

**Date: 2014-11-19**

**Session: Hip: Free Papers - Hip Acetabulum Reconstruction**

**Time: 10:30 - 12:00**

**Room: LEME**

**Abstract no.: 37200**

**TOTAL HIP ARTROPLASTY AFTER ACETABULAR FRACTURES**

Bartolome Jr ALLENDE, Alfonso LUGONES, Christian ALLENDE  
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Introduction: Acetabular fractures are life-altering injuries that commonly occur in the young and active. The incidence of post-traumatic osteoarthritis has been reported between 10% and 30%. Negative prognostic factors: over forty years of age, anterior dislocation, femoral head cartilage injury, posterior wall involvement, marginal impaction, initial displacement of  $\geq 20$ mm, non-anatomical reduction, postoperative incongruence of the acetabular roof, and extended iliofemoral approach. THA in these young active patients is more technically demanding. Objective: Restrospective description and analysis of cementless acetabular reconstruction in post-traumatic arthritis and compare them with THA in nontraumatic arthritis. Methods: 19 patients treated surgically with cementless acetabular reconstruction in post-traumatic arthritis secondary to acetabular fracture. The average age at the time of arthroplasty was 49.2 years (19 - 83). The age at the time of fracture was 46.2 years (16 - 81). The average time between the acetabular fracture and THR was 35.8 months (5 - 156). Results: No aseptic loosening / dislocations. 1 revision for infection. The Harris Hip Score averaged was 89.3 (57 - 99). The average follow-up was 3.6 years. The control group had 3.1 years follow-up, the HHS was 94.1 points (78 - 100). There was no significant difference with Harris HHS when comparing both groups. Conclusion: THA performed after previous operative treatment of an acetabular fracture, can be safe and efficacious. In the short term there are no clinical or radiographic differences in THR with cementless acetabular cups in post-traumatic arthritis patients compared with patients with nontraumatic arthritis

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**Room: LEME**

**Abstract no.: 36853**

**CLINICAL OUTCOME AND SURVIVAL OF TOTAL HIP ARTHROPLASTY AFTER ACETABULAR FRACTURE: A CASE-CONTROL STUDY**

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University of Toronto, Toronto (CANADA)

**PURPOSE:** The aim of this study was to compare the long-term clinical and radiographic results in patients who have undergone THA after acetabular fracture treatment as compared to patients who underwent THA for primary hip osteoarthritis. **METHODS:** Eighty patients were identified who were treated for acetabular fracture and subsequently underwent THA for post-traumatic arthritis or avascular necrosis. The primary outcome measurements were revision rate, time of revision and complication rates. **RESULTS:** The cohort of acetabular fracture patients included 55 male and 25 female patients with a mean age of 52 years (Range, 25-85 years) and mean follow up of 8.1 years (Range, 2-23 years). The cohort of osteoarthritis patients was matched for age and gender. The number of revisions for patients with THA following acetabular fracture was 24/80 (30%) as compared to 12/80 (15%) ( $p=0.038$ ) in the control group. There was a significant difference in the time from the initial THA to the revision between patients with previous acetabular fracture (7.7 years; SD, 5.1 years) and the matched cohort (12.8 years; SD, 5.9 years;  $p=0.015$ ). Patients with a previous acetabular fracture had a 6.25% infection rate and a 10% dislocation rate compared to no infections and a 2.5% dislocation rate in the matched group. **CONCLUSION:** Patients with a prior acetabular fracture had a higher complication rate, a higher revision rate and those requiring revision were done earlier than those patients without a prior acetabular fracture.

**Date: 2014-11-19**

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**Time: 10:30 - 12:00**

**Room: LEME**

**Abstract no.: 37995**

**EXCELLENT OUTCOME OF ACUTE TOTAL HIP REPLACEMENT IN ACETABULAR FRACTURES USING REGENEREX CUPTM**

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Introduction: Primary Total Hip Arthroplasty in Acute acetabular fracture is an unique challenge to the orthopaedic surgeon because of the difficulty in obtaining long term acetabular component fixation due to acetabular fracture itself as well as expected necrosis of the remaining bone fragments. Methods and Methodology: Twenty-five patients (25 hips) with acetabular fracture underwent acute Total Hip Replacement with porous metal cup (Regenerex<sup>™</sup> Ringloc Acetabular cup, Biomet orthopaedics, Warsaw, IN). Twenty males and 5 females with a mean age of 46.4 years (Range 21 to 57 years) were followed up for a minimum of 18 months (Range 12-24 months). No patient was lost during follow up. The patients were evaluated clinically and radiographically with serial X-rays. Result: All the patients had excellent clinical outcome with immediate pain relief, appropriate range of motion, early weight bearing, and good walking ability with functional improvement. All the cups were well integrated. There was no loosening in any cups as evidenced by the absence of lucent lines in X-rays. One patient had infection, which got resolved with debridement and one patient had sciatic nerve palsy. No failures were seen in the study. Conclusion: Though a longer follow up study is required, the short term study showed that Regenerex cup has sufficient primary stability and appears suitable for primary Total Hip Arthroplasty in acute acetabular fractures. Key words: Acute Acetabular fracture, Primary Total Hip Replacement, Regenerex Cup

**Date: 2014-11-19**

**Session: Hip: Free Papers - Hip Acetabulum Reconstruction**

**Time: 10:30 - 12:00**

**Room: LEME**

**Abstract no.: 38010**

**TOTAL HIP ARTHROPLASTY IN ACETABULAR FRACTURES IN ELDERLY USING CAGE SYSTEM- MID TO LONG TERM FOLLOW UP**

**Rajesh MALHOTRA, Vaibhav JAIN, Deepak GAUTAM**

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

All the patients older than 55 years with acetabular fractures fulfilling the criteria for acute Total hip arthroplasty (THA) were included in our prospective study. Cementless THA was done using cage System and autologous bone graft in all cases. 22 patients were available for latest follow up. The average follow up was 81.1 months. Mean Harris Hip Score was 91.1. Eighteen patients were walking without any support while four were using cane. There was no case of acetabular or femoral component loosening. We believe that this method of treatment is promising in older population as there is deficiency of bone stock which may lead to fixation failures. Primary THA using Octopus cage system can be a useful tool in the management of elderly patients in selected acetabular fractures.

**Date: 2014-11-19**

**Session: Hip: Free Papers - Hip Acetabulum Reconstruction**

**Time: 10:30 - 12:00**

**Room: LEME**

**Abstract no.: 38451**

**USE OF POROUS TRABECULAR METAL AUGMENTS WITH IMPACTION BONE GRAFTING IN MANAGEMENT OF ACETABULAR BONE LOSS**

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**Background** - The use of impaction grafting in revisions with larger acetabular bone defects has mixed outcomes and sometimes high failures rates. Patients and Methods - This prospective, single centre study reports a consecutive series of 24 patients who underwent complex reconstruction of the acetabulum using a trabecular metal augment, impaction bone grafting and a cemented high density polyethylene cup. Results - The 2-year WOMAC pain, function and stiffness scores showed significant ( $p<0.001$ ) improvement as did certain components (bodily pain, physical function, role physical, role emotional, physical component score and social function) of SF-36 score ( $p<0.05$ ). 23 of the patients were very satisfied with the overall outcome of the surgery and would have the surgery again for similar problem, and 19 reported great improvement in their quality of life after surgery. Radiographs at latest follow-up revealed incorporation of the augment with mean change in acetabular component inclination of less than 1 degree ( $p>0.05$ ) and cup migration of less than 5mm in both horizontal and vertical axis ( $p>0.05$ ). 1 patient required further revision at 13 month and was found to have a fractured augment at re-revision. Conclusion - This study shows that TM augments are effective in both filling the bone defect and provide a stable foundation for impaction bone grafting. We found satisfactory clinical and radiographic results using this technique, with low failure rate at a median follow-up of 5 years. Short term data are promising, but longer follow-up is needed to determine the true clinical value of the technique.

**Date: 2014-11-19**

**Session: Hip: Free Papers - Hip Acetabulum Reconstruction**

**Time: 10:30 - 12:00**

**Room: LEME**

**Abstract no.: 36569**

**TWO YEAR RESULTS OF A MODULAR TRABECULAR METAL CUP  
IN MANAGEMENT OF COMPLEX ACETABULAR  
RECONSTRUCTION IN BOTH PRIMARY AND REVISION SURGERY  
FROM A SINGLE CENTRE IN THE UNITED KINGDOM**

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Introduction: Reconstruction of acetabulum in patients with significant acetabular bone deficiency remains a major challenge. The system we reviewed utilises internal augments within the acetabular shell to allow optimal placement of cup with or without additional external augment to gain maximum purchase in host bone. Trabecular Metal cup utilises both internal and external cup augments offering diverse options. Methods: A retrospective review of 20 patients who undergone either complex primary hip replacement or revision hip arthroplasty using the Delta One Revision cup system with augments (8 complex primary and 12 revisions). Indication for revision was aseptic loosening. Minimum follow up was 24 months. All defects were classified according to Paprosky classification. Results: Average Harris hip score improved from 55 preoperatively to 76 postoperatively. At most recent radiographic evaluation, 18 cups demonstrated no lucent lines. There were two failures resulting in further surgery. One insulin dependent patient presented with a late infection 6 months post revision requiring 2 stage revision. A second patient sustained an early catastrophic dislocation of cup and augment assembly around a peri-acetabular fracture following a fall four weeks post-operatively. Both were revised successfully. Conclusions: Delta One revision cup system utilising modular augments both externally and within acetabular shell effectively manages complex primary and gross bone loss in revision situation. Internal cup augments add a useful dimension for management of complex deformity. The system leads to high patient satisfaction providing solid construct in face of significant bony deformity. Further review and assessment of long term outcomes is recommended.

**Date: 2014-11-19**

**Session: Hip: Free Papers - Hip Acetabulum Reconstruction**

**Time: 10:30 - 12:00**

**Room: LEME**

**Abstract no.: 37548**

**MODERN MATERIALS IN REVISION ACETABULAR RECONSTRUCTION WITH PAPROSKY IIC - III DEFECTS**

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From 2002 -2013 in our department was performed 281 revision hip arthroplasties and more than 5800 primary thr, 245(87,2%) of them included acetabular revision. From 2008 we use in revision surgery tantalum augments, buttresses, shims in 62 cases (25,3%). During revision surgery mostly we use augments in acetabular bone loss Paprosky 2 II b,c and III a,b. This material has very high rate of osteointegration (40% after 6 weeks). The main reasons of instability were components instability with osteolysis, components breakage, chronic dislocations and infections. We have particular experience and tip and tricks in augmentation. During revision surgery in II b cases we recommend augmentation, in II c – augmentation or buttress fixation of acetabular roof with partial bone grafting. III a osteolysis usually need two augments or buttress combination. In 3 cases we used with augments. We expect that revision with single ring in IIIa or IIIb cases with osteoporotic pelvic bones is contraindicated. It can lead to early instability. The most often complication were in III a,b lysions. 36 (14,7%) whole complication rate in this grope and 9,9% in Paprosky III defects. It means than the quantity of complications usually in that gropes. Summary: acetabular rings is recommended in Paprosky III without osteoporosis, in III b it's necessary augmentation, jumbo cup usually used 62-70 mm, tantalum components must be in contact with host bone.

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**Room: LEME**

**Abstract no.: 37635**

**A LONG-TERM CLINICAL AND RADIOLOGICAL ANALYSIS OF THE MULLER REINFORCEMENT RING IN PRIMARY TOTAL HIP ARTHROPLASTY**

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Introduction: Muller acetabular reinforcement ring (ARR) is one of the most common devices used for acetabular reconstruction in primary and revision total hip arthroplasty (THA) which showed favorable mid-term results. Objectives: The aim of our study was to investigate long-term survival and analyze radiological modes of failure. Methods and materials: We prospectively investigated 321 consecutive primary THA with Muller ARR implanted in 291 patients between 1984 and 2002. For survival analysis we included all patients and the endpoint was defined as revision of any component for all reasons. End up of the follow-up date was defined either as last contact date or death date. For radiological analysis only patients with >10 years follow-up were included. Radiological assessment included evaluation of osteolysis, migration and loosening. Results: During investigation period 19 acetabular components have been revised: one isolated cup revision for aseptic loosening, 11 for aseptic loosening in combination with the stem, six for infection and one for recurrent dislocation. The cumulative revision rate at 25 years of all components for all reasons was 17% (95% confidence interval (CI), 8-45), of the ARR it was 6.6% (CI 4-89) for all reasons and 3.4% (CI 1-89) for aseptic loosening. 139 (87%) of the 160 surviving THA with Muller ARR showed no radiological changes at final follow-up. Conclusions: The 25 years survival of the THA with Muller acetabular reinforcement ring was excellent and clinical or radiological loosening of the ARR was rare in the long-term.

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**Room: LEME**

**Abstract no.: 38236**

**OBLONG ACETABULAR CUP, TYPE TC, FOR REVISION TOTAL HIP ARTHROPLASTY**

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The authors describe the use of a novel oblong acetabular cup, type TC, for replacement of a loose acetabular component. **MATERIAL:** The TC cup was used in revision total hip arthroplasty in 40 patients treated between February 2004 and June 2007. A total of 31 patients were evaluated. **METHODS** At the end of 2009, 31 patients were evaluated at a follow-up of 24 to 62 months (average, 44.8 months) after revision surgery. The development implant stability was assessed on X-ray taken at 3, 6, and 12 months and then at 1 year after surgery. An objective assessment of the results was obtained by comparing the pre- and post-operative values of the Harris hip score (HHS). **RESULTS** The average HHS value increased from 41.86 points pre-operatively to 82.70 points. The results were recorded as excellent in six, very good in 17, satisfactory in six and poor in two patients. There was only one case of proximal migration of the TC cup, with osteolysis detected around all screws. **DISCUSSION** The acetabular cup is the most frequently re-implanted component in our country. Acetabular bone defects are usually extensive and the operative tactics are based on the Paprosky classification. The oval-shaped uncemented TC cup was developed with the objective to reconstruct defects on the bottom of the acetabulum, with firm primary fixation of the implant. **CONCLUSIONS** The results show good applicability of the oval-shaped implant which is easy to implant, maintains good primary fixation and allows for good bone remodelling in its vicinity.

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**Time: 10:30 - 12:00**

**Room: LEME**

**Abstract no.: 38141**

**FIXATION OF A NON-CEMENTED, HYDROXYAPATITE COATED ACETABULAR COMPONENT**

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Introduction: Total hip arthroplasty (THR) with non-cemented cups remains one of the most successful procedures performed today. In this study, we look at the safety and efficacy of a modern hemispherical acetabular component based on radiographic and clinical analysis. Methods - We looked at 211 consecutive patients between 2003 and 2007 who had a minimum 5 year (range, 5-9 years) radiographic follow up (108 were male, 103 were female). Average Hospital for Special Surgery (HSS) hip scores at latest follow up were recorded. Radiographic analysis included classification based on Delee and Charnley's zones and osseointegration was assessed based on SIHRCaB (Stress Induced Hypertrophic Reactive Cancellous Bone), trabeculae, and absence of radiolucency. EBRA software was used to assess cup placement. Results - At 5-9 year clinical follow up, average HSS score was 34.8, with 4.02% undergoing revisions for any reason, such as dislocation (1.34%), loose stem (0.89%), stem fracture (0.89%), pain/bursitis (0.45%), and infection (0.45%). At 5-9 year radiographic follow up, there were no revisions performed due to mechanical failures or due to failure to osseointegrate. No association of bearing surfaces to survivorship was noted. Conclusion - The hemispherical, peripheral press-fit, acetabular component was examined in a large, consecutive series by a single surgeon with a minimum 5 year radiographic follow up. We have demonstrated excellent radiographic osseointegration at latest follow up with no mechanical failures, high survivorship, and excellent clinical outcome scores.

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**Time: 10:30 - 12:00**

**Room: LEME**

**Abstract no.: 36848**

**TOTAL HIP ARTHROPLASTY AFTER SPHERICAL ACETABULAR OSTEOTOMY**

Yoshihiro NAKAMURA, Etsuo CHOSA, Takero SAKAMOTO, Shinji WATANABE, Hiroshi IKEJIRI, Taro FUNAMOTO, Ryo OKAMURA, Masaru HIYOSHI

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**Introduction:** Spherical acetabular osteotomy in patients with dysplastic hip improves anatomical and biomechanical hip function. We report the long-term outcome of spherical acetabular osteotomy in 182 dysplastic hips of 150 patients after an average follow-up of 17.3 years. The twenty-year Kaplan-Meier analysis revealed a survival rate of 95.1%. However, several patients develop increasing pain from progression of osteoarthritis and require a THA to allow relief of symptoms. The purpose of this study was to evaluate the clinical and radiographic results and discuss the surgical problems of arthroplasty after spherical acetabular osteotomy. The results of the 22hips (in 18patients) performed by one surgeon were reviewed at minimum of five years (median, 6.8years; maximum, 8.5years) postoperatively. **Method:** Preoperative and follow-up radiographic measurements included the Cup hip center, cup abduction/anteversion (degree), loosening/remodeling. Clinical evaluation was performed with use of the Japanese Orthopaedic Association (JOA) score. **Results:** All patients increased their functional score at last follow-up. Acetabular bone stock required no augmentation for implant coverage. There were 20 cups (90 %) for abduction and 19 cups (86 %) for anteversion located in the safe zone. **Conclusion:** Spherical acetabular osteotomy allows acetabular reorientation in all necessary planes, including anterolateral coverage as well as medialization to improve hip joint mechanics. This osteotomy may improve THA results in dysplastic hips. However, because the posterior wall were small, or sclerotic change of acetabulum in several cases, the press-fit was difficult.

**Date: 2014-11-19**

**Session: Hip: Free Papers - Total Hip Arthroplasty Resurfacing - Dual Mobility**

**Time: 14:00 - 15:30**

**Room: LEME**

**Abstract no.: 38416**

**CLINICAL RESULTS OF CEMENTLESS BIPOLAR HEAD ARTHROPLASTY FOR GERIATRIC FEMORAL NECK FRACTURES**

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[BACKGROUND] Many clinical guidelines suggest the results of cemented bipolar hip arthroplasty (BHA) for geriatric femoral neck fractures is equal or better than that of cementless BHA. However, the use of cementless implants is rapidly increasing in recent years. [PURPOSE] To investigate the clinical results of cementless BHA for geriatric femoral neck fractures. [PATIENT AND METHOD] From February, 2013 to January 2014, consecutive sixty six patients were randomly assigned into two groups, cementless stem, globally accepted fully coated Zweimuller stem, (Alloclassic, Zimmer Inc., group A) and newly developed matt-finished cementless stem, (Elance, Japan Medical Material (JMM) Inc., group E). Control was used the previous data of consecutive patients treated with cemented stem (Perfix 910, JMM Inc., group C) and proximally porous coated cementless stem, (Perfix 910, JMM Inc., group P). Clinical results (activities of daily living), radiographic results (subsidence of stem) and operative complications were investigated. [RESULT] The average amount of subsidence was greater in group P than that of cemented BHA and other two groups. Heterotopic ossification was occur one case of group E. Hip dislocation were occur four cases in group P and A, respectively. [DISCUSSION] Conventional cemented BHA is well-established, gold standard technique. However, many of recent papers reports excellent clinical results treated with cementless implants. Our results suggested several pitfalls, the amount of subsidence with proximally coated stem were greater than that of the other cementless stems, subsequent hip dislocation occur frequently. Results of European, fully coated stems were equally satisfactory.

**Date: 2014-11-19**

**Session: Hip: Free Papers - Total Hip Arthroplasty Resurfacing - Dual Mobility**

**Time: 14:00 - 15:30**

**Room: LEME**

**Abstract no.: 37552**

**INITIAL STABILITY OF A NEW DUAL MOBILITY CUP MODEL: COMPARISON WITH EUROPEAN REGISTER FINDINGS**

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**INTRODUCTION:** Dislocation continues to be a major complication of THA, as evidenced by European register findings. In British National Register 2012, risk of revision for instability for uncemented THA is 1.37% during first year, independently of closed reductions. In 2010 Swedish register, 35% of revisions during first year after implantation are due to instability. More specially, published studies have found that three-quarter of hip dislocation occur within one year of the procedure. Dual mobility cups were first introduced in France 40 years ago. We wanted to evaluate efficacy of the latest generation cup in preventing early dislocation. **METHODS:** A dual mobility cup having a pure hemispherical shape was implanted by 7 different surgeons at 5 facilities for arthritis, fractures or necrosis (prospective, continuous, multicentre study). Cementless fixation occurs through a bilayer coating of porous titanium underlayer that is covered by a hydroxyapatite layer. **RESULTS:** Between May 2012 and March 2013, 282 cups were implanted during primary THA in 278 patients (72,6 years old, 63% women). All were reviewed at 1 year. There were no acetabular component revisions and no dislocation. Three early complications occurred: one paralysis of sciatic nerve and two site infections, and one late complication: one haematoma in a patient taking anti-coagulants. Geometry of this new dual mobility cup does not limit joint range of motion and avoids impingement and wear of retaining collar. It is an effective option for preventing early dislocation after total hip arthroplasty, in comparison of standard uncemented cups, regardless of surgical approach.

**Date: 2014-11-19**

**Session: Hip: Free Papers - Total Hip Arthroplasty Resurfacing - Dual Mobility**

**Time: 14:00 - 15:30**

**Room: LEME**

**Abstract no.: 37462**

**DUAL MOBILITY CUP IN TOTAL HIP REVISION SURGERY. A PROSPECTIVE STUDY OF 79 PATIENTS: DISLOCATION RISK AND CUP FIXATION AT 2 YEARS FOLLOW UP**

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Clinique Des Cèdres, Grenoble (FRANCE)

BACKGROUND PURPOSES: dislocation is a classical complication in total hip arthroplasty (THA) revision. Cup fixation is the second concern. Since 1998 we routinely use cementless Dual mobility cup (DMC) in revision surgery. In order to know outcomes at 2 years, we followed a prospective series of 78 patients treated in our institution. Purpose is to demonstrate that DMC used in revision THA is safe as regards dislocation risk and bone fixation. MATERIAL METHODS: from January 2010 to January 2012 we collected cohort of 79 cases on 78 patients. Patients have been followed with a clinical and radio graphical standard examination. Mean delay between index surgery and revision was 12,9 years. Mean age at revision was 75,5 years. Two different types of DMC were used: standard DMC in 68 cases. In severe bone loss, a specific revision cup was used in 11 cases. RESULTS: at 2 years follow up, 65 patients have been reviewed. 5 patients are definitely lost to follow up. 8 patients deceased. One patient dislocated her hip at 1 month. Two early mechanical failures occurred DISCUSSION: purpose of this short term follow up study is to emphasize low risk of dislocation and trustable fixation of a cementless DMC used in revision THA. THA. Instability is the leading cause of failure. In our series dislocation rate is 1,2%. 2 patients presented an early mechanical cup failure (2.5%). CONCLUSION: considering outcomes of this series, we may assess that in in THA revision surgery, DMC can be recommended.

**Date: 2014-11-19**

**Session: Hip: Free Papers - Total Hip Arthroplasty Resurfacing - Dual Mobility**

**Time: 14:00 - 15:30**

**Room: LEME**

**Abstract no.: 37381**

**DUAL MOBILITY IN THA AND TREATMENT OF UNSTABLE FRACTURE OF THE UPPER FEMUR IN ELDERLY PATIENTS**

François STEFFANN, Jean Louis PRUDHON  
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Introduction: Using total hip arthroplasty (THA) in the treatment of upper femoral fracture is a wide subject of debate. Osteosynthesis has been the most popular treatment, but now arthroplasty seems to be a reliable procedure using a dual mobility cup. The purpose of this study is to compare the results of THA in this particular indication, respecting the previous conditions, to those of osteosynthesis procedures in term of mortality rate, revision rate and dislocation rate at 1 year in this high risk population. Methods: Patients have a regular out patient visit and radiographical examination till 1 year. Data's are collected in a personal register (FM Pro). 71 patients have been operated from June 2012 to May 2013 by one seniors surgeon. Results: Mean age at surgery was 81.3 gender was 85 % female, ASA 3, average Parker Score: 5.7. At 1 year, 15% patients died, 20% were lost to follow up. We deplore 10 % medical complication, 0.9% dislocation, 0% surgical complication (femoral subsidence, loosening infection). Discussion: Results suggest that THA is associated with less morbidity and mortality and greater satisfaction compared with internal fixation. In term of dislocation, morbidity and or mortality are similar to those presented in French symposium of Hip and Knee society. The failure rate for osteosynthesis is around 15%. Dual mobility cup in THA is a reliable option

**Date: 2014-11-19**

**Session: Hip: Free Papers - Total Hip Arthroplasty Resurfacing - Dual Mobility**

**Time: 14:00 - 15:30**

**Room: LEME**

**Abstract no.: 37238**

**IS THE DISLOCATION RISK DECREASED WITH A DUAL MOBILITY CUP? - A COMPARATIVE AND RETROSPECTIVE REVIEW OF 320 CHARNLEY-TYPE PRIMARY THA WITH A MINIMUM FOLLOW-UP OF 10 YEARS**

Jacques H CATON<sup>1</sup>, Jean Louis PRUDHON<sup>2</sup>, André FERREIRA<sup>3</sup>

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Introduction: Mid and long-term follow-up of Charnley total hip arthroplasty (THA) demonstrated good functional results with 85% survivorship at 25-year follow-up. However dislocation still remains an unsolved problem. Dislocation may occur all along the patient and implant life. The aim of this study is to answer the question: does Dual Mobility Cup (DMC) decrease the dislocation risk? Method : We report comparative results at ten years of follow-up of 2 groups of primary cemented Charnley-type THA, one with a standard polyethylene cup (group 1, n=215) and the other one with a DMC (group 2, n=105). Results: In group 1, twenty-six dislocations (12.9%) occurred. In group 2 only one dislocation (0.9%) occurred. This dislocation was successfully reduced by close reduction, without any recurrence. This difference was statistically significant ( $p=0.0018$ ). In group 1, reason for revision was recurrent dislocation in twenty one cases. Five patients have been revised for other reasons. The global revision rate was 12.9%. In group 2, two patients needed revision surgery for aseptic loosening. The global revision rate was 2.1%. This difference was statistically significant ( $p=0.0054$ ). The goal was reached for the patients of group 2 who had more risks factors of dislocation (age, aetiology, ASA and Devane scores) than those of group 1. When using a DMC, we observed a low rate of dislocation in primary THA (0.9%). This surgical choice seems to be a secure and effective technique in Charnley-type THA, especially in a high risk population.

**Date: 2014-11-19**

**Session: Hip: Free Papers - Total Hip Arthroplasty Resurfacing - Dual Mobility**

**Time: 14:00 - 15:30**

**Room: LEME**

**Abstract no.: 36608**

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

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Primary total hip arthroplasty (THA) is one of the most successful procedures in modern orthopaedic surgery. However, dislocation remains a troublesome complication with a reported prevalence ranging from 1% and 5% in the 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, Neyron, 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 (HHS) hip scores. Radiological evaluation was performed by two senior surgeons. Results: At a minimum 10 years follow-up, PMA score and HARRIS hip score significantly improved. 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: 2014-11-19**

**Session: Hip: Free Papers - Total Hip Arthroplasty Resurfacing - Dual Mobility**

**Time: 14:00 - 15:30**

**Room: LEME**

**Abstract no.: 38113**

**TOTAL HIP RESURFACING ARTHROPLASTY. CURRENT INDICATIONS, TECHNIQUE AND RESULTS**

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Hospital De Clínicas-UFPR e Instituto Paulo Alencar, Curitiba (BRAZIL)

The concept of resurfacing total hip arthroplasty is the precursor of conventional arthroplasty, the first models date back to the 30s. Only 60 years later, in the 90s, it reached the current models. The general idea was bone preservation, and the indication would be young and active patients. With concerns about metal on metal bearing surfaces, and the production of metal debris, enthusiasm in these implants have decreased. We decided to report the outcomes with resurfacing hip arthroplasty performed by our service in Curitiba, Brazil. In the period between 2006 and 2012. There were 108 patients, with age between 21 and 78 years old. Follow-up ranged from minimum of two to eight years. All patients underwent pre and postoperative functional evaluation based on the Harris Hip Score and serial radiological evaluation. There were no conversions to conventional total hip, and two reoperations to remove heterotopic bone. In general, these patients are very active, but no further complications were observed to date. With adequate selection of patients, properly trained surgeons and good implants, results are comparable to conventional total hip implants, with the advantage of normal tissues preservation.

**Date: 2014-11-19**

**Session: Hip: Free Papers - Total Hip Arthroplasty Resurfacing - Dual Mobility**

**Time: 14:00 - 15:30**

**Room: LEME**

**Abstract no.: 37616**

**TEN-YEAR SURVIVAL OF THE BIRMINGHAM HIP RESURFACING IN PATIENTS AGED 65 AND OVER**

Régis PAILHE, Gulraj MATHARU, Akash SHARMA, Ronan TREACY, Paul PYNSENT

Royal Orthopaedic Hospital, Birmingham (UNITED KINGDOM)

Background: Data from national joint registries suggests elderly patients, especially females, have an increased risk of revision following hip resurfacing. However, few studies have been published on the survival of hip resurfacing in elderly patients. Objectives: To determine the ten-year survival and functional outcome of the Birmingham Hip Resurfacing (BHR) in patients aged 65 years and over. Methods: All patients aged 65 years and over undergoing BHR between 1997 and 2011 at a single specialist arthroplasty centre were included. All procedures were performed by a single surgeon experienced in performing hip resurfacing. Patients were followed-up regularly in the clinic. Outcomes of interest were survival at ten-years and functional outcome. BHR failure was defined as revision of one or both resurfacing components. Functional outcome was determined using the Oxford Hip Score (OHS) questionnaire (healthy joint scores=0%). Results: A total of 180 BHRs were implanted in 160 patients during the study period. Mean age at BHR was 69.0 years (range 65.0-82.7 years) and 61 % (n=110) were male. At a mean follow-up time of 6.0years six hips required revision with three revised for fracture, 14 patients had died unrelated to surgery, and 8 patients were lost to follow-up. Ten-year BHR survival was 94 % ( CI 87-100%). There was no statistically significant difference between ten-year survival in males (98%; 95% confidence intervals 92-100%) and females (89%; CI 72-100%). There was a statistically significant improvement in OHS following BHR surgery (mean OHS 53.2% to 12.7%). Conclusions: The present study demonstrates acceptable ten-year survival and functional outcome in patients aged 65and over following BHR.

**Date: 2014-11-19**

**Session: Hip: Free Papers - Total Hip Arthroplasty Resurfacing - Dual Mobility**

**Time: 14:00 - 15:30**

**Room: LEME**

**Abstract no.: 37626**

**RADIOLOGICAL VALIDATION OF A FLUOROSCOPIC GUIDED TECHNIQUE OF FEMORAL IMPLANT POSITIONING DURING HIP RESURFACING**

Régis PAILHE, Etienne CAVAIGNAC, Jean Michel LAFFOSSE, Nicolas REINA, Philippe CHIRON  
CHU Toulouse, Toulouse (FRANCE)

**Purpose:** The positioning of the femoral cup in hip resurfacing is essential for the survival of the implant. We described a technique in 2005 to position the femoral cup guided by fluoroscopy independent of the approach performed. The main objectives were to study the positioning of the femoral components of the implant and the accuracy of the technique. **Methods:** Between 2003 and 2011 we conducted a prospective study of 160 consecutive hip resurfacings all operated with this fluoroscopic-guided technique. Three independent observers performed a radiographic analysis at the preoperative planning stage and on postoperative radiographs using OsiriX software. The statistical analysis was based on the comparison of two groups by Student's t test. **Results:** The entire implant was positioned in valgus, with an average of  $7.816^{\circ}$  valgus ( $p < 0.001$ ). All implants were positioned in neutral or anteverted with a mean of  $1.98^{\circ}$  ( $p < 0.001$ ). The risk of mal positioning on antero-posterior plane was less than  $1.41^{\circ}$  with  $p < 0.019$ . The risk of profile positioning error was lower than  $0.80^{\circ}$  with  $p < 0.047$ . **Conclusion:** This study validates a technique of femoral implant positioning for resurfacing. It is simple, precise and independent of the approach performed

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Reconstruction**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 38358**

**DUPLICATION OF THE THUMB. BONE AND JOINT DEFORMITIES IN MATURE SKELETON**

Carlos FERNANDES, Luis Renato NAKACHIMA, João Baptista DOS SANTOS, Walter ALBERTONI, Flavio FALOPPA  
Universidade Federal De São Paulo, Sao Paulo (BRAZIL)

**Introduction:** The objective of this research was describe the bone and joint deformities in duplication of the thumb that had skeletal maturation. **Methods:** We have evaluated retrospectively the radiographs of 12 hands. **Results:** By the Wassel's classification, one thumb was type II, three thumbs were type III, three thumbs were type IV, two thumbs were type V and three thumbs type VII. We observed fusion of metacarpal-phalangeal joint of the radial thumb in two thumbs type IV and one type VII. A varus deformity was observed in the metacarpal-phalangeal joint of the radial thumb in eight thumbs, two type III, three type IV and three type VII. In the type VII, two radial triphalangeal thumbs were hypoplastic. One ulnar triphalangeal thumbs had dominant appearance. A articular step in the interphalangeal joint was found in three thumbs, one type II and two type VII. On one thumb type V, we have found varus deformity of the interphalangeal joint. **Discussion:** Most studies in the literature report that main postoperative complications are decrease metacarpophalangeal joint and interphalangeal joint motion, instability and axial deformity. We believe that the decrease of joint motion and the axial deformity are not caused by intrinsic factors, not by factors related with the surgical procedure. **Conclusions:** We believe that the radiological changes found and not previously described, may contribute to a better understanding of the evolution of the deformity and provide data for a better planning treatment and forecasting results.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Reconstruction**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 38426**

**ONCOLOGY HAND SURGERY: DERMEPENTHESIS WITH  
TRANSOSSEOUS OSTEOSYNTHESIS**

Evgenij VARGANOV, Konstantin MOSIN, Aleksandr BALAKHNIN, Danil  
BIKMULLIN

Hand Surgery Center CMS "Paracelsus", Chelyabinsk (RUSSIA)

Introduction: The most important stage of reconstructive and restorative surgeries after remove the tumour of the hand is the closure of wound. Objective: Demonstration of the possibility to combine skin plasty and transosseous osteosynthesis fo treatment of hand tumours. Materials and Methods: The material for the analysis were 365 medical records of the patients who underwent treatment between 1992 and 2013 in the Center of hand surgery with tumors of the hand. All these patients carried dermepentthesis due to the presence of postoperative tissue defects. Primary skin plasty was used in 311 and the secondary one in 54. Depending on the condition of hand soft tissues, we use determin the version of plasty. Results: The analysis of short-term (less than 12 months) and long-term (up to 21 years) outcomes showed that in cases of commonly accepted techniques of skin plasty positive results were obtained in 73,8% and in the cases where transosseous osteosynthesis was used the success rate was 91,9%. The use of the combination of skin plasty and transosseous osteosynthesis provided a 1,5-fold reduction of the number of disability outcomes. Conclusions: The reduction of the treatment period for the patients with hand tumours that is achieved when primary reconstructive surgeries are performed in combination with transosseous osteosynthesis proves the efficiency of this trend in oncology and hand surgery.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Reconstruction**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 37554**

**THE CRITICAL ANGLE OF DEFORMITY IN DUPUYTREN'S**

Antony Claud RAYMOND, Michael PARRY, Rouin AMIRFEYZ  
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Introduction: Indications for surgical treatment of Dupuytren's contracture are neither evidenced based nor finger specific. We aimed to determine the degree of contracture in the ring and little fingers, at which hand function became importantly impaired. Methods: Five activities of daily living were incorporated into a newly developed and validated Dupuytren's Assessment Tool. Sixty healthy participants were assessed with the DAT wearing a range of 12 dorsal blocking splints; half on their right little finger with the rest on their ring finger. These induced flexion deformities mimicking DC of the MCPJ, PIPJ and a combination of the two. The angles of flexion deformity at which important hand disability occurred were calculated using receiver operating characteristic curves. Results: The flexion angulation at which clinically important hand disability occurred for the little finger MCPJ was 52.5 degrees. PIPJ angulation was 67.5 degrees. Combined MCPJ and PIPJ angulation was 75 degrees. Ring finger MCPJ angulation was 52.5 degrees. PIPJ angulation was 67.5 degrees. Combined MCPJ and PIPJ angulation was 75 degrees. Discussion: Clinically important hand disability occurs at 52.5 degrees of flexion deformity for MCPJ, 67.5 degrees for PIPJ and at 75 degrees when deformity is combined across both the PIPJs and MCPJs of the little and ring fingers. This new information will provide information for clinicians and patients as to when clinically important disability occurs in DC and will provide guidance for when surgery is appropriate.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Reconstruction**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 37145**

**OUR EARLY EXPERIENCE OF COLLAGENASE INJECTIONS FOR DUPUYTREN'S DISEASE**

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Introduction: Dupuytren's disease has traditionally been managed with surgical excision once flexion contracture is present. The development of collagenase injections gives the surgeon an additional tool for management which may be popular with patients as it avoids anaesthesia and scars. The aim of our study is to share our initial experience of this new technique. Methods: The first 50 cases using collagenase injections for the treatment of single digit Dupuytren's disease were collected prospectively. Patients were followed up for six months with any residual deformity or complications recorded. Results: The collagenase injections were successful in improving deformity in 96% of patients with only 8% requiring further collagenase injections during the study period. The rate of minor complications was high with reports of bruising (72%), swelling (60%), skin breakdown (10%) and mild allergic reaction (4%). Conclusion: Our initial experience of collagenase injections has been positive and we are likely to see an increasing use of this technique. The long term implications of this new technique at a local level are not yet known.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Reconstruction**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 38324**

**PROXIMAL ROW CARPECTOMY FOR LITCHMAN'S STAGE III  
KIENBOCK'S DISEASE**

**Yasser ASSAGHIR**

**Sohag Faculty of Medicine, Naser City (EGYPT)**

This study is dedicated to report results of proximal row carpectomy (PRC) for Litchman's stage-III Kienbock's disease. 17 wrists in 17 patients had been treated and followed-up for at least 3-years (mean:  $54.6 \pm 13.4$  months). Clinical assessment included pain, grip-strength, key-pinch, range of motion and complications. Radiological assessment included degenerative changes. Functional assessment included return to work, DASH and Mayo scores. All measurement were taken by 3 physicians and the mean of their measurements was recorded. Mean-age was  $28.5 \pm 5.8$  years. Ten had Litchman's stage-IIIa and 7 IIIb. Postoperatively none had wrist pain at rest. Fifteen had no wrist pain on exertion while 2 had occasional pain with mean VAS of  $.4 \pm .7$ . Compared to contralateral wrist, postoperative grip-strength improved from  $42.8\% \pm 9.6$  to  $89.0 \pm 5.8\%$ , key-pinch improved from  $52.8 \pm 9.8\%$  to  $93.9 \pm 3.5\%$ , flexion-extension range of motion improved from  $40.0 \pm 8.5\%$  to  $72.8 \pm 8.7\%$  and frontal ROM improved from  $42.8 \pm 7.5\%$  to  $74.7 \pm 9.6\%$ . DASH score improved from  $49.1 \pm 14.1$  to  $13.1 \pm 5.5$  while Mayo score improved from  $42.6 \pm 18.8$  to  $69.4 \pm 9.6$ . One patient developed asymptomatic radiocapitate-osteoarthritic changes after 5 years; we had no infection, or deaths. PRC is a reliable treatment for stage-III Kienbock's disease. Despite the suggestion that patients younger than 35 involved in demanding activities are not ideal candidates for PRC, we had no failures, although 11 of our patients were manual workers and their mean age 28.5 years. We attribute this to performing PRC in early stage of the disease, which may suggest that the disease-stage is more important than age and occupation in determining the outcome.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Reconstruction**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 38185**

**USE OF LIDOCAINE WITH EPINEPHRINE IN DIGITAL BLOCK**

Jose Mauricio CARMO, Fabiano CARDOSO, Ronaldo NOVAIS, Andre EIRAS, Jorge Ribamar COSTA

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This is a prospective clinical study to demonstrate the safety and efficacy of the use of anaesthetics with constrictors digital blocks using a 1% lidocaine with epinephrine 1:100.000 solution, on traumatic or non-traumatic fingers operative procedures. From July 2012 to December 2013, 20 patients were operated in emergency or scheduled basis. The systemic changes, digital intraoperative bleeding, signs of prolonged ischemia were evaluated. Only one case required the use of digital tourniquet, for excessive bleeding, all others had minor or moderate bleeding which was occasional use of bipolar coagulator. A volume of 2 to 3 ml solution injected in the subcutaneous tissue at level of digit palmar crease of the finger was done, after 15 minutes the specific finger skin became pale, like the ordinary exsanguination tourniquet technique, there were no systemic changes. In two patients, there was hematoma at the level of the incision, at post-operative visit, both operated for vascular tumours, with spontaneously resolution. The authors describe the technique of dilution to obtain the solution no commercially available heady immediate for use, they give also recommendation about injection manoeuvres and volume of the solution for more proximal procedures at level of the hand and wrist. We conclude that the use of lidocaine with epinephrine digital blocks in Hand Surgery showed up a safe and effective local anaesthetic technique, and without complications related to necrosis, providing efficient bloodless surgical field, allowing surgical procedures without the use of the tourniquet and prolonged analgesia time at post-operative period.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Reconstruction**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 38578**

**TEN-YEAR LONG-TERM RESULTS OF TOTAL JOINT ARTHROPLASTIES WITH ARPE® IMPLANT IN THE TREATMENT OF CARPOMETACARPAL OSTEOARTHRITIS**

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Since the first description of thumb carpometacarpal (CMC) joint replacement in 1973 (De la Caffinière, 1973), arthroplasty of this joint has become one of the established treatments for this condition. The Arpe CMC joint arthroplasty was introduced in 1991 (Comtet, 2000), this consists of an unconstrained uncemented arthroplasty with a cup inserted into the trapezium and a stemmed component inserted into the thumb metacarpal. Between May 1999 and April 2004 a total of 115 consecutive thumb CMC joint arthroplasties were performed in a total of 102 patients for carpometacarpal joint osteoarthritis using the cementless HA-coated unconstrained Arpe implant. Clinical, functional, and radiological results at 10 year follow-up are presented in this study. Survival analysis was performed using the Kaplan-Meier method. Five patients (six implants) were lost to follow-up, in the remaining: 101 implants (92,7%) were functional, and eight (7,3%) were considered as failed prostheses (three dislocated, three removed and converted into LRTI, and two with aseptic loosening not surgically revised). K-M survival estimate of the implant over 10 years was 94,1% [95% CI 82,3- 97,9]. With regard to the radiological results in 82,4% the appearance was satisfactory and 15,8% had minor radiologic alterations, compatibles with implant functionallity. Thumb carpometacarpal joint arthroplasty with the Arpe implant offers a reliable treatment alternative in patients with Eaton grade III or some selected IV thumb carpometacarpal joint arthritis in the presence of good bone stock.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Reconstruction**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 38178**

**RECONSTRUCTION OF FINGER JOINT BY COMPUTER ASSISTED  
COSTO-OSTEOCHONDRAL GRAFT**

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(Purpose) We used osteochondral graft from the rib to reconstruct the joint surface of PIP joints after severe trauma. We utilize the robotic modeling machine with DICOM data to solve this problem. (Materials and methods) We have treated 7 PIP joints destruction by computer assisted method. There were six cases which graft was done in proximal phalanx and in one case PIP joint was replaced totally by the osteochondral graft. The patients ranged in age from 18 to 55 years old (mean: 34 years). Osteochondral graft was taken from the 5th rib through the small skin incision made on the anterior chest wall. Graft was then harvested according to the volume needed. We acquired 3D data of the joint surface by using the industrial 3D scanner, recently it is possible to obtain data from CT of the contralateral side joint. The data was transferred to the modeling machine through host PC. Milling of the graft was automatically done. (Results) Postoperative follow up period ranged from 6 to 119 months. In all seven cases, bone union was obtained. Postoperative ROM was 49 degree on average and all joints were stabilized. (Discussion) Osteochondral graft from the rib is the useful technique for reconstruction of the finger joints. Our computer assisted method enabled automatic milling of the graft. Anatomical surface of the joint avoids the irregular movement between the proximal and distal joint surface which leads to the osteoarthritis change. Also careful reconstruction of the soft tissue is indispensable.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Reconstruction**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 37444**

**A RADIOLUCENT, CARBON FIBRE REINFORCED SYNTHETIC PLATE FOR DISTAL RADIUS FRACTURES: FIRST EXPERIENCE**

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Introduction: Steel and titanium are successfully used implant metals in traumatology. However, some disadvantages are related to metallic implants: They provoke artefacts in computed tomography (CT) and magnetic resonance imaging (MRI). Also, bone healing might be difficult to monitor in x-ray studies due to the invisibility of the bone underlying the implant. In order to avoid these problems carbon fibre reinforced polyetheretherketone (PEEK) implant material has been developed. The main advantages of this synthetic material are radiolucency, artefact-free imaging, good fatigue properties and biocompatibility. Recently plates for distal radius fractures have been developed. Methods: Seven consecutive cases of dorsally displaced extra- and intraarticular distal radius fractures were stabilized with a palmar semi-rigid carbon fibre reinforced PEEK plate with angular stable screw fixation (icotec AG, Altstätten, Switzerland). Integrated radiopaque tantalum filaments and metallic screw tips allow correct placement of the plate and make the implant visible under image intensifier. Clinical and radiographic follow-up was performed at 2 and 6 weeks, and at 3 and 6 months. Results: The ROM at final follow-up was comparable to the contralateral wrist, all patients were pain free 6 month postoperatively. DASH Score continuously increased, bony union was achieved in all cases. We did not record any infections, secondary dislocations or other complications. In one case where MRI of the wrist was performed we could compare artefacts of the used implant to Titanium. Conclusion: The implant might represent an interesting alternative to metallic implants. Potential advantages are radiolucency, no adherence to surrounding tissues no artefacts in CT and MR imaging.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Reconstruction**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 37369**

**MINIMALLY INVASIVE DISTAL RADIUS OSTEOTOMY**

Margaret Woon Man FOK<sup>1</sup>, Lizeth HERNANDEZ RIVERA<sup>2</sup>, Diego FERNANDEZ<sup>2</sup>

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Malunion remains to be one of the most common complications following distal radius fractures, with a prevalence of up to 46%% of all distal radius fractures. Corrective osteotomy for malunited fractures of the distal radius has become a standardized surgical procedure for symptomatic patients. We present a minimally invasive corrective osteotomy for symptomatic posttraumatic deformity of the distal radius. The indications for this correction were based on patients' activities, pain, functional limitation, loss of grip strength or deformity, together with an extra-articular pure sagittal rotational malunion of the distal end of the radius, in which the fulcrum of rotation or hinge was located at the volar cortex. This procedure included a dorsal open wedge osteotomy through a minimally invasive dorsal incision, that was stabilized with an extra and intra medullary fixed angle device. The bone defect was replaced with morsellized autologous iliac bone graft. Between 2003 and 2011, 12 patients, with an average age of 42 years old were recruited. They were followed up for an average of 3.7 years. Based on evaluations of pain, range of active motion, grip strength, four result ratings were established. 8 patients were classified as very good, 2 good and 2 fair. No patient was noted to have poor result on functional assessment. No complication was observed.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Reconstruction**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 38103**

**DOME - SHAPED OSTEOTOMY FOR CORRECTION OF MALUNITED COLLES' FRACTURES**

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**Aim:** the aim of this work is to study the effectiveness of the dome-shaped osteotomy in correcting the different components of the deformity of the lower end of the radius after malunited distal radial fractures. **Methods:** the study included 28 patients with malunited distal radial fractures. Mean age was 40 years. Fourteen were males (50%), the left side was affected in 71.4% (20 patients) and the dominant side was affected in 42.86% (12 patients). Half of the patients (14) were manual workers, 8 (28.57%) were housewives and 6 (21.43%) were employees. All patients were treated by dome shaped osteotomy done through a dorsal approach. An iliac graft was put in the osteotomy site. The osteotomy was fixed by 2 Kirschner wires. **Results:** full correction was achieved in 20 patient (71.43%) while 8 patients (28.57%) had residual deformities; 5 of them had residual dorsal tilt of the distal radial articular surface and 3 had residual prominence of the ulnar styloid. The radial shortening was also corrected from 6.30+ 3.15 mm to 1.13+ 1.48. The range of motion of the wrist improved significantly after operation except for the range of pronation, which showed an insignificant improvement. After correction, 5 patients (17.86%) only had mild pain. **Conclusion:** dome shaped osteotomy is effective in correcting malunited distal radial fractures with appreciable improvement in the range of motion of the wrist and forearm.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Trauma**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 38101**

**SCAPHOID NONUNIONS: TREATMENT WITH 1.-2. INTERCOMPARTMENTAL SUPRARETINACULAR ARTERY BASED (ICSRA) VASCULARIZED BONE GRAFT**

Engin Ilker CICEK<sup>1</sup>, Bahtiyar DEMIRALP<sup>2</sup>, Yalcin BOZKURT<sup>1</sup>, Zafer ATBASI<sup>3</sup>, Huseyin TASKOPARAN<sup>4</sup>

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Scaphoid fractures are commonly seen in clinical practice and because of its anatomical retroverted arterial circulation, these fractures prone to nonunion if neglected or left untreated. Healing of scaphoid nonunion is crucial to prevent carpal collapse and progressive osteoarthritis. Multiple studies have reported their results with the use of bone grafts and fixations for scaphoid nonunion treatment, including vascularized and non-vascularized bone grafts, screws, pins, and plates. Our objective is to evaluate the clinical outcome of vascularized bone graft in the treatment of nonunion of the scaphoid. In addition indications, contraindications, technique, and results of treatment are reviewed and detailed. Between 2007- 2013, 32 scaphoid nonunion cases treated with 1.- 2. intercompartmental supraretinacular artery based (ICSRA) vascularized bone grafts were included to the retrospective study. All of the patients were male. Surgical fixation constructed with Kirschner wire. The mean immobilization period was 9 weeks. Union, motion, pain and the patients' satisfaction rate were documented. Scaphoid unions are achieved successfully at an average of 12 weeks after surgery. Four patients fell off follow-up. We had not faced of any major complication. Meticulous physical therapy prevented the ROM restrictions especially in the range of flexion-extension. All of the patients were pain-free and satisfied in the final control. We concluded that treating scaphoid nonunion with this techniques is ultimately a safe and successful.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Trauma**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 38098**

**CHARACTERISTICS, RADIOLOGICAL AND FUNCTIONAL RESULTS  
IN OPERATIVE AND CONSERVATIVE TREATMENT OF THE  
"JERSEY FINGER TYPE III"**

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Introduction: Bony avulsion of the flexor digitorum profundus (FDP) tendon is very rare. Precise diagnostics and a well chosen therapeutic approach are obligatory to achieve a satisfying functional result. We present clinical results after operative and conservative treatment of this injury. Methods: 29 Patients with a bony avulsion of the FDP tendon were included. We retrospectively evaluated trauma mechanism, treatment modality and functional results. Surgical repair was indicated at a dislocation of the bony fragment of more than 1mm and at subluxation of the DIP joint. Patients were separated into 2 groups: Group 1: conservative treatment, Group 2: operative treatment. Grip strength, pinch strength, flexion and extension deficit, range of motion (ROM) and pathologic anomalies in radiographs were evaluated at follow up. To investigate life quality limitations we performed the DASH score. Correlations were analysed between all variables. Results: In 13 cases surgical repair was performed and a Kleinert protocol was applied. In this group 80 % of the patients showed a persisting extension deficit of 5° to 30° in the DIP joint. In 16 patients a conservative therapy by 4 weeks static splinting was conducted. These patients had no noteworthy impairment of ROM. Strength was equal and satisfactory in both groups. Primary articular displacement significantly correlated with extension deficit, impaired ROM, persisting articular displacement and complications. Patients reported no subjective limitations of life quality or hand function. Conclusion: Conservative treatment should be considered in non- or slightly dislocated bony avulsions of the FDP tendon due to satisfying functional results.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Trauma**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 37370**

**THE MEDIUM TERM RESULTS IN USING LOCKING PLATES FOR THE TREATMENT OF METACARPAL AND PHALANGEAL FRACTURES - A PROSPECTIVE STUDY**

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Introduction: Locking plates may provide a theoretical advantage for the management of unstable metacarpal and phalangeal fractures, as it gives a rigid and stable fixation for the fracture and also allow post-operative immediate mobilization. Method: Patients suffered from either acute metacarpal or phalangeal fractures within 2 weeks, presented with rotational deformities were recruited from Apr, 2011-Dec 2011. Open-reduction and internal-fixation using compact hand locking plates were performed. All patients were allowed free active mobilization exercise after the operation. The treatment outcome was then analyzed. Results: 17 patients with 18 fractures were studied. 3 patients had open proximal phalangeal fractures. Thirteen patients had fractures with either metaphyseal or intra-articular extensions. With an average follow-up period of 20 months, all except one patient with closed injuries achieved excellent active range of movement. The average power grip was 86%. Patients with open fractures had a relative inferior result. No significant complication was observed. Conclusion: Based on our study, even if the majority cases were comminuted fractures or had intra-articular and metaphyseal extension, locking plates still show promising result in the treatment of these fractures.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Trauma**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 37154**

**BIOMECHANICAL STUDY OF INTERNAL FIXATION MODALITIES FOR PROXIMAL INTERPHALANGEAL JOINT FRACTURE DISLOCATION**

**Gen Lin FOO**

**Tan Tock Seng Hospital, Singapore (SINGAPORE)**

**Purpose:** Selected middle phalangeal base fracture with proximal interphalangeal joint (PIPJ) dislocation are best treated with volar plate to provide stability for early mobilization. Biomechanical data is lacking for this relatively uncommon treatment modality. The aim of our study was to assess the biomechanical properties of the three internal fixation modalities that can be applied to the treatment of these fracture dislocations, namely interfragmentary screw (IFS), volar plating (VP), and buttress plating (BP). **Method:** Oblique osteotomy involving 50 percent of volar base of the middle phalanx was performed in fifteen cadaveric index, middle, and ring fingers. Five specimens were fixed with each modality. Each specimen was mounted onto a custom jig and preloaded to 2 Newtons after passive ranging of the PIPJ. Load was applied through the neck of the middle phalanx to extend the PIPJ. Failure was defined as implant cut out or fracture displacement. **Results:** Ultimate tensile strength for IFS was 15.6 N ( $\pm 5.46$ ), BP 8.86 N ( $\pm 3.9$ ), and VP 49.1 N ( $\pm 21.4$ ). Mean stiffness was IFS 2.44 N/mm ( $\pm 0.86$ ), BP 1.84 N/mm ( $\pm 0.71$ ), and VP 4.77 N/mm ( $\pm 1.32$ ). **Conclusion:** VP construct offers superior stability over BP and IFS fixation and provide sufficient stability for early mobilization and therapy in PIPJ fracture dislocations.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Trauma**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 37909**

**CLOSED REDUCTION AND PERCUTANEOUS K-WIRE FIXATION WITH POP CAST IN UNSTABLE FRACTURE DISTAL RADIUS - A VERY ACCEPTABLE MODE OF TREATMENT IN 3RD WORLD COUNTRIES**

**Ashok Kumar DAS**

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It is the most common fracture in elderly females. Distal Radial fracture includes Colle's, Smith's, Barton's and Chauffeur fractures. Aim of Studies: To establish this modality as acceptable, economical which yields good functional outcomes. Material Methods: 73 patients F:M::58:15, age group 53 to 87, having distal radial fracture taken. Out of 73, 61 had dorsally displaced with angulation 25 degree, having intact palmar cortex, 6 articular comminution with step off, 4 DRUG incongruity, 2 had loss of volar buttress with displacement. Under GA close reduction done, confirmed with C-arm. By 2, 3, 4 wire technique fixation done, checked and reinforced by plaster-slab. DRUG stabilize by K-wire. Result Analysis: Result analyzed in 3, 6, 12, 24 weeks with pain, swelling fingers, pin-tract infection, sensory function, deformity, stiffness and arthritis, functional outcome. About 68 patients had pain till 1st week-reduced by excises. 8 patients had pin-tract infection at 5-6 weeks which treated by debridement and antibiotics. 5 had secondary arthritis at 9 months – treated by physio and NSAIDs. 3 had Dinner-fork deformity treated with physio and dilantin-Na. 7 patients had stiffness treated by physiotherapy. Sensory branch of radial nerve injury improves by 9 months. 69 patients regained good function, like flexion-extension, pronation supination and finger movement. 4 patients had residual stiffness at 6 months due to not doing excise. Conclusion: This is very acceptable modality of treatment if done with proper reduction of fracture under C-arm control, with >90% of good functional outcome, with affordable cost in 3rd world countries.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Trauma**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 38018**

**THE JESS-TYPE MINI EXTERNAL FIXATOR IN TREATING  
INTRAARTICULAR FRACTURES OF THE DISTAL RADIUS:  
OUTCOME IN 50 CASES**

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Introduction: Fractures of the distal radius are one of the most common injuries seen in daily orthopaedic practice. Despite the general agreement that complex fractures should be treated operatively, no consensus exists on the type of surgical technique. Methods: The study cohort involved 50 patients (31 females and 19 males, mean age 36.4 years) with comminuted intraarticular distal radius fractures (six open) treated surgically between January 2008 and December 2009 using closed reduction and external fixation through a JESS-type mini external fixator (Joshi's External Stabilization System), kept in place for 6-8 weeks. Outcomes were assessed by functional and radiological examination after a minimum of 12 months. Results: The average operative time was 33.7 minutes. The radial height was restored in almost all cases. The mean dorsal tilt was 5°. No cases of nonunion or Sudecks dystrophy were encountered. Only one patient had pin tract infection that was cured by local care and oral antibiotics. As regards the functional outcome, 40 patients were rated as having excellent results, 8 with good and 2 with fair results. Conclusion: The JESS distractor is a reliable cost-effective minimally invasive fixation tool for treating comminuted articular fractures of the distal radius with satisfactory results to be expected in most treated cases with minimal adverse effects.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Trauma**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 37175**

**FRAGMENT SPECIFIC FIXATION OF DISTAL RADIUS FRACTURES  
IN ELDERLY USING PERCUTANEOUS K WIRNG**

**Sejal SHAH**

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Distal radius fracture accounts for 1/6th of all commonly occurring fracture seen in elderly in emergency department. Its importance in elderly is because of its metaphyseal region, osteoporosis, distal radioulnar joint, triangular fibrocartilage and biomechanics of wrist. Various methods from cast to surgical procedure like k wiring, plating, external fixator were used, but very few studies on antegrade k wiring verses conventional k wiring are done. Lunate facet seems to be centre of radiocarpal rotation and is keystone in carpal architecture. In this prospective randomized study carried out on 100 patient divided in group A- treated with antegrade k wiring and group B- with conventional k wiring. By using blunt tip k wire in antegrade fashion from radial side of proximal part of distal radius fracture to support the subchondral bone of distal fragment of radius – lunate fossa. Validated parameters used are patient rated wrist evaluation and radiological at 1.5, 3 and 6 months follow up to get functional and anatomical score respectively. On mean follow up of 3 months, 36 patients were rated clinically excellent, 10 good, 3 fair and 1 poor. There is significant improvement in radial inclination, volar tilt, radial length. following fragment specific fixation -lunate fossa. It suggest that there is a role of fragment specific fixation by using antegrade intramedullary k wiring in maintaing reduction in distal radial fracture, preventing collapse of intermediate column – lunate fossa with low or no rate of soft tissue complications.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Trauma**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 36474**

**CLINICAL AND RADIOLOGICAL RESULTS OF ORTHOGONAL PLATING OF COMPLEX HIGH ENERGY INTRAARTICULAR FRACTURES OF DISTAL RADIUS USING EXTENDED VOLAR APPROACH**

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**Introduction:** This study assesses the results of orthogonal plating via a single volar extended FCR approach in the management of complex fractures of distal radius. **Methods:** Twenty consecutive complex fractures of distal radius treated with orthogonal distal radius locking plates using extended volar FCR approach were identified and classified using Melone classification. Additional central joint depression element was identified. Radiological assessment was based on measurement of radial inclination, ulnar variance and dorsal or volar tilt. Clinical assessment was done by patient rated wrist evaluation (PRWE) score. **Results:** The average age of the patients was 47.25 years (18 - 67 years). Five fractures were Gustilo grade 1 open injuries. All fractures were complex unstable fractures according to Melone classification. Additionally, 5 fractures had significant central articular fragment depression. After surgery, average radial inclination improved from 13.6 degrees to 23.6 degrees, ulnar variance from +5.6 mm to -0.9 mm, dorsal tilt from 22.9 degrees to 3.2 degrees volar tilt (16 cases) and volar tilt from 23.3 degrees to 5.8 degrees volar tilt (4 cases). At the average 12.1 weeks (6 – 35 weeks) of radiological follow up, there was an average loss of 0.35 degrees of radial inclination, 0.65 mm of ulnar variance and 1.2 degrees of volar tilt. At an average clinical follow up of 26.4 weeks (6 - 51 weeks), average PRWE pain score was 10.6/50 (0 – 24), average PRWE function score was 12/100 (range 0 – 47) and average total disability score was 16.6/100 (5 – 39.5).

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Trauma**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 36485**

**EFFECT OF SCREW LENGTH AND JUXTA- ARTICULAR DISTANCE OF DISTAL ROW SCREWS ON STABILITY OF FIXATION IN UNSTABLE INTRA-ARTICULAR DISTAL RADIUS FRACTURES TREATED WITH 2.4 MM DISTAL RADIUS LOCKING PLATE - A STUDY INVOLVING 60 CONSECUTIVE CASES**

Vikas SHARMA, Micheal FEENEY, Suresh SRINIVASAN  
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Introduction: Aim of this study was to define a reproducible way to identify ideal distal row locking screw placement and length, which would maintain reduction and prevent dorsal and articular penetration in unstable distal radius fractures treated with locking plates. Methods: We analyzed radiographs of 60 unstable intra-articular fractures (Melone classification) treated by using volar locking plates. To avoid magnification error, ratio of distance between distal articular surface of lunate and distal articular surface of radius, and distance between distal articular surface of lunate and distal row screws in lateral articular view of wrist was used to assess juxta-articular screw distance. In same view, ratio of the screw length and antero-posterior dimension of radius at the level of distal row screws was used to assess distal row screw length. Loss of reduction, along with articular and dorsal penetration by screws was assessed. Statistical analysis was performed to predict a minimal screw length ratio and juxta-articular screw distance ratio which avoids fracture collapse. Results: The average distal row screw length ratio was 0.83 (0.50 - 1.1). The average juxta-articular distance ratio of distal row screws was 0.71 (0.41 - 1.0). Distal row screw length ratio of less than 0.65 had 100% sensitivity and 80% specificity for predicting loss of fracture reduction. The juxta-articular distance ratio of less than 0.6 had 100% sensitivity and 93% specificity for predicting loss of fracture reduction. Ratios above these but less than 1 are recommended to prevent collapse and avoid articular and dorsal penetration.

