fractures where locked nailing cannot be done like small distal metaphyseal fragments, vertical split, markedly comminuted fractures and in fractures with intra-articular extension.

Date: 2013-10-19

Session: Minimal Invasive Trauma

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 34860

FUNCTIONAL EFFECTS OF MALROTATION AFTER TREATMENT OF DISTAL TIBIAL METAPHYSEAL FRACTURE WITH MIPPO

Osman TECIMEL, Ahmet FIRAT

Ataturk Research and Education Hospital, Orthopaedics and Traumatology Clinic, Ankara (TURKEY)

Introduction: Recently, minimally invasive percutaneous plate osteosynthesis (MIPPO) is popularized for surgical treatment of distal tibial metaphyseal fractures. Main objective of this study was to determine the effects of tibial malrotation on functional results of MIPPO.

Methods: The inclusion criteria was OTA type 43-A fractures. Thirty-six patients treated with MIPPO were included in the study. The mean follow-up time was 18.6 month. At the last follow-up, CT scan of both lower extremities was conducted. Measurements and the differences for the injured and non-injured extremity were recorded. Angular deformities were evaluated by plain X-ray. The AOFAS and SF-36 scoring systems were used for clinical evaluation. **Results:** The mean age was 44(20-76). The union was provided in all patients. For the 20 tibia fractures in rotational group, the difference ranged from -18° to +10°. Fourteen fractures had internal malrotation (mean -8°), 6 had external rotation (mean +4°). There were 6° varus in 8 patients, 5° valgus in one patient and 5° of recurvatum in 2 patients. The mean AOFAS score was 80.2, while SF-36 was 85. There were no rotational and angular deformities in 14 patients (neutral group). The difference between the mean measures of AOFAS was significant at a p-value of 0.005. **Conclusion:** Malalignment and rotational deformities are generally minimal and usually neglected. In our case series, we found statistically better functional outcomes in the patient group which does not have any rotational deformity. In conclusion, for the MIPPO technique, more attempts should be made in order to obtain an anatomical reduction.

Date: 2013-10-19

Session: Minimal Invasive Trauma

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 35742

**PERCUTANEOUS WIRE FIXATION OF FRACTURES OF PATELLA - A
MINI INVASIVE APPROACH**

Yogesh PUROHIT, Govindbhai PUROHIT

Kheteswar Medical Educational Research Center, Ahmedabad (INDIA)

This is to demonstrate mini invasive approach to reduction and fixation of fractures of patella with intact or partly injured quadriceps tendon. Material & Methods: Twenty-one cases (13 males, 8 females) of fractures of patella treated by closed reduction and fixation by percutaneous method. In cases of undisplaced, minimally displaced or fractures of patella which can be easily reduced and quadriceps expansion is intact or partly injured clinically. After passing the wires and gradual tightening helped in reduction, alignment and approximation and compression of fracture fragments can be seen under C-arm IITV control. Results: All fractures healed uneventfully. The mean Lysholm II score was 84.8 (range, 75-96). All patients regained full knee range of motion within 6 to 7 weeks. Conclusions: Percutaneous closed reduction and fixation by Stainless steel wire is appropriate for undisplaced, minimally displaced, displaced transverse patellar fractures without major separation and comminution. Longitudinal or oblique fractures, even if there are more than 2 major fragments, are amenable to this technique, providing the fragments are large enough to be fixed with wires. This technique is minimally invasive and does not disturb the vascular supply of patella. It allows clear visualization of the reduction and stability of the fracture under C arm control, and facilitates early postoperative range of motion exercises. This method is also suitable for highly comminuted fractures or transverse fractures with minor separation that are not accompanied by rupture of the extensor mechanism.

Date: 2013-10-19

Session: Minimal Invasive Trauma

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 35389

**MIS PLATING OF IMPLANT-STABLE SUPRACONDYLAR PERIPROSTHETIC FEMORAL FRACTURES: PROS AND CONS?
RESULTS IN 16 CASES**

Rajiv THUKRAL, SKS MARYA

Max Healthcare, New Delhi (INDIA)

Introduction: Supracondylar periprosthetic femoral fractures are difficult to treat because of associated osteoporosis, comminution and bone loss. Open reduction internal fixation (ORIF) using the distal femoral locking plate allows rigid fixation and early mobilization, but usually necessitates additional bone grafting to prevent delayed union. Minimally invasive surgery (MIS) using biological techniques prevents soft tissue stripping, and minimizes morbidity. Strict patient selection and adherence to technique is essential to prevent complications.

Methods: Sixteen patients with implant-stable comminuted periprosthetic supracondylar fractures were operated over a 5-year period (Oct 2007 – Sep 2012). All were fixed using the MIS technique (using biological fixation method) with the distal femoral locking plate. Physiotherapy was supervised with hinged knee braces and toe-touch weight bearing walking with support till radiological union. Clinico-radiological follow-up (average, 36 months) was done at regular intervals, with pain and function assessed using the KSS scoring system.

Results: Average time to union was 4.5 months (range, 3.5 to 7 months). At final follow-up, all (but one patient) were walking unsupported, with minimal or no pain, and an average knee range of motion (ROM) of 90° (range, 55 to 100°). One patient developed valgus malunion, and one needed secondary bone grafting to achieve union. **Discussion:** Distal femoral locked plating of comminuted peri-prosthetic supracondylar fractures permits stable fixation and early mobilization. MIS technique (using biological methods) is possible in a properly selected subset of patients, and may reduce time to union and need for bone grafting.

Date: 2013-10-19

Session: Minimal Invasive Trauma

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 35435

**EARLY RETURN TO FUNCTION IN PROXIMAL HUMERAL FRACTURES
WITH MINIMAL INVASIVE PROXIMAL HUMERAL NAILING - A REVIEW
OF 57 CASES**

Pritish KHARDIKAR, Prakash DOSHI, Sachin BHAT

Dr.Balabhai Nanavati Hospital, Mumbai (INDIA)

Proximal humerus fractures represent 4-5% of all fractures with the highest incidence being in women over 6th decade of life. Osteoporosis increases the complexity of fractures. In the recent past, proximal humerus fractures (esp. type 11A2-A3, 11B2-B3) were treated with open reduction & plating. Avascular necrosis of the humeral head being a serious complication of this open procedure, overcoming it was the aim of initiating minimally invasive surgery for these type of fractures. In this study, 57 patients presenting with proximal humerus fractures (above mentioned types) underwent closed proximal Humerus nailing. Minimally invasive surgery has revolutionized the approach to fracture care on account of minimal blood loss, lower infection rates, rapid post-op rehabilitation & better patient compliance.

Date: 2013-10-19

Session: Minimal Invasive Trauma

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 35837

TENDO-ACHILLES REPAIR BY EXTERNAL FIXATOR

Santosh SHARMA, Jay SHARMA, Sadhna SHARMA

Orthotic & RD Gardi Medical College, Ujjain MP (INDIA)

Introduction: Tendo-achilles [TA] is vulnerable tendon to be injured by sudden contraction, fall of heavy weight/object or direct sharp cuts. It produces skin problem of closure, infection and non healing by methods available and longer rehabilitation. To avert such complications TA was fixed by EX-FIX. **Method:** The two K-wires passed proximal lateral to medial in TA, two more in the Calcaneum bone. In plantar-flexion of ankle, all four K-wires were fixed by clamps after close approximation of torn/ruptured/cut TA tendon. USG diagnosis and USG follow-ups, healing pattern and healing time observed. **Results:** Twenty-five such cases were followed up for three years and showed good results without much complications. It was better in cases where swelling, laceration or Diabetes was present. **Conclusion:** The method is minimally invasive so no skin healing problem occurred for coverage of TA. It was done under local anaesthesia as a day care process. Minimum instrumentation, easy compliance and quick rehabilitation is the key of good results, in comparison to other methods.

Date: 2013-10-19

Session: Minimal Invasive Trauma

Time: 10:30 - 12:00

Room: G.05 & G.06

Abstract no.: 34532

ACCURACY AND COMPLICATIONS OF CT-GUIDED, PERCUTANEOUS ILIOSACRAL SCREWS IN UNSTABLE DORSAL PELVIC RING INJURIES

Oliver PIESKE¹, Christoph LANDERSDORFER¹, Christoph TRUMM²,
Bianka RUBENBAUER¹

¹University Hospital Munich, Dep. of Traumatology, Munich (GERMANY),

²University Hospital Munich, Dep. of Radiology, Munich (GERMANY)

Introduction: Unstable dorsal pelvic ring injuries should be operated by internal fixation. Nevertheless, perioperative visualization of screw placement is difficult and malposition might lead to severe health risks like neurological damage or bleeding and other complications.

Methods: A cohort of 71 patients (40.8% male, 51.4 y mean age) with unstable dorsal pelvic ring injuries were operated by percutaneous iliosacral screw fixation: 54.9% type B and 45.1% type C-injuries. Clinical complications were documented over a 30-day-period postoperatively. A total of n=136 screws were placed with the use of CT-scan under fluoroscopic control trans-iliosacral to S1 and additional to S2 when needed. After the operative procedure a final CT-scan was performed to analyze the accuracy of screw placement. **Results:** 97.1% of all screws were placed correctly and completely intraosseous in the sacral bone. Three screws had a malposition of less than 1 mm and one screw of 2.2mm, but none of these had to be changed because of sufficient biomechanical stability and a lack of negative clinical symptoms. **Conclusion:** The vast majority of CT-guided, fluoroscopic controlled percutaneous placed screws were accurately placed in the sacral bone. Additionally, no postoperative complications like local/general infections or neurological failure were observed. Therefore, the minimal-invasive technique is a safe method for treatment of unstable posterior pelvic ring injuries allowing perioperative "online"-visualization of screw placement.

Date: 2013-10-19

Session: General Trauma

Time: 13:30 - 15:00

Room: G.05 & G.06

Abstract no.: 35598

DOES BLOOD TRANSFUSION INCREASE RISK OF MORTALITY IN HIP FRACTURE SURGERY?

Venugopal GUDURI, Shahzad SADIQ, Mohammad Usman KHATTAK

Worcestershire Royal Hospital, Worcester (UNITED KINGDOM)

This study analyses the blood transfusion requirement in patients admitted to our Hospital during the time period 1st August 2011 to 31st July 2012. During this time period 422 patients were admitted to Worcester Royal Hospital with diagnosis of hip fractures. There were 310 female and 112 male patients. The mean age of the patient population was 82.54 years with age ranging from 49 years to 106 years of age. In the transfusion group there were 87 intertrochanteric fractures, 16 Subtrochanteric fractures and 54 intracapsular fractures. In the non-transfused group there were 73 intertrochanteric fractures, 5 Subtrochanteric fractures and 187 intracapsular fractures. The length of stay was 12.29 days for the transfused group to 9.66 days for the non-transfused group. We transfused 157 patients (37.2%) with each receiving a mean of 2.745 Units of blood. We found that were 13 deaths in the transfused group (8.28%) and 29 deaths in the non-transfused group (10.9%) signifying more deaths in the non-transfused group. In our study we have noticed no significant correlation with type of hip fracture and blood transfusion requirement though patients who underwent IM nail tend to have higher blood loss as expected.

Date: 2013-10-19

Session: General Trauma

Time: 13:30 - 15:00

Room: G.05 & G.06

Abstract no.: 35095

INNOVATIVE NEGATIVE PRESSURE ASSISTED WOUND CLOSURE SYSTEM

Pradyumna Krishna MAJUMDAR, Narendra Kumar MAGU

Postgraduate Institute of Medical Sciences, Rohtak (INDIA)

The proprietary suction devices for negative pressure wound therapy cost anywhere between \$500 and \$1600 and the cost per dressing, \$100 to \$400. We present the results of an affordable innovative device comprising a modified nebulizer used as a suction machine, plastic tubing, canister and sterile sponge. The machine is run by an automatic unequal cyclic timer that turns the suction on for 3 minutes and off for 2 minutes in series. The machine was tweaked to the required pressure of 125 mmHg. Healing was measured objectively using saline displacement technique (wound volume change), wherein normal saline was filled to the brim of the wound, always adjusting the limb and wound such that it fits the maximum amount of fluid without spillage. The wound was vacuum sealed by using incisive surgical drape. The dressing was changed every 72 hours. The time to definitive procedure after injury and after institution of treatment was calculated and compared to normal saline dressing controls. We have used it successfully in managing traumatic cavitatory wounds (21 days vs 45 days), diabetic foot (18 days vs 42 days), decubitus ulcers (27 days vs 35 days), chronic osteomyelitis (18 days vs 36 days) and infected surgical wounds (32 days vs 75 days). The results are at par with the standard equipment used internationally both quantitatively and qualitatively at a fraction of the cost (\$50 for the system and \$5 for the dressing). We recommend this technique in developing nations for the management of such wounds.

Date: 2013-10-19

Session: General Trauma

Time: 13:30 - 15:00

Room: G.05 & G.06

Abstract no.: 34747

**DRESSING WOUNDS WITH GLYCEROL - IS IT THE TIME TO ABANDON
NORMAL SALINE FOR DRESSING OPEN FRACTURE WOUNDS?**

Sourabh CHACHAN, Barsha TUDU, Biswajit SAHU

VSS Medical College, Samabalpur (INDIA)

The standard protocol of using normal saline soaked gauze in wound dressings works by acting as a physical barrier to the spread of infection. Glycerol has hygroscopic properties and can help keep the wound dry for a prolonged time, subsequently decreasing infection rates and accelerating wound healing. A randomized clinical control study, including 18(m=10, f=8) cases of open grade IIIA fractures of tibia with 28 wounds, was conducted to compare normal saline and glycerol as dressing material. 8 patients had multiple wounds. Both group A and B had 9 patients with 14 wounds, with 4 patients of multiple wounds randomized to both therapies. All patients were surgically debrided and given external fixator within average of 24 hours (range=8-30hours) from injury. Post-operative protocols of daily wound dressings, antibiotics and rehabilitation were same for both groups except, Group A received glycerol soaked gauze while Group B received normal saline soaked gauze. Average wound size for group A was 14 sq.cm and for group B was 13.8 sq.cm. In group A average time between initial surgery and skin grafting was 7 days while in group B was 10.6 days. Using unpaired t-test, p value came out to be 0.009, which is statistically significant. 7 patients in group A reported a burning sensation in immediate post-dressing period, which subsided after few hours. No other complications were seen in any group. It was concluded that glycerol is a more efficient dressing material with significant decrease in wound healing time and subsequently reduced health care costs.

Date: 2013-10-19
Session: General Trauma
Time: 13:30 - 15:00
Room: G.05 & G.06

Abstract no.: 34725

THE INCIDENCE OF THROMBOEMBOLIC EVENTS IN PATIENTS WITH LOWER LIMB INJURIES

Aditya PRINJA, Jagwant SINGH, Mark LOEFFLER

Colchester Hospital University NHS Foundation Trust, Colchester (UNITED KINGDOM)

INTRODUCTION: Lower limb fractures and cast immobilization are well-recognised risk factors for the development of venous thromboembolism (VTE). The evidence regarding VTE in lower limb injuries is insufficient to draw firm conclusions and there is ongoing debate regarding thromboprophylaxis. We conducted this study to establish the incidence of thromboembolic events in patients with lower limb injuries. **METHODS:** Patients who presented to our centre, between January 2003 and May 2012, with lower limb injuries were identified. Inclusion criteria were lower limb fractures (excluding hip and femoral shaft) and soft-tissue injuries of the lower limb treated in plaster. Clinical notes of relevant patients were reviewed to establish thrombotic events, the injury, treatment received, period of immobilisation and risk factors for VTE. **RESULTS:** Of the 2863 patients who presented, 45 were investigated for DVT/PE of which 13 were positive (6 male, 7 female, age range 39-91y). There were six PE's and seven DVT's. There were six ankle, three tibial plateau, one calcaneal and two tibial diaphyseal fractures. There was one ankle sprain. No patients received extended thromboprophylaxis. One patient had a fatal PE. Overall, the incidence of venous thromboembolism was 0.45%. **CONCLUSION:** From this study, we have established that the incidence of thromboembolic events in patients with lower limb fractures or soft tissue injuries treated in plaster is low. On the basis of our findings, we would argue that the use of extended thromboprophylaxis for these patients is not justified unless there are significant pre-existing risk factors for VTE.

Date: 2013-10-19

Session: General Trauma

Time: 13:30 - 15:00

Room: G.05 & G.06

Abstract no.: 34047

**INHALATIONAL STEROID IN PROPHYLAXIS OF POST-TRAUMATIC
FAT EMBOLISM SYNDROME**

Shivaprakash SS, Ramesh SEN

PGIMER, Chandigarh (INDIA)

Background: As fat embolism syndrome is primarily a lung parenchymal disorder, it is expected that inhaled corticosteroids (Ciclesonide aerosol) given as prophylaxis may prevent the development of Fat Embolism syndrome in patients at risk for this complication. **Materials and methods:** Seventy(70) cases of skeletal trauma patients presenting within 8 hours of injury were randomly allocated in one of the two groups. In group 1 ciclesonide 640mcg was given with a metered dose inhaler and repeated once again after 24 hours whereas group 2 was taken as control. Both groups were observed for 72 hours for any episode of hypoxia by serial arterial blood gas monitoring along with haemogram, serum biochemistry, plasma lactate, platelet count, coagulogram and chest X-ray. The outcome was assessed using Gurd's criteria for the eventual development of fat embolism syndrome. **Results:** Out of 35 patients in group 1, 2 patients developed fat embolism syndrome whereas in group 2, 9 patients developed fat embolism syndrome. **Conclusion:** There is a significant decrease in the incidence of FES in ciclesonide prophylaxis group when compared to the control group. The prophylactic role of inhalational steroid in post-traumatic fat embolism syndrome is statistically significant in present study. **Key words:** fat embolism syndrome, inhalational steroid, Gurd's criteria, ciclesonide.

Date: 2013-10-19
Session: General Trauma
Time: 13:30 - 15:00
Room: G.05 & G.06

Abstract no.: 33720

**CHANGING PERCEPTIONS WITH A UNIQUE MODEL OF COMBINED
ORTHOPAEDIC GERIATRIC CO-CARE FOR HIP FRACTURE PATIENTS
AT A TEACHING HOSPITAL**

Rahul BHATTACHARYYA, Yuvraj AGRAWAL, Heather ELPHICK, Chris BLUNDELL

Northern General Hospital, Sheffield (UNITED KINGDOM)

Introduction: In 2010, a unique model of shared care for hip fracture patients was implemented in our hospital. In this model, patients are allocated to an orthogeriatric team, within 48 hours of surgery, who review patients daily to manage medical complications and coordinate multidisciplinary rehabilitation, with orthopaedic input if necessary. **Aim:** To compare the new model to the previous model of care as perceived by members of staff and compare clinical outcomes. **Methods:** Prospective data were collected using questionnaires given to medical, nursing and allied health professionals. Their opinions were rated using the Likert scaling system and analysed with the Mann Whitney U-test. Clinical outcomes were obtained from the hip fracture database and subsequently analysed. **Results:** 59 responses (100%); 21 doctors and 38 allied health professionals. The majority of staff believed that quality of patient care was better in the newer model and preferred to work in this model. The median length of stay in the previous model (274 patients) was 25 days compared to 19.5 days in the new model (249 patients) ($p=0.22$). 56.8% patients returned to their source of admission in the previous model compared to 72.7% in the new model ($p=0.00007$). The inpatient mortality rates improved from 12.4% in the previous model to 8.4% in the new model ($p = 0.26$). **Conclusion:** This unique model improved care for hip fracture patients and was cost effective. Furthermore, it highlighted excellent staff satisfaction. This can pioneer a change in the management of hip fracture patients nationally and internationally.

Date: 2013-10-19
Session: General Trauma
Time: 13:30 - 15:00
Room: G.05 & G.06

Abstract no.: 34789

**TREATMENT OF LONG BONE DEFECTS WITH THE INDUCED
MEMBRANE TECHNIQUE**

Suribabu GUDIPATI, Paul HARWOOD, Nikolaos KANAKARIS, Peter GIANNOUDIS

Leeds Teaching Hospital, Leeds (UNITED KINGDOM)

Purpose: To present our institutional results in a cohort of patients with bone defects who were treated with the use of the induced membrane technique. Materials and methods: Prospective study undertaken from Jan 2008-Dec 2012. Inclusion criteria: septic non-union, acute fracture with bone loss and chronic osteomyelitis. Data collection included demographics, pathology, previous surgical intervention, complications, size of bone defect and time-to-union. The cement spacer was removed after a minimum of 8 weeks in situ and the defect area following appropriate selection of implant stabilisation was grafted as per the principles of the 'diamond concept'. The minimum follow-up was 12 months. Results: Fifteen patients (12 males, mean age 50 years (18-80)) with bone loss after debridement of a septic non-union or an acute fracture were eligible to participate in the study. The mean length of the defect was 5cm (2-12cm). In 7 patients the above technique was applied following an acute fracture while in the remaining 8 cases it was for septic non-union. Radius was involved in 6, femur in 5, tibia in 3 and metatarsal in 1 patient. Clinical and radiological healing was achieved by 8 months (4 -20). 2 patients had 1-1.5cm leg length discrepancy, 1 had damage to superficial radial nerve. Discussion: The induced membrane technique appears to be an alternative good option for treatment of large bone defects secondary to acute bone loss or as a result of chronic infected non-unions as seen in this series of patients.

Date: 2013-10-19
Session: General Trauma
Time: 13:30 - 15:00
Room: G.05 & G.06

Abstract no.: 33686

USE OF ILIZAROV FOR TREATMENT OF 17 CASES OF IMPLANT FAILURE WITH NON-UNION

Mohamed ELDEEB

Jeddah National Hospital, Jeddah (SAUDI ARABIA)

Study of 17 cases with different fracture of the long bones (1 humerus, 4 femur, 11 Tibia, 1 Radius and ulna) from the year 2005-2012. Study includes causes of implant failure and different metal fatigue. Different techniques were used for the treatment of non-union including combination of the internal and external fixators for 5 cases, double irrigation system for infective non-union – 7 cases and distraction osteogenesis in non-union with gap of 2 cases. This study includes using different osteoinductive materials, to enhance bone healing as autografts, artificial graft, miacalcic, and alternative medicine (Lepidium sativum peads). Complications included pin tract infections, fracture of the wire loosening, and stiffness of nearby joints. Follow-up from 3 months-1½ years and results were convenient.

Date: 2013-10-19
Session: General Trauma
Time: 13:30 - 15:00
Room: G.05 & G.06

Abstract no.: 34505

COMBINED AND SEQUENTIAL USE OF EXTERNAL FIXATION AND NAILING IN RECONSTRUCTIVE SURGERY OF LONG BONES

Elena SHCHEPKINA, Leonid SOLOMIN, Pavel KULECH, Ivan LEBEDKOV
R.R.Vreden Research Institute of Traumatology and Orthopedics,
Saint-Petersburg (RUSSIA)

Introduction: The Sequential External Fixation and Nailing (SEFaN), Lengthening over the Nail (LON), External Fixation Assisting Nailing (EFAN) in deformity correction and non-union healing has actively developed recently. We analyzed our results in 56 cases. Methods: SEFaN was used in 27 cases (28 segments) in deformities (7), non-unions (18), delayed union (3). Varus deformity of lower limb was in 14 cases (MAD 15.71 ± 8.93 mm); valgus deformity - 12 (MAD 12.25 ± 10.8). In 14 patients (17 segments) LON was used. MAD in 11 cases was in the range 4 ± 5 mm, in the remaining cases – from 5 to 38 mm. In addition to well-known methods extracortical fixators were used (<http://ortho-suv.org>). In SEFaN, rate of correction was 1 mm per 24 hours, in LON it increased up to 2.5 mm in 49%. EFAN was used in 15 cases (16 segments) in deformities (11), non-unions (4). Results: In SEFaN time of deformity correction was 28.7 days. MAD in SEFaN and EFAN groups was 2.27 ± 2.34 mm; in the group of LON in 14 cases was in the interval of 4 ± 5 mm, the remaining patients needed the next step of the treatment. The complications were observed in 12 cases (19.7%): exacerbation of osteomyelitis - 3.3% (in ExFix-2.2%), pin-tract infection – 1.6% (in ExFix-11.8%), breakage of transosseous element – 1.6% (in ExFix-5.9%), non-union – 1.6% (in ExFix-4.7%), secondary deformation – 0 (in ExFix-2.4%), joint stiffness – 4.9% (in ExFix-8.3%), neuropathy – 4.9%, premature consolidation – 1.6%. These methods improve the life quality and decrease the number of complications.