**Date: 2014-11-19**

**Session: Hand: Free Papers - Hand Trauma**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 37699**

**TEN CASES OF FLEXOR POLLICIS LONGUS TENDON RUPTURE  
AFTER VOLAR PLATING FOR DISTAL RADIAL FRACTURE**

Kaoru TADA, Ai HACHINOTA, Syunrou OKAMOTO, Kazuo IKEDA,  
Fumio HASHIMOTO, Hiroyuki TSUCHIYA  
Kanazawa University, Kanazawa (JAPAN)

Introduction: Flexor pollicis longus (FPL) tendon rupture after volar plating for distal radial fractures occasionally occurs. This report examines ten cases of FPL tendon rupture. Patients: All patients were women, with an average age of 68.0 (range, 50-77) years, and average height of 148.8 (range, 141-159) cm. Seven of 10 patients were treated with the Acu-Loc distal radius plate system (ACUMED LLC, USA), and nine of 10 patients were treated by residents or general orthopaedic surgeons. The average period from surgery to tendon rupture was 10.9 (range, 1-26) months. Malposition of the plate or an insufficient reposition of the fracture site was suspected as the cause of tendon rupture in nine cases. The FPL tendon was caught between the plate and the radius in one case. Tendon transfer using the flexor digitorum superficialis was performed in six cases, and a tendon graft using the palmaris longus was performed in three cases. One patient did not hope any further treatment. Discussion: Whereas volar plating has become a popular method for treating distal radial fractures, one side effect is that there are some cases of FPL tendon rupture due to technical errors. Hand surgeons must continue to educate themselves on the proper surgical technique. Based on our operative findings, we propose that repeated stimulation by the volar plate can lead to tenosynovitis and tendon fraying, and finally to tendon rupture. Some volar plates might be too large for elderly Asian women, and tendon stimulation may be more common in these smaller patients.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Hip, Knee & Ankle**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 36999**

**INFLAMMATORY BIOMARKER PROFILES IN HIP DISORDERS OF YOUNG ADULTS**

James POWELL, Kamal BALI, Gerhard KIEFER, Kelly JOHNSTON, Pamela RAILTON, Akash FICHADIYA, Mohammed ALSHEHRI, Roman KRAWETZ

University of Calgary, Calgary (CANADA)

Introduction: Timing of surgical interventions for developmental hip disorders (DHD) is crucial for their eventual success. Ideally, these should be undertaken before the onset of structural cartilage damage or appearance of markers of early OA. The primary objective of this study is to evaluate the systemic inflammatory biomarker profile in the pre-arthritic hip joint in patients with DHD and to compare it with patients with and without osteoarthritis of the hip. Materials and Methods: 17 study patients and 20 controls were included. Clinical assessment included hip scores (Harris, WOMAC, SF-36 scores). Serum was collected from normal individuals (control) and patients undergoing joint preserving surgery. Milliplex MAP human cytokine/chemokine Panel (Millipore) was run on the Luminex 100 platform. All samples were assayed in duplicate with internal standards. The statistical analyses was completed in 2 steps: 1) each cytokine was examined in patient group comparisons to acquire a panel of significant cytokines within the serum. 2) Principal components analysis (PCA) was applied to the panel of cytokines to reduce the number of variable that define each population. Results: A comparison of the study and control serum samples revealed significant differences in the concentrations of GRO, MDC, MCP-1 and RANTES. Further analysis with PCA demonstrated that the study and control serum samples could be identified as two distinct groups. Specific cytokines responsible for the discrimination between groups and individuals within groups were determined. Conclusion: The early results suggest that biomarker profiles may help to identify patients who are at risk for developing OA.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Hip, Knee & Ankle**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 36995**

**INCIDENCE OF PSEUDOTUMOURS IN ASYMPTOMATIC FEMALE PATIENTS FOLLOWING HIP RESURFACING**

James POWELL<sup>1</sup>, Emil SCHEMITSCHKE<sup>2</sup>, Kamal BALI<sup>1</sup>, Bevan FRIZZELL<sup>1</sup>, Pamela RAILTON<sup>1</sup>, Paul BEAULE<sup>3</sup>

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**Purpose:** Primary objective of this study was to determine the incidence of pseudotumours using ultrasound in asymptomatic female patients with metal-on-metal hip resurfacings. Secondary objective was to ascertain if there is a correlation between increased whole blood levels of cobalt, chromium, component placement, pain, function and the formation of asymptomatic fluid collections/masses. **Methods:** Forty-five asymptomatic females (49 hips) with a minimum 2 years from index procedure were included in the study. Clinically assessment involved physical examination, collection of Harris Hip score, SF-36 and UCLA questionnaires. Further evaluation included radiographs and ultrasound of hip(s), and collection of whole blood for ion levels (cobalt and chromium). **Results:** Mean follow-up was 5.7 years (4-11years). Mean age at time of procedure was 47.7 years (34-56). Four patients had bilateral resurfacings. Head sizes ranged from 42-52 (19 - 44; 17 – 46). Ion levels ranged from (0.59ppb – 47ppb) cobalt and (0.99ppb – 22.7ppb) chromium. Two patients had cobalt levels over 6ppb. Ultrasound surveillance revealed a soft tissue mass (pseudotumour) in 3/49 hips. Two patients had increased abduction angles with femoral head size of 44. One of them had elevated ion levels; cobalt 47ppb; chromium 21ppb. Two of patients with pseudotumors eventually became symptomatic and have been revised. The third patient is being carefully followed. **Conclusion:** In asymptomatic females with hip resurfacing, although the incidence of pseudotumors remains low, it is definitely significant enough for cautious monitoring in the form of ultrasound and metal ion levels.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Hip, Knee & Ankle**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37084**

**EARLY DISLOCATIONS AFTER THR**

Zeljko JOVICIC, Slavko MANOJLOVIC, Sinisa BIJELJAC, Goran TALIC, Stanislav PALIJA, Bojan KUZMANOVIC, Petar CVIJIC, Bojan MIHOLJCIC, Milan JOVANOVIC  
IOPMR DR Miroslav Zotovic, Banja Luka (BOSNIA)

Introduction: The most common early complication after THR is dislocation of the prosthesis. The percentage of primary THR dislocations ranges from 1-3%, while at the revision and tumour goes up to 20%. Objectives: To retrospectively analyse patients operated in our institution and to show the most common causes for hip endoprosthesis dislocations, as well as their treatment. Methods: The analysis included 76 patients treated on our department in the period October 2003-December 2013. Diagnosis - clinical symptoms and X-ray. Patients are treated conservatively with closed reduction, and surgically - revision THR. Surgical technique was standard for hip revision surgery. Results: Out of 76 patients, primarily operated in our institution were 45 (1.59% of the 2830 primary THR). 32 were treated with closed reduction, and 44 underwent revision surgery. Out of surgically treated patients primary arthroplasty at our institution was performed in 22 cases (0.77%). At 27 patients components reorientation was performed (mainly acetabular), in 6 patient's liner was replaced, at 10 femoral head was changed and at one patient dual mobility cup was placed. We had no re-revision surgeries. Conclusions: The main cause of dislocation is poor surgical technique (malposition, impingement), after that follow factors regarding the patient (abductor insufficiency, failure to comply with the directions of restricted movements), as well as factors by the implant (bad choice, inadequate quality). To reduce the incidence of dislocation it is necessary to consistently comply with the principles and surgical techniques of primary total hip replacement, preoperative planning, proper implant selection.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Hip, Knee & Ankle**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 38180**

**THE MANAGEMENT OF PERIARTICULAR AND PERIPROSTHETIC FRAGILITY FRACTURES OF THE FEMUR USING THE POLYAX PLATING SYSTEM**

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The incidence of distal and proximal periprosthetic femur fractures is thought to be increasing with increasing rate of total hip (THR) and total knee replacements (TKR). Treatment of these fractures can present a major challenge in osteoporosis bones. Likewise treating fragility periarticular distal femur fractures can also be difficult in frail patients. The use of uni-axial and polyaxial plating systems have helped in the managements of these complex fractures. There is very little in the literature about the outcome of using these plates and therefore we report here on our experience of using the POLYAX Locked Plating System (DePuy) in femur periarticular and periprosthetic fractures. Method: We retrospectively reviewed all femur fractures treated with the POLYAX system. We only included fragility fractures defined as fractures that were sustained by a fall from a standing height in the elderly". Results: 50 cases fulfilled our criteria with a mean age of 78 years. All fresh fractures treated with the system united. The time to union was shorter in the distal femur fractures ( $p < 0.001$ ) with a mean delay of 14.5 weeks compared to 20 and 31 weeks in TKR and THR periprosthetic fractures respectively. From the 14 (28%) patients who were mobilising independently 7 (14%) returned to their previous state of mobility at the end of the follow up. There was one case of immediate post op deep wound infection which required surgical debridement and washout. The one-year mortality rate was 16% (n=8) including one patient who passed away as an in-patient.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Hip, Knee & Ankle**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 38200**

**THE INFECTED TOTAL JOINT ARTHROPLASTY: CAN WE DO BETTER THAN A SIMPLE I&D AND POLY EXCHANGE?**

**David LIONBERGER**

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**INTRODUCTION:** A new development used in treating infected total knees is the use of dissolvable antibiotic beads to deliver high-potency antibiotics over a more extended period of time. Calcium sulfate beads that incorporate one or two antibiotics administered at the time of irrigation and debridement and poly exchange, provide longer and more consistent elution. **MATERIALS AND METHODS:** A series of ten arthroplasties were reviewed prospectively as an early experience endeavor to ascertain whether the addition of calcium sulfate carrier for antibiotic bead incorporation is reasonable and/or feasible for improving clinical outcomes in I&D poly exchange (IDPE) patients. Enrollment included eight knees and two hips for which less than six weeks of symptoms and/or surgery were experienced. All had diagnosis of positive cultures and elevated serology. Once infection was diagnosed, incorporation of calcium sulfate beads (Stimulan product) 20-cc packs were delivered. **RESULTS:** Out of ten joints, seven joints were declared clinically successful in the use of the antibiotic beads to eradicate and cure the infection in a one-stage procedure. In the three failures, two were diagnosed outside of the 6-week cutoff for acute infections and one was a Staph aureus methicillin-resistant organism which failed to respond to the I&D and poly exchange. **DISCUSSION:** While not yielding 100%, it appears that infections diagnosed early in the acute phases of their involvement in joint arthroplasties may hold promise for not only the need for earlier intervention, but also an extension beyond merely irrigation and debridement and poly exchange by this new technology.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Hip, Knee & Ankle**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37388**

**ENHANCED RECOVERY PROTOCOLS FOR ELECTIVE ORTHOPAEDIC SURGERY REDUCE LENGTH OF HOSPITAL STAY AND COSTS OF PATIENT CARE - THE NEW ZEALAND EXPERIENCE**

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**Introduction:** Enhanced recovery protocols for elective orthopaedic patients provide a standardised multimodal, multi-disciplinary approach to patient care. They aim to alleviate the physiological and psychological stress of surgery, and have been shown to reduce patient length of stay (LOS). At a peripheral 210 bed New Zealand hospital, average LOS after elective joint replacement was amongst the highest in the country in 2012. We implemented an Enhanced Recovery After Surgery (ERAS) protocol (one of the first in New Zealand) to optimise patient care and reduce hospital length of stay. **Methods:** The ERAS protocol was introduced on January 1st 2013 for all consecutive elective joint replacements. Data from the pre-ERAS period (2011 and 2012) was collected retrospectively; data from the post-ERAS period was collected prospectively. **Results:** 444 elective joint replacements were performed pre-ERAS with a mean LOS of 5.59 days. 146 elective joint replacements were performed post-ERAS, with a mean LOS of 4.28. ERAS resulted in a reduction in LOS of -1.35 days per patient episode ( $p < 0.0001$ ). The cost of each patient episode was reduced by 11.4%. Readmission rates fell from 8.8% in 2012 to 6.9% in 2013. **Conclusions:** Introduction of a standardised, easily reproducible enhanced recovery protocol for elective joint replacements led to significant reductions in length of stay and costs of patient care. At a time when there are funding constraints for elective joint replacements, this could be key to accelerating patient discharge from hospital and reducing costs, without sacrificing the quality of care.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Hip, Knee & Ankle**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37510**

**MECHANICAL AXIS OF THE LEG FOLLOWING TOTAL KNEE ARTHROPLASTY**

**Ole SIMONSEN**

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Mechanical axis of the leg following total knee arthroplasty Introduction: Mechanical axis deviation (MAD) and malalignment of the leg is highly associated with pain and several tissue specific overuse injuries. In standard total knee arthroplasty (TKA) the standard positioning of the prosthetic components imply a 6 degree femur-tibial angle. Hitherto only a few studies have focused the geometric and clinical consequences of this standard procedure. Method: One hundred consecutive patients were examined by long leg radiography 2 month after TKA and followed-up by questionnaire including Oxford Knee Score (OKS) and EQ-5D after one year. Results: Age was 71.7 +/- 17.3 years (mean +/- 2 SD). 56 were females and 38 males. MAD after 2 months varied from 8 dg varus to 9 dg valgus ( MA = 179,7 +/- 6.5, mean +/- 2SD). After one year, OKS and EQ-5D were 20.5 +/- 17.8 and 0.85 +/- 0.37, respectively. Neither OKS or EQ-5D was statistically associated with the sex, age, or MAD (P > 0.05) Conclusions: Pronounced MADs were observed after standard TKA. Despite the non-statistical association with the 1 year clinical outcome, this study suggests increased focus on the mechanical axis following TKA. The long term consequences and the value of improved preoperative examination including i.e. long leg x-ray remains to be studied.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Hip, Knee & Ankle**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 38476**

**ANTERIOR OPENING WEDGE FOR BIPLANAR CORRECTION OF RECURVATUM VALGUS KNEE DEFORMITY**

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**Background:** The genu recurvatum of the knee may result from a pure osseous deformity, gradual stretching of the posterior soft tissue or combined bony and soft tissue deformity. Valgus deformity is a common association. The most common presenting symptom is anterior knee pain. **Patients and methods:** Anterior opening wedge osteotomy of the proximal tibia above the tibial tuberosity was done in 13 knees (10 patients). All cases had reversed tibial slope and resultant recurvatum deformity of average 22 degrees (from 15 to 30 degrees) and valgus deformity of average 18 degrees (from 10 to 25). The operation was done through anterior approach lateral to patellar tendon to correct the concomitant valgus coronal deformity. No detachment of the tubercle was performed. The tricortical graft was fashioned to correct the recurvatum and valgus deformity and fixation by a lateral buttressing plate. **Results:** At the last follow up of average 26 month (7 to 38 month), all the osteotomies showed full union. The average postoperative recurvatum was improved to 10 degrees (average from 5 to 18 degrees) and the postoperative valgus angle to 5 degrees (from 5 degree varus to 12 valgus). The post-operative knee society score was improved from 65 preoperatively to 92 degrees postoperatively. **Conclusion:** The anterior opening wedge using tricortical autograft gives satisfactory option to correct the combined recurvatum valgus deformity without the need for tibial tuberosity detachment.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Hip, Knee & Ankle**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 38139**

**DYNAMIC INTRALIGAMENTARY STABILIZATION AND PRIMARY REPAIR: A NOVEL CONCEPT FOR THE TREATMENT OF KNEE DISLOCATION**

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**Introduction:** Traumatic knee dislocation is a rare but devastating injury. A novel technique for primary anterior cruciate ligament (ACL) repair, through dynamic intraligamentary stabilization (DIS), was developed at the authors' institution. We analyzed the clinical outcomes of traumatic knee dislocations treated using the DIS technique for ACL repair, primary suturing of the medial collateral (MCL) and posterior cruciate ligaments (PCL), and repair or reconstruction of the lateral collateral ligament (LCL). **Materials and Methods:** 35 consecutive patients treated surgically for traumatic knee dislocation with the technique mentioned above were evaluated clinically (International Knee Documentation Committee [IKDC] score, SF-12 health survey, Lysholm score, Tegner score, Instrumented anterior-posterior translation) and radiologically over a mean follow-up time period of 2.2 years (range 1.0–3.5 years). **Results:** The anterior drawer (KT-1000) of the healthy and injured limbs was 4.83 mm (range 3–8 mm) and 7.3 mm (range 5–10) (89N) respectively. Valgus and varus stress testing in 30° flexion was clinically normal in 26 (74%) and 29 (82%) patients, respectively and close to normal in the rest of the patients. The IKDC score was B in 29 (83%) and C in 6 (17%) patients, while the mean Tegner score was 6 (range 4–8). The mean Lysholm score was 90.83 (range 81–95) and the mean SF-12 physical and mental scores were 54.08 (range 45–60) and 51 (range 39–62), respectively. **Significance:** Our surgical concept for the management of traumatic knee dislocations spares the need for graft utility and presents comparably good results to the reconstruction-based gold standard.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Hip, Knee & Ankle**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37100**

**MPFL RECONSTRUCTION WITH GRACILIS MUSCLE TENDON**

Stanislav PALIJA, Slavko MANOJLOVIC, Sinisa BIJELJAC, Zeljko JOVICIC, Goran TALIC, Bojan KUZMANOVIC, Petar CVIJIC, Bojan MIHOLJCIC, Milan JOVANOVIC  
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**Introduction:** The primary role of the medial patellofemoral ligament (MPFL) is in preventing of lateral dislocation of the patella. Indication for operative treatment is recurrent lateral patellar instability. Contraindications are skeletal immaturity, Q angle greater than 20°, patella alta and significant arthrosis. **Objectives:** Monitoring of patients treated surgically after the reconstruction of the MPFL with m. gracilis tendon, and their return to normal activities **Methods:** The analysis included 37 patients (15 men and 22 women) operated in our hospital from June 2011.- December 2013. Reconstruction of the MPFL was performed with m. gracilis tendon with arthroscopic control in all patients. Parameters were obtained with clinical examination before and after surgery. **Results:** The average follow-up period was 12.6 months (10 to 24 months). Apprehension test was positive and MRI indicated a lesion MPFL in all patients preoperatively. Apprehension test was negative and there was no clinical hypermobility of the patella in all patients postoperatively. We had one complication due to graft tightened too much that we have solved with relaxation of the part of graft fibers. This complication was clinically manifested by pain in the operated knee during flexion. **Conclusions:** Reconstruction of the MPFL with m. gracilis tendon is not a complicated procedure and has a low complication rate. Minimum of implanted material is necessary for this procedure. The most important moments of the operation are the positioning of the graft in isometric points and the determination of graft tension.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Hip, Knee & Ankle**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37445**

**COMPARATIVE BIOMECHANICAL EVALUATION OF POSTERIOR PILON FRACTURE AND CLASSICAL VOLKMANN FRACTURE IN TRIMALLEOLAR FRACTURE: A FINITE ELEMENT ANALYSIS**

**Dan JIN**

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Background: The clinical management of trimalleolar fractures remains a challenge due to the variable type of posterior malleolar fracture lines. The mainly two types of fractures involved in the posterior tibial plafond have been gradually recognized and defined mainly as classical Volkmann fracture and posterior pilon fracture (PPF). Although there are many surgical techniques described for both fracture types, there have been no reports regarding the comparison in the ankle stability, evaluation indexes and fixation effect. Methodology : A three-dimensional finite element model of normal ankle was established. The two types fracture models were built by cutting the lip in different orientations, while the three fixations were established and applied on the unstable models. The displacement and stress were identified under the loads of neutrality, plantar flexion and external rotation. The area of articular surface involved and fragment heights both affected the ankle stability. The T-plate system was proved superior to screw or tubular plate system both in the stress distribution and fixation stability. Conclusions/significance: Surgeons should be alerted to the PPF and justify the proper fixation of it. Posterior pilon fracture should be noticed due to the different index of stability and fixation chooses. When considering the appropriate management of the posterior pilon fracture, the fragment height and sizes of articular surface involved should be noticed. T-plate can be superior to screws and tubular plate both in the stress distribution and fracture stability.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37674**

**PELVIC FRACTURES ASSOCIATED WITH UROLOGICAL INJURIES.  
A 5 YEAR OBSERVATIONAL STUDY AT A TERTIARY PELVIC  
REFERRAL CENTRE**

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**Introduction** Pelvic fractures are common injuries, particularly in major trauma settings; chiefly associated with road traffic collisions and falls from height. Concomitant urological injuries are often overlooked acutely setting resuscitation and are sometimes a surgical complication. We investigated patients referred to our tertiary centre to ascertain classification of pelvic fracture, urological injury and residual complications. **Methods** The pelvic fracture referral files were used. Casenotes of patients with urological injury were analysed. The range of dates of injury from these notes was ascertained and all referrals made between these dates were analysed for comparison. Statistical analyses were performed using Excel. **Results** 1534 referrals, 2005 to 2010. 19/1534 (1.23%) urological injuries. 7/19 urethral disruption (2 posterior, 2 bulbar, 4 membranous), 8/19 extraperitoneal bladder tears, all primarily repaired. 4 developed erectile dysfunction during follow up. 4/7 urethral injury developed strictures requiring further surgery. No orthopaedic complications in these patients. 13/19 had open book pelvic fractures, 4/19 lateral compression injuries and 2 acetabular fractures. All had high energy mechanisms of injury. **Discussion** Urological injuries are a recognised complication following major trauma and pelvic fracture, with previous studies by Day et al (2007) suggesting most associated with AP compression type injuries. Few studies document the follow up of urological injuries in pelvic patients. We show a significant proportion of these have substantial issues at follow up. Of urological injuries seen urethral ruptures appear to have the worst long term outcomes.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37658**

**THE SAFETY AND EFFICACY OF PELVIC EXTERNAL FIXATION AS A DEFINITIVE MODE OF STABILISATION OF THE ANTERIOR PELVIC RING**

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**Introduction:** This study aimed to evaluate the outcomes and complications of pelvic external fixators (PEF) used to stabilise pelvic fractures. **Methods:** All consecutive patients admitted to a Level-I Trauma Centre who had pelvic fractures stabilised with a PEF between March 2007 and December 2012 were identified retrospectively from a national trauma database. Clinical notes and all radiographic studies were independently reviewed by two pelvic surgeons. All complications and outcomes (clinical/radiographic) were recorded. The minimum follow-up was 12 months (12-60 months). **Results:** A total of 73 patients with a mean age of 36.4 years (3-81 years) met the inclusion criteria with a mean Injury Severity Score of 27.4 (9-66). The pelvic injuries included 6 APC, 58 LC, 4 VS and 5 CM injuries. Sixty-eight PEFs were applied to the iliac crests and five to the supra-acetabular region, 61 were applied in conjunction with posterior fixation. The PEFs were removed after a mean of 51 days (30-94 days). Mean inpatient and intensive care stay was 28 and 6 days respectively. Fourteen patients (19.2%) developed superficial pin site infections requiring antibiotics – another patient (1.4%) developed a deep infection requiring debridement. There was one case (1.4%) of lateral-femoral-cutaneous nerve palsy from a pin. At final follow-up, 19 patients (26.1%) had asymptomatic anterior ring mal-union. There were no posterior mal-unions and one symptomatic sacral non-union. **Conclusion:** PEFs are a safe and effective intervention for the management of pelvic injuries, either in isolation or in combination with other modes of pelvic ring stabilisation.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37799**

**DO FRACTURES OF THE QUADRILATERAL PLATE OF THE ACETABULUM REQUIRE SPECIAL ATTENTION?**

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**Introduction:** The aim was to determine the incidence of quadrilateral plate fractures, the fracture patterns that are commonly associated with them, and whether or not these fractures require special attention during fixation. **Methods:** This study included 261 patients with acetabular fractures. Fractures involving the quadrilateral plate were identified (42) and were grouped into; Group A (17): no fixation of the quadrilateral plate was done. Group B (25): fixation of the quadrilateral plate was done. Means of fixation included: Spring plate (6 cases), infrapectineal plate (4 cases), Letournel screw (11 cases) and buttress screw (4 cases). Both groups were compared regarding: post-operative reduction, Joint congruency and medial subluxation of the femoral head. **Results:** Among the 261 fractures reviewed, 42 fractures involved the quadrilateral plate. They occurred in association with both column fractures (76.2 %), anterior column (11.9 %), T-Shaped (4.8%), and anterior column posterior hemitransverse (7.1 %). Group B showed a higher percentage of anatomical and satisfactory reductions (37.5 and 54.2 % respectively), with poor reduction in only 8.3 %.Group A Showed less incidence of anatomical and satisfactory reductions (17.6 and 17.6 % respectively), and higher incidence of poor reduction (64.7%) (P value = 0.001) .Medial wall subluxation of the femoral head was noted in 3 cases in group B, and 8 cases in group A. (P value = 0.6). **Conclusion:** Proper reduction and fixation of the quadrilateral plate was associated with better overall reduction of the fracture, better joint congruency, and reduced the medial subluxation of the femoral head

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37787**

**OPERATIVE TREATMENT OF ACETABULAR FRACTURES IN THE ELDERLY: OUR INSTITUTIONAL EXPERIENCE**

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**Purpose:** We present our institutional experience in the operative treatment of acetabular fractures in the elderly and evaluate their outcome. **Methods:** We retrospectively collected all acetabular fractures that were treated operatively in our institution, in patients more than 60y.o. The mean follow-up of our cohort was 27.7 months (range 12-60 months). **Results:** 44 patients met the inclusion criteria (average age at time of injury 73.2y.o.). Length of hospital stay was 33.1 days whereas the most common mechanism of injury was mechanical fall (25 patients), followed by fall from height (10 patients) and road traffic collisions (9 patients). All patients had a CT scan (1-24 days post-injury). The posterior column and/or wall was involved in 20 patients, compared to 15 patients sustaining two column injuries and 9 patients having injuries involving the anterior column and/or wall. The most common complications included heterotopic ossification (5 patients) and avascular necrosis of the femoral head (4 patients). 23 patients reported a good outcome, compared to 5 patients reporting a moderate and 15 a bad outcome (8 patients required a cemented total hip replacement (THR), on average 13.8 months post-operatively). Finally, 1 patient died in the immediate post-operative period, whilst another 11 patients died (27.3%) on an average of 21.4 months post-operatively. **Conclusion:** Acetabular fractures in the elderly represent an injury associated with significant morbidity and high mortality. For a satisfactory outcome, anatomical reduction should be obtained, but still patients can go on to develop post-traumatic arthritis within a relatively short period of time.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37276**

**MANAGEMENT OF SCIATIC NERVE INJURY IN PELVIC ACETABULAR FRACTURE - A REVIEW OF 27 CASES**

**Ashok Kumar DAS**

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Introduction: Sciatic nerve injury in pelvi-actabular fracture, present symptoms from radicular pain to foot-drop and due to post-traumatic, perioperative and post-operative etiology. Aim of Study: To learn tips and pearls for management of sciatic nerve injury in pelvic-acetabular fracture. Material and methods: 27 patients M:F::18:9, age between 19 to 61 taken. 23 RTA and 4 fall from height. 11 patients sustained sciatic nerve injury during trauma. 12 had nerve damage during intra-op procedures. 9 of 12 had sciatic nerve injury by compression of retractors and 3 by stretching of nerve by faulty positioning. One had implant migration, 2 haeterotopic ossification, 1 muscular scaring. Diagnosis confirmed by imaging and EMG studies, indicated location of injury. SSEP and EMG used in 15 cases for prevention. Result analysis: 3 patients had mal-positioning. 9 neuropraxia due to faulty retraction, treated by nerve stimulation and neurovitamins. one had implant retraction, irritation of nerve and treated by implant removal and physiotherapy. 11 patients with traumatic sciatic nerve injury treated by physiotherapy, neurovitamins and foot-drop splint. 9 out of 11 patients recover > 90% at the end of 1 year and rest 2 used splint. 2 had heterotrophic ossification encasing sciatic nerve, treated with Indomethasin and irradiation. One patient treated by surgical decompression for muscular scarring regained sensory part but motor part delayed till 15 months. Conclusion: Proper positioning, retraction, correct placement of implants are helpful. Management includes imaging. Intra-op fluoroscopy, SSEP and spontaneous EMG minimizes injury. Surgical decompression helpful for sensory than motor palsy.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37115**

**THE SAOUD'S MODIFICATION OF THE ILIO-INGUINAL APPROACH FOR MANAGEMENT OF PELVIC RING AND ACETABULAR FRACTURES: A PILOT STUDY WITH ANATOMICAL VALIDATION**

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**Background:** The middle window of the ilioinguinal approach described by Letournel requires dissection of important and dangerous structures (inguinal part). We have therefore developed a less invasive anterior approach consisting of a medial window (Pfannenstiel) combined with the lateral window of the ilioinguinal approach. **Methods:** Initially, anatomical validation on two cadaveric specimens proved feasibility of the assumption. Between 2007 and 2012, 15 patients with acetabular fractures and 35 patients with pelvic ring injuries were consecutively operated upon using the modified technique. The patients were prospectively followed up clinically and by standard X-rays for at least 1 year. **Results:** 50 patients with fractured pelvis or acetabulum managed to complete at least 1 year follow up. Anatomical reduction was achieved in 21 cases of pelvic fractures (60 % of pelvic fractures) and in 10 cases of acetabular fractures (67 % of acetabular fractures). Satisfactory reduction was achieved in 14 cases of pelvic fractures (40 % of pelvic fractures) and in 5 cases of acetabular fractures (33 % of acetabular fractures). **Conclusion:** The modified approach permits reduction of the anterior column and pelvic ring fractures without the necessity to dissect the inguinal neurovascular structures. Our results demonstrate that safe reduction and stable fixation of selected acetabular and pelvic ring fractures are possible.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 36845**

**COMPARATIVE ANALYSIS OF THE BACK WALL ACETABULUM INJURIES TREATMENT USING CONVENTIONAL AND MINIMALLY INVASIVE TECHNIQUES**

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Traditional methods of surgical treatment of injuries of the acetabulum require large operating approaches. They provide a good access to the surgical site and space for manipulation. But traumatic and big volume increases chance of late postoperative complications such as aseptic necrosis of the femoral head, post-traumatic coxarthrosis (5-60 %), heterotopic ossification (25.6%). The paper presents results of comparative evaluation of treatment outcomes in two groups of patients with fractures of the posterior wall of the acetabulum. Control group (25 patients) was treated with traditional surgical method using Kocher - Langenbeck access. Main group (25 patients) was treated with a minimally invasive technique using the developed by authors low-trauma access. Significant reduction in volume of trauma of para-articular tissues was achieved by laminating of muscles and often avoiding the joint capsule dissection. Traditional Kocher - Langenbeck access implies excision of muscular or tendon part of gluteus maximus, mesogluteus, square and piriform muscles. This causes considerable impairment joint trophism. Comparative analysis of outcomes in the main and control groups showed overall better results in main group at all stages. Above all, there is a clear tendency of myographic and reovazographic indicators normalization in the study group which led to 18% reduction in number of complications such as joint degenerative changes. Harris scale assessment also confirmed good outcomes in joint functionality. The studies were conducted in 6 and 12 months after surgery. One year after surgery the median in the main group reached 86.6 points with a standard deviation 15, 9 points.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37991**

**THE NEW PELVIC INTERNAL FIXATOR: TWO YEARS FOLLOW UP**

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Background: Posterior pelvic ring injuries are difficult tasks when it comes to fixation. The indicated patients are frequently medically unstable due to their high energy trauma with bad posterior skin condition. Most of methods of fixation require massive dissection and extensive use of image intensifier. We developed a new technique with iliac screws insertion, which is rapid, safe and not technically demanding. Methods: Thirty cases of pelvic ring injury with fractured sacrum and or sacroiliac dislocation fixed with our technique with minimally invasive insertion of two iliac screws on each side of the pelvis, connected to the other sided iliac screws by two rods applied deeply subcutaneous. Classified with Young and Burgess System and results assessed using Pohlmann score. Results: 30 patients with Pelvic ring injury managed to complete at least two years follow up. 23 patients had excellent result (77%). 4 patients achieved good result (13%). 3 patients achieved fair result (10%). No major complications. Conclusion: This new technique allows for rapid, safe and acceptable indirect and minimally invasive reduction and fixation of posterior pelvic ring injuries especially in polytrauma patients.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 38440**

**OPEN REDUCTION INTERNAL FIXATION AND ACUTE TOTAL HIP ARTHROPLASTY FOR COMPLEX ACETABULAR FRACTURES**

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The purpose of this study was to evaluate the intermediate clinical and radiographic follow up of acetabular fractures treated with combined ORIF and acute THA. The records of 23 patients presenting to a level I center between 2004 and 2010 with complex acetabular fractures underwent combined ORIF and primary THA were reviewed. Patient demographics, treatment related variables, and clinical and radiographic outcomes were recorded for each patient from the electronic medical records. End points were complications, radiographic outcomes and the need for reoperation. Average age was 67 years  $\pm$  2.6 (range, 50-89). Average follow up was 52 months  $\pm$  6.4 (Range, 22-105). There were 7 (30.4%) both column injuries, 7 (30.4%) isolated posterior wall (PW), 6 (26.1%) transverse and PW, 2 (8.7%) posterior column with associated wall fractures and 1 (4.4%) T-type. Procedure time averaged 189 minutes  $\pm$  10.9 (range, 118-241) Intraoperatively, 16 (70%) patients were found to have marginal impaction while significant femoral head injury was found in 19 (82%) patients. Three patients (13%) developed infections, one (4.3%) developed drop foot and 5 (21.7%) heterotopic ossification. Two (8.6%) patients developed multiple dislocations. 3(13%) required reoperation, one (4.4%) for recurrent instability and two (8.6%) for deep infection. All but one patient went onto radiographic and clinical fracture union. Combined ORIF and THA is an acceptable treatment an option for selected patients with severe acetabular fractures. Intermediate follow up demonstrates a low rate of revision and high rates of fracture union. However infection rates were higher than elective THA patients.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis Acetabulum**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 38380**

**MINIMAL INVASIVE FIXATION OF ACETABULAR FRACTURES**

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Minimal invasive fixation (MIF) of acetabular fractures has been described as a solution for minimally displaced acetabular fractures in order to avoid complications of extensive surgical approaches or drawbacks of conservative treatment with prolonged recumbency. This work includes 33 patients with displaced fracture acetabulum fixed by MIF under single fluoroscopic control. Twenty three were males and 10 were females. Age ranged from 16 to 72 years old. Inclusion criteria were simple (not multifragmentary) acetabular fractures. Fracture types included were 25 transverse, 3 T-shaped, and 5 anterior column. Eight patients had associated trans-acetabular trans-sacroiliac instability (type-C pelvic disruption). Closed fracture reduction was achieved in 21 patients. A mini-incision for limited open reduction was done in 12 cases. It was done via mini-pararectus approach in 10 patients and a small iliac window in 2. Fixation with percutaneous lag screws was achieved in all patients. According to Matta, anatomical reduction was achieved in 22 patients, satisfactory (less than 3mm) in 10 and unsatisfactory in one. Only one case had secondary displacement of the lag screw after early weight bearing. Union of the fracture was achieved in all cases within 12 weeks. Harris hip score was used to assess functional outcome with excellent results in 24 patients and good in 9. Accelerated functional recovery was noted. We recommend using percutaneous lag screws in stabilizing acetabular fractures, only if anatomical reduction of fracture is achieved either by closed maneuvers or using limited open approaches. It is an efficient method of fixation with satisfactory functional outcome.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis Acetabulum**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 38373**

**KLA APPROACH IN ACETABULAR FRACTURES TREATMENT**

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Introduction: KLA approach is the most common approach used to treat juxta-tectal transverse and t-type acetabular fractures. In this paper two modalities of fixation of the anterior column were compared. Design of the study: Non-randomized clinical trial. Patients presented within 3 weeks with juxta-tectal transverse and t-type acetabular fractures and without comminution of the anterior column. Intervention: KLA in the prone position. Reduction of the fracture by clamps is achieved first. Fluoroscopic assisted insertion of ilio-pubic anterior column screw. Plating of the posterior column and (posterior wall, if present). This intervention group -Group A- consisted of 23 patients. Comparison: The same approach and reduction strategy was done. Instead of the ilio-pubic screw, two plates were applied and screws were tightened while clamps in place. The medial plate, a straight small set dynamic compression plate, was applied close to the border of the greater sciatic notch. Screws were applied parallel to the quadrilateral plate, crossing fracture line and aiming at the pelvic brim. The lateral plate, a curved small set reconstruction plate, was spanned from the ischial tuberosity to the ilium buttressing the posterior wall component if present. This comparison group -Group B- contained 20 patients. Outcome: Primary: Accuracy of reduction of the anterior column and the overall accuracy of reduction measured in millimeters. Secondary: Clinical outcome in cases with more than 2 years of follow-up. Results will be presented.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis Acetabulum**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 37779**

**BLEEDING DURING ACETABULAR RECONSTRUCTION USING POSTERIOR APPROACH: OUR INSTITUTIONAL EXPERIENCE**

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**Introduction:** Displaced fractures of the acetabulum are the result of significant skeletal trauma and represent one of the most challenging fractures for the orthopaedic surgeon to successfully treat. Our aim was to audit our practice in regards to bleeding following acetabular reconstruction. **Materials and Methods:** Over a 3-year study period, 29 consecutive patients that presented in our institution with an acetabular fracture and underwent fixation through a Kocher-Langebeck's approach, were eligible to participate. Such details were documented and analysed as patient demographics, mechanism of injury, classification of fracture, other associated injuries, length of operation, blood loss, need for transfusion, complications, time to union and outcome. **Outcome** was assessed radiologically and by clinical examination. **Results:** The drain output was available in 24 patients with a mean of 133 ml and a standard deviation of 80 ml. Nine patients required a transfusion with a mean of 2.44 units of blood. Most common complications included heterotopic ossification (5 patients), superficial wound infection (3 patients) and thromboembolic events (3 patients had DVT confirmed by US and one patient had PE confirmed with a CT). **Conclusions:** Several methods have been proved successful and available techniques include autologous donation; intraoperative blood salvage; acute normovolemic haemodilution; and hypotensive anesthesia. More recent efforts, however, have focused on topical haemostatic and pharmacologic agents given in the perioperative period, that minimise bleeding through the inhibition of clot degradation. We plan to use topical Tranexamic acid during these procedures, to minimise the blood loss and need for transfusion.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis Acetabulum**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 36697**

**THE COMBINATION OF THE ILIAC AND STOPPA APPROACHES AS AN ALTERNATIVE OF ILIOINGUINAL APPROACH**

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**Introduction:** The ilioinguinal approach gives a good visualization of anterior column fracture of the acetabulum and requires careful attitude to the surrounding tissues. **Methods:** The ilioinguinal approach was used in 25 cases. There was a high rate of complications: infections – 3, vessels damages – 3, nerve damage – 1. Alternatively, we have been using a combination suprapubic Stoppa access and iliac access since 2010. This technique was used at 10 patients with complex acetabular fractures and 5 patients with pelvic fractures. When we were separating the tissue along the iliopectineal line there was formed a tunnel under the muscles and neurovascular bundle that connected two accesses. Reconstructive plate was fixed from the pubic symphysis to the sacroiliac joint. Stoppa and iliac access gave an overview of both pubic bones, the anterior wall of the acetabulum, quadrilateral plate, iliac wing, lateral mass of the sacrum, and allowed to fix the sacroiliac joint by plates, posterior column by long screws and cerclage through the greater sciatic notch. **Results:** In 85% of cases the anatomical and satisfactory reduction was achieved. Visualization was fully comparable with ilioinguinal approach. The following advantages were noted: reducing the size of the surgical field, no need of allocation the femoral vessels and nerve structures, the inguinal canal was preserved, rehabilitation of patients was more favorable. Among the complications was reported 1 case of infection. **Conclusion:** The combination of Stoppa and iliac approaches is less traumatic, has a low risk of complications and high efficiency as ilioinguinal approach.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis Acetabulum**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 36498**

**EFFICACY OF SURGICAL DISLOCATION OF HIP IN OPEN REDUCTION AND INTERNAL FIXATION OF ACETABULAR FRACTURES**

**Sahil BATRA**

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Over the past 40 years, the management of displaced fractures of the acetabulum has changed from conservative to operative. The most important prognostic factor is the accuracy of the reduction as it can lead to excellent results. Surgical dislocation of the hip in the treatment of acetabular fractures allows the femoral head to be safely displaced from the acetabulum and thereby, permits intra-articular acetabular and femoral head inspection. Surgical dislocation of the hip provides predictable mid-term outcome in the management of these difficult injuries without development of avascular necrosis of head of femur. We did a study on 30 patients, assessing the efficacy of this approach, in Maulana Azad Medical College on 30 patients. No case of avascular necrosis was reported in a minimum follow-up of 6 months. We find this approach very useful in open reduction and internal fixation of acetabular fractures especially transverse, T-type and both column fractures. In the end, we conclude that surgical dislocation of hip is a new and a safe approach that provides intra-articular exposure and thus helps in better reduction and internal fixation of the acetabular fractures besides being able to quantify and manage the chondral lesions of the femoral head. There are some limitations of this approach as we are not able to reduce and fix any displacement that involves the anterior column. The results of this study are short term and cases need to be followed up for a few years to know the long term efficacy of this new approach.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis Acetabulum**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 36459**

**RISK OF ARTERIAL INJURY IN PELVIC FRACTURES:  
RETROSPECTIVE ANGIOGRAPHY AND CLINICAL STUDY**

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Introduction: Arterial injury in pelvic trauma patients significantly worsens their prognosis. The goal of the study was to evaluate the risk of arterial injury in pelvic trauma. Methods: A total of 60 CT-angiograms of patients with lower extremity trauma or with ischaemic disease of lower extremities were evaluated. Intraluminal diameters were measured in 17 arteries running up to 10mm from the bony pelvis. A clinical group consisted of 474 patients with pelvic trauma. The fracture lines were adjusted into the planar pelvic model and this was subsequently correlated with the vessel's anatomic location. Results: The most intimate contact with the bone was, according to the angiography, found in a. iliaca interna, its dorsal and central branch, a. glutea superior. The biggest risk of the arterial injury was in pars lateralis ossis sacri, the dorsal slope of incisura ischiadica major and the vertebral body of S1 laterally from foramen sacrale ant. Pubic rami (62%) and sacrum (57%) were the most often injured structures in the clinical group of patients. Posterior structures were significantly more often injured in unstable fractures. Arterial injury was diagnosed in 10 patients (4x a. iliaca interna, 4x a. iliaca externa, 1x a. obturatoria, 1x corona mortis). Conclusion: Arteries with intimate contact up to 10mm to the bony pelvis are at a higher risk in unstable pelvic fractures with dislocation bigger than 10mm.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis Acetabulum**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 37218**

**CT-GUIDED TRANSILIOSACRAL SCREW OSTEOSYNTHESIS IN UNSTABLE PELVIC RING INJURIES: REPORT OF OUR EXPERIENCE**

Oliver PIESKE<sup>1</sup>, Christoph LANDERSDORFER<sup>1</sup>, Christoph TRUMM<sup>2</sup>, Axel GREINER<sup>1</sup>, Bianka RUBENBAUER<sup>1</sup>

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**Introduction:** Sacroiliac-percutaneous-screw-placement (SPSP) for unstable-posterior-pelvic-ring-injuries (UPPRI) might be associated with severe neurovascular complications because of screw-mal-position. The aim of the present study was to analysis the effectivity of computer-tomography-guided (CTG)-SPSP. **Methods:** A consecutive cohort of 71 patients with UPPRI had CTG-SPSP at a single trauma level 1 hospital. 136 sacroiliac screws were inserted to S1 and S2. Postoperatively, by the use of a computerized-radiologic-work-station all screws were visualised three-dimensionally. Their distances (mm) to the sacral-borders in anterior-posterior and cranio-caudal direction as well as to the neuroforamen S1/S2 were determined. After CTG-SPSP, injury-dislocation was quantified. Local and general complications were documented during the 30-day-period. In 55 patients (77.5%) a follow-up-investigation (29.1 ±19.1 months) was performed. **Results:** 132 screws (97.1%) were placed completely intraosseous, 3 screws (2.2%) perforated up to 1.0mm (n (S1) = one screw; n (S2) = two screws), and one screw (0.7%) extended 2.2mm into the S2-neuroforamen without contact to neural structures. Postoperative dislocation (anterior-posterior) was 1.3 ±0.9mm and dislocation (cranio-caudal) 1.5 ±0.9mm. No procedure-associated-complication was observed. Operation time showed a significant "learning curve" (initially: 88.6 ±60.3min; finally: 44.3 ±24.6min). Perioperative effective-radiation-dose for patients (male) was 5.9 ±3.1mSv and for patients (female) 8.7 ±4.5mSv. All injuries healed and 33 patients (46.5%) had metal removal after 11.0 (±4.9) months. Only two (5.0%) out of 40 patients complained persistent UPPRI-related pain and were not able to restart work. **Conclusions:** The CTG-SPSP is a safe procedure for UPPRI-stabilisation especially in S1 but also in S2. Injury reduction was excellent and no procedure associated complications were observed.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis Acetabulum**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 37356**

**OUTCOMES OF THE USE OF PERCUTANEOUS ILIOSACRAL SCREWS IN A PEDIATRIC POPULATION**

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**Background:** Complex pelvic ring injuries are challenging to treat. These fractures can be stabilized using various techniques. Percutaneous pelvic fixation with screws in the posterior pelvic ring has gained increasing popularity; however, the result of its use in a paediatric population has not been well described. We sought to describe the outcomes of use of this fixation method for pelvic ring injuries in paediatric patients. **Methods:** 11 patients with pelvic ring injuries, who underwent management using percutaneous iliosacral screws between 2000 and 2012, were retrospectively evaluated. Complications, time of union and post-operative return of function were analysed. **Results:** There were six male and five female patients with a mean age of 14years (range, 6-17y). The mean follow up period was 10.5months (range, 0-75mo). Ten patients went on to union. There were two complications, one of which was loss of reduction that required revision surgery; the other was post-operative weakness in the L5-S1 distribution with paresthesias to the lateral aspect of the foot. All other patients had return of function post-operatively. **Conclusions:** Percutaneous iliosacral screws for pelvic ring injuries, is a practical, effective and safe method for the paediatric population.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis Acetabulum**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 37960**

**THE ANATOMY OF THE CRANIAL BORDER OF TRANS-SACRAL CORRIDOR S1 EXPLAINS ITS VARIABILITY**

Daniel WAGNER<sup>1</sup>, Lukas KAMER<sup>2</sup>, Takeshi SAWAGUCHI<sup>3</sup>, Hansrudi NOSER<sup>2</sup>, Pol ROMMENS<sup>1</sup>

<sup>1</sup>Department of Trauma Surgery, University Medical Center Mainz, Mainz (GERMANY), <sup>2</sup>AO Research Institute Davos, Davos (SWITZERLAND), <sup>3</sup>Department of Orthopaedics & Joint Reconstructive Surgery, Toyama Municipal Hospital, Toyama (JAPAN)

**Purpose:** Knowledge of the cranial sacral anatomy and the limitations of the trans-sacral corridor S1 is crucial for the placement of trans-sacral implants, which are increasingly used in treatment of sacral insufficiency fractures. The goal of this study was to describe the upper sacral anatomy and quantify the trans-sacral corridor. **Methods:** 156 Computed Tomography (CT) scans of intact pelvis from 92 Europeans and 64 Japanese were included. After semiautomatic segmentation, 3D models of the pelvis were computed. The measurements of the trans-sacral corridors were taken in a semi-transparent lateral view. The location of the cranial limitation was classified: (1) medial 2/3 of sacral ala, (2) lateral 1/3 of the sacral ala and (3) iliac fossa. **Results:** The cranio-caudal diameter of the trans-sacral corridor S1 ranged from 0 – 21.8mm (mean 11.6mm, SD +/-5.4), the antero-posterior diameter S1 0 – 30.8mm (mean 23.2, SD +/-5.7). The antero-posterior diameter was always larger. The cranio-caudal diameter was significantly higher in Europeans (p 0.01, mean 12.5 vs. 10.3mm). On level S2 the trans-sacral corridors demonstrated a cranio-caudal diameter were 8.1 – 19.2mm (mean 14.0mm, SD +/-2.4) and antero-posteriorly 11.6 – 23.9mm (mean 17.6, SD +/-2.3). The cranial limit of trans-sacral corridor S1 was located in zone (1) in 41%, in zone (2) 19% and 40% were limited in zone (3). **Conclusions:** Due to the cranial limit of the trans-sacral corridor S1 a large number of sacra offered only limited space to position a trans-sacral implant whereas on level S2 the trans-sacral corridor varied less.

**Date: 2014-11-19**

**Session: Trauma: Free Papers - Trauma Pelvis Acetabulum**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 37973**

**LIMITATIONS IN VIRTUAL TRANS-SACRAL IMPLANT POSITIONING  
DEMONSTRATED IN 3D PELVIC MODELS**

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**Purpose:** The cranial anatomy of the sacrum is very variable and offers only limited space for implant positioning. Trans-sacral implants are used increasingly, especially in treating sacral insufficiency fractures. We studied the possible number and location of trans-sacral implant positioning in Europeans and Japanese. **Methods:** Pelvic 3D models were computed from 156 Computed Tomography (CT) scans of intact pelves from 92 European (48 females 44 males, mean age 61.5 years, SD +/- 11.2) and 64 Japanese adults (29 females and 35 males, mean age 74.3 years, SD +/- 13.6). Virtual trans-sacral implants (trans-section 7.3mm) with or without a safety zone (trans-section 12mm) were virtually positioned in the semitransparent lateral view. Nominal data was compared by the Fisher exact test. **Results:** Two trans-sacral implants were possible to place on level S1 with a safety zone in 36% (males significantly more often, p 0.01) while 49% of the pelves did not allow placing an implant surrounded by a safety zone. In 22% positioning of a trans-sacral implant alone without safety zone was not possible without perforating cortical bone in S1. In S2 respecting the safety zone, 22% did not allow trans-sacral implant positioning, however without safety zone implant positioning was always possible. Conventional SI-screws positioning was possible in S1 in all pelves. **Conclusions:** The anatomy of the pelvis is highly variable and trans-sacral implants can not always be used safely, with offering more consistently enough space. Conventional SI-screws were always possible. Therefore, preoperative planning is of outstanding importance.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Developing World**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38389**

**COST EFFECTIVE SURGICAL OPTION WITH LIMITED AVAILABLE RESOURCES - A COMPARATIVE ANALYSIS OF INTERNAL AND EXTERNAL FIXATION IN DISTAL RADIUS FRACTURES**

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<sup>1</sup>Frenchay Hospital, Bristol (UNITED KINGDOM), <sup>2</sup>M. S. Ramaiah Medical College, Bangalore (INDIA)

The objective of this study is to compare the two modalities for treatment of fractures of distal radius in terms of acceptable outcome and the economical impact on the patient. Internal devices like locking compression plates allow rigid fracture fixation but require expensive kit and implants. On the other hand, external fixation devices are cheap but excellent means of overcoming the displacing forces of the forearm muscles (by ligamentotaxis) while allowing a dynamic control over the fracture. A prospective study of 55 cases of fractures of distal end of radius treated with external fixator and/or internal fixation was undertaken at M.S.Ramaiah Medical College Hospital in Bangalore, India. The results were analysed using the Stewart et al radiological scoring system and Gartland and Werley's functional demerit point system. Our findings conform to the importance of anatomical reduction and early mobilization. We achieved 86.4% (external fixation) and 92.8% (internal fixation) good to fair outcome. In light of these results we conclude that in developing economies like Brazil and India where treatment is significantly dependent on patient's monetary capacity and has subsequent financial ramifications, it is prudent to consider all options before committing oneself to a particular method of fracture management.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Developing World**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37775**

**(ORTHOPAEDIC) SURGEONS AND INJURY SURVEILLANCE IN A DEVELOPING COUNTRY-EXPERIENCE FROM LAGOS STATE UNIVERSITY TEACHING HOSPITAL, IKEJA, NIGERIA**

Babatunde SOLAGBERU<sup>1</sup>, Rufai BALOGUN<sup>1</sup>, Ibrahim MUSTAFA<sup>2</sup>,  
Olufemi IDOWU<sup>1</sup>, Roland OSUOJI<sup>1</sup>, Nasiru IBRAHIM<sup>1</sup>, Mobolaji  
OLUDARA<sup>1</sup>

<sup>1</sup>Lagos State University College of Medicine, Ikeja (NIGERIA), <sup>2</sup>Lagos State University Teaching Hospital, Ikeja (NIGERIA)

Background: Injury Surveillance is recognised as a tool in injury control. Zollinger since 1955 termed “traffic injuries” as “surgical diseases”. In 1966, American College of Surgeons (ACS) referred to injuries as the “neglected disease of modern times” but it was not until 1974 when Dr James Styner, an orthopaedic surgeon initiated the Advanced Trauma Life Support. Objectives: to examine the spectrum of injuries, establish a database as a precursor for establishing State-wide and Nigeria national databases. Methodology: A 2-year prospective study of patients visiting the Surgical Emergency Room (SER) of Lagos State University Teaching Hospital (LASUTH) was done to identify trauma patients, their demography, trauma types, pre-hospital care, regions injured and outcome. Results: Some 17,437 patients were seen with 11,746 injuries (67.4% of SER cases). Top 10 injuries included road traffic injuries (RTI, 4,342, 37%), assaults (2,928; 24.9%), falls (2,101; 17.9%), domestic injury (517, 4.4%); foreign bodies (489, 4.1%); gunshot 450, 3.8%; burns 405, 3.5%; occupational injuries 362, 3.1%; plane crash 64, and birth trauma 53. Injury deaths were 489; 89 in the SER (59 from RTI, zero assaults, 11 GSI, 11 falls, seven burns) while 400 (174 RTI, 15 Assaults, 62 GSI, 30 falls, 60 Plane crash and 27 Burns) were brought-in-dead (BID). Conclusions: RTI, assaults and falls represent 80% of all injury patients; hence, Pareto Principle applies in targeted intervention. The BID cases should provoke improved pre-hospital care. Certainly, there is need for state and country-wide injury surveillance for improved management; orthopaedic surgeons should recognize their role.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Developing World**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36927**

**WHEN THERE IS NOT C- ARM IN THE OPERATING ROOM, WHAT  
COULD BE DONE?**

Mohsen TAVAKOLI

POTA (Persian Orthopaedic Traumatology Association), Tehran (IRAN)

It is clear that equipment open new fronts in orthopaedic surgery. C-arm is a popular technology that is present in many operating rooms all over the world. The operation becomes easier and the results are more satisfactory with it. Apparently, surgeons who get used to C-arm cannot do their operations without it. Due to their extreme dependence, an operation without C- arm is deemed to be impossible; particularly among recently graduated orthopaedic surgeons. Nevertheless, C-arm is not available in many operating rooms in developing countries especially in small cities. The surgeons in these countries have to perform their operations without C-arm while the academic texts that they are educated with come from the developed countries. All written and documented techniques of surgery are dependent on devices such as C-arm. In textbooks, some surgeries like hip nailing are almost impossible without C- arm. Then, what can the surgeon do in the absence of this equipment? In this presentation, I try to circumvent this problem in some orthopaedic surgeries.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Developing World**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38224**

**CLASSIFICATION OF NON-UNION AS SEEN IN A RESOURCE-POOR COUNTRY**

Babatunde SOLAGBERU<sup>1</sup>, Ibrahim MUSTAFA<sup>2</sup>, Rufai BALOGUN<sup>1</sup>,  
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<sup>1</sup>Lagos State University College of Medicine, Ikeja (NIGERIA), <sup>2</sup>Lagos State University Teaching Hospital, Ikeja (NIGERIA)

Background: Non-union as classified by Weber and Cech in 1976, Paley et al in 1989, McKee in 2000 and Frolke and Patka's classification of 2007 are well recognized. All of them derived from theoretical vasculature of the fractured ends and radiological appearance. Calori et al in 2008 proposed a scoring system aimed at improving existing classification. The presence of many methods of classification suggests the need for continuous improvement or understanding of the disease. Hence, in our resource poor environment (poor access to orthodox care and poor regulation or litigation which would have cautioned non-qualified personnel from tampering with fracture treatment), a number of preventable non-union cases are seen which challenge the surgeon on the non-union treatment failure. Objectives: a new classification that recognized these inadequacies is proposed. Methodology: Radiological and operative findings of the various types of non-union encountered by the author in the last 10 years were analysed using radiological descriptions of ends of fracture non-union with or without callus and intra-operative findings (pathological anatomy). Results: Eight stages or types are described and are compared with Weber and Cech and Frolke and Patka classifications with radiological and pathological differences and suggested treatment given. Conclusion: The unusual types of non-union included in this classification when treated escalates the failure rate of non-union beyond the acceptable 20% because of distortion of bone or soft tissue architecture which understanding must be adequate (pathological anatomy) for a successful treatment. This classification stimulates further research into non-union.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Developing World**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38095**

**TOTAL HIP REPLACEMENTS IN SICKLE CELL DISEASE: A CHALLENGING PROCEDURE IN A RESOURCE CHALLENGED ENVIRONMENT**

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Sickle cell disease (SCD) is widely prevalent in sub-Saharan Africa. Nigeria has the highest prevalence in the world. Life expectancy for patients with SCD has improved significantly due to advances in medical care. Avascular necrosis of the head of the femur is the most common form of disability seen in SCD in adults. We report the early outcome and complications of treating such patients with total hip replacements. 11 patients (six males and five females) underwent a total of 15 total hip replacements between 2010 and 2011 allowing for a minimum of two years follow up. Pre-operative treatment included exchange blood transfusion in some patients. All had cementless total hip replacement using the Corail/Duraloc or Pinnacle implants (Depuy). All presented with severe pain and immobility. There was no intra – or post-operative mortality. Average length of stay in the hospital was 14 days. Complications occurred after two procedures (13%) including a wound haematoma necessitating evacuation in one and pulmonary embolism in one patient. Pre-operative Oxford hip score range was 15-19 with a mean score of 16 while post-operative mean Hip Oxford Score was 25, 34, 36 and 46 at six weeks, three months, six months and one year respectively Total Hip arthroplasty is an excellent treatment option for SCD patients with disabling avascular necrosis of hip. It results in a dramatic positive impact on the quality of life. The procedure is however more complex and has slightly higher risk of complications than that for non-SCD patients.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Developing World**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37769**

**TUMOUR RELATED MUSCULOSKELETAL SURGERY BURDEN IN A DISTRICT HOSPITAL, A NIGERIAN EXPERIENCE**

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<sup>1</sup>National Orthopaedic Hospital, Kano (NIGERIA), <sup>2</sup>Federal Medical Centre Katsina, Katsina (NIGERIA)

**INTRODUCTION:** Amputation remains a very common form of intervention in medical facilities where limb salvage is non-existent. We observed a significant number of tumour related amputations and sought to establish the actual burden. **METHODOLOGY:** We examined the operation register over a two year period covering 2012 and 2013 to extract all cases of musculoskeletal tumours, as well as any other tumour involving the extremities. The traceable records were reviewed. **RESULTS:** 20 patients meeting the selection criteria had various procedures done within the period. We were able to trace the histology reports for thirteen out of the twenty and they form the basis of this analysis. The diagnoses include Squamous cell carcinoma (6 or 46.1%), Osteosarcoma (2 or 15.4%), Nodular melanoma (2 or 15.4%), fibro-lipoma, dermatofibroma-prouberans and harmatoma were 1 each (7.7%). We were unable to trace any of the x-rays, as these were unfortunately left for patients to take away with them. Follow up was almost non-existent and therefore there was hardly any consideration for adjuvant therapy, even though there was documentation that two were referred to an Oncology centre. We have no further report thereafter. **DISCUSSION:** Bone tumours are said to be rare, so it is expected that your interest be piqued if you see two fresh cases on your first clinic in a new post. The review revealed squamous cell carcinoma to be the commonest cause of tumour related amputations and malignant bone tumours remain rare.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Developing World**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37580**

**INFECTION AFTER IMPLANT SURGERY IN HIV-POSITIVE PATIENTS: A COMMUNITY HOSPITAL EXPERIENCE**

Praveen Kumar BIRRU<sup>1</sup>, Akbar BASHA<sup>1</sup>, Xavier Manubens BERTRAN<sup>2</sup>,  
Nayana JOSHI<sup>3</sup>

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31 HIV- positive patients were treated from July 2012 to February 2014 at our 14 bed orthopaedic unit, a part of rural community hospital. Of these, 6 were open fractures and 24 were closed fractures and 1 was valgus deformity of both knees. The patients were treated by a variety of surgical procedures like K- wire fixation, open reduction and internal fixation with nails, plates, screws and external fixation. All of them were operated by a single surgeon. It is an established fact that infection rates are higher in HIV-positive patients after implant surgery. In our study the incidence of infection in closed fractures is (0%) whereas in open fractures is (33.3%). Our experience suggests that internal fixation in closed fractures can be undertaken safely in HIV-positive patients. Further evaluation is required in this area with large patient numbers and is underway.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Developing World**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38419**

**TROPICAL PYOMYOSITIS: A NEW PERSPECTIVE ON THE TREATMENT**

Caio STAUT<sup>1</sup>, Evandro PALACIO<sup>1</sup>, Gabriel DI STASI<sup>1</sup>, Alcides DURIGAM JR<sup>1</sup>, Roberto MIZOBUCHI<sup>1</sup>, Eduardo JACOB<sup>1</sup>, Suellen GONZAGA<sup>2</sup>, Vinicius ESCUDEIRO<sup>1</sup>, Otavio TAKATA<sup>1</sup>, Aline SILVEIRA<sup>2</sup>, Eduardo ANTONIO<sup>1</sup>, José GALBIATTI<sup>1</sup>

<sup>1</sup>Marilia State Medical School, Marilia (BRAZIL), <sup>2</sup>Sao Paulo State University UNESP, Marilia (BRAZIL)

**Introduction:** Tropical Pyomyositis (TP) caused by *Staphylococcus aureus* can lead patients to death in a few days. The results of percutaneous drainage of the abscesses compared with open surgical drainage were prospectively assessed. **Methods:** A total of 25 patients with TP (Chiedozi grade II) were assessed. Patients were randomized into two groups: group A (n=17), treated with antibiotic therapy and open drainage of the abscesses; group B (n=16), treated with antibiotic therapy and percutaneous drainage guided by ultrasound. **Results:** Median age in groups A and B were 31 years and 29 years, respectively (p=0.51). In group A, eight patients (61.5%) were female and five were male (38.5%); in group B, three were female (25%) and nine were male (75%) (p=0.11). *Staphylococcus aureus* was the most commonly encountered microorganism (76%). The median length of hospitalization in group A was 14 days, whereas it was 10 days in group B (p=0.01). There was no statistical correlation between age and length of hospitalization neither in group A (p=0.89; r=0.04) nor in group B (p=0.68; r=0.13). The average length of antibiotic use for groups A and B were 12 days and 10 days, respectively (p=0.02). There was no statistical correlation between age and length of antibiotic neither in group A (p=0.76; r=0.09) nor in group B (p=0.8; r=-0.07). **Conclusion:** Percutaneous drainage of abscesses combined with antibiotic therapy constitutes an effective method for the treatment of Chiedozi grade II Tropical Pyomyositis, statistically reducing the length of antibiotic therapy and patient hospitalization.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Developing World**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36948**

**"ALL WELL - BUT PATIENT DIED"**

Sandeep SHRIVASTAVA, Pradeep Kumar SINGH, Sanjay DESHPANDE, Ratnakar AMBADE, Sohail KHAN, Jay SHARMA  
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This study is based on the audit of the deaths happened at our department of Orthopaedics and Traumatology during last 3 years. Overall 41 deaths had been reported. Out of which 18 are postoperative where in surgeon never anticipated a high risk towards mortality and operated reasonably well. Of such deaths 33.5% are following spine surgery chiefly the cervical spine followed by surgery for fracture neck of femur , Poly-trauma ( 24%) and closed reduction respectively Age wise the geriatric deaths (above 60years) are commonest following fracture neck of femur fixations and mostly had associated co-morbidity. The young patients (between 15-40 years) died mostly following sudden thrombo-embolic event. But most tragic deaths 3 / 18 happened in young children who had undergone closed reduction under short General anesthesia. They typically developed convulsions with fever on 2-3 postoperative day. Two of such children were found to be having cultures positive for Dengue-Virus. Though apparently all such cases were operated after adequate care and work-up towards their safety; procedures & operations also went as per the standardized norms, but still they were lost. This study tends to analyze such deaths in detail and find out the reasons which could have been catastrophic and had a cascading effect .It is concluded that, certain clinical features and events are very subtle in their presentation should be intensely inquired & investigated , especially considering the epidemic situations of the region. It may prevent many such miss-happenings in future.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Computer Aided Surgery & Knee Replacement**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38068**

**TOTAL KNEE ARTHROPLASTY AND TIBIAL OSTEOTOMY CARRIED OUT ON SEVERE DEFORMITIES WITHIN THE SAME OPERATION. A NEW COMPUTER-ASSISTED TECHNIQUE. DESCRIPTION AND RESULTS**

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Introduction: when a TKA is performed in some severe extra-articular bone deformities, it is difficult to obtain a correct mechanical axis and a satisfactory collateral ligament balance. The aim of this study is to present a computer-assisted technique whereby a TKR is carried out together with a tibial osteotomy without having to carry out an extensive ligament release. Materials and methods: The series includes 8 patients. Mean age was 66 years. Preoperative non reducible deformity was 15 to 19 ° varus in 9 cases and 10 to 12 ° valgus in 2 cases. All patients received a mobile-bearing TKR. The global deformity and its reducibility were quantified by computer. The tibial cut was made according to the residual degree of deformity. The femoral cuts were made taking into account the ligament balance without any particular ligament release, and then, the TO were performed to obtain a satisfactory axis. A long stem for the tibial implant was used. Results: The minimum follow-up was 2 years. The osteotomy was consolidated at 2 months. The mean knee and function scores were 91 and 70 respectively. The mean flexion was 110°. The mean HKA angle was 180° (179-181). There was no laxity or others complications. Discussion and conclusion: In case of knees with large non-reducible deformity, the computer assisted technique allows the surgeon to determine the precise correction to be made by the osteotomy in association with primary unconstrained TKA in order to obtain a satisfactory HKA and ligament balance without extensive ligament release.

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**Session: Knee: Free Papers - Computer Aided Surgery & Knee Replacement**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38109**

**TOTAL KNEE ARTHROPLASTY USING PATIENT SPECIFIC INSTRUMENTATION**

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Introduction: Adhering to to basic principles of total knee arthroplasty (TKA) in patients with severe deformity and morbid obesity can be challenging. TKA using patient specific instrumentation (PSI) aims to address these issues and improve lower limb mechanical alignment. Objectives: To establish whether performing TKA using a PSI system offers advantages over conventional TKA. Methods: A prospective study using validated patient functional outcome scores both prior to, and after surgery was carried out. Intra-operative blood loss and tourniquet time was also recorded. Standardized long limb alignment radiographs were assessed pre- and post-operatively. Results: PSI TKA was performed in 25 knees in 23 patients. The mean age of our patients was 60 years, with a mean body mass index (BMI) of 35 (range: 26-46). Mean tourniquet time was 80 minutes, with a mean blood loss of 2.5 g/dl. Mean length of stay was 3.6 (range: 2-6) days. Long leg post-operative alignment radiographs showed a mean of deviation of 1.2 degrees of varus in relation to the long axis of the lower limb. Knee Society Scores improved by at least 55%, Oxford Knee scores and WOMAC scores improved by over 100%. Follow-up was between 1.5 and 15 months. No complications were encountered. Conclusions: Tourniquet time and blood loss were not significantly improved. Functional scoring demonstrated a positive trend in all patients. Post-operative alignment films showed very good to excellent mechanical alignment. PSI improves the accuracy of bony resections and avoids the need for additional complex and time consuming steps during surgery.

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**Room: BARRA DA TIJUCA**

**Abstract no.: 38165**

**PROSPECTIVE IN-VIVO VERIFICATION OF THE ACCURACY OF PATIENT SPECIFIC CUTTING BLOCKS AND CONVENTIONAL JIGS IN TKRS USING PIN LESS COMPUTER NAVIGATION**

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Introduction. Implant alignment in TKRs is directly related to clinical outcome. In a drive to improve alignment, patient specific instrumentation (PSI) blocks have been introduced. This study assess the claimed improved accuracy of Trumatch<sup>TM</sup> over conventional jigs Patients/ Methods. Group 1 (PSI) and Group 2 (Conventional Jigs) compromised of 20 and 50 patients randomly selected. All had tri-compartmental OA. Patients with history of knee trauma or surgery, inflammatory arthritis, and major limb deformities were excluded. Senior author performed all replacements. Proposed coronal and sagittal alignment was checked in vivo using computer navigation and recorded on standardized proforma. Results. Data was collated and statistically analysed. In Group 1, proposed femoral coronal and sagittal alignment averaged 1° (-4°to+3°) and 6.2° (-0.5°to+12°) vs planned 0.5° (0°to +3°) and 1.7° (-3°to7°). Coronal alignment for tibial cuts averaged -0.03° (-4.5°to8.5°) vs 0° planned. Posterior slope recorded averaged +6.4 (0to+13.5). Planned alignment would have been achieved in 64%. Component size was 98% accurate. In Group 1, the average flexion was 3.9 °(±1.8°) with 24% > 5°. Combined femoral-tibial alignment revealed 36% within 3° varus, 18% within 3° valgus, 2 neutral, leaving 42% outliers. Conclusions. PSI technology has been promoted as the answer to implant misalignment. However evidence is conflicting. The evidence surrounding the accuracy of implant placement with PSI is still inadequate for us to change our practise. It doesn't appear to provide the purported advantages over standard conventional jigs or computer assisted surgery in restoring alignment.

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**Session: Knee: Free Papers - Computer Aided Surgery & Knee Replacement**

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**Room: BARRA DA TIJUCA**

**Abstract no.: 38037**

**HANDHELD ROBOT-ASSISTED UNICONDYLAR KNEE ARTHROPLASTY: A CLINICAL REVIEW**

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For patients suffering from osteoarthritis confined to one compartment of the knee joint, a successful Unicondylar Knee Arthroplasty (UKA) has demonstrated an ability to provide pain relief and restore function while preserving bone and cruciate ligaments that a Total Knee Arthroplasty would sacrifice. This study reports on 65 patients undergoing UKA using a handheld robotic assistive navigation system. It implements an image-free approach. The intra-operative planning phase allows the surgeon to determine the size and orientation of the femoral and tibial implant. The plan sets the boundaries of the bone to be removed by the robotic hand piece. The average age and BMI of the patient group was 63 years and 29 kg/m<sup>2</sup> respectively. The average pre-operative deformity was 4.5° (SD 2.9°, Range 0-12° varus). The average post-operative mechanical axis deformity was corrected to 2.1° (range 0-7° varus). The system's post-operative mechanical axis alignment was within 1° of intra-operative plan in 91% of the cases. Post-operative alignment was greater than 1° was due to a thickness increase in tibia prosthesis in 3/6 cases. The average difference between the 'planned' mechanical axis alignment and the post-operative long leg, weight bearing mechanical axis alignment was 1.8°. The average Oxford Knee Score pre and post operation was 38 and 24 respectively, showing a clinical and functional improvement in the patient group at 6 weeks post-surgery. The surgical system allowed the surgeons to precisely plan a UKA and then accurately execute their intra-operative plan using a hand held robotically assisted tool.

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**Session: Knee: Free Papers - Computer Aided Surgery & Knee Replacement**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37447**

**THE CHOICE OF CT VS MRI FOR MODELING OF PATIENT-SPECIFIC INSTRUMENTATION IN TOTAL KNEE ARTHROPLASTY: A REVIEW OF CURRENT EVIDENCE**

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**Introduction:** Increased accuracy of pre-operative imaging in patient-specific instrumentation (PSI) can result in longer-term savings, and reduced accumulated dose of radiation by eliminating the need for post-operative imaging or revision surgery. The benefits and drawbacks of CT vs MRI for use in PSI is a source of ongoing debate. This study reviews all currently available evidence regarding accuracy of CT vs MRI for pre-operative imaging in PSI. **Methods:** The MEDLINE and EMBASE databases were searched between 1990 and 2013 to identify relevant studies. As most studies available focus on validation of a single technique rather than a direct comparison, the data from several clinical studies was assimilated to allow comparison of accuracy. Overall accuracy of each modality was calculated as proportion of outliers >3 % in the coronal plane. **Results:** Seven studies matched our inclusion criteria. Outlier incidence was 12.5% (9.27-17.4%) with CT and 16.96% (1.2-44%) with MRI ( $p>0.05$ ). **Conclusions:** Current evidence shows comparable accuracy with both imaging modalities for PSI. Outlier incidence is slightly lower in the CT group with lower variation but this was not significant. At present there is not enough published data to convincingly conclude in favour of CT or MRI for accuracy of component alignment. It is our conclusion that CT is more favourable at present due to reduced scanning times, increased availability, and cheaper cost.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Computer Aided Surgery & Knee Replacement**

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**Room: BARRA DA TIJUCA**

**Abstract no.: 36994**

**INTRAOPERATIVE NAVIGATION OF PATIENT-SPECIFIC INSTRUMENTATION DOES NOT PREDICT FINAL IMPLANT POSITION**

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While many have attempted to verify the intraoperative position of patient-specific instrumentation (PSI) in relation to the preoperative plan, no study has compared intraoperative PSI position via navigation with postoperative component alignment. As such, the purpose of this study was to determine if PSI position measured by intraoperative navigation predicted final implant position in regards to 1) coronal, 2) sagittal, and 3) rotational alignments. We retrospectively reviewed 60 total knee arthroplasties completed with PSI. Imageless navigation was utilized to determine intraoperative alignment. These values were compared to postoperative coronal alignment based on long-leg radiographs, as well as femoral component rotation and tibial slope based on CT scans. The intraoperative coronal position of the tibial component indicated a significantly higher deviation from the neutral mechanical axis than the actual final position of the tibia ( $p = 0.03$ ). Similarly, the tibial slope and femoral component rotation measured by the intraoperative navigation significantly deviated from the final tibial slope ( $p < 0.0001$ ) and femoral component rotation ( $p < 0.0001$ ), respectively, as based on postoperative CT scans. In conclusion, intraoperative navigation of PSI position showed a significantly high deviation from the final implant position, and therefore did not predict appropriate postoperative alignment.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Computer Aided Surgery & Knee Replacement**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37791**

**PREDICTING MAXIMAL KNEE FLEXION ONE YEAR AFTER TOTAL KNEE ARTHROPLASTY BASED ON NAVIGATION DATA**

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**Introduction:** Postoperative maximal knee flexion (MKF) influences functional activities after total knee arthroplasty (TKA). The factors affecting MKF after TKA are not well understood and can be classified in patient specific and surgical modifiable factors. The purpose was to develop a predictive model for MKF based on demographic and intraoperative computer navigation data. **Methods:** This is a secondary analysis of data obtained during a clinical trial investigating the effects of fixed vs. mobile bearing TKA implants on clinical outcomes. Multiple linear regression analysis was performed to analyze predictors for postoperative MKF. The variables entered in the model were preoperative MKF, inlay thickness, medial flexion gap, femoral slope, tibial cut height, orientation of tibial cut, medial extension gap, mean extension gap and AP femoral position. **Results:** The prediction model was statistically significant,  $F(9, 56) = 3,74$ ,  $p < 0.001$ , and accounted for 37% of the variance of the 1 year MKF ( $R^2 = .376$ , Adjusted  $R^2 = .276$ ). From the nine variables entered in the model, only three added statistically significantly to the prediction: preoperative MKF ( $p = 0.006$ ), medial flexion gap ( $p = 0.02$ ) and medial extension gap ( $p = 0.02$ ). A strong positive correlation was found between preoperative MKF ( $r^2 = 0.42$ ,  $p < 0.001$ ) and 1 year MKF. Weak positive relationships were found between medial extension gap ( $r^2 = 0.28$ ,  $p = 0.01$ ), AP Translation ( $r^2 = 0.22$ ,  $p = 0.03$ ) and 1 year MKF. **Conclusions:** The strongest predictor of MKF after TKA is the preoperative MKF. Intraoperative obtained computer navigation parameters have limited capacity to explain the variance of MKF.

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**Room: BARRA DA TIJUCA**

**Abstract no.: 38147**

**OUTCOMES OF COMPUTER NAVIGATED SCORETM HIGHLY CONGRUENT MOBILE-BEARING TKA AT MINIMUM 5 YEARS FOLLOW-UP**

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Highly congruent mobile-bearing total knee arthroplasties (TKA) were introduced to improve the TKA long-term survivorship minimizing polyethylene wear, increasing implant conformity and reducing stresses between prosthesis components. Computer navigation systems are currently used to allow a better component alignment and, especially using the ligament referencing technique, a well-balanced ligamentous tension in all the range of movement. The purpose of this study was to assess the clinical outcome of highly congruent mobile platform design the SCORETM TKA (Amplitude, Valence, France) implanted with the specific computer navigation system AmplivisionTM. From July 2008 to December 2009 117 consecutive computer navigated SCORETM TKA were performed in a single hospital by three surgeons. Mean age was 71 years old (41-83 years). The mean body mass index was 27,6. The mean pre-operative Knee KSS score was 35 points (10-73), and the KSS functional score was 60 points. Mean follow-up was 5.2 years (maximum 5.6 years). Two patients were lost at the follow-up. Ninety-eight percent of the patients were satisfied or very satisfied. Preoperative scores significantly improved ( $P < 0.0001$ ). The Knee KSS score was 96.1 ( $\pm 3$ ) points and the KSS function score was 97.2 ( $\pm 4$ ). The KOOS score was 97.1 ( $\pm 4$ ). Radiographic results showed a mean HKA angle of 180° (ranging from 176° to 183°). There was only one case of early post-operative infection successfully treated with early poly exchange and antibiotics. There were no implant revisions.

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**Session: Knee: Free Papers - Computer Aided Surgery & Knee Replacement**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37972**

**TITLE: CT-BASED TRUMATCH™ PERSONAL SOLUTIONS FOR KNEE REPLACEMENT SURGERY. DOES IT REALLY MATCH UP?**

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**Introduction** CT-based TruMatch™ Personal Solutions for knee replacement surgery with its customized patient instruments and computer software system has been postulated to have the advantages of reduced surgical steps, fewer standard instruments needed, fewer instrument sets to re-sterilize, faster operating room turnover, less blood loss, more accurate implant sizing and more precise mechanical alignment **Methods:** In this prospective, single surgeon study, 32 consecutive patients underwent 40 TruMatch™ Personal Solutions total knee replacement surgery from January 2012 to April 2012. Intra-operative bone cuts were measured and compared with pre-operative planned cuts. These included distal medial femur (DMF), distal lateral femur (DLF), posteromedial femur (PMF), posterolateral femur (PLF), medial tibial (MT) and lateral tibial (LT) bone cuts. Planned and actual implant sizes were compared. **Results:** There was statistically significant undercutting of all the femoral bone cuts and overcutting of the medial tibia ( $p < 0.0001$ ). There were concerns with accurate tibial custom instrument placement in 16 cases (40%), necessitating conversion to extra-medullary tibial instrumentation. 1 tibial tray had to be upsized as a result. 1 case of femoral notching was recorded requiring a stemmed implant. Average operative time was 68 minutes. **Conclusion** Our early experience and results with CT-based TruMatch™ Personal Solutions for total knee replacement surgery has been poor. This may be due to design deficiencies with the current generation of customized instrumentation and computer software. We advise that surgeons who wish to continue using this technology should rigorously check all bone cuts and mechanical alignment intra-operatively.

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**Session: Knee: Free Papers - Computer Aided Surgery & Knee Replacement**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38261**

**IS THERE ANY BENEFIT IN VARUS-VALGUS STABILITY USING NAVIGATION IN UNICOMPARTIMENTAL KNEE ARTHROPLASTY? A KINEMATIC ASSESSMENT**

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Introduction: Aim of the study is to assess a kinematic protocol to establish any advantages in term of stability in navigated UKA using a dedicated software. Materials and Methods: 20 patients undergoing to a UKR using both the same prostheses and the same navigation system were prospectively included in the study. The image-less navigation software evaluates knee kinematics during different surgical steps assessing the mechanical axis, varus-valgus and anterior-posterior stability during the whole ROM. All the surgeries including the kinematic test were performed by one surgeon and the first 5 cases were excluded to avoid any bias due to the learning curve. Statistical analysis was performed with a parametric t-Student test using with difference significance threshold  $p \leq 0.05$  Results: There were 13 females and 7 males with a mean age of 66.4 years, Pre-operatively the mean Knee Society score was 44.5, the pre-operative Functional score was 48.4 and all the knee were clinically stable with a flexion of at least 110°. During the kinematic assessment the mean preoperative mechanical axes was 173.5° and the mean mechanical axes improved statistically to 179° with a mean tibial resection of 2mm. Even the varus-valgus laxity improved post-operatively from 7.0° to 3.6° ( $p=0.0029$ ). There were no statistical significative differences in anterior-posterior laxity between pre and post/post operative kinematic assessment. Discussion: . Our kinematic assessment using a dedicated software for UKA navigation demonstrated both a statistical significant improved limb alignment and varus-valgus stability in all the range of motion compared to the pre-operative data

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous I**

**Time: 10:30 - 12:00**

**Room: URCA**

**Abstract no.: 38216**

**COLLAGEN ISOFORM EXPRESSION PATTERNS IN POSTTRAUMATIC STIFF ELBOW ANTERIOR CAPSULES**

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Background: Post-traumatic elbow joint contracture produces severe functional limitations on the performance of daily living after elbow injury, such as fractures and/or dislocation. The type of collagen (notably I and III, minor collagens II, V, VI and X) and its organization in extracellular matrices plays a critical role in determining the properties (structural stiffness) of biological structures. Methods: We removed the anterior capsules of seven post-traumatically injured and stiff patients' elbow joints. Histological and western blot analysis was performed on the samples. Results: The results indicated that type-I and type-III collagen levels as well as lesser collagens II, V, VI and X were detected notably in western blot analysis. All showed maximum expression around 4 months (range 3 to 7months) of trauma duration. After 4 months post-trauma, the levels of collagen type II, V and X were consistently weaker than collagen VI in the contracture specimens. Collagen VI showed consistent expression throughout the trauma duration from 1 to 18 months. The results demonstrate a relative down-regulation of collagen II, V and X, which progresses with higher time of contracture formation. Conclusions: The experimental data may be useful for understanding and definition of elbow contracture at the molecular level. Clinical Relevance: The expression of minor collagens in capsular injury is not previously understood. Defining the relationship between minor collagens and contracture time may improve the understanding of joint capsule healing.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous I**

**Time: 10:30 - 12:00**

**Room: URCA**

**Abstract no.: 37511**

**WHOLE EXOME SEQUENCING OF FAMILIAL AIS UNCOVERS NOVEL MUTATIONS**

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There is strong evidence for a genetic component to idiopathic scoliosis, widely considered to be polygenic. Classical candidate gene studies and GWAS have achieved limited success in identifying genetic determinants of AIS. However, whole exome sequencing determines private causative variants in given families. Based on a targeted recruitment strategy, we performed whole exome sequencing of members of 5 families with multiple cases of AIS on the Illumina HiSeq platform. Variants considered in our analyses had to be unique i.e. not reported in public databases, and were common to all cases, but not present in unaffected family members. Subsequent filtering with PolyPhen revealed a shortlist of candidate variants in each family. Within the respective shortlists for 3 of the families, we observed a novel variant in a different previously implicated scoliosis-related gene in each setting. In Family 1, we observed a L1309F non-synonymous variant in FBN2 (PolyPhen score=1). In Family 2, we observed a K26Q non-synonymous variant in SNTG1 (PolyPhen score=0.759). In Family 3, we observed a S224F non-synonymous variant in MESP2 (PolyPhen score=0.906). This study has identified novel missense variants in 3 known scoliosis-related genes, namely FBN2, MESP2 and SNTG1, confirming the key biological role of these gene products. Efforts are underway to validate these novel observations further, test in sub-forms of idiopathic scoliosis and investigate their functional role in pathogenesis. This finding presents the potential opportunity for diagnostic applications and for novel therapeutic intervention for AIS by providing novel entry points in known scoliosis biological pathways.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous I**

**Time: 10:30 - 12:00**

**Room: URCA**

**Abstract no.: 37437**

**SUBSTANCE P PREVENTS SERUM DEPRIVATION-INDUCED APOPTOSIS IN BMSCS AND MC3T3-E1 CELLS VIA THE CANONICAL WNT SIGNALING PATHWAY**

**Dan JIN**

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Objective: Substance P (SP) contributes to bone formation by stimulating the proliferation and differentiation of bone marrow stromal cells (BMSCs) and osteoblasts; however, the effect of SP on apoptosis induced by serum deprivation (SD) in BMSCs and osteoblasts is unclear. Materials and methods: The effects of SP on BMSC and MC3T3-E1 cell viability and apoptosis were determined using an MTT assay, DAPI staining, cleaved-caspase-3 staining, and an Annexin V-FITC flow cytometric assay. The expression levels of apoptosis-related molecules and mRNA and protein levels of Wnt signaling molecules were examined using qPCR and Western blot analysis in the absence or presence of SP in addition to SP treatment in the presence of an NK-1 antagonist or the Wnt signaling inhibitor DKK1. Moreover, the effect of SP on the nuclear translocation of  $\beta$ -catenin was also confirmed by immunofluorescence staining. Results: The expression of the NK-1 receptor is maintained during serum deprivation in BMSCs and MC3T3-E1 cells. SP exhibited a protective effect, as cell viability, nuclear condensation, apoptotic rate, caspase-3 and caspase-9 activation, and the ratio of Bax/Bcl-2 were reduced by SP in the two cell types after 24 h of SD treatment. This protective effect was blocked by the inhibition of Wnt signaling or antagonism of the NK-1 receptor. Moreover, SP promoted the mRNA and protein expression of Wnt signaling molecules such as  $\beta$ -catenin, p-GSK-3 $\beta$ , c-myc, and cyclin D1 in addition to the nuclear translocation of  $\beta$ -catenin, indicating that active Wnt signaling is involved in SP inhibition of apoptosis.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous I**

**Time: 10:30 - 12:00**

**Room: URCA**

**Abstract no.: 37010**

**EVALUATION OF SOLUBLE CD200 LEVELS IN TYPE 2 DIABETIC FOOT AND NEPHROPATHIC PATIENTS: ASSOCIATION WITH DISEASE ACTIVITY**

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Background: CD200 (OX-2) is a novel immune-effective molecule, existing in a cell membrane-bound form, as well as in a soluble form in serum (s OX-2), which acts to regulate inflammatory and acquired immune responses. Material/Methods: We planned this study to evaluate the sOX-2 levels of type 2 diabetic foot (group B), and compare it with that of healthy controls (group A). The patient group had the following values: DM period: 27.9±10.3 year [mean ±SD], HbA1c: 9.52±2.44% [mean ±SD]. Results: Blood samples for sCD200 measurement were always taken in the morning between 8 and 10 A.M. The results were reported as means of duplicate measurements. Concentrations of sOX-2 in the serum samples were quantified using an ELISA kit. Serum hs-CRP levels were measured using an hs-CRP assay kit. The sOX-2 level in group B was 173.8±3.1 and in group A was 70.52±1.2 [p<0.0001]. In subgroup analysis of T2DM-DFI patients, we noticed that sOX-2 levels were higher in WGS (Wagner grading system) I and II patients than in WGS III and IV patients. The HbA1c, BUN, creatinine, hs-CRP levels, and sedimentation rates were higher in the patient group (p<0.0001, p<0.001, p<0.001, p<0.005, and p<0.0001, respectively).Conclusions: We suggest that there are vascular, immunologic, and neurologic components in DFI, whereas autoimmune diseases and inflammatory skin disorders have only an immunologic component. This is possibly evidence of a pro-inflammatory effect seen in DFI as a vascular

complication.

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**Session: Research: Free Papers - Research Miscellaneous I**

**Time: 10:30 - 12:00**

**Room: URCA**

**Abstract no.: 36840**

**MULTI-CHANNEL CROSSLINKED URETHANE-DOPED POLYESTER ELASTOMERS NERVE GUIDANCE CONDUIT: BIOCOMPATIBILITY AND EFFICACY**

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**Introduction:** Peripheral nerve injury is common in clinical practice. Nerve defect is a challenging scenario. The current gold standard of managing a nerve defect is autologous nerve graft. However, due to the selection of nerve graft and donor site morbidity, artificial nerve conduits are gaining popularity. However, there are drawbacks of single hollow conduit such as lack of internal support to prevent conduit collapse and inability so as to recreate the proper native spatial arrangement of cells and extracellular matrix within the conduit. In this study, the biocompatibility and efficacy of multi-channel Crosslinked Urethane-doped Polyester Elastomers (CUPEs) as nerve guidance conduit will be evaluated through a rat model with reconstruction of segmental peripheral nerve defect. **Method:** Eighteen adult Sprague-Dawley rats were used. They were randomly allocated to three groups: autograft group, five-channel conduit group and eight-channel conduit group with each consisted of six rats. A 10mm nerve defects were created at the right sciatic nerve. They were bridged with reverse autograft, 5-channel conduit and 8-channel conduit. After eight weeks the rats were euthanized and the reconstructed nerves were harvested for histomorphometric analysis. **Results:** All conduits showed regenerated nerve tissue inside. There was no collapse of the conduits. There were no severe tissue reaction, scarring or neuroma. Histomorphometric analysis showed nerve regeneration was enhanced with increasing number of channels inside conduit. The regenerated axons are in small diameter in multichannel group. **Conclusions:** CUPE nerve guidance conduit is biocompatible and shows good nerve regeneration in reconstructing nerve defect.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous I**

**Time: 10:30 - 12:00**

**Room: URCA**

**Abstract no.: 38384**

**ENHANCED EFFICACY OF CHEMOTHERAPY FOR PRIMARY AND METASTATIC BONE TUMOR BY SIMULTANEOUS SUPPRESSION OF MULTIDRUG RESISTANCE AND ANTIAPOPTOTIC CELLULAR DEFENSE: A NOVEL CO-DELIVERY SYSTEM**

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**Background:** Chemotherapy takes an important place in current treatment strategies in both primary and metastatic bone tumour. However, pre-existent and/or acquired multidrug resistances are main causes of treatment failures. Consequently, more effective therapy is urgently needed. The aim of this study was to composed one Co-delivery System (CDS) to simultaneously deliver siRNAs targeted to drug-resistance genes and doxorubicin to tumour cells. **Methods:** The drug delivery system contains four components: (a) liposome as a carrier, (b) DOX as an inducer of apoptosis, (c) siRNA targeted to ABCG2 mRNA as a suppressor of pump resistance, and (d) siRNA targeted to BCL2 mRNA as a suppressor of nonpump resistance. We investigated the intracellular localization of siRNA and DOX; the influence of the proposed system on the expression of genes and proteins involved in the multidrug resistance, cytotoxicity, and apoptosis induction and antiapoptotic defense. **Results:** This delivery-system down-regulated ABCG2 mRNA to 30% of control and BCL2 mRNA to 20% of control in breast cancer cells. It down-synthesized ABCG2 protein to 32% of control and BCL2 proteins to 19% of control. IC50 in breast cancer cells decreased significantly in exposure of the CDS compared with other groups. **Conclusions:** The proposed co-delivery system successfully delivered siRNAs to cytoplasm and DOX to cell nuclei. It inhibited ABCG2 and BCL2 protein synthesis, and substantially increased the anticancer activity of DOX by stimulating the caspase-dependent pathway of apoptosis in human breast cancer cells and osteosarcoma cells.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous I**

**Time: 10:30 - 12:00**

**Room: URCA**

**Abstract no.: 38209**

**PERCUTANEOUS ULTRASONIC DEBRIDEMENT OF CHRONIC TENDINOPATHY - RABBIT MODEL**

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Background Tendinopathy is a common clinical pathology, with mixed treatment results, especially when chronic. Treatment of such lesions by ablation using ultrasonic energy and removal of the emulsified necrotic tissue is a novel and attractive treatment modality. In this study, we examine the effects of an ultrasonic treatment modality to promote healing of achilles tendinopathy, in a rabbit chronic tendinopathy model. Method Skeletally mature female New Zealand white rabbits (n= 24) were injected with 0.150 ml of collagenase into the central region of the achilles tendon. The collagenase-induced achilles tendinopathy (1 or 3 weeks) were then treated with percutaneous ultrasonic (28.5KHz longitudinal energy) debridement at 1 and 3 weeks, after collagenase injection. The achilles tendons were harvested, at 1 or 3 weeks after treatment, and were subjected to biochemical (collagen content) and histological assessment (modified Movin score). Results Histopathological examination revealed that tendons injected with collagenase showed focal areas of hypercellularity, loss of normal tissue architecture, and focal areas of tendon disorganization and degeneration, as compared to control tendons. The treated tendons had lower (improved) histopathological scores than non-treated, injured tendons ( $P<0.0001$ ). Western blot analysis showed that ultrasonic therapy restored collagen type I, III, and X expressions in a treated tendon, to qualitative and semi-quantitative levels of a normal tendon. Conclusion The results showed a return to a normal qualitative and semi-quantitative collagen profile following treatment with the ultrasonic emulsification-evacuation probe. Further studies are needed to determine if and when normal quantitative tendon collagen profile restoration occurs.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous I**

**Time: 10:30 - 12:00**

**Room: URCA**

**Abstract no.: 38356**

**IN VIVO THERAPEUTIC EFFICACY OF TNFA SILENCING BY FOLATE-CHITOSAN-SIRNA NANOPARTICLES IN COLLAGEN ANTIBODY-INDUCED ARTHRITIS MICE**

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**Objectives:** Tumour necrosis factor-alpha (TNF-alpha), one of pro-inflammatory cytokines, has been showed to play a major role in the treatment in the progression of rheumatoid arthritis (RA). RA may benefit from a promising therapeutic strategy based on silencing TNF-alpha expression with siRNAs. An effective delivery system need to enclose siRNA in carriers for protection against nuclease destruction and transport to the cytoplasm of targeted cells. The main drawback with chitosan as a gene carrier is its typically low transfection efficiency and poor solubility. Folate-mediated transfection has been shown to facilitate siRNA internalization into cells via membrane receptors. **Method:** The water soluble diethylethylamine-chitosan derivatives (DEAE-CH) and folate-DEAE-CH derivatives was synthesized. DEAE-CH-siRNA TNF-alpha and folate-DEAE-CH-siRNA TNF-alpha nanoparticles have been formed. Their TNF-alpha-knockdown effects were tested in a murine collagen antibody-induced arthritis model. The inflammation markers (TNF-alpha) and various cartilage and bone turnover markers have been analyzed as well as histological examination and microCT analysis. **Results:** We demonstrated that nanoparticle of folate-chitosan-siRNA TNF-alpha had a significant effect on inflammation as assessed by the clinical score or TNF-a protein concentration in the serum or tissue. This nanoparticle can restore inflammation-induced articular cartilage destruction and bone loss. **Conclusion:** These results indicate that folate-chitosan is a safe and effective candidate for the non-viral gene delivery of siRNA, and the clinical application of this nanoparticle warrants further investigation.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous I**

**Time: 10:30 - 12:00**

**Room: URCA**

**Abstract no.: 37531**

**THE EFFECT OF HYALURONIC ACID BASED HYDROGELS IN THE HEALING OF INTERVERTEBRAL DISC IN AN IN VIVO MODEL OF DEGENERATION**

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**Introduction:** Intervertebral Disc (IVD) Degeneration is a major cause of lower back with a high degree of morbidity and financial burden. Current treatment modalities consisting of conservative or surgical measures only offer symptomatic relief. Degenerated discs are deficient in proteoglycans and water leading to decreased loading strength and disc height. We believe that implantation Hyaluronic Acid (HA), which forms the backbone for Aggrecan formation, into the Annular Fibrosis (AF) of the IVD will increase the proteoglycan concentration of the disc and thus its water content. **Methods:** An implantable HA hydrogel was assembled from Sodium Hyaluronate after cross-linking with 4-arm PEG with an amine end groups. 32 Sprague-Dawley rats were used. The three proximal IVD's of the rat-tail were identified under an image intensifier and were surgically exposed. There was three arms to the study, one untreated disc (control), the second had a window of AF excised and a HA hydrogel was implanted (treatment) and the third had the AF window excised but no treatment (sham). There were four time points (7, 14, 28 and 56 days), after which the rats had their IVD height analysed and the animals were then sacrificed and the discs analysed for histology, PCR and protein expression. **Results:** An up regulation of collagen type 2 compared to type 1, maintenance of disc height, pro-inflammatory genes were down regulated and matrix turnover genes were up-regulated in the treatment group in relation to the control groups. **Conclusion:** Implantation of HA hydrogel allows for a matrix turnover permitting regeneration of IVD.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous I**

**Time: 10:30 - 12:00**

**Room: URCA**

**Abstract no.: 37512**

**ANALYSIS OF MINOR BLEEDING COMPLICATIONS USING RIVAROXABAN AND ENOXAPARIN FOLLOWING CEMENTED TOTAL HIP REPLACEMENT**

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Introduction: Oral thromboprophylactic agents for total hip replacement (THR) have become popular. Clinical trials with rivaroxaban suggest that the efficacy and the risk of major bleeding are equivalent to the clinical trial comparator, subcutaneous enoxaparin. However, some recent retrospective studies have found an increased rate of infectious complications with rivaroxaban. Our aim was to compare the incidence of minor haemorrhagic and soft-tissue adverse effects after using enoxaparin or rivaroxaban for thromboprophylaxis. Methods: Consecutive patients undergoing primary elective cemented THR were enrolled in our prospective case-control study. Two groups were formed according to perioperative thromboprophylaxis: enoxaparin group versus dabigatran group. Collected variables included: thigh volume changes, perioperative blood loss, area of haematoma, the incidence and frequency of wound bleeding, duration and intensity of serous wound discharge on postoperative day 3 and day 7 were recorded. Results: 118 patients were enrolled in our study: 53 patients in the enoxaparin group and 65 patients in the rivaroxaban group. Extent of the area of haematoma was significantly larger on the operated thigh using rivaroxaban (Chi-square test,  $p < 0.05$ ). No other significant differences were found between the two thromboprophylactic agents, however, patients using rivaroxaban showed a clear tendency towards a higher wound bleeding rate. Conclusions: Both thromboprophylactic agents were found to have an appropriate antithrombotic profile. Using rivaroxaban the haematoma was more extensive around the surgical site. It might be the potential cause of the previously published elevated surgical site infection rate, however further investigations are required.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: URCA**

**Abstract no.: 38527**

**CAN WE IMPROVE CHONDRAL HEALING AFTER MICROFRACTURE? THE EFFECT OF ADIPOCYTE TISSUE DERIVED STEM CELL THERAPY**

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**Introduction:** In this prospective, randomised, blinded, invivo animal study, we aimed to investigate the effect of adipose tissue derived mesenchymal stem cells (AMSC) on chondral healing in addition to microfracture (MF) technic, which is a popular and commonly used way for management of osteochondral defects (OCD). **Methods:** 30 white male rabbits randomly divided into three groups, each includes 10 rabbits. All of the right knees of the rabbits explored with standard parapatellar incision and then, standard cylindrical OCD created on weight-bearing areas of medial condyles of all knees, which were 4 mm of diameter and 2 mm of deep. At first group we made MF with a 1,5 mm Kirschner wire. At second group we applied MF with same method and additionally we applied 3\*10<sup>6</sup> AMSC cells to the defective area. The control group is leaved to spontaneous healing after an OCD. At postoperative eighth week, all subjects' sacrificed and joint surfaces evaluated histopathologically according to ICRS. **Results:** The results of MF+AMSC group was significantly better than OCD group according to ICRS scale surface properties (Posthoc-Dunn; p=0,003). Matrix evaluation was better in OCD group, compared with MF+SC (p=0,01). Cell distribution, cell viability and subchondral bone parameters were similar between these groups (Kruskal-Wallis testi, p=0,198; p=0,387; p=0,699). MF+SC group was better than OCD according to cartilage mineralisation parameter of ICRS (p=0,001). Mean values were better in MF+SC group, compared to MF, but no significance detected between these (p=0,185). The effect of additional AMSC with MF treatment is not so clear.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: URCA**

**Abstract no.: 38320**

**EVALUATION OF THE CARATIVE EFFECT OF RAT CERCLAGE-INDUCED SPINAL CORD INJURY MODEL BY DIFFERENT TIMING OF EARLY DECOMPRESSION**

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An animal model of spinal cord injury was developed. A thread was used to constrict spinal cord of rats. A total of 48 SD rats were prospectively randomized to the four groups, namely, group A: only the laminectomy and dural sac circumference measurements. The spinal cord of groups B,C were constricted for 8 hours, 72 hours, then decompressed respectively; Group D was constricted but no decompression. Rat bilateral T13 lamina was resected and epidural cyst was revealed. Micro-small round needle with 4/0 white thread, needle nose inversion cross through the gap between the dural sac and vertebral posterior wall, one ligation strand, the other to measure the perimeter of dural sac(C1), with waterproof digital vernier caliper to measure the length, to obtain the length C2 by the algebraic formula ( $C2 = C1^*$ ), marked C2 length on the ligation strand, the dural sac cross-sectional area of the perimeter (C2) was 70% of the original cross-section. Relative pathology, MRI and behavior abnormalities were observed at different timing. The recovery of spinal cord injury with constricted in rats decompression after 8 hours was better than decompression after 72 hours, decompression group was better than non-decompression group. Spinal cord injury of cerclage-induced animal model in rats with reproducible, quantifiable, and clinical relevance of a certain degree, the model for further understanding of the early decompression after spinal cord injury in the therapeutic effect and the study of spinal cord decompression timing to provide an ideal way of modelling.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: URCA**

**Abstract no.: 37963**

**PLATELET RICH PLASMA (PRP) AUGMENTATION FOR ROTATOR CUFF REPAIR IN A SHEEP MODEL**

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Introduction: Rotator cuff tears have a significant non-healing rate of 20% to 90%, depending on biological and mechanical factors. It is well known that platelet rich plasma (PRP) contains growth factors that induce in vitro cell proliferation and promote angiogenesis during the healing process, but it's not clear the real benefits in tendon healing in vivo. The purpose of our study was to compare rotator cuff healing with and without PRP augmentation in a sheep model. Methods: The study was performed with 16 adult Hampshire Down sheep. A complete tear of the infraspinatus tendon was created and repaired with three Mason- Allen stitches. The animals were divided into two groups: one received PRP (3 ml) and the other one did not. Animals were sacrificed after 24 hours of the repair, one week, four weeks and after 10 weeks and the humeral head with all its muscle insertions was resected and submitted to histological evaluation. Results: No differences in terms of tendon healing were found between the groups after histological evaluation for the animals sacrificed 24 hours, one and four weeks after their tendon repair. At ten weeks the group that did not receive PRP presented with better healing. This group showed an organized fibrosis, characterized by the presence of active fibroblasts and no inflammatory infiltrate, as well as, the presence of a fibrocartilage area between the tendon and the bone. Conclusion: In this study the use of PRP hindered rotator cuff healing, at 10 weeks, in a sheep model.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: URCA**

**Abstract no.: 37891**

**DEFINITION OF PERTINENT PARAMETERS FOR THE EVALUATION OF CARTILAGE REPAIR TISSUE IN THE ANKLE USING MRI**

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Introduction: Since the introduction of the MOCART score (Magnetic resonance observation of cartilage repair tissue) in 2006 by Marlovits et al., the score has found a broad acceptance and was used in many studies. However, it was basically introduced for the knee joint. Therefore our aim was to introduce an adapted MOCART score for the ankle. Methods: Eighteen patients (12 female) after cartilage repair procedures of the ankle (12 MACT, 6 MFX) were included in the study. The average age at surgery was  $28.4 \pm 11.8$  years and the average defect size was  $1.4 \pm 0.4$  cm<sup>2</sup>. All patients were measured on a clinical 3 Tesla MRI (TRIO, Siemens, Erlangen, Germany) using a standard 8-channel knee coil. A sagittal and coronal PD-FSE-fs sequence was used for evaluation. The average follow up was  $60.8 \pm 33.0$  months. The AOFAS score was assessed for clinical evaluation and a paired t-test was used to test for differences between pre- and postoperative results. Results: We defined ten parameters: (1) Filling of the defect, (2) Repair Tissue Layer, (3) Integration to Border Zone, (4) Surface of the Repair Tissue, (5) Structure, (6) Subchondral Plate below Repair Tissue, (7) Subchondral Bone below Repair Tissue, (8) Edema, (9) Effusion and (10) Arthritis. The AOFAS score improved significantly from  $47.6 \pm 20.9$  to  $82.8 \pm 10.5$  ( $p < 0.001$ ). Conclusion: In dependence on the MOCART score, we have defined 10 parameters for the MOCART score of the ankle. Further steps will be the correlation with clinical results.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: URCA**

**Abstract no.: 37864**

**THE RELATIONSHIP BETWEEN MEDIAL MENISCAL SUBLUXATION AND STRESS DISTRIBUTION PATTERN OF THE KNEE JOINT: A FINITE ELEMENT ANALYSIS STUDY**

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Degenerative changes of the knee joint and clinical follow-up after meniscal subluxation are well documented. In the current study three-dimensional (3D) finite element analysis (FEA) of human lower limb was used to investigate the effect medial meniscal subluxation on the loadings of the knee structures. Except reference model, totally ten 3D models were created according to amount of medial meniscal subluxation. ANSYS 14 was used to analyze the stress/load distribution, that is to say maximum equivalent stress (MES) (von Mises stress), on bones, cartilages, ligaments and menisci. MES was expressed as Newton/mm<sup>2</sup> = Megapascal (MPa). According to current static and standing upright position human model, the MES on tibia and femur cartilage was 1.68 MPa and 1.75 MPa respectively in the reference model. The highest MES was obtained on posterior cruciate ligament (15.20 MPa) while MES on medial meniscus, lateral meniscus, medial collateral ligament, lateral collateral ligament and anterior cruciate ligament was 10.94 MPa, 5.14 MPa, 8.10 MPa, 6.38 MPa and 7.55 MPa respectively. Although MES increased in all structures with the increase of medial meniscal subluxation degree, tibia cartilage was found to be most affected structure with the increase of 22.73-fold in 10 mm subluxation model when compared with references values. This study showed that medial meniscus subluxation is associated with increased loadings on all knee structures including especially tibia cartilage. And also the degree of the medial meniscal subluxation correlates with distribution and the amount of loadings on tibia cartilage which may be prominent feature of knee osteoarthritis.

**Date: 2014-11-19**

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**Time: 16:00 - 17:30**

**Room: URCA**

**Abstract no.: 37343**

**EXPERIMENTAL STUDY ON SELECTIVE INNERVATION OF  
BLADDER BY SACRAL ROOTS**

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To study the selective innervations of sacral nerve roots to bladder in order to provide evidence for rebuilding bladder function after spinal cord injury and establishing experimental animal model of artificial bladder. Ten spinal cord injured SD rats were included in the study. The bilateral spinal roots of S1~S4 were electrostimulated separately and vesical plexus action, vesical smooth muscle complex action potential and intravesical pressure by pressotransducer through catheterization were recorded simultaneously. S1~ 4 nerve all participate the innervations of bladder in SD mice, among them, the S2 nerve is the most important one, next with S1, S3 and S4. is the minimum one. Different sacral nerve roots have different dominative effects to bladder smooth muscle. It is meaningful for patients of spinal cord injury to improve their urination function by performing artificially electric stimulation for emission through the main nerve roots controlling of bladder or rebuilding artificial bladder reflex are by neurorrhaphy.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: URCA**

**Abstract no.: 36869**

**A CUSTOM-MADE IMPLANT FOR FOCAL KNEE RESURFACING.  
ANIMAL AND INITIAL CLINICAL EXPERIENCE**

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Focal cartilage lesions ICRS grade IV remains a clinical challenge. We have developed a metallic (CrCo) implant for resurfacing of femoral focal chondral lesions. Here we report implant fixation data and effects on opposing cartilage from a 1-year study in a sheep model. Thirteen female sheep (2-6 years, 70-99 kg) were operated in one knee. The sheep were euthanized after 6 months (6 animals) and 12 months (6 animals). For osseointegration the implant was double-coated, first with a deep layer of titanium (60µm) and then a superficial layer of hydroxiapatite (60µm). Histological results from femoral condyles showed, at both time points, excellent bone-to-implant contact area in all cases. The percentage of bone-to-implant contact (BIC) area was 91+/-10 % at 6 months and 92 +/-3% at 12 months. Opposing tibia showed cartilage damage at 1-year of 8 Mankin (range 4-14; of a maximum 27 units), whereas the control side showed a cartilage damage of 6 Mankin units (6-11). There was a statistical significant difference of 1, 7 (p=0.04; 95% CI: 0, 08 - 3, 45) between operated and non-operated knee. There was a satisfactory bonding between the lower HA coated segment of the hat of the implant and surrounding osteochondral tissue. Conclusion: this study showed that an implant coated with a hydroxyapatite-on-top-of titanium layer will osseointegrate to bone. Opposing cartilage damage can be controlled provided accurate precision during surgical implantation. These implants are now subject to a first clinical trial on patients that have previously had an unsuccessful microfracturing procedure.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: URCA**

**Abstract no.: 36743**

**THE POSITIVE EFFECT OF PLATELET-RICH PLASMA ON FRACTURE HEALING: AN EXPERIMENTAL ANIMAL MODEL FOR LONG BONE FRACTURES**

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The purpose of this experimental study is to analyze the effect of platelet-rich plasma (PRP) on fracture healing for the long bone fractures and compare the outcomes with a control group in terms of radiological and histopathologic outcomes. Oblique femoral shaft fractures were created and fixed with K-wires apiece in a total of 16 New Zealand white rabbits. One week after the procedure, 8 of the rabbits were randomly selected from the study group and PRP was applied percutaneously (Group 1). The other 8 rabbits were left as the control group (Group 2). After radiological controls for the union at the 4th, 8th and 12th weeks, the rabbits were killed and the fractures were histologically analyzed and the results were statistically compared between two groups. As a result, there was statistically significant difference between 2 study groups in regard to the cortical callus formation on radiographs. There was also statistically significant difference between study groups on microscopic examination in regard to fibroblast and vascular proliferation and mature bone formation. In conclusion, we have found that, PRP has a positive effect on fracture healing with a more cortical callus formation on radiographs and more proliferative mature bone formation on histological examination. So we believe that, PRP application can be used in order to accelerate healing for long bone fractures. Future randomized clinical studies are needed including the effect of PRP on different fractures sites and different fracture types.

**Date: 2014-11-19**

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**Time: 16:00 - 17:30**

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**Abstract no.: 36619**

**CHANGES IN THE ENDPLATE OF THE INTERVERTEBRAL DISC ALLOGRAFT AFTER TRANSPLANTATION**

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**Introduction:** Integrity of the endplate is essential for nutrients diffusion from the vertebral capillaries to the cells in the normal intervertebral disc. This study examines the changes of the bony and cartilaginous endplates in a goat model of lumbar intervertebral disc allograft transplantation. The healing and remodeling of the host-bony interfaces was carefully examined to better understand the reestablishment of nutrient delivery to the disc allograft postoperatively. **Methods:** Intervertebral disc allograft transplantation was performed at lumbar L4/L5 in 15 male goats using the surgical techniques developed in our previous study. Five goats were sacrificed at 1.5, 6 and 12m postoperatively respectively. The transplanted segments together with the adjacent levels were harvested en bloc and fixed for micro-CT scanning and 3D reconstructions to observe the changes of bony endplates. Sequentially, the sample was cut mid-sagittally; one half was decalcified for histological staining to see the morphological characteristics of cartilaginous endplates and annulus-endplate integration, the other without decalcification was used for SEM and EDX mapping for assessing the ultra-microstructure in the endplate-areas. **Results:** The bony endplate of the disc allograft was replaced by newly formed trabecular bone. Atrophic cartilaginous endplates were seen and basically disappeared at the final follow-up. However the annulus-endplate integration was well preserved. **Discussion:** The integrity of endplate was not well preserved which may alter the nutrition pattern in the disc allografts in the long term. A further study on the revascularization of the disc allograft postoperatively is underway.

**Date: 2014-11-19**

**Session: Research: Free Papers - Research Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: URCA**

**Abstract no.: 36585**

**CAN WE PREDICT FRACTURE OUTCOME? EVALUATION OF SERUM BONE 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 (INDIA)**

Clinicians are unable to identify delayed and nonunions 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: 2014-11-19**

**Session: Tumours: Free Papers - Oncology I**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 38175**

**MAGNETIC RESONANCE IMAGING (MRI) SENSITIVITY AND SPECIFICITY TO DIAGNOSE RESIDUAL SARCOMA AFTER UNPLANNED SARCOMA EXCISION**

**Coonoor CHANDRASEKAR**

**Royal Liverpool University Hospital, Liverpool (UNITED KINGDOM)**

**Aim** Unplanned excision of soft-tissue sarcoma may have negative impact on the patient outcome. The aim of the study was to evaluate the sensitivity and specificity and the role of magnetic resonance imaging (MRI) in diagnosis of residual soft tissue tumours after unplanned sarcoma excision. **Methods-** We reviewed retrospectively 36 consecutive patients who had an unplanned surgical excision of a soft tissue sarcoma who were referred to our sarcoma unit. They underwent clinical assessment and subsequent MRI scans. After multidisciplinary meeting they underwent re-excision surgery and the final histological diagnosis was analysed. We evaluated the sensitivity and specificity of the MRI scan in diagnosis of residual tumours against final histopathological diagnosis. All the MRI scans were performed with a standard protocol and reported by specialist musculoskeletal radiology consultants. **Results-** 36 patients were referred from other centres after an unplanned excision of a sarcoma. There were 24 male and 12 female patients. Most common diagnosis was Leiomyosarcoma 18 cases, liposarcoma 8 cases, rhabdomyosarcoma 3, myxofibrosarcoma 3 and other sarcoma subtypes 4. We compared MRI diagnosis against final histological diagnosis and we found that sensitivity of MRI scans for residual tumours was 72.73% (95% CI: 49.78% to 89.20%) and specificity was 57.14% (95% CI: 28.92% to 82.24%). Positive predictive value of MRI scans was 72.73% (95% CI: 49.78% to 89.20%). **Conclusion-** We found that MRI scan had 72.73 % sensitivity and 57.14 % specificity with positive predictive value of 72.73% to diagnose residual sarcomas following unplanned primary excision of a sarcoma.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology I**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 38021**

**EN-BLOC RESECTION AND MERLE D'AUBIGNE TURN-ROUND PLASTY USING CUSTOM-MADE INTERLOCKING NAIL FOR GIANT CELL TUMOURS AROUND KNEE**

**Sanjeev BHANDARI**

**Bhandari Hospital, Solapur (INDIA)**

**Introduction:** In India, GCT constitute 30% of all skeletal tumours. In aggressive Campanacci stage 3 tumours around the knee, we prefer en-bloc resection with arthrodesis over custom megaprosthesis due to younger age and cost-restraints. **Methods:** Between 1992-2012, 12 patients of Campanacci stage 3 giant cell tumours around knee - 7 from distal femur and 5 from proximal tibia were treated by En-bloc resection and reconstruction by arthrodesis either by Turn-Round Plasty (10 cases - 83%) or Bi/Trifocal osteosynthesis using Ilizarov frame (2 cases- 17%). Between 8 to 10 cm. of bone had to be resected en-bloc with tumour. Before 2004, either Merle d'Aubigne turn-round plasty with plate and screws and prolonged cast immobilization or bi/trifocal osteosynthesis by Ilizarov frame were employed. Recently in 8 cases (66.6%), custom-made long femur-to-tibia interlocking nail with plate fixation was used, major advantage being stable fixation and no cast immobilisation. **Results:** Follow-up was available from minimum 2 to 18 years (Average 4.2 years). Previously, cumbersome plaster cast or Ilizarov frame had to keep for nearly 12 to 14 months. With long interlocking nail, only long knee brace was used post-operatively. Complications included one case (8.3%) each of fulminant deep infection, soft tissue recurrence, temporary peroneal nerve palsy and delayed arthrodesis. Overall, 11 cases (91.7%) had excellent or good results, while one case (8.3%) of amputation due to infection had poor result. **Conclusion:** d'Aubigne turn-round plasty with long femur-to-tibia interlocking nail offers the most acceptable modality with least morbidity and satisfactory long term results.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology I**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37992**

**SEGMENTAL MODULAR ENDOPROSTHESES OF THE HUMERUS FOR MUSCULOSKELETAL TUMORS**

Philipp Theodor FUNOVICS, Joannis PANOTOPOULOS, Reinhard WINDHAGER

Medical University of Vienna Department of Orthopaedics, Vienna General Hospital, Vienna, Austria, Vienna (AUSTRIA)

**Aim:** The purpose of this retrospective single-centre study was to investigate oncological and surgical outcome of modular prosthetic reconstruction of the humerus. **Methods:** 101 patients (55 males; 46 females; mean age, 48 years, mean follow-up, 37 months) underwent modular prosthetic reconstruction for tumor resection around the humerus. Indication was skeletal metastasis in 46, osteosarcoma in 27, chondrosarcoma in 9, Ewing's sarcoma in 4 and other tumors in 15 patients. There were 56 proximal, 27 distal and 13 total humerus reconstructions; 2 patients required an intercalary prosthesis only, 3 patients received a growing prosthesis. Soft tissue reconstruction around the shoulder was performed by use of a LARSTM ligament in 22 and fascia lata autografts in 10 cases. **Results:** 15 patients developed metastases, local relapse was observed in 4. 38 patients died throughout follow-up at a mean of 19 months post-operatively. Median overall survival was 171 months with an five-year survival of 53%. 23 patients required revision for complications, including 5 patients with multiple revisions. Infection and soft tissue-related complications (instability, dislocation) occurred in 10 cases each. Aseptic loosening and structural failures (mechanical, fracture) were treated in 3 patients each. Abductor function of the shoulder was insufficient in all patients, while mean range of motion of elbow replacements was 96° (range, 40° to 155°). Functional outcome was dependent from the extent of bone resection. **Conclusion:** Modular prosthetic reconstruction is a viable treatment option for tumors of the humerus. Infection and shoulder instability remain the major complications responsible for failure.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology I**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37987**

**EXTENSIVE RECONSTRUCTION AFTER RESECTION OF SOFT TISSUE SARCOMAS**

Philipp Theodor FUNOVICS<sup>1</sup>, Joannis PANOTOPOULOS<sup>1</sup>, Gabriele AMANN<sup>2</sup>, Reinhard WINDHAGER<sup>1</sup>

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**Aim:** Wide resection of soft tissue sarcomas (STS) frequently leaves anatomical defects requiring not only complex soft tissue closure but also the reconstruction of viable structures such as bone or neurovascular structures. Aim of this study was to compare the results of such extensive reconstructions with those of sole resections of STS. **Methods:** 621 patients underwent resection of STS. In 211 cases (34%; 114 men and 97 women; mean age, 49 years; mean follow-up, 65 months) surgical treatment required plastic surgical soft tissue closure (muscle laps, skin grafts), segmental neurovascular reconstruction, bone resection with endoprosthesis or biological replacement, viscerectomy or implants for functional soft tissue reconstructions (LARSTM, meshes). Predominant sites were the thigh (91), the calf and foot (57) and the trunk (25). Most frequent histologies comprised synovial sarcoma (31), liposarcoma (29) and leiomyosarcoma (26). 87 of these patients (41%) underwent re-resection after primary inadequate resection. **Results:** The 5-year overall survival of all 621 patients was 54%, the corresponding survival of patients with extensive reconstruction was 60%. This was slightly superior to the survival of patients with sole resection of their tumor ( $p=0.064$ ). In extensive resections, patients with re-resection had a significantly better survival than with primary resection ( $p=0.040$ ). Multivariate Cox regression identified bone resection as factor for improved survival ( $p=0.039$ ; HR=0.423; 95%-CI, 0.187-0.958). **Conclusion:** Extended resection for treatment of STS tends to show improved overall survival, underlining the necessity for an aggressive approach, especially when tumors are located close to bony structures or after inadvertent primary resections.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology I**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37884**

**TISSUE TOLERABLE PLASMA (TTP) ATTENUATES PROLIFERATION OF HUMAN OSTEOSARCOMA CELLS U2-OS IN-VITRO**

Denis GUEMBEL<sup>1</sup>, Matthias STOPE<sup>2</sup>, Matthias NAPP<sup>1</sup>, Jörn LANGE<sup>1</sup>, Axel SCKELL<sup>1</sup>, Martin BURCHARDT<sup>4</sup>, Axel EKKERNKAMP<sup>1</sup>

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**Introduction:** Human osteosarcoma is the most common primary malignant bone tumour in adolescence with restricted surgical options. The development of tissue tolerable plasma (TTP) has achieved future perspectives for treatment of tissues by reactive particles, however, cellular and molecular activities of TTP are poorly understood. The aim of our study was to investigate the effects of TTP treatment on human osteosarcoma cells. **Materials and methods:** Human osteosarcoma cells U2-OS were treated for 15 s with TTP (kINPenMED, Neoplas Tools) and seeded in 24-well cell culture plates. Cell proliferation was measured over a period of 120 h using a CASY Cell Analyzer (Roche Applied Science) and compared to carrier-gas treated control cells. Induction of apoptosis was assessed by TP53 and phospho-TP53 Western blot detection. Effects of plasma-born reactive particles were determined by co-incubation with radical scavenger ascorbic acid and N-acetyl cysteine. **Results:** TTP treatment of U2-OS cells led to significantly reduced cellular growth with cell number reductions of 48% (72 h), 37% (96 h) and 37 % (120 h). Supplementation of ascorbic acid and N-acetyl cysteine neutralized anti-proliferative effects. Western blot analysis showed induction as well as subsequent activation of the apoptotic regulator TP53. **Conclusion:** TTP attenuates cell proliferation in U2-OS cells in vitro. This effect is at least partially initiated by reactive particles and mediated by induction of apoptotic mechanisms. Therefore, TTP treatment could significantly expand the therapeutic alternatives in surgical oncology.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology I**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37590**

**COMPARATIVE ANALYSIS OF PROGNOSTIC MARKERS FOR AGGRESSIVENESS OF GIANT CELL TUMOUR**

Shishir RASTOGI, Chaitanya Dev PANNU, Parsanth I I, Shah Alam KHAN

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

Introduction-Prognostic markers like p53, DNA ploidy and female sex have been proposed to have role in aggressiveness of GCT. Method – DNA ploidy, P53, Er and Pr were studied in 28 patients. Results – Ploidy by flowcytometry showed that tumors with tetraploidy less than 11%(diploid) were 9 out of 12(75%). 2 of 9 (22.22%) diploid samples were campanacci grade I or II, while 7 of 9 (77.78%) diploid samples were grade III. 3 out of 12 (25%) have tetraploidy more than 11%(hyperploids). 2(66.67) hyperploids samples were grade III, while 1(33.33%) was grade I or II. Ploidy by Feulgen IOD showed that 10 of 20 (50%) were diploid, 9(45%) were hyperploids and 1(5%) was aneuploid. All 5 grade I and grade II were diploid (100%). 5 out of remaining 14(35.71%) grade III tumours were diploid, while 9(64.29%) were non diploid which was significant ( $p=0.013$ ). Estrogen and progesterone receptor was negative in all 11 female patients. P53 status Out of 21 patients in whom p53 was analysed, 4 were positive(19.05) and 17(80.95%) were negative. Out of 4 positive patients 3 were recurrent at presentation while 1 was primary. Out of 17 negative cases, 9 (52.94%) were primary and 8(47.06%) were recurrent which was not significant ( $p=0.314$ ). Conclusions – Aneuploidy is risk factor for aggressiveness of GCT. Hyperploidy of GCT correlates with clinical and radiological aggressiveness but has no correlation to recurrence of GCT. Estrogen and progesterone plays no role in aggressiveness of GCT. P53 has no correlation with aggressiveness of GCT.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology I**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37568**

**PROSPECTS OF MR SPECTROSCOPY AS A PROGNOSTIC MARKER FOR AGGRESSIVENESS OF GCT OF BONE: A PRELIMINARY STUDY**

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Introduction: Choline assessment in MR spectroscopy is useful investigation in various tumours. However its role in bone tumors especially giant cell tumors is not well defined. This study was conducted to evaluate whether the presence of choline peak correlates with the recurrence and aggressiveness of GCT. Method: 31 cases of recurrent GCT were recruited in prospective cohort study conducted in the Department of Orthopedics, AIIMS from November 2010 to October 2012. Patients were evaluated clinically and radiologically. Campanacci grading and Enneking staging system were used. Only Grade II and Grade III tumours were included. MRI evaluation included conventional and dynamic contrast enhanced sequences. In vivo Proton MRS was done using single voxel point-resolved spectroscopy sequence (2,000/30, 2,000/135, 2,000/270). Choline was considered positive if definite peak at 3.2 ppm is present in at least one of spectra. Results: Out of 31 patients 18 were recurrent GCT and 13 were aggressive GCT. 19 were females and 12 were males. Two patients were lost to follow up and two patients opted to leave the study in-between. Most common affected site was distal end femur. Out of 15 recurrent GCT in which study was completed, choline was observed in all. Out of 12 aggressive GCT in which study was completed, choline was positive in 11 and absent in 1. Conclusions: This study concludes that Choline is a reliable marker of aggressiveness and recurrence in GCT. Raised choline concentration in GCT is helpful in estimating the prognosis in advance which may have bearing on treatment.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology I**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37525**

**DYNAMIC MRI PATTERN IN RECURRENT AND AGGRESSIVE GCT**

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**Introduction:** Although GCT is considered as a benign bone tumour its clinical course is varied. We carried out this study to evaluate whether Dynamic MRI can be used to predict biological behaviour of GCT. **Method:** Study consisted of 31 cases of recurrent and aggressive GCT. Patients were evaluated clinically and radiologically. Campanacci grading and Enneking staging system were used. Only Grade II and Grade III tumours were included. MRI evaluation included conventional and dynamic contrast enhanced sequences. The temporal progression of signal intensity was plotted against time, and the progression of tumour enhancement was evaluated according to the shape of the time–signal intensity curve. **Results:** Out of 31 patients 18 were recurrent GCT and 13 were aggressive GCT. Two patients were lost to follow up and two patients opted to leave the study in-between. Most common affected site was distal end femur. Out of 14 recurrent GCT in which study was completed, 11 Patients had Type I Dynamic curve and 3 Patients had Type II curve. Out of 12 aggressive GCT in which study was completed, 5 Patients had Type I curve, 4 Patients had Type II curves and 2 Patients had Type III curves on Dynamic MRI. **Conclusions:** As Type I curve on Dynamic MRI is found most commonly in malignant tumours recurrent GCT are much more aggressive and have malignant tendencies than primary aggressive GCT. Although both aggressive and recurrent GCT may be benign on histopathology they show malignant pattern on dynamic MRI.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology I**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37380**

**LONG-TERM OUTCOMES OF INTENTIONAL MARGINAL RESECTION IN OSTEOSARCOMA PATIENTS WITH COMPLETE RESPONSE TO CHEMOTHERAPY**

Norio YAMAMOTO, Akihiko TAKEUCHI, Toshiharu SHIRAI, Hideji NISHIDA, Katsuhiko HAYASHI, Hiroaki KIMURA, Shingo SHIMOZAKI, Takashi KATO, Yu AOKI, Takashi HIGUCHI, Hiroyuki TSUCHIYA  
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**Objective:** When a favourable response to a combination of chemotherapy and caffeine administration is clinically obtained, we usually perform intentional marginal resection, which preserves the surrounding areas that are normally resected, such as ligament, nerves, blood vessels. We report on the long-term outcomes of osteosarcoma patients who underwent intentional marginal resection. **Subjects and Methods:** The subjects were 43 patients with osteosarcoma. The mean age was 15 years and the mean follow-up period was 101 months. The patients received preoperatively 3-5 courses of intraarterial fusion of caffeine combined with CDDP and ADM. The effectiveness of chemotherapy was evaluated using plain x-ray, angiography, MRI, and thallium scintigraphy. If the results of two or more imaging examinations showed effectiveness of the treatment, the patient was considered to have a complete response or partial response. **Results:** The treatment was effective in 14 patients (Grade III) and 29 patients (Grade IV) by histological evaluation that correlated with the results of imaging evaluation. Local recurrence was observed in only 2 patients (4.7%). For stage IIB patients, both 5- and 10-year cumulative survival rates were 93.8%. The outcome (IIB + IIIB) was CDF in 26 patients, NED in 8, AWD in 1, and DOD in 7. **Discussion:** In the present study, intentional marginal resection was performed in selected osteosarcoma patients who were clinically obtained favorable responses to a combination of chemotherapy and caffeine administration. They had a good clinical course and there was no negative effect on the survival rate or local recurrence rate.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology I**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37082**

**SURGICAL TREATMENT OF HAEMOPHILIC PSEUDOTUMOR**

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Introduction: Surgery is the most effective and thorough treatment for haemophilic pseudotumour. But there are complications including pseudotumour recurrence, fistula formation, infection and inhibitor formation. There were few reports about surgery for haemophilic pseudotumour. The purpose of this study was to follow up the patients who underwent surgery for haemophilic pseudotumour, and explore the effectiveness and complications. Methods: A total of 14 patients with haemophilic pseudotumour, who received surgical management from July 1996 to September 2013 in one hospital, were enrolled in this study. All patients were male. 12 were diagnosed with haemophilia A and 2 with haemophilia B. The average age at surgery was  $31.0 \pm 10.4$  years old (18-45). All patients were followed-up by phone and out-patient clinic. The median follow-up time was 50months (2-208 m). Results: The median operation time was 157min (90-315min), and the median amount of blood loss was 800ml (100-4000ml). The amount of RBC, serum and whole blood transfusion after surgery was 0-24 units, 0-2000ml, and 0-4600ml respectively. Three patients had infection after surgery, one patient got coagulation FVIII inhibitor. Two patients had recurrence, one with pelvic pseudotumor had recurrent pseudotumor after two years and was ceased after coagulation infusion; the other one had recurrence after 13 years and got FVIII inhibitor;. One patient had unhealed bone fracture after one year of external fixation tibia fracture. Conclusions: Surgery is an effective treatment for haemophilic pseudotumour, but the incidence of wound infection, coagulation factor inhibitor formation, haemophilic pseudotumor recurrence and fracture nonunion are high.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology I**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37065**

**ANTIMICROBIAL MEGAPROSTHESES SUPPORTED WITH IODINE**

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Deep infection associated with implants remains a serious complication. Infection rates after tumour surgery are very high particularly. In order to reduce the incidence of implant-associated infection, several biomaterial surface treatments have been proposed. We clinically evaluated antibacterial effects and biological safety of iodine-supported megaprosthesis. We have treated 47 patients with malignant bone tumour or pyogenic arthritis using iodine-supported titanium megaprotheses. The mean age was 53.6 years (15-85). Twenty-six patients were male and 21 were female. The iodine-supported implants used were 42 Kyocera Limb Salvage System and 5 KOBELCO K-MAX. These megaprotheses were used to prevent infection for 21 patients and to treat infection for 26 patients. The mean follow-up period was 30.1 months (8-50). Infection was prevented in 20 out of 21 patients. Only one patient had surgical site infection caused by pseudomonas aeruginosa, who was cured without removal of the implant. In all 26 treatment cases, infection subsided without an additional surgery. White blood cell (WBC) and C-reactive protein (CRP) were measured pre- and post-operatively. To confirm systemic effects of iodine, thyroid hormone levels in the blood were examined. WBC and CRP levels were returned to normal within four weeks after surgery. Abnormalities of thyroid gland function were not detected. Radiological evaluations were performed regularly. Loosening of the implants was not shown. Excellent bone ingrowth and ongrowth were found around iodine-supported megaprotheses. Iodine-supported titanium megaprotheses can be very effective and promising in the prevention and treatment of infections for large bone defect.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology II**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37850**

**JOINT-PRESERVING RECONSTRUCTION OF METAPHYSEAL  
OSTEOSARCOMA USING TUMOR-BEARING MASSIVE BONE  
TREATED WITH LIQUID NITROGEN**

Takashi HIGUCHI, Norio YAMAMOTO, Hideji NISHIDA, Hiroaki  
KIMURA, Akihiko TAKEUCHI, Shingo SHIMOZAKI, Takashi KATO, Yu  
AOKI, Subhadrabandhu SARAN, Hiroyuki TSUCHIYA  
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**Purpose:** The purpose is to evaluate the results of intentional joint preservation reconstruction using frozen autografts containing tumour treated with liquid nitrogen in patients with osteosarcoma involving the metaphysis. **Patients and methods:** Between 2003 and 2013, we have treated with this surgical technique for 14 cases of osteosarcoma patients who achieved good response for neoadjuvant chemotherapy. In all cases, tumours involved the metaphysis with or without diaphysis of long bones (9 distal femurs, 5 proximal tibias). After neoadjuvant chemotherapy, they underwent intentional marginal excision with epiphyseal osteotomy to preserve their knee joint. The bony lesions containing tumour were frozen in liquid nitrogen and utilized for reconstruction with intramedullary nailing or plates. Functional evaluations were performed using MSTS score. **Results:** Functional outcomes were assessed as excellent in eight patients, good in four, fair in one and poor in one with the mean follow-up of 27.9 months. The mean functional score was 86.6%. 12 patients regained good range of motion of knee joint and can walk and run almost normally. The others needed additional surgery because of postoperative infection or tumour recurrence originating from surrounding soft tissues. No intraoperative complications, such as surrounding soft-tissue damage or neurovascular injury, were observed. **Conclusion:** Joint-preserving reconstruction using frozen autografts yielded excellent function for patients with metaphyseal osteosarcomas.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology II**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37402**

**IMPROVED PATIENTS SELECTION BY STRATIFIED SURGICAL INTERVENTION: AARHUS SPINAL METASTASES ALGORITHM**

Miao WANG, Haisheng LI, Ming SUN, Kristian HOEY, Peter HELMIG, Gilava BORHANI, Ebbe HANSEN, Cody BUNGER

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Summary of background data. While the choice of optimal surgical treatment for spinal metastatic patients remains a significant challenge for spine surgeons. The aim was to evaluate the clinical outcomes of the stratified surgical interventions based on the Aarhus Spinal Metastases Algorithm (ASMA). Methods. This study consists of 515 surgically treated spinal metastatic patients. Surgeons evaluated patients' life expectancy and the anatomic spine tumor location by using Tokuhashi scoring system and Tomita classification system, and then classified patients into five surgical groups (group 1-5) preoperatively. Survival outcomes and complications were analyzed. Results. Decompression +pedicle screw system (PSS) surgery had the longest survival time in patients with the worst prognosis (Tokuhashi score 0-4). Reconstruction +decompression +PSS surgery achieved the best survival outcomes in patients with short (Tokuhashi 5-8) or moderate (Tokuhashi 9-11) life expectancy. En bloc- and intralesional vertebrectomy surgery performed in patients who were not recommended by ASMA was followed by shorter survival than preoperatively predicted and had the highest complication- and reoperation rate. There were 469 patients (92.3%) have maintained or regained neurological function postoperatively. The overall reoperation rate and complication rate were 13.5% and 13.8%. Conclusions. Patients with shortest survival may undergo instrumentation fusion without additional survival risks compared with laminectomy alone. Patients with predicted median survival had longer survival, when treated by decompression+fusion+reconstruction. En bloc- and intralesional vertebrectomy could perform on the patients who were recommended by ASMA. Surgical interventions based on ASMA may thus prevent additional complications, and improve survival in spinal metastases patients.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology II**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37391**

**EARLY REOPERATION IN SPINAL METASTASES PATIENTS**

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Introduction: spinal metastases patients is at the end stage of their disease. The benefits from surgery should be extra carefully weighed against potential risks. The Aim was to describe the early complications comprising neurological function and subsequently destroying the aim of primary surgery. Methods: we retrieved 696 spinal metastases patients who underwent surgical treatments, among whom 45 patients (6.5%) undergone reoperation within 30days after the first spinal surgery. Results: the mean age of patients at the first operation was 58.2 years old. Median survival of this cohort is 8.1 months. There were 37 patients who underwent one reoperation, 6 patients who underwent two reoperations, and 2 patients who underwent three reoperations. Early deterioration of neurological function was the clinical picture in 21 patients who underwent reoperation within the first seven days. Hematoma is the most common complication (31%) in this cohort followed by superficial infection (10%). Patients who underwent decompression plus pedicle screw system implantation had the highest reoperation rate (43%). In our cohort, 62% (28 out of 45) of the early reoperation happened in patients with low Tokuhashi score (score 0 to 8), 29% (13 cases) happened in patients with median Tokuhashi score (score 9 to 11). Conclusion: this important risk of recurrent paraplegia should be addressed by postoperatively pertinent suction drain, and surgery regions should avoid direct compression. Patients should not be placed in prone position. Surgical treatment for spinal metastases should be carefully selected, especially on the patients who has short life expectancy (low Tokuhashi score).

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology II**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37319**

**COMBINED DISTAL FEMORAL AND PROXIMAL TIBIAL  
MEGAENDOPROSTHETIC RECONSTRUCTION FOLLOWING  
TUMOUR RESECTION**

Florian SEVELDA, Philipp FUNOVICS, Markus RIEDL, Martin  
DOMINKUS, Reinhard WINDHAGER

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There is only little data on the oncological and functional outcome of patients who recieved a combined distal femoral and proximal tibial megaendoprosthetic replacement (CFTR) following massive tumor resections of the knee joint. We retrospectively reviewed 39 patients treated with CFTR between 1984 and 2010. 16 females and 23 males with a mean age of 32 years and a mean follow-up of 93 months were included. 21 patients received their endoprosthetic replacement initially after tumour resection and 18 patients had a previous partial reconstruction of the knee converted into a secondary CFTR. A total of 26 patients had osteosarcoma, 4 chondrosarcomas, 2 Ewing sarcomas, 2 Giant cell tumours, 2 soft tissue sarcomas and one malignant fibrous histiocytoma. 33% had no revisions after a median follow-up of 36 months, 10% had one revision within 82 months median follow-up and 56% had multiple revisions after 128 months of median follow-up. The median revision free survival was 27 months. In 38% soft tissue failure occurred, in 3% aseptic loosening, in 26% structural failure, in 38% infection and in 3% tumour progression. 2 (6%) patients had to be amputated due to massive infection. At last follow-up 67% had no evidence of disease, 10% were alive with disease and 23% died of disease. 9 sarcoma patients suffered from metastasis. Median MSTS score was 76%. In this first retrospective trial focused on CFTR we could show a high infection and revision rate compared to other megaendoprosthetic reconstruction sites. However limb survival with 94% was satisfying.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology II**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37229**

**RECONSTRUCTION OF MALIGNANT BONE TUMORS USING  
PEDICLE FROZEN AUTOGRAFT TREATED WITH LIQUID  
NITROGEN**

Hiroyuki TSUCHIYA, Hideji NISHIDA, Norio YAMAMOTO, Katsuhiko  
HAYASHI, Akihiro TAKEUCHI, Takashi KATO, Yu AOKI, Takashi  
HIGUCHI

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Purpose to study the results of pedicle frozen autografts of malignant bone tumours by a new surgical reconstruction technique that uses autografts containing tumour treated with liquid nitrogen. Patients and methods since 2002 we have treated 47 cases of malignant bone tumour by this method. The sites of the tumours were 32 femurs, 8 tibias, 6 humeri, and 1 calcaneus. In 22 cases, one-site osteotomies were performed. Twenty-five cases were not osteotomized, and were instead just dislocated from the joint. Bony lesions connected to the limb were rotated and frozen in liquid nitrogen. The reconstructions were performed by intramedullary cemented nailings or plates in 27 cases, and composite prosthetic replacements in 20 cases. Functional evaluations were performed using Enneking's system. Results Excellent function was achieved in 30 patients, good in 8, fair in 3 and poor in 6. At the final follow-up (mean 28.6 months), 16 patients had died, 23 remained free from disease, while 8 were alive with disease. Intraoperative complications, such as surrounding soft-tissue damage or neurovascular injury, were not found. 5 graft fractures were found on intermediate follow-up. Conclusion Pedicle frozen autografts achieved successful reconstruction of malignant bone tumours. This is a new, simple and effective surgical technique.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology II**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37216**

**RETROSPECTIVE EVALUATION OF THREE TREATMENT STRATEGIES FOR SPINAL METASTASES**

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**Objectives:** To retrospectively evaluate the efficacy of three treatment strategies-Tomita scoring system, Tokuhashi scoring system and so-called “flow-chart” strategy-for spinal metastases. **Methods:** This study investigated 105 patients. Tomita scoring system and Tokuhashi scoring system (edition 2005) as well as flow-chart strategy were respectively applied to these cases to produce different management algorithms. The two subgroups of cases according to each algorithm were divided by comparison between the expected algorithm and the real management approach. Each group according to the different management approaches judged by flow-chart strategy were also divided into two subgroups by comparison between the deduced algorithm and the real management approach. **Results:** There was no significant difference in comparison ( $P>0.05$ ) of the survival time of the cases in the same-treatment subgroup ( $9.96\pm12.54$  months) and the cases in the different-treatment subgroup ( $10.22\pm7.24$  months) according to Tomita scoring system. There was either no significant difference was shown in comparison ( $P>0.05$ ) of the survival time of the cases in the same-treatment subgroup ( $9.76\pm9.68$  months) and the cases in the different-treatment subgroup ( $11.21\pm9.48$  months) according to Tokuhashi scoring system ( $P>0.05$ ). While the survival time of the cases in the same-treatment subgroup ( $13.07\pm13.05$  months) was significantly longer than the cases the different-treatment subgroup ( $8.30\pm6.11$  months) according to the flow-chart strategy ( $P<0.05$ ). Among the approaches in the algorithm according to the flow-chart strategy, there was no significant difference, except for the excisional surgery ( $P<0.05$ ). **Conclusion:** The flow-chart strategy is better than either Tomita or Tokuhashi scoring system with regards to improvement of survival time.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology II**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37122**

**SKELETAL METASTASES IN 301 BREAST CANCER PATIENTS:  
PATIENT SURVIVAL AND COMPLICATIONS AFTER SURGERY**

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**Introduction:** The objective of this article was to identify prognostic variables associated with survival in a large cohort of breast cancer patients after surgical treatment of skeletal metastases. In doing so, we sought to document and characterize complications and re-operations rates after reconstructive surgery. **Patients and methods:** This study includes 301 patients with breast cancer operated for skeletal metastases during 1986-2012. Kaplan-Meier analysis was used to calculate survival. Cox multiple-regression analysis was performed to study risk factors and results were expressed as hazard ratios (HR). **Results:** The median age at surgery was 61 (interquartile-range [IQR] 52-70) years. The cumulative 1-, 2-, and 5-year survival after surgery was 45% (95% CI 39-51), 27% (22-32), and 8% (5-12), respectively. The median follow-up time was 1 (IQR 0.2-2) year. Age over 60 years (HR 1.9) and hemoglobin levels <110 g/L (HR 2) increased the risk of death after surgery. Patients with impending fractures (HR 0.4) had a lower death rate. The overall neurological function in patients with spinal metastases improved after surgery ( $p<0.001$ ). The complication rate including surgically and non-surgically complications was 25%. The re-operation rate was 14%. The most common reason for re-operation was implant failure ( $n=12$ ), followed by periprosthetic or stress fracture ( $n=11$ ), and local tumour progression ( $n=8$ ). **Conclusion:** Survival data and analysis of complications of this large cohort of surgically treated breast cancer patients help to set appropriate expectations for the patients, families, and medical staff.