Date: 2013-10-19

Session: General Trauma

Time: 13:30 - 15:00

Room: G.05 & G.06

Abstract no.: 34668

MANAGEMENT OF BUERGER'S DISEASE BY ILIZAROV'S TECHNIQUE

Ankit CHOUHAN, Devi Sahai MEENA

SMS Medical College, Jaipur (INDIA)

Buerger's disease is a nonatherosclerotic inflammatory disease that most commonly affects the small and medium-sized vessels of extremities of young adult males with history of chronic tobacco smoking. Although the etiopathogenesis of this disease has been studied in detail over a period of more than 120 years, its management still remains challenging with no pharmaceutical agent or surgical technique universally acceptable as the gold standard. This study aims to evaluate the role of longitudinal tibial corticotomy and gradual lateral distraction of the corticotomised fragment with Ilizarov's Ring Fixator in a case of Buerger's Disease of lower limb. We have subjected 20 patients to this technique after confirming the diagnosis with typical infra-popliteal stenosis in CT-Angiography. Lateral distraction was started in the 2nd week at a rate of 0.5mm/day, which was continued for four weeks. The assembly was removed around the 6th post-op week. Thereafter the corticotomised tibia was supported by GT cast for 3 weeks and PTB cast for another 3 weeks. Results were evaluated at 3rd and 6th post-op months. 16 of them showed complete relief of ischaemic pain, improvement in claudication symptoms, healing of ulcers and resumption of pain free domestic activities. 2 patients reported partial improvement and need regular care of ulcer and analgesics. 2 patients continued to have progressive gangrene of the limb, which were ultimately amputated. We conclude that the principle of "Distraction Histogenesis" can be used for the management of Buerger's Disease of lower limb with encouraging success rate and acceptable complication rate as compared to other treatment modalities.

Date: 2013-10-19

Session: Trauma - Distal Femur

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 35747

**STUDY OF TITANIUM ELASTIC NAILS FIXATION IN FRACTURE SHAFT
FEMUR OF CHILDREN 6-16 YEARS OLD**

Suresh Kumar Bhuriya SURESH

PT.B.D.S PGIMS, Rohtak (INDIA)

INTRODUCTION: Treatment of femoral fractures in children between 6-16 years of age is controversial. There has been a resurgence worldwide for operative fixation. **MATERIAL AND METHOD:** 48 patients (34 males, 14 females) aged 6-16 years with femoral shaft fracture (44 closed, 2 open) were stabilised with titanium elastic nails. These fractures were in proximal third(n=4) middle third(n=36) and distal third(n=8). The results were evaluated using Flynn's criteria. Statistical analysis was done using Fischer's exact test. **RESULTS:** All 48 patients were available for evaluation after a mean of 9.46 months of follow-up. Radiological union in all cases were achieved in a mean time of 6.62 weeks and full weight-bearing was possible in a mean time of 6.62 weeks. Mean duration of hospital stay was 9.5 days. The results were excellent in 42 patients (87.5%), satisfactory in 6 patients (12.5%), and poor in 0 patient (0%). All patients had early return to school. **CONCLUSION:** Intramedullary fixation of fracture shaft of femur with titanium elastic nails is a very effective treatment modality in properly selected patients of the 6-16-year age group.

Date: 2013-10-19

Session: Trauma - Distal Femur

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 35481

MANAGEMENT OF DISTAL FEMUR FRACTURE WITH DFN - A CLINICAL STUDY IN 23 CASES

Ashok Kumar DAS

Calcutta Medical Research Institute, Kolkata (INDIA)

Introduction: Different type of osteosynthesis for DF fracture like DCS, CBP, DFN, and liss-plates. I treated by DFN having good functional results. **Aim of study:** To achieve good functional outcome, stable fixation, maintaining axis, length and rotation with preservation of vascularity by DFN. **Material:** 23 patients, 14M, 9F, age group 22-63 taken. 4 had T-Y #, splitting the condyles. 11 extra-articular, 1 periprosthetic, 7 partial articular fracture. **Methods:** Position supine, fracture reduced, DFN introduced through intracondylar notch, and locked proximally and distally. Wound closed. Knee-bending from day 3. Walking after 3 weeks without weight-bearing. Partially weight-bearing 6 weeks, full weight-bearing after 12 weeks. **Result analysis:** Results analysed after 3, 6 weeks, 6 months, 1 and 2 years, considering delayed-union, infection, pain, shortening, periprosthetic fractures, intra-articular impingement. Delayed union in two patients – treated by bone graft. Infection in two cases in 1st week, controlled with antibiotics. Pain:- VAS>4 in 3 weeks, VAS<2 in 6 weeks. In one, pain persisted. Shortening:- after 6 months - by shoe-raise. Periprosthetic fractures:- 2 patients after 1 year - plate-osteosynthesis. Intra-articular impingement:- after 12 weeks - one tolerated till union and in 2nd re-do surgery. **Discussion:** In DF fracture, often there is bone loss medially in osteoporotic bone. Medial support with bone graft sometimes required. Delayed union, shortening, periprosthetic fractures are due to aging degeneration and osteoporosis. Fixation by DFN have certain advantages like early weight-bearing, preservation of vascularity, low incidence of wound infection and early joint rehabilitation. **Conclusion:** Out of the different types of osteosynthesis, DFN yields a very good functional outcome if properly used in selective patients.

Date: 2013-10-19

Session: Trauma - Distal Femur

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 34590

TO EVALUATE EARLY FUNCTIONAL OUTCOME OF OPEN REDUCTION AND INTERNAL FIXATION OF DISTAL FEMUR UNICONDYLAR FRACTURES WITH CALCANEAL PLATE BY NEER SCORING SYSTEM AT 6 MONTHS

Arun MEENA, R.K. VERMA, Sudhir Kumar YADAV, Narendra JOSHI

Sawai Man Singh Medical College, Jaipur (INDIA)

Aim: Open reduction and internal fixation (ORIF) is strongly recommended in literatures for unicondylar fractures of femur but specifically designed implant for isolated medial or lateral condyle fractures is lacking. Purpose of this study is to evaluate early functional outcome of ORIF of distal femur unicondylar fractures with Calcaneal plate by NEER scoring system at 6 months. **Method:** Study was conducted on 11 skeletally mature patients of unicondylar fracture femur (AO type 33B1, 33B2, 33B3) without neurovascular deficit. Standard medial or lateral surgical approach was chosen. D-shaped Calcaneal plate was applied with the help of 3.5 mm cancellous and cortical screws after restoring articular congruency. The mean age at the time of surgery was 37.182 years (range, 25-60). On 3rd post-operative day knee mobilization and quadriceps strengthening exercise was started. Partial weight bearing was started at 8 weeks and progressed to full weight bearing as tolerated. Functional outcome was evaluated at 6 months by NEER scoring system. The mean clinical and radiological follow-up was 7.818 months (range, 6-12). **Results:** 6 cases show excellent results with NEER score more than 85 units. 2 cases show satisfactory outcome with NEER score between 85-70 units. 1 case shows unsatisfactory outcome with NEER score of 58 units. 2 cases were considered as failures with NEER score less than 55 units. No displacement of fracture fragments was observed. **Conclusion:** Till date no specific implant for unicondylar fracture femur is available. Calcaneal plate is a good option especially for comminuted medial and lateral condyle fracture of femur.

Date: 2013-10-19

Session: Trauma - Distal Femur

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 33817

FEMORAL ROTATION AND FRACTURE HEALING FOLLOWING INTRAMEDULLARY NAILING OF FEMORAL SHAFT FRACTURES – THE GENEVA EXPERIENCE

Michael BETZ, Joe WAGENER, Hermes MIOZZARI, Axel GAMULIN, Pierre HOFFMEYER, Robin PETER

University Hospital Geneva, Geneva (SWITZERLAND)

Introduction: Femoral malrotation is a possible complication following intramedullary nailing of femoral shaft fractures and occurs in up to 27% of cases. Postoperative CT-Scan offers the best means of quantifying femoral rotation. The purpose of this study was to present our results of femoral nail fixation in terms of femoral rotation and fracture healing. **Methods:** 52 patients underwent postoperative CT-Scan for femoral rotation assessment following intramedullary nail fixation. Malrotation was defined as a difference in femoral rotation of 20°. After a minimal follow-up of 3 months (range 3-41 months) fracture healing was evaluated on standard radiographs. **Results:** Average femoral rotation difference was 8° with external femoral rotation in 13 patients (range 1-22°) and internal rotation in 36 patients (range 1-36°). Malrotation occurred in 11 patients (21%) whereof 7 patients underwent femoral derotation. All derotation procedures were successful with a mean of femoral rotation difference of 7° (range 1-18°). Fracture healing occurred in 42 patients (81%) after a minimal follow-up of 3 months, although dynamisation of the nail was necessary in two patients to allow fracture healing. 2 patients presented pseudarthrosis managed successfully with decortication, autograft and additional plate fixation. In 6 patients follow-up was too short to evaluate fracture healing. 2 patients were lost to follow-up. **Conclusions:** Malrotation represents a common problem following ORIF using intramedullary femoral nailing. Development of reliable intraoperative adjuncts would be desirable to diminish the high rate of this complication. In our hands, femoral nailing represents a safe fixation device ensuring a high union rate.

Date: 2013-10-19

Session: Trauma - Distal Femur

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 34580

**SURVEY THE RELATIONSHIP BETWEEN IPSILATERAL KNEE INJURY
WITH FEMORAL SHAFT FRACTURE**

Mohammad Kazem EMAMI MEYBODI¹, Morteza JANNESARI¹, Alireza RAHIM NIA¹, Tohid EMAMI MEYBODI²

¹Department of Orthopedics, Faculty of Medicine, Baqiyatallah University of Medical Sciences, Tehran (IRAN), ²Shahid Sadoughi University of Medical Sciences, Yazd (IRAN)

Background and Objective: Femur is the longest and strongest tubular bone in the body and femoral shaft fractures often result from high energy forces (motor vehicle accidents, falling, and gunshot wound) especially in young men. Complications associated with mid-shaft femoral fractures include intra- and extra-articular knee injury that was maybe missed during the initial evaluation and could cause future complications for the patient. **Methods:** Forty-four knees (42 patients) with diaphyseal femur fracture and no previous knee injury were evaluated. After fixation of fracture, an examination was done under anesthesia and arthroscopy of the knee joint or open examination of knee was also performed. Femoral fixation was done through interlocked nails in 36 subjects, external fix in 3 and plate and screws in 1 case. **Results:** Examination revealed laxity greater than grade I in LCL in 4 cases (9.1%) and in MCL in 15 (34.1%). Significant arthroscopic findings included 16 partial and 2 complete (4.5%) ACL injuries, 2 partial PCL injuries, 12 medial meniscus and 3 lateral meniscus tears. Osteochondral lesions were detected in 20 knees. Overall, 21 knees had injuries among which 68% had significant effusion while 32% had mild or no effusion. **Conclusion:** This study evaluated the incidence of injuries detected via arthroscopy or examination under anesthesia. A high incidence of knee injuries was found mostly in association with ipsilateral femoral shaft fractures. Based on this finding, there is a high index of suspicion for co-existing knee injuries in femoral shaft fractures. Early diagnosis of such injuries can improve the outcome and recovery of patients.

Date: 2013-10-19

Session: Trauma - Distal Femur

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 35707

FIBULAR GRAFTING TO MANAGE BONE DEFECTS IN SUPRACONDYLAR FRACTURE OF THE FEMUR - A CASE REPORT

Abraham VINEET THOMAS, Marimuthu CHANDRASEKARAN, R.

NANDAKUMAR

Mahatma Gandhi Medical College and Research Institute, Pondicherry
(INDIA)

A 32-year-old male presented with a grade 3A Muller's Type C2 Supracondylar fracture of the femur and an ipsilateral segmental fracture of the tibia. The patient was initially treated with wound debridement and Orthofix fixation of the femur and Ex fix fixation of the tibia. After 10 days, once the wounds had healed the External fixators were removed. Retrograde intramedullary nail fixation of the fracture femur was done, as there was an 8 cm bone loss, we harvested fibula from the contralateral side and split the graft and placed 5 cm of graft on either side of the nail to bridge the defect due to bone loss. Corticocancellous graft from the ipsilateral iliac crest was also packed into the fracture site. Intramedullary interlocking nailing for the tibia was also done. Post-operatively patient still has 3 cm shortening. At 6 months both the fractures have united well. Discussion: Supracondylar fractures of the femur with bone defects are a challenge to treat. In our technique we used fibular grafts along with corticocancellous graft to manage the bone defect and achieved good bony union. Tani Y, et al have used a fibular strut graft in a periprosthetic fracture around a TKR prosthesis. Kumar A. et al used fibular strut graft in cases of ununited supracondylar fractures of the femur. We report this case as there have been no reported cases of fibular grafting in open fractures of the femur to manage bone defects as a primary mode of treatment.

Date: 2013-10-19

Session: Trauma - Distal Femur

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 33986

MANAGEMENT OF COMPLEX FEMORAL NONUNION WITH MONORAIL EXTERNAL FIXATOR - A PROSPECTIVE STUDY

Hemendra Kumar AGRAWAL, Mohit GARG, Ashish JAIMAN, Sumit

BATRA, Vinod Kumar SHARMA

VMMC & Safdarjung Hospital, New Delhi (INDIA)

Introduction: Femoral nonunion is a functional & economical challenge for the patient, as well as a treatment dilemma for the surgeon. Complex femoral nonunion includes infective & gap nonunion & limb length discrepancy secondary to traumatic bone loss which need specialized treatment to ensure the functional integrity of femoral bone. Reconstruction for nonunion is difficult; the associated bone defect, shortening, and deformity may further complicate matters. Monorail unilateral external fixator can be used as treatment modality in these non-unions.

Methods: 61 patients (49 male, 12 female) aged 18 to 62 years underwent surgery with debridement and resection of nonviable bone, followed by application of monorail external fixator for nonunion of femoral shaft fractures with or without bone loss. All patients had a bone defect of >6 cm. Bone transport was done with monorail fixator. The lengthening index, radiographic consolidation index, functional status, bone healing, and various problems, complications encountered during the treatment were assessed and analyzed.

Results: All patients achieved bone union. Bone healing was excellent in 52 and good in 9 patients. None had neurovascular complications, joint subluxations, or refracture of the regenerated bone. Most common complication encountered with treatment was pin track infection which were managed by regular pin track care and local antibiotic injections. Other complications encountered included knee stiffness ($n=10$) and knee flexion contracture ($n=3$). nine patients with an initial bone defect of >10 cm had delayed union and underwent bone grafting.

Conclusion: Bone transport using a monolateral external fixator is safe and effective for treating complex nonunion.

Date: 2013-10-19

Session: Trauma - Distal Femur

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 35944

ILIZAROV PRINCIPLES IN NONUNION OF FEMORAL SHAFT FRACTURE

Mohammed FADEL¹, Ahmed MOUNIR², Fahd EL HAYAWI³, Ali AL SALHI³

¹EI-Minia University Hospital, Egypt, Cairo (EGYPT), ²Al-Helmia Military Hospital, Cairo (EGYPT), ³LRS. PD, Cairo (EGYPT)

Introduction: Many conventional methods are used for management of nonunion of shaft femur. **Aim of the study:** We aim to evaluate the Ilizarov principles in management of post-traumatic infected nonunion femoral shaft fracture. **Patients and methods:** We treated twenty cases of infected nonunion of the femoral shaft which had been treated between September 2004 and 2008. Their average age was 30 years (range: 18:62). There were 3 female. Patients presented with discharging sinus in 12 cases, intermittent discharging sinus in 4 cases, and past history of infection less than 6 months in 3 patients. The wound and bone were debrided and the bone fixed with Ilizarov device. Bone transport was needed for 2 cases. The wound was debrided and excision of the sinus was performed. The bone was explored, debrided, sequestrectom was removed, followed by local antibiotic. Ilizarov external fixator was applied, then acute compression, compression followed by distraction compensating lengthening, bone transport using gradual compression with distraction at the corticotomy site, and correction of deformity. **Results:** We used monofocal technique in 14, and bifocal in 4 (one with acute docking), free vascularized fibular graft in one, and free nonvascularized fibular graft in one. After mean follow-up were 24: 36 months. All fractures healed between 6 and 25 months. **Conclusion:** We concluded that the Ilizarov external fixator has a nonconventional radical effective in management of post-traumatic infected nonunion femoral shaft fracture. It provides advantages of acute docking, lengthening, and correction of deformity if needed with early rehabilitation.

Date: 2013-10-19

Session: Trauma - Distal Femur

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 35620

INTER-PROSTHETIC FRACTURES OF FEMUR – A MANAGEMENT CHALLENGE

Biyyam RAO, Michael MOSS, Lee TAYLOR

St. Richard's Hospital, Western Sussex NHS Trust, Chichester (UNITED KINGDOM)

Introduction: Management of Inter-prosthetic femoral fractures are challenging due to associated factors of poor bone stock, advancing age, potential prosthetic instability and limited fracture fixation options both proximally and distally. **Objectives:** To analyse management of inter-prosthetic femoral fractures following ipsilateral hip and knee joint arthroplasty along with their results and complications. **Methods:** Retrospective analysis of 11 patients (8 women, 3 men) with mean age of 82 years treated with NCB distal femoral locking plates (N=4), Periarticular distal femoral plates (N=1), Periprosthetic proximal femoral plates (N=2), Retrograde Nailing (N=3) and Dynamic compression plate (N=1). **Results:** Average union time for fractures was 14 weeks. Analysis of mean Harris Hip and Oxford Knee Scores showed significant decrease of hip or knee function and severe limitations in gait and activities of daily living in 4 patients. Referring to the clinical outcome, 3 patients returned to their pre-injury activity level and 4 patients died of associated co-morbidities within a year's time. There was one failure of fixation. **Conclusions:** Regarding the complexity and challenges in these cases, an adequate analysis of the fracture aetiology and a best possible treatment concept is needed. The principles for treatment of inter-prosthetic fractures remain the same and need bypassing the adjacent prosthesis by a minimum of two femoral diameters to prevent a stress riser. Locked plating is an effective method for the treatment of inter-prosthetic femoral fractures. The morbidity and mortality remains high in these patients due to complex fractures in frail individuals.

Date: 2013-10-19

Session: Trauma - Distal Femur

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 35609

MANAGEMENT OF PERIPROSTHETIC FRACTURES OF DISTAL FEMUR IN ELDERLY USING DISTAL FEMORAL ARTHROPLASTY AND FIXATION! COMPARATIVE STUDY OF OUTCOMES AND COSTS

Biyyam RAO, Michael MOSS, Adhish AVASTHI, Lee TAYLOR

St.Richard's Hospital, Western Sussex Hospitals NHS Trust, Chichester
(UNITED KINGDOM)

Introduction: The aim of this study was to evaluate the results of distal femoral arthroplasty (DFA) as an alternative to fixation and compare the outcomes along with cost effectiveness.

Methods: We include 21 patients (mean age 78) of type III (Rorabeck et al) distal femoral periprosthetic fractures treated with DFA in group 'A'. In group 'B' we had 40 patients (mean age 74) treated with fixation (17 retrograde nailing and 23 Locking plates) of Type II (Rorabeck et al) fractures. Outcomes were analysed using Oxford scores, Knee society scores, length of hospital stay, full weight bearing and fracture healing times. The cost analysis was done using hospital tariffs for management in both groups from National Health Service tariffs. **Results:** Mean length of hospital stay was 12 days in group 'A' whereas in Group 'B' was 32 days. All the patients were full weight bearing by day 3 in Group 'A' compared to mean 11 weeks in Group 'B'. At follow-up of two years, mean Oxford scores in Group 'A' was 32 and Knee society score was 76 compared to 30 and 72 in Group 'B'. The average fracture healing and full weight bearing was 13 weeks in fixation group. There was no major cost differences between both groups and associated medical complications were less in DFA group. **Conclusions:** The DFA offers a useful alternative treatment to internal fixation in elderly patients in these complex fractures. The advantages are of early mobilisation avoiding prolonged hospital stay and preventing medical co-morbidities.

Date: 2013-10-19

Session: Trauma - Distal Femur

Time: 08:30 - 10:00

Room: Hall 1

Abstract no.: 34630

FLOATING KNEE INJURIES - PROSPECTIVE ASSESSMENT OF EPIDEMIOLOGY, TREATMENT MODALITIES AND OUTCOMES

Mahesh KADE, Parag SANCHETI, Ashok SHYAM, Chetan PRADHAN

Sancheti Institute of Orthopaedics and Rehabilitation, Pune (INDIA)

Introduction- Floating knee injuries focus more on the articular and neurovascular plane of the knee. In our study we have tried to analyse the cases of floating knee with respect to the pre-operative factor, treatment modality and the effect on outcome of these difficult injuries

Methods- From January 2007-December 2009, 25 cases with floating knee injuries classified according to Fraser's classification and operated. Different modalities of treatment were used. The patients were assessed clinically using Karlstrom-Olerud criteria and radiologically till 2 years. The p value was calculated using ANOVA test. **Results-** In our series, fractures of 17 patients united with single surgery while 8 patients required repeat surgery. Total average union time was 8.4 ± 3.9 months with 8 excellent, 11 good, 4 fair and 2 poor results. In the comparison based on fracture type, p value was significant for union time (i.e. $p=0.001$), however no significant difference between hip and knee range of motion was found. There was no significant difference in either hip range of motion or knee range of motion in fractures with different grades on compounding. Also we found no significant difference in cases of union time with respect to degree of compounding. **Final functional results-** As per Karlstrom and Olerud criteria, there were 8 excellent, 11 good, 4 fair and 2 poor results. **Conclusion-** Surgical management of floating knee gives acceptable results and functional outcome. The advent of good surgical technique and rising experience of surgeons are important factors in achieving successful outcome.

Date: 2013-10-19

Session: Trauma Upper Limb - Clavical & Proximal Humerus

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 35893

VERTICAL FRAGMENT SIGN NEEDS PLATING

Mohan THADI

Medical Trust Hospital, Kochi (INDIA)

Comminuted middle third clavicular fractures with a vertically aligned fracture segment on X-ray need to be primarily openly reduced and fixed as they will invariably not unite if treated conservatively. Imaging (both X-ray & CT) clearly shows the degree of displacement with the segment actually keeping the primary fracture fragments wide apart. More than 25 fractures with a vertical fragment were followed up for 3 months without any sign of union on sling treatment. All ended up being internally fixed. We call this sign the vertical segment sign and recommend it as primary indication for internal fixation.

Date: 2013-10-19

Session: Trauma Upper Limb - Clavical & Proximal Humerus

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 35179

CLINICAL AND RADIOGRAPHIC RESULTS OF PROXIMAL HUMERUS FRACTURES TREATED WITH A NEW LOCKING PLATE FIXATION DEVICE - PILOT CLINICAL TRIAL

Carlo Felice DE BIASE¹, Giovanni ZIVERI¹, Marco DELCOGLIANO¹, Francesca DE CARO¹, Massimiliano ALESCI¹, Giovanni PITTALIS², Alessandro CASTAGNA³

¹Azienda Ospedaliero Universitaria di Parma, Parma (ITALY), ²Ospedale San Carlo di Nancy, Roma (ITALY), ³Istituto Clinico Humanitas, Milano (ITALY)

Introduction: proximal humerus fractures represent about 5% of all fractures. Surgery should be considered in approximately 20% of fractures. Over the past decade, locking plate fixation for proximal humerus fractures has gained considerable popularity. These implants are increasingly used and widely accepted but a notable number of complications are also reported. In this study we report the preliminary clinical and radiographic results of 3 or 4 fragments proximal humerus fractures treated with a new locking plate fixation device named "Diphos". **Methods:** from April 2010 through June 2012 we treated 20 patients with 3-4 parts displaced fractures of the proximal humerus with "Diphos" device. All patients had a preoperative trauma series imaging of the shoulder, completed with a CT scan. There were 7 (35%) 3-part and 13 (65%) 4-part fractures. **Results:** mean Costant Score at 6 months follow-up was 61 points and increased significantly ($p<0.05$) at 12 months (65 points). VAS score improved significantly. The mean forward flexion improved from $88^\circ \pm 9^\circ$ at 3 months follow-up to $130^\circ \pm 15^\circ$ at 1 year; the mean abduction improved from $70^\circ \pm 8^\circ$ at 3 months to $120^\circ \pm 14^\circ$; mean external rotation improved $20^\circ \pm 7^\circ$ at 3 months to $52^\circ \pm 12^\circ$ at 1 year. **Conclusions:** the advantage of using this device is that the PEEK translucency allows the surgeon to achieve a careful bone reduction during surgery. The low rate of complications that we reported in our series is probably due to the fact that our senior surgeon is an expert in shoulder surgery.