**Date: 2014-11-19**

**Session: Tumours: Free Papers - Oncology II**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 36787**

**PREDICTIVE VALUE OF SIX PROGNOSTIC SCORING SYSTEMS FOR SPINAL BONE METASTASES - AN ANALYSIS BASED ON 1374 PATIENTS**

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**Objectives:** Models to aid in the decision making process for the treatment of spinal bone metastases (SBM) have been developed by Tomita, Tokuhashi, Van der Linden, Bauer, Rades and Bollen. The aim of this study was to assess the validity and predictive accuracy of these six models designed to estimate survival of patients suffering from SBM. **Methods:** All patients who were treated for SBM between 2000 and 2010 were included in this international multi-center retrospective study (n=1379). Medical records were reviewed for all items needed to use the models. Survival time was calculated as the difference between start of treatment for SBM and date of death. Survival curves were estimated using the Kaplan-Meier method and accuracy was assessed with the c-statistic. For the lowest predictive group of each model, survival rate at two months was assessed. **Results:** Median follow-up was 6.7 years (95%CI 5.6-7.7) with a minimum of 2.3 years and a maximum of 12.3 years. The overall median survival was 5.1 months (95%CI 4.6-5.6). The most common primary tumours were breast (n=388, 28%), lung (n=318, 23%) and prostate cancer (n=259, 19%). The Tomita, Tokuhashi, Bauer and Van der Linden models performed similar with a c-statistic of 0.64 and a 2-month accuracy of 42%. The Rades model (c-statistic 0.58) and Bollen model (c-statistic 0.69) had a similar 2-month accuracy of 53%. **Conclusion:** The newer Rades and Bollen model perform better than the older models. However, improvements are still warranted to increase the predictive accuracy.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Osteoporosis**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 38131**

**ASSESSMENT OF BONE MINERAL DENSITY FROM DIGITAL RADIOGRAPHY**

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We aim to investigate the use of aluminium equivalent grading and cortical measures as assessment of bone mineral density in digital radiographs. Fifty digital antero-posterior radiographs of proximal femoral fractures were taken with an aluminum step wedge incorporated. Analysis of the radiographs on MatLab allowed calculation of aluminium equivalent measures of the proximal femur, corrected for soft tissue variations and scatter contributions. Use of dimensions of the step wedge allowed calculation of cortical thicknesses of the femoral diaphysis. All patients underwent Dual X-ray Absorptiometry (DXA) of the un-injured proximal femur. Aluminium equivalent measures of the proximal femur demonstrated mild correlation with DXA ( $r=0.35$ ;  $p=0.07$ ). Thickness of the medial and lateral cortex of the femoral diaphysis, one 'femoral head' diameter inferior to the superior aspect of the lesser trochanter demonstrated significant correlation with DXA (lateral  $r=0.72$ ;  $p<0.001$ ; medial  $r=0.67$ ;  $p<0.001$ ). Use of a 'combined cortical thickness' to 'diaphyseal thickness' ratio did not improve the correlation ( $r=0.64$ ;  $p<0.001$ ). Thickness of the medial and lateral cortex of the femoral diaphysis, one half 'femoral head' diameter below this, provided similar correlations with DXA (lateral  $r=0.57$ ;  $p<0.001$ ; medial  $r=0.73$ ;  $p<0.001$ ). Use of the 'cortex:diaphysis' ratio at this level did not improve the correlation ( $r=0.61$ ;  $p<0.001$ ). Use of a combined score of the four cortical measures provided the strongest correlation with DXA ( $r=0.77$ ;  $p<0.001$ ). When adjusted for magnification, simple cortical measures of the femoral shaft provide statistically significant correlations with DXA. The correlation is improved by using combinations of these measures. Such measurements may provide objective pre-operative information on bone quality.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Osteoporosis**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 37907**

**BONE IRON CONTENT IS MORE PROMINENT THAN SERUM FERRITIN IN PREDICTING BONE STATUS IN POSTMENOPAUSAL WOMEN WITH HIP FRAGILITY FRACTURES**

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Introduction: Despite extensive in vivo and clinical studies showing that higher serum ferritin is associated with accelerated bone loss and low bone mineral density, the association between bone iron content and BMD has not been clarified. Methods: This is a retrospective clinical study from the date of Second Affiliated Hospital of Soochow University, including 202 postmenopausal women with hip fragility fractures aged 56-93 years. BMD was measured and osteoporosis was diagnosed by the WHO definition. The bone tissue was obtained during surgery with the consent of the patient. Bone iron content was measured by ICP-MS and stained by prussian blue. Results: Initially, we divided the subjects into eight groups with the interval of 5 years old. During aging, BMD values at all measured sites decreased and serum ferritin concentrations increased. Meanwhile, femoral head bone iron content increased. Multiple regression analysis showed that serum ferritin was inversely associated with BMD values at only one site of five measured sites, while femoral head bone iron content was inversely associated with BMD values at four sites of five measured sites. Furthermore, when we divided these women into bone iron content quartiles, the odds for prevalent osteoporosis were 5.798-fold (95% CI=2.328-14.438) higher in subjects in the highest quartile compared with those in the lowest quartile. In addition, we did bone iron prussian blue staining and what we found were consistent with that from bone iron content. Conclusions: These results provide the first clinical evidence that the bone iron content is associated with BMD.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Osteoporosis**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 37234**

**COMPARING OSTEOPOROSIS AND OSTEOPOROSIS-RELATED FRACTURES RATES, FUTURE FRACTURE RISK, AND PAST OSTEOPOROSIS SCREENING AND MANAGEMENT IN 781 MALES VERSUS 2342 FEMALES OVER AGE 45 REFERRED FOR BONE MINERAL DENSITY SCANNING IN BRAZIL**

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Background: Our primary objectives were (1) to compare the rates of osteoporosis and osteopaenia in adult Brazilian males versus females, 45 years old and over, presenting for bone mineral densitometry (BMD); (2) to compare males and females as to past osteoporosis screening, management, and future fracture risk; and (3) to identify and compare predictors of past treatment and BMD testing in the two sexes. Methods: From our clinic population, we prospectively surveyed 781 males and 2342 females  $\geq$  age 45 who had presented for BMD testing, to identify baseline demographic and clinical characteristics; risk factors for osteoporosis and osteoporotic fractures; overall osteoporosis and 10-year fracture risk; and evidence of prior assessment for and/or management/prevention of osteoporosis. Final osteoporosis risk was determined using the results of BMD testing, the FRAX<sup>TM</sup> tool, and the Brazilian version of the FRAX<sup>TM</sup> calculator. Results: No differences were noted in the rates of prior fracture, spinal fracture or long-bone fracture between the sexes, though women were more likely to have osteoporosis of the spine and femur, and had higher estimated risks of future osteoporotic fracture. Women also were significantly more likely to have received treatment for their osteoporosis and to have had prior BMD testing. Conclusions: Despite similar past fracture rates, and lower but still appreciable future fracture risk, far fewer Brazilian males than females receive prior screening or management of their osteoporosis. Whereas prior BMD screening appears to be predicted by certain clinical parameters in females, the rationale behind BMD screening seems less clear in males.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Osteoporosis**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 37000**

**MULTIDISCIPLINARY PROGRAM FOR FRAGILITY FRACTURE MANAGEMENT IN ORTHOPAEDICS. PERSISTENCE AND COMPLIANCE TO TREATMENT AFTER ONE YEAR.**

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**Objectives:** The impact of fragility fractures (FF) is a growing health care issue. In our orthopaedic department, only 12% of patients with FF were treated for osteoporosis before 2010. To close this care gap, a multidisciplinary program for FF was implemented. Patients were evaluated and prescribed an antiresorptive agent, calcium and vitamin D at the baseline visit. We wanted to evaluate persistence and compliance to treatment after 1 year. **Methods:** Between July 2010 and July 2013, we enrolled 543 patients over 40 years of age with a FF in our institutions. Patients who completed 12 months of follow-up (161 women, 23 men) had their persistence and compliance to treatment evaluated. We compared their reported perceived persistence to the prescription refills from the national health insurance drug plan database of our province. **Results:** Only 62% of the patients that sustained a FF agreed to be investigated and treated. Of these, 89.7% reported they were adherent to treatment. The national database showed that 55.8% of the patients were persistent and 38.5% were compliant to osteoporosis treatment after 12 months. **Conclusion:** It is well known that only 40-60% of the patients are still persistent and compliant to chronic disease treatment after one year. Patients in our program reported that they were persistent to treatment (89.7%). The national database showed that, in fact, only 55.8% were. Our data demonstrate that management program for FF improves diagnosis and initiation of treatment but do not improve compliance and persistence as early as 90-days after fracture.



**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Osteoporosis**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 37968**

**SACRAL INSUFFICIENCY FRACTURES IN THE LIGHT OF THE SACRAL BONE MASS DISTRIBUTION**

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**Purpose:** The number of sacral insufficiency fractures (SIF) is increasing, they present distinct fracture patterns and their treatment is challenging. The knowledge about the bone mass distribution may help developing new treatment concepts. **Methods:** We computed a statistical model of sacrum from intact pelvic Computed Tomography (CT) scans of 64 adults (29 females and 35 males, mean age 74.3 years, SD +/-13). The mean bone mass in Hounsfield Units (HU) was calculated and a virtual bone probe performed along the trans-sacral corridors. **Results:** The bone mass distribution showed distinct features: Along trans-sacral corridors, first there was a peak of high HU corresponded to cortical bone of the auricular surface. This was followed by a zone of minimal values located in the paraforaminal lateral zone also called "alar void". Intermediate values were observed in the vertebral bodies. Overall lower values were detected in S2 and in females. The largest difference in HU values between females and males was found in the vertebral bodies. **Conclusions:** The averaged bone mass distribution explain the distinct fracture patterns occurring in SIF with lowest bone mass located paraforaminally lateral. Interestingly, the largest difference in males and females was in the vertebral bodies, where conventional SI-screws are anchored.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Osteoporosis**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 37964**

**SECONDARY CAUSES FOR OSTEOPOROSIS SIGNIFICANTLY  
CONTRIBUTE TO FRACTURE RISK IN PATIENTS WITH  
OSTEOPENIA AND A RECENT FRACTURE**

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The reported prevalence of secondary causes for osteoporosis in men and women aged  $\geq 50$  years with a fracture is 35-60%, but data on these causes are scarce in patients with osteopenia and fractures. Consecutive patients of both genders aged  $\geq 50$  years presenting with a recent fracture over an 18-month period, and who had osteopenia, were evaluated using FRAX and laboratory investigations for screening for secondary causes for osteoporosis. Patients with a fracture and osteoporosis were used as controls. Of 553 patients presenting with a fracture, 30% had osteoporosis and 56% osteopenia. In this latter group median age was 66 years, male/female ratio was 1:3 and 76% had  $\geq 1$  identifiable secondary cause for osteoporosis compared to 81% of patients with osteoporosis. Mean FRAX score was 10%/3% and captured 48% of secondary causes for osteoporosis: smoking(16%), excessive alcohol use(14%), corticosteroid use(13%), rheumatoid arthritis(2%) and other secondary causes including insulin dependent diabetes, hyperthyroidism, hypogonadism and early menopause(20%). On additional laboratory investigations 45% had serum-25OHD  $< 50$  nmol/L, 11% impaired renal function (eGFR  $< 60$  ml/min), 10% monoclonal gammopathy, and 2 and 6% primary and secondary hyperparathyroidism, respectively. There was no difference in prevalence of secondary causes for osteoporosis between patients with osteopenia and osteoporosis. In patients with osteopenia, 54% of secondary causes were identified by laboratory investigations, 32% were amenable to lifestyle changes and 39% were treatable. Our findings suggest a high prevalence of potentially reversible secondary causes for osteoporosis which may contribute to fracture risk by altering bone quality in patients with osteopenia and a recent fracture.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Osteoporosis**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 37942**

**WHAT SHOULD WE DO AFTER BALLOON KYPHOPLASTY**

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Balloon Kyphoplasty has been widely applied in the treatment of elderly osteoporosis vertebral compression fracture because of its minimal invasive procedure, instant pain relief and short stay. However, the consecutive treatment post operation is under consideration for guidance in community and exercise at home. So we excogitate a comprehensive way for discharged patients, which includes a set of back and lower extremity muscle training tutored by physiotherapist, anti-osteoprosis therapeutic regimen suggested by pharmacist and follow-up by surgeon. Furthermore, a randomised controlled trial aimed to verify the effectiveness of comprehensive treatment post kyphoplasty for the OVCFs. In the study, 44 OVCF patients post operation were accepted, in which 28 were randomly allocated to an intervention group and 16 to a control group receive nothing guidance. The variation of kyphotic angle and vertebral height was measured on X-ray films, pain control was tested by VAS score, physical function by ODI, daily activity by SF-36. The complications after surgery were collected and collated during 2 years follow-up. As a result, the intervention group showed significant difference on the ODI, and Physical exercise of SF-36 compared to the control group ( $p < 0.05$ ). There's no difference on the VAS and radiological change ( $p > 0.05$ ). Refracture, as commonly recorded complication, showed a higher rate in the control group (21.3%). Conclusion: the study showed the positive effective of post operation treatment, which could improve the daily ability and decrease the refracture rate significantly based on Balloon Kyphoplasty.

**Date: 2014-11-19**

**Session: Miscellaneous: Free Papers - Osteoporosis**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 38415**

**IS ZOLEDRONATE STILL GOOD AFTER TWO YEARS? I DON'T THINK SO**

Evandro PALACIO<sup>1</sup>, Gabriel DI STASI<sup>1</sup>, Caio STAUT<sup>1</sup>, Sergio MULLER<sup>2</sup>, Trajano SARDENBERG<sup>2</sup>, Leticia OLIVEIRA<sup>3</sup>, Elisa CHEN<sup>3</sup>, Cristina CASAGRANDE<sup>1</sup>, Angelica CRUZ<sup>3</sup>, Gustavo REIS<sup>1</sup>, Luiz GONZAGA FILHO<sup>1</sup>, Erika ORTOLAN<sup>2</sup>

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**Introduction:** Zoledronate (ZA) inhibits bone resorption through osteoclasts apoptosis. In this study it was evaluated the densitometry, biomechanical and microtomographic effects of ZA on the femurs of ovariectomized rats after 12 and 24 months. **Materials:** Eighty female rats were prospectively assessed. Within 60 days animals were randomized in group O (bilateral ovariectomy) (n=40) and group S (sham surgery) (n=40). At 90 days old, groups were randomized in OZA (n=20), ODW (n=20), SZA (n=20) and SDW (n=20), according to the administration of ZA or distilled water (DW). Animals were euthanized at 12 (n=40) and 24 (n=40) months of age. The hip was selected for investigation. **Results:** At 12 months, a significant increase in bone density was observed in groups OZA and SZA compared with groups ODW and SDW ( $p<0.001$ ). Groups OZA and SZA had a significant increase in maximum load bone resistance compared with groups ODW and SDW ( $p<0.001$ ). A significant enlargement in cancellous bone volume was observed in groups OZA and SZA, compared with groups ODW and SDW ( $p<0.001$ ). At 24 months, the bone density in groups OZA and SZA was the same compared with groups ODW and SDW ( $p=0.55$ ). The maximum load bone resistance in groups OZA and SZA was the same compared with groups ODW and SDW ( $p=0.61$ ). The cancellous bone volume in groups OZA and SZA was the same compared with groups ODW and SDW ( $p=0.59$ ). **Conclusion:** Zoledronic Acid increased bone density, bone load resistance and cancellous bone volume at 12 months, but not at 24 months

**Date: 2014-11-19**

**Session: Spine: Free Papers - Spine Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: GLÓRIA**

**Abstract no.: 38371**

**COMPARISON OF OSTEOSSETM2 DEMINERALISED BONE MATRIX VERSUS AUTOGRAFT IN ANTERIOR CERVICAL DISCECTOMY AND FUSION: A PROSPECTIVE CONTROLLED STUDY**

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Study design: a prospective non-randomized controlled study. Objective: To compare the safety and efficacy of OsteoSetTM2 DBM versus autograft in patients who underwent anterior cervical discectomy and fusion (ACDF) with 2 years follow-up. Methods: From 2008 to 2010, a total of 150 patients who underwent ACDF due to cervical spondylotic radiculopathy and/or myelopathy were divided into two groups: OsteoSetTM2 DBM (n=76) and autograft (n=74). The clinical and radiographic data were compared at 1, 3, 6, 12 and 24 month post-op. Results: All patients finished 2-year follow-up. At 2-year follow-up, a significant improvement of VAS and ODI scores was noticed in both groups ( $P < 0.05$ ). Seventy-six patients in OsteoSetTM2 DBM group had a 96% fusion rates at 2-year follow-up, while 100% fusion rates were achieved for the autograft group. No adverse events related to the use of the OsteoSetTM2 DBM were observed. Conclusion: OsteoSetTM2 DBM can be used as a safe and effective graft in anterior cervical fusion.

**Date: 2014-11-19**

**Session: Spine: Free Papers - Spine Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: GLÓRIA**

**Abstract no.: 38308**

**ANTERIOR INTERBODY FUSION WITH CAGES VERSUS PLATING  
AND GRAFTING IN DEGENERATIVE CERVICAL DISC DISEASE**

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Background: Anterior cervical discectomy and fusion is the gold standard treatment for cervical disc herniation, many technical modifications have been reported since its description by Smith and Robinson and the later report by Cloward. Autologous iliac bone grafting is widely used either with or without a supplemental anterior plate, however autologous iliac bone grafts are associated with significant donor site morbidity and complications. To decrease the risk of such complications several types of interbody fusion cages have been developed recently. Methods: The study included 40 patients diagnosed with degenerative cervical disc disease, the patients divided randomly in two groups, group A: included 20 patients treated with cervical interbody fusion cage and bone graft, group B: included 20 patients treated with autologous iliac bone grafting and anterior cervical plate. Results: At the end of the follow up , the both groups had the same results as regard arm pain , 11(55%) patients had no or minimal pain, 8(40%) patients had mild pain and one patient (5%) had moderate pain. The same results of surgical outcome were achieved in both groups, 11 patients (55%) had excellent outcome, 7 patients (35%) had good outcome, one patient (5%) had fair outcome, one patient (5%) had poor outcome. Conclusion: both techniques give almost similar results without any evidence that one of them is superior to the other and both are satisfactory .Keywords: Cervical interbody fusion cage, bone graft, anterior cervical plate.

**Date: 2014-11-19**

**Session: Spine: Free Papers - Spine Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: GLÓRIA**

**Abstract no.: 37350**

**SCREW PLACEMENT STRATEGY OF TRANSORAL  
OCCIPITOATLANTOAXIAL INTERNAL FIXATION FOR  
CRANIOCERVICAL JUNCTION DISEASES**

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**Objectives:** To study the screw placement strategy of transoral occipitoatlantoaxial internal fixation for craniocervical junction (CCJ) diseases. **Methods:** 30 patients with CCJ disease (atlantoaxial dislocation, basilar invagination, and congenital CCJ deformation) were surgically treated with transoral atlantoaxial reduction plate-III (TARP-III) internal fixation in 2010. All the patients had the symptoms of neck pain, extremity anesthesia and asthesia in different degree. Preoperative imaging of all the cases showed the obvious ventral cord compression. According to ASIA score standard, 5 cases were in C grade and 25 in D. Three-dimension craniocervical models of all the cases were made according to the technique of CAD-RP for the preoperational projection. Four techniques of screw placement for TARP were adopted including C1 Lateral mass/occipital condyle complex screw, C1 lateral mass screw, transoral C2 transpedicular screw, and transoral C2 articular mass screw. **Results:** The symptoms in all the cases were improved postoperatively in different degree. Postoperative imagings showed the ideal position of internal fixation and the thorough spinal cord decompression. The classification of 8 cases improved from D to E and 5 from C to D. The D grade of 17 cases didn't change postoperatively however with the motor scores increased. At follow-up of average 7.2 months, all the cases obtained bone fusion and no complications of infection, neurological or vascular injury, or screw-loosening were observed. **Conclusions :** TARP internal fixation operation is effective for CCJ diseases with ventral spinal cord compression. The internal fixation could be strengthened by the multiple combinations of the occipitoatlantoaxial screws.

**Date: 2014-11-19**

**Session: Spine: Free Papers - Spine Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: GLÓRIA**

**Abstract no.: 37158**

**THE DESIGN, IMPROVEMENT AND PRELIMINARY APPLICATION OF JEFFERSON FRACTURE REDUCTION AND INTERNAL FIXATION PLATE (JERP) SYSTEM FOR THE JEFFERSON'S FRACTURE**

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**Objective** To introduce the preliminary clinical effect of Jefferson Fracture Reduction and Internal Fixation Plate (JeRP) System (Figure 1,2) and its improvement (Figure 3). **Methods** 8 cases of unstable Jefferson's fracture with transverse ligament of atlas intact which was approved with CT scan were underway the reduction and fixation with original self designed JeRP system through transoral approach. Follow-up was taken for all these cases. To solve the problem during the preliminary application, applicative anatomy of C1 was studied and the original JeRP was improved. The improved system was used in 4 cases of Jefferson's fracture. **Results** Oropharynx wounds got primary healing without any adverse in all the 8 cases treated with the original JeRP system. Excellent reduction and fracture healing were obtained. But, among them, lateral mass screw penetrated the atlantooccipital joint was observed in 3 cases. To solve this problem, the JeRP was improved according to the results of C1 applicative anatomy. The improved JeRP was used in another 3 cases. The results showed good with no screw penetrating the atlantooccipital joint (figure 4). **Conclusions** Transoral reduction and internal fixation with JeRP system is a good method for the treatment of unstable Jefferson's fracture, which could obtain anatomic reduction of separated anterior arch of C1 and reconstruct the stability of atlantooccipital and atlantoaxial joints. The improved JeRP can prevent the lateral mass screw penetrating the atlantooccipital joint and the motion function of the upper cervical can be reserved almost entirely.

**Date: 2014-11-19**

**Session: Spine: Free Papers - Spine Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: GLÓRIA**

**Abstract no.: 38322**

**BURST C2 FRACTURES WITH TRAUMATIC SPONDYLOLISTHESIS:  
WHEN SINGLE-SESSION SINGLE-INCISION APPROACH IS  
POSSIBLE**

**Yasser ASSAGHIR**

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A retrospective case series to define the indications, safety and efficiency of a single-incision single-session treatment of burst C2 fractures combined with Hangman's or odontoid fractures to preserve C1-C2 motion. Only a few cases of the rare burst C2 fractures were reported. The treatment options include conservative treatment, posterior fusion or combined anterior and posterior fusion. Methods: We report 6 cases combined with C2-C3 spondylolisthesis and an odontoid fracture treated with "go anterior first, you may not need to go posterior" policy. Assessment measures were self-reported (pain, and disability); physiologic (range of motion, plain x-rays, CT, and MRI) and functional (daily activities, and work status). Minimum follow-up was 36 months. All patients were treated using one-session-one-incision anterior discectomy fusion with anterior plating using 3 or 4 screws configuration. Reduction was assessed using Roy-Camille's criteria and improvement of canal compression ratio. Clinical outcome was graded excellent, very good, good, and poor according to pain; range of motion and work status. Results: Reduction was judged to be excellent in four and good in two. Four patients had excellent clinical results and two had good results. Conclusion: A single anterior approach is possible and desirable "in young patients with big bone-fragments and good bone-quality" because it proved successful in achieving union and regaining function with preservation of C1-2 motion. However, we believe that ideal management is yet to evolve.

**Date: 2014-11-19**

**Session: Spine: Free Papers - Spine Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: GLÓRIA**

**Abstract no.: 37755**

**CERVICAL HEMIAMINOPLASTY FOR CERVICAL MYELOPATHY**

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**【Introduction】** Cervical laminoplasty is one of the surgical procedure for the cervical spondylotic myelopathy, cervical ossification of posterior longitudinal ligament(OPLL)and cervical spinal cord tumor, and the good operative results have been reported. In our hospital, the hemilaminoplasty have been applied for the cervical lesions. In this series, the operative results of the cervical hemilaminoplasty is reported. **【Method】** Clinical materials are 57 operated cases . They are 46 males and 11 females. The mean age of the operation was 71.3 years old. Mean follow-up periods is 20.6 months. Clinical diagnosis are as follows; CSM 39cases, OPLL 17 cases and cervical cord tumor 1 case. The change of cervical canal space on the CT photograph before and after the operation is calculated. Mean recovery rate, mean operating time and operative bleeding volume and post-operative complications such as axial pain and C5 root palsy are reviewed **【Results】** the change of the cervical canal space is as follows. From 0.8cm<sup>2</sup> to 1.8cm<sup>2</sup> at C 3/4, 0.9cm<sup>2</sup>→2.0cm<sup>2</sup> at C4/5, 0.9cm<sup>2</sup> →1.8cm<sup>2</sup> at C 5/6 and 0.8cm<sup>2</sup> → 1.7cm<sup>2</sup> at C 6/7. Mean operating time is 2hours 18 minutes, mean bleeding volume is 355ml and mean recovery rate is 60%. Post-operative axial pain was found in 7cases and post-operative C5 root palsy in 2 cases. **【Conclusions】** The cervical hemilaminoplasty is one of the useful surgical procedure for the cervical compressive lesions because of the enlargement on the CT photograph after surgery and good operative results with less severe complication.

**Date: 2014-11-19**

**Session: Spine: Free Papers - Spine Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: GLÓRIA**

**Abstract no.: 37771**

**RESTORATION OF VERTEBRA BODY HEIGHT WITH  
TRANSPEDICULAR BONE GRAFTING IN THORACOLUMBER SPINE  
BURST FRACTURE**

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The burst fracture is the commonest fracture at thoracolumbar junction. Transpedicular screw fixation is nowadays a standard procedure to fix the fractured vertebrae. However complications of delayed significant collapse of anterior body height of the fractured vertebra and delayed failure of implant fixation are not uncommon. 26 patients of thoracolumbar spine (D10-L3) fractures were treated from July 1999 to June 2012. There were 19 male, 7 female with the age ranging from 23 to 60 years. The procedure consists of transpedicular screw fixation of one vertebra above and one below the fractured vertebra. The height of the fracture was restored with distraction. The fractured vertebral body was reconstructed with transpedicular bone grafting. Bone graft was procured from iliac crest and from removed lamina and spinous process. Surgery was performed by a single surgeon. Whole procedure is done under fluoroscopy. All patients were followed up for at least 2 years. At last follow up, all implants remained intact. All patients had improved neurologically from at least 1 to 5 grades from preoperative status. In our opinion, transpedicular fixation and bone grafting of body of fractured vertebra restore the vertebral body height; prevents delayed anterior body collapse and enhances the chances of neurological recovery in these fractures.

**Date: 2014-11-19**

**Session: Spine: Free Papers - Spine Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: GLÓRIA**

**Abstract no.: 37364**

**IS IT NECESSARY FOR ROUTINE BONE BIOPSY DURING PERCUTANEOUS KYPHOPLASTY FOR VERTEBRAL COMPRESSION FRACTURE?**

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Background: Percutaneous kyphoplasty (PKP) have been widely applied in vertebral compression fractures (VCF) , which are often considered to be caused by osteoporosis in elderly patients. The diagnosis of osteoporotic fracture is based on clinical and radiologic findings; however, it is not always the true cause: unsuspected lesion might be found by biopsy. Object: To report the rate of unsuspected lesion found in routine bone biopsy during PKP , and to estimate the cost-effectiveness of routine bone biopsy during PKP, compared with non-biopsy in the procedure. Methods: Vertebral bone biopsies were performed in 103 consecutive VCF patients during PKP operations. Histological evaluation was reported and surgical duration, blood loss , cost-effectiveness and bone cement leakage rate were compared with PKP in non-biopsy VCF patients. Results: Among 103 cases, 3 patients with history of cancer found no malignant lesion. Four cases (3.9%) found unexpected lesions, including 2 multiple myeloma, 1 Paget's disease and 1 chronic osteomyelitis. Compared with non-biopsy group, there was no difference in operation duration, blood loss and bone cement leakage rate. We need spend more CNY 19635.6625 (about 3194 US dollars) , when a positive cases was found. Conclusion:In PKP for VCF in eldly patients, routine bone biopsy and histological evaluation show its clinical value in finding unsuspected lesion, and operation duration, blood loss and bone cement leakage do not increase as well. Routine bone biopsy during PKP may be a cost-effective strategy for the treatment of elderly patients hospitalized with VCFS in China compared to non-biopsy in the procedure.

**Date: 2014-11-19**

**Session: Spine: Free Papers - Spine Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: GLÓRIA**

**Abstract no.: 36922**

**A PROSPECTIVE STUDY OF NEUROLOGICAL OUTCOME IN  
RELATION TO FINDINGS OF IMAGING MODALITIES IN ACUTE  
SPINAL CORD INJURY**

**Roop SINGH, Nishant SETIA, Sarita MAGU  
Pt. B.D. Sharma PGIMS, Rohtak (INDIA)**

Introduction: Diagnostic imaging, particularly Magnetic Resonance Imaging (MRI) plays a crucial role in evaluating and detecting spinal trauma. Aims: To correlate the clinical profile and neurological outcome with findings of imaging modalities in acute spinal cord injury (SCI) patients. Methods: Imaging (X-rays, CT, and MRI) features of twenty five patients of acute SCI were analyzed prospectively and correlated with clinical and neurology outcome at presentation, 3, 6 & 12 months. Results: Sagittal index > 10° ( $p=0.624$ ), Gardner's index > 20° ( $p=0.570$ ) and Regional kyphosis > 10° ( $p=0.1.000$ ) were observed to be associated incomplete SCI at presentation. Compression percentage was more in patients with complete injury in comparison to patients with incomplete injury and neurologically healthy patients. Quantitative MRI findings; Maximum spinal cord compression, Maximum canal compromise were found to be predictive of severity of neurological status at presentation. Qualitative MRI findings; Hemorrhage ( $p=0.044$ ), cord swelling ( $p=1.000$ ), stenosis ( $p=0.816$ ) showed a predilection towards complete injury at presentation. Improvement in canal dimensions ( $p=0.001$ ), Beck index ( $p=0.008$ ), spinal cord edema ( $p=0.010$ ) and stenosis ( $p=0.001$ ) was more significant in patients managed operatively; but it was not associated with improved neurological outcome. Cord edema was found more in incomplete injury patients. Patients presenting with complete injury improved neurologically to a lesser extent. Conclusions: It is concluded that imaging findings of severe kyphotic deformities, higher canal compression, lesion length, hemorrhage, and cord swelling are associated with poor neurological status. Initial complete injury predicts poor neurological recovery. MR images obtained in acute period significantly and usefully predict neurological outcome.

**Date: 2014-11-19**

**Session: Spine: Free Papers - Spine Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: GLÓRIA**

**Abstract no.: 37228**

**SHORT SEGMENT PEDICLE SCREW INSTRUMENTATION WITH AN INDEX LEVEL SCREW AND CANTILEVERED HYPERLORDOTIC REDUCTION IN THE TREATMENT OF TYPE-A FRACTURES OF THE THORACOLUMBAR SPINE**

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**Introduction:** The purpose of this study was to evaluate and compare the effect of short segment pedicle screw instrumentation and an intermediate screw (SSPI +IS) on the radiological outcome of type A thoracolumbar fractures (TLF), as judged by the load-sharing classification, percentage canal area reduction and remodelling. **Methods:** We retrospectively evaluated 39 patients who had undergone hyperlordotic SSPI+IS for an AO-Magerl Type-A TLF. Their mean age was 35.1 (16 to 60) and the mean follow-up was 22.9 months (12 to 36). There were 26 men and 13 women in the study group. In total, 18 patients had a load-sharing classification score (LSS) of seven and 21 a score of six. All radiographs and CT scans were evaluated for sagittal index, anterior body height compression (%ABC), spinal canal area and encroachment. **Results:** There were no significant differences between the low and high score groups with respect to age, duration of follow-up, pre-operative sagittal index or pre-operative anterior body height compression ( $p = 0.217$ ,  $0.104$ ,  $0.104$ , and  $0.109$  respectively). The mean pre-operative sagittal index was  $19.6^\circ$  ( $12^\circ$  to  $28^\circ$ ) which was corrected to  $-1.8^\circ$  ( $-5^\circ$  to  $3^\circ$ ) post-operatively, and  $2.4^\circ$  ( $0^\circ$  to  $8^\circ$ ) at final follow-up ( $p = 0.835$  for sagittal deformity). No patient needed revision for loss of correction or failure of instrumentation. **Conclusion:** Hyperlordotic reduction and SSPI+IS is a safe and effective method of type A TLF. It gives excellent radiological results with a very low rate of failure regardless of whether the fractures have a high or low LSS.

**Date: 2014-11-19**

**Session: Spine: Free Papers - Spine Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: GLÓRIA**

**Abstract no.: 37572**

**AN EVALUATION OF THE VALIDITY OF A DNA-BASED PROGNOSTIC TEST FOR ADOLESCENT IDIOPATHIC SCOLIOSIS**

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**Introduction:** The purpose of this study was to determine if Scoliscore, a DNA-based prognostic test, effectively risk-stratifies our AIS patients. **Methods:** 126 patients at two centers were administered the Scoliscore after meeting inclusion criteria (Caucasians with AIS, aged 9-13, initial Cobb angle 10°-25). After adequate follow-up, two groups were created: a progression group (Cobb>40° or fusion) and a non-progression group (skeletal maturity without curve progression). Scoliscore values and risk levels were compared between the groups. Negative and positive predictive values were calculated for low and high risk scores, respectively. **Results:** There was no significant difference in Scoliscores between patients with curve progression (107 ± 55) and those without (102 ± 62) (p=.706). Among patients with high risk scores, 26.7% had curve progression, compared to 12.9% of patients with low risk scores (p=.399). The positive predictive value (PPV) of the test was 0.27 (95% CI: 0.09-0.55) and the negative predictive value (NPV) was 0.87 (95% CI: 0.69-0.96). Scoliscores and rates of progression were not affected by brace wear. **Conclusion:** Scoliscores did not differ between patients with and without curve progression, and the negative and positive predictive values were lower in our study than the previously published validation study. This may be due to differences in our test population, such as higher acuity of practice in tertiary pediatric hospitals, genetic variability, or failure of non-progressors to follow-up. This work is the first attempt to externally validate and better understand the prognostic ability of the Scoliscore test.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement I**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 38059**

**COMPARISON OF UNILATERAL AND SIMULTANEOUS BILATERAL KNEE ARTHROPLASTY IN TERMS OF COMPLICATIONS, CLINICAL OUTCOMES AND PATIENT SATISFACTION**

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**INTRODUCTION:** Osteoarthritis of the knee is a disorder that usually affects both joints. . The **PURPOSE** of this study is to compare the results of unilateral and simultaneous bilateral operations by means of clinical results, patient satisfaction and perioperative and late complications. **METHOD:** Our study included 371 patients screened retrospectively and followed up for minimum of 2 years. Their mean age was 67.8+ - 4.3 years. 244 patients were operated bilaterally whereas the remaining 127 patients had unilateral operation. There was no difference between these groups by means of demographic features and preoperative HSS scores. These 2 groups were compared with each other according to their perioperative morbidity and mortality rate, aseptic loosening of the prosthesis clinical results and patient satisfaction. **RESULTS :** The rate of perioperative morbidities like cardiac and neurologic complications were statistically higher in bilateral group ; however deep venous thrombosis was seen more frequently in unilateral group which was statistically significant ( $p<0.05$ ). There was no significant difference between both groups by means of perioperative mortality and pulmonary emboli rate. There was also no difference in the rate of infection and aseptic loosening. Patient satisfaction and HSS Knee Score was higher among bilateral group (bilateral group 91.8 + - 8.3 unilateral group 86.7 + - 7.7) which was statistically significant ( $p<0.05$ ). **CONCLUSION:** Performance of bilateral knee arthroplasty for bilateral advanced knee osteoarthritis, simultaneously at the same time seems to be a better decision in terms of clinical results and patient satisfaction.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement I**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 37739**

**PATELLAR CLUNK SYNDROME AFTER TOTAL KNEE ARTHROPLASTY: RISK FACTORS AND FUNCTIONAL OUTCOMES OF ARTHROSCOPIC TREATMENT**

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**Introduction:** The patellar clunk syndrome is one of the leading reasons for non-revision reoperation in total knee arthroplasty (TKA). While arthroscopic debridement and risk factors have been described, there is little information regarding long-term outcomes after this complication and technical factors associated with the development of this syndrome have not been well established. The purpose of this study is to report long-term functional outcomes of arthroscopic treatment for patellar clunk syndrome and to identify technical and radiographic risk factors associated with PCS. **Methods:** From 2001 until 2012, all patients undergoing primary TKA by a single surgeon at a single institution using only posterior stabilized components were identified. All patients diagnosed and treated arthroscopically for patella clunk were identified. Follow-up was conducted using SF-12 and WOMAC questionnaires. Operative notes and immediate pre- and post-operative radiographs were reviewed. **Results:** 2271 patients underwent TKA. A total of 75 knees in 68 patients were treated arthroscopically for PCS for an incidence of 2.67%. Average follow-up was 4.2 years. 4 patients developed a recurrence at an average of 9 months. Functional scores demonstrated no statistical difference. PCS patients had a significantly more valgus preoperative alignment and significantly greater postoperative posterior femoral offset. Thicker preoperative patella, longer preoperative patellar length, and smaller patellar component size were associated with development of patellar clunk. **Conclusion:** PCS is a relatively common complication following posterior stabilized TKA. Arthroscopic treatment yields functional results comparable to control patients undergoing TKA. Both radiographic and technical factors are associated with development of PCS.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement I**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 37560**

**ANALYSIS OF FACTORS AFFECTING RANGE OF MOTION IN TOTAL KNEE ARTHROPLASTY**

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**Materials methods:** A total of 75 primary TKA were included in the study, 67 were osteoarthritis and 8 rheumatoid. CS, CR, DEEPDISH implants were studied. Patient's age > 45 years, minimum follow up period of 2 years. **Results:** 75 knees had an average pre-op flexion ROM of 87.678. After TKA they achieved an average flexion ROM of 105.538. 86.15% had more than 100 degrees flexion, and 13.84% had less than 100 degrees flexion. 69.2% of patients with average pre-op flexion less than 90 degrees had an average post-op flexion of 103.763. 30.79% of patients with average pre-op flexion of more than 90 degrees had an average post-op flexion of 109.55. 36.92% of patients with pre-op fixed flexion deformity had a post-op rom of 97.5 degrees. Average post-op flexion rom in 34 males was 108.75, 41 females- 103.65. The average post-op flexion in obese patients was 95, non-obese was 107.454. The average post-op flexion in RA patients was 96.25, and OA patients was 107.462. The post-op rom in 16 CR was 104.0625 and 39 PS was 101.052 and 20 cruciate sacrificing deep dished design was 112.5. post-op flexion versus change in ap diameter of femur did show co-relation. **Conclusion:** Average post-op ROM was 105.538. Patients with decreased pre-op ROM and FFD seem to have gained more on post-op ROM. Significant relationship noted between obesity and ROM. patients with higher pre-operative range of motion had a higher post-operative ROM. RA patients had a significant decrease in ROM compared to the OA group. Patients with increased fixed flexion deformity had a reduced ROM.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement I**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 36462**

**LONG TERM RESULTS OF ROTATIONAL HINGED IMPLANT IN  
PRIMARY INDICATIONS**

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Indications for the use of a hinged TKA design in primary indications are restricted. Objective of this study was the evaluation of a rotating linked constrained implant in primary indications. In 1993, 238 TKA's using a rotating linked constrained prosthesis were implanted in our clinic. Mean follow-up was 13.5 years, while 141 patients were available for follow-up (59%). Sixty-two patients died of unrelated causes (26%). Nineteen patients underwent a revision operation (8%) and sixteen patients (7%) were lost to follow-up. The overall survivorship in patients above 60 years was 94%, while patients younger 60 years revealed a survivorship of 77 %. Correlation between survivorship and deformity revealed in varus-alignment a survivorship of 97%, in valgus only 79%. There was no correlation between survivorship, gender, previous operations and primary diagnosis. If necessary in primary indications, rotating linked constrained implants should be reserved for patients > 60 years with a combined varus-alignment.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement I**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 38259**

**OUTCOMES OF ONE-STAGE VERSUS TWO-STAGE BILATERAL TOTAL KNEE ARTHROPLASTY**

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**Background:** This study aims to compare the functional outcomes, complications, and cost effectiveness of one-stage and two-stage bilateral total knee arthroplasty. **Materials:** Between May 2008 and May 2011, a total of 79 patients' underwent bilateral total knee arthroplasty of which 56 patients (12 males and 44 females) underwent one-stage procedure and 23 patients (10 males and 13 females) underwent two-stage procedure. The mean age was 64.4years (40-84years). The mean weight was 62.7Kg (53-76 Kg). All patients' were implanted with Gemini MK II total knee system. Patients were assessed by the Knee Society clinical scoring system (including knee score and functional scores) for clinical function, and patients' satisfaction. **Results:** Mean operating time was 188min in one-stage compared to 124min in two-stage group, mean hemoglobin level was 127.7g/l postoperatively and 87g/l postoperatively, mean length of stay was 14.4days in one-stage group and 16.2day in two stage group. There was approximately 14 times increased need for blood transfusion in the one-stage. Total hospital charges averaged \$14,178 for one-stage procedure versus \$16,666 for two-stage procedure. No statistical difference was detected between the two groups in terms of complications, Knee score, functional score, and patients' satisfaction at the final follow-up of five years. No signs of radiolucency and osteolysis were seen at bone-implant interface in both groups at the final follow-up. **Conclusion:** One-stage procedure is a safe, cost effective procedure alternative to two-stage procedure, except for increased amount of blood transfusion.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement I**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 37649**

**PROSPECTIVE RANDOMISED TRIAL COMPARING UNLINKED, MODULAR BICOMPARTMENTAL KNEE ARTHROPLASTY VERSUS TOTAL KNEE ARTHROPLASTY**

Nicholas YEO, Jerry CHEN, Shi Lu CHIA, Seng Jin YEO  
Singapore General Hospital, Singapore (SINGAPORE)

There has been increasing interest in the use of Bicompartmental Knee Arthroplasty (BCA) in patients with isolated medial and patellofemoral osteoarthritis (OA) of the knee. In this study, we compared the outcomes of patients with knee osteoarthritis who received either an unlinkd, modular BCA or TKA. 48 patients with primary knee OA involving principally the medial and patellofemoral compartments were randomized to receive either a BCA with an independent unicompartamental and patellofemoral prosthesis or TKA. Primary outcomes measured included pain scores, range of motion and various outcome scores (Knee Society Score, Oxford Knee Score, SF-36). We report outcomes at 5 years post-surgery. The intraoperative blood loss was calculated using the haemoglobin balance method. Both groups shared similar demographic and disease profiles. There was significant improvement in post-op pain and patient satisfaction scores in both groups ( $p < 0.05$ ). However, no statistically significant difference could be demonstrated between the 2 groups at 5 years. One patient in the BCA group was complicated by medial tibial plateau periprosthetic fracture requiring revision surgery. The pre-operative serum hemoglobin levels in the BCA and TKA groups were 13.10g/dl (12.68 - 13.70) and 13.15g/dl (12.55 - 14.18) ( $p > 0.05$ ), while the drop in serum hemoglobin levels post-operatively was 1.55g/dl (0.70 - 1.90) and 2.30g/dl (1.88 - 2.80) respectively ( $p < 0.001$ ). The 5-year results of our study suggest that BCA performs at least as well as TKA in selected patients with knee OA. The intra-operative blood loss was significantly lower in the BCA group.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement I**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 37640**

**INDIAN EXPERIENCE WITH THE ORTHOGLIDE KNEE  
RESURFACING: ONE YEAR FOLLOW UP**

**Sankalp SANKALP**

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Background: This study examined One Year results of patient treated by Orthoglide Medial Knee Implant. Methods: Eleven Knees of Orthoglide Knee Resurfacing performed between March 2012 to March 2013 (6 males and 5 females studied) The mean age of patient was 57.8 years (Range 50 to 70) mean follow up period was minimum one year. The Preoperative Diagnosis was unicompartmental Osteoarthritis in 11 patients. Results: The mean improvement in Oxford Knee score was from 15 (Range from 10 to 16) to 40 (Range from 35 to 46) and mean WOMAC score improved from 30 (range 20 to 36) to 85 (Range from 80 to 92) at mean follow up of 400 days. Good to excellent results obtained in all of the knees with one case of persistent anterior knee pain managed by Vissco supplementation and Knee Brace over 3 months. Conclusions: Newer designed; minimally invasive knee resurfacing implant like Orthoglide appears to be safe and can provide effective pain relief along with rapid recovery and excellent functional result suitable for Indian lifestyle as it allows squatting & sitting cross legged. This uncemented, arthroscopic, muscle sparing day care surgery provides excellent option in our hands in surgical treatment of knee osteoarthritis patients.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement I**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 36917**

**PROSPECTIVE RANDOMISED CONTROL TRIAL: COMPARING THE AGC & VANGUARD TOTAL KNEE ARTHROPLASTY**

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**Introduction:** The AGC Knee (Biomet Inc.) has been in use since 1983. Its excellent long term survivorship has been widely published (Ritter et al 2009, Swedish Arthroplasty Register 2013.) The Vanguard Knee (Biomet Inc.) system was introduced in 2003. The femoral component was designed to improve both patellar tracking and flexion with the introduction of intermediate sizes. A monobloc tibial design and a modular version are both available with a choice of finned or I beam stems. **Objectives:** The aim of our study was to assess whether the newer design of the Vanguard TKA leads to improved functional results over the AGC. **Methods:** A prospective randomised control trial was commenced in November 2011. To date 289 patients have been randomised to either an AGC or Vanguard TKA. Follow-up is from a minimum of 6 weeks to a maximum of 2 years with a mean of 12.7 months. Sixty patients have been followed up for > 2 years (30 in each group) and 126 patients (63 in each group) for > 1 year. Outcome was primarily assessed by range of movement (ROM) and by the Kujala functional knee score. **Results:** At 2 years, mean scores for ROM were 0.5 -110° for AGC and 1.2 - 118° for Vanguard. The Kujala scores were 71.2 and 68.8 respectively. The Noble & Weiss score for Gardening, Kneeling and satisfaction, OKQ, HSS & AKSS showed comparable results. **Conclusion:** As yet we have not been able to demonstrate any difference in functional outcomes between the two groups

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement II**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 38248**

**INTRAARTICULAR ADMINISTRATION OF TRANEXAMIC ACID FOLLOWING TOTAL KNEE ARTHROPLASTY: A CASE-CONTROL STUDY**

Kaveh BASHTI<sup>1</sup>, M.N TAHMASEBI<sup>1</sup>, Gh GHORBANI<sup>2</sup>

<sup>1</sup>Tehran university of medical sciences, Tehran (IRAN), <sup>2</sup>Tehran university, Tehran (IRAN)

Background: Tranexamic acid (TXA) has received extensive attention in management of blood loss in orthopedic surgeries. However, the ideal method of TXA administration is still controversial. Purpose: This study aims to determine whether intraarticular injection of TXA reduces blood loss after total knee arthroplasty (TKA). Materials & Methods: Through a retrospective case-control study consecutive TKA patients receiving intraarticular TXA (Case group) were compared with similar patients undergoing TKA using traditional blood management strategy (Control group). Hemoglobin levels (Hb) before and after the surgery, need for transfusion, and reoperation due to massive blood loss were compared between the two groups. Results: Fifty TXA patients were compared with 50 patients of the control group. There was no significant difference between the two groups in terms of age, gender, and preoperative Hb. Postoperative blood loss and transfusion rate were significantly reduced in TXA patients compared to the control group ( $p < 0.05$ ). Conclusion: Our study revealed that intraarticular administration of TXA reduces postoperative blood loss as well as need for blood transfusion in patients undergoing TKA. Keywords: Tranexamic Acid; Total Knee Arthroplasty; Intraarticular Injection; Blood Loss; Hemostasis; Transfusion

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement II**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 38275**

**LONG-TERM SATISFACTION ANALYSIS AND EXTENSIVE PROMS DATA 1 - 21 YEARS FOLLOWING TOTAL KNEE REPLACEMENT USING A CONTEMPORARY IMPLANT WITH 1147 PROCEDURES FROM AN INDEPENDENT CENTRE**

**Mathias NAGY, Graham KEYS**

**Macclesfield District General Hospital, Macclesfield (UNITED KINGDOM)**

Introduction: Total knee replacement (TKR) is a common procedure with reliable results. Patients' satisfaction with the procedure is an important outcome measure, however there is a paucity of data regarding long-term satisfaction following TKR. Methods: All consecutive TKRs performed in a single centre between 1992 and 2012 were retrospectively reviewed. One general orthopaedic surgeon performed all procedures in a District General Hospital. Patients were assessed using a detailed questionnaire investigating patients' satisfaction, knee function, general health and Oxford Knee Score. Results: 1147 consecutive TKRs were performed on 912 patients (235 bilateral procedures, 420 male and 492 female patients). One patient was lost to follow up. 702 patients were alive and 210 deceased at the time of our investigation. The average age at surgery was 71.8 years (42–93). Mean follow up was 8.2 years (1–21). 81% of patients were happy or very happy with the outcome of the procedure, 16% rated it "ok" and 3% were never happy. Average satisfaction score on a visual analogue scale (0-100) was 86 and average general health score was 69. Patients were satisfied or very satisfied regarding improvement in function in 85% and regarding improvement in pain in 91% of the cases. 84% would undergo surgery again and 92% would recommend surgery. Regarding expectation prior to TKR and outcome of surgery 80% stated that their "expectations were met", 7% "expectations not met" and 13% did not have any expectations. Conclusion: Our results demonstrate excellent long-term satisfaction with the procedure especially regarding improvement in pain.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement II**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 37312**

**IS EVERY KNEE OSTEOARTHRITIC? SPONTANEOUS AVASCULAR NECROSIS OF THE MEDIAL TIBIAL CONDYLE**

Chandrashekhar YADAV, Sanjay YADAV, Hiralal NAG, Nishikant KUMAR, Samarth MITTAL, Swapnil SINGH  
All India Institute of Medical Sciences, New Delhi (INDIA)

Introduction: Avascular necrosis (AVN) of knee is an uncommon cause of joint degeneration. AVN of tibial condyles especially the medial condyle of tibia is uncommon accounting for about 2% cases and it may mimic osteoarthritis with varus deformity. The differentiation between spontaneous and secondary osteonecrosis is important for appropriate management. Case study: A 45-year old female presented with insidious onset pain in bilateral knees with sudden increase on right side over 4 weeks. She denied any trauma or knee locking but weight bearing increased the pain. Tenderness was localized to medial proximal tibia near joint line. Varus stress test was positive. On X-rays, medial tibial condyle on right side showed significant bone loss, tibial subluxation and varus deformity with degenerative changes (Carpentier Grade III). MRI of knee showed type-B pattern (Lotke et al). T1-weighted image showed low-signal intensity in tibial plateau on medial side extending to metaphysis. T2-weighted and fat-suppressed images showed increased signal-intensity representing subchondral bone marrow edema. Surgical plan of total knee arthroplasty (TKA) was performed with standard posterior stabilized implant. Knee was balanced the knee with 8-mm polyethylene insert with cement-screw support for the medial collapsed tibial plateau. Postoperative period was uneventful. Follow-up X-ray showed well-fixed and well-aligned implant without any instability. Conclusion: The differentiation between spontaneous and secondary osteonecrosis is important for appropriate management. Whenever there is sudden clinical deterioration, such a possibility should be kept in mind.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement II**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 37547**

**COMPARISON OF TIBIAL INSERT POLYETHYLENE DAMAGE IN ROTATING HINGE AND CONSTRAINED REVISION TKA: A RETRIEVAL ANALYSIS**

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London Health Sciences Centre, University of Western Ontario, London, Ontario (CANADA)

Introduction: The objectives were to study the patterns of tibial insert damage in rotating hinge (RH) and highly constrained (HC) implants, and to identify if these implants differed as far as articular, backside, or post damage. Methods: This retrieval analysis study included 19 retrieved RH inserts and 19 retrieved HC tibial inserts. Each insert was divided into 16 damage zones and each zone was subjectively graded from a scale of 0-3 for seven different damage modes (burnishing, abrasion, cold flow, scratching, pitting, delamination and embedded debris). The maximum possible damage score by this method was 336. Results: The two groups were matched for time in vivo ( $p=0.335$ ) and body mass index ( $p=0.731$ ). The overall damage scores were comparable for the two groups (64.1 for RH vs 66.1 for HC,  $p=0.549$ ). The HC group, however, had greater post damage compared to the post-hole of RH (8.8 in RH vs 21.7 in HC,  $p<0.01$ ). The RH group had greater backside damage (16.7 in RH vs 8.2 in HC,  $p<0.01$ ). The pattern of damage was also different, with burnishing and cold flow being more common in HC group while pitting, scratching and embedded debris were more common in the RH group. Conclusions: Although the overall damage scores are comparable in both the groups, the location and pattern of damage is very different with RH inserts associated with much higher backside wear while HC inserts are prone to high-grade damage to the post of the tibial insert.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement II**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 37582**

**IMPACTION BONE GRAFTING IN PRIMARY TOTAL KNEE ARTHROPLASTY-WHEN, WHY & HOW?**

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<sup>1</sup>B L K Superspeciality Hospital, New Delhi (INDIA), <sup>2</sup>Apollo Hospital, Delhi (INDIA)

Large peripheral tibial bone defects are encountered during primary total knee replacement. In such cases structural bone grafts or wedges may not suffice. Proximal tibial vertically oriented peripheral segmental deficiencies were reconstructed using a mesh followed by impaction auto grafting. This technique is akin to revision knee arthroplasty has not been used in primary knee replacement. Materials and methods: Twelve knees(11 patients) 48-78 years) with vertical bone defects measuring > 40 % of cut tibial surface and > 2.5 cm deep were contained using a stainless steel mesh stabilised with screws ,followed by impaction autografting . Followed by cementing of the tibial component. Stem extenders are used in all. The average follow-up was 5.6 years(range 2 to 7.4 years. Results: graft union was seen in all cases with complete incorporation . Impacted autograft incorporated early in 6-12 weeks. No graft collapse, non-union, loss of fixation, implant loosening was seen in any of our cases.. Infection was not seen in any of our patients .One patient developed pes anserine bursitis which settled on conservative treatment. One had periprosthetic fracture which was plated. No tibial radiolucencies were observed .None of the knees showed features of aseptic loosening. There were no revisions. Knee society scores improved from 40 to 90 points .Average range of motion achieved was 0 degree to 128 degrees. Conclusion: It is a predictable method of reconstruction during primary total knee replacement. It preserves bone for future revisions, is more biological, cost effective as the autograft is available then and there.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement II**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 36681**

**LESS WOUND-HEALING PROBLEMS USING STANDARD SKIN SUTURES COMBINED WITH RETENTION SUTURES IN TOTAL KNEE ARTHROPLASTY: A PROSPECTIVE, RANDOMIZED STUDY**

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**Introduction:** Wound-healing problems following TKA, are potentially devastating complications, which often occur on skin overlying patellar tendon. The cause may be related to the excessive tension in this area during active motion, results in skin ischemia and hypoxia. Retention sutures are often used for skin protection to reduce tension on the wound edges. This study aims to determine whether retention sutures in TKA would reduce wound-healing problems **Methods :** This prospective, randomized study recruited 146 patients undergoing TKA between May 2012 and November 2013. Wound closure for all patients was performed with absorbable suture at the level of the arthrotomy and the subcutaneous layer. In the control group, the skin was re-approximated with staples. In the intervention group, the skin was re-approximated with staples combined with retention sutures which were placed through all layers of the anterior soft tissues of patellar tendon (Figure 1). No statistical differences were shown in any confounding variables. **Results:** A total of 126 patients were eligible for randomization. There were no wound healing problems in other areas, except for the skin overlying the patellar tendon. The rate of wound-healing problems in the intervention group was significant lower than the control group (0/63 vs. 6/63,  $p = 0.028$ ). There were dehiscence in two patients, skin-edge necrosis in two, delayed healing in one and sloughing in one. For these six patients, subsequent deep infection occurred in one patient. **Conclusion:** The present study suggests that standard skin sutures combined with retention sutures can significantly reduce wound-healing problems.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement II**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 36628**

**METAL ION RELEASE IN TOTAL KNEE ARTHROPLASTY**

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Laboratory of Biomechanics and Implant Research, Clinic for Orthopedics and Trauma Surgery, Heidelberg University Hospital, Heidelberg (GERMANY)

Failure of total-knee-arthroplasty(TKA) is mainly caused by biological reactions against wear particles. So far, wear has been mainly attributed to polyethylene (PE). However, evaluation of metal wear particles and ion release in TKA has been neglected so far, although the implants present large metal surfaces. We therefore aimed to analyse metallic wear in TKA and to study the kinetics of metal ion release. We hypothesized that relevant levels of Cobalt(Co), Chromium(Cr), Molybdenum(Mo) and Titanium(Ti) will be released. Implants were subjected to an in-vitro simulation applying physiological loadings and motions for 5 million walking cycles. Wear processes were determined gravimetrically and by measuring the release of Co, Cr, Mo and Ti ions using HR-ICP-MS. An average PE wear rate of  $7.28 \text{ mg}/10^6 \text{ cycles}$  ( $R=0.995; p \leq 0.001$ ) was determined. The cumulative release of metals measured  $1.63 \pm 0.28 \text{ mg}$  for Co,  $0.47 \pm 0.06 \text{ mg}$  for Cr,  $0.42 \pm 0.06 \text{ mg}$  for Mo and  $1.28 \pm 0.14 \text{ mg}$  for Ti. The rate of sole surface corrosion was  $0.06 \text{ mg}/10^6 \text{ cycles}$  ( $R=0.993; p \leq 0.001$ ), whereas the rate of articulation induced metal release was found to be  $0.80 \text{ mg}/10^6 \text{ cycles}$  ( $R=0.996; p \leq 0.001$ ). For other metallic implants it is well known that metal ions are able to interact with the immune system leading to immunotoxic effects (e.g.hypersensitivity/pseudotumors, etc.). To our knowledge, this is the first study that analysed the release of metallic wear in TKA in-vitro. We found that approx. 10% of the whole wear products are metallic and we believe that these particles and ions are relevant. Their effect regarding the clinical outcome of TKR will be analysed in further studies.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement II**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 37562**

**A PROSPECTIVE RANDOMIZED PLACEBO-CONTROLLED TRIAL  
STUDYING EFFICACY AND SAFETY OF INTRA-ARTICULAR  
INJECTION OF TRANEXAMIC ACID FOLLOWING PRIMARY  
UNILATERAL TOTAL KNEE ARTHROPLASTY**

Chandrashekhar YADAV, Prashant BHAVANI, Shah Alam KHAN,  
Sanjay YADAV, Samarth MITTAL

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

**Introduction:** Blood loss is a major problem with total knee arthroplasty (TKA). Tourniquet time is an important factor for post-operative blood loss which acts by triggering fibrinolysis activity. Inhibiting the fibrinolysis pharmacologically can prevent post-operative blood loss and potential complications of allogenic transfusion. Though tranexamic acid (TXA) is approved for oral/iv administration; desired mode of administration is debatable. Locally administered TXA can be more effective and safe because of the presence of drug at target site and minimal systemic absorption. **Objectives:** We propose to assess the efficacy and safety of intra-articular TXA in primary unilateral TKA. **Methods:** We did a prospective study in 50 unilateral TKA in which intra-articular tranexamic acid-1000mg/10ml [TXA-group] and 0.9% normal saline of equivalent volume [Control-group] was given in 25 knees each after closure. Efficacy was measured as fall in hemoglobin and hematocrit; blood transfusion requirement and post-operative blood collection in drain. Safety was measured in terms of Doppler ultrasonography of lower limbs to detect DVT post-operatively. **Results:** There was significant reduction in fall in hemoglobin ( $p<.002$ ) and drain collection ( $p<0.001$ ) in TXA group. There were no patients with DVT in both the groups. **Conclusions:** Intra-articular injection of tranexamic acid is effective and safe in reducing post-TKA blood loss and blood transfusion requirements.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement II**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 37504**

**TIBIAL PLATEAU FRACTURES: WILL I NEED A KNEE REPLACEMENT?**

Eleanor DAVIDSON, William OLIVER, Timothy WHITE, John KEATING  
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**Introduction:** The principal long-term complication of tibial plateau fractures is post-traumatic osteoarthritis with the usual salvage procedure being total knee arthroplasty. Our aim was to define the incidence of secondary osteoarthritis requiring arthroplasty following fracture and identify the risk factors. **Methods:** We looked at all 888 tibial plateau fractures between 1995 and 2008 in our defined population. The main outcome measure was total knee replacement. 25 patients in the population underwent arthroplasty (2.8%) after a mean of 27 months. **Results:** Split depression fractures (Schatzker II) carried the highest risk of requirement of arthroplasty, 6% and operative management of the original fracture also led to more knee replacements being performed, 4% ( $p=0.003$ ). Age over 60 and female gender were also independently associated with progression to arthroplasty. The mechanism of injury was comparable in those requiring arthroplasty and those who did not. **Conclusion:** Although tibial plateau fractures are commonly associated with degenerative radiographic changes, we concluded that the incidence of symptomatic osteoarthritis severe enough to require arthroplasty is low.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement II**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 37596**

**EFFICACY OF TOPICAL VERSUS INTRAVENOUS USE OF  
TRANEXAMIC ACID IN REDUCING BLOOD LOSS AFTER TOTAL  
KNEE ARTHROPLASTY**

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**Introduction:** Bilateral total knee arthroplasty (TKA) results in substantial perioperative blood loss with increased morbidity. Tranexamic acid (TXA) in intravenous or topical form has been found to be effective in reducing perioperative blood loss. Objective was to compare efficacy of topical versus intravenous TXA in reducing perioperative blood loss. **Methods:** In a prospective, randomized, double-blinded clinical trial in 70 patients undergoing bilateral TKA, Group 1(n=35) received equivalent dose of TXA intravenously 30 minutes prior to deflation of tourniquet of first knee and another dose repeated after 2 hours. Group 2(n=35) received topical TXA (15mg/kg in 100 ml normal saline) applied into the joint for 10 minutes at end of implant insertion. Outcome measures were total blood loss (as calculated from the difference between preoperative and postoperative day3 haemoglobin (Hb) or Hb prior to transfusion), total drain output and amount of blood transfusion. **Results:** Perioperative blood loss in group 2 ( $561.42 \pm 248.99$ ) was reduced significantly as compared to group 1 ( $1037.04 \pm 506.650$ ) ( $p < 0.001$ ). Postoperative Hb in group 2 ( $10.30 \pm 1.11$ ) was also significantly higher as compared to group 1 ( $9.66 \pm 1.47$ ) ( $p < 0.001$ ). Total drain output in group 2 ( $269.14 \pm 120.98$ ) was significantly reduced as compared to group 1 ( $574.14 \pm 269.03$ ) ( $p < 0.001$ ). Only 7 cases required blood transfusion in Group 1 and none in Group 2. There were no reports of deep vein thrombosis or pulmonary embolism in either group. **Conclusion:** Topical application of tranexamic acid significantly decreased blood loss in bilateral total knee arthroplasty by about 45% more as compared to intravenous group.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement III**

**Time: 14:00 - 15:30**

**Room: LAPA**

**Abstract no.: 38060**

**SHORT-TERM FUNCTIONAL AND RADIOLOGICAL OUTCOME OF TOTAL KNEE ARTHROPLASTY USING DISHED POLYETHYLENE WITH RESECTED POSTERIOR CRUCIATE LIGAMENT IN ASIAN POPULATION**

Prabu Vairavan PRAGASAM<sup>1</sup>, B. Mohan CHOUDHARY<sup>1</sup>, Mohan Kumar MURUGESAN<sup>1</sup>, Senthil NATHAN T<sup>2</sup>, Marios G. LYKISSAS<sup>3</sup>, Vanchi PRAVIN<sup>1</sup>, Karthik JEYACHANDRAN<sup>1</sup>

<sup>1</sup>Sri Ramachandra Medical College & Research Institute, Chennai (INDIA), <sup>2</sup>Mediclinic Welcare Hospital (University of Louisville Hospital), Dubai (Kentucky) (UNITED ARAB EMIRATES), <sup>3</sup>University of Ioannina, Ioannina (GREECE)

Resecting or preserving the Posterior Cruciate Ligament (PCL) is still a matter of debate. Both have their own advantages and pitfalls. Post-Cam or Deep dish polyethylene insert in a PCL resected knee is still questionable. Our study reviews the short-term results of Total Knee Arthroplasties (TKA) using a dish polyethylene insert with resected PCL. A two-year retrospective study of prospectively collected data of 41 knees in 40 patients. All patients had total knee replacement using a deep-dish polyethylene insert, all with PCL resected and non-patella resurfaced (Smith and nephew genesis II system) Pain and function were analyzed using Knee society scoring. At the mean follow up period of 1.7 years (Range 6-24 months), ROM has improved from preoperative mean of 70 degrees to 115 degrees ( $P < 0.03$ ). Knee society pain and function scores increased from means of 38 (Range 3-60) to 40.0 (Range 5-65) to 90 (Range 51-100) and 70.5 (Range 30-100) respectively (both  $P < 0.001$ ). Results were good or excellent in 94%. One patient reported fair because of co-existing morbidity. The use of a dish polyethylene insert in a primary total knee arthroplasty provides good to excellent short-term results. Our experience also shows that deep dish implant also obviates the need for resecting inter condylar bone thus maximizing bone volume for future revision and decreasing the risk of potential fracture. Increased jump factor also increases the stability of the joint and better kinematics.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement III**

**Time: 14:00 - 15:30**

**Room: LAPA**

**Abstract no.: 38246**

**CAUSES OF FAILURE OF HIP AND KNEE REPLACEMENT IN DEVELOPING COUNTRIES: DATA FROM EGYPTIAN COMMUNITY ARTHROPLASTY REGISTER**

Mahmoud HAFEZ, Ibrahim NADA

October 6 University, Cairo (EGYPT)

Introduction: The causes of failure in hip and knee arthroplasty in developed countries are well reported in literature. These causes are aspectic loosening, infection, instability, malalignment, periprosthetic fractures and pain. However, no such reports are available for developing countries. Methods: Data of 550 hip and knee arthroplasty procedures from the Egyptian community arthroplasty register were analyzed to identify the causes of failure from January 2007 to December 2013. The failure was identified either during the follow up of cases, which were listed in the registry as primary arthroplasty or during the entry of revision cases that their primary procedures were not listed in the registry. Results: The causes of failure were infection, questionable quality of metals or polyethylene, poor cement quality, failure of low cost implants, inadequate surgical techniques. Discussion: The surgical practice in developing countries is different, as patients present late with complex or neglected pathology. There are economic limitations reflected on the quality of implants, hospital settings, and structured training programs. Also, the risk of infection could be high as there are little or no dedicated operating rooms for arthroplasty, laminar flow with excessive use of antibiotics. Conclusion: This alarming result highlights the importance of arthroplasty registers in developing countries and call for the establishment of medical device agency to alert surgeons and health care providers.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement III**

**Time: 14:00 - 15:30**

**Room: LAPA**

**Abstract no.: 38218**

**HOW DO YOU DIAGNOSE ALLERGIC REACTION TO NICKEL IN TOTAL KNEE REPLACEMENTS?**

**David LIONBERGER**

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

**Introduction:** A more sensitive nickel testing assay called modified lymphocyte stimulation test has been more accurate for nickel sensitization. However, the question still arises as to whether nickel sensitization in total joint arthroplasty is a reality or an overly fantasized process. We studied sensitized nickel allergy patients to determine whether a relationship existed between a nickel allergic patient and failure of implants. **Methods and materials:** Patients were treated with similar implants using a Columbus or EnduRo long stem revision (Aesculap). Histologic samplings were taken of the synovium and stained both for Hematoxylin and Eosin as well as CD4 and CD8 immunologic staining techniques. These slides were read by two independent pathologists for interobservational variance comparisons and cell counts were taken accordingly in each group under each cell staining technique. **Results:** Histologic results of CD4 to CD8 in the nickel group were significantly higher than control patients. In the control group of non-nickel reactive patients, the CD8 cell line was significantly higher in concentration than CD4 cell line. There was a strong correlation in H&E staining techniques in the nickel-sensitized patients. It was not as significant when compared in the two groups between control and nickel-sensitized patients. **Discussion:** This study suggests the importance of considering nickel allergic sensitization in failed total knees where clinical and/or radiographic abnormalities do not exist. The results of this study weigh heavy the importance of considering nickel allergies as a source of clinical dissatisfaction in total joint arthroplasties.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement III**

**Time: 14:00 - 15:30**

**Room: LAPA**

**Abstract no.: 37212**

**ADAPTIVE BONE REMODELING OF THE PROXIMAL TIBIA AFTER UNCEMENTED TOTAL KNEE ARTHROPLASTY USING A NOVEL POROUS TITANIUM CONSTRUCT (REGENEREX™) INGROWTH SURFACE – A PROSPECTIVE RANDOMIZED STUDY**

Nikolaj WINTHER<sup>1</sup>, Claus LINDKAER JENSEN<sup>1</sup>, Thomas LIND<sup>2</sup>, Henrik SCHROEDER<sup>2</sup>, Claus MUNK JENSEN<sup>2</sup>, Gunnar FLIVIK<sup>3</sup>, Michael MOERK PETERSEN<sup>1</sup>

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Introduction: A novel Titanium construct (Regenerex™) was recently introduced as a highly porous surface with biomechanical characteristics is very close to that of normal trabecular bone. The aim of this study was to compare this novel construct to a well-proven porous plasma sprayed tibial (PPS) implant after total knee arthroplasty. Methods: Sixty-one patients scheduled for TKA were enrolled in a prospective randomized study and received one of two uncemented tibial components with different Coating: Regenerex™ or porous plasma sprayed (PPS). Changes in bone mineral density (BMD) of the proximal tibia were measured by DEXA postoperatively and at 3, 6, and 12 months of follow-up in three region of interest. Results: BMD in the lateral region increased significantly in both groups at 3, 6, and 12 months with p values between  $0.0001 > p < 0.03$ . The relative changes in percent were an increase of  $6.4\% \pm 11.4\%$  and  $8.1\% \pm 11.4\%$  at 12 months for the PPS and Regenerex group respectively. We measured a small increase in BMD in the medial region at all follow-ups and a small in-significant decrease in the distal region. The Knee and function scores and the subjective WOMAC score improved significantly in both groups without any differences between groups. Conclusions: The increase in BMD suggest that the novel porous titanium construct (Regenerex) and the porous plasma sprayed (PPS) implant used as tibial component in uncemented TKA has a pronounced beneficial effect with regard to maintaining periprosthetic BMD in all the regions of interest investigated.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement III**

**Time: 14:00 - 15:30**

**Room: LAPA**

**Abstract no.: 37939**

**A PROSPECTIVE RANDOMIZED COMPARATIVE STUDY OF EARLY OUTCOME IN TOTAL KNEE ARTHROPLASTY WITH SUBVASTUS APPROACH VS MEDIAL PARAPATELLAR APPROACH**

**Dinesh CHOUDARY, Vijay KISHORE REDDY  
APOLLO HOSPITAL, CHENNAI (INDIA)**

**INTRODUCTION:** The subvastus and medial parapatellar approaches are 2 commonly performed techniques in total knee arthroplasty, but the optimal approach for total knee arthroplasty remains controversial. The medial parapatellar approach in total knee arthroplasty is more common, but the subvastus approach is less insulting to the quadriceps. **METHODS:** In a prospective randomized study, we compared the clinical and radiological results of primary TKA using a mini-subvastus approach or a standard medial parapatellar approach in 100 patients. The mini-subvastus approach was used on 50 patients (group I) and the parapatellar approach on 50 patients (group II). Mean follow of patients was 24 months ( 20-36 months ) **RESULTS:** Assessment of the results of both operating approaches was based on functional, clinical Knee Society Score, and pain (visual analog scale).No statistically significant differences existed between assessed end points in both groups at 24- and 52-weeks, and 24-months postoperatively. The subvastus approach has given patients better early clinical results; however, at longer follow-up, both groups had similar outcomes. **CONCLUSION:** The subvastus approach is an alternative to the standard medial parapatellar approach in TKA which can be used with equally good results.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement III**

**Time: 14:00 - 15:30**

**Room: LAPA**

**Abstract no.: 38345**

**METAL AND CEMENT HYPERSENSITIVITY IN TOTAL KNEE ARTHROPLASTY - A REVIEW OF 33 CASES**

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**Objectives:** As the incidence of joint diseases continues to increase, an ever-growing percentage of the affected population will undergo total knee arthroplasty (TKA). Recent technological advances have produced materials improving wear resistance; however, the sensitivity response of these materials has not been fully documented. Unexplained pain and stiffness after TKA could be caused by hypersensitivity to metals or cement. **Material and Method:** We reviewed 33 patients that were presenting with unexplained pain and stiffness after TKA between May 2012 and February 2014. All patients were tested using Metal-Lymphocyte Transformation Test assays. **Results:** Mean age was 64.7±8.7 y.o. for 18 women and 15 men. Twenty-nine patients out of 33 tested positive for metal or cement hypersensitivity (mildly reactive, reactive, and highly reactive). Twenty-one patients were sensitive to Nickel (63.6%; 18.2% highly reactive), 11 patients to bone cement particles (33.3%). The majority of patients (n=19) were sensitive to 1 or 2 metals and 9 patients for 3 metals or more. **Conclusion:** Material composition of implants may affect clinical outcomes. Unexplained pain and stiffness experienced by patients with TKA might be explained by hypersensitivity to metal or PMMA cement.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement III**

**Time: 14:00 - 15:30**

**Room: LAPA**

**Abstract no.: 38348**

**DYNAMIC SPLINTING AFTER TOTAL KNEE ARTHROPLASTY. A RANDOMIZED CLINICAL TRIAL FOR IMPROVING RANGE OF MOTION**

Julio FERNANDES, Pierre RANGER, G. Yves LAFLAMME, Eros DE OLIVEIRA, Josee DELISLE, Fabiana ANTUNES  
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(CANADA)

Objective: Stretching is considered a vital therapeutic protocol to reduce contracture following a total knee arthroplasty (TKA). The purpose of this study was to evaluate the impact of the Knee Flexion Dynasplint orthosis (KFD) on range of motion (ROM) after a TKA. Methods: Sixty patients that underwent TKA were enrolled in this study. They were grouped by treatment method: Control (CG) vs. Experimental (EG). Experimental patients used the KFD 6 hours per day for 1 month. Patients were evaluated preoperatively and at 1 and 6 months post TKA using quality of life and functional outcomes. Results: At 1 month follow-up, flexion was 115.9° in the EG compared to 112.5° in the CG. At six months, EG showed a mean flexion of 127.8° compared to 123.6° in the CG. Both groups showed significant increase of ROM at 6 months compared to their respective preoperative and 1 month ( $p < 0.001$ ). There were no statistical differences between the 2 groups ( $p > 0.05$ ). Patients with a preoperative flexion  $< 100^\circ$  in both groups, had a significant difference in their ROM at 1 month (EG=107.8°; CG=92.8°;  $p = 0.02$ ) and at 6 months (EG=121.7°; CG=106.4°;  $p = 0.004$ ). Fourteen EG patients were not able to use the KFD according to the protocol due to pain and discomfort related to the KFD wear. Conclusion: Utilisation of KFD after a TKA significantly increases ROM in patients presenting a preoperative flexion  $< 100^\circ$ . Discomfort and pain due to KFD use in 46% of the EG suggest that better pain control would eventually allow better results.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement III**

**Time: 14:00 - 15:30**

**Room: LAPA**

**Abstract no.: 37989**

**NATURAL DISTRIBUTION OF THE FEMORAL MECHANICAL-ANATOMICAL ANGLE IN AN INDIAN OSTEOARTHRITIC POPULATION AND ITS RELEVANCE TO TOTAL KNEE ARTHROPLASTY**

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Restoration of the mechanical axis is an important determinant of the longevity of a total knee prosthesis and a distal femoral cut perpendicular to the mechanical axis of the femur is an crucial step in achieving this goal. Most surgeons performing conventional total knee replacement use the same distal femoral valgus resection angle for all patients. This assumes little or no variation in the femoral mechanical-anatomical angle for different patients. In this study 116 pre-operative CT scanogram hip-knee-ankle readings of 58 osteoarthritis knee patients undergoing total knee replacement were analysed. Measurements of mechanical femorotibial (MFT) and femoral mechanical-anatomical (FMA) angles were made. There were 38 women and 20 men with a mean age of 63.5 years. The mean FMA angle for the study group was 7.05° ( range 3° to 10°) There was no statistically significant difference between the FMA angle for males and females. There was a statistically significant correlation between preoperative coronal lower limb alignment and FMA angle. The median FMA angles were 5 degrees for valgus subgroup, 6° for varus deformities <10° and 7 degrees for varus deformities >10°. The results indicate a wide distribution of FMA angle in an osteoarthritic population and the use of a fixed valgus resection angle is not suitable for all patients and it may be preferable to adjust the distal femoral cut angle according to the individual patient's pre-operative FMA angle Further the current study shows satisfactory postoperative coronal alignment correction in 85% of cases after adjusting distal femoral cut angle.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement III**

**Time: 14:00 - 15:30**

**Room: LAPA**

**Abstract no.: 37952**

**RCT COMPARING THE PITHING TECHNIQUE WITH THE SUBPERIOSTEAL RELEASE FOR BALANCING IN A TOTAL KNEE REPLACEMENT**

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**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 two 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 motion 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 two years.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement III**

**Time: 14:00 - 15:30**

**Room: LAPA**

**Abstract no.: 37372**

**REDUCTION IN RISK OF JOINT STIFNESS AFTER KNEE ARTHROPLASTY BY PREOPERATIVE PATIENT EDUCATION**

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Introduction: Joint stiffness (JS) after total knee replacement (TKR) with pain and decreased range of motion may be extremely disabling. As well-established postoperative stiffness is difficult to treat effectively and associated with a high treatment risk profile, new approaches to prevent postoperative stiffness and optimal treatment programs are current challenges. Methods: During a 4-year period, 665 OA patients were treated by unilateral TKR. All patients were offered a 4 hour preoperative course. If flexion was less than 90 or extension deficit more than 10, manipulation under anaesthesia (MUA) was performed after 8-12 weeks (N=36). At follow-up (1-5 years) the groups (+/- MUA) were compared as regards risk factors and long term results. Results: Attending the preoperative patient education reduced dramatically the risk of JS by a factor 6 (OR 0.16 (0.004-0.73)  $p < 0.001$ ). Other significant risk factors were previous knee surgery (OR 6.62 (1.37 - 32.08)  $p < 0.01$ ) and high preoperative Knee Society Function Score (OR 0.94 (0.91-0.98) for every 1 increase,  $p < 0.05$ ). At follow-up, quality of life and Oxford Knee Score (OKS) after MUA were equivalent to patients without JS. (EQ-5D 0.768 and 0.820 respectively,  $p = 0.46$ . OKS 26.63 and 23.35, respectively,  $p = 0.23$ ) Conclusions: JS after TKR was treated effectively by MUA at 8-12 weeks followed by adequate pain management and rehabilitation. The risk of JS was reduced by a factor 6 by preoperative patient education, suggesting a significant psychological effect on postoperative pain and mobilisation.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement III**

**Time: 14:00 - 15:30**

**Room: LAPA**

**Abstract no.: 37198**

**COMPARISON OF A NOVEL POROUS TITANIUM CONSTRUCT (REGENEREXTM) TO A WELL PROVEN POROUS COATED TIBIAL SURFACE IN CEMENTLESS TOTAL KNEE ARTHROPLASTY. A PROSPECTIVE RANDOMIZED STUDY**

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Background: Regenerex is a novel porous titanium construct with a 3-dimensional porous structure and biomechanical characteristics close to that of normal trabecular bone. The aim of this study was to compare this novel construct to a well-proven porous plasma sprayed tibial (PPS) implant after total knee arthroplasty. Methods: Sixty-one patients scheduled for a TKA were randomized to receive either the novel titanium construct or the PPS tibial component. Radiostereometric analysis of the tibial components was performed postoperatively at three, six, and twelve months. Maximum total point motion (MTPM) and segment motion of the implant were analyzed. Results: Knee and function scores as well as the WOMAC score improved significantly from preoperatively to 1-year follow-up. Maximum total point motion (MTPM) between 6 and 12 month was 0.1mm in the Regenerex group 0.06 mm in the PPS group with a total migration during the first year of 1.67mm versus 1.51 mm respectively. The dominant mode of migration in both groups was subsidence, external rotation and posterior tilt. Conclusion: We found no statistically significant differences between the two groups regarding MTPM, rotation or translation along X-, Y- and, Z-axes. If we excluded a group of high migrators (n=10), where high migration could partly be explained by insufficient bone support, the MTPM in both groups could be reduced to approximately 1mm, close to that of cemented implants. The novel titanium construct looks promising with the majority of migration appearing during the first 3 months showing a stable migration pattern.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement IV**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 37586**

**DIFFICULTIES IN RESTORATION OF THE KNEE JOINT LINE ORIENTATION IN HIGHLY DEFORMED KNEES DURING TOTAL KNEE ARTHROPLASTY**

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**Aim:** To compare changes in knee joint line orientation with total knee arthroplasty (TKA) in respect of the preoperative amount of varus deformity. **Methods:** Sixty knees of 59 patients (30 knees with minor deformity in mechanical axis preoperatively ( $<20^\circ$ , group 1), and 30 knees with major deformity ( $>20^\circ$ , group 2)) who had TKA between November 2005 and February 2014, were included. Mechanical axis, femoral and tibial component positioning, and their orientation relative to the floor were evaluated in postoperative X-rays according to the American Knee Society Radiographic Evaluation System. The influence of the degree of deformity on orientation of joint line was evaluated. Statistical analyses were performed utilizing SPSS v18. **Results:** Mean mechanical axes were  $11,13^\circ \pm 4,07$  in group 1 and  $22,60^\circ \pm 2,24$  group 2 pre-operatively and  $3,32^\circ \pm 2,5$  in group 1 and  $4,65^\circ \pm 4,02$  in group 2 postoperatively ( $p=0,136$ ). Femoral and tibial component positioning did not differ significantly between two groups but orientation of tibial and femoral components relative to the floor did. Orientation angle of tibial component was  $4,73^\circ \pm 2,58$  in group 2 whereas  $3,07^\circ \pm 1,77$  group 1 ( $p=0,005$ ). Orientation angle based on femoral component was  $5,24^\circ \pm 2,36$  in group 2 but  $3,69^\circ \pm 1,87$  in group 1 ( $p=0,007$ ). In highly deformed knees joint line obliquity was greater after TKA. **Conclusions:** In highly deformed knees routine instrumentation is less reliable due to soft-tissue contractures and release procedures. Even if mechanical axis restoration is possible, it does not guarantee the final component position.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement IV**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 37443**

**TEN YEAR SURVIVORSHIP OF PRIMARY KNEE ARTHROPLASTIES  
IN A STANDARD NHS POPULATION**

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Howie COLIN<sup>1</sup>

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Expectations of patients requiring knee arthroplasty surgery have become higher than in the past, with more strain being put on modern prostheses by fitter and younger patients. The objective of this study was to analyse the survivorship of primary knee arthroplasties at a minimum of ten years, with end points of revision and death. Patients who had a total (TKA) or unicompartmental (UKA) knee arthroplasty performed at a university teaching hospital were identified from the local arthroplasty database. Electronic and operative records were analysed to determine parameters including operative indication, subsequent revision surgery, and patient mortality. Results were collated and analysed using PASW software. A total of 1023 patients were recruited, with 566 (55%) female and 457 (45%) male. Minimum follow up was 10.1 years, with an average of 12.1 years (S.D 0.87). 64.9% of patients were alive at follow up, with an average age of 79.7 years (S.D 8.7). 92.8% were operated on for osteoarthritis (OA), 6.6% for rheumatoid arthritis (RA) and 0.6% for other indications. Kaplan–Meier analysis estimated survival of 94% (S.D 0.008) at eleven years, with no statistical difference found in survivorship of knees operated on for OA or RA. Similarly no statistical difference was found between survivorship of UKA or TKA implants ( $p=0.43$ ) using ANOVA. Of those that died by follow up, 95.2% did so with their original implant. We conclude that both TKA and UKA offer a lasting solution for patients, with excellent outcomes achieved in both rheumatoid and osteoarthritic patients.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement IV**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 37260**

**EFFICACY AND MIDTERM RESULTS OF LATERAL PARAPATELLAR APPROACH WITHOUT TIBIAL TUBEROSITY OSTEOTOMY FOR PRIMARY TOTAL KNEE ARTHROPLASTY IN FIXED VALGUS KNEES**

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<sup>1</sup>BRJ Orthocentre, Coimbatore (INDIA), <sup>2</sup>Sagar hospitals, Bangalore (INDIA)

Performing Knee arthroplasty in valgus deformity through medial approach for moderate to severe fixed deformities can be difficult and challenging. The lateral parapatellar approach, despite providing direct access to pathological area, is generally not preferred because of the need for tibial tuberosity osteotomy, fear of inadequate closure of lateral prosthetic joint and technical difficulty. We performed modified lateral (keblish) approach which consisted coronal z plasty of lateral retinaculum, quadriceps snip, titrated sequential lateral release and closure with expanded lateral structures in 32 arthritic fixed valgus knees. In 30 knees, either tendon of popliteus or lateral collateral ligament or both could be preserved. At an average follow-up of 5 years, the valgus alignment improved from 25.4° (11° - 60°) to 4° (0 - 10°) and knee society score improved from 34 to 95 points. There was no late instability or revisions. There was no patellar maltracking. The inherent benefits of lateral approach in valgus knees can be reaped with expansile lateral approach without the complications and technical difficulties associated with tibial tubercle osteotomy. This approach is rational, eliminates patella maltracking, applicable in severe deformities and with titrated release, can preserve the posterolateral knee stabilizers that are necessary for long term implant survival.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement IV**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 37272**

**ACCURATE BALANCING IN TOTAL KNEE REPLACEMENT IS JUST A NEEDLE AWAY!**

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Varus knees have traditionally been balanced using the subperiosteal release of the medial soft tissue sleeve. Medial pithing technique of MCL as described by Bellemans helps in accurate controlled balancing while performing a total knee arthroplasty in varus knees. Medial pithing technique was used in 26 varus knees in patients between the ages of 45-77 years operated over period of three months. The mean varus deformity was 18 degrees (8-22 degree). Valgus deformity and complex primary Knees were not included. After the bony cuts were done, to achieve accurate balancing of the MCL the joint was distracted using two lamina spreaders and the medial and lateral joint space was measured in extension and flexion using scales. The MCL was palpated with a finger and an 18 gauge needle was used for pithing the MCL. Pithing was done upto 5 times at a go into the most tight part of the MCL. Accurate balancing was achieved in all 26 patients.. MCL pithing alone was sufficient to accurately balance in 24 cases. One case with severe varus deformity (varus > 22 degree) and one case with very tight medial structure required additional subperiosteal release. All were followed for 2 years. Medial pithing technique of MCL using an 18 gauge needle is an accurate way to balance soft tissues around the knee without compromising the integrity of the MCL. It prevents the danger of over release of the MCL using a periosteal elevator.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement IV**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 37452**

**THE PREVALENCE OF STIFFNESS FOLLOWING PRIMARY TOTAL KNEE ARTHROPLASTY (TKA)**

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**Introduction:** The primary aim of this study is to determine the prevalence of stiffness following primary total knee arthroplasty (TKA). The secondary aim is to evaluate the results of manipulation under anaesthesia (MUA) for stiffness following TKA. **Methods:** A retrospective review of all cases of TKA over a 30 month period was conducted at our institute. Demographic data, pre and post-operative range of movement (ROM), ROM at MUA, ROM at follow up after MUA and duration between TKA and MUA were recorded. **Results:** A total of 1350 patients underwent a primary TKA during the study period. The prevalence of stiffness following TKA was 2.44% (n=33) with 2.3% (n=31) of patients requiring a MUA. The mean flexion was 55.7 degrees before MUA, 100.7 degrees intra-operatively and 93.8 degrees at follow up after. The mean improvement of the ROM from pre MUA to intra-operative was 52.04 degrees ( $p<0.001$ ) and the mean improvement from pre MUA to follow up after was 43.81 degrees ( $p<0.0001$ ). There was also a statistically significant difference ( $P<0.021$ ) in improvement for MUA done before 8 weeks (58.6 degrees) compared to those that were done after 8 weeks (25.5 degrees). **Conclusion:** The prevalence of stiffness following TKA in our series was 2.4%. MUA was a satisfactory treatment option with better results observed if performed within 8 weeks of the primary operation.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement IV**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 37648**

**IMPLANT DESIGN ENHANCES PATIENT OUTCOME FOLLOWING  
TOTAL KNEE ARTHROPLASTY: A PROSPECTIVE DOUBLE BLIND  
RANDOMISED CONTROLLED TRIAL**

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PATTON, Colin HOWIE, Matthew MORAN, Paul GASTON  
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Total Knee Arthroplasty (TKA) is an established and successful procedure. Despite this, implant designs are consistently modified by the manufacturers in attempt to optimise patient function and outcomes. The aim of this study was to determine if patient outcome following total knee arthroplasty could be influenced by the design of the prosthesis employed. 212 patients were enrolled to a single centre double blind trial and randomised to either Kinemax (group 1) or Triathlon (group 2) total knee replacement. Patients were assessed pre-operatively, at 6 weeks, 6 months, 1 year and 3 years post-surgery. Outcome assessments were the Oxford Knee Score, range of motion, pain numerical rating scales, lower limb power output, timed functional assessment battery and satisfaction survey. Data was assessed incorporating change over all time points, using repeated measures analysis of variance (ANOVA) longitudinal mixed models. Significance was accepted at  $p=0.05$ . Implant group 2 displayed significantly greater range of motion ( $p=0.009$ ), lower limb power output ( $p=0.026$ ) and worst daily pain report ( $p=0.003$ ) over 3 years follow-up. Differences in Oxford Knee Score ( $p=0.09$ ), average daily pain ( $p=0.57$ ) and timed functional performance tasks ( $p=0.23$ ) did not reach statistical significance. Satisfaction with outcome was significantly enhanced in group 2 ( $p=0.001$ ). These results suggest that patient outcome following knee arthroplasty can be influenced by the prosthesis employed, and that modern designs may enhance function compared to previous models.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement IV**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 37550**

**HI-FLEXION TOTAL KNEE REPLACEMENT - DOES IT WORK?**

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**Introduction:** Range of flexion is important factor used to determine success after TKR. Though Flexion up to 110° allows all activities of the daily living but cultural and religious activities like squatting, kneeling and cross-legged sitting require up to 165° of flexion. Hi-flex designs are supposed to achieve that, but do they do so? **Material & methods:** Total 84 patients (38 M, 46 F), Average age- 62 years (Range 50-73). Bilateral TKR in 61, unilateral in 23, total 145. All patients underwent Genesis II TKR with Hi-flex insert. 56 patients had mean fixed flexion deformity of 18° (range 5°-50°). 25 knees have preoperative range of flexion up to 80°, 56 up to 100° and rest more than 100°. There was no comparison group in the current study. **Results:** 26 patients achieved flexion up to 110° and rest achieved more than 110°. Average gain in ROM was 28° (range 0°-50°). Patients with pre-operative ROM ≤ 90° achieved more gain in flexion: 30° Vs. 23° for patients with pre-operative ROM > 90°. Knee Society Knee Score improved from an average of 9.4 to 85.98 and Functional Knee Score improved from an average of 13 to 76. Patients with bilateral TKR had better post-operative Functional Knee Score of 84 vs. 68 for patients who had unilateral TKR. **Conclusions:** Current study shows significantly higher flexion in patients undergoing high flexion TKR Vs. standard designs but little improvement in functional outcome with high flexion implants compared to traditional implants when compared with results with standard design published in literature.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement IV**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 36772**

**IS IT POSSIBLE TO USE SEMI CONSTRAINED CRUCIATE  
RETAINING TOTAL KNEE ARTHROPLASTY IN RHEUMATOID KNEE  
WITH DEFORMITY OR WE HAVE TO USE SEMI CONSTRAINED  
POSTERIOR STABILIZED TKA?**

Dariush SAVADKOOHI, Mersad MOOSAVI, Babak SIAVASHI, Arash  
ALIREZAEI

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One of the problems in developing countries is obligation to use one type of prosthesis and also we are not able to prepare all of the versions of TKA systems in the operation room. In this study we had to use CR semi constrained TKA instead of PS TKA in the cases of rheumatoid knee with deformity. In this study in a retrospective manner about 5 years, we reached this hypothesis that there are not significant difference in insall score in post operation follow up between CR and PS TKA in the cases of rheumatoid knee with deformity and when we assess the system of semi constrained prosthesis, we found that tibial insert with special curvature and depth act as PS TKA.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement IV**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 37806**

**COMPARISON OF PAIN IN BILATERAL TOTAL KNEE REPLACEMENT WITH OR WITHOUT TOURNIQUET AT A TERTIARY LEVEL CENTER**

Chandrashekhar YADAV, Swapnil SINGH, Sanjay YADAV, Nishikant KUMAR, Samarth MITTAL

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

Introduction: Tourniquet pain is one of the most intriguing pains which is cause of concern for orthopaedic surgeons. The purpose of this study was to evaluate the hypothesis that tourniquet is associated with more postoperative thigh pain. Methods: Patients undergoing simultaneous bilateral primary TKRs were included. Patients with cardiac or neurologic comorbidities were excluded. All patients received TP(tourniquet pressure)- 100mmHg plus systolic blood pressure(SBP) on one thigh(thigh-1) and no tourniquet on other thigh(thigh-2). The thigh which received tourniquet was randomized by tossing a coin. Tourniquet cuff used was 85cmX8.5cm in size. One cotton soft-roll was applied between skin and cuff. All surgeries were performed sequentially by same surgical team with standard technique under combined spinal-epidural anaesthesia. No Esmarch bandage was used. It was released after wound closure and compressive dressing. Post-operatively, analgesia was given with epidural morphine. Thigh pain was evaluated with Visual Analogue Scale. Result: Twenty eligible patients having simultaneous bilateral primary TKAs were included. There were 7-men and 13-women with mean age-58years(range:45-69). Left thigh had TP-SBP+100mmHg (9-patients) and right in 11. There were no statistical differences in tourniquet times in both thighs(thigh-1= 68.35±3.75minutes;thigh-2= 69.1±3.04minutes). There were statistically significant differences in VAS score between thigh-1 and thigh-2 on the first(0.001), second(0.001), Third(0.001) and 2-week(0.01) post-operatively. We did not find statistical significant difference at 6-weeks after surgery. Conclusion: Pain relief in the immediate postoperative period following TKA is crucial in facilitating early recovery. Prompt patient satisfaction will avoid a delay in physical therapy and will reduce hospitalization time.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement IV**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 38347**

**MULTIMODAL STRATEGIES FOR BLEEDING MANAGEMENT IN TOTAL KNEE ARTHROPLASTY**

Julio FERNANDES, Josee DELISLE, Andreea BANICA, Cynthia GRAMMONT, Pierre RANGER, Yves LAFLAMME  
Hopital du Sacre Coeur de Montreal, Montreal (CANADA)

**Objectives:** Risk factors associated with blood transfusions are low haemoglobin levels, blood volume, comorbidities, and bilateral total knee replacement (TKR) among others. Mean blood loss after a TKR is 1.495 ml. The goal of this study was to evaluate simple, cost-efficient measures that could decrease blood transfusion rates after a TKR. **Method:** One-hundred-and-one subjects underwent TKA between June 2012 and January 2013. Of these, 71 (Before blood management group, BBM) had no pre-operative management of their haemoglobin levels; were under a liberal transfusion protocol triggered when Hb levels were less than 7g/dL. The other 30 patients (after blood management group, ABM) were under a blood management protocol that included haemoglobin levels higher than 13g/dL before surgery, no automatic triggers for transfusion, multidisciplinary evaluation of co-morbidities and clinical symptoms before blood transfusions were prescribed. We compared blood loss during surgery, pre and post op haemoglobin levels, and number of blood transfusions. **Results:** Perioperative blood loss was lower in the ABM group ( $195.3 \pm 131.5$  vs.  $304.2 \pm 136.5$ ,  $p=0.000$ ). Pre-operative haemoglobin levels of the BBM group ( $129.8 \pm 14.9$ ) were lower than the ABM group ( $142.9 \pm 11.6$ ) ( $p=0.000$ ). Although post-op Hb levels were similar in both groups ( $9.6 \pm 1.3$  vs  $9.1 \pm 1.1$ ), there were no blood transfusions in the ABM group, whereas 36.6% of the BBM group were transfused ( $p=0.000$ ). **Conclusion:** Patients less than 65 years old with pre-operative haemoglobin level greater than 13.5 g/dL had lower than 3% transfusion risk. Better preoperative risk assessment, preoperative preparation and proper postoperative management are cost-effective, easy measures to implement.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement IV**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 36765**

**KINEMATIC TOTAL KNEE ARTHROPLASTY**

Zaid BAHHO, Peter MCEWEN

Orthopaedic Research Institute of Queensland (ORIQL), Townsville  
(AUSTRALIA)

**Introduction/Aims:** Kinematic alignment in total knee arthroplasty (TKA) ignores coronal alignment but restores the primary kinematic axis of the knee to its pre-morbid state. The current gold standard for TKA is computer assisted mechanically aligned TKA. This paper examines positional data and early clinical results of 25 kinematically aligned TKAs with a cohort of computer assisted mechanically aligned TKAs. **Methods:** Between August 2011 to September 2012, 115 TKAs in 100 patients were performed with the same fixed bearing, single radius, cruciate-retaining prosthesis (Stryker Triathlon). 24 patients (24 knees) underwent kinematically aligned TKA as part of the Australian Shapematch Clinical Trial. The Stryker Precision Navigation System was employed to record positional data. The remaining patients underwent mechanically aligned TKA using the same navigation system. Intra-operative measurements of femoral and tibial resections, component alignments, overall limb alignments, and knee kinematics were recorded. Data was collected prospectively. **Results:** The mean coronal limb alignment for the kinematically and mechanically aligned knees was  $-0.3^{\circ}$  and  $-0.6^{\circ}$  respectively. Nine of 24 limbs in the kinematic group and five of 91 in the mechanical group had coronal alignment greater than three degrees from neutral. The mean femoral component rotation relative to the transepicondylar axis was  $4.2^{\circ}$  (internally rotated) in the kinematically aligned knees and  $-0.2^{\circ}$  in the mechanically aligned knees. The OKS was similar in both groups. **Conclusion:** Femoral rotation is the positional parameter of greatest deviation between kinematically and mechanically aligned TKAs. Early outcomes are at least equivalent to the currently accepted gold standard.

**Date: 2014-11-19**

**Session: Knee: Free Papers - Knee Replacement IV**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 38083**

**TOTAL JOINT ARTHROPLASTY IN TRANSPLANT RECIPIENTS: IN-HOSPITAL ADVERSE OUTCOMES**

Victor Hugo HERNANDEZ, Priscill CAVANAUGH, Mohammad RASOULI, Antonia CHEN, Mitchell MALTENFORT, Zachary POST, Zachary OROZCO, Alvin ONG

The Rothman Institute at Thomas Jefferson University, Philadelphia (UNITED STATES)

Introduction: The increase in patients undergoing organ transplantation along with their improved survival has increased the number of transplant recipients undergoing total joint arthroplasty (TJA). This study aims to determine in-hospital complications in transplant recipients undergoing TJA. Methods: The Nationwide Inpatient Sample database was queried for patients coded for history of transplant and hip or knee arthroplasty (primary or revision) over the period of 1993-2011. Approximately 0.19% of TJA cases had at least one transplant with kidney transplants as the largest group. Logistic regression was used to analyze data. Results: Kidney transplant significantly increased the risk of periprosthetic joint infection (PJI) (odds ratio (OR)=2.05,  $p<0.05$ ), systemic infection (OR=2.95,  $p<0.05$ ), deep venous thrombosis (DVT) (OR=2.11,  $p<0.05$ ), acute renal failure (ARF) (OR=3.61,  $p<0.05$ ), respiratory (OR=1.37,  $p<0.05$ ), and cardiac (OR=1.22,  $p<0.05$ ) complications. Liver transplant was significantly associated with PJI (OR=2.33,  $p<0.05$ ), respiratory complications (OR=1.68,  $p<0.05$ ), cardiac complications (OR=1.34,  $p<0.05$ ), and ARF (OR=4.49,  $p<0.05$ ). Heart transplant increased risk of wound complications (OR=2.05,  $p<0.05$ ), respiratory complications (OR=1.91,  $p<0.05$ ), and ARF (OR=4.74,  $p<0.05$ ). Lung transplant was associated with respiratory complications (OR=3.37,  $p<0.05$ ), and ARF (OR=6.10,  $p<0.05$ ). Bone marrow transplant was associated with cardiac complications (OR=1.56,  $p<0.05$ ), and ARF (OR=4.31,  $p<0.05$ ). Pancreas transplant was not statistically associated with complications. There was no significant difference between transplant and non-transplant groups regarding the incidence of pulmonary embolism. Conclusion: It seems that transplant patients might be at increased risk of in-hospital

**Date: 2014-11-20**

**Session: Spine: Free Papers - Spine**

**Time: 16:00 - 17:30**

**Room: SÃO CONRADO**

**Abstract no.: 38457**

**COMBINED ANTERIOR AND POSTERIOR VERSUS ALL POSTERIOR APPROACH FOR SURGICAL TREATMENT OF THORACOLUMBAR TUBERCULOSIS: AN ANALYSIS OF OUR OUTCOMES**

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<sup>1</sup>Kenyatta National Hospital, Nairobi (KENYA), <sup>2</sup>University of Nairobi, Nairobi (KENYA)

Background: Posterior approaches to the spine were the first to be established. Today it is possible to perform anterior spinal surgery with acceptable safety. The versatility of these approaches have proponents and opponents in equal measure. The aim of present study is to compare our outcomes of (A) combined anterior and posterior versus (B) all posterior approach to debridement interbody fusion and pedicle screw fixation for the surgical treatment of thoracolumbar tuberculosis. Materials and Methods: Fifty seven patients (23 females, 34 males; mean age: 36.7 years, range: 17-67 years) were retrospectively reviewed. Mean follow-up time was 67.9 (range: 36 to 120) months. 32 cases (A), 25 cases (B), various parameters were assessed. Results: Mean surgical time in (A) was 3 hours 10 min versus 2 hours 45 min in (B) ( $P>0.05$ ). Average blood loss in group (A) was 1300 ml compared to 1000 ml in group (B) ( $P>0.05$ ). In (A), correction in kyphosis was 81.25%, 76% in (B). Bony fusion 93.75% in, A; 92% in (B). Two in (A) needed prolonged immediate postoperative HDU admission none in (B). Average postoperative hospital stay was 10.2 days in group A and 9.9 days in group (B). There was no significant difference in degree of neurological improvement in (A) & (B) ( $p = 0.266$ ). Conclusion: Both approaches; are good methods for debridement, stabilization and in producing significant neurological recovery, even though, (A) appeared superior in kyphosis correction but inferior to (B) in morbidity.

**Date: 2014-11-20**

**Session: Spine: Free Papers - Spine**

**Time: 16:00 - 17:30**

**Room: SÃO CONRADO**

**Abstract no.: 36952**

**EVALUATION OF BEHAVIOR OF SPINAL DEFORMITIES IN TUBERCULOSIS OF THE SPINE**

**Roop SINGH, Narender Kumar MAGU**

**Pt. B.D. Sharma PGIMS, ROHTAK (INDIA)**

Introduction: Spinal tuberculosis is the most common cause for a kyphotic deformity in many parts of the world. Material: We observed the behavior of spinal deformities during initial two years in 50 adult patients treated for spinal tuberculosis. Average vertebral height loss (AVHL), Deformity Angle, Kyphosis/lordosis angle and Lumbosacral joint angle (LSJA) at final follow-up were compared with the values at initial presentation. The relationship between the amount of initial vertebral body loss and final kyphotic angle was analyzed. Results: AVHL, Deformity Angle, Kyphosis/lordosis angle and LSJA initially were 0.26, 12.51, 2.26 and 12.3; and final values were 0.7, 17.8, 5.64 and 10.8 respectively. Increase was extremely significant for deformity and kyphotic angles in thoracic and thoracolumbar regions during first two years of the disease process (p value 0.0006); but the increase in lumbar & Lumbosacral regions was significant only in the initial six months (p value 0.01). We could not find correlation between initial VBL and final kyphotic angle ( $r = 0.302$ ;  $p > 0.05$ ). Conclusions: Tubercular deformity of the spine is more pronounced in dorsal spine and least in the lumbar spine. It may be due to various anatomical and biomechanical reasons (size of vertebral body, facet joints orientation, and normal kyphosis in the dorsal spine; wedge vs. telescoping collapse and subsidence). Moreover, with healing of tuberculosis normal lordosis might be regained in the lumbar and lumbosacral spine. Kyphotic deformity keeps on increasing even after 6 months of antituberculous treatment, and it does not correlate with initial VBL.

**Date: 2014-11-20**

**Session: Spine: Free Papers - Spine**

**Time: 16:00 - 17:30**

**Room: SÃO CONRADO**

**Abstract no.: 38398**

**SURGICAL TREATMENT OF LUMBAR SPINE INFECTIONS BY POSTERIOR LUMBAR INTERBODY FUSION WITH ANTERIOR RECONSTRUCTION BY SPINAL SHORTENING**

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Sohag (EGYPT)

There are few reports on the treatment of lumbar spondylodiscitis using posterior lumbar interbody fusion (PLIF) and pedicle screw fixation. None of these reports utilized spinal shortening for anterior spinal reconstruction. Twenty –two patients of lumbar spine infections were treated by PLIF and reconstruction of the anterior defect was performed by spinal shortening. No anterior bone graft was used. The patients' mean age was 56.5 years. Levels affected were L1-2 in 3 patients, L2-3 in 5 patients, L3-4 in 2 patients, L4-5 in 9 patients, L5-S1 in 2 patients and double levels affection (L4-5-S1) in one patient. Localized spinal deformity (local lordotic angle) was measured as the angle between the upper and lower end plates of the affected vertebral levels. The angle is expressed as (+) if lordotic and (-) if is kyphotic. Operative time ranged between 110-180 minutes. Mean follow up was 35.8 months. Mean pre-operative local lordotic angle was 2.5° (range; + 30° to - 10°) improved post-operatively to a mean of 10.04° (range; +35° to -10°). The difference was statistically significant. At the end of follow up, the mean local lordotic angle was 9° (range; + 33° to - 11°). Post-operative functional outcome was graded as excellent in 9 patients, good in 10 patients, fair in 2 patients and poor in one patient. PLIF utilizing spinal shortening for reconstruction of anterior defect is a good option for management of spinal infections in lumbar spine

**Date: 2014-11-20**

**Session: Spine: Free Papers - Spine**

**Time: 16:00 - 17:30**

**Room: SÃO CONRADO**

**Abstract no.: 37576**

**TITANIUM SPINE IMPLANTS ARE NOT ASSOCIATED WITH LOWER INFECTION RATES**

David ROYE<sup>1</sup>, Margaret WRIGHT<sup>1</sup>, Hiroko MATSUMOTO<sup>1</sup>, Regina WOON<sup>2</sup>, John FLYNN<sup>3</sup>, Michael VITALE<sup>1</sup>, David SKAGGS<sup>2</sup>

<sup>1</sup>Columbia University Medical Center, New York (UNITED STATES),

<sup>2</sup>Children's Hospital Los Angeles, Los Angeles (UNITED STATES),

<sup>3</sup>Children's Hospital of Philadelphia, Philadelphia (UNITED STATES)

**Introduction:** The purpose of this study was to determine the effect of implant metal composition on the rate of Surgical Site Infection (SSI) following pediatric spine deformity surgery. **Methods:** This was a retrospective case control study of patients who underwent spinal instrumentation from 2006-2008 at three large children's hospitals. All etiologies of scoliosis and procedure types were included, but patients undergoing insertion of Vertical Expandable Prosthetic Titanium Rib implants were excluded. A chi-squared test was performed to determine the relationship between type of metal instrumentation and development of a surgical site infection. **Results:** The study included 874 patients who underwent 1,156 procedures. 752 (65%) procedures used stainless steel (SS) instrumentation, 238 (21%) procedures used titanium (Ti) instrumentation, and 166 (14 %) procedures used cobalt chrome (CC) and titanium hybrid instrumentation. The overall infection rate was 6.1% (70/1,156) per procedure; 5.9% (44/752) for SS, 6.7% (12/238) for Ti and 6.0% (10/166) for CC. Univariate analysis found no significant differences in the metal type used between patients with and without infection ( $p=.886$ ). The final regression analysis found that instrumentation to the pelvis and neuromuscular etiology were independent risk factors for infection ( $p<.001$  and  $p=.039$ , respectively). **Conclusion:** There was no difference in infection rates with stainless steel, titanium, or cobalt chrome/titanium instrumentation among patients in our population. This study found a similar overall infection rate (6.1%) to previously reported studies, and confirmed previously reported patient (neuromuscular) and surgical (instrumentation to pelvis) characteristics as risk factors for infection.

**Date: 2014-11-20**

**Session: Spine: Free Papers - Spine**

**Time: 16:00 - 17:30**

**Room: SÃO CONRADO**

**Abstract no.: 37416**

**MEASURING THE THICKNESS OF FAT ON MRI SCAN IS A MORE SENSITIVE INDICATOR THAN THE BODY MASS INDEX [BMI] AS A PREDICTOR OF POST-OPERATIVE INFECTION AFTER LUMBAR MICRODISCECTOMY**

Quah CONAL, Jaber AL-SHUKRI, Girish SWAMY, Darryl RAMOUTAR, Denis CALTHORPE

Royal Derby Hospital, Derby (UNITED KINGDOM)

**Introduction:** The purpose of this study was to investigate whether measurement of subcutaneous fat on lumbosacral MRI scans was a more sensitive predictor of post-operative infection and complications than measuring BMI alone. **Methods:** A retrospective review of case notes and MRI scans from 2008 to 2012 was conducted for all patients who underwent single level lumbar microdiscectomy performed by a single surgeon. All patients were followed up at two weeks and six weeks following surgery, and given an open appointment for a further six months. The BMI as well as subcutaneous fat thickness and the distance from the lamina to the skin at the level of pathology were measured. **Results:** Out of the 262 patients were available for analysis, 4 (1.5%) developed post-operative site infection. BMI was found not to be significantly associated with infection, whereas skin to lamina distance ( $p<0.05$ ) and subcutaneous fat thickness ( $P=0.01$ ) were found to be significant risk factors. **Conclusion:** Our study suggests that measuring the thickness of fat at the operative site is a more sensitive predictor of post-operative infections than BMI and therefore should be measured pre-operatively.

**Date: 2014-11-20**

**Session: Spine: Free Papers - Spine**

**Time: 16:00 - 17:30**

**Room: SÃO CONRADO**

**Abstract no.: 36635**

**INNOVATIVE SURGICAL TREATMENT FOR PYOGENIC VERTEBRAL OSTEOMYELITIS BY USING IODINE-SUPPORTED SPINAL INSTRUMENTS**

Satoru DEMURA, Hideki MURAKAMI, Toshiharu SHIRAI, Satoshi KATO, Katsuhito YOSHIOKA, Takashi OTA, Hiroyuki TSUCHIYA  
Kanazawa University, Kanazawa (JAPAN)

**Introduction:** Reports have detailed the increasing use of spinal instrumentation in the treatment of pyogenic vertebral osteomyelitis to achieve a lower pseudarthrosis rate and restoring spinal alignment. However, controversy remains over the use of instrumentation in the presence of active infection because of concern about increased bacterial adherence and biofilm formation on the metallic implant surface. **Methods:** A consecutive series of 14 patients who underwent surgery with newly developed spinal instrumentation with iodine-containing surfaces on titanium implants were reviewed. The nine women and five men had a mean age of 72 years. Implant breakage, lucencies of the screw and bone–cage interfaces on radiographs, and multi-planar reconstruction computed tomography images were evaluated. White blood cell (WBC) count and C-reactive protein (CRP) level were analyzed during the follow-up period. To confirm the influence of iodine release from the implant, thyroid-stimulating hormone (TSH), free triiodothyronine (FT3), and free thyroxine (FT4) were also examined. **Results:** The infection subsided in all 14 patients. Both WBC counts and CRP levels returned to normal range by the final follow-up. One patient showed a lucent area around the screw and two patients showed lucencies inside the cage. However, no cage dislocations, cage migrations, or screw pull-outs were noted and all patients' FT3, FT4, and TSH levels were within normal ranges during the follow-up period. **Conclusion:** Here we demonstrated the efficacy of iodine-supported titanium implants in the management of pyogenic vertebral osteomyelitis. No cytotoxicity or adverse effects were noted in this series.

**Date: 2014-11-20**

**Session: Spine: Free Papers - Spine**

**Time: 16:00 - 17:30**

**Room: SÃO CONRADO**

**Abstract no.: 36782**

**RISK FACTORS FOR SURGICAL SITE INFECTION AFTER TOTAL EN BLOC SPONDYLECTOMY**

Hiroyuki HAYASHI, Satoru DEMURA, Hideki MURAKAMI, Toshiharu SHIRAI, Satoshi KATO, Katsuhito YOSHIOKA, Hiroyuki TSUCHIYA  
Kanazawa University, Kanazawa (JAPAN)

Introduction: Surgical site infection (SSI) associated with metallic implants remains a serious complication in patients who undergo major spinal surgery such as total en bloc spondylectomy (TES). The purposes of this study were to identify independent risk factors for SSI and to evaluate the positive effect of newly developed iodine-supported implants in the prevention of SSI. Methods: One hundred twenty-five patients who underwent TES were evaluated. Risk factors for SSI were analyzed using logistic regression. Results: The rate of SSI was 6.4% (8/125 patients). By multivariate logistic regression, combined anterior and posterior approach and non-use of iodine-supported spinal instruments were associated with an increased risk of SSI. The rate of SSI without iodine-supported spinal instruments was 12.5%, whereas the rate with iodine-supported spinal instruments was 1.4%. This difference was statistically significant. Among the 69 patients with iodine-supported spinal instruments, 2 patients required additional surgery due to instrument failure. However, there were no obvious involvements with the use of iodine-supported spinal instruments. Conclusions: This study identified combined anterior and posterior approach, and non-use of iodine-supported spinal instruments to be independent risk factors for SSI. Iodine-supported spinal instrument was effective for prevention of SSI in patients with compromised status, and it had no detection of cytotoxic or adverse effects on the patients.

**Date: 2014-11-20**

**Session: Spine: Free Papers - Spine**

**Time: 16:00 - 17:30**

**Room: SÃO CONRADO**

**Abstract no.: 37856**

**KYPHO-IORT – 12-MONTH RESULTS**

Frederic BLUDAU<sup>1</sup>, Tina REIS<sup>2</sup>, Frederik WENZ<sup>2</sup>, René SCHMIDT<sup>3</sup>, Udo OBERTACKE<sup>1</sup>

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66 patients suffering of 82 spinal metastases were treated with Kypho-IORT (intraoperative radiation and kyphoplasty) and included in this prospective study. Data of 13 patients who finished the 12-14 months-follow-up are presented. Methods: Clinical and radiographic follow-up examinations. Results: 13 patients (11 females, 2 males) with an average age of 61 years were included. 10 patients had breast cancer, 2 pat. suffered from prostate cancer and one with ovarian cancer. 11 thoracic and 2 lumbar vertebrae were treated with an surgical-time of 66min./vertebra. Median FU time 483(345-851) days. Karnofsky Index was constant with 87% preoperative versus 81% 12M-FU. The VAS decreased: 3,6 pre- to 1.3 postoperatively, 0.8 at 12M-FU. In 12/13pat. a dose of 8Gy in a radius of 5mm was used, 1 case received 8Gy in 8mm distance. 1 patient had a local progress needing open surgery and EBRT. 12 patients showed a general tumor progress. Conclusions: Kypho-IORT can offer a fast pain reduction, immediate stabilization and prevention of secondary fractures. VAS decreased postoperatively and this was maintained during FU. Local tumor control by IORT could be achieved in 92% of the vertebrae over 12 month, which seems to be better than EBRT. KI stayed constant over the follow-up period showing the low morbidity of the intervention. All 12/13 patients were treated with the lowest treatment dose; probably an even higher local tumor control is achievable by higher doses. These results warrant further evaluation of this technique by a dose escalation and a multicenter study, which is under way.

**Date: 2014-11-20**

**Session: Spine: Free Papers - Spine**

**Time: 16:00 - 17:30**

**Room: SÃO CONRADO**

**Abstract no.: 38417**

**HERNIATED AND SPONDYLOTIC INTERVERTEBRAL DISCS OF THE HUMAN CERVICAL SPINE: HISTOLOGICAL AND IMMUNOHISTOLOGICAL FINDINGS IN 700 SEMI-EN BLOC SURGICAL SAMPLES**

Yasuo KOKUBO, Kenzo UCHIDA, Atsushi YAMAGISHI, Daisuke SUGITA, Tomoo INUKAI, Tsuyoshi MIYAZAKI, Hideaki NAKAJIMA, Ai YOSHIDA, Naoto TAKEURA, Hisatoshi BABA

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This study was designed to identify histological and immunohistochemical differences between cervical disc herniation and spondylosis. A total of 705 cervical intervertebral discs were excised from 531 patients: 284 patients with disc herniation and 247 patients with spondylosis. We examined semi-en bloc samples of endplate-ligament-disc complexes. Types of herniation and graded degrees of disc degeneration in magnetic resonance images were examined histologically and immunohistochemically. The herniated discs showed granulation tissue, newly developed blood vessels, and massive infiltration of CD68-positive macrophages, which surrounded the herniated tissue mainly in the ruptured outer layer of the annulus fibrosus. The vascular endothelial cells expressed nerve growth factor (NGF), and free nerve fibers, positive for neurofilament (NF) 68, growth-associated protein (GAP)-43, and substance P, were strongly apparent near the newly developed vessels. Chondrocytes positive for matrix metalloproteinase (MMP)-3, tumor necrosis factor (TNF)- $\alpha$ , basic fibroblast growth factor (bFGF), vascular endothelial growth factor (VEGF), and NGF were abundant in both herniated and spondylotic discs. We observed here that herniated discs showed more advanced degeneration in the outer layer of the annulus fibrosus around the granulation tissue than spondylotic discs. On the other hand, spondylotic discs showed more advanced degeneration in the cartilaginous endplate and inner layer of the annulus fibrosus with thicker bony endplates. Our results indicated that herniated and spondylotic intervertebral discs undergo different degenerative processes. It is likely that TNF- $\alpha$ , MMP-3, bFGF, and VEGF expression is upregulated via the herniated mass in the herniated intervertebral discs, but by nutritional impairment in the spondylotic discs.

**Date: 2014-11-20**

**Session: Spine: Free Papers - Spine**

**Time: 16:00 - 17:30**

**Room: SÃO CONRADO**

**Abstract no.: 36719**

**QUANTITATIVE T2 MAPPING AND MAGNETIC TRANSFER RATIO  
RESONANCE IMAGING OF EXPERIMENTALLY INJURED CANINE  
INTERVERTEBRAL DISC**

Dike RUAN, Chun CHEN, Zhihua HAN, Deli WANG, Qing HE  
Department of Orthopedic Surgery, Navy General Hospital, Beijing  
(CHINA)

Introduction: Quantitative MRI analysis has been previously shown to reflect the early structural integrity of the disc matrix. However, in vivo studies concerning T2 mapping and magnetic transfer ratio (MTR) changes in the early course and the sensitivity of degeneration, especially for cartilage endplate zone(CEPZ), are not known. Methods: Six dogs underwent experimental annular stab incision. The animals underwent repeated 3.0T MRI and were sacrificed 4, 8 and 12 weeks after operation. Presence of degenerative changes were controlled with histologic and biochemical analysis. Results: Both T2 and MTR values changed for CEPZ, nucleus pulposus (NP), and annulus fibrosus (AF) tissues within 12 weeks. The measured areas of the NPs reduced significantly in 2 weeks ( $P<0.05$ ) in T2 values. However, No significantly changed was noted for CEPZ and AF tissues in T2 or MTR. T2 values decreased significantly for the NP, AF, and CEPZ separately at pre-operation, 4, 8, and 12 weeks when compared each time. The MTR did not change significantly between pre-operation and 4 weeks in the NP, and CEPZ, and between 8 weeks and other times in CEPZ. However, there were an increase in the MTR with each time comparison in the AF of MTR ( $P<0.05$ ). Correlation analysis between the both quantitative MRI area values and biomechanical analysis were significantly correlated ( $P<0.05$ ). Conclusion: Early traumatic or degenerative changes are detectable with T2 mapping and MTR. Since the two imaging reflect different disc properties, performing under same condition will helpful in the evaluation of disc degeneration using both imaging.

**Date: 2014-11-20**

**Session: Spine: Free Papers - Spine**

**Time: 16:00 - 17:30**

**Room: SÃO CONRADO**

**Abstract no.: 36866**

**SURGICAL TREATMENT OF RETROODONTOID PSEUDOTUMOR**

Minoru KASHIHARA

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Introduction: Retroodontoid pseudotumor is regarded as a nonneoplastic mass that arises as a result of instability of the atlantaxial joint. Methods: We describe six patients with cervical myelopathy due to the retroodontoid pseudotumor treated by occipitocervical posterior fusion and laminectomy of the atlas. Two patients had rheumatoid arthritis and two had previously undergone cervical laminoplasty. We evaluated atlantaxial instability, the recovery rate through the Japanese Orthopaedic Association (JOA) score and regression of pseudotumor. Also we evaluated enlargement of the retroodontoid mass (pseudotumor) after cervical spinous process-splitting laminoplasty of 101 patients in our hospital. Results: Four patients had atlantoaxial instability except two patients. The average recovery rate through the JOA score was 47% (21~74%), and pseudotumor was regressed in all cases. In the series of 101 patients of cervical spinous process-splitting laminoplasty, postoperatively retroodontoid pseudotumor enlarged in eleven patients, and the spinal cord was compressed in three patients. Conclusion: Occipitocervical posterior fusion and laminectomy of the atlas led to pseudotumor regression and neurological improvement in all cases. In some cases of cervical laminoplasty, long-term mechanical stress on the occipitoaxis through a decrease of ROM in the middle and lower cervical spine was thought to have been responsible for progression of the retroodontoid pseudotumor after cervical laminoplasty.

**Date: 2014-11-20**

**Session: Shoulder & Elbow: Free Papers - Shoulder & Elbow Soft Tissue**

**Time: 16:00 - 17:30**

**Room: LEBLON**

**Abstract no.: 38312**

**SHOULDER CALCIFYING TENDINITIS: IS IT A LOCAL OR SYSTEMIC DISEASE?**

Carina COHEN, Benno EJNISMAN, Alberto POCHINI, Carlos Vicente ANDREOLI, Simone TORTATO

Universidade Federal de São Paulo, São Paulo (BRAZIL)

Introduction Shoulder calcifying tendinitis (SCT) is common disorder of unknown etiology, characterized by deposition of crystals of calcium on rotator cuff tendons. The calcification may have local origin, however, is unclear whether there is influence of a systemic control in this mechanism. Aim: Evaluate relationship between patients with SCT and symptomatic metabolic diseases (kidney stones, gallstones and gout). Methods: SCT was diagnosed in 102 patients between May 2007 and February 2012. All were treated by same surgeon and interviewed to following data: age at diagnosis, sex, affected side, dominant side, body mass index, smoking and history of kidney stones, gallstones or gout. A control group of 100 patients with other orthopaedic diseases and similar demographic characteristics was used. Results: Among 102 patients with SCT, 55% were male. Right side was affected in 60%, average age was 48,2 years. 49% had history of metabolic disease, 34% reported kidney stones, 9% gallstones and 6% gout. 2% had concurrent diagnosis of kidney stones and gout. In control group, 17% had history of metabolic disease, 9% kidney Stones, 6% gallstones and 2% gout. Conclusion: There are no reports on association of SCT and the disturbances analyzed in this study. Control group showed prevalence of nephrolithiasis of 9%, while in patients with SCT prevalence was 34%. These data were statistically significant with  $p = 0.001$ . The high frequency of nephrolithiasis in patients with SCT suggests that there are common mechanisms in the pathophysiology of these disorders. Better understanding may enable the improvement of diagnose and treatments.

**Date: 2014-11-20**

**Session: Shoulder & Elbow: Free Papers - Shoulder & Elbow Soft Tissue**

**Time: 16:00 - 17:30**

**Room: LEBLON**

**Abstract no.: 37438**

**DIAGNOSTIC RELIABILITY OF THE MODIFIED JOBE TEST FOR SUPRASPINATUS TEARS**

Maria TUCA, Claudio MORAGA, Ignacio VILLALON, Max HUBE, Felipe TORO

Clinica Alemana - Universidad del Desarrollo, Santiago (CHILE)

Objective: report the accuracy of the Modified Jobe Test (MJT) for the diagnosis of supraspinatus tears (SS). Method: prospective study of 131 adult patients that consulted for subacute atraumatic shoulder pain to the same Orthopedic Surgeon. Inclusion criteria: shoulder pain > 2 months prior consult, lacking history of trauma and ages between 18-70 years old. Exclusion criteria: previous shoulder injuries or surgeries. MJT was performed to all the patients, and subsequently they underwent a shoulder ultrasonography (US) that was performed by 3 specialized radiologists. Results: The MJT has a diagnostic accuracy of 71,4% Sensitivity, 83% Specificity, 71,4% of Positive Predictive Value (PPV) and 83% of Negative Predictive Value (NPV) for the MJT when diagnosing total and subtotal SS tears. When only total SS tears were included for the statistical analysis, 27 patients were true positives, 2 false negatives, and 80 true negatives. 22 patients were false positives, of which 8 were subtotal tears and the remaining 14 had calcic tendinopathy. Therefore the diagnostic accuracy of the MJT for total SS tears is of: 93% sensibility, 78,4% specificity, PPV of 55% and a NPV of 97,5%. Conclusion: according to the results obtained, the MJT appears as an excellent clinical tool for ruling out total SS tears. As a result of its high NPV for these injuries, a negative test minimizes the chance of a total SS tear. When facing a positive MJT, the clinician must suspect for either SS tears or calcic tendinopathy, which accounts for all the false positives in this series.

**Date: 2014-11-20**

**Session: Shoulder & Elbow: Free Papers - Shoulder & Elbow Soft Tissue**

**Time: 16:00 - 17:30**

**Room: LEBLON**

**Abstract no.: 36465**

**ULTRASOUND-GUIDED BARBOTAGE FOR CALCIFIC TENDONITIS OF THE SHOULDER; A SYSTEMATIC REVIEW INCLUDING 908 PATIENTS**

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(UNITED KINGDOM)

**Purpose:** A systematic review to assess the outcomes and complications of ultrasound guided barbotage (repeated injection and aspiration) for calcific tendonitis of the shoulder. **Methods:** A literature search of Medline, Embase and Cochrane databases using all relevant keywords was conducted on 26th June 2013, this revealed 1,454 original manuscripts. After removing duplicates, full-text articles were assessed for eligibility, those meeting the inclusion criteria were selected for review. Data was then systematically extracted onto a predefined proforma. All studies, except one, that were analysed were case series with no comparative studies being available. **Results:** 13 articles with a total of 908 patients were analysed. The mean age ranged between 40.3 and 63 and their follow-up between 1 month and 10 years. Patients had experienced pain between 1 week and 3 years. The overall complication rate was 7%, however, all of these were minor with no long-term disability being caused. In all papers reviewed, authors reported a good clinical outcome, with many achieving marked improvement in clinical scores or overall satisfaction with the treatment. **Conclusion:** Ultrasound-guided barbotage is a safe technique, with a high success rate and low complication rate. However, there is no evidence assessing its effectiveness as compared to other major treatment modalities. A randomised trial comparing ultrasound-guided barbotage, extracorporeal shockwave therapy and arthroscopic calcific deposit excision would be of great value. Whilst awaiting such a trial, based on results of this systematic review, we recommend that ultrasound-guided barbotage is attempted prior to considering surgical excision of calcific deposits.

**Date: 2014-11-20**

**Session: Shoulder & Elbow: Free Papers - Shoulder & Elbow Soft Tissue**

**Time: 16:00 - 17:30**

**Room: LEBLON**

**Abstract no.: 37627**

**OUR EXPERIENCE OF LOW-INVASIVE TREATMENT CALCIFIC TENDINITIS OF THE SHOULDER ROTATOR CUFF**

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We have treated 152 patients with calcific tendinitis of shoulder rotator cuff between 2005 and 2013. The average age of patients was 43.4 years, women were twice as many as men. In 79% of cases accumulation of calcium hydroxyapatite was observed in the supraspinatus muscle tendon, in 12% calcifications were found simultaneously in supraspinatus and infraspinatus, in 6% of patients calcifications were localized in infraspinatus and in 3% - in subscapularis muscle. For treatment of calcific tendinitis, we use needling under ultrasound navigation. With the help of ultrasound we found calcifications, injected needle (diameter 18 G) into it and connected syringe filled with saline. During cycles of sequential injection - aspiration of saline the washout of calcifications were performed. At the end of the procedure we injected 1ml of prolonged steroid anti-inflammatory drugs into subacromial space. Results were evaluated in 2 weeks, in 3 and 12 months after the manipulation. In 2 weeks term symptomatic calcifications were found in 36 % of patients. In this case, manipulation was repeated, and in 1 month we performed X-ray and ultrasonic testing again. In 12 patients (8%) after 2 treatment sessions calcifications were symptomatic and so we performed removal of calcifications and necrotic parts of supraspinatus muscle tendon under arthroscopic control. Evaluation of outcomes of treatment of calcific tendinitis in our patients in 1 year after the procedure revealed that we obtained excellent and good results in 92 % of cases with practically full restoration of function of the affected shoulder joint.

**Date: 2014-11-20**

**Session: Shoulder & Elbow: Free Papers - Shoulder & Elbow Soft Tissue**

**Time: 16:00 - 17:30**

**Room: LEBLON**

**Abstract no.: 38311**

**ADHESIVE CAPSULITIS IN BRAZIL: DO WE KNOW WHO OUR PATIENTS ARE?**

Carina COHEN, Benno EJNISMAN, Alberto POCHINI, Carlos Vicente ANDREOLLI, Eduardo FIGUEIREDO, Paulo BELANGERO  
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Adhesive capsulitis (AC) is highly disabling painful disease characterized by significant reduction in active and passive movements of shoulder. Incidence is 2-5% in general population and 11% in diabetic patients, affects individuals between 40 - 60 years, mainly women. Cause and risk factors are unknown although diabetes have been strongly associated. Aim: Evaluate risk factors for AC in Brazilian population. Methods: 83 patients with AC were evaluated by questionnaire and 185 individuals with other orthopedic conditions were used as controles. All were admitted to Federal University of São Paulo and quizzed on epidemiological data and associated diseases. Results: 50% females. Mean age of onset was 51.1. About 10% presented positive family history of AC. Bilaterality was in 24.1%. Clinical comorbidities were in 86.1%, specially dyslipidemias (31.6%), thyroopathy (30.4%) and hypertension (29.1%). 52% presented 3 or more comorbidities. Frequency of renal failure (15.8% vs 0%;  $p=0,012$ , by Qui-square test) and thyroid nodules (3.3% vs 26.3%;  $p=0.008$ ) was higher in patients with bilateral capsulitis. Psychitatric disorders, autoimmune diseases, dyslipidemias, thyrophathy, diabetes mellitus and nephrolithiasis were risk factors. However, after adjustment for gender, age and other significant comorbidities, a multiple logistic regression analysis revealed only diabetes ( $p=0.029$ ;  $OR=2.592$ ; 95%  $CI=1.1-6.1$ ) and thyroopathy ( $p<0.001$ ;  $OR=5.444$ ; 95%  $CI=2.57-11.53$ ) were major and independent risk factors for AC. Conclusion: We found statistically significant association of AC with diabetes mellitus and thyroid diseases suggesting they contribute to risk as independent variables. Patients presenting bilateral AC had significantly higher frequency of history of renal insufficiency or thyroid nodules than unilateral.

**Date: 2014-11-20**

**Session: Shoulder & Elbow: Free Papers - Shoulder & Elbow Soft Tissue**

**Time: 16:00 - 17:30**

**Room: LEBLON**

**Abstract no.: 36974**

**RESULTS OF ARTHROSCOPIC ADHESIOLYSIS VERSUS MANIPULATION UNDER ANESTHESIA IN TREATMENT OF RESISTANT FROZEN SHOULDER**

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Introduction: Frozen shoulder or periarthritis shoulder is a self-limiting disease. However few number of patients experience long term symptoms. Manipulation under anesthesia and arthroscopic release are the options commonly used in case of patients unresponsive to conservative treatment. In this study we intend to compare the clinical and functional results of manipulation under anesthesia versus arthroscopic release in resistant frozen shoulders. Materials and methods: 40 patients were included in a study having persistent pain and stiffness with one year of conservative treatment. First twenty patients underwent manipulation and remaining patients underwent manipulation followed by arthroscopic adhesiolysis. All patients underwent similar physiotherapy protocol in postoperative period. Patient were followed up for average of 1 year and assessed in terms of pain, range of movement and function. Results: Patients with manipulation followed by arthroscopic adhesiolysis did well as compared to manipulation alone in terms of pain, range of movement and function at last follow up. There were no intraoperative or postoperative complications. Conclusion: Arthroscopic adhesiolysis should be used as early intervention of choice in cases of resistant frozen shoulder.

**Date: 2014-11-20**

**Session: Shoulder & Elbow: Free Papers - Shoulder & Elbow Soft Tissue**

**Time: 16:00 - 17:30**

**Room: LEBLON**

**Abstract no.: 38039**

**ARTHROSCOPIC TREATMENT FOR THE ANTEROSUPERIOR ROTATOR CUFF TEAR**

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**Objective:** Evaluate the results of the arthroscopic anterosuperior rotator cuff repair. **Methods:** Fifty nine patients, 39 females, with mean age of 57 years old were included in this study. All subjects were evaluated through the UCLA score and range of motion pre and post operatively. The mean follow up was 18 months. The statistical analysis was used to compare the pre and postoperative results of range of motion and UCLA score by using the Wilcoxon test, with  $P \leq 0,05$ . Also the correlation between the type of the subscapular tear and the postoperative result was evaluated with the Mann-Whitney test and, the relationship between the period from the onset of pain till surgery and the postoperative UCLA score was evaluated by the Spearman correlation test. **Results:** There was a statistical significant improvement ( $p < 0,001$ ) comparing the range of motion values and the UCLA score pre- and postoperatively. Twenty three patients (39%) were classified as excellent results, twenty (33,9%) were good, fourteen (23,7%) fair and two (3,4%) poor results. There was statistical significance correlation when comparing the type of the subscapular tear with the functional result and between the period from the onset of pain till surgery and the postoperative UCLA score. There were five patients with complications (8,5%), four cases of clinical re-ruptures and one adhesive capsulitis. **Conclusion:** In this study the treatment of the anterior-superior rotator cuff lesions showed 72,9% of satisfactory results and 8,5% of complications.