Date: 2013-10-19

Session: Trauma Upper Limb - Clavical & Proximal Humerus

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 34403

**HIGH-ENERGY SHOULDER INJURIES AFFECT PROGNOSIS OF
SHOULDER JOINT FUNCTION**

Bingwen ZHANG, Wenjun CHEN, Quan ZHANG

Huashan Hospital, Fudan University, Shanghai (CHINA)

Background: Treatment of patients with high-energy trauma to the clavicle and scapular neck joint is often complicated by associated injuries. The impact of associated injuries on shoulder joint function prognosis was evaluated by using Constant-Murley Score (CMS).

Methods: A retrospective assessment was conducted of 22 patients (19 male; 3 female) with a mean age of 48.2 years presenting high-energy shoulder injury with or without associated injuries between 2006 and 2013. All patients were diagnosed with floating shoulder injury requiring surgical intervention, generally caused by falls from height, car or motorcycle accidents, or wringer injuries. Constant-Murley Score (CMS) were collected for patients at 1-19 months (mean 7.45 month) follow-up. 22 patients were followed up to evaluate optimal treatment strategies and outcomes. **Results:** High-energy shoulder injuries were complicated by associated injuries in 81.8% (18/22) patients. Following surgery, CMS scores were reduced to ranges from 22-92 (mean 57.3). Associated injuries for which postoperative CMS scores were measured included simple shoulder bone-ligament ring injury (4 cases; CMS 83), brachial plexus injury requiring bone soft tissue surgery (13 cases; CMS 43.7), vascular injury without distal extremity blood supply occlusion (4 cases; CMS 42.5), and associated open injury (7 cases; CMS 41.8). **Conclusion:** Associated injuries should receive priority treatment in high-energy trauma cases. Associated brachial plexus injury and other injuries were shown to be indicators of poor prognosis for shoulder joint function following rehabilitation in patients with floating shoulder injury requiring improvement in treatment strategies.

Date: 2013-10-19

Session: Trauma Upper Limb - Clavical & Proximal Humerus

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 34060

PROXIMAL HUMERAL FRACTURES: CALCIUM SULPHATE AUGMENTATION IN INTERNAL FIXATION

Karthik SOMASUNDARAM, Chris HUBER, Victor BABU, Hamid ZADEH

West Middlesex University Hospital, London (UNITED KINGDOM)

Introduction: We report our experience and the study on our surgical technique for proximal humeral fractures and fracture-dislocations using locking plates in conjunction with calcium sulphate augmentation and tuberosity repair using high strength sutures. We used the extended deltoid-splitting approach for fracture patterns involving displacement of both lesser and greater tuberosities and for fracture-dislocations. **Methods:** We retrospectively analyzed 22 proximal humeral fractures in 21 patients. 10 were male and 11 female with an average age of 64.6 years (Range 37 to 77). Average follow-up was 24 months. Fractures were classified according to Neer and Hertel systems. Pre-operative radiographs and CT scans in three and four-part fractures were done to assess the displacement and medial calcar length for predicting the humeral head vascularity. **Results:** The mean DASH score was 16.18 and modified Constant & Murley score was 64.04 at the last follow-up. 18 out of 22 cases achieved good clinical outcome. All the fractures united with no evidence of infection, failure of fixation, malunion, tuberosity failure, avascular necrosis or adverse reaction to calcium sulfate bone substitute. There was no evidence of axillary nerve injury. The CaSO₄ bone substitute was replaced by normal appearing trabecular bone texture at an average of 6 months in all patients. **Conclusion:** In our experience we have found the use of locking plates, calcium sulphate bone substitute and tuberosity repair with high strength sutures to be a safe and reliable method of internal fixation for complex proximal humeral fractures and fracture-dislocations.

Date: 2013-10-19

Session: Trauma Upper Limb - Clavical & Proximal Humerus

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 33726

LOCKING PLATE FIXATION OF FRACTURES OF THE PROXIMAL HUMERUS: ANALYSIS OF OUTCOME AND COMPLICATIONS

Hitendra Gulabrao PATIL, Sandeep Ramesh BIRARIS, V.M. KHALEEL,
M.C. JOHN, Vikas Tukaram SONALE
Medical Trust Hospital, Cochin (INDIA)

Introduction: Proximal humeral fractures requiring surgical stabilization remain a therapeutic challenge particularly in elderly patients with unstable fracture types and poor bone quality. Locking plate technology has been developed as a potential solution to the difficulties encountered using conventional plating to treat these types of fractures. The fixed angle construct that prevent screw toggle and pullout offer increased load to failure when compared with unlocked plates. Many common complications associated with conventional plating can be avoided. **Methods:** We analyzed functional and radiographic outcome of 58 patients (average age 40.96 years). As per Neer's classification system we had 36 two-part, 16 three-part, 6 four-part fractures. All patients treated with open reduction using Synthes 3.5 locking proximal humeral plates via deltopectoral approach. Patients had follow-up at 1,3,6 and 12 months. **Results:** Constant Murle Score was used to assess functional outcome. Accordingly 8 patients had excellent, 40 patients had good and 6 patients had fair results. Average Score was 78.70. Two patients developed AVN, both were four-part fracture involving anatomical neck. None of the patients developed implant failure, however two patients developed refracture due to second episode of trauma. No patient developed hardware impingement, infection or neurological complications. **Conclusion:** With regards to fracture healing and functional outcome, our initial experience with this implant is encouraging. The stable fixation allowed early rehabilitation. Sound union was achieved in all patients. None of the patients were having secondary loss of reduction or implant failure.

Date: 2013-10-19

Session: Trauma Upper Limb - Clavical & Proximal Humerus

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 33707

INTERNAL FIXATION OF UNSTABLE PROXIMAL HUMERUS FRACTURES: AN INDIAN EXPERIENCE WITH THE PHILOS LOCKING PLATES

Jefferson GEORGE, Dhanpal SINGH, Senthil NATHAN

Rajah Muthiah Medical College Hospital, Chidambaram, Tamil Nadu
(INDIA)

Introduction: Proximal humerus fractures account for 5-9% of all fractures. Most proximal humerus fractures can be managed conservatively, but 3-part and 4-part fractures are unstable and need internal fixation. We report our results of internal fixation of these fractures with Locking Compression Plates. **Methods:** 32 cases (19 males, 13 females) with unstable fractures of proximal humerus treated from June 2011 to February 2013 in the mean age 47.5 (25-70) years formed the study group. Indications for surgery were 3-part & 4-part closed humeral fractures, surgical neck fractures with angulation greater than 45 degrees or greater tuberosity fracture with displacement of more than 1 cm. Standard Deltopectoral approach was used. Anatomical reduction and Internal fixation with LCP was done in all patients. Rotator cuff tears, capsular and subscapularis muscle avulsions were meticulously repaired. Post-operatively, immediate passive mobilization exercises were started. Patients were assessed clinically, radiologically (Plain X-rays) and functionally (Constant Murley shoulder score) at 6 weeks and at 3, 6, 9 and 12 months. **Results:** Patients were followed up for a mean duration of 10.31 months. Mean time to radiological union was 14.06 (6-24) weeks. The mean Constant shoulder score was 71.25 points and was categorized good. Complications included varus malalignment in two patients, restriction of shoulder movements in two patients and subacromial impingement in one patient. **Conclusion:** The PHILOS plating is a safe and effective technique of fixing unstable proximal humeral fractures. Anatomical reduction, proper plate placement and aggressive post-operative rehabilitation ensure a satisfactory functional outcome.

Date: 2013-10-19

Session: Trauma Upper Limb - Clavical & Proximal Humerus

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 35202

FLOATING SHOULDER: OSTEOSYNTHESIS OF CLAVICLE

Kodali Siva Rama Krishna PRASAD, Naveed AHMED, Ignatius JOSEPH,

Ajay SHARMA

Prince Charles Hospital, Merthyr Tydfil (UNITED KINGDOM)

Introduction: Ipsilateral fractures of neck of scapula and clavicle are generally described as 'floating shoulder' – a combination of injuries, considered unstable with the implication that conservative treatment may lead to asymmetry and poor functional outcome of shoulder. According to a biomechanical study, however, fracture of clavicle contributes only a little to instability of fracture of the neck of scapula. Additional fractures or disruption of acromioclavicular and coracoacromial ligaments or coracoacromial and coracoclavicular ligaments are required to cause significantly unstable 'floating shoulder'. We are reporting an illustrative concomitant fracture neck of scapula and clavicle, 'floating shoulder', treated with plate fixation of clavicle. **Methods:** A 52-year old man fell off scooter and sustained a combination of fracture through neck of left scapula extending to body and spine of scapula with little displacement and ipsilateral fracture of clavicle – 'floating shoulder' - with no obvious neurovascular problems. He also had uncomplicated fractures of left 2 to 6 ribs. When the general condition stabilised, because of significant pain we treated the 'floating shoulder' with plate osteosynthesis of fracture of clavicle and polysling for six weeks and physiotherapy. He had dramatic improvement of pain after fixation. **Results:** Fracture of clavicle with plate and fracture of scapula – 'floating shoulder'- healed uneventfully. At 1 year, he achieved full asymptomatic function of left shoulder. **Conclusion:** Fractures of neck of scapula and clavicle –'floating shoulder'- without significant displacement of neck of scapula, or additional fractures, or ligament disruption may be treated by fixation of clavicle alone.

Date: 2013-10-19

Session: Trauma Upper Limb - Clavical & Proximal Humerus

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 35815

REVERSE SHOULDER PROSTHESIS IN THE TREATMENT OF FRACTURES OF THE PROXIMAL HUMERUS

Pedro MARTINS, Rita JERÓNIMO, Álvaro BOTELHO, Joaquim NEVES

Centro Hospitalar do Barlavento Algarvio, Portimão (PORTUGAL)

Reverse shoulder prosthesis is a demanding surgical technique that could be an option in acute complex proximal humeral fractures. The authors study is about 27 patients treated between January 2009 and January 2012. The main indication was a three or four part fracture or fracture-dislocation not suitable for ORIF or hemiarthroplasty, in patients above 70 years old, with a past history rotator cuff disease and with a normal deltoid function. Clinical results were evaluated using the Constant-Murley scoring system. AP and lateral radiographs were carried out monthly, for 2 months, then once a year. Every year, the subjective grade of satisfaction was evaluated. The results and complications are presented in our series, with a mean follow-up of 24 months.

Date: 2013-10-19

Session: Trauma Upper Limb - Clavical & Proximal Humerus

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 34029

MODULAR SHOULDER HEMIARTHROPLASY IN THREE AND FOUR PART PROXIMAL HUMERAL FRACTURES IN OSTEOPOROTIC BONE: OUR EXPERIENCE

Sandeep Ramesh BIRARIS, Suhas Kisanrao NIKAM, Darius Fardoon SOONAWALLA, Jamshed J BUNSHAH

The B D Petit Parsee General Hospital, Mumbai (INDIA)

Introduction: Proximal humeral fractures are third most common fractures in patients aged >65 years. Open reduction and internal fixation (ORIF) with locked plating has demonstrated promising results in the treatment of displaced, comminuted proximal humerus fractures. A prerequisite for a stable osteosynthesis is an efficient bone stock. Patient with comminuted unstable fractures and diminished bone stock can be very well treated with shoulder hemiarthroplasty. **Aims and objectives:** To evaluate the functional outcome of patients with 3 part and 4 parts proximal humeral fractures with or without associated dislocation in patients with diminished bone stock, treated using modular shoulder hemiarthroplasty. **Materials and methods:** From January 2008 to December 2011 there were 18 patients who were included in the study after defining proper criteria. Out of which 14 were females and 4 were males. Patients were reviewed at one month and thereafter every three months till one-year. One patient was lost to follow-up, so only 17 patients were available for statistical analysis and 'p value' was evaluated. **Results:** At final follow-up all patients united with average abduction ranged from 85 to 97.69 degrees while flexion was 92.5-109.23 degrees and average Constant-Murley score was 49.11 (range, 26-60). 8 patients had moderate outcome and 9 had poor outcome. Patients in whom surgery was performed within 7 days after trauma had moderate outcome, this was significant (p value-0.03). **Conclusion:** Modular hemiarthroplasty is good option for elderly patients with diminished bone stock as it reduces morbidity and operation done early improves the functional outcome.

Date: 2013-10-19

Session: Trauma Upper Limb - Clavical & Proximal Humerus

Time: 10:30 - 12:00

Room: Hall 1

Abstract no.: 35182

**SURGICAL OUTCOME FOLLOWING MIDDLE 1/3RD FRACTURE
CLAVICLE - RESULTS OF ORIF WITH LOCKING PLATE**

Rajesh BAWALE, Onur BERBER, Sanjay SINHA, Bijayendra SINGH
MEDWAY MARITIME HOSPITAL, GILLINGHAM, KENT (UNITED
KINGDOM)

Introduction: The clavicle fracture represents 2.6% to 5% of all fractures. Most clavicle fractures are situated in the middle part (81%), whereas lateral (17%) and medial fractures (2%). **Objective:** The aim of the study is to evaluate early results of clavicle midshaft fractures treated with pre contoured and locking plates. **Methods:** We reviewed 32 patients retrospectively treated operatively between June 2008 – Jan 2012. **Inclusion criteria:** midshaft displaced clavicle fractures. **Exclusion criteria:** undisplaced fractures, floating shoulders. Mean follow up was 18 months with age of 20 to 60 years (mean age was 35 years). Patients had check x-rays and clinical evaluation with oxford shoulder and DASH score. **Results:** 6 patients had prominent metalwork which was removed later and 3 patients are waiting for metalwork removal. No non-union was noted. The mean time to radiographic union was 14.3 weeks. The mean DASH score at the end of one year was 16.2 +/- 4 and mean oxford shoulder score was 34+/- 4. **Conclusion:** Stageman et al. reported a 15% nonunion rate and 31% patient dissatisfaction rate in conservatively treated displaced middle-third fractures. Operative fixation of a displaced fracture of the clavicular shaft results in improved functional outcome and a lower rate of malunion and nonunion at one year of follow-up. **References:** Stageman Et al. Displaced mid shaft fractures of the clavicle: non operative treatment versus plate fixation (Sleutal TRIAL). A multicentre randomised controlled trial. BMC musculoskeletal Disorder. Aug 2011.

Date: 2013-10-19

Session: Trauma Upper Limb - Shaft & Distal humerus

Time: 13:30 - 15:00

Room: Hall 1

Abstract no.: 35382

COMPARISON BETWEEN FUNCTIONAL OUTCOMES AND COMPLICATIONS BETWEEN MEDIAL VERSUS LATERAL PLATING IN CLOSED FRACTURES OF THE SHAFT OF THE HUMERUS

Mandar RAILKAR¹, Rahul SAPRA¹, R K VERMA²

¹SMS Medical College, Jaipur (INDIA), ²MGM Hospital, Jaipur (INDIA)

Amongst all fractures of the human body humeral shaft fractures account to be approximately 3%to 5%. Internal fixation by plate osteosynthesis using the AO DCP or LCP, remains the criterion standard of fixation against which other methods should be compared. Though lateral plating through an anterolateral approach remains the conventional method according to AO methodology, medial plating through the same approach has proven to have many advantages as per our study. In this study, 50 patients (43 male, 7 female), were treated for humeral shaft fracture by using anterolateral approach, for lateral (25patients) and medial (25patients) plating. All patients being followed up for a period of 6 months. The medial plating group patients had better outcomes in terms of bone union , range of movements, functional outcomes as per the A.S.E.S and the NAIMAN scores as well as did not have any complications like iatrogenic radial nerve palsies (2 in lateral plating group) ,delayed bone union or implant failure as observed in the lateral plating group. To conclude we were encouraged to find out that the results in the medial plating group were par excellence in terms of subjective complaints, bone union and post operative rehabilitation without the occurrence of any complications so as to say medial plating no longer remains a contradictory entity rather sets a new trend to follow.

Date: 2013-10-19

Session: Trauma Upper Limb - Shaft & Distal humerus

Time: 13:30 - 15:00

Room: Hall 1

Abstract no.: 34805

COMPARATIVE STUDY OF HUMERAL SHAFT FRACTURES MANAGEMENT WITH DYNAMIC COMPRESSION PLATING AND INTERLOCKED NAILING AT PERIPHERAL INSTITUTE

Amol DHAWALE, Vishwanath IYER, Ajit SHINDE

Mhaishalkar Shinde Orthopaedic Institute and Research Centre, Sangli, Maharashtra (INDIA)

Introduction: Fracture of the humeral shaft is a common occurrence. There are different modalities of management mentioned, including conservative, which also has good results. In the recent era, prompt mobilization after fixation is gaining importance. Fixation also ranges from simple dynamic compression plates (DCP) to newly designed locked compression plates. Purpose of our randomized controlled trial was to compare results and complications of interlocked nailing (ILN) and DCP. **Aims and objectives:** Study and compare the results of the management of humeral shaft fracture by DCP and ILN with respect to union, shoulder movement and infection. **Materials and methods:** From February 2006 to January 2008; 42 patients with humeral shaft fractures were grouped in two groups; one was fixed DCP and other was fixed using ILN, after defining criteria. Methods were prospectively randomized for interlocked nailing and dynamic compression plating and the results of both are compared and statistically analyzed. **Results:** As per Stewart and Hundley's criteria excellent outcome was seen in 21 patients out of whom 15 were plated. Good outcome was observed in 13 patients out of whom 7 had undergone plating. There were few complications such as infection, elbow and shoulder stiffness and non union. These were more in ILN group. **Conclusion:** Internal fixation of fractures of the shaft of the humerus with DCP gave better result than ILN. Shoulder stiffness was associated with ILN and elbow stiffness with DCP. Complications were more in ILN group than DCP. DCP stands out to be implant of choice.

Date: 2013-10-19

Session: Trauma Upper Limb - Shaft & Distal humerus

Time: 13:30 - 15:00

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Abstract no.: 33763

RESULTS OF NON UNION OF HUMERUS TREATED WITH RETROGRADE HALDER HUMERAL NAIL

Bobin VARGHESE, Hinesh BHATT, Subhash HALDER

Calderdale & Huddersfield NHS Foundation Trust, Huddersfield (UNITED KINGDOM)

Introduction : Humerus fracture account to 5-10% of all fractures.Treating non union of humerus is a surgical challenge with variable outcome. **Objective :** We report outcome of 51 cases of non union of humerus treated Retrograde Halder Humeral Nail. **Materials and Methods:** 51 cases in our institute with non union of humerus fractures were treated with retrograde Halder humeral nail. Mean age of patient was 54 years with mean duration of non union of 8 months.The patients who had clinical and radiological signs of non union at 4 months since the time of original treatment were included in this study. Constant Score for shoulder and Mayo Score for elbow was recorded at the time of union. **Results :** Of 51 patients 48 patients had clinical and radiological signs of union at mean 10 months (Range 4-24 months, Standard Deviation : 4.82).2 patients still had radiological non union but were asymptomatic. 1 patient was lost to follow up. 18 patients out of 51 needed bone grafting to aid union.The mean Constant Score at last follow up was 83 and mean Mayo Score for elbow was 80.There were no reported cases of infection. 3 patients developed radial nerve palsy which fully recovered at 3 months. **Conclusion:** Our results of non unions of humerus treated with retrograde Halder humeral nail are excellent. Union rate is about 94% with no complications and good outcome scores.Our results are better than other methods of treatment for non union of humerus published in literature.

Date: 2013-10-19

Session: Trauma Upper Limb - Shaft & Distal humerus

Time: 13:30 - 15:00

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Abstract no.: 35990

A REVIEW OF CONSERVATIVE AND SURGICAL MANAGEMENT OF DISTAL HUMERAL FRACTURES

Ravi RAY¹, Helen AUNG¹, Zameer SHAH², Steven CORBETT²

¹Southampton General Hospital, Southampton (UNITED KINGDOM), ²Guys & St Thomas NHS Trust, London (UNITED KINGDOM)

In this review, we have gone back to assess the historical non-operative management of distal humeral fractures and further assessed in great depth, the modern surgical techniques that have now been subject to a higher quality of trial. Conservative measures have been shown to be satisfactory for only the very worst injuries that were "un-reconstructable". What was known as the "Bag of Bones" complex distal humeral fracture has now been shown to benefit from early surgery to allow early movement and subsequent improvement in function. When the surgeon comes across such a fracture pattern, it has been clearly shown by newer literature that fixation may not be possible and that arthroplasty is the preferred surgical option. We have looked through around 80 years of medical literature and present our findings of higher quality trials of surgical treatment to include fixation, hemiarthroplasty as well as the more conventional total elbow replacement. The last Cochrane review is almost a decade old and the plethora of randomized controlled trails have now permitted a better understanding of which treatment would best suit this troublesome group of injuries in elderly patients. We show that conservative measures are usually reserved for the very frail patient who may not survive an operation but almost all other patients would benefit from surgical intervention, the exact nature of which is discussed in the paper.

Date: 2013-10-19

Session: Trauma Upper Limb - Shaft & Distal humerus

Time: 13:30 - 15:00

Room: Hall 1

Abstract no.: 34529

DIFFERENCE IN FUNCTIONAL OUTCOME OF DISTAL HUMERAL FRACTURES TREATED BY INTERNAL FIXATION WITH OLECRANON OSTEOTOMY VERSUS VAN GORDENER APPROACH

Shah Waliullah WALI¹, Sharma VINEET², Kumar SANTOSH¹, Kumar ASHISH³, Kushwaha NARENDRA²

¹King George Medical University, Lucknow (INDIA), ²K G M U, Lucknow (INDIA), ³king george Medical University, lucknow (INDIA)

Introduction: Distal humeral fractures are challenging fractures to manage because of pre-carious bone stock at distal end, comminution at fracture site and osteoporosis in older age group. Different approaches have been described to manage these fractures. We have evaluated the difference in functional outcome in management of distal humeral fractures treated with Olecranon Osteotomy versus Van Gordener distal Tricep tongue reflecting approach.

Method and Material: Total 42 patients with distal humeral fracture AO Type C, were taken. They were divided in two groups, Group A (n=22) were managed by Olecranon osteotomy and internal fixation while Group B (n=20) were managed by Van Gordener distal Tricep tongue reflecting approach and internal fixation. Cases were followed up clinically as well as radiologically. Functional outcomes of patient were assessed in terms of Mayo Elbow Performance score (MEPS).

RESULTS: All patients were followed for a minimum of 36 months. In group A all patients had shown union, 17 patients had shown good to excellent score, 4 patients had fair outcome while 1 had poor outcome. There was delayed union at osteotomy side in 2 patients. In group B all patients except one had shown union, 17 patients had shown good to excellent score, 4 patients had fair outcome while 1 had poor outcome. In group A MEPS score at final recent follow-up was 89 while in Group B it was 86 ($p>.05$).

CONCLUSION: There was no difference in functional outcome at final follow-up in both groups, we conclude that distal humeral fractures can be managed by either approach depending fracture geometry, quality of bone and surgical expertise.