**Date: 2014-11-20**

**Session: Shoulder & Elbow: Free Papers - Shoulder & Elbow Soft Tissue**

**Time: 16:00 - 17:30**

**Room: LEBLON**

**Abstract no.: 37227**

**SURFACE-HOLDING REPAIR: AN ORIGINAL ARTHROSCOPIC ROTATOR CUFF REPAIR TECHNIQUE**

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Arthroscopic rotator cuff repair provides satisfactory results; however, a high percentage of retear has still remained. The objective of this study was to present a surface-holding technique that we recently developed for arthroscopic rotator cuff repair in detail and to evaluate the clinical outcome as well as cuff repair integrity with this new method. A consecutive series of 116 patients with full-thickness rotator cuff tears underwent arthroscopic surface-holding repair and were monitored with the Japanese Orthopaedic Association, Constant-Murley, and University of California–Los Angeles scores to assess the clinical outcome. The mean follow-up period was 17.9 months (range, 12-40 months). Cuff repair integrity was evaluated by magnetic resonance imaging. All 3 rating systems at the time of final follow-up reflected a significant improvement in functional recovery of the shoulder compared with the preoperative scores. The overall rate of rotator cuff retear was 19.0% (22 of 116 shoulders), and the rates were 13.6% (9 of 66 shoulders) for small and medium-sized tears and 26% (13 of 50 shoulders) for large and massive tears. The rate for large and massive tears was much higher in patients older than 70 years (58.3%) compared with those younger than 70 years (36.3%), whereas the retear rates were similar in these 2 groups (22.2 % and 17.5%, respectively). Arthroscopic surface-holding repair technique with medial suture and transosseous fixation improved rotator cuff healing. This method may be useful both for young patients and for elderly patients, who frequently have chronic large and massive tears, including osteoporotic bones.

**Date: 2014-11-20**

**Session: Shoulder & Elbow: Free Papers - Shoulder & Elbow Soft Tissue**

**Time: 16:00 - 17:30**

**Room: LEBLON**

**Abstract no.: 36722**

**THE ROLE OF MR ARTHROGRAPHY IN THE ASSESSMENT OF PRIMARY AND RECURRENT GLENOHUMERAL DISLOCATIONS**

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**Introduction:** The glenohumeral is the most commonly dislocated joint and can be associated with injury to the glenoid, humeral head or surrounding capsulolabral complex. This study aims to assess the incidence of Bankart and Hill-Sachs lesion in both primary and recurrent anterior glenohumeral dislocations. **Methods:** A retrospective review of all patients undergoing MR arthrogram after both primary and recurrent dislocations between February 2011 and 2014 was performed. Only adults who had suffered at least one episode requiring formal reduction were included. Patients who had undergone previous stabilising surgery were excluded. MR arthrography was performed under fluoroscopic guidance where 10-15ml of normal saline and Gadolinium was injected. MR scan was performed with the arm in a neutral position and analysed by one of four musculoskeletal radiologists. **Results:** 97 patients underwent MR arthrography during the study period, 24% following a primary dislocation and 76% after recurrent dislocations. 81% of patients were male and the mean age was 29, of those with a primary dislocation 96% were male and the mean ages was 28 (range 18 to 50). MR arthrogram demonstrated a soft tissue Bankart lesion in 87% in the primary and 86% of the recurrent group. Bony Bankart lesions were more prevalent in the recurrent group (20%) than primary group (4%) as were Hill-Sachs lesions, 42% and 26% respectively. **Conclusion:** Nearly 90% of all patients have a soft tissue Bankart lesion, those in the recurrent group are more likely to have either a bony Bankart or Hill-Sachs lesions predisposing to instability.

**Date: 2014-11-20**

**Session: Shoulder & Elbow: Free Papers - Shoulder & Elbow Soft Tissue**

**Time: 16:00 - 17:30**

**Room: LEBLON**

**Abstract no.: 36502**

**PRIMARY SHOULDER DISLOCATIONS IN PATIENTS OLDER THAN 50 YEARS**

Romain LANCIGU, Laurent HUBERT, Nicolas BIGORRE, Pascal BIZOT  
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Introduction: Primary shoulder dislocation in old patient is less frequent and not as well documented than in younger. The aim of our prospective study was to evaluate the morbidity of shoulder dislocation in patients older than 50 years and our management in this trauma. Materials and Methods: The study included 65 patients with a primary shoulder dislocation. The mean age at dislocation was 72 years [50-92]. All patients were reviewed for clinical and radiological examinations, using the Constant and DASH scores, sonography at 2 months and electromyograms in case of neurological lesions. Results: 25 patients had associated lesions (38%): 13 greater tuberosity fractures, 10 neurological lesions and 2 early recurrences. Seven patients needed a surgical procedure: 3 total shoulder replacements, 1 arthrolysis, one osteotomy of the greater tuberosity, one cuff tear repair and 1 palliative acromioplasty. 33 patients (51%) had a rotator cuff lesion. Four patients had a recurrent dislocation. Two patients had incomplete neurological recovery. At the 12-month evaluation, four patients had died. The mean Constant score was 78 [28-100] and the mean DASH score was 20 [11-49]. Conclusion: Shoulder dislocation in patients older than 50 years is not a benign traumatism. In this series, 38% of patients had initially associated lesions, 51% had rotator cuff lesions, and 10,7 % need surgery within 12 months. We do recommend associated to the clinical and radiological exams, a systematic ultrasound examination within 3 month and an electromyogram in case of neurological deficiencies.

**Date: 2014-11-20**

**Session: Shoulder & Elbow: Free Papers - Shoulder & Elbow Soft Tissue**

**Time: 16:00 - 17:30**

**Room: LEBLON**

**Abstract no.: 38042**

**PROPRIOCEPTION EVALUATION OF THE SHOULDER IN PATIENTS SUBMITTED TO LATARJET PROCEDURE**

Roberto IKEMOTO, Joel MURACHOVSKY, Luis NASCIMENTO, Rogerio SERPONE, Luiz ALMEIDA, Lima GUILHERME, Lara CECILIO, Henry KIYOMOTO

ABC Med School, Santo Andre (BRAZIL)

Objective: Evaluate the reestablishment of the proprioception of the shoulder in patients after Latarjet procedure. Method: Eighteen patients with unstable shoulder submitted Latarjet surgery, due to the presence of more than 25% of glenoid bone loss, were assessed in the post-operative period, to evaluate the active proprioception in 30° and 60° external rotation. The test was performed in the Biomechanics laboratory, using isokinetic dynamometer BiodexR, model system 3. After covering the patients' eyes they were asked to try to position the limb at 30° and 60° of external rotation in an active way. The position errors were analyzed and the Wilcoxon test and the Spearman Correlation test were used for statistical analysis with  $P \leq 0,05$ . Results: the average positioning error in 30° was  $5.6^\circ \pm 4.4^\circ$  and in 60° was  $7.0^\circ \pm 5.8^\circ$ , and the average error in the contralateral side was  $5.7^\circ \pm 5.5^\circ$  in 30 and  $9.3^\circ \pm 10.11^\circ$  in 60°. Comparison of analysis of proprioception using the positioning of 30° and 60° external rotation in the same shoulder showed no statistically difference ( $p = 0.76$ ) and there was no difference when comparing both sides, as well ( $p = 0.6$ ). According to Rowe's scale it was found fifteen cases with excellent results (83.3%) and three cases with good results (16.6%). Conclusion: This study showed that with the Latarjet procedure we can re-establish the shoulder proprioception.

**Date: 2014-11-20**

**Session: Infection: Free Papers - Infection**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 38208**

**A TWO STAGE RE-IMPLANTATION PROTOCOL FOR THE TREATMENT OF DEEP PERIPROSTHETIC HIP INFECTIONS. LONG-TERM RESULTS IN A TERTIARY REFERRAL CENTER**

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The purpose of our study is to present the long-term results of the two-stage re-implantation protocol in the treatment of periprosthetic hip infections. We retrospectively investigated all cases of periprosthetic hip infections treated at our institution between 1999 and 2007. All patients were treated with two-stage re-implantation protocol. In brief, the patients underwent surgical removal of all implants, cement and suspicious tissues, and postoperatively received intravenous antibiotics for 6 weeks. In the condition of normal laboratory examinations, and 2-4 weeks after completing the antibiotic regimen, a new prosthesis was re-implanted. The study included 84 patients with periprosthetic hip infections. Infection presented 6 months to 15 years after the last operation (mean 7.2 years). Mean WBC count was 8.200/dl, mean CRP value was 158 µg/dl and mean ESR value was 57 mm/hr. Mean follow-up time was 8.4 years. Isolated bacteria were coagulase negative staphylococci (39.6%), Gram negative bacteria (22.7%), *Staphylococcus aureus* (18.2%) and other bacteria (15.9%). One patient underwent surgical debridement because of persistent raised CRP. The protocol was successfully repeated 4 months after the initial re-implantation in one obese, diabetic patient because of recurrence of the infection. Two patients under vancomycin presented a temporary raise in serum creatinine and one patient developed a superficial vein thrombosis, one week after re-implantation. At the latest follow-up, all patients were free of infection, had well-functioning hip arthroplasties and had no radiological signs of loosening. In conclusion, two-stage re-implantation produces good outcome in the treatment of periprosthetic hip infections.

**Date: 2014-11-20**

**Session: Infection: Free Papers - Infection**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 36839**

**USE OF TANTALUM AUGMENTS IN ONE-STAGE EXCHANGE IN PERIPROSTHETIC HIP INFECTION**

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Introduction: During the one-stage exchange procedure for periprosthetic joint infection (PJI) after total hip arthroplasty (THA), acetabular defects challenge reconstructive options. Porous tantalum augments are an established tool for addressing acetabular destruction in aseptic cases, but their utility in septic exchange is unknown. Methods: This retrospective case-control study presents the initial results of tantalum augmentation during one-stage exchange for PJI. Primary endpoints were rates of re-infection and short-term complications associated with this technique. After lost to follow up after 3 years 42 patients in the study (SG) and 44 in the control group (CG) were left. Mean age of SG was 72 and CG 69 years. The SG consisted of patients with acetabular destructions Paprosky grade IIA to IIC, whereas the CG had no severe destruction of the acetabulum. Results: Beside descriptive statistics of the available data e.g. gender, blood loss, surgery time, organism pre- and intra-operatively, the odds ratio (OR) has been calculated. The risk for re-infection between both groups was 1.05 with a 95% confidence-interval (CI) between 0.14-7.82 ( $p>1$ ), periprosthetic fracture OR 0.2 (95% CI 0.01 - 4.29,  $p<0.5$ ), haematoma OR 1.05 (95% CI 0.06 - 17.34,  $p>1$ ) and dislocation OR 0.91 (95% CI 0.23 - 3.62,  $p>1$ ). Conclusion: Study patients had no higher risk of re-infection with equivalent durability at early follow-up. Tantalum augments are a viable option for addressing acetabular defects in one-stage exchange for septic THA. Further study is necessary to assess long-term durability when compared to traditional techniques for acetabular reconstruction.

**Date: 2014-11-20**

**Session: Infection: Free Papers - Infection**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 36838**

**ONE-STAGE EXCHANGE IN FUNGAL PERIPROSTHETIC INFECTION: RESULTS OF 10 CASES AFTER 7 YEARS FOLLOW UP**

Till Orla KLATTE<sup>1</sup>, Zahar AKOS<sup>2</sup>, Johannes Maria RUEGER<sup>1</sup>, Kamath ATUL<sup>3</sup>, Thorsten GEHRKE<sup>2</sup>, Daniel KENDOFF<sup>2</sup>

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Introduction: Fungal periprosthetic infections of the knee and hip are rare but devastating complications. This retrospective study evaluates the results of a single-stage exchange in patients with fungal periprosthetic infection. Methods: 14 patients (10 hip and 4 knee arthroplasties) with fungal infection treated in our institution between 2001 and 2011 were reviewed. Thirteen of these patients underwent re-implantation of the prosthesis performed in a one-stage procedure. One patient was excluded because re-implantation was not possible due to a significant acetabular defect, while 3 patients were excluded in cause of death and early fungal infection. Results: After an average follow up of 7 years, a total of 10 patients were available for follow up, (range, 3 to 11 years). One fungal re-infection occurred at two months post-operatively. Further complications were in one case a hip dislocation and in another a delayed wound healing. In the same patient, 29 month post-operatively, a periprosthetic femur fracture occurred. At final follow up, the mean Harris Hip Score increased to 74 points (range, 63 to 84;  $p < 0.02$ ), and the mean Hospital for Special Surgery Knee Score increased to 75 points (range, 70 to 80;  $p < 0.01$ ). Laboratory infection parameters were at the time of follow up in all patients within normal ranges. The radiological follow up revealed only in one patient slight signs of loosening around the cup with up to 2mm radiolucency. Conclusion: A one-stage procedure for arthroplasty in the setting of fungal periprosthetic infection is a viable option with an acceptable reinfection rate.

**Date: 2014-11-20**

**Session: Infection: Free Papers - Infection**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 37217**

**ADVANTAGE OF ANTIMICROBIAL IODINE-COATED IMPLANTS FOR PREVENTION AND TREATMENT OF IMPLANT-ASSOCIATED ORTHOPAEDIC INFECTIONS**

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Post-operative infection associated with implants remains a serious complication in orthopedic surgery. A clinical trial was performed using iodine-supported titanium implants. We have treated 434 patients with post-operative infection or compromised status. The mean age was 49.4 years (5-85). Two hundred forty-four patients were male and 190 were female. The types of the implants were 182 spinal instrumentations, 95 plates for osteosynthesis, 87 prostheses, 60 external fixation, eight nails and two cannulated screws. The mean follow-up period was 30 months (3-69). Acute infection developed in three tumor cases among the 326 patients on preventive therapy. All three recovered without removal of the implants. Infection was cured in the all 108 patients with infection. Sixty-three patients underwent one-stage revisions, while 45 two-stage revisions. Median white blood cells levels were in the normal range and median C-reactive protein levels returned to < 0.5 within 4 weeks after surgery. To confirm systemic effects of iodine, thyroid hormone levels in the blood were examined. Abnormalities of thyroid gland function were not detected. None of the patients experienced loosening of the implants. There were two patients with mechanical implant failure, which was treated by re-implantation. Excellent bone ingrowth and ongrowth were found around the prostheses. The chronological changes of the iodine amount were evaluated using half pins removed after completion of external fixation. One year later, the amount of iodine remained about 40%. Iodine-supported titanium implants can be very effective for preventing and treating infections after orthopedic surgery. Cytotoxicity and adverse effects were not detected.

**Date: 2014-11-20**

**Session: Infection: Free Papers - Infection**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 36473**

**CONTROLLED LOCAL RELEASE OF GENTAMICIN PALMITATE AND SUPPORTING SYSTEMIC APPLICATION TO PREVENT PERIPROSTHETIC JOINT INFECTIONS IN A RAT MODEL**

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Periprosthetic joint infections are an increasingly demanding challenge due to unfavorable biological conditions, bacterial properties and incremental resistance to antibiotic treatment. Therefore different bactericide or bacteriostatic implant coatings have been developed recently to control local intramedullary infections. In addition to bioactive implants it is common to use systemic antibiotics to increase their therapeutic effect. Controlled local release of gentamicin base from a highly lipophilic gentamicin palmitate compound achieves extended intramedullary retention times and thus may improve its bactericide effect. Eighty male Sprague-Dawley rats were divided into four groups receiving an intramedullary femoral injection of  $10^3$  CFU of a common *Staphylococcus aureus* strain (Rosenbach) and either an uncoated femur nail (Group 1) or a nail coated with gentamicin palmitate (Group 2). Secondary both nails were supplemented with additional weight-adapted intraperitoneal injection of gentamicin sulfate (Groups 3+4). Animals were observed for 30 and 40 days. Serum Haptoglobin and relative weight gain were assessed as well as roll over cultures of explanted femur nails and histological scores of periprosthetic infection in dissected femurs. Implants coated with gentamicin palmitate significantly reduced periprosthetic bacterial growth as well as signs of systemic inflammation as compared to uncoated implants. Additional intraperitoneal injection of gentamicin sulfate did not improve outcome of coated nails while periprosthetic bacterial growth was significantly higher in uncoated implants. Gentamicin palmitate appears to be a viable coating for the treatment of periprosthetic joint infections whereas additional systemic antibiotics remain questionable. These findings will have to be confirmed in larger animal models.

**Date: 2014-11-20**

**Session: Infection: Free Papers - Infection**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 37784**

**INFECTED METALWORK FOLLOWING TRAUMA: IMPLICATIONS AND CLINICAL RESULTS**

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**Introduction:** The aim of our study was to recognise the causative microorganisms and report the antimicrobial treatment and outcomes of trauma patients who underwent removal of implants as a result of a suspected implant infection. **Methods:** This is a case series of patients treated in our institution with implant removal following an SSI. An SSI was defined as evidence of clinical signs and symptoms of infection along with microbiological evidence of wound infection from laboratory tests. **Results:** Over a 4-year period, fifty patients (mean age 54 years, range 19 to 92) underwent fifty-four procedures for removal of implant following SSIs. The median follow up was 4.5 months. The most frequent sites of SSI were the ankle, the femur and the forearm. The mean time from the initial operation to the removal of implant was 5.0 months (range 0.1 to 37.6 months). Average hospital engagement was 35 days (range 1 to 242 days). Staphylococcus Aureus was the most common microorganism isolated on cultures (50.0%), with eight patients being MRSA positive. Fourteen intra-operative specimens (28%) failed to grow anything on cultures. The mean duration of antibiotic therapy was 46 days (range 2 to 153 days). Chronic osteomyelitis was reported in ten patients (20%) and was the commonest type of complication, whilst four patients deceased. **Conclusion:** Once infection is suspected clinically, timely diagnosis and treatment are crucial. After the diagnosis is made, prompt surgical and microbiology-guided treatment can have a high rate of success and can provide good long-term results.

**Date: 2014-11-20**

**Session: Infection: Free Papers - Infection**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 36575**

**ANTICOAGULATING SYNOVIAL FLUID SAMPLES IN SEPTIC ARTHRITIS: A 12-YEAR RETROSPECTIVE STUDY**

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**Objectives:** The efficacy of Gram-stain microscopy for diagnosis of septic arthritis is fundamentally limited by an inherent false-negative rate of 25-50%. The aim of this study was to calculate the sensitivity of Gram-stain microscopy of synovial fluid collected in heparinised containers and to investigate if this collection method improves diagnostic value. **Methods:** 12-year retrospective study of patients undergoing synovial fluid analysis between 1998 and 2010. Gram-stain result was correlated with culture result and clinical diagnosis. The formula  $\text{sensitivity} = \frac{\text{number of true positives}}{\text{number of true positives} + \text{number of false negatives}}$  was used for analysis. **Results:** 602 cases of culture proven septic arthritis analysed with Gram-stain microscopy were identified over this time period. All samples were collected in heparinised containers. The most common joint affected was the knee in 390 cases. 568 cases were correctly identified by Gram-stain microscopy as positive and 34 were falsely identified as negative giving a false-negative rate of 5.6%, and a sensitivity value of 94%. **Conclusion:** This is the largest study investigating the efficacy of Gram-stain microscopy in the literature. We report a sensitivity of 94% for Gram-stain microscopy, far higher than previously reported (50-75%). No direct comparison was made to non-heparinised synovial fluid samples however we hypothesise that anticoagulation of our samples is directly responsible for this increased sensitivity. Based on these findings Gram-stain microscopy of anticoagulated synovial fluid samples is still a valuable investigation for suspected septic arthritis.

**Date: 2014-11-20**

**Session: Infection: Free Papers - Infection**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 38331**

**CAUSES FOR NON-RESPONDENCE IN OSTEOARTICULAR TUBERCULOSIS: IS DRUG RESISTANCE THE ONLY CAUSE OF NON-RESPONDENCE?**

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Introduction: Osteoarticular tuberculosis, being endemic in India, is commonly diagnosed on the clinico-radiological features and subjected to empirical anti-tuberculous therapy (ATT). Patients who don't respond clinico-radiologically within 3 to 5 months to ATT are often subjected to 2nd line ATT considering drug resistance as main cause for non-response. Materials and methods: This prospective case series (funded by Bombay Orthopaedic society) of 40 patients, conducted between October 2010 to December 2012, studied reasons for non-response after 3 months of ATT. All patients were evaluated clinico-radiologically and by laboratory parameters. Patients were subjected to histopathological examination and culture and drug-sensitivity (DST) to ascertain the cause of non-response. Results: based on the results of biopsy performed after inclusion in the project. The patients were divided into four groups, group I (culture positive) having 22 patients, most with resistance, group II (culture negative, histopathology-tuberculosis) with 5 and group III non-tuberculous diagnosis with 8 - and IV non-representative samples having 5 patients. Treatment for patients in first group was modified as per DST. Surgical cause for non-response was found in most of group II patients. Appropriate treatment modifications were suggested for non-tuberculous diagnosis (III) and repeat biopsy was advised for patients with non-representative samples (IV). Conclusion: This study shows that empirical modification of ATT without obtaining Tissue diagnosis and drug sensitivity in cases of Non response is inappropriate. and culture positivity with appropriate methodology for collection and testing is high .

**Date: 2014-11-20**

**Session: Infection: Free Papers - Infection**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 38418**

**MODERN DIAGNOSTIC CRITERIA OF PERIPROSTHETIC INFECTION IN PATIENTS OF RHEUMATIC DISEASES IN HIP AND KNEE ARTHROPLASTY**

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Background: the risk of infectious complications after replacement of large joints in patients with rheumatic diseases (RD) is 2-7 times higher than in patients with osteoarthritis. Objective: to determine the modern diagnostic criteria for periprosthetic infection in hip and knee arthroplasty in patients with RA. Materials and methods: during the period from 2009 - 2013 produced 654 knee and 549 hip arthroplasty. Results: periprosthetic infection developed in 12 (3.63%) patients with total knee arthroplasty and 8 (2.95%) patients after total hip arthroplasty. Patients with RD classic clinical and laboratory signs of infection are often not clearly expressed. A joint pain (67%), local inflammatory symptoms (63%), fever (46%), purulent separated (59%), fistula (33%), superficial infections of skin (23%) was the most frequent sign. Diagnosis periprosthetic infection is considered specific when the following criteria: 1) the fistula connecting to the prosthesis or 2) pathogen isolated from two tissue samples taken separately or synovial fluid (SF) from the affected joint prosthetic or 3) has four of the following six criteria: increasing ESR > 30 mm/h or serum levels of CRP > 10 mg/l; leukocytosis in SF; increased neutrophils SF; presence of pus in the affected joint; abjection of a sample of tissue or periprosthetic SJ; histological study periprosthetic tissue - not less than 5 neutrophils in each of the five fields of view at high magnification microscope. Conclusions: practical use of these criteria allowed 11 patients to identify early sluggish periprosthetic infection, early surgical treatment to produce without removing the prosthesis and to avoid the recurrence of infection in 81.8% of patients.

**Date: 2014-11-20**

**Session: Infection: Free Papers - Infection**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 38328**

**DRUG RESISTANT OSTEOARTICULAR TUBERCULOSIS: ARE CHILDREN DIFFERENT THAN ADULTS? RESULTS OF A BOMBAY ORTHOPAEDIC SOCIETY PROJECT**

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Osteoarticular tuberculosis has attained epidemic proportions in the Indian subcontinent. The problem of diagnosis and management of this disease is magnified due to no clear guidelines for its diagnosis as well as paucity of clear criteria about the type, duration and the end point of antituberculous therapy, leading to non-respondent, presumed drug-resistant cases. This study, (first study to be funded by a professional orthopaedic association- Bombay Orthopaedic society) studied the causes of non-response and non-response. This was a prospective case series of 76 patients between October 2010 and September 2013 at a tertiary care institute, referred from various parts of the city, who are not responding after 3 months of anti-tuberculous therapy. Amongst them, 32 were found to be culture positive which were divided into two groups- those below 18 years of age (Group I) and those above 18 years (Group II). As a result there were 18 patients in group I (Age 1-18 years) and 14 patients in group II (Age 19-55years). The startling observation was that there were more number of multi- and extensively drug resistant patients in Group I as compared to Group II. There were also a greater number of primarily drug resistant cases in group I as compared to Group II. This is a really alarming statistic in a place like Mumbai, with its rampant environmental pollution and overcrowding and can thus be seen as a "tip of the iceberg" for the spread of DR-TB in the paediatric populace.

**Date: 2014-11-20**

**Session: Infection: Free Papers - Infection**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 38298**

**INTERLEUKIN-6 AND OTHER INFLAMMATORY MARKERS VERSUS  
CONVENTIONAL MICROBIOLOGIC CULTURE IN DIAGNOSIS OF  
PERIPROSTHETIC JOINT INFECTION**

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Background: Orthopedic community continues to struggle for accurate diagnosis of periprosthetic joint infection (PJI) and there is no universally accepted diagnostic test that is absolute or reliable for detection of PJI. Aim of study: To evaluate diagnostic value of interleukin- 6 (IL-6) and other inflammatory markers; C- reactive protein (CRP), Erythrocyte sedimentation rate (ESR), and White blood cell count (WCC) in the diagnosis of PJI. Subjects and methods: 40 patients (21 males, 19 females) admitted for surgical intervention after knee or hip arthroplasties. Patients had preoperative serum IL-6, CRP, WCC and ESR. Peri-implant tissue specimens were subjected to microbiological culture and histopathological examination. Results: Mean age of studied patients was (58.4 year) (range, 38-72 years). Intraoperative cultures and histopathological examination revealed that 11 patients were infected (PJI), and 29 patients were aseptic failure of prosthesis. Four presumed markers of infection were tested preoperatively: ESR; CRP; WCC; and IL-6. Results showed that ESR ( $p=0.0001$ ), CRP ( $p=0.004$ ), WCC ( $0.0001$ ), and IL-6 ( $p=0.0001$ ) were significantly higher in patients with septic revision arthroplasty than those with aseptic failure. Serum IL-6 ( $> 10.4\text{pg/ml}$ ) had a sensitivity (100%), a specificity (90.9%), a PPV (79%), a NPV (100%), and accuracy (92.5%). Conclusions: We found that IL-6 is the most accurate laboratory marker for diagnosing PJI when compared to ESR, CRP, WCC. IL-6 above 10.4 pg/ml and CRP level above 18 mg/L will identify all patients with PJI and combination of CRP+ IL-6 is an excellent screening test to identify all such patients (sensitivity 100%, NPV 100%).

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Deformities**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37736**

**FINAL FUSION AFTER GROWING ROD TREATMENT FOR EARLY ONSET SCOLIOSIS: IS IT REALLY FINAL?**

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<sup>2</sup>Growing Spine Study Group, San Diego (UNITED STATES),

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<sup>4</sup>Arkansas Children's Hospital, Little Rock (UNITED STATES), <sup>5</sup>Boston Children's Hospital, Boston (UNITED STATES)

Background: Final Fusion is usually the end point for early onset scoliosis (EOS) patients with growing rod (GR) treatment. This study determined the incidence and cause of any reoperation after final fusion. Methods: An international EOS database was analyzed to identify GR patients with a minimum of 2 years follow up. Reoperations (return to the operating room for any reason related to the spinal deformity) and causes were recorded. Results: There were 119 potential patients. 100 patients (84%) met inclusion criteria: 38 neuromuscular, 31 syndromic, 22 idiopathic, and 9 congenital. Mean age at final fusion was 12.2 years (range, 8.5 to 18.7 years). Mean follow-up was 4.3 years (range, 2 to 11.2 years). Twenty-two patients (22%) had 32 complications requiring reoperation (59 procedures). Mean complications per patient was 1.5. Ten neuromuscular, 8 syndromic, 4 idiopathic, and no congenital patients required operation. There were 9 infections (9%) (33 procedures); 6 (6%) instrumentation failure (8 procedures), 5 (5%) painful or prominent instrumentation (6 procedures); 3 complications (3%) each for coronal deformity (3 procedures), pseudoarthrosis (3 procedures), or sagittal decompensation (3 procedures); 2 complications (2%) for neurological conditions (2 procedures); and 1 prominent rib hump (1%) requiring a thoracoplasty (1 procedure). Mean time to first reoperation after final fusion was 1.8 years (range, 11 days to 7.4 years). Conclusions: A higher than anticipated percentage required reoperation after final fusion. Long term follow-up is necessary to determine final results. Parents should be counseled to the possibility of further surgery after final fusion.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Deformities**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37127**

**CONGENITAL RADIOULNAR SYNOSTOSIS, A NOVEL OPERATION  
IN TWENTY CASES**

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(EGYPT)

Background: CRUS is difficult to treat. For Wilkie type I, many techniques have been tried in an effort to restore forearm rotation. However, they have not been successful, because of the initial extensive soft tissue and bony involvement and postoperative scarring. It is inadvisable by many surgeons to perform any operation with the hope of obtaining pronation and supination. Patients and Methods: 20 children, 3 - 9 years old with CRUS Wilkie type I, with fixed full pronation deformity were managed by a new technique. A one stage intervention including separation of the bony fusion, special cementation technique of the ulnar (or radial) side of the osteotomy, double osteotomy of the radius and a single osteotomy of the ulna with intramedullary K. wire fixation of the osteotomies and above elbow casting - at the midprone position - for 6 weeks. Results: Significant passive (average: 1550) and active (average: 1150) ranges of forearm rotation were obtained with no major complications or re-fusion, after a follow-up period of 3 - 6 years (average 4.2 y). Conclusion: This one stage intervention for CRUS -Wilkie type I- is technically simple, with a significant obtained active functional range of forearm rotation with few minor complications.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Deformities**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 38491**

**THE NATURAL HISTORY OF SPINAL DEFORMITY IN HURLER'S SYNDROME (MPS TYPE 1)**

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**Introduction** A gibbus (focal kyphosis) has been commonly associated with Hurler's syndrome. We analysed the Irish population of Hurlers to evaluate the progression of thoracolumbar kyphosis, lumbar hyperlordosis and gibbus kyphosis as well as concomitant spinal pathologies in the era of bone marrow transplant. **Methods:** Between 1989 and 2013 we retrospectively analysed 51 Irish patients with mucopolysaccharoidosis type 1 H (MPS1). After exclusion, 31 patients with whole spine radiographs and MRIs of Spine were reviewed. Thoracic (T5-T12) kyphosis, lumbar (L1-S1) lordosis and gibbus kyphosis were measured at mean ages of 1,5,10, 13.5 years. 6 patients had Orthopaedic Intervention to prevent progression. **Results:** 58% were male. Mean thoracic kyphosis at mean age (MA) 1,5,10, and 13.5 years were 14,18,18 and 16 degrees. Mean lumbar lordosis at MA 1,5,10 and 13.5 years were 36,48,50, and 42 degrees. Mean gibbus Cobb angle at MA 1,5,10 and 13.5 years were 27,35,30 and 40 degrees. The incidence of concomitant spinal pathology is high: cervical spine pathology (29%), retrolisthesis (19%), scoliosis (48%), platyspondyly (9.6%). 2 Children are being braced and 5 patients have instrumentation including Growing Rods, VEPTR, and Halo using anterior and posterior approaches. **Conclusion:** This is the first paper to examine the natural history and increasing progression of thoracic kyphosis, lumbar hyperlordosis and gibbus kyphosis in Hurler's syndrome. Presence of concomitant spinal pathology is associated with increasing spinal deformity.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Deformities**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 38284**

**37 YEARS EXPERIENCE IN THE TREATMENT OF PECTUS DEFORMITIES IN CHILDREN AND ADOLESCENTS WITH USE OF BRACES AND EXERCISES**

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The authors summarize an experience of 37 years in the treatment of pectus deformities in children and adolescents with use of braces (Dynamic Chest Compressor - CDT) and exercises, which was indicated in 3198 of the total 5239 patients evaluated between 1977 and 2014 (mean age 13.2). The severity and flexibility of pectus were evaluated, and classified as: superior carinatum (PCS), lateral carinatum (PCL), lower carinatum (PCI), wide excavatum (PEW) and localized excavatum (PEL). The indication of treatment initiation was: (1) PCS - early childhood, (2 ) PCI and PCL - beginning in adolescence , (3 ) PEA and PEL - beginning in preadolescence, or in childhood for those with early onset. The brace was built in a personalized way, with the CDT I usually being used in cases of carinatum and the CDT II used in cases of excavatum. An exercise protocol was taught. The treatment results were evaluated by analysis of serial photographs and a scoring system. The results were analyzed statistically. 2211 patients had complete notes in medical charts and a minimum follow- up of 1 year. A significant improvement occurred in 77 %, 62 %, 42%, 40% and 31% of cases of PCI, PCL, PCS, PEL and PEW, respectively. More flexible deformities and those patients with a daily use of the braces greater than 18 hours a day showed better results ( $p < 0.005$ ). Conservative treatment with an orthosis and exercises can lead to good results in all types of pectus.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Deformities**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 38115**

**SURGICAL TREATMENT OF JUDET GRADE 4 RADIAL NECK FRACTURES IN CHILDREN**

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Introduction: Radial neck fractures represent 14% of all elbow fractures in children 1. They result from a fall on the outstretched arm with the elbow extended and the forearm supinated<sup>2</sup>. The Judet classification is a simple descriptive system<sup>3</sup>. Objectives: We are reporting three cases of Judet grade 4a and 4b in children (8-10 years of age) during one year. Our patients were initially treated with conservative methods (cast immobilisation) before they were referred to our institution. On imaging done in our institution (4-8 days after the injury) radial head position was unacceptable. Therefore we decided for open surgical treatment due to the elapsed time from the injury. Methods: We used Kocher's posterolateral approach. K wires were used for fixation in the safe zone of the head. Elbow was immobilized for 3 weeks (90° of flexion in the position of supination-pronation). After 3 weeks the immobilization was removed and full range of motion was allowed. Results: Three months after the injury full elbow function was achieved in all three cases. No radiographic or clinical signs of avascular necrosis were present. Also, no signs of radioulnar synostosis were present. Conclusion: Open reduction and internal fixation paired with intensive physical therapy after the removal of immobilisation gave excellent results in all three patients. Due to the elapsed time between injury and surgical treatment it is our belief that open reduction was the best treatment option. It is highly questionable what the results would be should closed or percutaneous reduction were attempted.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Deformities**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37922**

**THE TREATMENT OF NEGLECTED BADO TYPE I MONTEGGIA FRACTURE IN CHILDREN WITHOUT ANNULAR LIGAMENT RECONSTRUCTION**

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**Background:** There were many techniques described in treatment of neglected Bado type I fracture in children. The necessity of annular ligament reconstruction is an issue. The purpose of this study is to report our clinical experience without annular ligament reconstruction. **Methods:** This is a retrospective review of 10 patients treated for neglected Bado type I Monteggia fracture between 2008 and 2012. The mean age at surgery was 6 years and 7 months old. The average follow-up was 15 months. The procedure included open reduction of the radial head, ulnar lengthening angulation osteotomy. There is no need for additional stabilization in cases of stable radial head reduction after open reduction and ulnar corrective-lengthening osteotomy. However, in unstable case, a trans-capitellar K-wire was applied. **Results:** All 10 patients except one had improved elbow motion clinically. The range of motion of elbow improved to 120.5° after surgery from 88.5° before surgery. However, average pronation-supination arc was 82.5°-80° before surgery, and 74°-81° after surgery. Radiographically, the reduction of radial head maintained in all cases at last follow up. **Conclusions:** The management of neglected type I Monteggia fracture in children can be difficult. We present our surgical strategy to reduce radial head without annular ligament reconstruction with maintained reduction and improved functional results.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Deformities**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37893**

**NERVE INJURY ASSOCIATED WITH ELBOW FRACTURES IN CHILDREN**

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**Introduction:** In some cases, elbow fractures in children are complicated by nerve injuries. It is reported nerve injury in elbow fracture in children is resolved spontaneously. **Patients and methods:** six patients with nerve injury after fractures in the elbow who visited the special clinic for peripheral nerve injury in Tokyo Metropolitan Hiroo Hospital from January 2005 to March 2014 were reviewed retrospectively. Types of fractures were as follows; supracondylar humerus fractures in four cases, olecranon fracture in one, and radius head fracture in one. Affected nerve were radial nerve in two, posterior interosseous nerve in two, median nerve in two, and ulnar nerve in one. (In one case, median and ulnar nerve injuries are coexisted.) **Follow-up periods** were ranged from 3 to 22 months from the injury. **Results:** In two cases, the MMT were recovered in 3 months above M3, but in the other four cases, the MMT didn't improve above M3 in 6 months. In one case, followed up to 22 months from the injury, but the recovery of the palsy is very poor. This patient had posterior interosseous nerve injury with radial head fracture. The MMT remains below M2 at the last visit. **Conclusion:** There are some cases of nerve injuries related elbow fractures in which the results of spontaneous recovery were very poor even in children.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Deformities**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37516**

**SURGICAL TREATMENT OF UNSTABLE PELVIC FRACTURES IN VERY YOUNG CHILDREN**

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The management of unstable pediatric pelvic fractures continues to be controversial. The purpose of this study was to investigate the clinical features and treatment of unstable pelvic fractures in very young children. We presented two rare cases of severely unstable pediatric pelvic fractures, including fracture-dislocation of the sacroiliac joint, associated with femoral fracture, pubic ramus fracture or pubic symphysis separation, the age of the two patients was respectively 13 and 16 months at the time of injury, and both of them belonged to “Torode-Zieg” type IV fractures. The two patients have been performed with open reduction and internal fixation, and the time from injury to operation was 15 and 18 days, respectively. According to Matta assessment criteria, reduction of the fractures was excellent in 2 cases, and the healing time was 10 and 12 weeks, respectively. None of the two patients suffered wound complications or growth arrest at final follow-up of 46 and 16 months post-operatively, and both of them recovered fine with equal lower limb length, satisfactory walking and running functions according to Majeed criteria, and favourable radiological outcomes.. Pelvic injuries in children are uncommon lesions, especially under the age of 2 years old. Pediatric pelvic fractures used to be managed by conservative treatment, but for unstable pelvic fractures, the basic principles of management remain the same as in adult patients. This report illustrates that such principles can be employed successfully, even in very young children.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Deformities**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37482**

**APPLICATION OF DIGITAL TEMPLATE AS NAVIGATION FOR OSTEOTOMY IN CHILDREN WITH CUBITUS VARUS, A PILOT STUDY**

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Treatment of cubitus varus deformity from a malunited fracture is a challenge. Anatomically accurate correction is the key to obtaining good functional outcomes after corrective osteotomy. The aim of this study was to observe the application of digital template as navigation for treatment of cubitus varus deformity. Between September 2011 and April 2013, the computer simulation technique was applied to 7 cubitus varus deformity in 7 patients. All patients underwent CT scan for the three-dimensional reconstruction. The 3D reconstruction models for the desired elbow were generated by using the Mimics 15.0 software. The 3D models of elbow were imported into Imageware 10.0 software. A virtual navigational template was established according to humerus anatomic trait. The accurate angle of osteotomy was defined using rapid prototyping and osteotomy navigation templates were designed according to the anatomic features of the range of osteotomy. Accurate angle of osteotomy was confirmed with postoperative X-ray. Bone fractures healed in the 7 cases without nonunion or nerve palsy. Before operation, the mean angle of varus was  $32^{\circ} \pm 6^{\circ}$ . After a mean follow-up of 21 months, the mean valgus angle of the elbow was improved to  $9^{\circ} \pm 2^{\circ}$  ( $P < 0.05$ ). Internal rotation deformity was also ameliorated in 1 case. In conclusion, a novel method of osteotomy navigational template using digitized 3-dimensional reconstruction techniques has been developed, the patient-specific template is found to be highly accuracy and has great expectation.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Deformities**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37321**

**GUIDED GROWTH WITH THE TENSION BAND PLATE CONSTRUCT:  
A PROSPECTIVE COMPARISON OF TWO METHODS OF IMPLANT  
PLACEMENT**

Victoria ALLENDE<sup>1</sup>, Julio Javier MASQUIJO<sup>1</sup>, Lucas LANFRANCHI<sup>1</sup>,  
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**Introduction:** Since its introduction in 2007, the use of eight-plates has gained great popularity for the correction of diverse deformities in skeletally immature patients. In this study, we evaluate two different techniques of implant placement. **Methods:** A consecutive series of patients with indication of guided growth around the knee (femur or tibia) were included in the study. Patients were randomly divided in two groups, with eight-Plate inserted using technique as described by Stevens versus technique modified from Paley. We analyzed operative time, radiation exposure, incision size and intra-operative complications. Comparisons between groups were performed with a Mann-Whitney test. A two-tailed p-value < 0.05 was considered significant. **Results:** We evaluated a total of 31 procedures in 18 patients (16 in group A, and 15 in group B). Age and sex was similar in both groups (p=0.470, and 0.720). Operative time and radiation exposure was significantly lower in group B: 20' (11.37' - 29.30') versus 13.09' (9.31' - 25') (p 0.009), and 0.30cGy (0.10cGy - 1.30cGy) versus 0.10cGy (0.00cGy to 0.70cGy) (p 0.013) respectively. The incision size was also smaller in group B: 27mm (23 - 29mm) versus 23mm (18 - 24mm) (p 0.05). There were no intraoperative complications in any of the two groups. **Conclusions:** Modified technique for eight-plate placement seems to reduce operative time, radiation exposure, and incision size for guided growth around the knee. **Study design:** Prospective randomized (Level of evidence II)

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Deformities**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37085**

**PELVIC INJURY IN CHILDHOOD: WHAT IS ITS CURRENT IMPORTANCE?**

Claudio SANTILI, María Roxana Viamont GUERRA, Andre Luis Valsecchi CASALE, Miguel AKKARI

Santa Casa de Misericórdia de São Paulo, São Paulo (BRAZIL)

Introduction: Pelvic fractures in children are rare and, for this reason, they lack specific classification protocols or treatment. Aim: To assess the importance of pelvic fractures in children by analyzing their incidence; epidemiological characteristics; associated injuries; and clinical outcome at two large referral centers in trauma care in the metropolitan region of São Paulo. Method: Retrospective study based on medical records data from individuals younger than 16 years of age with pelvic fracture admitted to the Emergency Service in two tertiary hospitals in the last 10 years. Results: We analyzed 25 cases, among which 20 (80%) were caused by automobile accidents. The patients were brought by the rescue service in 22 cases (88%). Among the victims, 10 (40%) presented hemodynamic instability; and 11 (44%) had unstable pelvic fractures. Associated injuries were present in 14 cases (56%): 32% genitourinary; 28% abdominal; 20% vascular; 16% chest; and 12% neurological injuries. Pelvic external fixation was necessary in 18 cases. The average length of stay was 15.8 days and 36% of the children needed to be admitted to the intensive care unit. The overall mortality rate was 3 children (12%). Conclusion Pelvic fractures in childhood are rare events, but can affect children of all ages. They require high-energy trauma in order to occur, mainly due to automobile accidents. When unstable, they lead to high mortality and morbidity (12% of deaths) secondary to the occurrence of associated injuries, hemodynamic instability, and traumatic brain injury.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Deformities**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 36652**

**HOW IMPORTANT IS CAST APPLICATION TO THE SUCCESSFUL MANAGEMENT OF PAEDIATRIC DISTAL RADIUS FRACTURES?**

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**Introduction:** Distal radius fractures are among the commonest skeletal injuries in childhood. For displaced fractures, closed reduction and cast immobilisation has been the mainstay of treatment. However risk factors for redisplacement include initial fracture displacement, poor reduction and ineffective casting. The aim of this study to establish whether the cast or gap index predicts risk of redisplacement following manipulation for displaced paediatric distal radius fractures. **Methods:** A retrospective analysis was performed between September 2010 and April 2013 of all children undergoing manipulation under anaesthesia for a distal third radius fracture. Open fractures, cases with associated dislocations and epiphyseal injuries were excluded from the study. Pre-operative radiographs were reviewed for initial displacement according to Mani et al. Intra-operative radiographs were scrutinised to assess the success of closed reduction. The cast and gap index were measured from the first post-operative radiographs. Clinic records and post-operative radiographs were reviewed to identify any redisplacement as described by Alemdaroglu et al. **Results:** 132 children were included, 69.9% boys with a mean age of 9.3 years. 26 patients (19.7%) suffered a radiographic redisplacement during follow up although only 6 underwent further surgery. The redisplacement group had a significantly higher cast index (0.88 versus 0.78) and gap index (0.41 versus 0.27) than those with good radiographic outcomes. Additional risk factors associated with a significant risk of redisplacement were initial grade of fracture displacement and a successful reduction intra-operatively. **Conclusion:** Our data suggests that gap index is a better predictor than cast index for redisplacement.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Knee, Tibia & Foot**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 38014**

**GUIDED CORRECTION OF ANGULAR DEFORMITIES AROUND THE KNEE USING RECONSTRUCTION PLATE: A CHEAP, RELIABLE METHOD**

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**Joint Reconstruction Research Center, Tehran University of Medical Sciences, Tehran (IRAN)**

Introduction: Angular deformity in the lower extremities results in cosmetic deformity, gait disturbance, pain, and early joint degeneration. Recently, using a tension band plate construct ("8-plate") has been promoted for hemiepiphysiodesis, citing ease of surgical technique and more rapid rate of correction. However, it is expensive and not easily accessible in developing country. We conceived this study to examine if 3.5 mm reconstruction plate is as much effective as 8-plate in the correction of angular deformity around the knee. Methods: 15 patients (30 knees) with a mean age of 11.5 years underwent medial distal femoral hemiepiphysiodesis using reconstruction plate and 3.5 mm cortical screws. All patients were followed for 18 months. Correction of deformity and complications such as breakage or back out of device, over correction, limited range of motion were scrutinized. Results: All deformities were corrected in appropriate time. In two patients we had to remove plate because of overcorrection. One patient didn't get complete correction. No breakage or back out of device was seen. Conclusions: Our study showed that 3.5 mm reconstruction plate is an effective device for the treatment of angular deformities in growing children.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Knee, Tibia & Foot**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 37786**

**CORRECTION OF RELAPSED, NEGLECTED AND RIGID CTEV BY G. A. ILIZAROV TECHNIQUE**

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**Russian Ilizarov Scientific centre Kurgan, Bari Ilizarov Orthopaedic Centre, Dhaka Bangladesh, DHAKA (BANGLADESH)**

Introduction: Relapsed, neglected and rigid CTEV at the age of 1 and above present specific difficulties. These may be due to neglect, improper treatment or inadequate bracing or they may follow soft tissue releases and are stiff and have severe deformities of cavus, ductus and equinovarus. Materials & Methods: From December 1992 to December 2012 we treated 186 feet in 1088 children. The ages of the patients ranged from 12 months to 33 years averaging 5 years. In relatively supple feet, casting is still a choice. At the end of casting, hindfoot equinus persists. At this stage, Ilizarov apparatus was applied. The fixator duration is short and full correction of the hindfoot equinus was achieved. Result: In older children, with very stiff feet, the Ilizarov external fixator offers significant advantages due to modularity and flexibility in application. Inadequate correction was seen in 3 feet. In 1 foot, there was flattening of the talar dome. In another patient, inadequate follow-up caused the incomplete correction in both his feet. Mild persistent cavus remained in the forefoot and varus in the heel. The parents were not unhappy as they got at least 95% improvement. The mean follow-up time was 36 months (12 months – 15 years). Conclusion: Modularity of the Ilizarov fixator permits us to confirm the Ponseti principles which allow us to have a kinesiological correction with fewer complications. It gives total control and better results.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Knee, Tibia & Foot**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 37405**

**ARTHROLYSIS WITH FLAT FOOT IMPLANT (FFI): 7 YEARS OF TREATMENT**

Antonio MEMEO<sup>1</sup>, Elena PANUCCIO<sup>1</sup>, Leopoldo PEDRETTI<sup>1</sup>,  
Francesco VERDONI<sup>1</sup>, Jacques H CATON<sup>2</sup>

<sup>1</sup>Gaetano Pini, Milano (ITALY), <sup>2</sup>Clinique E. de Vialar, Lyon (FRANCE)

Introduction: Arthrolysis with FFI is one option for the treatment of flatfoot (Pesabductoplanovalgus) in children. The aim of the study was to evaluate any correlation between various foot angles and their respective American Orthopaedic Foot and Ankle Society (AOFAS) scores for pain, and the correction clinical outcomes. Methods: In a retrospective clinical follow-up study, all patients that were treated with arthrolysis with FFI from 2005 to 2013 were included. One foot was operated at a time, and the contralateral foot was operated 3 months later if indicated. Postoperatively, partial weightbearing was performed for 1 week. Assessment was performed before surgery, at 2 years followup. Foot angles including anteroposterior (AP) and lateral talocalcaneal (TC) angles, AP and lateral talo- first metatarsal (TFM) angles, calcaneal pitch angle and talonavicular (TN) angle were measured, as were AOFAS scores for pain for the forefoot, midfoot, and hindfoot and Visual-Analogue-Scale Foot and Ankle (VAS FA). Results: 518 patients were included in the study (age, 10.6 [8-12], 45% male). In comparison with the preoperative parameters, after orthosis treatment, all scores and all foot angles improved significantly, the AOFAS hindfoot score correlated positively with the lateral TC angle of the foot and VAS FA scores were increased. The parameters did not differ between followups. Conclusion: Medial arch support orthosis significantly improved AOFAS scores and foot angles. Calcaneal pitch angle and lateral TC angle correlated well with AOFAS hindfoot scores. All relevant parameters improved after arthrolysis with FFI in pes planovalgus in children.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Knee, Tibia & Foot**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 37326**

**TYPE VI SALTER-HARRIS PHYSEAL FRACTURES OF THE FOOT AND ANKLE**

Victoria ALLENDE, Julio Javier MASQUIJO, Lucas LANFRANCHI  
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Salter-Harris VI fractures (SHVI) are injuries in which part of the physis is missing. They are rare in children but potentially devastating. The aim of this study was to evaluate the mechanism of production, treatment, and functional outcomes of these injuries in the foot and ankle. Material and methods: All patients with foot and ankle SHVI injuries were retrospectively analyzed. Demographics, classification, mechanism of injury, type and number of associated injuries that required surgery were documented. Patients were assessed functionally with the AOFAS score and radiographically to determine the viability of the physis, limb length discrepancies or angular deformities. Results: 5 fractures in 4 patients (3 male, 1 female) were analyzed. Mean follow-up was 26.2 months (range, 12-37 months). According to Peterson sub-classification 3 belonged to group A, 1 to group B and 1 to group C. 3 injuries occurred as a result of motorcycle accidents, and 2 in a car accident. 100% were associated with soft-tissue injuries, 75 % had more than one bone injured and 50% had tendon lesions. Each patient required an average of 3.2 surgeries (range, 2-5). The average AOFAS was 79.8 points (range, 62 - 100 points). Radiographically, only 40% of the affected physis remained viable at last follow-up. Conclusion: SHVI fractures are associated to several injuries, require multiple surgeries and often result in premature growth arrest and some degree of disability. Prevention measures are required to prevent the exposure of children to this type of injury. Early treatment is essential to prevent the development of deformities.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Knee, Tibia & Foot**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 37171**

**COMPARISON OF SUBTALAR ARTHROERESIS TO CALCANEAL LENGTHENING FOR FLAT FOOT CORRECTION**

Peter STEVENS<sup>1</sup>, David CHONG<sup>1</sup>, Bruce MACWILLIAMS<sup>2</sup>, Teresa HENNESSEY<sup>1</sup>, Neolle TESKE<sup>1</sup>

<sup>1</sup>University of Utah, Salt Lake City (UNITED STATES), <sup>2</sup>Shriners Hospital - Intermountain, Salt Lake City (UNITED STATES)

Introduction: There is no consensus regarding the surgical treatment of unremitting, painful flatfeet in children. Calcaneal lengthening or medial shift osteotomy has been preferred by many. They have been reluctant to accept subtalar arthroeresis because of unproven concerns about producing hindfoot stiffness. Consequently there is a paucity of orthopedic literature regarding outcomes. We hypothesized that the results of arthroereisis would be biomechanically and clinically equivalent to the more established method of calcaneal lengthening. Methods: We enrolled 15 patients (24 feet) with a mean age of 12.8, who had idiopathic painful, planovalgus feet, in a prospective, non-randomized trial. Seven patients (13 feet) were in the subtalar arthroereisis group, and 8 patients (11 feet) had calcaneal osteotomies. Prior, and at 1 year post-operatively, we performed, radiographs, pedobarographs, kinematic motion analysis, and validated outcome questionnaires (Oxford Ankle-Foot Questionnaire for Children), comparing outcomes of both groups. Results: We found statistically significant improvements by all parameters in both groups, but no statistical difference between the outcomes to support one treatment over the other. Neither arthroeresis nor calcaneal lengthening caused hindfoot stiffness; the range of motion was preserved with increased varus offset. Radiographs in both groups showed statistically significant improvements in the lateral talocalcaneal angle, AP and lateral talo-first metatarsal angle, and AP-talonavicular coverage. Conclusions: Subtalar arthroereisis is less invasive, more cost-effective, and is a feasible alternative to lateral column lengthening. While either procedure can achieve the desired outcome, the informed choice should be individualized, in accordance with parental expectations and desires.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Knee, Tibia & Foot**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 37169**

**GUIDED GROWTH FOR BLOUNT'S DISEASE**

Peter STEVENS, John HEFLIN, Joshua KLATT, Heather FILLERUP  
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Introduction: Progressive tibia vara is best treated by surgical intervention. Some colleagues have decried the use of hemi-epiphysiodesis, regardless of the technique selected; They prefer the traditional approach of corrective osteotomy, despite the attendant risks, including recurrent varus. Methods: This is a retrospective review of 17 patients (10 bilateral = 27 limbs) who underwent guided growth. There were 12 boys and 4 girls, age 2 -14, at the time of index surgery, Methods: We reviewed clinical findings and obtained full length, weight-bearing radiographs of the legs, noting the mechanical axis, the PMTA, and Langenskiold changes. The standard technique of tension band placement is employing a single plate and cannulated 4.5 mm screws, taking care to avoid leaving a gap between the plate and the metaphysis of the tibial plate. This will avert screw fatigue / breakage. The fibula was left intact. Results: With an average follow-up of 30 months, 21 of 27 limbs (78%) fully corrected in an average time of 13.5 months, without recurrence or permanent arrest. Five adolescent patients experienced incomplete correction; 2 underwent corrective osteotomy. Two patients had deformity after osteotomy following osteotomy and were subsequently corrected with guided growth. Ten of 27 limbs with 15-30 degrees of inward torsion experienced full correction of same, without need for osteotomy. Conclusion: Regardless of the arbitrary subtype (infantile, juvenile, adolescent), children with Blount's disease, who do not have a defined physeal bar, can be successfully managed with guided growth, employing a lateral tension band plate, reserving osteotomy for salvage situations.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Knee, Tibia & Foot**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 36979**

**A NOVEL COMPUTER-ASSISTED DRILL GUIDE TEMPLATE FOR ANGULAR DEFORMITY**

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The present method of hemiepiphysiodesis for correction of angular deformity relies on anatomical landmarks for 8-plates placement. Placement of 8-plates using drill template has not been described in the literature. The authors reported on their experience with placement of 8-plates using a novel computer-assisted drill template in nine patients. 3D model of tibia was reconstructed by software MIMICS 10.01. The 3D tibial model was then exported in STL format, and opened in a workstation running software UG imageware 12.0 for determining the optimal screw size and orientation. A virtual navigational template was established according to the tibial anatomic trait. The physical tibia and navigational template were manufactured using rapid prototyping. The navigational template was sterilized and used intraoperative to assist the placement of 8-plates. Overall, nine 8-plates were placed and the accuracy of screw placement was confirmed with postoperative X-ray and CT scanning. There were not complications of related screws insertion. Average follow-up was 9 months (range 4-13 months). Postoperative computed tomographic (CT) scanning was available for allowing the evaluation of placement of 8-plates, all of which were in good position. This study shows a patient-specific template technique is easy to use, can simplify the surgical act and generates highly accurate screw placement. Advantages of this technology over traditional techniques include planning of the screw trajectory is done completely in the presurgical period as well as the ability to size the screw to the patient's anatomy.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Knee, Tibia & Foot**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 36486**

**MID-FOOT LENGTHENING BY THE METHOD OF TRANSOSSEOUS OSTEOSYNTHESIS IN MANAGEMENT OF CHILDREN WITH CONGENITAL FOOT PATHOLOGY**

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Introduction: At present foot lengthening in children including cases with deformities remains rather topical. (Zharnikova N.A., Konyukhov M.P., 2003; Koczewski 2004). Material: Between 2000 and 2013 88 patients (107 feet) were treated in our hospital with congenital foot shortening from 6 to 18 years. 19 patients had bilateral pathology. In 82 cases foot shortening was associated with deformity. Methods: All patients underwent mid-foot osteotomies (though cuboid and cuneiform bones) and Ilizarov fixator was applied on the tibia and foot; upon indications the following was done: Achilles tendon tenotomy, foot plantotomy, tenotomy of toe flexors with diafixation of toes with wires. In addition, calcaneal osteotomy was done in 76 cases. Results: AOFAS functional scale was applied for treatment result evaluation. At short-term follow-up (2 months-1 year) excellent results were observed in 43% of cases, good – in 30.8% of cases (33 feet), satisfactory – 22.5% of cases (24 feet), and poor – in 3.7% of cases (4 feet). Long-term follow-up (1-5 years) was studied in 36 feet, among which excellent results were observed in 50%, good – in 33%, satisfactory – 17%. Average duration of mid-foot lengthening was  $28.4 \pm 11.2$  days. Amount of mid-foot lengthening varied from 1.0 to 5.0 cm. Average duration of external fixation was  $52 \pm 6.3$  days. Conclusion: So, mid-foot osteotomies in management of children with congenital foot shortening by Ilizarov method of transosseous osteosynthesis is the optimal way to restore anatomic and functional parameters of the segment, which contributes to psychological and social adaptation of the child.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Lower Extremity**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37932**

**COMPLICATIONS ASSOCIATED WITH THE REMOVAL OF SALTER PINS**

James RICKETTS, Peter RALTE, Graeme WILSON, Simon ROBINSON, David WRIGHT, James LEROY, Bruce COLIN  
Alder Hey Children's Hospital, Liverpool (UNITED KINGDOM)

**Introduction:** The Salter innominate osteotomy is performed at our institution for the treatment of developmental dysplasia of the hip. Our current practice to remove the threaded pins used to stabilise the osteotomy at approximately 12 months. **Methods:** Patients were retrospectively identified from the theatre database. Between July 2007 and November 2011, 137 Salter osteotomies were performed on 128 patients. The average age of patients at the time of their primary procedure was 2.8 years (0.8 - 8.8). **Results:** One hundred and twenty seven (92.7%) patients underwent removal of their Salter pins. The average time to pin removal was 12.9 months (2.8 - 35.6) and the average age of the patients was 3.8 years (1.8 - 10.8). One hundred and six (83.5%) patients underwent pin removal alone, while 21 (16.5%) had additional procedures performed at the same time. Three (2.4%) cases of wound infection were identified following pin removal. Two (1.6%) were superficial and resolved with a single course of oral antibiotics. One (0.8%) case of deep wound infection required readmission, wound debridement and several weeks of antibiotics prior to resolution. **Discussion:** A survey of UK institutions revealed that 85% routinely remove their hardware. The decision to remove relies on the presumption that remnant metalwork may complicate future surgery, as well as the risk of migrating metalwork causing injury. This must be weighed against the morbidity associated with repeat surgery and its potential complications. Furthermore, consideration must be given to the financial cost associated with their removal.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Lower Extremity**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37800**

**TEN-YEAR FOLLOW-UP OF DIAPHYSEAL TIBIAL FRACTURE IN PEDIATRICS BY ELASTIC STABLE INTRAMEDULLARY NAILS (ESIN)**

**Waleed AMRHASSAEN**

**EL HELAL HOSPITAL, CAIRO (EGYPT)**

**Objectives:** the objectives of this study were to investigate the safety and efficacy of elastic stable intramedullary nailing in treatment of pediatric tibial shaft fractures. **Background:** using intramedullary nailing technique in treatment of one of common injuries involving the lower extremities in children and adolescents. **Methods:** a retrospective study of six hundred and twenty children with tibial shaft fracture that had been admitted to EL HWLAL Hospital between Mar 2003 and Jun 2013, all patients had diaphyseal tibial fracture. The average age of the patients in this series was 11.3 years (range 5-15 years). Patient charts and radiographs were prospectively reviewed. Outcomes were classified as excellent, satisfactory, or poor according to the Flynn's classification for flexible nail fixation as functionally assessment and associated with radiologically assessment using Radiographic Union Scale of Tibial fracture scoring system in 4th week and 12th week. **Results:** All patients achieved full weight bearing at a mean of 9.7 weeks (range 8–16 weeks). The results were excellent in 81% of patients and satisfactory in (15%) of patients. 4% of patient show 5-10 °degree of angular malalignment, other 3 cases were complicated with nail end protrusion and limb length discrepancy  $\leq 2$  centimeter. No patient was with poor result. **Conclusion:** Based on these results, elastic stable intramedullary nailing with titanium elastic nails is an effective surgical technique which allows rapid healing of tibial shaft fractures with an excellent long term follow up result.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Lower Extremity**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37718**

**"BOOMERANG" PRE-MOLDED PLATE FOR SUBTROCHANTERIC  
OSTEOTOMY TO TREAT LATE SCFE DEFORMITY**

Miguel AKKARI, Andre Volpi OTANI, Clarissa Pereira IANONI, Wilson LINO JUNIOR, Gilberto WAISBERG, Susana Reis BRAGA, Claudio SANTILI

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**Aim:** To evaluate the radiographic correction and the complications in subtrochanteric osteotomy for SCFE using a pre-molded plate based on clinical and radiographic evaluation. **Method:** We retrospectively analyzed 21 patients (23 hips) with moderate to severe chronic SCFE that underwent a subtrochanteric flexion and derotation osteotomy fixed with a pre-molded plate to the great trochanter curve and with an anterior angulation between 40 and 60 degrees and without a wedge resection. There were 10 boys and 11 girls, the average age was 15.3 years and the average follow-up was 47 months. The average Southwick angle in Lauenstein was 66. The clinical and radiographic results were classified as described by Southwick. **Results:** We had excellent and good results in 20 patients (86.9%) and 3 patients had poor results. The average post-operative Southwick angle was 17 and the average correction was 48 degrees. Two patients had poor results secondary to chondrolysis and in one patient the source of pain and limping was not identified. Overall we had 3 cases of chondrolysis and no avascular necrosis. **Conclusion:** Subtrochanteric osteotomy for late SCFE deformity with the "Boomerang" plate is reliable technique, providing excellent and good results in 86.9% of the patients.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Lower Extremity**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37475**

**A NOVEL COMPUTER-ASSISTED NAVIGATIONAL TEMPLATE FOR  
SALTER ACETABULAR OSTEOTOMY**

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Treatment of developmental dysplasia of the hip (DDH) in children is a challenge. Anatomically accurate correction is the key to obtain good functional outcomes after corrective osteotomy. The aim of this study was to attempt to increase the accuracy of treatment by use of 3-dimensional (3D) computer-aided design. We describe a novel method for ensuring an accurate osteotomy method in the treatment of DDH in children. Between July 2008 and August 2010, 16 female and 4 male patients with DDH underwent scanning with spiral computed tomography (CT) preoperatively. The mean age was 3.7 years, ranging from 2 to 6 years. Three-dimensional CT image data of the affected and contralateral normal bones of cubitus were transferred to a computer workstation. Three-dimensional models of acetabulum were reconstructed by use of MIMICS software. The 3D models were then processed by Imageware software. An osteotomy template that best fitted the angle and range of osteotomy was “reversely” built from the 3D model. These templates were manufactured by a rapid prototyping machine. The osteotomy templates guide the osteotomy of acetabulum. An accurate angle of osteotomy was confirmed by postoperative radiography. After 18 to 30 months’ follow-up, the mean postoperative acetabular index angle in 20 patients with DDH was 13.2° (range, 9° to 21°), with a mean correction of 12.6° (range, 11° to 15°). The patient-specific template technique is easy to use, can simplify the surgical process, and generates highly accurate osteotomy in DDH in children.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Lower Extremity**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37451**

**INJURY PATTERN OF FIRST EPISODE PATELLAR DISLOCATION  
IN CHILDREN AND ADOLESCENTS**

Maria TUCA, Cristian OLMEDO, Mauricio NUÑEZ, David FIGUEROA,  
Rafael CALVO

Clinica Alemana - Universidad del Desarrollo, Santiago (CHILE)

**Objectives:** Describe clinical characteristics and image findings after first episode patellar dislocation in children and adolescents. **Methods:** Retrospective cohort study of 91 children and adolescents affiliated to a scholar health insurance, who presented with a first episode patellar dislocation between 2008–2012. All patients were evaluated with a magnetic resonance (MRI). Clinical data and image findings were registered. Average follow-up was of 32.9 months (7-60). **Results:** The sample consisted of 91 patients (31 girls and 60 boys), with an average age of 14.8 years (11–18). MRI showed partial ruptures of the medial patellofemoral ligament (MPFL) in 36 patients (40%). Of these, 26 occurred at the patellar insertion, 7 at the femoral insertion, and 3 were intrasubstance ruptures. Ten patients had total MPFL ruptures (11%), 7 at the patellar insertion, 2 at the femoral insertion, and 1 at both. Subchondral fractures were seen in 27 patients, 10 in the external femoral condyle, 15 in the patella and 2 in both locations. Only 10 patients (11%) underwent surgery after their first episode of patellar dislocation, for having osteochondral fragments > 10mm. During follow-up, 18.6% (17 cases) suffered a re-dislocation, that was on average 11.3 months after the first episode (2–28). **Conclusion:** MPFL injury following patellar dislocation in children and adolescents more frequently compromises the patellar insertion, differing from the injury pattern described for adult population. Primary surgical treatment is rare. One fifth of the patients will suffer a re-dislocation in the following 24 months.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Lower Extremity**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37040**

**PEDIATRIC RECONSTRUCTION OF THE HIP JOINT FOLLOWING SEPTIC ARTHRITIS**

**Mikhail TEPLENKIY**

**Russian Ilizarov Scientific Center, Kurgan (RUSSIA)**

Introduction: Difficulties with surgical correction of a condition following septic coxitis are caused by evident deformity and low adaptation potential of articular components. Purpose: Review results of pediatric reconstructive treatment using the Ilizarov external fixation applied for sequelae of septic coxitis. Material and methods: Treatment results of 26 children aged from 4 to 10 years treated for septic coxitis were reviewed. The hips were grouped according to Choi as follows, 2, type IIa, 2, type IIb, 5, type IIIa, 2, type IIIb, 9, type IVa, and 6, type IVb. Transtrochanteric osteotomy only was performed for 6 types II and III patients, and femur and pelvis were osteotomised in 5 cases. Cervical stump was reduced into acetabulum, proximal femur formation and pelvic osteotomy were produced for dislocated femur (type IV). Results were followed from 18 months to 6 years. Functional outcomes were assessed using Merle d'Aubigné-Postel Score, types II and III showed 7 good and 4 fair results; type IV, 4 good, 8 fair and 3 poor outcomes. Radiological assessment of deformity types II and III showed 5 good and 6 fair results according to Kruczynski grading system. No recurrence was observed with a type IV deformity. Cervical stump coverage was 80-90%. Congruence of articulating surfaces according to Coleman was as follows, type III, 8 and type IV, 7. Conclusions: The usage of the technique is practical enough even with evident destruction of the proximal femur. The approach can be alternative to trochanteric arthroplasty and pelvic support osteotomy.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Lower Extremity**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 36891**

**DEGENERATIVE OSTEOARTHRITIS AFTER PERTHES' DISEASE: A 36-YEAR FOLLOW-UP**

Eijiro ONISHI<sup>1</sup>, Toyoji UEO<sup>2</sup>, Noboru IKEDA<sup>2</sup>, Tadashi YASUDA<sup>1</sup>, Koichi IWAKI<sup>1</sup>, Ryosuke Ikeguchi<sup>1</sup>, Satoshi OTA<sup>1</sup>, Gota KIMURA<sup>1</sup>, Hidenori KYO<sup>1</sup>, Hisanori TAKEUCHI<sup>1</sup>, Masashi KANAMURA<sup>1</sup>, Yuki OKUTANI<sup>1</sup>, Mutsumi WATANABE<sup>1</sup>