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Session: Trauma Upper Limb - Shaft & Distal humerus

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Abstract no.: 34201

**CLINICAL OUTCOME ANALYSIS OF PARALLEL PLATE TECHNIQUE IN
INTRA-ARTICULAR DISTAL HUMERUS FRACTURES**

Mohamed Ismail DHEEN

Madras Medical College, Chennai (INDIA)

BACKGROUND: Parallel plating of intra-articular distal humerus fractures proves to be superior in biomechanical studies compared to orthogonal plating yet there are inadequate clinical studies to make valid comparisons. The purpose of this prospective clinical study was to analyse the outcome of parallel plate technique in fixation of intra-articular distal humerus fractures. **METHODS:** We studied twelve consecutive adults for an average duration of 14 months after an early internal fixation with parallel plate constructs for intra-articular distal humeral fractures. According to AO classification, there were seven C2 and five C3 fractures. Clinical outcomes were evaluated using Mayo Elbow Performance Score (MEPS). **RESULTS:** Solid radiologic union was achieved primarily in all patients. Hardware failure did not occur in any patient. One patient with associated head injury developed severe heterotopic ossification who underwent resection for severe restriction of movement. Non-union at olecranon osteotomy site occurred in one patient. The mean flexion-extension arc was 95°. The mean MEPS score was 82. The results were excellent for 5 elbows, good for 5, moderate for 1, and poor for 1 patient. **CONCLUSIONS:** Functional results were satisfactory in intra-articular distal humerus fractures treated with stable fixation by parallel- plate technique which allows early active elbow motion. **KEYWORDS:** parallel plating , Mayo elbow Performance score, heterotopic

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Time: 13:30 - 15:00

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Abstract no.: 33931

**CONDYLAR ORIENTATION PLATING IN COMMINUTED
INTRA-ARTICULAR FRACTURES OF ADULT DISTAL HUMERUS**

Achin MURARKA, Sukhendu SARKHEL, Sailendra BHATTACHARYYA
BHATTACHARYYA ORTHOPAEDICS AND RELATED RESEARCH
CENTRE, KOLKATA (INDIA)

Introduction: The condyles of distal humerus have characteristic orientation in reference to the diaphysis. Anatomical reduction of the articular surface in intraarticular fractures of adult distal humerus does not always restore preinjury functional status. The purpose of the study was to determine the outcome of treating these fractures with our technique of condylar orientation precontoured plating. The principle of the technique is to primarily restore the anatomical orientation of the reconstructed distal humeral condyle with the diaphysis of the humerus apart from anatomical reduction of fracture. **Material and Methods:** Between 1999 – 2009, 71 consecutive patients with comminuted intraarticular adult distal humerus fractures were treated with the condylar orientation plates which were specifically designed. 43 fractures were AO type C3, 24 were C2 and 4 were C1. On medial and postero-lateral side of distal humerus, precontoured plates were applied. Patients were followed up for a mean of 3 years. They were assessed clinically [using Mayo Elbow Performance Score] and radio-graphically. **Results:** 61 (86%) patients regained MEPS of 90 or more i.e. excellent result. One patient had non-union and two patients developed heterotopic ossification. The mean MEPS was 95. Average extension & flexion was 150 & 1330. The result was graded as excellent in 60, good in 7, fair in 3 and poor in 1. At the time of most recent follow up 63 elbows were painless. **Conclusion:** Excellent pain free range of motion with high rate of union can be achieved in comminuted intraarticular distal humerus fractures in adults with the use of condylar orientation precontoured plating technique. Condylar orientation is very important with perfect articular congruity in elbow motion.

Date: 2013-10-19

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Time: 13:30 - 15:00

Room: Hall 1

Abstract no.: 35191

**LONG-TERM FUNCTIONAL OUTCOME AFTER FRACTURE
DISLOCATION OF ELBOWS IN ADULTS**

Deepthi Nandan ADLA¹, Ryan CHAU¹, Murali VENKATESAN², Amit MODI¹

¹Leicester Royal Infirmary, Leicester (UNITED KINGDOM), ²Northampton General Hospital, Northampton (UNITED KINGDOM)

AIM: Evaluation of clinical outcome following elbow fracture dislocations. **BACKGROUND:** Fracture dislocations of the elbow requiring surgical fixation are uncommon but potentially debilitating injuries . Long term clinical outcomes are poorly documented in the literature. Although it is difficult to compare pre-existing functions of the uninjured limb, the use of standard outcome measures can be used to monitor and to make meaningful attempts at patient care improvement. Previously, short -term general assessments (range of motion, strength, and sensation) are made at follow-up, with little patient input. Recently, there is increasing support for the use of patient-reported outcome measures (PROMs), reflecting the patient's, rather than the clinician's, perspective. **METHOD:** Forty consecutive patients who had surgery for elbow fracture dislocation were identified in the Leicester Royal Infirmary, UK, from 2004-2011. Dates and information about the injuries were retrieved, and outcome assessments documented at follow -up clinics. Postal questionnaires were sent to the patients to evaluate their latest symptoms and functions through PROMs. **RESULTS:** Functional outcome was based upon the Oxford Elbow, and DASH scores. Results showed that the average flexion-extension arc of elbow motion was 105 degrees +/- 20 degrees , and the average pronation-supination arc was 110 degrees +/- 36 degrees . Grip strength averaged 68% of the contralateral extremity. None of the injury characteristics, patient demographics or treatment modalities was significantly associated with a poor outcome at the 95% confidence interval. **CONCLUSION:** Although fracture dislocations of the elbow are severe injuries, surgical management appears to provide clinical functional benefit.

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Abstract no.: 35114

TECHNIQUE FOR OPEN REDUCTION AND INTERNAL FIXATION OF TYPE 4 CAPITELLAR FRACTURES WITH NORMAL FUNCTIONAL OUTCOME.

Harshil PAREKH, Vishal MANGROLIA

G T Sheth Orthopaedic Hospital, Rajkot (INDIA)

Background: Incidence of Capitellar fractures is 1% of elbow fractures. Fixation is treatment for type 1 and type 4 fractures. Functional outcome of Type 4 fractures is associated with elbow stiffness. Our purpose of this study was to evaluate surgical technique which gives normal functional outcome. **Methods:** This is retrospective study of 10 cases with capitellar fractures. We had included three patients who had type 4 capitellar fractures. All three patients were male (mean age was 26years). The new sub-classification by Ring and Jupiter was also considered. We operated within 48 hours with mean operative duration of 35 minutes. We used classical lateral Kocher approach. Under image intensifier headless screw was inserted from posterior to anterior direction. **Results:** As per Mayo Elbow score all patients had excellent result from 4-5 weeks. All patients had restored normal elbow functions at 3 to 4 months. There were no complications during early and delayed post-operative period. **Discussion:** Lateral radiograph of elbow with semilunar appearance and double arc sign are classical features for diagnosis of these fractures. We do not need to extend Kocher's approach. Muscle stripping is not necessary as we insert screw from posteriorly by mini incision. This fracture becomes stable in elbow flexion thus eliminate use of clamp. Moreover postero-anterior direction of screw prevents cartilage penetration. **Conclusion:** Restoration of fracture fragments at its anatomical position, avoiding iatrogenic damage and rigid compression for early mobilization are key points for normal recovery in all patients.

Date: 2013-10-19

Session: Paediatrics - Foot & Ankle

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 35822

SURGICAL MANAGEMENT OF TIBIAL SHAFT FRACTURES IN CHILDREN AND ADOLESCENTS BY USING INTRAMEDULLARY FLEXIBLE NAIL

Mohsin SYED, Mallikarjun REDDY

jjm medical college, davangere (INDIA)

Introduction: Tibial and Fibular shaft fractures are the third most common pediatric long bone fracture. Tibial shaft fractures are managed commonly by closed reduction with long leg casting, it is not uncommon to come across complications like shortening, angulations, malrotation at the fracture site including longer duration of immobilization, along with knee stiffness. **Method:** Prospective study carried out from September2010 to September2012 on children between age group of 5-16 years with tibial shaft fractures there were 12 boys and 8 girls. In this period 20 cases were studied by treating them with CRIF with Flexible nails both titanium and stainlessteel nails under image intensification and were reviewed with Antero-posterior and Lateral radiographs on their follow up visits at 1,2,3,6 months and a year. **Final outcome was measured by Flynn's criteria.** **Results:** In this study, mean age group was 9.5 years, mean duration of surgery was 57minutes, with mean duration of hospital stay was 7.8days with an average time of union being 12.65weeks. We had 1(5%) patient with superficial infection,1(5%) with deep infection with no significant major angular deformities and limb length discrepancy. We found 95% of excellent outcome,5% Satisfactory with no poor outcome. **Conclusion:** Flexible intramedullary nail is an effective method which can be adopted for the treatment of tibial shaft fractures in children and adolescents aged between 5 to 16years preventing damage to the epiphysis without interfering with fracture hematoma, with no stiffness of the knee and limb length discrepancies and thereby decreasing the morbidity of the patient.

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Session: Paediatrics - Foot & Ankle

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 35215

WHAT DETERMINES THE NUMBER OF CASTS IN CTEV; PIRANI SCORE VS AGE: A RETROSPECTIVE COMPARATIVE STUDY

Neeraj GUPTA, Anil AGARWAL

Chacha Nehru Bal Chikitsalya, Delhi (INDIA)

Introduction: We studied the relative influence of Age and Pirani score on the number of casts required to prepare the foot for tenotomy in Ponseti method. **Material and methods:** We retrospectively analyzed the records of 297 children with primary idiopathic clubfoot. A statistical analysis using negative regression analysis was used for finding correlation between child age and number of casts per child and the pirani score and number of casts.

Results: There were a total of 297 children (446 feet) under the study meeting the inclusion criteria. The average age of the child at presentation was 10.3 months (2 weeks to 110 months). The average number of casts was 7 per child (2 to 18). 88 children had a Pirani score of less than or equal to 4 (average casts 5.8), whereas 211 children had a Pirani score of more than 4 on presentation (average casts 7.5). The regression analysis gave that the approximate number of casts varied as $6.4 + 0.05 \times \text{age in months}$. Whereas, the number of casts varied with pirani score as $4.1 + 0.6 \times \text{pirani score}$.

The multiple regression analysis showed that the no. casts is equal to $2.5 + 0.8 \times \text{pirani score} + 0.07 \times \text{age in months}$.

Conclusion: Both the age and the pirani score at the initial presentation had a positive effect on the total number casts required before the tenotomy and the relation is directly proportional. But, when statistically analysed, it was observed that pirani score is 10 times more influential.

Date: 2013-10-19

Session: Paediatrics - Foot & Ankle

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 33795

MODIFIED PONSETI METHOD OF MANAGEMENT OF NEONATAL CLUB FEET

Pavan BELEHALLI¹, Malhar.N KUMAR², Chethan G²

¹HOSPITAL FOR ORTHOPAEDICS,SPORTS MEDICINE,ARTHRITIS AND TRAUMA(HOSMAT), BENGALURU (INDIA), ²HOSMAT, BENGALURU (INDIA)

Introduction-In this study, the classical Ponseti technique has been modified, for decreasing the duration of casting and the number of casts.**Methods-**This method was used in 82 feet with idiopathic talipes equinovarus. 32 children with bilateral club feet and 18 with unilateral club feet. All children were neonates who presented to the hospital within 4 weeks of birth.**Method** 1) a percutaneous tenotomy of the tendo Achilles done at the first visit and a corrective cast applied ; 2) the first 'supination cast' used in the classical Ponseti method was omitted. It should be emphasized here that the supination manoeuvre described by Ponseti (elevating the first metatarsal to correct the cavus deformity) was not omitted. The subsequent steps of manipulation as described by Ponseti ; 3) only one cast was used for a period of 3 weeks following which, the cast was removed and an external rotation splint was used for maintenance of correction.**The scoring systems of Pirani and of Dimeglio were used for assessing the deformity before and after treatment.****Results-**The mean Dimeglio score was 12.7 before tenotomy at the first visit . It reduced to 6.5 after tenotomy and further reduced to 3.6 after 3 weeks of casting. The mean Dimeglio score was 1.3 at the final follow-up. The mean Pirani score was 3.5 at the first visit before tenotomy . It reduced to 1.8 immediately after tenotomy. It further reduced to 0.7 after 3 weeks of casting. The mean Pirani score was 0.2 at the final follow-up.

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Room: Hall 2

Abstract no.: 34841

PONSETI TECHNIQUE USED FOR CLUBFOOT IN OLDER CHILDREN

Xu LI, Qiang SHI, Weiping WU, Dadi JIN

Department of Pediatric Orthopaedics, The 3rd Affiliated Hospital of Southern Medical University, Guangzhou (CHINA)

Objective This prospective clinical study was performed to assess the feasibility of Ponseti technique used in older children above age 1 with clubfoot. **Methods** Sixteen older children (19 clubfeet) were treated with ponseti technique in our institute from Jun 2008 to Aug 2011, of which 9 children were never treated, the other 7 cases represented with recurrent deformity after ponseti treatment, tibialis anterior tendon transfer, posteromedial release and achilles tendon lengthening. The children aged 15-76 months (average 34 months) at the initial treatment time and were followed up by an average of 27.6 months (range 11-49 months). We measured initial and consecutive Pirani-Scores, the ankle joint ROM, and taking radiographs during follow-up. All children have accepted the ponseti cast under intravenous anesthesia for 4-11 times (average 7.1 times). After completion of the deformity corrections including forefoot adduction, varus and inversion of hindfeet, the final residual equinus deformities were corrected by percutaneous achillotomy, or combined with posterior release. After removal of the last cast, we used Dennis shoes or customized abduction braces to maintain the corrected feet shapes. **Results** The final Pirani-Scores consists of 1 point in 6 feet, 0.5 point in 8 feet and 0 in 5 feet. The ankle joints dorsal flexion angle ranged 15-40 degrees (average 26 degrees). Most children have obtained a painless gait and had satisfaction with the results. **Conclusion** The results of this study advocate the application of ponseti technique in older children, and the excellent results of long time follow-up can be expected.

Date: 2013-10-19

Session: Paediatrics - Foot & Ankle

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Room: Hall 2

Abstract no.: 34607

PONSETI METHOD IN NEGLECTED CLUBFEET

Anil MEHTANI, Alok SUD, Abhinav SINHA

Lady Hardinge Medical College, New Delhi (INDIA)

Introduction - Following the success of Ponseti method in clubfeet in infants till the age of one year, we evaluated the efficacy of Ponseti method in neglected clubfeet as well. Materials & Methods - Ponseti method of manipulation and casting was used in the management of neglected clubfeet for 56 feet, in a population of 43 children with a mean age of 3 years (1 to 10.5 years). Both Pirani and Dimeglio scores were used for the evaluation of the clubfeet. However, Dimeglio scoring was found to be more useful in the evaluation of these feet. All the patients underwent percutaneous tenotomy of the Tendoachilles under GA. The number of casts required for the correction of the deformity ranged from 8-18. It was observed that cavus was stubborn to correct in this group of patients. The correction of cavus was continued while the foot was being abducted. Another difference found was that following tenotomy dorsiflexion achieved was lesser as compared to infants, it ranged from 5-15 degrees. Improved dorsiflexion to 20-30 degrees was achieved by re-casting for two to three weeks. As the children were school going and walking, foot abduction braces were used only at nap times. Results - All the feet showed complete correction of clubfoot deformities. The mean Dimeglio score before and after treatment was 16 and 3 respectively. In a mean follow up of one year, there were 5 recurrences of which 2 were treated with repeat casting and 3 with Tibialis Anterior transfer.

Date: 2013-10-19

Session: Paediatrics - Foot & Ankle

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Room: Hall 2

Abstract no.: 35649

MANAGEMENT OF NEGLECTED CLUBFOOT IN CHILDREN USING ILIZAROV AND MINIMAL INVASIVE SURGERY (PROSPECTIVE STUDY)

Mohamed Fawzy KANDIL¹, Mohamed FADEL²

¹EI helal hospital, cairo (EGYPT), ²EI Minia university hospital, EI Minia (EGYPT)

Background: using Ilizarov in management of neglected clubfoot in children is not a new method but it increasing nowadays especially in developing countries. Purpose: To directly evaluate the outcomes of Ilizarov and minimal surgery in correction of neglected club foot in 62 feet (42 child). Study Design: prospective study. Methods: forty two child (62 feet) were followed up for 1-2 months with gradual correction in the planes of the deformities using ilizarov device and minimal invasive surgery is done, according to pirani scale 29 feet was grade IV and 33 was grade III . 34 males, 8 females, 10 Lt foot, 12 Rt foot and 20 bilateral cases. the age of patients ranging from 5 to 15 years old. Results: All cases was corrected after a mean follow up period of 6 weeks in ilizarov followed by a period of 2 months in cast and observation period for another 6 months with success rate (100%). According to the American foot and ankle score all cases were excellent except 3 cases were poor result. one case had infected skin and subcutaneous tissues and needed debridement . three cases developed skin sloughing and changes in color and needed close follow up and cessation of the gradual correction for some time , 4 patients show unhappiness with the device in the last one week. Conclusion: we recommend combined Ilizarov and limited invasive technique in management of moderate to severe neglected club foot cases in children .

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Session: Paediatrics - Foot & Ankle

Time: 10:30 - 12:00

Room: Hall 2

Abstract no.: 33916

UMEX® MINI-EXTERNAL FIXATORS IN COMPLEX CONGENITAL FOOT DEFORMITIES

Shreedhar ARANGANATHAN¹, Carpenter CLARE², Thomas DANIEL PHILLIP³, Hemmadi SANDEEP³, O'Doherty DECLAN³

¹Ysbyty Gwynedd, Bangor, Wales, UK, Bangor (UNITED KINGDOM),

²University Hospital of Wales, Wales (UNITED KINGDOM), ³University Hospital of Wales, Cardiff (UNITED KINGDOM)

Complex congenital foot deformities pose a challenge to the surgeon due to poor results. Extensive open surgical procedures lead to painful scarring and stiffness in this patient cohort. Though Ilizarov type fixators avoid these complications, they are not techniques for an occasional surgeon. We are the first centre in the UK to report clinical outcomes using a simple external fixator (UMEX® -Universal mini-external fixator System) which achieved good functional outcomes in children with complex foot deformities. UMEX® frames use the principle of distraction osteogenesis in restoring adequate function while causing minimal damage to soft tissue and bones. Since 2004 we have treated 32 children (35 feet) who presented with deformities secondary to resistant/recurrent Congenital Talipes Equino Varus(CTEV), cavo-varus deformity secondary to Charcot-Marie-Tooth disease, arthrogryposis, fibular hemimelia and other congenital abnormalities. Twenty-six patients achieved pain-free function in the first postoperative year and 19 patients continued this function up to fifth postoperative year, to date. Pin-site infection requiring oral antibiotics alone was the predominant complication (10 patients). With a short learning curve and low-complication rates, these frames could achieve good functional outcome in patients with complex congenital abnormalities.

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Session: Paediatrics - Foot & Ankle

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Room: Hall 2

Abstract no.: 33887

**SEQUENTIAL THERAPY OF VACUUM SEALING DRAINAGE AND
PEDICLED FLAP TRANSPLANTATION FOR CHILDREN WITH
MOTORCYCLE SPOKE HEEL INJURY**

Bin YU¹, Fu DONG², Nan JIANG²

¹Department of Orthopaedics and Traumatology, Nanfang Hospital,

Guangzhou (CHINA), ²Department of Orthopaedics and Traumatology,

Nanfang Hopsital, Guangzhou (CHINA)

Purpose: To investigate clinical characteristics and efficacy of sequential therapy of vacuum sealing drainage (VSD) and pedicled flap transplantation for children with motorcycle spoke heel injury. Methods: Ten children with the injury received sequential therapy of VSD and pedicled flap transplantation. All cases had exposure and partial soft tissue defects. The wound size ranged from 3cm×3cm to 6cm×10cm. Tissue defects included single tendon defect and multiple defects of the bone and tendon. After thorough debridement of the wound, VSD was applied for twice in 9 cases and three times in one case. Thereafter, different kinds of pedicled flaps with or without neuroanastomosis were selected according to the wound characteristics. Special attention and measures were taken regarding the flap survival postoperatively. The wound healing and functional recovery were also followed up. Results: After VSD therapy, no infection was identified in all cases and the granulation tissue surrounding the exposed areas of tendons and bones grew well. All flaps survived well except for one had partial skin necrosis in the distal site. Sensory recovery achieved S3 in 5 cases applicable for neuroanastomosis. The mean follow-up time was 14.3 months and most cases were satisfied with the flap appearance and functional recovery. Conclusions: The characteristic of paediatric motorcycle spoke heel injury lies in its combination of crush and incised damages. Sequential therapy of VSD and pedicled flap transplantation can be used to obtain fine outcome of wound healing and satisfying functional recovery for the management of paediatric motorcycle spoke heel injury.

Date: 2013-10-19

Session: Trauma - Tibia I

Time: 10:30 - 12:00

Room: Hall 3

Abstract no.: 34040

ANATOMICAL STUDY OF FOUR COLUMN CLASSIFICATION OF TIBIAL PLATEAU FRACTURES BASED ON THREE DIMENSIONAL CT RECONSTRUCTION IMAGES

Shicai FAN

the third affiliated hospital of southern medical university, Guangzhou
(CHINA)

The four column classification theory based on three-dimensional CT reconstruction images was proposed, and its use in guiding the choosing of specific surgical approach was evaluated. Fifty-seven patients treated surgically between June 2009 and June 2012 were reviewed. Seen from the superior aspect of the tibial plateau, the tibial eminence was set as a central point, four lines were drawn to tibial tubercle, anterior rim of fibular head, medial tibial spine, and end point of posterior cruciate ligament from the central point respectively, thus, the tibial plateau was divided into four columns: anterolateral, anteromedial, posterolateral, and posteromedial. The choosing of the surgical approaches were based on the fracture patterns according to the four column theory, including the anterolateral, anteromedial, posterior, extensive lateral approaches, and their combinations. All 57 patients had undergone surgeries smoothly, and been followed-up. The mean follow-up time was 13 months (6 to 18 months). Neurological injuries occurred in 3 cases, all fully resolved within 3 months. No vascular injuries nor wound infections occurred. All fractures healed completely. Secondary depressions occurred in two cases, and genu valgum occurred in one case. The postoperative knee functions were excellent in 77 patients, good in 32 patients, and fair in 8 patients, according to the Rasmussen's score system. The good and excellent rate was 93.1%. The four column classification of the tibial plateau can reflect the fracture patterns comprehensively, and guide the choosing of the surgical approaches to achieve optimal outcomes.

Date: 2013-10-19

Session: Trauma - Tibia I

Time: 10:30 - 12:00

Room: Hall 3

Abstract no.: 35966

ILIZAROV CIRCULAR FIXATOR- A SAFE AND RELIABLE ALTERNATIVE IN THE TREATMENT OF PROXIMAL TIBIAL FRACTURES.

Seetha Rama Prasad YALAMANCHILI¹, Leela Prasad BADA²

¹Dr Seetha Ram's Ortho Clinic, Visakhapatnam (INDIA), ²Hyma spine and ortho clinic, Visakhapatnam (INDIA)

Fractures of the proximal tibia present a challenge to the treating surgeon. Achieving a stable fixation with ORIF using plates/screws is difficult because of comminution and poor bone stock, while the precarious soft tissue condition and the necessity of large incisions/dual plating increases the risk of skin necrosis and wound infection. We present our experience in the treatment of these fractures in 39 patients using the Ilizarov ring fixator. Displaced intra-articular fragments were first fixed with percutaneous screws. Stable fixation was achieved by using tensioned K wires, passed in a multi-planar, multi-directional manner, in the proximal segment, and using a combination of wires and tapered threaded pins on posts in the distal segment. The total number of rings used depended on the extent of comminution and bone contact. The knee joint was included only when there is instability even after fixing the fracture. The time to union, range of motion in the knee and the need for any secondary procedures were analysed in the follow-up. The Ilizarov method of fixation offers a safe and reliable alternative in the treatment of these fractures. The risk of skin necrosis is less as there are no large incisions. The direction and plane of fixation is flexible and can be tailor made according to the fracture pattern, unlike in a plate where it is pre-determined by the fixed holes and the direction of the screws in the holes. This increases the stability of fixation and allows early weight bearing and healing.

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Session: Trauma - Tibia I

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Room: Hall 3

Abstract no.: 35708

**MANAGEMENT OF INTRA-ARTICULAR TIBIAL PLATEAU FRACTURES
WITH POSTEROLATERAL ARTICULAR DEPRESSION**

Sandeep GUPTA

G.M.C.H , sector-32, chandigarh (INDIA)

Intra-articular tibial plateau fractures with posterolateral articular depression are increasingly frequent injuries. We present our experience with treating such injuries in 10 patients using a posterior midline/L-shaped incision with or without sequential anterolateral incision. All except one patient achieved satisfactory reduction with articular step-off <2mm. All the patients achieved union with full weight bearing within 3 months. None of the patient had any wound-healing problem. Mean flexion achieved was 120degrees(110-140) at mean follow-up of 4-15 months. We conclude that it is very important to identify posterolateral articular depression by properly studying pre-op CT-scans. Once identified ,such injuries should be addressed directly by a posterior approach which would allow an anatomic reconstruction of articular surface

Date: 2013-10-19

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Room: Hall 3

Abstract no.: 34305

EVALUATION OF 154 PATIENTS WITH INTERNAL FIXATION OF INTRAARTICULAR PROXIMAL TIBIA FRACTURES.

Ashwinkumar UNDHAD, Lokesh A V, Mukul SINGHAL

Hosmat hospital, Bangalore (INDIA)

OBJECTIVE: To evaluate the functional and radiological outcomes of patients with intraarticular proximal tibial fractures treated operatively. **METHODS:** We had operated on 220 cases of intraarticular proximal tibial fractures in our center from June 2006 to February 2012. 154 patients were followed up for a minimum period of 2 years, ranging from 24 to 72 months (averaging 46 months) and evaluated for the functional outcomes by a series of standard questionnaire, HSS score and WOMAC Score. **RESULTS:** The fractures in all 154 patients healed with an average time of 10 weeks and the mean interval between the operation and full functional mobility was 14 weeks (ranging from 12 to 18 weeks). The adequacy of reduction was checked and found to be good in all but 15 patients. 89% patients has returned to previous level of activity. 10% patients had persistent pain and had signs of early arthritis. 72% patients had full ROM knee on final follow up. The mean range of knee flexion was 106 (ranging from 70 to 130°).The average HSS Score was 91.The average WOMAC pain subscore was 4 and physical function subscore of 11. 5 patients needed flap surgery due to wound complications. **CONCLUSION:** Intraarticular proximal tibial fractures treated operatively show good functional outcome in term of knee ROM, knee stability, relief of pain and return to previous activity. **KEY WORDS:** Intraarticular proximal tibial fracture, Internal Fixation, Adequacy of Reduction.

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Room: Hall 3

Abstract no.: 35983

STAGED DEFINITIVE FIXATION OF DISTAL TIBIA FRACTURES USING LOCKING PLATE OSTEOSYNTHESIS

Dabis JOHN¹, Chakravarthy JAGANNATH², Oni TOFFIE³, Bose DEEPA²

¹Croydon University Hospital Spinal Unit, London (UNITED KINGDOM),

²Queen Elizabeth University Hospital, Birmingham (UNITED KINGDOM),

³Queen Elizabeth University Hospital, London (UNITED KINGDOM)

Distal tibial fractures are often associated with significant soft tissue injuries, which prevent definitive fixation. We present our experience with 18 patients who had definitive fixation after initial temporary external fixation. There were seven open fractures and 11 closed fractures. We classified the fractures using the AO classification. We also classified the soft tissue injuries using the Gustillo Anderson and Tscherne classification. Surgery was conducted only when the soft tissues permitted. The average duration between external fixation and definitive fixation was 18.9 days (range 5 – 70 days) excluding one patient, with duration of 240 days. 17 patients were treated with a Synthes distal tibia LCP and one with an Anterolateral LCP. Of the united fractures one required revision fixation due to implant failure at 32 weeks. There were 2 non-unions, both in patients with open fractures. One of the two patients required bone grafting at 26 weeks and pulse magnetic stimulation at 36 weeks and still has not united. One patient required an amputation before union due to complications of multiple ipsilateral lower limb fractures. There were two superficial wound infections, which settled with oral antibiotics. There were no pin site or deep infections. Conclusion – Initial external fixation is required in patients with significant soft tissue injuries and complex fractures. Our series shows good results in patients who are converted from preliminary external fixation to definitive fixation with minimal infection rates and non-union rates. Our series shows that locking plate osteosynthesis are appropriate for this subset of patients.

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Abstract no.: 35448

OSTEOSYNTHESIS OF DISTAL TIBIAL FRACTURES BY I.M.NAIL AND FIBULAR FIXATION

Vijayanand LOKHANDE, Wasudeo GADEGONE

CHANDRAPUR MULTISPECIALTY HOSPITAL, CHANDRAPUR (INDIA)

From May 2007 to may 20012, in 61 patients (19 females and 42 males; mean age, 46.2 years [range, 19-83 years]) of distal tibia were treated with IM nailing. The fractures were classified according to (AO) classification. Four fractures presented a distal articular extension treated with additional screws fixation . Close fracture 50 and 11 grade 1 .Compound type 2 , 3 or more extensive fractures were excluded. Fixation was done with reamed snugly fitted intramedullary nail in all cases. Nail was distally locked with two screws and proximally locked with single screw in dynamic mode. Additional poller screws were used in 11cases. Fibular fracture were fixed with screw intramedullary nail 36.The patients were evaluated clinically and radiologically . The bone union rate was 97.6% in a mean 15.7 weeks.. A leg shortening was found in 4 cases, but it was less than 1 cm in every case. Angulation greater than 5° and less than 10* were observed in 14 cases. In two cases infections were observed mainly at the screw insertion sites. Two cases had bent interlocking screws, BONE grafting were performed in two and exchange nailing was done one case. The mean Olerud functional score at 12 months was 83.5 Concurrent intramedullary nailing for fractures of the distal tibia and fibula is effective in preventing malalignment .

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Room: Hall 3

Abstract no.: 35373

OPEN DISTAL TIBIA & ANKLE FRACTURES TREATED WITH INTERNAL AND EXTERNAL STABILIZATION TECHNIQUES

Florian M KOVAR, Johannes LEITGEB, Rupert SCHUSTER, Patrick

PLATZER

AKH-Vienna, Vienna (AUSTRIA)

Introduction: The purpose of this study was to determine whether different forms of stabilization for open distal tibia fractures can be performed without influencing overall outcome. Although the traditional management of these injuries is external fixation, a trend towards definitive stabilization techniques has evolved in the current literature. **Methods:** All open distal tibia fractures presenting to our urban Level I trauma centre during a ten-year period were reviewed. Fifty patients were initially treated at the above institution within six hours of injury. All patients underwent emergent wound irrigation, debridement and antibiotic therapy. Study population (44 patients) consisted of twelve (27%) G I, nineteen (43%) G II and thirteen (30%) G III fractures. **Results:** Initially fracture management was performed with plating (PL) 17 (39%), external fixation (EF) 10 (23%), with nail and plate five (12%), with EF and K-wire 2 (5%), with EF and PL 2 (5%), K-wire and screw 2 (5%), EF and screw 1 (3%), K-wire 1 (3%), cast 1 (3%), and amputation 1 (3%). In two cases (6%) no treatment was performed because of imminent death after admittance. Complications occurred in our study population in a total of nine (21%) cases. **Conclusion:** Using internal fixation techniques in acute fracture treatment for open distal tibia fractures is a safe and effective surgical technique, when it comes to evaluating complications in our study group.

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Room: Hall 3

Abstract no.: 34634

MANAGEMENT OF GRADE 3 OPEN TIBIAL FRACTURES WITH A CIRCULAR FRAME

David DICKSON, Yvonne HADLAND, Hemant SHARMA

Hull Royal Infirmary, Hull (UNITED KINGDOM)

Introduction: The management of grade 3 open tibial fractures presents a complex problem for all trauma and orthopaedic surgeons particularly as there is no agreement on the best method of treatment. **Methods:** We examined 40 consecutive Grade 3 open fractures treated with a circular frame. We assessed both the surgical and patient scored outcomes with the use of the Olerud and Molander Ankle score, the Iowa Knee score and the EuroQol EQ-5D health questionnaire. **Results:** The union rate was 92.5% and this occurred in a median of 204 days. The pin-site infection rate was 27.5% and deep infection occurred in 5% of cases. There were no cases of malunion. The median Visual Analogue Score was 80. Good to excellent function was achieved in 79.4% of ankles and 76.5% of knees. The range of motion in the knee was similar to the uninjured side whilst it was significantly reduced in the ankle. The majority of patients were free from pain (52.9%), anxiety or depression (73.5%) with the rest experiencing mainly minimal symptoms. The majority of patients had minimal or no problems in mobilising (58.8%), using the stairs (61.8%), washing and dressing (85.3%) in partaking in recreational activities (52.9%), running (55.9%), jumping (61.8%) whilst 79.4% felt they were able to undertake their activities of daily living normally or with a loss of tempo. **Discussion:** The outcomes achieved with a circular frame are generally, either equal to or superior to those achieved with results described using other techniques in the literature.

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Session: Trauma - Tibia I

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Abstract no.: 34266

**MANAGEMENT OF LARGE BONE GAP BY INTERNAL BONE
TRANSPORTATION (RRBTT)**

Rakesh TRIPATHI

upchar hospital, jhansi (INDIA)

Back Ground: Recent era of fast vehicular traffic often involves multiple pieces (communited) fracture resulting into bone loss and bone gap. With the help of new innovated technique RRBTT (Rakesh Remote Bone Transportation Technique) several cases were treated to fill large bone gap without incision at fracture site. **Material :** 1. Bone scoop with cover, 2. Bone picker, 3. RRBTT transportation tube, 4. Flexible bone pusher. **Method:** Bone grafts harvested from the entry point of inter locking nail and iliac crest, are then transported to the fracture gap with the help of transportation tube under IITV. In this method there is no need to open fracture site which in terms is very helpful in fracture healing and filling of large bone defects. **Advantage:** Corticocancellous bone harvested from entry point and then transported at the # site is done for the first time in orthopaedic history. Internal transportation of bone is vascular friendly method thus fracture heals in a much shorter duration with negligible infection rate. RRBTT procedure is economical. **Result:** 24 cases shows good and excellent result with mean healing period 14-18 weeks. **Conclusion:** Till today bone gap are managed with corticotomy, gradual transportation, docking and definitive secondary bone grafting. This new innovated method of internal transportation has shown wide vision and opened a new window through which bone transportation enhances osteogenesis without opening fracture site.

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Abstract no.: 35414

THE IMPACT OF COMPARTMENT SYNDROME, FASCIOTOMIES, NAILING AND OTHER RISK FACTORS ON TIME TO FRACTURE HEALING AFTER CLOSED AND OPEN GUSTILO-I TIBIAL FRACTURES.

Suribabu GUDIPATI¹, Maria Mercedes REVERTE-VINAIXA¹, Peter GIANNOUDIS²

¹Leeds Teaching Hospitals NHS Trust,, leeds (UNITED KINGDOM), ²Leeds Teaching Hospitals NHS Trust, Leeds (UNITED KINGDOM)

Introduction: Acute compartment syndrome (ACS) represents a potentially devastating complication, requiring early recognition and prompt treatment with fasciotomies in order to prevent chronic disability. The aim of this study is to compare the time to union in tibial fractures with and without development of compartment syndrome. **Materials and methods:** Thirty-one patients with open Gustilo type-I and closed diaphyseal tibial fracture who underwent reamed tibial IM nailing and had fasciotomies for ACS met the inclusion criteria. 33 similar matched controlled patients without ACS formed the control group of the study. Parameters studied included the time-to-union, age, gender, mechanism of injury, Injury Severity Score, time of onset the symptoms to fasciotomy and other risk factors known to be associated with delayed fracture healing such as obesity, smoking, drug abuse, increased alcohol consumption, steroids used and non-steroidal anti-inflammatory drugs. **Results:** Overall 64 patients were studied. The incidence of delayed union and non-union was greater in the ACS group ($p=0.033$). A multivariate Cox proportional hazard analysis showed that patients with ACS and subsequently fasciotomy had a statistically significant association with delayed union or non-union ($HR=2.34$; $p=0.009$), steroids drugs ($HR=6.712$; $p=0.015$), and alcohol consumption ($HR=2.12$; $p=0.064$). They were strongly and independently predictive variables of delayed union and/or non-union. **Conclusion:** Patients with tibial fractures complicated by compartment syndrome should be informed that they have a greater than two fold increased risk of delayed union and non-union compared to patients without the development of this complication.

Date: 2013-10-19

Session: Trauma - Tibia II

Time: 13:30 - 15:00

Room: Hall 3

Abstract no.: 35971

CAN WE PREDICT ANTERIOR KNEE PAIN AFTER TIBIAL INTRA MEDULLARY NAILING?

Prasad SORAGANVI, Ramakanth RAJAGOPALAKRISHNA

PESIMSR, Kuppam,AP (INDIA)

Introduction : Intramedullary nailing has been used frequently for treatment of tibial diaphyseal fracture. Chronic anterior knee pain has been considered most frequent post operative complication of this technique. We investigated relationship between anterior knee pain and position of nail tip in proximal tibia. **Methods:** 103 patients were selected among patient who underwent interlocking nailing in our institution. Patients with other factors that might cause anterior knee pain were excluded. In all patients intramedullary nailing was done using Transpatellar approach. The patients were evaluated in two groups, 42 patients had anterior knee pain where as 61 patients did not had pain. The distance from nail tip from tibial plateau measured on lateral x rays. Also nail prominence from anterior tibial cortex measured. **Results:** two groups were similar with respect to gender and follow up period. Out of 42 patients who had knee pain 21 patients(20%) had nail tip within proximal third distance from plateau to tibial tuberosity. 24 patients (42%) among knee pain group had nail prominence of more than 5mm from anterior tibial cortex followed by 12 patients(29%) within 5mm and 12 patients (29%) buried within anterior cortex. **Conclusion:** our findings suggest that more incidence of knee pain is found when nail is prominent more than 5mm and when it is in proximal third distance from tibial plateau to tuberosity. Patients should be aware of high incidence knee pain when nail tip is place in proximal third and prominence of more than 5mm.

Date: 2013-10-19

Session: Trauma - Tibia II

Time: 13:30 - 15:00

Room: Hall 3

Abstract no.: 33956

**NAIL POSITION HAS INFLUENCE ON ANTERIOR KNEE PAIN AFTER
TIBIAL INTRAMEDULLARY NAILING**

Nikica DARABOS, Ivana DOVZAK BAJS, Aljosa MATEJCIC, Esmat ELABJER, Srecko SABALIC, Tihomir BANIC

UNIVERSITY CLINIC OF TRAUMATOLOGY, CLINICAL HOSPITAL
CENTER SISTERS OF CHARITY, ZAGREB (CROATIA)

Anterior knee pain (AKP) is common complication following intramedullary nailing of tibial shaft fracture. We evaluated postoperative outcome results of 215 patients, operated in last 4 years, with healed fractures initially treated with intramedullary reamed nails with 2-3 interlocking screws on both parts of nail, with use of medial paratendinous incision and three-quarter outer protective sleeve for nail entry portal. Our aim was to analyze possible relationship between AKP according to VAS scale, Nail position was marked as a distance from tip of nail to tibial plateau (NP) and to tuberositas tibiae (NT), measured postoperatively on L-L knee X-rays with respect to calibration using the size of tip of nail. Two groups of patients were formed on the basis of presence of pain related to AKP (the level of pain was neglected): with pain - Group A and without pain - Group B. The difference between two groups concerning NP and NT measurements (SAS EG and Kolmogorov- Smirnov normality test) appeared and it was statistically significant concerning NT measurement ($p < 0.05$), with high accuracy according to Classification tree. We presume that a position of a proximal tip of the nail and its negative influence on innervation pattern of area dorsal to patellar tendon could be key factor of AKP. We conclude that symptoms of AKP will not appear with three-quarter outer protective sleeve usage and if tip of nail position shall be more than 5,5 mm from tibial plateau (NP) and more than 2,5 mm from tuberositas tibiae (NT).

Date: 2013-10-19

Session: Trauma - Tibia II

Time: 13:30 - 15:00

Room: Hall 3

Abstract no.: 35584

ENDERS NAILING IN OPEN TIBIA FRACTURES - STANDING TEST OF TIME

Ajoy MANAV¹, Abhinav SINHA²

¹PATNA MEDICAL COLLEGE AND HOSPITAL, PATNA (INDIA), ²lady hardinge medical college, new delhi (INDIA)

One hundred and fifty six cases of fracture tibia were treated with enders nailing in a prospective study between 2002 and 2012. The fractures included compound fractures, Gustilo grade I (33.3%), grade II (55.2%) and grade IIIA (11.53%). Closed nailing using IITV control was done. The average operating time was twenty minutes and blood loss of less than 20 ml (under tourniquet). Soft tissue coverage where needed was done with suitable flaps within 14 days. Average hospital stay was 7 days. Partial weight bearing was allowed after 3 weeks with crutches. Average union time was 19.5 weeks. Delayed union was seen in 24 cases (> 6 months). Maximum time to union was 10 months. Superficial infection of the stitched wound was found in ten cases. Chronic Osteomyelitis was seen in 2 cases of grade III fractures. Average shortening of the limb was less than 1 cm. Malunion was seen in 14 cases. Patients were symptom free with normal movement of knee and ankle within 20 weeks. Proximal migration of nails was observed in 4 cases with mild pain in knee flexion. In comminuted, unstable fractures with bone loss, bone grafting was done (24 cases) and weight bearing was delayed for an average upto 24 weeks. The process is minimally invasive, safe, cost-effective with less hospital stay. The infection rates, overall results and time to union were better than unreamed and reamed interlocking nail and external fixators.

Date: 2013-10-19

Session: Trauma - Tibia II

Time: 13:30 - 15:00

Room: Hall 3

Abstract no.: 34378

COMBINING PLATES AND NAILS FOR FIXATION OF SEGMENTAL TIBIAL FRACTURES INVOLVING PROXIMAL THIRD

Rohit JINDAL, Sandeep GUPTA, Varun AGGARWAL, Sudhir GARG

Government Medical college, Chandigarh (INDIA)

Introduction: Interlock-nailing is the preferred treatment for segmental fracture of shaft tibia but is riddled with problems related to inadequate reduction if the proximal fracture line is at proximal 1/3rd. There is a high chance of unacceptable malalignments. Various methods have been described in literature to improve the situation and includes use of polar screws, modifications in entry portal, change in nail design and supplementary use of plate. We describe our experience with standard tibial nail along with unicortical small fragment plate (applied unicortically on anteromedial surface at proximal fracture). **Methods:** We studied 18 consecutive patients with isolated closed segmental fracture tibia (where proximal fracture is at proximal 1/3rd) treated with the technique. All the patients were electively plated with 3.5 plate (recon/lcdcp/lcp) with mini incision followed by standard nailing. None of the patients had any skin healing problem. Post-operatively patients were mobilized non-weight-bearing for 6 weeks followed by gradually increasing weight-bearing mobilization. **Results:** Average age was 42 years (19-64 years). The average follow up was 14 months (11-16 months). All fractures healed without any further intervention in average 26 weeks (22-34 weeks). None of the patients had malalignment >5 degrees, knee range of movement was full in all the patients. 3 patients complained of prominent hardware but were not discomforted enough to demand plate removal. **Conclusions:** Though our is a small series but early results show that this technique significantly circumvents the problem with malalignment in such fractures without adding to surgical difficulty.

Date: 2013-10-19

Session: Trauma - Tibia II

Time: 13:30 - 15:00

Room: Hall 3

Abstract no.: 34133

UNREAMED NAILS IN FRACTURES OF THE DISTAL TIBIA

Khaled Hamed SALEM

Dept. of Orthopaedic Surgery, Faculty of Medicine, Cairo University, Cairo
(EGYPT)

Background: Unreamed nailing has gained widespread acceptance in the treatment of diaphyseal long bone fractures specially in cases with polytrauma or high-energy injuries. Its application in distal tibial fractures, however, remains controversial. **Methods:** In this study, 101 distal tibial fractures treated using closed unreamed nailing were reviewed after a mean follow-up of 32 months. There were 59 type A and 42 type B fractures. The most common fracture pattern was the A1 spiral fracture (n: 40) followed by the B2 wedge fracture (n: 18). Intraarticular extension was encountered in 14 cases. One-fourth of the patients (n: 24) had open injuries. Forty-seven patients had additional injuries, nearly one-third of them were polytraumatised. **Results:** Union occurred after a mean time of 23.9 (range: 11-134) weeks. There were 13 cases of delayed union and 7 non-union, all healed eventually with additional surgery in only 6 fractures. Malunion was seen in 12 cases (5 valgus, 2 varus and 5 external torsion), 10 of them were associated with unplated fibular fractures. Three fractures (2 open) were treated successfully for deep infection. The most common complication seen was fatigue failure of the locking screws (n: 27 cases). **Conclusion:** Unreamed nailing represents a viable alternative in treating distal tibial fractures. Although technically demanding and liable to complications, its advantages in terms of closed reduction, biological fixation and a low risk of infection are indispensable in treating the notoriously challenging fractures of this segment.

Date: 2013-10-19

Session: Trauma - Tibia II

Time: 13:30 - 15:00

Room: Hall 3

Abstract no.: 33996

OUTCOME OF INTERLOCKING INTRA-MEDULLARY NAILING FOR DISTAL TIBIA FRACTURES

Abhijit KAWALKAR, Chandrashekher BADOLE, Akshay PHADKE

Mahatma Gandhi Institute of Medical Sciences, Sewagram (INDIA)

BACKGROUND: Tibia is one of the most common bones to sustain injury and fracture. The blood supply to distal part of tibia is precarious due to its subcutaneous nature. Thus complications like non union, delayed union and infections are very common in these fractures and thus management of these fractures is very controversial. The aim of this study was to evaluate the outcome of interlocking intramedullary nailing in the treatment of extra-articular distal tibial fractures. **MATERIALS & METHOD:** 31 patients with mean of age 41 years with extra-articular distal tibia fractures both closed and compound were treated with simple tibia interlocking nail or tip locking tibia interlocking nail. Clinical diagnosis included AO/OTA type A1, A2 and A3 fractures, and Grade I, II and IIIA open tibial fractures by Gustilo and Anderson classification. Patients were assessed clinically and radiographically with Klemm and Borner classification with mean follow up period of 8 months and results graded as excellent, good, fair and poor. **RESULTS:** Among 31 patients 3 patients were loss to follow up, 23 patients achieved union within 14-20 weeks, 3 patients had delayed union with mean union time of about 32 weeks. Superficial infection was seen in 3 grade II compound cases. Functional outcome was excellent in 21 patients, good in 5 patients and fair in 3 patients. **CONCLUSION:** Intra-medullary interlocking nail is a reliable and satisfactory method for treatment of fractures of distal one third of tibia with good functional results and high union rates with low complications.

Date: 2013-10-19

Session: Trauma - Tibia II

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Abstract no.: 34005

POSTEROMEDIAL PLATING IN COMPLEX TIBIAL PLATEAU FRACTURES- A CASE SERIES

Yuvaraja MURUGAN, Singaravelu VAIDYANATHAN

Madras Medical College, Chennai (INDIA)

Introduction: Recent reports of a consistent posteromedial fracture fragment in many cases of bicondylar fractures has led to a change in the surgical treatment of complex tibial plateau fractures. The posteromedial fragment usually involves about 25% of articular surface and is prone to shear instability and varus collapse. Isolated lateral column plating, which was practiced extensively till recently, fails to address this fragment due to its peculiar 3D orientation. Hence dual incision technique with anterolateral and posteromedial plates has become popular. **Aim:** To analyse the functional and radiological outcomes of posteromedial plating for medial condyle fragment in bicondylar tibial plateau fractures. **Methods:** 15 patients with bicondylar tibial plateau fractures were included in our study. Mean age was 48 years. Evaluation included trauma series radiographs and CT scan. Dual incision bicolumn plating was performed in all patients. Analysis was done using knee society score and radiological articular step off and MPTA(medial proximal tibial angle). **Results:** Average time to union was 14.5 weeks. At average 25 months follow up, knee society score was excellent in twelve and good in three. Radiological parameters were suboptimal in one patient. Notably, comparable results were obtained with both locking and nonlocking lateral plates. **Conclusion:** Our series shows excellent to good functional outcomes and satisfactory radiological outcomes from dual incision bicolumn plating in bicondylar tibial plateau fractures. Major complications like deep infection, implant failure, non union are absent in our series. Preoperative CT scans are necessary to study the fracture pattern and identify posteromedial fragment

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Abstract no.: 34030

FUNCTIONAL OUTCOME OF HIGH-ENERGY DISTAL TIBIAL FRACTURES TREATED USING LOCKED COMPRESSION PLATE

Sandeep Ramesh BIRARIS, Vikas Tukaram SONALE, Hitendra Gulabrao

PATIL, V M KHALEEL, M C JOHN

Medical Trust Hospital, Kochi (INDIA)

Introduction: High-energy trauma can lead to metaphyseal and intra-articular damage. These fractures may have significant metaphyseal, articular comminution or diaphyseal extension and are usually associated with high complication rates. The optimal treatment modality has been a source of controversy for a long time. We present our results of distal tibial fractures managed using locking compression plate. **Aims and objectives:** To evaluate union rates, associated complications and functional outcome of patients with high-energy distal tibial fractures treated using locking compression plates. **Materials and methods:** From August 2008 to June 2011, there were 30 patients included in the study after defining proper criteria. Out of which 26 were males and 4 were females. Patients were reviewed at one month and thereafter every three months till one-year. One patient was lost to follow-up, so only 29 patients were available for final analysis. 13 were closed fractures and 16 were open. They were classified as per AO/OTA classification. **Results:** At final follow-up all patients united except one with average IOWA ankle score of 85.3 (A-86.7, B-84.5, C-82.4). Average union occurred at 20.68 weeks, which was more in open fractures. 11 patients had excellent and good outcome each while 7 patients had moderate outcome. **Conclusion:** Closed fracture group did well in relation to union rates and outcomes. Functional results were better in AO type A fractures. Type C fractures had fair outcome. Ankle stiffness was common complication after these fracture management. Considering these facts locking compression plate stands out implant of choice for these fractures.