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Although the prognosis of Perthes' disease at skeletal maturity is considered favorable, little is known about the long-term results after middle age. We retrospectively analyzed the radiographic and functional outcomes of 67 patients (70 hips) who had been treated for Perthes' disease. Of these patients, 28 patients (29 hips) were evaluated using JOA score and radiographs at follow-up (Group 1), 39 patients (41 hips) were evaluated by a postal questionnaire (Group 2). The mean follow-up period was 36.1 years. The mean age at follow-up was 43.1 years. Group 1; Good radiographic results (Stulberg class I or II) were achieved in 59% of hips. No osteoarthritis (Tönnis Grade 0) was observed in only 48% of hips. The clinical results were good (Japanese Orthopaedic Association [JOA] score  $\geq 70$ ) in 79% of hips. The Tönnis grade and JOA score declined after 40 years of age. All patients older than 50 years showed severe osteoarthritis. The severity of osteoarthritis correlated significantly with age at follow-up. Group 2; The clinical results were good (JOA score  $\geq 56$ ) in 76% of hips. In both group, no patient had undergone total hip arthroplasty. Younger age at diagnosis ( $< 8$  years) correlated significantly with a better result. The JOA score correlated significantly with age at follow-up. Patients who were treated for Perthes' disease have a risk of osteoarthritis and a clinically poor outcome after the age of 40–50 years.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Lower Extremity**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 36588**

**EVALUATION OF HIP ARTHRODIASTASIS IN THE MANAGEMENT OF LATE ONSET PERTHES' DISEASE IN ELDERLY CHILDREN**

**Ajai SINGH, R.N. SRIVASTAVA**

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Background: Hip distraction in Perthes' disease unloads the joint, which negates the harmful effect of the stresses on the articular surfaces, which may promote the sound healing of the area of necrosis. We have examined the effect of arthrodiastasis on the preservation of the femoral head in older children with Perthes' disease. Method and Material: Twelve children with age more than 8 years with Perthes' disease of less than 01 years were treated with hip distraction by a hinged mono-lateral external fixator. Observation and Results: Mean duration of distraction was 13.9 days. These children were evaluated by clinico-radiological parameters for a mean period of 32.4 months. There was a significant improvement in the range of movements and mean epiphyseal index, but the change in the percentage of uncovered head femur was insignificant. There was significant improvement in Harris Hip score. Conclusions: Hip distraction by hinged mono-lateral external fixator seems a valid treatment option in cases with Perthes' disease in the selected group of patients, where poor results are expected from conventional treatment.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Lower Extremity**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 36495**

**LIMB SPARING RECONSTRUCTIVE SURGERY AND ILIZAROV LENGTHENING IN FIBULAR HEMIMELIA OF ACHTERMAN-KALAMCHI II PATIENTS**

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<sup>1</sup>Tanta University, Tanta (EGYPT), <sup>2</sup>Heidelberg Universitat, Muenchen (GERMANY)

Fibular hemimelia is the commonest congenital deformity or absence of long bones. It encompasses a spectrum of anomalies affecting femur, knee, tibia, ankle, and foot. It may be associated with other complex syndromes as Femur Fibula Ulna Syndrome (FFU), but mostly occurs as an isolated deformity. Management of this complex deformity is controversial, and the question has always been; is amputation a must? The aim of this study was to evaluate the long-term results of management of fibular hemimelia (Achtermann–Kalamchi,type-II) using limb reconstructive surgeries, followed by staged lengthening by the Ilizarov method. We reviewed 157 consecutive patients (180 limb segments) with a mean follow-up period of 10.7 years (1.2–21 years). The results were favorable, and all the patients walked independently. Although, this type of management is technically demanding and entails a lengthy procedure with many complications anticipated, the Ilizarov lengthening after limb reconstruction is still an attractive option for management of this type of limb deficiency.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Lower Extremity**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 36432**

**PRELIMINARY RESULTS USING THE LOCKING PLATE TO TREAT  
LEG LENGTH DISCREPANCY IN ADOLESCENTS**

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Andrei DZEMIANTSOU

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Introduction: Guided growth has become the accepted method for the equalization of limb lengths. The low morbidity which accompanies this relatively uncomplicated operative technique, short hospital stay and convalescence make it an attractive alternative for correction of moderate discrepancies in the growing child with average, or near average, height potential. Purpose: To compare the fixators and evaluate their efficiency in correction of the LLD. Materials and Methods: In two groups we used guided growth. Two types of fixators are compared: plate for guided growth with cone shells and locking plate for guided growth. In group 1 (16 patients) we used plate with cone shells, and in group 2 (10 patients) we used locking plates. Statistical significance was assigned to P values  $<0.05$  Results: During the first year of observation mean rate of correction in group 1 was 1,05 sm per year, in group 2 – 1,28 ( $p<0,05$ ). For the second year of follow up mean rate of correction in group 1 was 0,92 sm and in group 2 – 1,17 ( $p<0,05$ ). Discussion: Preliminary results indicate that the use of locking plates accelerates the correction rate of the lower leg length discrepancy. This may be particularly important when this method used in older children, when necessary to obtain maximum correction in a short time.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Neuromuscular Problems**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 38359**

**SPASTIC DISLOCATION OF THE HIP IN CEREBRAL PALSY: IMMEDIATE SURGICAL RESULTS AFTER RECONSTRUCTION OF THE HIP WITHOUT INTRA-ARTICULAR PROCEDURE**

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Introduction: subluxation and dislocation of the spastic hip are recognized challenges regarding patients with cerebral palsy. The therapeutic approach is based on an effort in prevention or performing surgical treatment. Surgical options are described as soft tissue procedures, femoral and pelvic osteotomies and intra-articular procedures. Purpose: measure the capacity of immediate correction of spastic hip in patients with cerebral palsy who underwent to surgical treatment including soft tissue procedure, femoral varus derotation osteotomy (VDRO) and acetabuloplasty without intra-articular procedure. Methods: included 24 patients with spastic cerebral palsy (GMFCS) - 1 level II, 3 III, 4 IV and 16 V) summing 32 hips, 14 girls and 10 boys, 17 right hip and 15 left. We analyzed radiographic parameters as acetabular index (AI), Reimers migration index (RMI) and neck shaft angle (NSA) before and after procedures. Results: mean AI pre-op was  $32,31^{\circ}$  (21 to 46), RMI was 80,93% (40 to 100) and NSA was  $162,78^{\circ}$  (145 to 172). Mean post-op angles: AI -  $20,03^{\circ}$  (13 to 32), MRI – 5,31% (0 to 30%), NSA –  $118,36^{\circ}$  (102 to 136). Regarding surgical procedure and 6 months of follow up, we observed all hips reached immediate congruency, 4 patients (12,48%) presented difficult pain control, 2 (6,24%) with MRI above 20% (25 and 30%) and 1 (3,12%) dislocated after cast removal (8 weeks). Conclusion: all patients achieved immediate articular congruency. Three hips (9,36%) , all level V, described as 2 hips with MRI above 20% (25 and 30%) and 1 hip dislocated after cast removal.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Neuromuscular Problems**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 38354**

**DISTAL FEMORAL OSTEOTOMY IN CROUCHING ADOLESCENTS WITH SPASTIC CP DIPLEGIA USING A PROXIMAL HUMERUS PLATE**

Mahmoud MAHRAN<sup>1</sup>, Walid ABDEL GHANY<sup>1</sup>, Mohamed GABER<sup>2</sup>, Mostafa MAHRAN<sup>1</sup>, Mootaz THAKEB<sup>1</sup>

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**Background:** In crouching patients with spastic cerebral correction of a fixed knee flexion deformity is mandatory for the improvement of gait pattern. The supracondylar femoral extension osteotomy (SEO) is a popular method to achieve this goal. The standard implant used is the conventional technically demanding AO blade plate. LCP pediatric condylar 90-degree plate was described but is costly for an underprivileged health care facility. The aim of this study was to report the outcome of using a proximal humerus locked plate for SEO. **Methods:** fifteen patients undergoing SEO were included. All patients were ambulatory spastic diplegics with crouch gait pattern and fixed knee flexion deformity. The mean knee flexion deformity angle was 31.5 (range: 20-45 degrees). The mean age was 15 (range: 12-20 years) at the time of surgery. Four patients had unilateral procedures and 11 had bilateral procedures. This was done in the context of single event multilevel surgery for management of hypertonia and, correction of muscle contractures and lever arm dysfunction. **Results:** The mean operative time of the index procedure (after subtracting the whole surgical event time) was 72 minutes (range, 30 to 150 min) and the mean blood loss was 118.6 (range, 60 to 250 mL). Full extension was achieved in all cases. Three months after the index operation, all osteotomies were radiologically consolidated. At one year postoperatively, there were no malunions or nonunions. **Conclusions:** proximal humeral plate provides a stable, safe and economic fixation of distal femoral correction osteotomies in adolescent patients with spastic cerebral palsy.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Neuromuscular Problems**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 38099**

**IS PERCUTANEOUS GRACILIS TENOTOMY AS EFFECTIVE AND SAFE AS THE OPEN PROCEDURE?**

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**Introduction:** The purpose of this prospective study was to describe the effects of percutaneous gracilis tenotomy (PGT) and to compare them with those of the open procedure (OGT). **Methods:** This is a cross-over randomized controlled trial including 59 consecutive hips from 31 patients with cerebral palsy scheduled for gracilis tenotomy. A pediatric orthopaedic surgeon conducted a PGT. Another surgeon extended the wound to explore what had been cut during the PGT, and completed the tenotomy if necessary. Hip abduction (HA) was assessed by a third surgeon immediately before PGT, after PGT, and then after OGT. All 3 surgeons were blinded to the others' findings. The percentage of muscle portion sectioned percutaneously, and its influence on hip abduction (HA) were evaluated. Statistical analysis was done using a paired t-test, Student's t-test and Pearson correlation coefficient. Bleeding was assessed and iatrogenic lesions were identified. **Results:** Mean HA (hips/knees extended) measured 33.71 degrees preoperatively and increased to 45.90 degrees after PGT ( $P < 0.0001$ ). After OGT, HA averaged 48.71 degrees with no statistical gain compared with that observed after PGT ( $P = 0.21$ ). The muscular portion of gracilis origin was cut to an average of 91.95%. Considerable bleeding with hematoma formation requiring hemostasis during the open control procedure occurred in 30 hips. **Conclusions:** This is the only prospective study assessing PGT. Although it is a fast, simple and effective procedure, it is not as safe as the open release even when done correctly by an experienced surgeon, mainly because of the increased risk of bleeding.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Neuromuscular Problems**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 38023**

**FUNCTIONAL EVALUATION OF SALVAGE PROCEDURES IN NON AMBULATORY CEREBRAL PALSY PATIENTS WITH CHRONIC HIP DISLOCATION**

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Introduction: Hip dislocation is a common problem in cerebral palsy (CP) leading to deformation of femoral head, consequent osteoarthritis, difficulty in nursing and perineal care. We analysed the outcome of salvage procedures in non-ambulatory CP patients with symptomatic chronic dislocated hip with CPCHILD and PedsQL scoring system and also compared the functional outcome between proximal femoral valgus osteotomy with femoral head excision (Group 1), proximal femoral valgus osteotomy (Group 2) and proximal femoral resection interposition arthroplasty (Group 3). Methods: Twenty Seven patients underwent one of the salvage procedures and were divided in groups based on the type of surgery performed. Group 1 (8 patients), Group 2 (7 patients) and Group 3 (12 patients). The functional score and clinical outcome of each group were analyzed and comparison among the group was done. Results: The mean age of surgery was 15.04 years and average follow up was 43.5 months. Prior to the surgery 23 patients (85.2%) had painful and difficulty in sitting or positioning. Seven patients developed complications and the rate was highest (41.6%) in Group 3. There was an improvement in the mean postoperative functional scores for both CPCHILD (55 which improved to 69.1) and PedsQL scoring system (652.8 improved to 787.9) in all the groups. However the scores did not have a statistical significance between the three groups. Conclusion: Non ambulatory CP patients with symptomatic chronic hip dislocation benefit from palliative surgical procedure with an improvement in their quality of life. We recommend resection and valgus osteotomy, as it has a good outcome with least complication rate.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Neuromuscular Problems**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 37760**

**RESULTS OF SURGERY IN CEREBRAL PALSY CHILDREN**

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Cerebral Palsy (CP) is a non-progressive upper motor neuron disease due to injury to immature brain and is one of the commonest neuromuscular disorder seen in children. As age advances, this disorder can lead to loss of muscular balance with a mixture of spasticity and contracture of affected joints. This is a study of 121 CP patients treated by us from January 2004 to December 2012. There were 73 male and 48 female. Their age ranged from 2 to 49 years. Common presentation was spastic gait. Scissoring and equinus are common deformities in lower limb and pronation and wrist flexion deformity in upper limb. Lower limbs were operated in 102 patients and upper limb in 19. Surgical procedures included soft tissue release, tendon transfer, corrective osteotomy and arthodesis. 14 patients who presented with rigid deformities were treated with Ilizarov external Fixator. 11 patients were lost in follow up. All patients improved significantly. CP is quite common in developing countries like India due to poor socio-economic conditions. Surgical treatment indicated when deformities and/or contracture interfere with activities of daily living. In early stages most of the deformities and contracture can be corrected with soft tissue release to tendon transfer. At later stage when deformities are rigid, they can be safely corrected with Ilizarov Fixator. The results were better in younger patients. What surgery can achieve in hours, physiotherapy cannot in years.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Neuromuscular Problems**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 37623**

**RELEASE IN THE TREATMENT OF SHOULDER ADDUCTION AND INTERNAL ROTATION CONTRACTURE IN CHILDREN WITH ERB'S PALSY**

**Ismat GHANEM, Elias NAOUM, Elie SAGHBINI, Ayman ASSI  
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The aim was to evaluate the results on shoulder function following isolated proximal subscapularis release in children with Erb's palsy. A retrospective study was conducted on 64 consecutive children with Erb's palsy who underwent a Carlioz proximal subscapularis release between 2001-2012. 51 children with complete records and a minimum follow-up of 2 years were included for evaluation. Age at surgery ranged from 1.3 to 4.5 years (average 2.6). Preoperative passive and/or active (depending on age at surgery) shoulder abduction/anterior elevation (ABD), external and internal rotations (ER-IR) as well as the Mallet score were compared with those found at 6 and 24 months postoperatively. The results were compared between children less than 3 years of age at surgery and those older, and between children who had an isolated C5,C6 and those with greater involvement. ABD improved 21° at 6M and 31° at 2y with an overall Mallet abduction score improvement of 0.58 at 6M and 0.6 at 2y. ER improved 52° at 6M and 35° at 2y with an overall Mallet ER score improvement of 1.3 at 6M and 0.52 at 2y. There was no statistically significant improvement in IR. No correlation existed between the child's age or the severity of involvement at surgery and the end result. Proximal subscapularis release according to Carlioz is simple and effective in improving overall shoulder function in children with Erb's palsy, mainly ABD and ER. Improvement tends to reach a plateau around 6 to 12 months postoperatively.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Neuromuscular Problems**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 37521**

**PRONATOR TERES TRANSFER FOR FOREARM AND WRIST DEFORMITY IN CEREBRAL PALSY CHILDREN**

Ken N KUO<sup>1</sup>, Jimmy HO<sup>2</sup>, Ting-Ming WANG<sup>3</sup>, Jeng-Yi SHIEH<sup>3</sup>, Kuan-Wen WU<sup>3</sup>, Shier-Chieh HUANG<sup>3</sup>

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Background: Forearm pronation and wrist flexion contracture can be a disability for daily living care and two-hand function in cerebral palsy (CP) children. It may be beneficial to improve their posture and hand grip power for better functional outcome. The purpose of our study was to investigate the outcome of pronator transfer in CP children. Methods: Seventeen spastic CP patients (14 hemiplegic, 3 diplegic, 14 male, 3 female, mean age 12y 5mo) underwent pronator teres transfer for forearm pronation and wrist flexion contractures. The mean follow up period was 46 months. We recorded gross motor function classification system level, modified Ashworth scale, forearm and wrist range of motion, forearm resting position, grip power, and 3 basic daily living skills pre- and postoperatively. Paired T-test was used for statistical analysis. Results: The average forearm active supination gained 80.9° ( $p < 0.05$ ) and the active forearm pronation lost 22° ( $p < 0.05$ ) with average post-operative total active forearm range of motion 130.9° ( $p < 0.05$ ). The average active wrist extension gained 76.9° ( $p < 0.05$ ) and the active wrist flexion lost 31.8° ( $p < 0.05$ ). The average grip power gained 4.5 kg ( $p < 0.05$ ). The average forearm resting position improved to 10° pronation ( $p < 0.05$ ). The basic daily living skills showed great improvement. Conclusion: Our procedure improved the functional outcome in wrist extension and decreased the forearm pronation. Therefore significant grip strength enhancement and better forearm posture was noted. It is an additional armamentarium in management of upper extremity disability in cerebral palsy children.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Neuromuscular Problems**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 37436**

**SUBTALAR ARTHRORRISES IN SPASTIC CEREBRAL PALSY FEET**

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Rodrigo Montezuma Cesar De ASSUMPÇÃO, Celso SVARTMAN  
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**PURPOSE:** The goal of this study is to retrospectively evaluate the results of the treatment of the spastic planovalgus feet with subtalar arthrorrises described by Pisani. **METHODS:** Between July 1991 and September 2008 45 children (87 feet) with spastic Cerebral Palsy were submitted to surgical treatment, the mean age was six and four months. 22 males and 23 females, 36 diplegic, 8 tetraplegic and 1 hemiplegic; functionally 28 community ambulators, 13 household ambulators and 4 non ambulators. The evaluation was clinical and radiographic. Clinically the correction/improvement of the deformity, shoe/braceware difficulties and the presence/absence of pain. Radiographic evaluation: ap view: talocalcaneal angle, cuboid abduction angle, and lateral view: talocalcaneal angle, talus inclination angle and calcaneus inclination angle. All measurements were done preoperative, immediate postoperative and at the last evaluation. Eight patients (14 feet) were lost during the follow-up resulting in the study group of 37 patients (73 feet). The mean follow-up period was eleven years and nine months. **RESULTS:** Clinical: 59 feet (80%) were considered satisfactory, 14 feet (20%) unsatisfactory results being re-operated with another technique afterwards. Radiographic: The ap talocalcaneal and talus inclination angles presented with statistically significant correction and maintenance till the last evaluation. The cuboid abduction and lateral talocalcaneal angles showed statistically significant immediate postoperative correction but lost of it during the follow-up. The calcaneus inclination angle was the only one with statistically significant immediate postoperative correction and improvement during the follow-up period. **CONCLUSION:** Subtalar arthrorrises with Pisani's technique is an option in the treatment of this deformity.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Neuromuscular Problems**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 36496**

**HIP REDUCTION IN MYELOMENINGOCELE (MMC) PATIENTS;  
INDICATIONS AND GUIDELINES**

**Mohamed HOSNY**

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Background: Evaluation and treatment of the musculoskeletal problems in MMC patients can be quite difficult due to the loss of sensation affecting some or all parts of the lower extremities, associated congenital anomalies of the spine and lower extremities, and muscle imbalance that affects skeletal development over the entire period of growth. Furthermore, some patients who have MMC, have a static encephalopathy that impairs coordination and results in the loss of strength of the lower and upper extremities. In addition, progressive neurological deterioration may occur because of tethered cord syndrome or syringomyelia. Reduction of a dislocated hip in MMC patients was always controversial. Patients & Methods: In this study we present the reduction of 12 dislocated hips in 6 lower lumbar MMC patients, whom we followed for a minimum of 2 years,( 2-7 years). Results: All the patients achieved assisted ambulation within the follow-up period. Significance: MMC patients with lower lumbar lesions (quadriceps function  $\geq$  grade3), are potential community ambulators and this warrants hip reduction and reconstruction in dislocated cases.

**Date: 2014-11-20**

**Session: Paediatrics: SICOT/IFPOS Free Papers - Neuromuscular Problems**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 36411**

**THE ROLE OF RECTUS FEMORIS TRANSFER IN THE DEVELOPMENT OF CROUCH KNEE GAIT IN CEREBRAL PALSY**

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The aim of this study was to evaluate the influence of rectus femoris transfer (RFT) in the development of crouch knee gait in cerebral palsy (CP). Inclusion criteria were Gross Motor Function Classification System (GMFCS) levels I-III; kinematic criteria for stiff-knee gait at baseline and individuals who underwent orthopedic surgery in the lower limbs and had done gait analyses before and after the intervention. Patients who fulfilled the inclusion criteria were divided in 2 groups: Group A (185 knees), including patients who underwent orthopedic surgery without a RFT between exams; Group B (123 knees), including patients who underwent orthopedic surgery including a RFT. The primary outcome was minimum knee flexion in stance (MKFSt) and the secondary outcomes included total knee range of motion (KROM). In Group A, the mean MKFSt increased from 13.19° to 16.74° ( $p=0.003$ ) and in Group B from 10.60° to 14.80° ( $p=0.001$ ). The post-operative MKFSt was similar among Groups A and B ( $p=0.534$ ). In Group B, the MKFSt after surgery was higher in patients with GMFCS III (22.51° -  $p<0.001$ ). A significant increase in MKFSt in the second exam (from 13.01° to 22.51°) was observed only in the GMFCS III patients in the RFT group ( $p<0.001$ ). An improvement in KROM (from 32.79° to 36.63°) after surgery was noted only in Group B ( $p<0.001$ ), and this effect was more remarkable for patients GMFCS II. In this study, RFT was not related to the development of crouch knee gait after a mean follow-up time of 3 years.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Total Hip Arthroplasty Bearing - Surface**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38146**

**CLINICAL AND RADIOGRAPHIC PERFORMANCE OF LARGE CERAMIC HEADS AGAINST HIGHLY CROSSLINKED POLYETHYLENE BEARING: A 5-YEAR STUDY**

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Introduction Wear and osteolysis are major contributors which limit the durability of total hip arthroplasty (THA) and ultimately cause it to fail. Efforts were made to decrease the wear by highly cross-linked polyethylene (HXLPE) and using ceramic bearings. The purpose of this study is to analyze the five year performance of large sized ceramic and metal heads against X3 HXLPE (Stryker). Materials and Method 52 non-cemented THA (48 patients) from ceramic on HXLPE (CoX3) group and 32 hips (29 patients) from metal on HXLPE (MoX3) group were evaluated at their 5 year follow-up. Mean age was 62 years (45 to 75). Wear was measured on an AP pelvis X-ray using the computer-assisted Roman software. Results At the final follow up, the mean wear rates were  $0.019 \pm 0.04$  mm/yr and  $0.029 \pm 0.04$  mm/yr for CoX3 and MoX3 groups, respectively. When negative values were considered zero, wear rates for CoX3 and MoX3 groups were  $0.027 \pm 0.03$  mm/yr and  $0.039 \pm 0.02$  mm/yr, respectively. In both groups, clinical outcome and satisfaction were similar. Survivorship for revision for all causes was 100% and radiographic evaluation did not reveal any incidences of osteolysis or loosening. Discussion and Conclusion This five year data on large diameter femoral heads against HXLPE bearing demonstrated safety and efficacy of these bearings; however, there was one fold increase in wear in the MoX3 bearing. Furthermore, wear data is in consistent with the literature wear for these bearings.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Total Hip Arthroplasty Bearing - Surface**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38511**

**A RANDOMIZED PROSPECTIVE STUDY OF CERAMIC ON CERAMIC AND CERAMIC ON HIGHLY CROSS LINKED POLYETHYLENE IN PATIENTS WITH PRIMARY TOTAL HIP ARTHROPLASTY**

**Dinesh CHOUDARY, Pandian SELVARAJ, Arun Kumar PANDIAN  
ABIRAMI HOSPITALS, CHENNAI (INDIA)**

**INTRODUCTION:** Alternative bearing surfaces, such as highly cross-linked polyethylene and ceramic-on-ceramic articular surfaces, have been introduced in an attempt to reduce wear and osteolysis following total hip arthroplasty. However the ideal bearing surface for young patients undergoing total hip replacement (THR) remains controversial. **METHODS:** This is a single center prospective study comparing the clinical and radiological results in cementless total hip arthroplasty using ceramic on ceramic and ceramic on highly cross linked polyethylene. 60 patients formed the study group, with 30 patients undergoing ceramic on ceramic belonging to group 1 and 30 patients undergoing ceramic on highly cross linked polyethylene belonging to group 2. The average follow up is 36 months (24-50 months) and the average age of the patients was 45 years (32-60 years) **RESULTS:** At the final follow-up there were no significant differences between the two groups for the mean Western Ontario and McMaster Universities osteoarthritis index or Harris hip scores. Radiological outcomes revealed no significant wear in both the groups. **CONCLUSION:** Both ceramic on ceramic and Ceramic on highly cross linked polyethylene produce excellent results in the young active patients with the latter being least expensive and more affordable by the average Indian patient.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Total Hip Arthroplasty Bearing -  
Surface**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38203**

**TOTAL HIP ARTHROPLASTY USING DELTA CERAMIC-ON-CERAMIC ARTICULATION**

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**Purpose:** We evaluated clinical and radiographic results after cementless total hip arthroplasty using Delta ceramic bearings. **Materials and Methods:** One-hundred twenty-three patients (130 hips) with an average age of 54 years were included in the current study and mean follow-up period was 4.2 years. The clinical evaluation included Harris hip score (HHS), location of pain and presence of the noise around the hip joint. The radiographic analysis was performed regarding stability of components. Complication was evaluated regarding ceramic fracture, dislocation, heterotopic ossification, periprosthetic joint infection and fracture. Revision for any reasons was also evaluated. **Result:** The mean HHS improved from 54 preoperatively to 95 points at the final follow-up. Pain at inguinal area and thigh was demonstrated in 8 and 6 patients, respectively. Noise around the hip joint was reported in 4 patients. No ceramic fracture was demonstrated while liner dissociation was shown in 1 hip. There was no loosening, but periprosthetic fracture occurred in 2 patients, who were treated with stem revision or simple wiring, respectively. Two hips were dislocated. Heterotopic ossification occurred in 9 patients. Two hips were revised due to periprosthetic fracture and liner dissociation, respectively. **Conclusion:** Cementless total hip arthroplasty using Delta ceramic bearings demonstrated good clinical and radiographic results. However, we still remain concerned about the long-term implications of the noise. Also, surgeons should take more attention during seating ceramic liner.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Total Hip Arthroplasty Bearing - Surface**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37181**

**LONG-TERM OUTCOME OF CERAMIC ON CERAMIC BEARINGS FOR TOTAL HIP ARTHROPLASTY**

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The advantage of alumina ceramic bearing for THA include low coefficient of superior lubrication and superior wear resistance. Our purpose of this study was to determine overall a 10-year survivorship of titanium enhanced ceramic on ceramic bearing couple. At two institutions implanted 66 patients (66 hips) implanted with an average age of 56 years old with cementless hips and ceramic bearings Trident ceramic system (Stryker Co). 23 were male and 43 were female. The etiology was OA; 48hips, osteonecrosis of the femoral head; 15 hips, RDC; 2 hips, and RA; 1hip. All patients were treated by posterior approach. Twelve hip joints have a past history of surgery. Average follow-up was 9.5 years (range, 4-12). Clinical and radiographic data was analyzed annually by patients records. Average operative time was 103 minutes and average blood loss was 340g. One trochanteric fracture was treated by proximal wiring. One case was revised to polyethylene and metal head due to granuloma. These two hips were satisfactory during observation. One patient was died three years after surgery by unrelated cause of THA. A total 64 hips could be investigated. There was no infection or dislocation. JOA hip score before operation and one year, five years, and final follow-up after operation was  $55.8 \pm 10.3$ ,  $80.4 \pm 11.8$ ,  $89.8 \pm 6.3$ , and  $91.0 \pm 5.6$ , respectively. Radiographic fixation of acetabular component was bone ingrown fixation in 62 hips, and fibrous fixation in 2 hips. We found at last follow-up on routine radiographs no evidence of osteolysis. There was no squeaking hip.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Total Hip Arthroplasty Bearing -  
Surface**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38280**

**HIGH INCIDENCE OF CERAMIC HEAD AND LINER FRACTURE IN  
THIRD-GENERATION CERAMIC-ON-CERAMIC TOTAL HIP  
ARTHROPLASTY**

**Kyung-Soon PARK, Taek-Rim YOON, Jae-Yoon CHUNG**

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The study evaluated the clinical and radiological results of third-generation ceramic-on-ceramic articulation for total hip arthroplasty (THA) performed at our institute. Five hundred twenty seven patients (577 hips) who underwent primary THA using third-generation ceramic-on-ceramic articulation were retrospectively reviewed. They were followed up for an average of 5.9 years and the mean age at the time of surgery was 47.9 years. The sockets used were the SecurFit cup and third-generation ceramic head and liner (BioloX Forte<sup>TM</sup>; Osteo AG, Selzach, Switzerland). Seven different stems were used. Clinical results were evaluated using the Harris hip score (HHS) and radiological evaluation was performed using the method of DeLee and Charnley for the acetabular osteolysis and method of Gruen et al. for the femoral osteolysis. Complications were also evaluated. The mean HHS improved from 65.3 preoperatively to 93.8 at the final follow-up. There were no changes in cup position, and no osteolytic lesions around the femoral and acetabular components in the last follow-up radiographs. Seven hips experienced ceramic liner fracture and 14 hips experienced ceramic head fracture (Accolade stem was used in one case, M/L Taper in one case, and Conical stems in 12 cases). Squeaking occurred in eight hips. Dislocation occurred in three hips, bone ingrowth failure on the stem and subsidence was observed in three hips, and postoperative infection occurred in five hips. THA with third-generation ceramic-on-ceramic articulation was associated with a higher rate of fracture. The incidence of ceramic fracture was 3.6% and that of squeaking was 1.4%.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Total Hip Arthroplasty Bearing - Surface**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36854**

**A RANDOMIZED CONTROLLED TRIAL COMPARING WEAR OF OXIDIZED ZIRCONIUM AND COBALT-CHROME ON STANDARD AND CROSS-LINKED POLYETHYLENE**

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**PURPOSE:** To investigate the outcome of four different bearing surfaces for use in total hip replacement surgery. **METHODS:** 80 patients (91 hips) undergoing total hip arthroplasty between November 2004 and October 2007 at a single center were randomized to 1 of 4 bearing surfaces: (1) cobalt-chrome (CoCr) and standard (ultra-high molecular weight) polyethylene; (2) CoCr and XLPE; (3) Oxinium and standard polyethylene; (4) Oxinium and XLPE. All patients received identical acetabular and femoral components with 28mm femoral heads. Standardized radiographs were taken at each follow-up visit and polyethylene wear measured in a blinded fashion. **RESULTS:** 42 men and 38 women participated; average age was 52 yrs (range, 22-67 yrs). The mean follow-up was 6.8 yrs (range, 2-8.3 yrs). There was no difference in the mean cup abduction angle for each group; there was no correlation between abduction angle and wear rate ( $r < 0.2$ ). There were no differences in the SF-12 or WOMAC scores in any of the groups. The linear wear rates for Groups 1 and 2 were 0.241mm/yr and 0.076mm/yr respectively ( $p=0.00$ ) and for Groups 3 and 4 0.238mm/yr and 0.061 mm/yr ( $p=0.00$ ). There was no statistical difference in wear rates between Oxinium and CoCr when used with the same polyethylene liner ( $p>0.24$ ). **CONCLUSIONS:** There is a significant difference in the annual linear wear rate between cohorts with a UHMWPE and HXLPE. There were no differences in wear rates between head types at 6.8 years follow-up.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Total Hip Arthroplasty Bearing - Surface**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38229**

**THE INFLUENCE OF THE ACETABULAR CUP ORIENTATION, THE PELVIC PARAMETERS AND THE CHANGES IN PATIENT POSITION ON METAL IONS LEVEL IN PATIENTS WITH METAL ON METAL BEARING SURFACES IN PRIMARY HIP ARTHROPLASTY**

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Introduction: Modern metal-on-metal bearing articulations are being used in an effort to maximize the longevity of hip replacements. However, there are potential biologic consequences of this articulation. Acetabular cup orientation appears to have a significant role in increase wear and revision. The variations in pelvic tilt may significantly modify the prosthetic hip biomechanics and component positions leading to edge loading. Purpose: to study the clinical and radiological issue of painful metal on metal THA and to determine the effect of position changes (sitting, standing) on pelvic parameter and acetabulum orientation and metal ion level. Methods: Retrospective cohort study of 104 patients with 120 MOM-THA. Radiographic analysis measured using Imatri software. The blood ions level results captured from the laboratory web system in the hospital. Results: Metal Ions level: Cobalt 2.6 ppb {0.7–18}, Chromium 3.1 ppb {0.9-17}. Also, Changes in position from standing to sitting led to Increases in pelvic tilt by 38.07, Decrease in sacral slope by 23.9 and Increase in cup Anteversion by 12.6. Higher level of blood metal ions noticed in One patient with ALVAL lesion and nine symptomatic female patients with a marked increase in pelvic tilt (with position changes). Conclusions: The changes in position from standing to sitting have an effect on cup orientation and pelvic tilt and perhaps that may contribute to edge loading and increase in metal ions release. Lumbo-pelvic views in sitting and standing position will help us to better identify this group.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Total Hip Arthroplasty Bearing - Surface**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37283**

**EOSINOPHILIC METALLOSIS IN METAL-ON-METAL ARTHROPLASTY**

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Approximately 1 million people have been implanted with a Metal-on-Metal total hip replacement. The failure rate for these prostheses can be as high as 15%. Failed Metal-on-Metal arthroplasty has been associated with a wide range of adverse tissue reactions including tissue metallosis, pseudotumors, aseptic lymphocyte dominant vasculitis associated lesions (ALVAL) and tissue necrosis. While scant eosinophils have been noted in prior series, they have never been identified as a primary inflammatory mediator such as they are in asthma and parasitic infestation. We report on the unique pathology seen in a 53-year-old woman with a painful Metal-on-Metal total hip replacement. Histopathologic examination of the pseudotumor and surrounding tissue revealed an eosinophilic infiltrate as well as the previously reported reactions such as ALVAL, metallosis and necrosis. Eosinophilic metallosis represents a newly described pathologic mechanism in Metal-on-Metal arthroplasty which is most likely incited by the NLRP3 inflammasome.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Total Hip Arthroplasty Bearing - Surface**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36962**

**MINIMUM FIVE-YEAR RESULTS FOR A LARGE DIAMETER METAL ON METAL HIP REPLACEMENT FROM A SINGLE SURGEON IN A DISTRICT GENERAL HOSPITAL: PROSPECTIVE REVIEW OF REVISION RATE, METAL IONS, ALVAL AND OUTCOMES FOR 138 PROSTHESIS.**

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Introduction: We report 5-7 years results of ASR XL hip in a District General Hospital in UK, including revision rates, metal ions, ALVAL and pain. Objectives: To determine failure rate at a minimum of 5 years for single surgeon in single centre. Methods: Prospective review of 112 patients (138 prosthesis). Results: 56 females and 55 males (31-70 years). Metal ions ranged from Cobalt 7-1753 nmol/ml and Chromium 7-1490 nmol/ml. MRI confirmed ALVAL in 58 cases of varying sizes. 30 cases revised on basis of metal ion levels and ALVAL. 5 patients were asymptomatic despite an evolving ALVAL over a period of 6 months and had revision thereafter. Revision involved a standard regime for collection of histological and microbiological specimens. 1 patient had full revision of stem, head, and cup. 29 patients had revision of only head and cup. Post-operatively 5 patients had on-going groin and scar pain but no cases of thigh pain. 29 patients revised have registered for a class action suit. Conclusions: Our results show a cumulative failure of 30% at a minimum of 5 years for the ASR XL cup and head combination on a Corail stem. Corail stem has survived in 136 out of 138 cases.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement I**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36874**

**COMPARISON OF SYNOVIAL FLUID, URINE AND SERUM ION LEVELS IN METAL-ON-METAL TOTAL HIP ARTHROPLASTY AT A MINIMUM FOLLOW-UP OF EIGHTEEN YEARS**

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<sup>1</sup>Medical University Vienna, Vienna (AUSTRIA), <sup>2</sup>Sanatorium Hera, Vienna (AUSTRIA)

Diagnosis of adverse reactions to metal debris in metal-on-metal hip arthroplasty is a multifactorial process. Systemic ion levels are just one factor in the evaluation and should not be relied upon solely to determine the need for revision surgery. Furthermore, the correlation between cobalt or chromium serum, urine or synovial fluid levels and adverse local tissue reactions is still incompletely understood. In our present study we evaluated the serum, urine as well as the joint aspirate metal concentrations of 105 cementless primary total hip arthroplasties (THA) with metal-on-metal articulating surfaces at a minimum of eighteen years postoperatively. We performed a correlation analysis to evaluate the relationship between these values and the failure of metal-on-metal articulations. Spearman correlation showed a high correlation between the joint fluid aspirate concentration of cobalt and chromium with the serum cobalt ( $r=0.81$ ) and chromium level ( $r=0.77$ ) in patients with the THA as the only source of metal ions. In these patients serum metal-ion analysis is a valuable method for screening. In patients with more than one source of metal or renal insufficiency additional investigations, like joint aspirations are an important tool for evaluation of wear and adverse tissue reactions in metal-on-metal hip arthroplasty.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement I**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38005**

**SYSTEMIC LEVEL OF METAL IONS INCREASES AFTER METAL ON METAL TOTAL HIP ARTHROPLASTY**

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**Introduction:** Birmingham Mid Head Resection (BMHR) arthroplasty and Articular Surface Replacement (ASR) hip resurfacing Arthroplasty used to be one of the options for the young adults requiring hip arthroplasty. However, an increased serum metal ion levels is a matter of concern with respect to wear and possible adverse effects. The aim of the study was to measure the systemic level of serum metal ions following BMHR and ASR. **Materials and Methods:** We have investigated the levels of the metal ions in use of BMHR and ASR prosthesis, a cobalt-chrome metal on metal device. Cobalt (Co) and chromium (Cr) ions were measured by inductively coupled plasma-atomic emission spectrophotometer (ICP-AES) from the patient's serum at a period of more than one year after implantation. **Results:** The serum levels of cobalt and chromium in 50 patients (35 BMHR and 15 ASR) were studied. There was an initial decrease in Serum Cobalt level as compared to the baseline value but started increasing then after at 1 year and 2 years following surgery. The Chromium levels on the other hand were static for initial one year but again started increasing at 2 years postoperatively. **Conclusion:** Overall, the serum metal ion level is found to be increasing postoperatively after being implanted with BMHR and ASR. These levels need to be monitored to evaluate any potential adverse effects. **Keywords:** Birmingham Mid Head Resection, Cobalt, Chromium

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement I**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36903**

**THE POSTERIOR APPROACH REDUCES THE RISK OF SAGITTAL MAL-POSITIONING OF A SHORT TAPERED STEM**

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**Purpose:** A neutral stem alignment in the sagittal plane is recommended for cementless femoral stems in total hip arthroplasty. Our aim was to evaluate any effect of the surgical approach on the sagittal orientation of a short tapered femoral stem. We used the Tri-Lock BPS (Bone Preservation Stem) stem; a new short single-taper stem (Depuy Synthes). **Method:** We retrospectively reviewed the immediate post-operative radiographs of 352 patients (176 on each group) who underwent a total hip arthroplasty using a Tri-Lock BPS stem inserted through either a direct lateral or posterior approaches. The femoral stem position was assessed in the sagittal view using the computer-assisted EBRA-FCA (Einzel-Bild-Röntgen-Analyse-Femoral Component Analysis) method. All radiographic measurements were performed twice with a time interval of at least 3 weeks by a single independent observer who was not involved in the management of these cases. **Results:** There was a significant difference between the two approaches in the sagittal stem orientation ( $p=0.01$ ). A neutral stem tip position was significantly more difficult to obtain with a direct lateral approach, when compared to the posterior approach. **Conclusion:** The anatomy of the proximal femur in the sagittal plane makes it difficult to achieve a neutral alignment of a short tapered stem with either approach. However, the posterior approach avoids the cuff of glutei that can lever the proximal stem anteriorly causing an anterior entry point and consequently reduces the risk of sagittal mal-positioning.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement I**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36499**

**MINIMALLY INVASIVE TOTAL HIP REPLACEMENT (MODIFIED ROTTINGER TECHNIQUE): A 400-PATIENT SERIES**

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Introduction: Anterior and posterior approaches are commonly used for total hip arthroplasty. Recent advances have enabled surgeons to utilize various minimally invasive approaches. The only complete muscle-sparing technique is the anterior, minimally invasive Rottinger or mini-Hueter procedure. The purpose of this study was to describe the modifications of the Rottinger technique that we routinely employ and report the outcomes of 400 patients. Patients and methods: Since 2006, our hospital has utilized the modified Rottinger procedure, which involves having the patient in a 45° lateral position on the table, which enables us to perform acetabulum exposure with minimal changes compared with the usual anterolateral and posterior hip approaches. Using this particular positioning, the surgeon could thus stay behind the patient for the whole procedure, including that of femur implantation. The clinical and radiological study is retrospective; only primary replacements were included, with a mean follow-up time of 2 years and 3 months. Results and discussion: The mean duration of the procedure, blood loss, post-operative pain, dislocation rate, and mean duration of hospital stay confirm the benefits of this total muscle-sparing technique, leading to a quick functional recovery with very few complications (one deep infection and three greater trochanter fractures) and a good PMA score. Cup inclination and difference between the femoral stem and femur axis also confirm a good reproducibility. The prosthesis infection rate observed is certainly a side effect of muscle preservation, in which a highly vascularized barrier developed between subcutaneous tissues and the prosthesis.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement I**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36897**

**AVAILABILITY OF NOVEL NON-INVASIVE MECHANICAL NAVIGATION ON CUP, STEM PLACEMENT AND LEG LENGTH ADJUSTMENT IN TOTAL HIP ARTHROPLASTY FOR DYSPLASTIC HIP**

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This study assessed the accuracy of cup and stem positioning and limb length adjustment for developmental dysplasia of the hip (DDH) using our new mechanical navigation system compared with imageless navigation or a computed tomography (CT)-based navigation system. One hundred twenty-two primary total hip arthroplasties (THAs) for DDH were evaluated. At pre-operative positioning, patients were placed in a precise lateral decubitus position by tilting the surgical table using simple ready-made articles. During surgery, cups were intentionally placed at 20° anteversion and 45° inclination by using a level gauge and goniometer. Cup inclination was  $44.1^\circ \pm 3.4^\circ$  (range, 32.0°–51.2°), cup anteversion was  $19.6^\circ \pm 5.9^\circ$  (range, 3.0°–33.1°), stem alignment was  $0.06^\circ \pm 0.83^\circ$  (range, -2.1° to 3.2°), and leg length discrepancy was  $-0.47 \pm 4.2$  mm (range, -12.8 to 9.2 mm) in postoperative radiographs. Outliers (outside  $\pm 10^\circ$  from intentional position) occurred in 14 cases (11.5%) in inclination or anteversion. Postoperative dislocation did not occur in any cases. Cup and stem positioning in THAs with our new mechanical navigation yielded satisfactory results compared with previously reported imageless navigation or CT-based navigation. Our results were superior with regard to being non-invasive and low cost and involving minimum radiation exposure.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement I**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36924**

**A 5-YEAR REVIEW OF PRIMARY HIP ARTHROPLASTY AND THEIR POST-OPERATIVE OUTCOMES IN AN OBESE COHORT**

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**Introduction:** There is variable evidence regarding outcomes of arthroplasty in obese patients. **Objectives:** investigate outcomes following primary hip arthroplasty in an obese cohort. **Methods:** a retrospective review of 57 patients undergoing primary hip arthroplasty from July 2004 - April 2013. **Results:** 59.6% were females and 40.4% were males. Mean age was 60.3 years. Mean BMI was 40.6 (range 35-72). Mean operative duration was 64.3 minutes. Average blood loss was 723.4 mls. There was poor documentation of blood loss in 10 patients; only 50 patients were documented to have reinfusion post operatively (the range 100-420mls) and 5 patients required post-operative blood transfusions. Average hospital stay was 6.5 days. Complications were encountered in 23 patients; 8 leaking wounds, 6 wound infections one requiring washout, and 1 peri-prosthetic fracture. Two hips revised, one for catastrophic failure of ceramic liner, and second for aseptic loosening. **Conclusions:** Recent studies have shown no significant relationship between obesity and complication rate. In our study we found a high rate of morbidity in this obese cohort. There is also a significant correlation of high BMI with operative duration, perioperative blood loss and length of stay. Despite the increased perioperative complications, a good functional outcome was achieved.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement I**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36992**

**SIGNIFICANT FUNCTIONAL AND FINANCIAL IMPACT OF ISOLATED AND RECURRENT HIP INSTABILITY**

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Few studies have investigated the functional outcomes and financial implications of patients after either a single dislocation or multiple episodes of instability after primary total hip arthroplasty (THA). As such, the goals of this study were to determine the (1) functional impacts (HHS, WOMAC, and SF-12) and (2) financial burdens of either an isolated dislocation or multiple dislocations. Our secondary goal was to determine if there was a difference in patients who were treated non-operatively and operatively. We retrospectively reviewed 71 patients with instability (30 isolated dislocations, 41 with recurrent instability) from a national database. The mean age was 67 years, and the minimum follow-up was 2 years. Patients with recurrent instability had a significantly higher HHS, lower WOMAC pain and stiffness scores, and a higher SF-12 mental score due to the fact that they were more 3-fold more likely to undergo operative treatment. Likewise, those who underwent operative intervention had a higher HHS, lower WOMAC pain, stiffness, and function scores, and higher SF-12 physical and mental scores. As expected, recurrent instability and operative treatment significantly increased costs by 300% and 40%, respectively, when compared to isolated dislocations and non-operative management.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement I**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37150**

**EARLY TOTAL HIP REPLACEMENT POST ACETABULAR FRACTURES**

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**Introduction:** The challenge of performing THR in the acute or neglected fracture of the acetabulum is primarily related to creating a stable construct that supports an acetabular cup. **Methods:** Early THR with cemented cup and cementless stem was performed for 23 patients with acute or neglected acetabular fractures at a mean of four months from original trauma. The mean age of these patients was 49 years. Fifteen patients were under non-operative treatment while 8 were presented with acute fractures. Three of these patients had combined fracture neck of femur and acetabular fractures. Fracture of both acetabular columns was present in 14 patients while 9 patients had fractures of the posterior column. Acute fractures were stabilized using plate and screws and metal mesh to cover highly comminuted medial wall of the acetabulum. Impaction graft to the floor/postero-superior parts of the acetabulum was performed in 19 hips while 4 hips had bulk autograft. Muller acetabular cage was used in 3 patients. **Results:** At an average follow up of 4 years (range 2-7) all patients were satisfied with their hip replacement. At the latest follow up the average HHS was 85 (range 77-89). All fractures had united. Additionally, the impaction and bulk grafts were incorporated. **Conclusion:** The results of this series support the excellent results of THR for acute and neglected acetabular fractures. Addition of impaction graft to the floor of the acetabulum and internal fixation provide an environment for healing of the fracture and remodeling of the graft

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement I**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37874**

**RESULTS OF PROXIMAL FEMORAL ALLOGRAFT-PROSTHESIS COMPOSITE IN TREATMENT OF RECURRENT GIANT CELL TUMOUR OF PROXIMAL FEMUR**

**Rajesh MALHOTRA, Bhavuk GARG, Vijay KUMAR**  
**AIIMS, New Delhi (INDIA)**

Giant cell tumors usually affect young patients and conservative surgical treatment often leads to local recurrences. Radical excision creates the challenge of a massive bone defect and long life expectancy of the patient where a cure is achieved. We report the result of use of proximal femoral allograft in treatment of recurrent giant cell tumor of proximal femur. 7 patients with recurrent Giant cell tumor of proximal femur were treated with proximal femoral allograft composite with a total hip replacement. The allograft-prosthesis composite was made by cementing cementless femoral stem in the allograft and implanting the composite in a cementless manner in the host femur through a step- cut junction. Cementless cup was implanted in the acetabulum in all cases using the largest possible femoral head size. Postoperatively, the patients were kept on protected weight bearing for 6 months. The average age of the patients was 45 years (range, 42 to 47 years). The average number of surgeries before presentation was 2.4. The average follow up was 40 months (range, 30-48 months). There was no local recurrence, graft failure and infection in any case. There was no dislocation in any case. The Harris Hip score at the time of final follow up was 90. Proximal femoral allografts restore bone stock after resection of giant cell tumor and offers the advantage of longevity.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement I**

**Time: 14:00 - 15:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37245**

**SLEEP DISTURBANCE FOLLOWING TOTAL KNEE AND TOTAL HIP**

Victor Hugo HERNANDEZ, Alvin ONG, Zack POST, Fabio OROZCO,  
Victoria YOUNGER, Benjamin ZMISTOWSKI, Luke AUSTIN  
Rothman Institute, Philadelphia, PA (UNITED STATES)

Postoperative sleep disturbance is a common complaint following total knee (TKA) and total hip arthroplasty (THA). Modern arthroplasty techniques and postoperative protocols have focused on rapid recovery of patient function and pain. However, little information exists on sleep recovery following TKA and THA arthroplasty. Since adequate sleep plays a role in postoperative healing and also in patient satisfaction, it is necessary to investigate and characterize sleep disturbances in patients undergoing THA and TKA. With IRB approval, forty-two consecutive patients undergoing total knee (n=35) or total hip (n=7) arthroplasty were enrolled in this prospective study. Patients were surveyed preoperatively and postoperatively at intervals of 2, 4, 6, 12, and 24 weeks. Patient outcomes were scored using the Pittsburgh Sleep Quality index (PSQI), and the Visual Analog Score (VAS). A lower PSQI score indicated improved sleep. Results were evaluated using a student's t test. Sixty-one percent of patients reported pre-operative PSQI scores indicative of sleep disturbance (score >6 out of 21), with an average preoperative PSQI of 7. A statistically significant improvement in PSQI was achieved at 3 months (mean score 4.9, p 0.042) and continued to improve through 6 months. A PSQI score < 5, considered normal, was achieved by 65% (15/23) at 3 months, and 65% (15/23) at 6 months. Following surgery, pain improves quickly but sleep disturbance lags behind and significant improvements are not seen until 3 months following the procedure.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement II**

**Time: 16:00 - 17:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38153**

**LONG-TERM CLINICAL RESULTS OF A FIRST GENERATION  
HIGHLY CROSS-LINKED POLYETHYLENE IN YOUNG AND ACTIVE  
PATIENTS**

Chitranjan RANAWAT, Morteza MEFTAH, Amar RANAWAT  
Hospital for Special Surgery, New York (UNITED STATES)

Background: Highly cross-linked polyethylene (HCLPE) was introduced to improve wear related osteolysis in total hip arthroplasty (THA). The purpose of this prospective study was to assess minimum 10-year wear rates and survivorship of non-cemented total hip arthroplasty using metal on HCLPE in patients in young and active patients. Methods: Between January 2001 to December 2003, 52 hips consecutive THAs (43 patients; 26 males and 17 females) age of 55 years and younger with an average University of California Los Angeles activity (UCLA) score of 5 and above at the time of surgery were identified from our Institutional Review Board-approved prospective database. The mean age of patients was  $47.4 \pm 7.8$  years old (range 24 to 55 years) and the mean UCLA was  $7.3 \pm 1.5$  (range 5 – 10). Indication for surgery included osteoarthritis in all cases. All components were non-cemented SecurFit femoral stem, Cobalt-Chromium (Co-Cr) femoral head, and Trident PSL solid acetabular shell with Crossfire acetabular liner (Stryker). At minimum 10-years follow-up (mean  $11.5 \pm 0.94$  years), wear rates (Roman software), clinical and radiographic data and survivorship were analyzed. Results: The mean linear wear was  $0.019 \pm 0.018$  mm/year (range 0-0.082). There were no revisions for osteolysis or loosening, periprosthetic infection or dislocation in this cohort. Kaplan-Meier survivorship was 100% for all failures. Conclusion: This study demonstrates that metal on HCLPE has an excellent survivorship rates at a minimum 10-year follow-up in young-active patients. Oxidation concern with Crossfire up to 10 years has not shown clinical significance.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement II**

**Time: 16:00 - 17:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38199**

**CONTEMPORARY CEMENTLESS TOTAL HIP ARTHROPLASTY WITH THIRD GENERATION ALUMINA BEARINGS IN PATIENTS WITH OSTEONECROSIS OF FEMORAL HEAD YOUNGER THAN FIFTY: A FOLLOW-UP STUDY AT MINIMUM OF 10 YEARS**

Shin-Yoon KIM, Seung-Hoon BAEK, Jun Young KIM, Tae Seong KIM  
Department of Orthopedic surgery, Kyungpook National University  
Hospital, Daegu (SOUTH KOREA)

**Purpose:** We present long-term outcomes after total hip arthroplasty using alumina bearings, at a minimum of ten years postoperatively. **Methods:** Among sixty patients (71 hips) with a mean age of 39.1 years, seven patients (seven hips) died and four patients (four hips) were lost to the follow-up before minimum 10-year follow-up. The remaining 49 patients (60 hips) were included in this study with an average follow-up period of 12.9 years. All procedures were performed by one surgeon and the results were evaluated serially. The clinical evaluations included the Harris hip score and the presence of noise around the hip joint. Radiographic analysis was performed regarding ceramic fracture, component loosening and osteolysis. **Results:** The mean Harris hip score was 95 points at the time of the final follow-up. Seventeen patients reported noise around the hip joint and one patient required a change of the bearings because of a ceramic head fracture. Loosening or osteolysis was not observed in any hip. The ten-year survival rate of total hip prostheses using third generation alumina bearings with revision for any reason as the end-point was 99%. **Conclusions:** On the basis of our encouraging outcomes after a minimum of ten years of follow-up, we conclude that this cementless total hip arthroplasty with third generation alumina bearings was found to be a promising procedure for young, active patients with osteonecrosis of the femoral head. However, we still remain concerned about the risk of ceramic fracture and implications of the noise that was reported in these hips.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement II**

**Time: 16:00 - 17:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37275**

**TOTAL HIP ARTHROPLASTY BEFORE THE AGE OF TWENTY**

Vera HALVORSEN

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Introduction: THA may be the only option for severe pain and disability due to advanced hip disease, even in the youngest. Few studies have reported the outcome with more than ten years follow-up for this group of patients. Material and Methods: Seventy out of 98 eligible patients, younger than 20 years reported to the Norwegian Arthroplasty Register between 1987-2010, were evaluated by clinical and radiographic examinations. Self-reported health parameters were assembled. Results: Average age at surgery was 17.3 (11-20) years and average follow-up was 13 (2-25) years. One fourth of the patients had inflammatory disease. In total 18 patients (25%) had been revised. In the overall material half of the patients were revised after 13 years. There have been very few revisions when the primary arthroplasty was performed after 1996. General VAS was 74 with no difference between patients with or without previous revisions. HHS was 84 (30-100) and physical activity score according to UCLA was 6.5 out of 10. EQ-5D and SF-36-data showed that the patients performed relatively well compared to a normal population, even the revised patients. Radiographic examinations showed a large variety of implants and high wear in implants inserted before the change of the millennium. Conclusion: Although the youngest patients with THA have a high revision rate, they perform relatively well clinically according to HHS, VAS, UCLA, EQ-5D and SF-36. HHS is relatively good at follow-up even if there are signs of loosening on radiographic examinations.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement II**

**Time: 16:00 - 17:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37682**

**CEMENTED TOTAL HIP REPLACEMENT (THR) IN BELOW FIFTY-YEAR-OLD USING A NOVEL TECHNIQUE IN ACETABULAR SUBCHONDRAL BONE DECORTICATION: TWO- TO FOURTEEN-YEAR FOLLOW-UP**

Mazin Saad IBRAHIM, Gurdip CHAHAL, Sheethal Prasad PATANGE  
SUBBA RAO, Krishaiah KATAM, Trevor LAWRENCE  
Solihull Hospital, Solihull (UNITED KINGDOM)

The indications of THR have been expanded to involve young population. The risk of having a revision early in life is daunting. A well-cemented prosthesis is key to avoiding such devastating consequence. We report on a cohort of young patients with cemented THR using a novel technique in preparing and cementing the acetabulum with two- to fourteen-year follow-up. A prospectively compiled database was reviewed. Modified short-form WOMAC score was used. Wilcoxon signed-Rank test was performed using SPSS. Annual AP radiographs were assessed for evidence of implant migration, loosening or osteolysis. The acetabulum was prepared by complete excision of the subchondral bone with osteotomes supplemented by drill holes resulting in a fresh "fractured" cancellous bed for cement pressurisation. In 10% of patients, the bed was considered too sclerotic for successful cementation and complete impaction autografting was undertaken. 137 THRs in 126 patients were performed over a 12-year period (2000-2012). Average age was 42 (range, 19-50) years with 62 male and 64 females. Median preoperative WOMAC pain score was (15 (4.5)) (median (IR)) and postoperatively was (3 (7.5)), (2(6)), (2(4)) at two, five and ten years, respectively. These were all significantly improved ( $P < 0.001$ ). The preoperative total WOMAC score (35 (10.5)) were improved significantly at two (4(13)), five (4(13)) and ten (4(11)) years ( $P < 0.001$ ). Survivorship was 100% at maximum 12 years. Our technique of preparing the acetabulum in combination with cement fixation is reproducible with excellent results in a cohort of patients prone to early aseptic loosening of the acetabular component.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement II**

**Time: 16:00 - 17:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37592**

**TOTAL HIP REPLACEMENT IN SICKLERS USING CEMENTLESS IMPLANTS: MANAGEMENT AND OUTCOME IN THIRTY-NINE PATIENTS**

Mrinal SHARMA, Yash GULATI  
B L K hospital, New Delhi (INDIA)

Sickle cell disease leading to endarteritis induces skeletal changes in the form of osteitis, sclerosis of femoral canal and osteonecrosis of femoral head. All these make THA difficult and prolonged. There is increased risk of infection, sickle cell crisis and complication rate. Thirty-nine patients with sickle cell disease who had osteonecrosis of femoral head were operated between 2007-2011. The mean age of patients was 22 years (range 13-49 years). Twenty eight were females 11 were males. .Bilateral cementless total hip replacement was performed in 11 patients (22 hips) and the rest unilateral (28 hips). Pre-operative and post-operative Modified Harris Hip Score was evaluated. The follow-up 2-6 years (av 3.8 years). Results: The average operating time was 96 minutes (88-148 minutes). The average blood loss was 880 ml (range 650-1200ml).The average intra-operative blood transfused were 2.3 units (range 2-5 units). All patients showed an improvement in Harris Hip score from 42 points to 92 points at follow-up. Intra-operatively one patient had peri-prosthetic fracture. Six patients developed acute sickle cell crisis and were managed in ICU. Three patients developed wound hematoma. Three patients developed limb length discrepancy less than 1 cm. None had early or late dislocations, infection, heterotopic ossification, sciatic nerve palsy and aseptic loosening. THA in sicklers requires a multidisciplinary approach involving the anaesthetist, haematologist and the orthopaedic surgeon. Contrary to previous reports, THA in sicklers now has predictable outcome especially with use of cementless implants.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement II**

**Time: 16:00 - 17:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37672**

**INTRAOPERATIVE PROXIMAL FEMORAL FRACTURE IN PRIMARY CEMENTLESS TOTAL HIP ARTHROPLASTY**

James PURTILL, Danielle PONZIO, Ali Sina SHAHI

Rothman Institute at Thomas Jefferson University, Philadelphia (UNITED STATES)

Introduction: Intraoperative femoral calcar fracture occurs during primary cementless THA at rates of 1.5-27.8%. Methods: A retrospective review of 2423 consecutive primary cementless THA cases of a single surgeon over 13 years identified 95 hips with a fracture in the medial calcar noted upon insertion of the stem, managed with cerclage cables above the lesser trochanter. Multivariate analysis compared fracture rates between implants utilized, Manufacturer A and Manufacturer B, and evaluated potential risk factors using a randomized 718 cases without fracture matched to the fracture cohort by date of surgery (DOS). A group of 160 patients was matched by gender, age, BMI, DOS, and preoperative scores to compare Harris Hip Score (HHS). Results: Femoral calcar fracture incidence was 3.9% (95/2423) (3.5% [36/1019] Manufacturer A/4.2% [59/1404] Manufacturer B). Both implants demonstrated increased fracture incidence over time and increased odds of fracture with decreasing stem size. Fracture was more common amongst females. Females, on average, had a smaller stem size (Manufacturer A  $2.4 \pm 0.9$ /Manufacturer B  $3.7 \pm 2.1$ ) than males (Manufacturer A  $3.4 \pm 0.9$ /Manufacturer B  $5.9 \pm 2.0$ ). No difference was found in clinical outcomes with no femoral revisions and a mean HHS postoperative score of 58.2 points in the fracture cohort. Discussion: In the largest consecutive series reported, the incidence of proximal femoral calcar fracture upon impaction of a cementless wedge tapered stem was relatively constant despite different manufacturers. However, fracture incidence increased over time and with smaller femoral stems. If recognized, cerclage of intraoperative fractures reliably offers satisfactory stability with no compromise to clinical outcome.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement II**

**Time: 16:00 - 17:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38528**

**MINIMALLY INVASIVE ANTERIOR APPROACH VS. POSTERIOR APPROACH IN TOTAL HIP ARTHROPLASTY: A PROSPECTIVE RANDOMIZED STUDY**

Pascale DEROME, Benoit BENOIT

Université de Montréal, Montréal (CANADA)

**Objectives:** The aim of the study is to compare two minimally invasive approaches in total hip arthroplasty: the anterior and posterior approaches. Recovery rate, length of hospital stay, surgical time, complications and implant position were some of the data studied. **Method:** In this prospective randomized multicenter study, a total of 55 patients (28 anterior approaches, 27 posterior approaches) were enrolled between February 2011 and July 2013. The functional recovery rate was sampled 2 weeks, 1 month, 3 months, 6 months, 1 year and 2 years post-operatively with the use of the Visual Analog Scale (VAS) and Harris Hip Score (HHS). Surgical time and complications were documented. Radiological analysis was used to assess implants position. **Results:** According to the Harris Hip Score, preliminary results showed that functional recovery is faster in patients who underwent anterior approach until 4 weeks post-operatively (66.6 VS 59.8). When compared to the posterior approach, the average surgical time for the anterior approach is slightly increased, but remains less than 60 minutes in both groups. As for radiological analysis, implants position were similar between both groups, but lengthening was greater in the posterior group (0,5mm VS 4,3mm  $p=0,015$ ). **Conclusion:** The minimally invasive anterior approach for implantation of total hip arthroplasty appears to be a safe and effective option, offering some benefits in the early postoperative period, including a faster functional recovery, without compromising implants positioning.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement II**

**Time: 16:00 - 17:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38289**

**SURGICAL APPROACH HAS NO SHORT-TERM EFFECT OF TELEREHABILITATION OUTCOMES IN PATIENTS AFTER PRIMARY TOTAL HIP REPLACEMENT SURGERY. ANTERIOR VS. ANTEROLATERAL APPROACH**

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Department of Orthopaedics and Traumatology, Warsaw (POLAND)

Direct anterior approach considered minimally invasive technique is anticipated to affect faster short-term recovery when compared with the anterolateral approach group. It is considered as a result of no need for reattachment of the abductor muscles in primary hip replacement surgery. Recently, the telerehabilitation becomes the new option of treatment for patients who prefer postoperative rehabilitation at home. The aim of the study was to compare short term outcomes of telerehabilitation for anterior vs. anterolateral approach THR patients. Patients were enrolled to the four weeks, individual home telerehabilitation program regardless surgical approach. Patients were supervised asynchronously, by best performance videoclips and weekly synchronous videoconference with supervising physiotherapist. Short term outcomes were assessed based on physical function, WOMAC and pain scores. Statistical analysis was performed using Statistica 10.0  $P < 0.05$  was considered significant. The telerehabilitation was introduced for the group of 43 patients. Twenty-two patients underwent primary THR surgery using anterolateral approach and nineteen of the direct anterior approach. Results: No statistically significant differences of outcomes were noted between the anterior and anterolateral approach groups. Similar improvement was noted for both groups of patients after postoperative telerehabilitation program. No significant differences of results, in both groups, when compared to the pre-rehabilitation in all three All three domains assessed by WOMAC questionnaire were comparable for both groups regardless surgical approach. There were no statistically significant differences, which would demonstrate that the method of surgical approach affects the condition of patients after postoperative rehabilitation program. The surgical approach does not affect short-term telerehabilitation outcomes.

**Date: 2014-11-20**

**Session: Hip: Free Papers - Hip Replacement II**

**Time: 16:00 - 17:30**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37215**

**THE DIRECT ANTERIOR APPROACH IN REVISION TOTAL HIP ARTHROPLASTY: AN ILLUSTRATION OF THE EXTENSILE NATURE OF THE SMITH-PETERSON APPROACH**

Lieven DOSSCHE

Antwerp University Hospital, Antwerp (BELGIUM)

The introduction of a direct anterior approach (DAA) in total hip replacement is best performed in a stepwise fashion. After gradual use of DAA in primary procedures, this technique was progressively introduced in our revision surgery practice. Finally the decision was made to use DAA as the standard approach for revision THR. Another approach was used when indicated during preoperative planning. From December 2013 until January 2014, 38 consecutive revision THRs were performed. In 28 cases (73.7%) an anterior approach was used, a posterior approach was used in 5 cases, a lateral approach in 5 cases. In 15 anterior revision THRs, there were no adaptations to the primary DAA technique; in the remaining 13 anterior THRs there were one or several adaptations to the primary technique. Most frequent adaptations were a transverse release of the tensor fascia lata muscle and an additional incision for a femoral cortical window. Recorded intra-operative technical problems and peri-operative complications were very limited. The most frequent reason for use of a posterior approach was an extensive acetabular reconstruction; for lateral approach it was a recent intervention in which a lateral approach had been used. A direct anterior approach can be a good option for revision THR if well selected, based on surgeon's experience. Selective extensions and adaptations to the standard DAA may facilitate femoral and acetabular access. This will be illustrated.

**Date: 2014-11-20**

**Session: Trauma: Symposium Natural Disaster: The Prerequisite**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 37060**

**MY FIRST EXPERIENCE OF HUMANITARIAN SURGERY IN HAÏTI**

Farikou IBRAHIMA

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YAOUNDE (CAMEROON)

At the call of the Société Internationale de Chirurgie Orthopédique et de Traumatologie (SICOT) I am an active member, I made a humanitarian mission led by Médecins Sans Frontières (MSF) from 15 July to 15 August 2010 in Haiti to operate the victims of the earthquake that struck the country in January of the same year. The purpose of my oral presentation is to share this experience of first humanitarian mission to bring hope to other vocations among my younger orthopedic and trauma surgeon colleagues.

**Date: 2014-11-20**

**Session: Research: Free Papers - Research Stem Cells & Miscellaneous**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 36570**

**THE ENHANCEMENT OF BONE-IMPLANT INTEGRATION BY USING NEWLY DEVELOPED COPPER BEARING MEDICAL GRADE STAINLESS STEEL**

Margaret FOK<sup>1</sup>, Ling REN<sup>2</sup>, Karen WONG<sup>1</sup>, Ke YANG<sup>2</sup>, Kelvin YEUNG<sup>1</sup>

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Introduction: The osteoconductivity of stainless steel does not satisfy the demands in bone-implant integration, thereby resulting to aseptic loosening and eventually implant failure. Therefore, new stainless steel incorporating with nano-sized copper-rich participations has been fabricated. The present study aims at investigating the biological properties of this metal including osteogenic differentiation ability, bone formation ability and inflammatory response under in-vitro and in-vivo. Methods: The new 317L-Cu stainless steel samples were prepared and conventional 317L SS served as control. Material characterizations included electrochemical corrosion, scanning electron microscopy and energy dispersive spectrometry. The Cu<sup>2+</sup> ions released in-vitro was investigated. The samples were cultured with mammalian cells for various time points. Also, they were implanted into rat models for 15 days. Post-op analyses included new bone formation and mineral density evaluation, inflammatory response and mechanical strength of bone-implant interface. Student's t-test was applied to evaluate the statistical significance. Results & Discussion: More actin filaments were found on Cu-SS sample in cell morphology examination after 2-day culture. The cell proliferation and ALP, Col1a1, Opn and Runx2 expressions in Cu-SS group were significantly higher, whereas the cytotoxicity was lower than that of SS. Additionally, the TNF- $\alpha$  expression on Cu-SS sample was significantly less at early days, indicating that the small amount of released copper ions could help suppress inflammatory response. New bone formation, bone-to-implant contact ratio, bone mineral density and push-out force were superior in Cu-SS sample. The amount was approximately 1.4 ppb per day, while its corrosion resistance generally maintained.