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Room: Hall 3

Abstract no.: 34399

THE ROLE OF EXTERNAL FIXATION IN THE PILON FRACTURE MANAGEMENT

Andris JUMTINS¹, Silvestris ZEBOLDS², Ruta JAKUSONOKA¹

¹Riga Stradins University, Riga (LATVIA), ²Hospital of Traumatology and Orthopaedics, Riga (LATVIA)

Introduction: During last years bone external fixation (ExFix) is widely used method in the pilon fracture treatment mostly as a temporary osteosynthesis. Few years ago it mostly was used as a definitive method. Purpose of this study is assessment of the role of ExFix in the osteosynthesis of pilon fractures ,as well as indications of external fixators replacement by internal fixation, according to clinical material of the Hospital of Traumatology and Orthopaedics (TOS),Riga,Latvia.

Methods: Material included 68 clinical cases of acute pilon fractures in the time period from 2006-2012 where ExFix device for tibial distal metaphysis has been applied. To analyse the tendencies for ExFix application indications (temporary or definitive) patients where devided in two groups. First group (year 2006-2008) 27 patients, second (year 2009-2012) 41 patient. Age of patients (group 1): 25-80 (mean-50) Gender: 6 females, 21 male. Trauma mechanism: 14 cases low energy, 13-high energy. Open fractures -13.

Results: Group 1 - AO type A,B closed fractures in 15%, type C fractures in 37% cases, open AO type A,B fractures in 15%, type C in 33%. Temporary ExFix was used in 44%, definitive 41%, 15 % within combined therapy. Satisfactory reduction was achieved in 67% cases of definitive treatment group. As temporary osteosynthesis method ExFix device has been applied in average for 17,2 days (min-1,max-62). There were early complications in 9(33%) cases, average time of hospital stay-24 days(min-10,max-62).

Conclusions: Analysis of TOS data confirms ExFix as first choice treatment in case of AO type A,B open and AO type C3 pilon fractures. According to the study ExFix can be used either as definitive osteosynthesis method (56% group 1) or within a staged treatment protocol.

Date: 2013-10-19

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Room: Hall 3

Abstract no.: 34623

RESULTS OF MINIMALLY INVASIVE OSTEOSYNTHESIS OF PILON FRACTURES

Sandeep BISWAL

SUM and IMS University, Bhubaneswar, Bhubaneswar (INDIA)

The objective of minimally invasive osteosynthesis (MIO) is the anatomical reconstruction of the distal tibial articular surface, with preservation of the soft tissue to allow early functional movement. INDICATIONS: Fractures type Rüedi I+II or AO 43-B1, -B2, AO 43-C1, -C2, without IIb and III° soft tissue injuries. It may also be used as an additional technique for osteosynthesis with external fixators. SURGICAL TECHNIQUE: Preoperative analysis of conventional X-rays and CT images is necessary. The first step is reduction of the fracture with axial traction. The definitive reduction is performed with K-wire joysticks or reduction clamps. The key step is the intraoperative X-ray control of the reduction in various planes. All manipulations are performed with minimally invasive technique. Under X-ray control in two planes, the plate is adjusted into position and preliminarily fixed with K-wires. The screws are inserted using the minimally invasive technique. POSTOPERATIVE MANAGEMENT: Immediate mobilization starting on day 1 with non weight bearing for 4-6 weeks, postoperative split cast for 2 weeks depending on degree of swelling and early functional physiotherapy. Full weight-bearing depending on fracture type after 6-8 weeks. RESULTS: Advantages of MIO include protection of the soft tissue and no further disturbances of circulation. In 50 patients after osteosynthesis of pilon fracture, no reoperations were necessary when using MIO. In addition, no infections were observed with MIO. The average Olerud/Molander Score was 95 points for the MIO group. Conclusion: MIO is a good approach for pilon fractures.

Date: 2013-10-19

Session: Spine Techniques

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Room: Hall 6

Abstract no.: 35885

POSTERIOR SPINE FUSION VS PERCUTANEOUS FUSION OF THORACOLUMBAR FRACTURES TYPE A WITHOUT NEUROLOGIC COMPROMISE - COMPARATIVE RETROSPECTIVE STUDY-

Raquel CARVALHO, Joaquim BRITO, Marco SARMENTO, António TIRADO, Pedro FERNANDES

Hospital Santa Maria, Lisboa (PORTUGAL)

The most treatment in type A fractures by AO classification is conservative. Surgical treatment is indicated in the presence of posterior ligamentous capsular injury, to decrease the risk of local kyphosis. With the advent of percutaneous spine surgery, there has been a decrease in the number of interventions by the classical pathway. Comparative retrospective study from 2007 to 2011, which included 46 patients with type A thoracolumbar fractures without neurologic compromise (ASIA E), divided into two homogeneous groups. The mean age was 51 years (min-16;max-86), predominantly male (61%). Average kyphosis measured 14 ° before surgery. Open posterior fusion (PSF) was performed in 17 patients and percutaneous fixation (MISS) on 29. The mean residual kyphosis of PSF group averaged 12.5 ° (30.6% correction) versus MISS group (6.6° and 28.3% correction) at final follow-up. The loss of correction was 1.7 ° in PSF versus 1.0 ° in MISS. Two cases of implant failure developed in PSF, one case with need to do a circumferential fusion and proximal extension of the instrumentation, and in another, for peri-implant infection requiring extraction of the material. The results presented are the same as those in the literature, with an increase of minimally invasive surgery. Analyzing these two series, MISS is an effective technique for treating type A fractures with the same correction and losses at the follow-up as PSF. The preservation of paraspinal musculature appears to be the major advantage of the method thus preserving the posterior ligamentous complex.

Date: 2013-10-19

Session: Spine Techniques

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 35709

POSTERIOR APPROACH IN THORACOLUMBAR TUBERCULOSIS: A CLINICAL AND RADIOLOGICAL REVIEW OF 67 OPERATED CASES.

Nikhil JOSHI, Kapil MOHAN, Saurabh RAWALL, Abhay NENE

P.D.Hinduja National Hospital & Medical Research Centre, Mumbai (INDIA)

(1) To present the indications of single stage all posterior surgery in thoracolumbar tuberculosis. (2) To evaluate the results of single stage all posterior surgery. We analyzed 67 patients who underwent single stage all posterior surgery with follow-up of 31.37 months. We performed following surgeries depending upon level and case requirements. (Group A) Instrumentation alone for instability, (Group B) Transpedicular decompression and instrumentation for neurological compression in thoracic and thoracolumbar spine, (Group C) Transforaminal approach for anterior column access in lumbar spine along with posterior instrumentation, (Group D) Pedicle subtraction osteotomy and instrumentation for deformity correction, (Group E) Posterior decompression alone for posterior epidural compression, (Group F) Reconstruction of anterior column by all posterior approach. 38 had neurodeficit whereas 29 were Frankel E. In 12 cases, anterior reconstruction was done. In the remaining 55 cases, we relied on vertebral reconstitution under chemotherapy. Operative time was 150.5 min and blood loss was 514.18 ml. Of 38 patients with deficit, 34 improved. There was radiological fusion in all patients. Pre- and post-operative Cobb's measurements were 9.95 and 8.1, respectively, in thoracic and thoracolumbar spine and -9.39 and -11.42, respectively, in lumbar spine. Of 55 cases where anterior reconstruction was not done, 3 had progression of Cobb's >10 degree. Posterior approach can achieve adequate decompression of offending middle column and even anterior reconstruction. Posterior approach is versatile, with many surgical options depending on the level and case requirements. Keywords: Thoracic tuberculosis, Lumbar tuberculosis, Posterior instrumentation, Transpedicular decompression, Surgical anterior column reconstruction

Date: 2013-10-19

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Room: Hall 6

Abstract no.: 35563

MANAGEMENT OF THORACOLUMBAR BURST FRACTURES WITH A NEW POSTERIOR REDUCTION TECHNIQUE

Kamil Cagri KOSE, Mustafa Erkan INANMAZ, Hakan BASAR, Islam CALISKAN

Sakarya University Faculty of Medicine, Sakarya (TURKEY)

INTRODUCTION: To analyse the outcomes of short-segment fixation with a new reduction technique in 46 patients with thoracolumbar burst fractures.
METHODS: Forty- six patients (30m/16f) with traumatic TypeA3 thoracolumbar (T11-L3) fractures treated with a new posterior reduction technique and short- segment fixation between 2009-2011 were included. The radiological measurements included: local kyphosis (LK) ,sagittal index (SI,) and the vertebral height (VH). All were neurologically intact preoperative. The mean age was 42.5 years (range 15-66). The mean follow-up was 16 months (12-36).
SURGICAL REDUCTION: Monoaxial bicortical pedicle screws were used at the upper and lower ends. Polyaxial screws were inserted to the fractured vertebrae. Then two rods given 40-50 degrees of lordosis were locked to the upper pedicle screws first then two in-situ benders were used to cantilever the rod into the lower end pedicle screws. After locking of the lower screws, the screws in the middle were locked.
RESULTS Significant improvements were seen in LK, SI and VH in the postoperative period and this was maintained in the last follow-up. The mean improvement in VH and LK were 82% and 10.1 degrees respectively. The mean duration of hospital stay was 3.7 days (2-6 days).
CONCLUSION: The new reduction technique when combined with posterior short segment fixation yielded excellent restoration of the anatomy in thoracolumbar burst fractures which was maintained in time.

Date: 2013-10-19

Session: Spine Techniques

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Room: Hall 6

Abstract no.: 35836

DIAGNOSTIC ACCURACY OF TRANSPEDICULAR VERTEBRAL BODY BIOPSY

Rohit JINDAL, Pranaw KUMAR, Sudhir GARG

Govt. Medical College, Chandigarh (INDIA)

Purpose: To determine the diagnostic accuracy and adequacy of transpedicular vertebral biopsy under C-arm fluoroscopy and to discuss its usefulness in workup of suspicious vertebral lesions. Methods: 62 patients with suspicious vertebral lesions in whom the diagnosis could not be ascertained after a complete clinical biochemical and radiological work up underwent transpedicular biopsy for T3-L5 lesions .11 to 14 gauge bone biopsy needles were used. Biopsies were done under local anesthesia and conscious sedation with the use of biplanar fluoroscopy. Diagnostic yield was measured in terms of adequacy (whether or not a diagnosis could be made on the basis of pathologic examination) or the accuracy (whether or not the primary diagnosis by transpedicular biopsy was correct). Results: The site of disease could be biopsied in all patients. Adequate sample could be obtained in 60 of the 62 patients(96.5%). Both the patients with inadequate sample had sclerotic lesions. Out of 5 sclerotic lesions adequate material could be obtained only in 3 lesions. There were 31 metastasis;5 plasmacytomas, 1 schwannoma,2 haematological malignancies, 14 compression fractures,5 tuberculosis and 2 non specific inflammation. Out of 60 adequate samples, the diagnosis was found to be incorrect in 2 cases giving an accuracy of 96.6%. The two incorrect diagnoses were labeled as compression fractures which gave a different diagnosis on subsequent open biopsy during spinal decompression. There were no complications Conclusion: Transpedicular biopsy of vertebral body lesions under C-arm fluoroscopy guidance can be performed safely and efficaciously as an outpatient procedure with good adequacy and accuracy.

Date: 2013-10-19

Session: Spine Techniques

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 34525

KYPHOPLASTY USING ‘PROPER TIME, LOW PRESSURE, SLOWLY, STAGED CEMENT INJECTION TECHNIQUE’ FOR THE TREATMENT OF OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURES

Huilin YANG¹, Tao LIU²

¹The first affiliated hospital of Soochow university, suzhou (CHINA), ²The first affiliated hospital of soochow university, suzhou (CHINA)

Objective】 To prospectively compare kyphoplasty using ‘Proper time, Low Pressure, Slowly, Staged cement Injection Technique’ (‘Stage injection group’) with kyphoplasty using traditional injection technique(‘Traditional injection group’) for the treatment of osteoporotic vertebral compression fractures. **【Methods】** The study population included 129 patients (160 vertebral fractures) in the ‘Stage injection group’ and 105 patients(128 vertebral fractures) in the ‘Traditional injection group’. The mean follow-up period was 25.3 months and 24.7 months respectively. **【Results】** In the ‘Stage injection group’, VAS improved from 7.8 ± 1.3 preoperatively to 2.1 ± 1.9 at last follow-up ($P < .05$). Preoperatively, the ODI was 77.3 ± 5.9 , which improved to 39.7 ± 9.7 ($P < .05$). In ‘Traditional injection group’, VAS improved from 7.5 ± 1.6 to 2.3 ± 2.5 at last follow-up ($P < .001$). Preoperatively, the ODI was 75.3 ± 7.2 , which improved to 38.7 ± 10.9 ($P < .05$). There was no significant difference in VAS, ODI between the two groups both preoperatively and postoperatively ($P > 0.05$). There was no significant difference in the occurrence of new fractures of vertebral bodies of the‘Stage injection group’ (7.8%) versus the ‘Traditional injection group’ (7.6%). There were only 3 patients having cement leakage (2.3%) in ‘Stage injection group’, which was significantly less than ‘Traditional injection group’ (8 patients, 7.6%) ($P < .05$). **【Conclusions】** Both kyphoplasty using ‘Proper time, Low Pressure, Slowly, Staged cement Injection Technique’and kyphoplasty using traditional injection technique are effective at improving pain, functional disability, vertebral height and kyphosis angle; however, kyphoplasty using ‘Proper time, Low Pressure, Slowly, Staged cement Injection Technique’

Date: 2013-10-19

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Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 34351

CAUDA EQUINA LESIONS IN LUMBAR SPINE FRACTURES : ROLE OF DELAYED SURGERY.

Viral PAPAIYA¹, Mihir BAPAT¹, Kiran PAKNIKAR¹, Mehandi ANSARI²

¹KOKILABEN DHIRUBHAI AMBANI HOSPITAL AND MEDICAL RESEARCH INSTITUTE, MUMBAI (INDIA), ²MIOTS, CHENNAI (INDIA)

Introduction: In developing countries, delay in surgery is common due to lacunae in health care system. We present recovery patterns in 20 patients with delayed presentation.
Material and Methods: 20 patients(average age 24.5years) with delayed fractures below L1vertebra-incomplete cauda-equina injury underwent surgery from 2000-2008. Post injury delay was 2-36 weeks, due to co-morbid injuries and transit delay. 16patients were males.TLISS was 7(n=15), 8(n=2), 9(n=2) and 10(n=1). 4patients recovered >one grade before surgery but all demonstrated non-functional motor power distal to injury level(ASIA-B=7 and ASIA-C=13).The apex was L2(n=10). In 8 anterior and In 12 posterior and anterior surgery was performed. The patient was mobilized as per neuro-recovery. The follow-up was prospectively maintained by a pre-designed software 'Horizon' 3monthly for the first year and then yearly assessments for 2years(2-6years).
Result: 3 out of 7patients(ASIA-B) and 12 out of 13patients(ASIA-C) showed recovery atleast by one grade. 12 showed poor recovery of L5 root. The neuro-recovery started within 2weeks and completed by 9-12months. 3 Out of 9patients with severe bladder affection, recovered near normal bladder function. The average VAS was 4.3 and ODI was 28.5. Three out of 15 patients returned to a near normal functional status. Fusion was seen in 19patients with Implant failure in one.The problems encountered were sacral sore(2), recurrent urinary infection(3), superficial infection(1) and paralytic ileus(1).
Conclusions: In incomplete cauda equina lesions significant neurological recovery can be expected even with delayed surgery. ASIA-C has a potential to recover significantly. Persistent foot drop is common weakness. Canal clearance anteriorly should be attempted wherever possible.

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Room: Hall 6

Abstract no.: 34339

THE CLINICAL AND RADIOGRAPHIC RESULTS OF UNILATERAL TRANSFORAMINAL LUMBAR INTERBODY FUSION (TLIF) USING ONE DIAGONAL Z-CAGE WITH SUPPLEMENTAL TRANSPEDICULAR SCREW/ROD INSTRUMENTATION FOR SYMPTOMATIC LUMBAR DISEASE

Jie ZHAO, Kai ZHANG, Youzhan XIE, Wei SUN

Ninth People's Hospital, Shanghai Jiaotong University School of Medicine;
Shanghai Key Laboratory of Orthopaedic Implants, Shanghai (CHINA)

Objective: To investigate the clinical outcomes and radiographic results of unilateral TLIF using one diagonal Z-cage with supplemental transpedicular screw/rod instrumentation for symptomatic degenerative lumbar spinal disease. **Methods:** Retrospective study was done on 56 cases of symptomatic lumbar diseases treated with decompression via unilateral approach and TLIF using one diagonal Z-cage with supplemental transpedicular screw/rod instrumentation from January 2010 to April 2011. There were 26 males and 30 females, and mean age was 57.1 years (range, 22-72 years). All patients underwent single (L3-4 /L4-5 /L5-S1) or two-level(L3-4-5 /L4-5 -S1) procedures. Operation time, intra-operative bleeding, postoperative hospital stay and complications were recorded. Clinical outcomes were evaluated by VAS, ODI and SF-36 scores. The Bridwell criterion was used for evaluating the interbody fusion. **Results:** The mean operative time was 128.8 minutes (range, 100-180 minutes), and mean blood loss was 293ml (range, 150-560 ml). The hospitalization time after surgery was 5-15d, an average of 7.5 d. All cases were followed-up for 12-24 months (average 19.6 months). VAS and ODI scores showed statistically significant improvements ($P < 0.01$). There were 51 cases (91.1%) were grade I and II according to the Bridwell criteria. **Conclusions:** TLIF using one diagonal Z-cage with unilateral pedicle screw instrumentation is an ideal surgical method for degenerative lumbar spinal disease, which can provide little trauma, forceful fixation, optimal fusion rate, and less complication, etc. But close attention should be paid to pedicle screw placement and cage size.

Date: 2013-10-19

Session: Spine Techniques

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 35560

POSTOPERATIVE CEREBROSPINAL FLUID LEAK OF THE SPINE SURGERY: TREATED WITH PERCUTANEOUS EPIDURAL BLOOD PATCH

Kamil Cagri KOSE, Mustafa Erkan INANMAZ, Hakan BASAR, Emre BAL
Sakarya University Faculty of Medicine, Sakarya (TURKEY)

Introduction :A persistent cerebrospinal fluid leak after spinal surgery can be associated with both meningitis and/or pneumocephalus. Therefore, early active intervention is recommended with surgical exploration, lumbar subarachnoid drain, and less commonly epidural blood patch. **Method:**Twenty –six patients, after thoracal and lumbar spine surgery with instrumentation and primary closure was complicated by incidental dural tears, developed severe symptomatic headaches and persistently drainage that failed conservative therapy. All patients underwent epidural blood patch. Patients evaluated post-operative at least 6. Months using MRI and clinically.**Results:** The average age was 43.9years (range 5-72years). Nine patients had kyphoscoliosis and performed vertebral osteotomy and 17 patients had spinal stenosis . The average follow-up was 11.2months (6-16).There were no neurological deficits. There were no early superficial or late deep infections. All patients had symptomatic relief of their headaches and successful treatment of dural leaks patch.**Conclusion:**Percutaneous placement of blood patch may provide nonsurgical treatment for postoperative CSF leaks, potentially avoiding a major and technically difficult surgical procedure.

Date: 2013-10-19

Session: Spine Techniques

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 35016

CPK, MRI, OR EMG ? -- WHICH INDICATOR IS MORE EFFECTIVE FOR ASSESSMENT OF MUSCULUS SACROSPINALIS INJURY AFTER LUMBAR SURGERY

Feizhou LV, Hongli WANG, Xiaosheng MA, Xinlei XIA, Lixun WANG

Huashan Hospital, Fudan University, Shanghai (CHINA)

Objective: To systematically compare the effectiveness of blood creatinine phosphokinase (CPK) and its isoenzyme (CPK-MB), electromyography(EMG) and Magnetic resonance imaging(MRI) for assessment of sacral spinal muscle damage after lumbar fusion. **Methods:** From September 2006 to June 2008, 79 patients were randomized to receive minimally invasive surgery (MIS, Mast Quadrant-assisted transforaminal lumbar interbody fusion surgery, 41 cases) or open surgery (improved transforaminal lumbar interbody fusion surgery, 38 cases). Two groups of patients were examined for CPK and one day before surgery and 1, 3, and 7 days after the surgery. The patients underwent electrophysiological examination and a 3.0-T MRI examination of the sacral spine three months after surgery. **Results:** All patients received at least 2 years clinical follow-up. During the perioperative period, the MIS group had prolonged intraoperative fluoroscopy time, and the open surgery group had larger postoperative drainage volume and prolonged postoperative recovery time (for all, $p < 0.05$). MRI scanning showed that multifidus T2 relaxation time in the MIS group was significantly lower than that in the open surgery group 3 months after surgery ($P < 0.01$). Surface electromyography (EMG) examination of the musculus sacrospinalis segment showed that the average discharge amplitude and frequency were significantly better in the MIS group than in the open group ($P < 0.01$). **Conclusions:** For the assessment of musculus sacrospinalis injury after lumbar surgery, many factors interfere with the quantitation of CPK and CPK-MB, which may result in certain errors. MRI and electrophysiology examination may be more accurate assessment methods.

Date: 2013-10-19

Session: Spine Techniques

Time: 10:30 - 12:00

Room: Hall 6

Abstract no.: 34276

**USE OF SINGLE DOSE TRANEXAMIC ACID TO REDUCE BLOOD LOSS
IN OPERATIVE THORACOLUMBAR TRAUMA: A RANDOMIZED TRIAL**

Sarvdeep DHATT¹, Bhavuk GARG², Mandeep DHILLON¹

¹PGIMER, Chandigarh (INDIA), ²AIIMS, Delhi (INDIA)

Introduction: Thoracolumbar trauma surgeries are frequently associated with significant blood loss, mandating multiple transfusions. Risks of transfusion acquired infection and immune modulation effect of allogenic blood are major concerns of spine surgeons which led to the use of synthetic anti fibrinolytics like Tranexamic acid (TA). **Methods:** 52 patients undergoing posterior fixation of single level thoracolumbar trauma without neurological deficit not meeting the exclusion criteria were randomized into 2 groups after obtaining informed consent. Group I (n=26) and Group II (n=26) received bolus intravenous dose (15 mg/kg) of TA and placebo (Normal saline), 15 minutes before the incision respectively. Standard surgical protocol was adopted for all patients. Intra and post operative blood losses were primary outcome variables and drop in hemoglobin levels, number of blood units transfused, D-dimer levels, thrombotic complications were secondary variables. Statistical analysis was carried out using student t test and Chi square test and SPSS software (version 10.0). **Results:** Mean intra operative and post operative blood losses were as follows: Group I: 410 ml (range, 300–510 ml), Group II: 615 ml (range, 515– 750 ml) ($p=0.02$) and Group I: 210 ml (range, 150–325 ml), Group II: 490 ml (range, 370–540 ml) ($p=0.003$) respectively. 6 patients in TA group and 18 patients in placebo group required blood transfusion of 8 units and 30 units respectively ($p=0.04$). **Conclusion:** Administration of single intravenous dose of TA (15mg/kg) just before surgery significantly reduces intraoperative as well as postoperative blood loss in patients undergoing operative thoracolumbar trauma.

Date: 2013-10-19

Session: Spine Minimal Invasive

Time: 13:30 - 15:00

Room: Hall 6

Abstract no.: 35714

PROSPECTIVE STUDY TO EVALUATE THE MINIMAL INVASIVE DECOMPRESSION IN LUMBAR SPINAL STENOSIS

Wolfram TESKE¹, Janine FLOR², Sonja ZIRKE³, Matthias LAHNER¹, Thomas LICHTINGER¹, Christoph VON SCHULZE PELLENGAHR¹

¹Departemt of Orthopaedics and Trauma Surgery Ruhr University Bochum, Bochum (GERMANY), ²Department of Anaesthesiology Ruhr University Bochum, Bochum (GERMANY), ³Institute of Spine Research Bochum, Bochum (GERMANY)

Introduction: Treatment of the LSS is up for controversial discussion. Life quality impairment from low back and leg pain and the walking disability results in decompression or in spine fusion. A prospective study design was used to evaluate the outcome of the minimal invasive decompression. **Methods:** 34 patients with LSS of L3/L4 and L4/L5 verified by MR were included. Measurements were performed preoperative (t0) and six months (t1) after surgery to determine subjective complaints. Parameters low back pain, leg pain, daily work, ADL were raised. The SSE Spine Tango document was used. Data of age, sex, duration of preoperative complaints and the localization of the stenosis were collected. The data interpretation was performed with paired t- test and Wilcoxon test. **Results:** Mean age (n= 17 female, n=17 male) was 69,9 years. Mean duration of complaints was 12,3 months with a maximum of 24 months. Level L4/L5 was most affected (n=23).Surgery reduced low back pain and leg pain significant ($p<.001$). Impairement of ADL was reduced ($p<.001$). Quality of life was increased in evidence ($p<.001$). 29 (85,3%) patients stated, that surgery helped or helped a lot. **Discussion:** High incidence of positive results showed, that microdecompression results in significant improvement of the quality of life. In the self evaluation the reduction of pain is remarkable. Microdecompression is an effective treatment regarding the patient's outcome compared with the standard laminectomy and the fusion. Further investigations are needed to evaluate the different surgical procedures to allow a therapy focused on patients.

Date: 2013-10-19

Session: Spine Minimal Invasive

Time: 13:30 - 15:00

Room: Hall 6

Abstract no.: 33937

ENDOSCOPIC LUMBAR DISCECTOMY : RESULTS IN 300 PATIENTS

Paresh DEY

KIMS-Kalinga institute of medical science, Bhubaneswar (INDIA)

Background : Endoscopic discectomy is an established method for treatment of lumbar disc herniation. Many studies have not been reported in literature for lumbar discectomy by Destandau Endospine System. We report a series of 300 patients operated for lumbar discectomy by Destandau Endospine System. **Material and Methods :** A total of 300 patients suffering from lumbar disc herniations were operated between August 2008 and February 2012. Technique comprised localization of symptomatic level followed by insertion of an endospine system devise through a 15mm to 20mm skin and fascial incision. Endoscopic discectomy is then carried out by Endospine instruments by minimal invasive route. The results were evaluated by macnab's criteria after a minimum follow up of 12 months and maximum up to 24 months. **Results :** Based on modified Macnab's criteria, 92% patients had excellent to good, 6% had fair and 2% had poor results. The complications observed were discitis in two patients and dural tear in one patient and nerve root injury in one patient. 92% patient were able to return to light and sedentary work with an average delay of 3 weeks and normal physical activities after 6 weeks. **Conclusion :** Endoscopic Lumbar discectomy provides a safe, effective and minimal access corridor for lumbar discectomy. The technique also allows early post operative mobilization and faster return to work. **Key Words :** Endospine, Lumbar discectomy, laminotomy, radiculopathy.

Date: 2013-10-19

Session: Spine Minimal Invasive

Time: 13:30 - 15:00

Room: Hall 6

Abstract no.: 33782

MICRO-ENDOSCOPIC DECOMPRESSION IN LUMBAR SPINAL STENOSIS

Mohinder KAUSHAL

Trinity Hospital and medical Research Institute, Chandigarh (INDIA)

Introduction: Microendoscopic laminoforaminotomy is an established method for treatment of lumbar canal stenosis. Many studies have not been reported about this technique in literature. We report a series of 400 patients suffering from lumbar canal stenosis who underwent bilateral endoscopic decompression by unilateral approach. **Methods:** 400 patients suffering from lumbar canal stenosis were operated between January 2004 and December 2011 by Destandau Endospine system. Sole inclusion criteria for study was severe neurological claudication. 210 patients were men and 190 were women. Patient age ranged from 50 to 104 years (median, 70 yr). 54 cases had associated disc prolapse and underwent endoscopic discectomy simultaneously at time of decompression. Bilateral endoscopic laminoforaminotomy by unilateral access was carried out by Destandau's mobile endospine system. Patients were made ambulatory on day of surgery except those patients who suffered dural and nerve root injuries. **Results:** Patients were followed up for a minimum of 12 months and maximum up to 24 months. As per Modified MacNab's outcome assessment of patient satisfaction patients 90% Patients had excellent to good, 8% fair, and 2% had poor results. The complications observed were dural tear in 8 (2%) patients and nerve root injury in 4(1%) patients. **Conclusion:** Bilateral decompression by unilateral Endoscopic approach provides a safe and minimal access corridor for lumbar canal decompression. The technique also allows early postoperative mobilization and faster recovery in a aging population. **Key words:** Endoscope, endoscopic laminoforaminotomy, endospine, facetectomy, laminotomy, radiculopathy

Date: 2013-10-19

Session: Spine Minimal Invasive

Time: 13:30 - 15:00

Room: Hall 6

Abstract no.: 35561

WHICH LUMBAR INTERBODY FUSION TECHNIQUE IS BETTER IN TERMS OF L5-S1 FOR THE TREATMENT OF DEGENERATIVE DISORDERS?

Kamil Cagri KOSE, Mustafa Erkan INANMAZ, Hakan BASAR, Emre BAL,
Islam CALISKAN

Sakarya University Faculty of Medicine, Sakarya (TURKEY)

INTRODUCTION: The purpose of this study was to investigate and compare clinical and radiographic outcomes of 2 kinds of lumbar interbody fusion (LIF) for the treatment of degenerative disorders at L5-S1 levels **METHODS:** Nineteen patients who underwent anterior LIF (ALIF-8 patients) and transforaminal LIF (TLIF-11 patients) L5-S1 fusion have been performed , between 2010 and 2011.We were retrospectively reviewed. Clinical results were investigated using the visual analog scale (VAS) and Oswestry Disability Index (ODI) scores, and using radiographic measurements, including disc height (DH), segmental lordosis, whole lumbar lordosis (WL), sacral slope (SS), and pelvic tilt.**RESULTS:** In both groups, VAS and ODI scores had significantly improved at both treatment levels. Statistical analysis showed no significant difference . Radiographic results indicated that ALIF was superior to TLIF in its capacity to restore DH, WL, SS. The radiological evidence of fusion shows no intergroup difference.**CONCLUSIONS :** The ALIF group demonstrated key radiographic advantages compared with the TLIF group for adult degenerative disorders at L5-S1 levels . However, clinical and functional outcomes did not demonstrate significant differences between groups.

Date: 2013-10-19

Session: Spine Minimal Invasive

Time: 13:30 - 15:00

Room: Hall 6

Abstract no.: 34447

**APPLICATION OF INTERSPINOUS DYNAMIC STABILIZATION SYSTEM
IN TREATING LUMBAR DEGENERATIVE DISEASE**

Chao ZHENG¹, Ji WU²

¹Department of Orthopedics, Chinese PLA Air Force General Hospital,

Beijing (CHINA), ²Department of Orthopedics, Chinese PLA Air Force General Hospital,, Beijing (CHINA)

【Abstract】 Objective: To investigate interspinous dynamic stabilization system in the prevention of adjacent segment degeneration (Adjacent Segment Degeneration ASD). Methods: The clinical data were retrospectively analyzed in this group since 2007-2010 application Wallis interspinous stabilization system for treatment of simple L4/5 segment of Discogenic Low Back Pain(DLBP), including 13 male and 20 females with average age of 45.2 years. The VAS and ODI were scored to evaluate the clinical efficiency. The DH and ROM were also recorded to assess the change before and after operation. Results: There was a significant change in the VAS and ODI scores between pre-operation and post-operation ($P<0.05$). Surgery section of disc height from preoperative (9.2 ± 1.7) to follow-up (9.9 ± 2.5), the increase was statistically significant. The adjacent segment disc height Preoperative and postoperative contrast there was no significant difference ($P> 0.05$). ROM of surgical segmental from preoperative (13.2 ± 1.7) ° decreased to follow-up (8.2 ± 2.5) °, and statistically significant ($P < 0.05$). Each adjacent segment ROM preoperative and postoperative contrast there was no significant difference ($P> 0.05$). Conclusions: Interspinous dynamic stabilization system in the effective treatment of discogenic low back pain. Maximize the retention of the surgery segments of the physiological activity , does not increase the stress of the adjacent segments and the incidence of degeneration, has a protective effect of adjacent segment degeneration.

Date: 2013-10-19

Session: Spine Minimal Invasive

Time: 13:30 - 15:00

Room: Hall 6

Abstract no.: 34164

OSTEOPOROTIC FRACTURES WITH NEUROLOGICAL DETERIORATION: RADIOLOGICAL PATTERNS AND SURGICAL MANAGEMENT PROTOCOL.

Kiran PAKNIKAR¹, Mihir BAPAT¹, Viral PAPAIYA¹, Mehandi ANSARI²

¹Kokilaben Dhirubhai Ambani Hospital, Mumbai (INDIA), ²MIOT, Chennai (INDIA)

Introduction: Vertebral Osteoporotic fracture OPF depict a low velocity compression fracture pattern. We report a series of 15 cases with neurological deficit .**Material and methods:** 15 patients . Average age 71.5 years (male : female = 9: 6). Three patient groups A: Patients presenting with neurological deficit (N= 9). 6 patients were ASIA C and 3 ASIA D. B: Patients under supervised conservative treatment with late neurological deficit (N=3). . All patients belonged to ASIA C.C: Patients treated with vertebroplasty developed delayed neurological injury (N=3). 2 presented as ASIA D while 1 was ASIA C. **Surgery:**Anterior and posterior decompression and stabilisation was done in 10. 5 patients underwent laminectomy and posterior fixation. In 2 vertebroplasty was added for anterior stability.**Results:** . The mean follow-up 16 months (6-24months). At final follow-up of 10 patients, 7 moved from ASIA C to D. 11 were grouped as ASIA D and one ASIA E. The average ODI improved from 88.6% to 36.9% and the back pain scores improved from 9 to 5.2. The commonest complication was urinary tract infection in 4 followed by delayed wound healing in 3. .**Conclusion:**the radiological risk factors for predicting instability in OPF are large cavitation, progressive collapse, posterior element fracture and intrinsic cord edema. These fractures should closely monitored during conservative treatment.We recommend posterolateral decompression with anterior reconstruction in canals with more than 20 % compromise due to retropulsed body fragment.In patients with less than 20% canal compromise, Vertebroplasty for anterior support with laminectomy and posterior stabilization suffices.

Date: 2013-10-19

Session: Spine Minimal Invasive

Time: 13:30 - 15:00

Room: Hall 6

Abstract no.: 34217

EARLY VERTEBROPLASTY AS A SALVAGE PROCEDURE IN MORBID ELDERLY PATIENTS.

Musale VILAS¹, Kiran PAKNIKAR², Mihir BAPAT², Viral PAPAIYA²

¹KOKILABEN DHIRUBHAI AMBANI HOSPITAL, MUMBAI (INDIA),

²Kokilaben Dhirubhai Ambani Hospital, Mumbai (INDIA)

Introduction: Elderly patients exhibit a fine balance between medical co-morbidities and function. Vertebral fractures alter this balance. **Aim:** Analyze role of vertebroplasty in
1) Altering life-threatening co-morbidity
2) Pain relief and functional improvement
3) Long term patient satisfaction
4) Early and long term complications.
Study Group: Consecutive 30 patients (M:F = 12:18) from 2008-2011 prospectively analyzed. Average age 74.06(62-88). Average kyphosis D1-D12 (62.20) and D12-L1(14.930). L1-S1 lordosis 33.130. Distribution D6(1), D10(1), D11(2), D12(15), L1(9), L2(2), L3(2), L4(1), L5(2). Average fracture age 32.33 days (7-90). Average ODI was 92.66 and Pain VAS 9.56. The average ASA (American society of anesthesiologists) grade was 2.83 and co-morbidities 2.7. 14 patients (46.66%) developed 21 new complications (Electrolyte imbalance(7), UTI(6), sepsis(2), GI bleeding(2), intractable arrhythmia(1), pneumonia(1), bedsores (2)). Uni-pedicular Approach was used. Average indoor-stay was 2.93 days. Average follow-up was 18.16 months. **Results:** Patients with complications had average indoor stay of 4.92 days ($p < 0.001$). Vertebroplasty was abandoned in 1, due to de-saturation and repeated after 4 days. One patient died after 4 weeks. Patients experienced significant improvement in VAS scores (4.06) immediately after the procedure $p < 0.001$. Final VAS score however was insignificantly better at 3.66 ($p > 0.001$). The ODI (3 months) and final follow-up was 54.55, 52.68 respectively ($p > 0.001$). At conclusion (on a scale of 10), average patient satisfaction 7.20. Functional outcome poorly correlated with the final ODI ($p > 0.001$). Cement leakages (2 intra-discal, 3 anterior) were asymptomatic. 4 patients had adjacent segment fracture within 3 months (1 re-cementing, asymptomatic 1). Auto-fusion occurred with adjacent vertebra in 11 (37.93%). **Conclusion:** 1) Early vertebroplasty averts and improves co-morbidity related complications. 2) Pain relief occurs immediately and progressive pain

Date: 2013-10-19

Session: Spine Minimal Invasive

Time: 13:30 - 15:00

Room: Hall 6

Abstract no.: 34594

THE ROLE OF VESSEL-X, VESSEL-LOCK, AND SRHA CEMENT IN THE TREATMENT OF OSTEOPOROTIC VERTEBRAL COMPRESSION PROBLEMS

Aloysius Bambang DARWONO

Gading Pluit Hospital, Department of Orthopaedic, Jakarta Utara, 14250 (INDONESIA)

Object. Vertebroplasty and Kyphoplasty are used to treat VCFs with a risk of certain cement leakage. Regarding cement leakage the new technique Vesselplasty use a non stretchable PET container to prevent leakage of the injected cement and then left as an implant body expander. Instead of PMMA, the new SrHA cement is to be used. To treat a complex case (Osteoporotic VCFs, multiple stenosis, kyphotic and degenerative scoliosis) the new innovative Vessel-lock system is used. The purpose of this study : review surgical techniques, 5 years result, compare the effect of SrHA and PMMA cement. Methods. Non randomized prospective study to treat VCFs using Vesselplasty with PMMA and SrHA cement. his new technique the Vessel-X™ system is a percutaneous non fusion technique to stabilize, restore VCFs., and prevent leakage risk of cement. Compare the effect of SrHA and PMMA using X-ray and CT-scan : just after treatment, 3 months and 6 months after treatment. Results. A total of 250 cases consist of 298 VCFs (VT3 – VL 5) that have been treated using this new technique included 178 PMMA and 120 SrHA cases is reported also the 5 preliminary report of Vessel-Lock system. Conclusions. The Vesselplasty is a new technique to treat osteoporotic vertebral fractures. This technique allows the stabilization and restoration of vertebral body height of VCFs, with the advantage in preventing the leakage of BFM. SrHA cement is superior compare to PMMA in the elderly cases. The Vessel-Lock could be the solving of difficult cases.

Date: 2013-10-19

Session: Spine Minimal Invasive

Time: 13:30 - 15:00

Room: Hall 6

Abstract no.: 34542

INFLUENCE OF SAGITAL ALIGNEMENT OF SPINE ON SPONDYLOLISTHESIS SURGICAL RESULTS

Zoubaier ELLOUZ, Mourad AOUI, Zied BELLAAJ, Chiheb BAHLOUL, Ameur ABID, Wajdi BOUAZIZ, Slim MOALLA, Fakher GDOURA, Kamel AYADI, Hassib KESKES
CHU Habib Bourguiba, Sfax (TUNISIA)

Introduction: Many surgical procedures are performed for the treatment of spondylolisthesis. To ensure the success of surgery, many elements must be into consideration. **Methods:** This is a retrospective study, clinical and radiological of 30 patients undergoing surgery for spondylolisthesis. **Results:** A painful symptoms causing discomfort limiting daily functional gestures and professional life with a rebel medical management were the indication for surgery. Neurological release and posterolateral fusion (PLF) were systematic for all patients. Interbody fusion (PLIF) was added for 5 patients. With a fellow up greater than 2 years, our clinical results were very good and good in the majority of cases. Bone fusion was considered solid for 29 cases. A good sagittal balance was achieved in 84%. Pelvic parameters and many other radiological parameters were calculated before and after surgery. The type of fusion (PLF or PLIF) and the number of level instrumented(one or two level) influence the variation of pelvic tilt, lumbar lordosis and the sagital alignment of spine. **Conclusion:** The success of the spondylolisthesis surgery depends mainly on good positioning of the arthrodesis which depends on several parameters described in the literature: the mobility of the vertebrae and the radiological assessment of the disk. Our study demonstrates the influence of other parameters. So, for balanced patients, the fixation of the slippage segment with a PLF on L4L5 spondylolisthesis and PLIF on L5S1 spondylolisthesis is sufficient. Extend the fixation for an adjacent vertebra is necessary for unbalanced patients with PLF for L4L5 and PLIF for L5S1 spondylolisthesis.

Date: 2013-10-19

Session: Spine Minimal Invasive

Time: 13:30 - 15:00

Room: Hall 6

Abstract no.: 34464

MISSILE INDUCED PERIPHERAL NERVE INJURY

Thamer HAMDAN

Chancellor, University of Basrah, Basrah (IRAQ)

Peripheral nerve due to missile is not rare, usually missed because it is painless and more serious injuries usually dominate and drawing the attention of the treating physician. Approximately 70% of the missile wounds that require exploration include either complete or partial section of nerve. Because anatomically the nerve and vessels are anatomically close, to each other, so nerve injury should be considered together. For the last 34 years, 780 peripheral nerve injuries were recorded, which involve almost every nerve in the body. This paper will discuss in details the peripheral nerve, in addition to discussing the indication for exploration, with avoidance of primary repair. The rule of sympathectomy for the treatment of causalgia will be emphasised. Follow up is variable but extend to several years in some cases.

Date: 2013-10-19

Session: Trauma Upper Limb - Distal Radius

Time: 08:30 - 10:00

Room: MR1.05 & MR1.06

Abstract no.: 33934

AN INNOVATIVE TECHNIQUE FOR FIXATION OF MASON TYPE II AND RADIAL NECK FRACTURES IN ADULTS

Aditya Krishna MOOTHA

Siddhartha Hospital, Kakinada (INDIA)

Introduction: Management of radial head/neck fracture in adults range from conservative management to open reduction and internal fixation. We describe an innovative technique of fixation with jess for such fractures **Methods:** 9 cases (3 mason type II and 6 radial neck fractures) are prospectively included in this study. Surgical technique included closed reduction of the fragment by joystick maneuvering by a 1.8/2.0 mm k wire in the radial head fragment and this wire is stabilized with 2nd k wire in shaft interconnected by JESS under slight tension (2 cases needed open reduction). Post operative protocol included ROM from POD1/2 as tolerated by the patient. **Results:** All fractures went to union. Fixator is removed by 4-6 weeks. According to Steele's grading system results are excellent in 6 cases and good in the other 3. Complications included premature loosening of k-wires in 2 patients by 3 weeks. However reduction is maintained in one of them and ultimately had excellent outcome. 2 patients developed pin tract infection and settled on conservative management. **Conclusion:** Mason type II and angulated radial neck fractures in adults can be managed successfully by our technique of percutaneous k-wires and JESS application thus avoiding the complications of open reduction and bulky implantation.

Date: 2013-10-19

Session: Trauma Upper Limb - Distal Radius

Time: 08:30 - 10:00

Room: MR1.05 & MR1.06

Abstract no.: 35968

**EARLY FUNCTIONAL OUTCOME AFTER AN INDIGENOUS
NON-BRIDGING EXTERNAL FIXATOR FOR FRACTURES OF THE
DISTAL RADIUS**

Jay Santosh Kumar SHARMA

J.N.M.C, Wardha (INDIA)

Objectives: A randomized study conducted to analyze the functional and anatomical outcomes of Non-Bridging external fixator in the management of displaced fractures of the distal radius. **Materials and Methods:** Twenty two adult patients with displaced fractures of distal radius were treated by an indigenous Non-bridging fixator. Patients were managed with closed reduction and application of JESS type of Non-bridging fixator and maintained for 6 weeks. The patients were followed-up for 6 months. Functional outcome measurement using DASH score and clinico-radiological assessment using Jakim's scoring system done. **Results:** Fixator showed statistically significant improvement in maintaining the radial length at 6 months ($P<0.0001$) and Volar tilt restoration ($P=0.008$). The DASH score from the 2 weeks post operative to the 16 weeks post operative was statistically significant ($P<0.0001$). The Flexion-Extension and the Pronation-Supination arc of motion achieved at the end of 16 weeks were 147 and 164 degrees respectively. **Conclusions:** They offer a better reduction and anatomical restorations, as the distal pins permit the surgeon to have a direct control over the distal fragment. The advantage of early rehabilitation, leads to a fast functional recovery, as evident from the low DASH

Date: 2013-10-19

Session: Trauma Upper Limb - Distal Radius

Time: 08:30 - 10:00

Room: MR1.05 & MR1.06

Abstract no.: 35952

MULTIPLE VARIETY ANGLE VOLAR LOCKING PLATING FOR DISTAL RADIUS FRACTURES

Martin MAJEWSKI

University of Basel, Basel (SWITZERLAND)

Background Distal radius fractures are common. The increasing prevalence of osteoporosis contributes to frequently complex articular injuries sustained even after low energy falls. Locking plating is widely used. Measures of success are based on technical measurements Patients satisfaction is increasingly important for surgical success. We report our experience using multiple angle volar locking plates for typ A to C distal radius fractures. Methods Over five Years we treated 226 patients with distal radius fractures using locked volar plating. 80 type A, 9 type B and 137 type C. We retrospectively evaluated all pre and post operative radiographs as well as clinical examination accessible. Results There were 51 men and 175 women. All of the fractures had united by 3 months. The 226 patients studied had an average age of 52 years (Women 58 years, men 46 years). There were no cases of wound infection , no pseudarthrosis and some tendon injury. Patients reported low pain scores, good patient rated wrist evaluation scores and high levels of satisfaction. Conclusions Multi angle volar locking plating for simple as well complex distal radius fractures produces good results. Further work should address whether locked volar plating offers superior outcomes and patient satisfaction compared to external fixation.

Date: 2013-10-19

Session: Trauma Upper Limb - Distal Radius

Time: 08:30 - 10:00

Room: MR1.05 & MR1.06

Abstract no.: 34523

DISTAL RADIAL FRACTURES. A COMPARISON OF THE RESULTS OF A NON BRIDGING EXTERNAL FIXATION, A BRIDGING EXTERNAL FIXATION AND A ORIF (OPEN REDUCTION AND INTERNAL FIXATION) TECNIQUE.

Domenico POTESIO¹, Emmanouil THEODORAKIS², Filippo LAURENTI²

¹Rome American Hospital, Rome (ITALY), ²Policlinico Umberto I, Rome (ITALY)

Surgical management gold standard of unstable distal radial fractures is controversial. We compared functional outcomes of treatment using a non-bridging external-fixation,a bridging external-fixation and a ORIF tecinque.From January 2009 to December 2010 Sixty patients with an unstable distal radial fracture were treated with a non-bridging external-fixation(twenty),a bridging external-fixator(twenty patients),a ORIF with volar plate.The Orthopaedic Trauma Association fracture classification was used.Patients completed the DASH and the PRWE questionnaire at 1,3,6 month and 1 year after surgery.The ranges of motion of the wrist and forearm, and radiographic parameters were evaluated.At 1 month,mean PRWE and DASH scores for the patients with non-bridging ex-fix was significantly better than that for patients treated with bridging external-fixation and ORIF.At three months,mean PRWE and DASH scores for patients with a non-bridging external-fixation and ORIF were significantly better than that for patients treated with bridging external-fixation.By six months and one year, all three groups had DASH scores comparable with those for the normal population.The range of motion of the wrist differed significantly among the three groups at 1,3 and 6 months after surgery being better for the non bridging group and for the ORIF group.There were no significantly differences in radial inclination and radial length maintenance at one year.Use of a non bridging external fixator on our opinion leads to better patient-reported outcomes(DASH and PRWE scores)in the first three months after fixation.However,at six months and one year,the outcomes of the three techniques evaluated in this study were found to be excellent,with the only differences among them in terms of motion.

Date: 2013-10-19

Session: Trauma Upper Limb - Distal Radius

Time: 08:30 - 10:00

Room: MR1.05 & MR1.06

Abstract no.: 34755

DIAGNOSING DELAYED AND NON-UNIONS- ARE X-RAYS GOOD ENOUGH?

Biswajit SAHU, Barsha TUDU, Sourabh CHACHAN

VSS Medical College, samabalpur (INDIA)

At least 6 months are needed to diagnose delayed union and 9 months to diagnose non-union on X-rays. Color Doppler can show neovascularisation and predict fracture healing outcomes. A prospective follow-up study including 86 fractures of shaft humerus, was conducted to compare color Doppler with X-rays in diagnosis of delayed and non-unions. All cases were treated by plating osteosynthesis. Evaluation was done by using fortnightly color Doppler and X-rays. Mean follow-up period was 20 weeks (range=12-40 weeks). Out of 86 cases, 69 had complete union, 12 had delayed union and 5 had non-union. It was observed that union cases showed consistent increase in vascularity around the fracture site. In union cases average Resistive Index (RI) fell from 0.78 at 2nd week to 0.41 at 12th week. But the 12 cases of delayed union showed less persistent increase in vascularity and average RI at 2ndth and 12th week were 0.86 and 0.75 respectively. The 5 cases of non-union did not show any increase in vascularity on repeated color Doppler examinations and RI were consistently high in this group with average being 0.88 and 0.80 at 2nd and 12th week, respectively. The time to diagnose delayed and non-union was significantly decreased to 12-14 weeks using color Doppler. So it can be concluded that color Doppler can help in early interventions for faulty fracture healing outcomes. Using Doppler instead of x-rays can help resolve the complications much before they can even be diagnosed by radiography and with significant reduction in health care expenditure.

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Session: Trauma Upper Limb - Distal Radius

Time: 08:30 - 10:00

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Abstract no.: 35166

CORRECTIVE OSTEOTOMY OF MALUNITED DISTAL RADIUS USING VOLAR LOCKING PLATE AND BONE GRAFT SUBSTITUTE

Mohan Krishna PULLAGURA¹, Kiran SINGISETTI², Alan MIDDLETON²

¹Queen Elizabeth Hospital, Gateshead (UNITED KINGDOM), ²University Hospital of North Tees, Stockton (UNITED KINGDOM)

Malunion is a common complication of the distal radius fracture with the most common deformity being dorsal angulation, displacement and shortening. Although a direct dorsal approach can be convenient, it is often associated with tendon problems. Autograft is the gold standard but donor site morbidity is not uncommon. The objective of the current study is to look at the radiological union, deformity correction and at the functional outcome of these wrists. We performed this procedure on 18 wrists with malunited distal radii using the more familiar volar approach, variable angle locking plate and actifuse putty to fill in the metaphyseal defect of the distal radius. At the final follow-up of a minimum of 18 months, 14 wrists were available to analyse. Radiological evidence of union, correction of the deformity was achieved in all cases. Clinical and functional improvement using Quick DASH score showed a significant improvement using paired t-test. Without the use of autologous bone grafting, corrective open wedge osteotomy fixed by a volar locked plate provides a satisfactory functional outcome and bony union.

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Session: Trauma Upper Limb - Distal Radius

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Abstract no.: 34075

NON-SCAPHOID CARPAL INJURIES - INCIDENCE AND ASSOCIATED INJURIES

Anantha Krishnan RAGHUPATHI¹, Prathap KUMAR²

¹Darlington Memorial Hospital, Darlington (UNITED KINGDOM), ²Darlington memorial Hospital, Darlington (UNITED KINGDOM)

Nonscaphoid carpal fractures and associated injuries are frequently missed and difficult to diagnose and late diagnosis can lead to serious ligamentous disruption and permanent wrist dysfunction. Exact incidence throughout the world is still unknown. Aims: To identify the incidence of Nonscaphoid carpal fractures in our population, comparing it with literature and to analyse the patterns of associated injuries. A retrospective analysis of all wrist x-rays and CT scans was carried out in our hospital for a three year period from 2008 to 2011. A total of thirty - three patients were included in our study . Casenotes were accessed to gather clinic data. Fracture Our study Literature Triquetrum 35% 4-31% Hamate 27% 7% Capitate 14% 1.3% Lunate 11% 1% Trapezium 8% 3-5% Pisiform 5% 1-2% The incidence of nonscaphoid carpal fractures in our study is considerably higher when compared to the literature. We always have to look for any associated injuries with any type of carpal fractures based on our study findings. We propose that high index of suspicion should always be borne in mind when dealing with carpal fractures and detailed examination of wrist should be conducted, even when x rays does not show any obvious bony injuries, CT scans and other specialized images should be judiciously used in areas of suspicion for early diagnosis, to initiate adequate and immediate treatment, for early mobilisation and good functional recovery. Therefore the incidence of these injuries are not low as we think.

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Session: Trauma Upper Limb - Distal Radius

Time: 08:30 - 10:00

Room: MR1.05 & MR1.06

Abstract no.: 33831

TREATMENT OF MASON'S TYPE II RADIAL HEAD FRACTURE BY CLOSED MINI-EXTERNAL FIXATOR. A NOVEL TECHNIQUE.

Hrushikesh SARAF, Sarang KASTURE

Peridot Superspeciality Hospital, Pune (INDIA)

Treatment of Mason type II radial head fractures is controversial. Options range from non-invasive conservative treatment to more invasive plate fixation with none of them being ideal. In this prospective study, 22 patients with Mason's type II radial head fracture were treated by a novel technique of closed reduction with joystick maneuver and mini external fixator application. Elbow flexion and extension movement was started immediately and pronation – supination movement was started after removal of the fixator. All patients were evaluated for operative time, pain, time to discharge, associated complications and time to union. Functional assessment was evaluated by Mayo elbow performance score and Murray functional rating. All patients achieved painless, stable elbow and full range of motion with good to excellent outcome. We believe that closed mini-external fixator application for Mason's type II radial head fracture may be a better alternative to other modalities as it is safe, less invasive and aids in faster rehabilitation.

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Session: Trauma Upper Limb - Distal Radius

Time: 08:30 - 10:00

Room: MR1.05 & MR1.06

Abstract no.: 33690

DYNAMIC EXTERNAL FIXATION AND PERCUTANEOUS PINNING FOR THE MANAGEMENT OF UNSTABLE DISTAL RADIUS FRACTURES.

Mohamed Altayeb MUSSA¹, Adel Refaat AHMED², Mohamed Mostafa EL-HENAWI², Mohamed Adel WANAS²

¹Hull Royal Infirmary, Hull (UNITED KINGDOM), ²Alexandria University Hospital, Alexandria (EGYPT)

Introduction: Fractures of the distal radius constitute a substantial proportion of the workload in orthopedic trauma practice. Published studies on distal radius fractures have correlated deformities with loss of function. We set to evaluate the results of treating unstable distal radius fractures using dynamic external fixator combined with percutaneous Kirschner wire (K-wire) fixation. **Methods:** 20 patients with unstable distal radius fractures were included in the study. The mean age was 39.5 (15 – 60) years. 10 patients were females and the right side was affected in 9 patients. The fracture was the result of a mechanical fall in 15 patients and road traffic collision in 5 patients. **Results:** Patients were followed up for a mean period of 12 months. The functional results at the end of the follow up period were excellent in 35% of patients, good in 50% and fair in 15%. The complications encountered were superficial pin tract infection in 2 patients, superficial radial nerve injury in 1 patient, and iatrogenic fracture of the second metacarpal bone in 1 patient. **Conclusion:** Combined dynamic external fixation and percutaneous pinning of unstable distal radius fractures is a simple and effective treatment modality. It effectively maintains the fracture reduction while allowing early wrist joint mobilization that yields satisfactory functional as well as radiological outcome.

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Session: Trauma Upper Limb - Distal Radius

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Abstract no.: 35234

ONE BONE FOREARM RECONSTRUCTION, A SIMPLE SOLUTION

Devendra AGRAHARAM, Dheenadhayalan JEYARAMARAJU

Ganga Hospital, Coimbatore (INDIA)

Introduction: Management of severely injured limbs with composite soft tissue and bone loss is a major challenge to any orthopaedic surgeon and the functional outcome is always unpredictable.

Patients and Methods: 20 patients treated with One bone forearm reconstruction between 1995 and 2011 were analysed with a minimum follow up period of one year. Among 20 patients, 13 patients underwent One bone forearm reconstruction in acute situations and in 7 patients, planned reconstruction was done. Among 13 patients, Six patients sustained severely mangled upper limb injury and avulsion amputation of upper limb in 7 patients. All patients underwent immediate one bone forearm reconstruction followed by neurovascular repair and soft tissue reconstruction. In elective group, 5 patients were with post traumatic infective non-union and two patients were post traumatic deformity correction. Four patients underwent reconstruction with free vascularised fibula graft and in 3 patients, tricortical iliac crest graft was used.

Results: All patients were analysed with minimum followup period of 1year. The functional outcome in acute situations was analysed by Ch'en criteria and among 13 patients, 7 patients had Grade I results, Grade II and III results in three patients each. There were no secondary amputations and poor results. In elective group, 5 patients had excellent and two patients had good results according to Peterson et al scoring system.

Conclusion:One bone forearm reconstruction is a simple and viable option in difficult situations and provides a stable forearm with good functional and cosmetic results as well as patient satisfaction.

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Session: Hand Trauma & Reconstruction

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Abstract no.: 34996

SCAPHOID NONUNION- COMPARISON OF 3 FIXATION TECHNIQUES

Bahubali ASKI, P. K. Raju K. V.

BANGALORE MEDICAL COLLEGE, BANGALORE (INDIA)

objective: To compare outcomes of 3 fixation modalities for scaphoid non-union. **Methods:** 31 patients aged between 20 to 48 years with non-union of the scaphoid involving the proximal pole(13), waist(12), and distal pole(8) were randomised to undergo the Herbert screw fixation(11), the Matti Russe bone grafting(9), or the Kohlman modification of vascularised muscle pedicle graft procedure (n=13). The mean duration of non-union was 10months.

Results: The mean follow-up duration was 28 months. 30 of 33 achieved correction of both scapholunate and radiolunate angles. The mean range of motion increased from 112° to 155°. The mean grip strength increased by 30%. Functional outcomes of the 3 groups were comparable; they were excellent in 13 patients, good in 10, fair in 6, and poor in 4. There was no hardware failure or any iatrogenic fracture during pedicle dissection. One patient had superficial infection, which was resolved after antibiotic treatment. At the 6-month follow-up, in the respective 3 groups, 8, 6 and 11 patients achieved scaphoid union after mean intervals of 17, 16, and 15 weeks. **Conclusion:** The time to union was earliest in the Kohlman modification of vascularised muscle pedicle graft procedure, which is recommended for patients with old non-union (>1 year) or proximal pole fractures.

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Session: Hand Trauma & Reconstruction

Time: 10:30 - 12:00

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Abstract no.: 34917

DIAMOND TWINSTM PROCEDURE IN SCAPHOID NONUNIONS

Werner KNOPP¹, Klaus DRAENERT²

¹Department of Traumatology, Hand and Reconconstructive Surgery, University Medical Center Saarland, Homburg, Germany, Homburg / Saar (GERMANY),

²Center for Orthopaedic Science, München,, München (GERMANY)

Methods The Diamond TwInSTM procedure uses (water cooled) diamond tools, coated with natural diamonds. By this method, the only artifact visible is a slight demineralization along the border of the graft cylinder, the trabeculae remain intact. For taking these graft cylinders out, a sharp extractor is used. The set of the instrument is based on the “twins principle”, that means that the outer diameter of the smaller tools are 1/10 within the larger tools, smaller than the inner diameter of the next following tool. Using this method a press-fit seat of the graft is possible. This press-fit seat of the graft allows an early revascularisation of the transplanted graft cylinders, after one week a bony integration can be shown in histological examinations. This method is routinely used in bone-cartilage transplantation and in this series in the treatment of scaphoid nonunions. **Material** The series consist of 14 patients with scaphoid nonunion, which had been treated with this new grafting technique by the author. In cases of humpback deformity (5 cases), a double graft cylinder technique was used. In 12 of these cases a Herbert screw was used additionally. **Results** Radiographic (CT) and clinical bony union could be achieved in all patients within a range from 2 to 4 months. The pain relief displayed on VAS reached 1.9. According to the Mayo Wrist Score Chart a satisfactory result (69 points) was achieved. **Summary** This procedure is an promising alternative procedure in treating scaphoid non-unions

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Abstract no.: 34059

RESULTS & OUTCOMES OF TREATMENT OF CHRONIC UNREDUCED PERILUNATE DISLOCATIONS

Prashanth SHESHAPPA, Abhijeet WAHEGAONKAR, Ajeet TIWARI,
Chetan NERPAGAR

Hand & Upper Limb Center-Apollo-Jehangir Hospital, Pune (INDIA)

Objective Perilunate dislocations are comparatively uncommon and account for only about 10% of all carpal injuries. Results of treatment of acute perilunate dislocations are satisfactory if the patient is seen early, but these injuries are often unrecognized or inadequately treated. Method 8 patients with chronic perilunate dislocations that had been untreated for a minimum of 6 weeks after injury were treated at our institution, by a single surgeon. All patients were men with a mean age of 36.6 years(range 19-60 years).The mean time since injury was 7.7weeks(range 6-10 weeks);and the mean follow-up period was 8.6 months(range 3-15 months).All patients underwent an open reduction using only a dorsal approach with ligament reconstruction & repair irrespective of the duration since injury. Result The mean preoperative ROM was 55.5°(range 30°-75°)&the postoperative ROM was 111.5°(range 90°-130°).The mean postoperative grip strength was 30.8lbs (range 28-35 lbs) as compared to the mean preoperative grip strength of 14.2lbs(range 10-20lbs).The mean preoperative Mayo wrist score was 29.5(range 10-55) & the mean postoperative Mayo Wrist Score was 78 (range 65-90). There were 2 excellent to good & 6 satisfactory results. Conclusion Perilunate dislocations & associated injuries may be easily overlooked or misdiagnosed. The upper time limit at which an initially unrecognized perilunate dislocation may be reduced with an acceptable result is unknown.Although late open reduction can be accomplished up to 1 year after injury; in our series, the end results in cases treated within 2 months of injury were better.

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Abstract no.: 34132

DISTAL RADIUS MEASUREMENTS AND EFFICACY OF FIXED ANGLED LOCKING VOLAR PLATES

Mahmut Nedim AYTEKIN¹, Ismail AGIR²

¹Department of Orthopedics and Traumatology, Yıldırım Beyazıt University Ankara Ataturk Training and Research Hospital, Ankara (TURKEY),

²Department of Orthopedics and Traumatology, Adiyaman University, Adiyaman (TURKEY)

Purpose: For surgical treatment of unstable distal radius fractures present, fixed angled locking volar plate fixation is being popular nowadays because of some advantages over other surgical techniques. We discussed the fitting of fixed angled locking volar plates to distal radius according to changes of distal radial angles. Materials and methods: We firstly took the conventional radiography of 18 dried radius and later we measured the palmar subchondral angle, dorsal subchondral angle, mid-subchondral angle and the palmar cortical angle on lateral radiographies. Results: According to the measurements the volar subchondral angles (alpha) ranged in between 10,2 degree to 28,1, the middle subchondral angles ranged in between 55,9 degree to 93,2 degree ,the dorsal subchondral angles ranged in between 77 degree to 109,6 degree and the volar cortical angles ranged in between 134,5 degree to 158,4 degree. Conclusion: Although fixed angled locking volar plates accepted as anatomical, our measurements show that, volar cortical angles and the subchondral angles are variable. Therefore, the term anatomic distal radius volar plate should be discussed.

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Abstract no.: 35185

**AUGMENTED HAMATE REPLACEMENT ARTHROPLASTY IN CHRONIC
PIP FRACTURE DISLOCATION: A MODIFICATION**

Binu THOMAS, Samuel PALLAPATI, George ANDERSON

Christian Medical College & Hospital, Vellore, TN (INDIA)

Introduction: Hemi-hamate replacement arthroplasty(HHRA) reconstructs the “volar buttress” following unstable PIP dorsal fracture-dislocation(DFD). We noted late development of hyperextension deformity when HHRA was done for chronic injuries. Our modifications were added to augment joint stability and prevent this hyperextension deformity by 1) avoiding transection of collateral ligaments by a collateral ligament slide from its proximal insertion, 2) reinserting volar plate with trans-osseous sutures to middle phalanx base,3) repair of collateral ligament/volar plate interval. **Aims:** To present results of this modified procedure in ten patients with chronic/neglected PIP dorsal fracture-dislocation(PIPFD) treated by the augmented HHRA .**Methods and Material:** Ten patients with chronic PIPJ DFD presenting at an average of 14 weeks following injury with minimum 40% articular damage was treated with the modified HHRA. **Final evaluation included clinical assessment, radiological evaluation of union, resorption of graft/AVN, measurement of grip strength with Jamar dynamometer, ROM.** **Results:** At a minimum follow up of 2years (24 months to 60 months) the range of motion at the PIP joints was a mean of 84 degrees with an improvement of 73.5 degrees and significant (p value 0.026). Passive testing showed no instability.. Pain reduced to a mean of 1.6 from 9.6 using the VAS (p= 0.026). Grip strength improved by 17.5%. No redislocations and graft resorption was noted in our patients.**Conclusions:** Addition of the modifications augments the good results of the HHRA in the management of chronic PIPFD and prevents a hyperextension or redislocation.

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Abstract no.: 35120

**A NEW TECHNIQUE OF SILICON INTERPOSITIONAL
METACARPOPHALANGEAL AND INTERPHALANGEAL JOINTS
ARTHROPLASTY (JAFRI ARTHROPLASTY)**

Mohammad Irfanulhaq KHAWAJA, Shehzada Mehmood-Ul-Hassan JAFRI,
Akram MUHAMMAD

LAHORE INSTITUTE OF HAND AND ARM SURGERY (LIHAS), LAHORE
(PAKISTAN)

Introduction: We are introducing a unique and absolutely new technique of cartilage regeneration with silicon sheath interposition for metacarpophalangeal, proximal and distal interphalangeal joint function loss due to osteoarthritis and post-traumatic osteoarthritis. Surgical indications for the use of joint prostheses include loss of joint space, synovial proliferation with joint destruction, loss of normal joint alignment, and uncontrolled pain. Multiple surgical options include ligament reconstruction, resectional arthroplasty, tendon interposition, arthrodesis or total joint replacement arthroplasty with silicon, pyrocarbon and metal prosthesis.

Methods: Procedure was performed under general/regional anesthesia through dorsal approach. In the first stage procedure, joint was exposed, damaged articular surface of the joint was excised and deformed/arthritic joint was reshaped at metacarpophalangeal, proximal or distal interphalangeal joint. Silicon sheath was placed for three months. In the second stage, SS was removed. Fibrocartilage was found to be formed alongwith synovial sheath around the articular surface. Postoperatively, physiotherapy protocol was followed to restore functional ROM.

Results: Pain free functional range of motion was achieved alongwith deformity correction and improved grip strength without any use of prosthesis. We found this cost effective procedure useful for relief of pain and enhancement of movement of the joint and associated with relatively fewer complications.

Jafri's silicon arthroplasty is new addition to literature which does not involve complications like loosening of implants, implant breakage, periprosthetic fractures and silicon synovitis.

Key Words & Abbreviations: Metacarpophalangeal Joint (MCPJ), Proximal Interphalangeal Joint (PIPJ), Distal Interphalangeal Joint (DIPJ), Silicon Sheath (SS), Range of Motion (ROM)

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Abstract no.: 35807

EARLY SEQUENCING OF SELECTIVE JOINT STABILISATION AND MUSCULOTENDINOUS TRANSFERS IN THE MANAGEMENT OF BRACHIAL PLEXUS INJURED PATIENTS

George Alfred ANDERSON¹, Binu Prathap THOMAS², Samuel Rasj PALLAPATI²

¹CMC Hospital Vellore, VELLORE (INDIA), ²CMC Hospital Vellore, Vellore, Tamil Nadu (INDIA)

Introduction: While there is rapid strides in surgery for Brachial Plexus avulsions by primary Nerve transfers secondary surgery are still done late. A robust early approach of secondary procedures - 'the Christian Medical College, Vellore, India method' is proposed. **Methods:** The earliest Brachial Plexus injury surgical service in India was 52 years ago at CMC Hospital Vellore, India. Between 1991 and 2010 there was a shift for early secondary reconstruction in post primary neural surgery patients (PPNS) - 88 and those without primary neural surgery (NPNS- 240). These were analysed. **Results:** Shoulder arthrodesis in 83 patients gave union rate in 98.6% and wrist arthrodesis in 104 by Anderson-Thomas technique gave 100% union rate. Bateman's Trapezius advancement (21 patients) and use of distal half of Trapezius insertion in 6 gave an average of 64° shoulder abduction.. The 34 LD transfers to Triceps, Biceps and Infraspinatus, and the 63 Steindler procedure for elbow flexion gave an average of 72% active range. The 19 FCU transfers to half BR tendon- Anderson technique, provided an average of 60 ° supination. The NPNS patients preferred shoulder stabilisation to transfers and the PPNS, wrist fusion and elbow transfers. **Conclusion and Relevance.** Severe brachial plexus avulsions necessitate judicious primary and secondary surgery. The socioeconomic burden in developing world patients mandates early restoration of acceptable function and cost cutting. Expensive late free musculotendinous transfers and joint stabilisation should ideally give way to early sequencing of reconstructive surgery where possible as by the 'robust CMC Vellore, India technique'.

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Abstract no.: 35069

EARLY TENDON TRANSFERS IN PERIPHERAL NERVE INJURIES OF THE UPPER AND LOWER EXTREMITY

Anil DHAL, Sumit SURAL, Vineet DABAS, Tarun SURI, Ajeesh SANKARAN, Ankit THORA, Purushottam LINGAIAH

Maulana Azad Medical College, New Delhi (INDIA)

INTRODUCTION: Early tendon transfers are used in peripheral nerve injuries to restore useful limb function while awaiting recovery and to supplement incomplete return of power. Usually a single important function is restored through a simple transfer, which can be performed before, with or after neurorrhaphy. **MATERIALS AND METHODS:** Forty-eight patients underwent various transfers specific to their nerve injuries, distributed as follows-Ulnar nerve-Palmaris longus, elongated with palmar aponeurosis strip, transfer was performed to the A1 pulley in ten patients to correct clawing. The assisted and unassisted angles were measured preoperatively and at follow up. Radial nerve- Pronator teres to extensor carpi radialis brevis transfer was performed in fifteen patients and a single tendon flexor carpi ulnaris transfer was done in ten patients. Power and precision grip strength, and wrist range of motion were the parameters followed. Median nerve- Opponensplasty was performed in ten patients, with extensor indicis proprius as the motor in nine and palmaris longus in one. Range of opposition and Power and Precision grip were followed. Sciatic nerve- A posterior tibial to the dorsum of the foot transfer was performed in three patients to correct foot drop. Range of dorsiflexion and the Stanford foot score were followed. **RESULTS:** The parameters followed for each transfer showed a statistically significant improvement over a minimum of 6 months follow-up. No deformity developed in the opposite direction even after recovery. **CONCLUSION:** Early tendon transfers are indicated in nerve injuries to simply and safely restore limb function at the earliest while avoiding cumbersome splintage.

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Abstract no.: 34055

THE OUTCOME OF COVERAGE OF SOFT TISSUE DEFECTS OF THE HAND WITH RADIAL PERFORATOR FOREARM ISLAND FLAPS

Chetan NERPAGAR, Ajeet TIWARI, Prashanth SHESHAPPA, Abhijeet WAHEGAONKAR

Hand & Upper Limb Center-Apollo-Jehangir Hospital, Pune (INDIA)

Purpose: The traditional reverse radial forearm fascial flap is widely used in soft-tissue reconstruction of the hand. In patients with an abnormal Allen test because of an incomplete palmar arch, the traditional reverse radial artery flap is contraindicated unless a vein graft is used to reconstruct the radial artery. A simpler alternative approach for hand reconstruction in such patients is a distally based Radial Perforator Forearm Island Flap based on radial artery perforators. The purpose of this study was to evaluate the outcomes of this procedure in 20 consecutive patients and to evaluate the functional and aesthetic outcomes. **Methods:** Twenty patients with a palmar or dorsal soft-tissue loss had a radial perforator flap. All surgeries were performed on an emergency basis after the patient presented to the ER with soft-tissue loss. **Results:** All twenty patients recovered full hand function and 3 cases of distal flap margin necrosis, all of which healed without any intervention. 1 patient had a superficial necrosis which required a full thickness skin graft. 1 patient had partial loss of donor site skin graft. All patients reported a satisfactory outcome and were pleased with their aesthetic result. All patients went back to their previous level of activities after complete recovery. **Conclusion:** The radial artery perforator flap based on distal radial artery perforators is suitable for coverage of soft-tissue defects in hands with either a complete or an incomplete palmar arch. This flap is a thin flap and provides excellent cosmetic results and allows for early rehabilitation.