**Date: 2014-11-20**

**Session: Research: Free Papers - Research Stem Cells & Miscellaneous**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 38512**

**MESENCHYMAL STEM CELLS FACILITATE HEALING OF MENISCUS TEAR AND IMPROVES FUNCTIONAL OUTCOME**

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Introduction: Successful surgical restoration of the damaged meniscus has been a challenge due to its poor healing potential. Meniscectomy often leads to articular cartilage degeneration and secondary osteoarthritis. Objective: was to evaluate the efficacy of mesenchymal stem cells in healing of meniscal tear. Methods: It was a Prospective, randomised, case-control double blinded study performed in 30 patients with meniscus tear of knee. Both cases and controls were 15 in numbers. No cases were lost to follow up. MRI was done twice pre and post intervention. In cases, autologous bone marrow was aspirated, cultured and injected percutaneously near the meniscus tear under ultrasound guidance. In controls, normal saline was injected as placebo. All patients received standard physiotherapy. Objective assessment was done by functional scoring systems (WOMAC, KOOS, VAS SCORE). Mean follow up was 11.86 months. Results: There was significant reduction in VAS scores in case group ( $p=.001$ ) as compared to control group ( $p=.166$ ). There was improvement in functional outcome WOMAC score ( $P=.001$ ) and Global KOOS score ( $p=.001$ ) vis-a-vis control group ( $p=0.419$  &  $0.910$ ). Significant improvement was observed in MRI signals in case group as compared to control group ( $p=.013$ ) depicting healing of meniscal tears with injection of mesenchymal stem cells. Conclusions: Mesenchymal stem cells stimulate healing of meniscal tear which reduces pain, helps in integration of torn meniscus and improves functional outcome.

**Date: 2014-11-20**

**Session: Research: Free Papers - Research Stem Cells & Miscellaneous**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 38413**

**INNOVATIVE METHOD OF BONE BANKING PARTIALLY  
DECALCIFIED ALLOIMPLANT, AN ECONOMICAL ALTERNATIVE.  
OUR EXPERIENCE AT A TERTIARY CARE CENTRE**

Nishant JAIN<sup>1</sup>, Narender MAGU<sup>2</sup>

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Introduction: Fractures of long bones that occur annually, 5-10 % end in delayed or nonunion and require augmentation for bone healing. Freshening at non-union site and bone grafting are the standard procedures used to treat non-union of fracture. Purpose: We observed the efficacy of partially decalcified bone allograft in treatment of delayed or non-union of diaphyseal fractures of long bones. Methods: Between May 2010 and May 2013, twenty patients with diaphyseal fracture non-union of both upper limb and lower limb, with  $\geq 6$  months duration were enrolled in our study. . The study outcomes were assessed on union rate, time of union, operation time, postoperative clinical signs and complications. Result: cost of allograft was <1 \$ for 50 c.c allograft. The time from the fracture to surgery ranged from 6 to 80 months. Union was seen seventeen/twenty patients (85 %) with average time to union 21.33 weeks. Average surgical time for allografting was less as compared to autografting. Conclusion: Our study revealed allografts can produce treatment results as good as those with autografts in non-union while preventing donor site complications and act as an economical alternative.

**Date: 2014-11-20**

**Session: Research: Free Papers - Research Stem Cells & Miscellaneous**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 38179**

**THE IMPACT OF METAL PARTICLE SIZE ON THE MICROSCOPIC AND MACROSCOPIC TISSUE RESPONSE IN FAILED LARGE-DIAMETER METAL-ON-METAL HIP ARTHROPLASTIES**

Raghavendra Prasad SIDAGINAMALE<sup>1</sup>, Shonali NATU<sup>2</sup>, Thomas JOYCE<sup>1</sup>, Antoni NARGOL<sup>2</sup>, David LANGTON<sup>3</sup>

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<sup>3</sup>Northern Retrieval Registry, Stockton on Tees (UNITED KINGDOM)

Recent National Joint Registries have shown a higher failure rate of large diameter (LD) metal on metal (MoM) hips than any other bearing combinations. Assessment of the periprosthetic tissue reaction plays an important role in the evaluation of MoM hip arthroplasties. Though it has come to light that such reactions are not necessarily a dose dependent response, the mechanism of the adverse reaction to metal debris (ARMD) is not fully understood. We analysed periprosthetic tissue samples and revision operative findings from 327 failed LD MoM hip arthroplasties that were revised at a single centre. The macroscopic appearance of soft tissue damage and bone loss was meticulously assessed and graded at revision surgery as per previously published method. A detailed histological analysis was performed to identify lymphocyte-dominated reaction, histiocytic-dominated reaction, grade of metal particle sizes, associated vasculitis, presence or absence of granulomas and plasma cells as per previously published methods. Our results suggest that the smaller metal particles are associated with lymphocyte dominated reaction ( $P=0.01$ ) and presence of granulomas ( $P<0.001$ ), whereas the larger particles are associated with a histiocytic dominated response ( $P=0.02$ ) and periprosthetic bone loss ( $P=0.007$ ). While we understand that ARMD is not just a dose dependent response, we believe that morphology of the metal particle has a major role to play. We recommend further studies to look at characterization of these periprosthetic metal particles.

**Date: 2014-11-20**

**Session: Research: Free Papers - Research Stem Cells & Miscellaneous**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 38016**

**EFFICACY OF USE OF MESENCHYMAL STEM CELLS IN EARLY OSTEOARTHRITIS KNEE**

Aditya K AGGARWAL<sup>1</sup>, Sreekanth R RAJOLI<sup>1</sup>, Vivekanand JHA<sup>2</sup>, Mahesh PRAKASH<sup>3</sup>

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Introduction: There is no effective therapy available today that alters the pathobiologic course of osteoarthritis. Recent advances have shown Mesenchymal stem cells to be a potential disease modifying treatment. Considering the tissue differentiation property and vast paracrine effects of MSCs we proposed the present study to find out the safety and efficacy of MSCs in osteoarthritis of knee joint. METHODS: 12 patients with grade 1 and 2 bilateral osteoarthritis knee (Ahlback's radiological grading) were selected. 8-10 ml of bone marrow was aspirated under strict aseptic precautions from the iliac spine. After the stem cell culture and expansion for 4-6 weeks the MSC suspension in 10xPBS was injected directly into the 24 knees by lateral approach. The outcome was evaluated by modified VAS score, WOMAC score, KOOS and MRI measurement of knee articular cartilage integrity by the modified WORMS score. RESULTS: Statistically significant improvement in VAS score, total WOMAC score and total KOOS score was observed from pre injection to 1st follow up at 6 weeks, 2nd follow up at 6 months and final follow up of mean 26.7 months. There was also a significant improvement from 1st follow up to 2nd and final follow up. The modified WORMS score showed a statistically significant decrease of 1.49 %. CONCLUSION: Intra-articular injection of autologous bone marrow derived culture-expanded MSCs can be considered a potential treatment of early osteoarthritis knee which relieves pain, stiffness, improves physical functions, and improves the articular cartilage integrity.

**Date: 2014-11-20**

**Session: Research: Free Papers - Research Stem Cells & Miscellaneous**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 37827**

**EVALUATION OF RESULTS OF PROXIMAL FEMORAL ALLOGRAFT PROSTHESIS COMPOSITE IN THE TREATMENT OF PROXIMAL FEMORAL GIANT CELL TUMOURS**

**Rajesh MALHOTRA, Vijaykumar DIGGE, Kirankumar GOWDA, Vijay KUMAR**

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

Introduction: Giant cell tumor is the most common aggressive benign tumor of the musculo-skeletal system which is known for its local recurrence. Reconstruction of the joint becomes a challenging job when it occurs in the proximity of the hip joint. Option for reconstruction after wide resection includes use of megaprosthesis or allograft- prosthesis- composite. Objective: we performed a clinico-radiological study and evaluated the functional results of proximal femoral allograft- prosthesis - composite in the treatment of proximal femoral giant cell tumors after wide resection. Methods: This is an observational study, from 2006 to 2012, of 18 patients with proximal femoral Giant Cell Tumours were included in the study. Following resection of the tumour proximal femoral allograft-prosthetic-composite was used all cases for reconstruction. The mean follow up of 54 months with mean age of the study group was 32 years. Result: We achieved excellent outcome in 72% of the patients and good in rest. Clinico-radiological evaluation demonstrated 100% union and 0% infection and/or recurrence of the tumor without any graft failure, fracture or resorption of the allograft. Conclusion: Resection of and reconstruction of proximal femoral giant cell tumors with proximal femoral allo-prosthetic-composite is a better option considering the age profile the patients, restoration of bone stock and excellent restoration of function. However, demanding bone banking techniques, effective measures to prevent infection and stability at the allograft-host junction are crucial for excellent result.

**Date: 2014-11-20**

**Session: Research: Free Papers - Research Stem Cells & Miscellaneous**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 37661**

**HOW LONG CAN YOU STORE A FRESH OSTEOCHONDRAL ALLOGRAFT? ASSESSMENT OF CELL VIABILITY AT 12 WEEKS**

Sergio ARELLANO<sup>1</sup>, Rafael CALVO<sup>1</sup>, Maximiliano ESPINOSA<sup>1</sup>, David FIGUEROA<sup>1</sup>, Valeska SIMON<sup>2</sup>, Luz María POZO<sup>2</sup>, José Pablo GONZÁLEZ<sup>2</sup>, Paulette CONGET<sup>2</sup>

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**Objective:** To evaluate the effect of storage of fresh osteochondral tissue at 4°C for up to 12 weeks on cell viability of human chondrocytes. **Hypothesis:** Cell viability of chondrocytes obtained from human osteochondral tissue decreases significantly at 12 weeks of storage. **Materials and Methods:** Experimental study in 21 samples of femoral condyle osteochondral tissue. Samples were obtained from patients undergoing total knee replacement. The samples were kept stored at 4°C in PBS and disrupted enzymatically at time 0, 4, 8 and 12 weeks. Cell viability was analyzed by flow cytometry by vital staining (propidium iodide-SytoBC). The results of cell viability (mean ± standard deviation) test were analyzed statistically using Mann-Whitney. P values <0.05 were considered statistically significant. **Results:** At time 0, cell viability was considered 100%. This percentage decreases to 50% after 4 weeks, 50% after 8 weeks and 10% after 12 weeks of storage. 96.9% (p> 0.05). **Conclusions:** The cell viability in human cartilage chondrocytes declines significantly after 4 weeks of storage at 4°C. At 12 weeks, the viability of chondrocytes is minimal.

**Date: 2014-11-20**

**Session: Research: Free Papers - Research Stem Cells & Miscellaneous**

**Time: 16:00 - 17:30**

**Room: LAPA**

**Abstract no.: 37128**

**OSTEOINTEGRATION OF BONE ALLOGRAFT IMPREGNATED WITH ALENDRONATE. EXPERIMENTAL STUDY**

Christian ALLENDE<sup>1</sup>, Luis RUCHELLI<sup>2</sup>, Bartolome Luis ALLENDE<sup>2</sup>, Santiago IGLESIAS<sup>2</sup>, Javier NUÑEZ<sup>2</sup>

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The use of bone allograft is common in spinal surgery, arthroplasty revisions and oncologic reconstructions; its use can be associated with its reabsorption, which may cause loss of stability and failure of reconstructions. The purpose of this experimental study in rabbits was to evaluate the variability in bone reabsorption in alendronate-impregnated bone allografts versus non impregnated bone allografts. Eighteen New Zealand rabbits were divided into two groups of nine animals each; we worked on the right femur, made a bone window and bone allograft rinsed with alendronate was placed in the defect in group I, and bone allograft without alendronate was used in group II. All rabbits were sacrificed 10 weeks after the initial procedure and we evaluated: histological changes, radiographs and CT scans; to determine: osteointegration, vascularization and bone quality. No deaths or infections were reported. Histological evaluation showed better osteointegration in group I than group II ( $p < 0.003$ ), showing well defined attachment between receptor bone tissue and low osteoclastic activity. Assessment of bone reabsorption using x-rays and CT scan showed no statistically significant difference between group I and II (group I showed more osteointegration of the allograft ( $P=0,577$ ), being not statistically significant). The results achieved in this experimental study showed that bone allografts impregnated with alendronate improve their osteointegration. It also showed that their use is not associated to local or systemic complications in rabbits, even when using high doses.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Time: 14:00 - 15:30**

**Room: STA. TEREZA**

**Abstract no.: 36980**

**DIAGNOSIS OF THE GROIN PAIN SYNDROME IN ATHLETES**

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Introduction: Sports Groin Pain Syndrome (SGPS) represents 5-11.2% of all sports injuries. Groin Pain Syndrome (GPS) occurs and localises depending on the type of sports activity undertaken and occurs most frequently in team sports such as football, hockey, etc. Materials and Methods: In the period from 2004 to 2013 we thoroughly examined 286 patients with Groin Pain Syndrome that underwent treatment at the Clinic of Sports and Ballet Injuries SI "Institute of Traumatology and Orthopedics National Academy of Medical Sciences of Ukraine". Results: The SGPS diagnosis was established based on the medical history, the results of clinical and equipment-based examinations as well as differential diagnostics with other syndromes and dis-eases. The most informative equipment-based examinations were MRI (accuracy – 89%) and sonographic screenings (accuracy – 84%), less informative – X-ray (12%) and spiral CT (23%). To improve the SGPS diagnostics accuracy we have developed an MRI examination method that applies colour mapping. This examination method applies digital processing of standard MRI images in PD FS (Proton Density Fat Saturation) using PC software that transforms different gray shades into various colour ranges. Thus, improving the differentiation of finer tendon changes, the difference between various gray shades is less perceivable by the eye, whereas the differences between various colours is more clearly perceived by the eye to allow achieving the SGPS diagnostics accuracy of up to 98%. Patients with intra-articular hip injuries were subjected to therapeutic and diagnostic arthroscopy.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Time: 14:00 - 15:30**

**Room: STA. TEREZA**

**Abstract no.: 37496**

**OUR EXPERIENCE ABOUT STRESS FRACTURE**

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If the first description of a fatigue fracture was made at the level of the forefoot in the military, one must concede that the markets forced, and today, the race walk, hold the palm in terms of frequency of occurrence of the order of 1-30% of the young recruits (1st month +++). During ten years (2000-2009) ; we collected 27 locations in 23 patients (17 men and 6 women) of average age 28 years including 2 bilateral locations in the upper tibia metaphysis (1st location with 15 cases) occurring mostly among young recruits but also of young active members including 2 medical officers. MRI in time allows early diagnosis even if bone scintigraphy is specific but non-sensitive; therefore CT-scan is useful for some locations (sacrum - Talus). Functional orthopedic treatment is in good standing, surgical indications will be exposed. In any event, the resumption of the sport does as a general rule only after a minimum of 3 months, after obtaining a radiographic satisfactory bone consolidation. Finally, we will insist on the fact that sport resumption must be gradual, over several weeks, after correction of possible contributory factors in particular food and hormonal imbalances for women. Prevention will be oriented on the adaptation of training programs and training of coaches and young recruits training cycles.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Time: 14:00 - 15:30**

**Room: STA. TEREZA**

**Abstract no.: 37583**

**CHARACTERIZATION OF ACETABULAR CARTILAGE DIMENSIONS USING REFORMATTED MRI**

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**INTRODUCTION:** Assessment of acetabular articular cartilage size is important prior to performing acetabular rim-trim for pincer femoroacetabular impingement (FAI). The aim of this study was to use reformatted MRI sequences to establish the dimensions of normal, dysplastic, and deep acetabula. **METHODS:** IRB approval was obtained to retrospectively review MRI's of symptomatic hips with acetabular dysplasia or pincer FAI, and pelvic CT scans of asymptomatic control hips. Each group consisted of at least 20 skeletally mature patients. Superior lunate cartilage width (SLCW) and cotyloid fossa height (CFH) were measured on coronal reformats; anterior lunate cartilage width (ALCW), posterior lunate cartilage width (PLCW), and cotyloid fossa width (CFW) were measured on axial reformats. Comparisons between the three cohorts were made with using multivariate ANOVA with Bonferroni's adjustment for multiple comparisons. **RESULTS:** Dysplastic acetabula were significantly globally smaller than control and pincer acetabula ( $p<0.001$ ). Pincer acetabula were only significantly larger than control acetabula in the anterior (ALCW) lunate cartilage dimensions ( $p<0.01$ ). A subgroup of pincer acetabula had a significantly larger cotyloid fossa ( $p<0.01$ ) and significantly smaller superior (SLCW) cartilage size than controls ( $p<0.001$ ). **DISCUSSION AND CONCLUSION:** Understanding acetabular articular cartilage size will help to determine appropriate surgical intervention for pincer FAI. If the lunate cartilage is large, then acetabular rim-trim to create an articular surface of normal size is possible. If the lunate cartilage is small, a reverse periacetabular osteotomy that reorients yet preserves the size of the articular surface may be more appropriate.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Time: 14:00 - 15:30**

**Room: STA. TEREZA**

**Abstract no.: 38094**

**CORE BODY TEMPERATURE VARIATION DURING HIP ARTHROSCOPY**

Tanmay SURI<sup>1</sup>, Anand SARDESAI<sup>2</sup>, Andrea VOLPIN<sup>3</sup>, Graciela MUNIZ-TERRERA<sup>4</sup>, Vikas KHANDUJA<sup>2</sup>

<sup>1</sup>University of Cambridge, School of Clinical Medicine, Cambridge (UNITED KINGDOM), <sup>2</sup>Addenbrooke's Hospital, Cambridge (UNITED KINGDOM), <sup>3</sup>University of Padua, Department of Trauma and Orthopaedic Surgery, Padua (ITALY), <sup>4</sup>MRC Unit for Lifelong Health and Ageing, London (UNITED KINGDOM)

**Purpose:** To determine the incidence of post-operative hypothermia (below 36°C) in hip arthroscopy patients and factors affecting perioperative body temperature variation. **Methods:** A prospective audit of 50 consecutive patients undergoing hip arthroscopy for a variety of pathologies was carried out. Core body temperature was measured with a nasopharyngeal temperature probe at the induction of anaesthesia and at the end of the procedure. Other recorded variables were type of warming blanket, ambient theatre temperature and duration of surgery. It was noted whether the patient was shivering immediately post-operatively. The following demographic details were recorded: age, sex, body mass index and the American Society of Anaesthesiologists physical status score. The statistical analysis was performed with Stata<sup>TM</sup> 12 (StataCorp LP, College Station, Texas) by use of a conditional regression model to calculate associations between post-operative body temperature and other variables. The final sample size was 46 due to missing data in 4 patients. **Results:** The series included 30 female and 16 male patients aged 18 to 57 years (mean 35), with a mean BMI of 26.4 (standard deviation 4.2). Overall incidence of hypothermia below 36°C was 61%. Results of the conditional regression analysis suggested a positive association between post-operative body temperature and pre-operative body temperature ( $P < .001$ ). **Conclusions:** Incidence of hypothermia in hip arthroscopy patients is high (61%). We recommend warming patients pre-operatively with forced air warming devices to reduce this incidence.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Time: 14:00 - 15:30**

**Room: STA. TEREZA**

**Abstract no.: 38089**

**EXTRACORPOREAL SHOCK WAVE TREATMENT FOR OSTEITIS PUBIS IN PROFESSIONAL AND AMATEUR ATHLETES**

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Introduction: Osteitis Pubis often presents with nonspecific symptoms and difficult characterization, causing a delay in accurate diagnosis. Treatment can take several months or longer to completely take effect. The Aim of this study is demonstrate the results, efficacy, and safety of ESWT in the treatment of Osteitis Pubis in professional and amateur athletes. Methods: From February 2004 to November 2012, were treated twelve cases of chronic Osteitis Pubis resistant to conservative and surgical treatments. Of these, eleven were followed. We used a single application of 3000 pulses and 0.12 mJ/mm<sup>2</sup> of energy flux density under regional anesthesia in an outpatient clinic. We used MRI and radiological evaluation at the end of follow-up, beyond a visual analog pain scale, and return to activities in the analysis of results. There were no significant complications. Results: Ten athletes became asymptomatic after treatment. One patient did not improve. Discussion: Even after several conservative or surgical treatments, many athletes still present with disabling pain complaints enabling them practicing sport. The biomechanical effects of ESWT produce a biological response and based on this new concept of "tissue regeneration", new indications for the use of ESWT have been reported and studied. Conclusion: ESWT should be considered as an alternative in the treatment of chronic Osteitis Pubis in athletes. It is non-invasive, which is not considered doping, has no complications, is less expensive than surgery, does not have the risk of surgical procedures, and reduces the time an athlete is absent from training and competitive activities.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Time: 14:00 - 15:30**

**Room: STA. TEREZA**

**Abstract no.: 38114**

**LABRAL TEARS IN YOUNG SEXUALLY ACTIVE WOMEN: AN EVALUATION OF PATIENT SATISFACTION AFTER HIP ARTHROSCOPY**

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(UNITED KINGDOM)

**Aim:** To evaluate the effects of symptomatic labral tears on the sex lives of women and if there had been any resolution in the symptoms experienced during intercourse following arthroscopic labral debridement or repair. **Methods:** 120 consecutive women were identified who had undergone hip arthroscopy and labral debridement/repair under a single surgeon in a tertiary referral centre. A questionnaire was designed and sent to each of the patients. Data was collected on the nature of symptoms, if they experienced symptoms during sexual intercourse, if this had impacted on their sex lives and their degree of resolution of symptoms after the procedure, on a scale of one to ten. **Results:** Sixty responses were available at the time of submission. The age range of the patients was 16-61 years. Fifty women reported that they were sexually active. Of these, 92% reported pain during intercourse affecting their sex life. Twenty women specified that symptoms were positional, and pain was experienced in particular when the hip was in a flexed or abducted position. Eight women reported symptoms for days following intercourse and four stated that they are often not able to continue on account of the pain. Mean patient satisfaction with resolution of symptoms during intercourse was 7.8/10. Only 4 patients reported no improvement. **Conclusions:** Labral tears do have a significant effect on the sex life of women. Arthroscopic debridement/repair seems to relieve the pain experienced by women with labral tears during intercourse, with a resultant improvement in their sex lives.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Time: 14:00 - 15:30**

**Room: STA. TEREZA**

**Abstract no.: 36883**

**COMBINED ARTHROSCOPIC MANAGEMENT OF CONCURRENT POSTERIOR AND ANTERIOR ANKLE PATHOLOGIES**

**Nasef Mohamed Nasef ABDELATIF**

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**Purpose:** To determine the technical feasibility and preliminary clinical efficacy of performing simultaneous arthroscopic management in cases with combined posterior and anterior ankle pathologies utilizing previously described standard arthroscopic procedures within a single surgical sitting. **Methods:** Nineteen consecutive patients with combined anterior and posterior ankle pathologies were included in the current study, after at least 6 months of failed conservative managements. Combined standard posterior and anterior ankle arthroscopy was performed in all patients within the same surgical session; first with the patient in the prone position, then with the patient turned onto the supine position to perform the anterior procedure. **Results:** All patients were available for the follow up; the median follow up period was 33 months (range: 22-61 months). No persistent neurological deficits or infections were recorded. The American Orthopedic Foot and Ankle Society (AOFAS) Ankle and Hind foot Scale score significantly improved from  $70.2 \pm 15.2$  points pre-operatively to reach  $93.0 \pm 5.4$  points at one year post-operatively ( $p < 0.001$ ). Sixteen patients (84.2%) returned to their previous activity levels. **Conclusions:** Combined arthroscopic management of concurrent posterior and anterior ankle pathologies within the same surgical session is initially clinically encouraging; it allows for an earlier return to activities of daily living without a significantly added morbidity.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Time: 14:00 - 15:30**

**Room: STA. TEREZA**

**Abstract no.: 37690**

**ARTHROSCOPIC RADIOFREQUENCY SHRINKAGE FOR THE TREATMENT OF MILD METATARSOPHALANGEAL PLANTAR PLATE LESIONS: GRADES 0 AND 1**

Daniel BAUMFELD<sup>1</sup>, Caio NERY<sup>2</sup>, Fernando RADUAN<sup>2</sup>, Tania MANN<sup>2</sup>,  
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<sup>1</sup>Hospital Felicio Rocho, Belo Horizonte (BRAZIL), <sup>2</sup>UNIFESP, São paulo (BRAZIL), <sup>3</sup>UFMG, Belo Horizonte (BRAZIL)

The aim of this prospective study is to show the results obtained in the treatment of a group of patients with Grade 0 and Grade 1 plantar plate lesions by arthroscopic radio-frequency shrinkage and sealing of the plantar plate lesions combined with Weil metatarsal osteotomy with an average follow-up of 25 months. Methods: From January 2009 to June 2011, we prospectively treated 68 patients (100 MTP joints) with lesser MTP joint instability. Nineteen patients (35 MTP joints) were treated by the arthroscopic radio-frequency shrinkage and sealing of the plantar plate lesions combined with a Weil metatarsal osteotomy and were included in this study. We analyze the length of symptoms, the location and magnitude of pain. The AOFAS forefoot score was used to evaluate pre and postoperative results. The joint instability was measured using the metatarsophalangeal "drawer" test. Results AOFAS average improves from 53 points preoperatively to 92 points postoperatively and the VAS pain score average decrease from 8 points preoperatively to 0 points postoperatively. With the treatment instituted we demonstrate an improvement in pain relief, stability and congruency. Postoperatively, 83% of the MTP joints were totally stable with more than 97% of congruent joints. This result was not related to stiff joints. Eighty percent of patients had a positive "toe purchase" postoperatively and 94% of them presented the toe touching the ground with no residual elevation. Conclusion: arthroscopic radiofrequency shrinkage is an effective and valuable alternative for the treatment of both Grade 0 and Grade I Plantar Plate lesions.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Time: 14:00 - 15:30**

**Room: STA. TEREZA**

**Abstract no.: 37684**

**LESSER METATARSOPHALANGEAL JOINT ARTHROSCOPY:  
ANATOMICAL DESCRIPTION AND COMPARATIVE DISSECTION**

Daniel BAUMFELD<sup>1</sup>, Caio NERY<sup>2</sup>, Fernando RADUAN<sup>2</sup>, Tania MANN<sup>2</sup>,  
Benjamim MACEDO<sup>1</sup>, Michael COUGHLIN<sup>3</sup>, Marco Antonio ANDRADE<sup>4</sup>  
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Paulo (BRAZIL), <sup>3</sup>Coughling Clinic, Boise (UNITED STATES), <sup>4</sup>UFMG,  
Belo Horizonte (BRAZIL)

**Purpose:** The aim of this article is to describe the normal arthroscopic anatomy of the lesser metatarsophalangeal (MTP) joints compare it with open dissection in cadaveric models. **Methods:** We performed arthroscopic examination of 18 metatarsophalangeal joints of 6 normal fresh frozen feet. The second, third and fourth MTP joints were studied due to the higher incidence of pathologies found in these joints. During the arthroscopy, each anatomical structure identified was named and marked with different color sutures using straight suture needles. After the arthroscopic procedure of identification and marking each metatarsophalangeal joint was dissected and all the anatomical structures were grossly identified. With this data, the correlation between the arthroscopic and the direct visualization of a normal MTP joint was established. **Results:** Considering the joint regions, we found that the examination accuracy of the medial gutter was 92% while the central joint accuracy reached 100% and the lateral gutter, 98%. The overall arthroscopic accuracy for the lesser MTP joints was 96%. **Conclusions:** There is a high level of anatomic accuracy at lesser MTP joint arthroscopy.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Time: 14:00 - 15:30**

**Room: STA. TEREZA**

**Abstract no.: 37656**

**PRP IN THE TREATMENT OF HAMSTRING AND GLUTEUS MEDIUS TENDINOPATHIES**

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Introduction: Platelet Rich Plasma is a promising way of treatment for sport injuries and chronic tendinopathies such as lateral epicondylitis, achilles... Efficacy is still debated. PRP concentration, separation systems and leucocytes optimization are topics of interest and discussion. PRP have never been investigated in the treatment of gluteus medius and hamstring tendons tendinopathies. Methods: We conducted a randomized controlled trial comparing PRP and corticosteroid injection in patients presenting chronic tendinopathy of either gluteus medius or hamstring tendons since at least 3 months. None of them have treated by any other injection before. Randomization was performed by a block randomization method. Clinical evaluation and Pain Visual Analogue Scale were performed before and 3 months after injection. Results: Forty-six patients were involved, 23 in each group. Groups were comparable in terms of age, gender and sports activity. Pain VAS was significantly improved in PRP group (-28,2/100) compared to Steroid group (-25,2/100) at 3 months ( $p<,05$ ). level of activity and clinical scores after injection were comparable. We found no infection or complication in either group but 40% of patients in PRP group kept discomfort at injection point up to 5 days. Patients felt efficacy as excellent or good in 75% in PRP group and 70% in the other. Conclusions: Platelet Rich Plasma has shown to be an efficient and safe technique for the treatment of hamstring and gluteus chronic tendinopathy.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Miscellaneous**

**Time: 16:00 - 17:30**

**Room: STA. TEREZA**

**Abstract no.: 37619**

**UNPLANNED ADMISSIONS OF DAY CASE ARTHROSCOPIC KNEE AND SHOULDER PROCEDURES IN AN ELECTIVE ORTHOPEDIC HOSPITAL**

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Aim of the study: To address the various reasons for the unplanned admissions of the shoulder and knee arthroscopic day surgery patients in an elective orthopedic hospital. Study Design: It was a retrospective study of all arthroscopic shoulder and knee cases over period of seven months between august 2012 to February 2013 in an elective orthopedic hospital. Data was obtained from preoperative and intraoperative anesthesia notes, postoperative recovery forms, and relevant case notes and also from EPR (Electronic Patient Records). Results: There were in total of 689 patients who underwent day case surgery procedures during study period. There were 104 patients who stayed overnight which contributed to about 15 percent of all the day case surgery. Hand, Foot and Ankle procedures were excluded. Out of 104 patients 79 case notes were retrieved. Average age of the patient was 51.4 years. ASA grade 2 and 3 together accounted for 67 % of admissions. Anesthesia related reasons accounted for maximum number of patients forming 40.5%. Next common cause was patients waiting for the physiotherapy which were 20.25% of patients. 8.8% stayed back because of inadequate pain relief. Medical reasons like chest pain, previous history of deep vein thrombosis were found in 7.5 % of admissions. Social reasons like alone in the home accounted for 5%. No reasons could be found in 2.5% of patients. Conclusion: systematic planning before day surgery by a team of surgeon, Anesthetist and Physiotherapist can reduce unplanned overnight admissions of day surgery patients.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Miscellaneous**

**Time: 16:00 - 17:30**

**Room: STA. TEREZA**

**Abstract no.: 37826**

**AN EXPLORATORY STUDY OF SCHOOL INJURIES: ANALYSIS OF 3285 MEDICAL ENTRIES**

Nikhil SHETTY, Vijay SHETTY, Prajyot JAGTAP, Sourabh KULKARNI, Vikas SONALE, Prashant MANE

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Background: Injuries in school are, by far, a common occurrence. However, there is very limited information in the literature on the epidemiology of injuries in schools. This study examined the medical records of a suburban school, in India, over a period of five months to understand the pattern of injuries in school children. Methods: We examined all medical entries, in a school, made between June 2012 and October 2012 (both months inclusive). The entries included names of the individuals seeking medical attention for any medical condition including injuries sustained. Results: There were a total of 3285 entries, made in the registry, during the above period. Of 3285 medical entries, 2956 entries pertained to school children alone. Of the 2956 entries, 1776 entries (60.1%) were injuries sustained by school children. 1701 entries out of 1776 entries (95.8%) injuries were outdoor injuries. 1369 entries out of 1776 entries indicated that open injuries (77.1%). Conclusions: Our study indicates that almost one in ten children (an average 8% of children) attend medical room with various medical conditions, approximately half of which are due to injuries. This is an important observation and can help in planning prevention of avoidable injuries in a school atmosphere.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Miscellaneous**

**Time: 16:00 - 17:30**

**Room: STA. TEREZA**

**Abstract no.: 37837**

**GENE EXPRESSION ANALYSIS IN PATIENTS WITH TRAUMATIC ANTERIOR SHOULDER INSTABILITY SUGGESTS DEREGULATION OF COLLAGEN GENES**

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Shoulder dislocation occurs in 1–2% of the population. Capsular deformation is a key factor in shoulder dislocation; however, little is known about capsule biology. This is the first study to evaluate gene expression in the glenohumeral capsule. We evaluated the expression of COL1A1, COL1A2, COL3A1 and COL5A1 in the antero-inferior, antero-superior and posterior regions of the glenohumeral capsule of 31 patients with traumatic anterior shoulder instability and 8 controls. The expression of collagen genes was evaluated by quantitative reverse transcription-PCR. Both the expression of COL3A1 and the ratio of COL1A1/COL1A2 were increased in all three portions of the capsule in patients compared to controls ( $p<0.05$ ). COL1A1 and COL1A2 expression was also upregulated in the antero-superior and posterior sites of the capsule of patients ( $p<0.05$ ). The ratio of COL1A2/COL3A1 expression was reduced in capsule antero-inferior and posterior sites of patients compared to controls ( $p<0.05$ ). In the capsule antero-inferior site of patients, the ratios of COL1A1/COL5A1 and COL1A2/COL5A1 expression were increased ( $p<0.05$ ). We found deregulated expression of collagen genes across the capsule of shoulder instability patients. These molecular alterations may lead to modifications of collagen fibril structure and impairment of the tissue healing process, possibly explaining the mechanism underlying capsular deformation.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Miscellaneous**

**Time: 16:00 - 17:30**

**Room: STA. TEREZA**

**Abstract no.: 38391**

**LATARJET RECONSTRUCTION IN PATIENTS WITH ANTERIOR SHOULDER INSTABILITY AND SIGNIFICANT BONE LOSS**

**Abd Elrhman Ahmad ELGANAINY, Mohammed Abou Elnour BADRAN**  
**Mansoura Faculty of Medicine, Mansoura (EGYPT)**

**Introduction:** Different procedures have been described for anterior shoulder instability, including capsulolabral reconstructions, subscapularis transfers, and coracoid transfer procedures. The Latarjet coracoid transfer procedure provides a “triple blocking” effect in the treatment of anterior shoulder instability. First, the coracoid bone block increases the anterior posterior diameter of the inferior portion of the glenoid fossa, preventing subluxation or dislocation. Second, the conjoint tendon acts as a sling reinforcing the inferior capsular ligamentous complex. Finally, repair of the inferior capsular ligamentous complex to the stump of the coracoacromial ligament reconstructs the capsulolabral anatomy. **Patients & methods:** From October 2009 to November 2012; twenty-one patients underwent open Latarjet procedure for recurrent glenohumeral instability. The mean age of the patients was 26.4 years (range: 19-41 years). There were 18 males and 3 females. The mean number of dislocations was 10 (range: 6-18). The average follow-up time was 13 months (range: 6-31 months). **Results:** At the time of the latest follow up, none of the patients had recurrent dislocations or subluxations. Two patients had positive apprehension. According to system of Rowe et al.: 17 patients had excellent results, 3 patients had good results, one patient had fair result. **Conclusion:** Latarjet is a very good option for anterior glenohumeral instability especially in patients with: 1. Number of dislocations five times or more, 2. Initially severe trauma that axillary load the humeral head, 3. Further instability with minor trauma and with simple life activates, 4. Radiologic evidence of bone loss.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Miscellaneous**

**Time: 16:00 - 17:30**

**Room: STA. TEREZA**

**Abstract no.: 38464**

**LIMITED CAPSULAR RELEASE AND CONTROLLED MANIPULATION UNDER ANAESTHESIA FOR THE TREATMENT OF FROZEN SHOULDER SYNDROME**

Amit Sharad Chandra BIDWAI, Maryke NEILSEN, Peter BROWNSON  
Liverpool Upper Limb Unit, Liverpool (UNITED KINGDOM)

Introduction: To determine the results of limited anterior capsular release and controlled manipulation under anaesthesia (MUA) technique without sub-acromial decompression in the treatment of primary frozen shoulder syndrome in terms of Patient-Related Outcomes Measure, range of motion and re-intervention rates, in light of recent interest in the cost-effectiveness of the treatment options available for frozen shoulder syndrome. Methods: Review of prospectively collected data of patients undergoing capsular release with MUA in a single surgeon series, with a minimum follow-up of six months from index procedure. Outcome measures included pre and post-operative Oxford Shoulder Scores, range of motion and need for re-intervention. Results: 54 procedures were performed in 52 patients. Mean age 50 years, range 42-59. M: F 12:42 There was a highly statistically significant improvement in both pain and function modules of the Oxford Shoulder Score ( $p < 0.005$ ) and range of motion ( $p < 0.005$ ) at six months. The median post-operative score was 41 from 48 points with an average improvement of 24 points. No patients required surgical re-intervention. Conclusion: We have been able to demonstrate significant improvement in Oxford Shoulder Score and range of motion outcome for patients undergoing a limited capsular release and a controlled MUA in isolation without the need for a secondary surgical intervention. A combination of limited release along with an MUA for the treatment of primary frozen shoulder syndrome is a safe and effective procedure resulting in marked improvement in pain, function and range of motion.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Miscellaneous**

**Time: 16:00 - 17:30**

**Room: STA. TEREZA**

**Abstract no.: 38292**

**SHORT-TERM EVALUATION OF ARTHROSCOPIC MANAGEMENT OF TENNIS ELBOW INCLUDING RESECTION OF RADIO-CAPITELLAR CAPSULAR COMPLEX**

Abdulrahman BABAQI<sup>1</sup>, Mohamed KOTB<sup>2</sup>, Hatem SAID<sup>1</sup>, Mohammed ABDULHAMID<sup>1</sup>, Hesham ELKADY<sup>1</sup>, Maher ELASSAL<sup>1</sup>

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**Background:** There has been controversy regarding the pathogenesis and treatment of lateral epicondylitis. Different surgical techniques for the treatment of lateral epicondylitis prescribed. The purpose of this study was to evaluate the short-term outcomes of arthroscopic management including resection of the radio-capitellar capsular complex, using different validated scores. **Methods:** In this study, arthroscopic resection of a capsular fringe complex was done beside debridement of the undersurface of Extensor Carpi Radialis Brevis (ECRB). Thirty-one patients with recalcitrant lateral epicondylitis for a minimum of 6 months had surgery. In all patients, a collar-like band of radio-capitellar capsular complex was found to impinge on the radial head and subluxate into the radio-capitellar joint with manipulation under direct vision. Outcomes were assessed using Mayo Elbow Performance Index (MEPI), The Patient-Rated Tennis Elbow Evaluation (PRTEE), and the Disability of the Arm, Shoulder, and Hand (DASH), beside visual analog scale (VAS) for pain and satisfaction criteria. **Results:** After arthroscopic surgery, Overall satisfaction was extremely positive, over the 31 patients, 93.5% of the patients are satisfied. The mean score for pain improved from 8.64 to 1.48 points. The total PRTEE improved from 55.53 to 10.39 points. The mean MEPI score was improved from 61.82 to 94.10 points. DASH score also improved from 24.46 to 4.81 points. All Improvements are statistically significant ( $P < 0.05$ ). **Conclusion:** Arthroscopic release of ECRB and radio-capitellar capsular complex in patients with chronic lateral epicondylitis is a reproducible method with a marked improvement in function within a short period.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Miscellaneous**

**Time: 16:00 - 17:30**

**Room: STA. TEREZA**

**Abstract no.: 38484**

**ARTHROLYSIS FOR STIFF ELBOW**

Imran ALI, Ford QURESHI, Shervin VAZIRI

Doncaster and Bassetlaw Hospitals, Nottinghamshire (UNITED KINGDOM)

Elbow stiffness following trauma is common. Currently good results have been achieved following arthroscopic or open surgical Arthrolysis of the elbow using a variety of techniques with structured postoperative rehabilitation. This study reports on the prospectively collected outcomes of our own surgical techniques and the use of immediate postoperative Continuous Passive Movement for a period between 2008-2012. 23 patients (mean 51 years) with stiff elbows underwent Arthrolysis and manipulation under general anaesthesia. 16 patients were post-traumatic. 7 had primary osteoarthritis. 15 patients underwent an arthroscopic Arthrolysis. 8 open Arthrolysis. 9 patients also had retrieval of loose bodies. Only 3 patients had radial head excision. 9 patients received inpatient CPM care for 5 days. Range of motion was assessed at regular post-operative intervals. Mean range of flexion/extension movement improved from 71° to 125° with a mean pronosupination improvement by 10°. Function and pain of the upper limb improved from 51 to 8.4 DASH score and from 54.4 to 89.4 Mayo Elbow Performance Score. Oxford Elbow Score from 24.8 to 42. A Visual Analogue Score of pain showed an improvement from 6.6 to 2.1. All patients completed a "patient satisfaction survey" recommending the treatment. We found that some patients did not improve in pain despite an improvement in functional ROM. Arthrolysis should still be considered in young patients who require a more functional ROM with underlying degenerative processes whether from primary or secondary causes.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Miscellaneous**

**Time: 16:00 - 17:30**

**Room: STA. TEREZA**

**Abstract no.: 38136**

**DEBRIDEMENT VERSUS REPAIR IN PERIPHERAL TEARS OF THE TFCC WITHOUT DRUJ INSTABILITY - A PRELIMINARY REPORT**

Ahmed AFIFI<sup>1</sup>, Mostafa MAHMOUD<sup>1</sup>, Nasef Mohamed Nasef ABDELATIF<sup>2</sup>, Mohamed HEGAZY<sup>1</sup>

<sup>1</sup>Cairo University Teaching Hospital,, Cairo (EGYPT), <sup>2</sup>Bani Suef University Teaching Hospitals, Bani Suef (EGYPT)

Hypothesis: Superficial peripheral TFCC tears are commonly encountered during diagnostic wrist arthroscopy performed for other causes of wrist pain. Debridement of tears not causing DRUJ instability was compared with the classic outside-in repair to the ulnar capsule. Methodology: A prospective cohort of 29 patients with superficial peripheral TFCC tears (with no DRUJ instability) was treated arthroscopically between 2011 and 2013. There were 26 males and 3 females, with a mean age of 32.9 years. The dominant hand was affected in 19 patients (65.5%). Patients were divided into 2 groups. The first group included 15 patients. Arthroscopic repair was done using the outside-in technique. The second group included 14 patients for whom arthroscopic shaving and debridement were performed. Patients were evaluated with the Visual Analogue Scale (VAS), the quick DASH score and Mayo modified wrist score. Results: Both groups were comparable on the short-term follow-up. In the 1st group, the mean follow-up period was 21.87 months. The mean VAS score improved from 3.53 to 1.07, the mean quick DASH score improved from 36.33 to 21.60 and the mean Mayo modified wrist score improved from 71.33 to 85.33. In the 2nd group, the mean follow-up period was 19.71 months. The mean VAS score improved from 3.86 to 1, the mean quick DASH score improved from 34.43 to 19.79 and the mean Mayo modified wrist score improved from 77.14 to 90. Conclusions: Debridement alone seems to give comparable results to repair, in peripheral tears of the TFCC without instability of the DRUJ.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Miscellaneous**

**Time: 16:00 - 17:30**

**Room: STA. TEREZA**

**Abstract no.: 37723**

**DIAGNOSTIC VALUE OF OUTERBRIDGE AND ICRS CLASSIFICATIONS FOR ARTHROSCOPIC GRADING OF CHONDRAL LESIONS IN THE KNEE**

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Clinica Alemana - Universidad del Desarrollo, Santiago (CHILE)

Objectives: Assess de diagnostic accuracy of Outerbridge (OB) and ICRS classifications for chondral lesions of the knee. Methods: diagnostic test study, with a prospective design and data collection. 30 chondral lesions encountered in consecutive knee arthroscopies performed by the same surgical team were recorded. 7 knee surgeons, graded according to their expertise, were asked to observe a video were 30 chondral lesions were shown through arthroscopic view. Simultaneously they were asked to classify them according to OB and ICRS. Finally, they had to define how they would manage the lesion, among 6 treatment options (observation, mechanical/thermic chondroplasty, microfracture, OATS or biological therapies). A week later, they repeated the same procedure. Results: Interobserver agreement was weak ( $\kappa$  0.25) for ICRS classification and moderate for OB classification ( $\kappa$  0.45). Intraobserver agreement for ICRS ranged from moderate to excellent (average  $\kappa$  0.67), and for OB ranged from good to excellent ( $\kappa$  0.83). Neither classification correlated with surgeon's experience. Interobserver agreement for therapeutic choice was poor ( $\kappa$  0.33). However, intraobserver agreement was good to excellent ( $\kappa$  0.82) in all cases, showing a direct correlation with the surgeon's experience. Logistic regression used to assess the ability of both classifications to discriminate among treatment options, showed in both cases an area under the roc curve in the no-effect range. Conclusion: Both classifications showed low interobserver and high intraobserver agreements for arthroscopic grading of chondral lesions. In both, OB was more reliable than ICRS. As for guiding therapeutic management, none of the classifications could unify surgical criteria.

**Date: 2014-11-20**

**Session: Sports Medicine: Free Papers - Miscellaneous**

**Time: 16:00 - 17:30**

**Room: STA. TEREZA**

**Abstract no.: 38485**

**NOVEL Y-KNOT™ ANCHORAGE FOR SHOULDER INSTABILITY**

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<sup>1</sup>Doncaster and Bassetlaw Hospitals, Nottinghamshire (UNITED KINGDOM), <sup>2</sup>Spire Manchester Hospital, Manchester (UNITED KINGDOM)

Conservative treatment of shoulder dislocation has a disappointingly high recurrence rate, particularly within the younger population. Since the advent of anchor sutures and advances in arthroscopic repair in 2000s, several modifications have been made with the technology. Larger (>3mm) metal and PLLA/PEEK anchors have recognised complications and associated morbidities. The introduction of much smaller (1.3mm) “all suture anchors” such as the Y-Knot™ (ConMed) has removed these less desirable complications with 80 % more preservation of the glenoid bone stock. We present our experience of arthroscopic fixation using the Y-Knot™ for first time, recurrent and revision cases of shoulder dislocations with prospective data collected from two hospitals between 2012 to 2014. 47 patients underwent standard arthroscopic fixation using Y-Knot™. All patients completed preoperative and postoperative Oxford Instability Score (OIS) with a physiotherapy led post-operative rehabilitation. The study population comprised of six shoulder instabilities, three subluxations, four primary dislocations and 34 recurrent dislocations. 10 patients required additional surgery during same episode of arthroscopic stabilisation using Y-Knot™, of which 8 SLAP repairs and 2 Remplissages were performed. Mean preoperative OIS were 19.7 (Range 14-32). 6 month follow up postoperative mean OIS score were 38.2 (range 18-45). Subjective patient response post operatively showed that 25 patients were very satisfied, 11 much better, 9 better and 2 had no improvement both of whom required a further open Latarjet procedure. Our Y-Knot™ “all-suture” series shows a successful method of repair for shoulder instability, with minimal complications and a marked improvement of patient rated outcome scores.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers I**

**Time: 08:30 - 10:00**

**Room: ARPOADOR**

**Abstract no.: 37651**

**MRI-ANALYSIS OF RESISTANT CLUBFEET AFTER CONSERVATIVE TREATMENT**

**Nikolay RUMYANTSEV, Ekaterina ADAEVA, Igor KRUGLOV**

**Institute of Perinatology and Pediatrics, St.Petersburg (RUSSIA)**

18 patients (25 resistant clubfeet) were studied. Ponseti method was used as a start-up therapy for all feet. The distance between medial malleolus and navicular was initially calculated using ultrasonography. Many clubfeet had small tibionavicular distance (3-9 mm). MRI was used for anatomical specification. The following data were MRI-evaluated: talar body-neck angle, tibio-navicular distance and position of navicular on talar head. Transversal navicular size, position of ossific nucleus in the cuboid, and calcaneo-cuboid relationships were also analyzed. Results: the talar body-neck angle ranged from 15° to 56°. Tibionavicular distance was from 4 to 10 mm. 10 feet (40%) had talonavicular subluxation, 11 feet (44%) showed talonavicular decentralization and 4 feet (16%) had normal talonavicular relationships. Transversal navicular size in affected feet was 27% bigger than in the normal opposite foot. The ossific nucleus of cuboid was medially decentralized in 76%. 16% of feet had normal calcaneo-cuboid anatomy; the rest 21 feet (84%) had medial deviation of distal calcaneal facet. There were no feet with calcaneo-cuboid dislocation. Conclusions: Ponseti corrected feet had intermediate (25° – 40°) values of talar body-neck angle, tibionavicular distance was 7 mm or more; decentralization or normal relationships were detected in talonavicular joints. Ponseti resistant feet had low (<25°) or high (>40°) values of talar body-neck angle, tibionavicular distance was ≤ 6 mm, and talonavicular subluxation was detected in most of these feet. In cases of unilateral clubfoot the transversal navicular size was significantly bigger on the affected side.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers I**

**Time: 08:30 - 10:00**

**Room: ARPOADOR**

**Abstract no.: 37135**

**REMODELLING IN THE TREATMENT OF NEGLECTED CLUBFOOT:  
IS AGE A LIMITING FACTOR? - A MRI STUDY**

Monica NOGUEIRA<sup>1</sup>, Denise TOKESHI<sup>2</sup>

<sup>1</sup>HSPE AACD, São Paulo (BRAZIL), <sup>2</sup>Hospital Sirio Libanes, São Paulo (BRAZIL)

Introduction: clubfoot treatment has radically changed in the last decade, and satisfactory functional and clinical results were obtained with Ponseti Method. This treatment is a consense in newborns and cartilaginous remodeling has been demonstrated within 5 weeks. Treatment of neglected clubfeet by Ponseti Method has been addressed recently with good results but remodeling has not yet been demonstrated. We present MRI sequences before, during and after treatment of a 7 year old child treated by Ponseti Method. Method: Sequences were oriented perpendicularly to talonavicular joint, calcaneocuboid joint, and to the ankle and subtalar joints for the study of cartilaginous and ossification nuclei changes. Results: Reduction of talonavicular and calcaneocuboid joints are shown with good cartilaginous remodeling and maintenance of articular congruency after 10 weeks of treatment. There was good healing and remodeling of Achilles tendon after complete tenotomy. Some stress changes in talus and calcaneous reflect the effect of weight bearing in an osteoporotic bone. Discussion: Adequate remodeling of cartilage was shown after 5 weeks and after 10 weeks. This study provides evidence of good healing of Achilles tendon after complete section and integration of anterior tibial tendon to the third cuneiform; shows remodeling of the cartilaginous anlage, with joint congruency. This study is evidence and extends the indications of Ponseti Method to children after walking age.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers I**

**Time: 08:30 - 10:00**

**Room: ARPOADOR**

**Abstract no.: 37636**

**20 YEARS' FOLLOW-UP AFTER CLUBFOOT SURGERY:  
COMPARISON OF RESULTS EVALUATION VIA DIFFERENT RATING  
SCALES**

Nikolay RUMYANTSEV<sup>1</sup>, Victor EZROHI<sup>1</sup>, Igor KRUGLOV<sup>1</sup>, Gamzat OMAROV<sup>2</sup>

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<sup>2</sup>Turner's Pediatric Orthopedic Institute, St.Petersburg (RUSSIA)

We compared the existing clubfoot evaluating systems in the same group of patients who were treated 20 years ago. Methods: 34 patients (50 severe clubfeet) were included in the study. Typical soft-tissue release via Cincinnati approach was used. Result evaluation was done using 10 different rating systems. Results: mean patient's age at the time of the follow-up evaluation was 20 years. Evaluation of the same group of patients using different rating scales showed significant divergence in results. According to the McKay system there was 8% good, 62% fair and 30% poor results; there was no excellent results. According to the Seringe and Magone systems there were 8% excellent, 44% good, 48% fair and poor results. According to the Ghanem scale there was 54% excellent, 42% good and 4% fair results. According to the Atar scale there was 54% excellent, 38% good and 8% fair results. According to the Laaveg scale there was 42% excellent, 42% good and 16% fair results. Conclusions: the final statistics of clubfoot correction depends directly on the applied evaluating system. McKay, Seringe and Magone systems were the most strict ones, while Ghanem, Atar and Laaveg systems were the most loyal ones. The percentage of excellent and good results varies from 8% to 96%; the percentage of correction (= excellent + good + fair results) varies from 70% to 100% depending on the loyalty of the evaluating system. Significance: this study demonstrates that an international consensus might be necessary to optimize the clubfoot evaluation standards.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers I**

**Time: 08:30 - 10:00**

**Room: ARPOADOR**

**Abstract no.: 37539**

**IS THE DEGREE OF RIGIDITY A POTENTIAL FACTOR PREDICTING THE RELAPSE AFTER CLUBFOOT MANAGEMENT USING PONSETI METHOD?**

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This study was designed to investigate whether the degree of rigidity (DR) in clubfoot could predict the likelihood of its recurrence in patients treated using Ponseti method. A series of patients with idiopathic clubfeet, undergoing no previous management, were treated with Ponseti method at the age younger than 6 months and had a minimum 2-year follow-up. The demographic data included gender, laterality, number of casts, percutaneous Achilles tenotomy (PAT), and bracing compliance. Prior to the initial treatment, all the feet were rated with Pirani scoring system. The degree of deformity was divided according to Pirani scores. DR was represented by the value of Pirani score divided by number of casts. DR over 1 indicated less stiffness while DR less than 1 indicated more stiffness. Relapse was defined as clubfoot requiring additional procedures. Sixty-nine patients with 106 feet, 49 boys and 20 girls, were included. Thirty-two patients had unilateral clubfeet (right 20 and left 12). Forty-three feet were categorized as less stiffness while 63 feet as more stiffness. The PAT rate was 14.2% (15/106) while noncompliance rate was 43.5% (30/69). Relapse happened in 30.4% (21/69). It was found that DR and bracing noncompliance significantly increased the likelihood of recurrence. A clubfoot of more stiffness was 33 times more likely to have a relapse than one with less stiffness. DR was also a significant risk factor for recurrence of deformity as well as brace noncompliance.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers I**

**Time: 08:30 - 10:00**

**Room: ARPOADOR**

**Abstract no.: 38357**

**RADIOGRAPHIC CORRELATION WITH CLINICAL CORRECTION IN  
IDIOPATHIC CLUBFEET UNDERGOING PONSETI TREATMENT**

**Elsayed SAID**

**South Vally University, Qena (EGYPT)**

We include 42 feet in our study (27 patients); 21 patients (77.8%) presented before the age of 1 month and 6 patients (22.2%) presented after the age of 1 month. The age of patients at the time of presentation varied from one week to 5 months. 12 patients (44.4%) were male, 15 (55.6%) patients were female. 15 patients (55.6%) had bilateral involvement, 12 patients (44.4%) had unilateral involvement. According to Pirani score, the clinical correction was excellent in 41 feet (97.6 %), and good in 1 foot (2.7 %), before correction the mean Pirani Total score was 4.2, which was reduced to 0.4 after the correction. The mean of pre correction talocalcaneal angle in AP view was 21.4 (standard deviation 8.8). The mean of post correction increase in these patients was 45.8 (standard deviation 16). 6 months Follow up mean was 39.8 (standard deviation 15.5). The mean of pre correction talo-calcaneal angle in lateral view was 10.7 (16 cases were 0 degree) and standard deviation was 16.9. The mean of post correction increase to 45.6 (standard deviation 20). 6 months Follow up mean was 44.7 (standard deviation 20). The mean of pre correction talo-first metatarsal angle in AP view was 23.6 (standard deviation 20). The mean of post correction decreased to 9 (standard deviation 18). 6 months follow-up mean was 0.22 (standard deviation 12). Conclusion: The talo-calcaneal angle (TCA) in AP and lateral view and talo-first metatarsal angle showed significant correlation with the clinical correction.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers I**

**Time: 08:30 - 10:00**

**Room: ARPOADOR**

**Abstract no.: 38395**

**MAGNETIC RESONANCE IMAGING REVEALS SOFT TISSUE ABNORMALITIES ASSOCIATED WITH TREATMENT RESPONSIVE AND RESISTANT CLUBFOOT**

**Matthew DOBBS**

**Washington University School of Medicine, Saint Louis (UNITED STATES)**

Clubfoot treatment failures are relatively common and often result in impaired quality of life. An understanding of the soft tissue abnormalities associated with both treatment responsive and treatment resistant clubfoot is necessary to improve diagnosis, prognosis, and treatment methods. Twenty clubfoot patients treated with the Ponseti method were recruited for magnetic resonance imaging of their lower extremities. These include 7 patients (6 unilateral) with treatment responsive clubfoot, and 13 (5 unilateral) with treatment resistant clubfoot. For the unilateral clubfoot patients, the percentage difference in cross sectional area between the affected leg and the "normal" leg was calculated for 1) muscle, 2) subcutaneous fat, 3) intracompartment fat and 4) total area. Comparison of inter-leg differences in cross sectional areas (unilateral clubfoot patients) and Intracompartment Adiposity Index (IAI) between treatment responsive versus treatment resistant groups were made using the Wilcoxon signed rank test. Extensive soft tissue abnormalities are more present in treatment resistant compared to treatment responsive clubfeet. In unilateral patients, treatment resistant clubfoot is associated with significantly greater difference in muscle (-47.8% vs -26.6%;  $p=0.02$ ) and intracompartment fat (402.6% vs 9%,  $p=0.01$ ) cross-sectional area compared to patients with treatment responsive clubfoot. Magnetic resonance imaging demonstrates a range of soft tissue abnormalities in patients including unique patterns of specific muscle compartment aplasia/hypoplasia that are present in patients with treatment resistant clubfoot and not present in patients with treatment responsive clubfoot. Correlations between MRI imaging, physical exam, and treatment responsiveness may aid the development of a prognostic classification system for clubfoot.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers I**

**Time: 08:30 - 10:00**

**Room: ARPOADOR**

**Abstract no.: 37143**

**PONSETI IN MYELODYSPLASTIC FEET - A LATIN AMERICAN EXPERIENCE**

Monica NOGUEIRA<sup>1</sup>, Francisco VIOLANTE<sup>2</sup>, Marina BATISTA<sup>3</sup>

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<sup>3</sup>Montevideo, Montevideo (BRAZIL)

**Introduction:** Myelodysplastic feet are a challenge for treatment, due to co-morbidities, motor and muscle imbalance, and proprioceptive deficits. Ponseti treatment can be successfully applied if good attention to detail and technique are given. **Results:** 65 feet in 37 children are presented, 16 males (28) and 21 females (37 feet); 22 feet were classified as high lumbar level, 35 lower lumbar level, 3 thoracic level, 2 sacral level, 2 sacral agenesis and 1 as myelodysplasia. The average age at the beginning of treatment was 1y3m (12d-6y9m), with an average follow up of 2y11m. 3 children treated unilateral infected pressure sores, and 37% of all children had already had previous treatment with short leg casts. 4 children abandoned treatment. 78% of feet were completely corrected after initial treatment (46/59), and 44% of children were able to maintain correction until the latest follow up. Tenotomies were performed in 76% of cases, and in 9% of cases, 2 tenotomies were performed. Average number of casts was 5. 56% of the feet recurred, 74% from these during the brace phase. From all the recurrences, 63% were treated with new casts and 21% with new surgeries. 39% of all children underwent some surgery (PMR, ant tib transfer, posterior release, tenectomy, shortening of lateral column, fasciotomy, or talectomy). 24% of all children underwent posteromedial release. **Discussion and Conclusion:** Results showed that Ponseti Method could be applied in the treatment of myelodysplastic clubfeet, requiring good training and attention to detail. Recurrences are common, but radical surgical interventions are reduced.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers I**

**Time: 08:30 - 10:00**

**Room: ARPOADOR**

**Abstract no.: 38503**

**GROSS MOTOR SKILLS OF CHILDREN WITH IDIOPATHIC CLUBFOOT TREATED WITH THE PONSETI METHOD: A PILOT STUDY**

Wallace LEHMAN, Alice CHU, Debra SALA, Anita SIM

NYU Hospital for Joint Diseases, New York (UNITED STATES)

The Gross Motor Scale of the Peabody Developmental Motor Scales is a standardized norm-referenced test which consists of three subtests: Stationary – ability to maintain stable postures; Locomotion – ability to walk, hop, jump, and run; and Object Manipulation – ability to throw, catch and kick a ball. A Gross Motor Quotient is calculated from all of the subtests to provide an overall assessment. From November 2011 to August 2012, 18 potential participants returned for a follow-up clinic visit; 9 children with mean age 52 months (range 36-68) were enrolled. Of these participants, 7 were male and 2 were female; 5 had bilateral involvement and 4 unilateral; mean age at initial presentation was 10.6 days (range 6-18), mean number of casts per foot was 5.7 (range 5-7). No surgery other than a percutaneous tendo-Achilles lengthening, which 10 of the 14 feet required, was performed. The Gross Motor Quotient was above average for 2 children (22%), average for 4 (44%), below average for 2 (22%) and poor for 1 (11%). For the subtests, the score was above average for 2 and average for 7 for Stationary; above average for 1, average for 5, and below average for 2 for Locomotion; and above average for 1, average for 6 and below average for 2 for Object Manipulation. This pilot study is suggestive of the possible need to evaluate the gross motor skills of the young child with a treated clubfoot in order to provide early intervention to prevent continued gross motor impairment.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers I**

**Time: 08:30 - 10:00**

**Room: ARPOADOR**

**Abstract no.: 38392**

**GENOME-WIDE ASSOCIATION STUDY IDENTIFIES NEW DISEASE  
LOCI FOR ISOLATED CLUBFOOT**

Matthew DOBBS, Christina GURNETT

Washington University School of Medicine, Saint Louis (UNITED  
STATES)

Clubfoot is a common congenital birth defect with complex inheritance patterns. Currently, the genetic and morphological basis of clubfoot is poorly understood. To identify genetic risk factors associated with clubfoot, we performed a genome-wide association study of common genetic variants. The DNA of 396 isolated clubfoot patients and 1000 controls of European descent was genotyped for >600 000 single nucleotide polymorphisms (SNP) using the Affymetrix 6.0 array. Replication was performed with an independent cohort of 370 isolated clubfoot cases and 363 controls of European descent. Strongest evidence for an association of clubfoot was found with an intergenic SNP on chromosome 12q24.31 between NCOR2 and ZNF664 (rs7969148, OR=0.58,  $p=1.25 \times 10^{-5}$ ) that was significant on replication (combined OR=0.63,  $p=1.90 \times 10^{-7}$ ). Additional suggestive SNPs were identified near FOXN3, SORCS1 and MMP7/TMEM123 that also confirmed on replication. Our study suggests a potential role for common genetic variation in several genes that have not previously been implicated in clubfoot pathogenesis.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers I**

**Time: 08:30 - 10:00**

**Room: ARPOADOR**

**Abstract no.: 37398**

**AN EPIDEMIOLOGICAL COMPARATIVE STUDY FOR EVALUATION OF EPIDEMIOLOGICAL AND GENETIC RISK FACTORS FOR IDIOPATHIC CTEV**

Ubale TUSHAR, Abdul RAHEMATULLAH, Nayak VIVEK, Bhaskar ATUL, Satishchandra KALE, Pilankar SAMIR  
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Birth prevalence of CTEV varies by Race, ethnicity, gender, rank of pregnancy, birth weight, type of delivery, gestational age, maternal and paternal age, seasonal variation. Objectives of this study was to collect the epidemiological data in the idiopathic CTEV in children and their parents and compare with the epidemiological data of normal children born to our hospital and their parents and then to correlate and establish epidemiological and genetic risk factors associated with idiopathic CTEV. The study was done during September 2010 to August 2012. The study recruited 150 case parent triads from patients and their parents presenting to OPD and 150 normal children and their parents as control. We collected all epidemiological data related to case parent triad and control parent triad in the form of case profile. We have given an epidemiological picture of a large series of children with CTEV in India and normal children and their parents. In current study genetics as well as uterine restriction appears to play a role in causation of disease. It doesn't support role of pollutant and infective aetiology in causation of disease. As the folic acid supplementation during index pregnancy is very small as compared to normal children and as folic acid has role in causation of disease as evident by protective role of MTHFR 677T polymorphism in our other study there is need of fortification of food with folic acid and national level programmes for increasing awareness of folic acid use during index pregnancy.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers II**

**Time: 10:30 - 12:00**

**Room: ARPOADOR**

**Abstract no.: 37747**

**MODIFIED DISTAL FIRST METATARSAL OSTEOTOMY TECHNIQUE  
FOR HALLUX FLEXUS TREATMENT. PRELIMINARY REPORT**

Veronica ABDALA, Eduardo TAMBLAY, Catalina PAROT, Cristian  
CONTRERAS

Hospital Dr. Luis Calvo Mackenna, Santiago (CHILE)

Introduction: Hallux flexus is not uncommon as clubfoot surgery sequelae. It is also seen in patients with cerebral palsy and after vertical talus surgery. The consequence is a dorsal bunion, which may be painful and shoes may cause scars on it. Several techniques have been described to give a solution to this problem, combining first metatarsal osteotomies, soft tissue procedures and tendon transfers, being the technique described by Lapidus one of the most used. Methods: A simple technique is described. Modifying SERI (simple, effective, rapid, inexpensive) first metatarsal osteotomy described for hallux valgus treatment, the bone deformity and muscle imbalance can be corrected. This technique has been performed in 9 patients (10 feet), all males, between five to fifteen years-old. Only one had vertical talus, the others were sequelae of clubfoot surgery. The follow up has been from 1 year to 2 years and 8 months. Results: The bunion disappeared in all patients and the consequent pain and scars, the retraction of flexor hallucis brevis was corrected spontaneously after the osteotomy and the first metatarsal head restored its plantar support improving gait and stability. Conclusion: Although we still have very few patients and with short follow up, this simple technique promises to be an effective solution for hallux flexus. We believe it may be also used in patients with cerebral palsy with good results, but we have not tried it yet.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers II**

**Time: 10:30 - 12:00**

**Room: ARPOADOR**

**Abstract no.: 37773**

**EFFICACY OF PERCUTANEOUS ACHILLES TENOTOMY VS. COMBINED POSTERIOR CAPSULOTOMY AND OPEN ACHILLES TENOTOMY IN THE CORRECTION OF EQUINUS DEFORMITY IN CONGENITAL TALIPES EQUINOVARUS**

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The efficacy of percutaneous Achilles tenotomy alone (AT) was compared to combined posterior capsulotomy of the ankle joint together with open Achilles tenotomy (PC+AT) in 167 children with 260 clubfeet as a method to correct equinus after Ponseti serial casts. 189 idiopathic, and 71 non-idiopathic clubfeet were reviewed (20 with spina bifida, 12 with Arthrogryposis) with a minimum follow-up of two years (Mean  $4.8 \pm 2.4$  years). 73 idiopathic and 12 non-idiopathic clubfeet underwent AT, while 116 idiopathic and 59 non-idiopathic clubfeet underwent PC+AT. Mean age at surgery was  $4.5 \pm 4.5$  months. Mean dorsiflexion improved from  $-32.5^\circ$  to  $24.3^\circ$  postoperatively and to  $11.7^\circ$  at the latest follow up in idiopathic and non-idiopathic clubfeet ( $p < 0.001$ ). Immediate postoperative improvement was significantly higher in the non-idiopathic group than the idiopathic ( $p < 0.005$ ), but this was not sustained until latest follow up ( $p = 0.405$ ). Recurrence rate was significantly higher in non-idiopathic clubfeet (62%) than idiopathic clubfeet (37%),  $p < 0.005$ , regardless of type of surgery. There was no difference in the mean dorsiflexion range ( $p = 0.333$ ) at final follow-up or recurrence rate ( $p = 0.545$ ) between PC+AT and AT groups in idiopathic and non-idiopathic clubfeet. It might therefore be advisable to perform percutaneous Achilles tenotomy alone without the need for posterior capsulotomy of the ankle joint for equinus in idiopathic as well as non-idiopathic clubfeet. It is also worth mentioning, that in this follow up period of  $4.8 \pm 2.4$  years, more extensive surgery with capsulotomy did not lead to excessive scarring or reduced ankle dorsiflexion compared to percutaneous Achilles tenotomy alone.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers II**

**Time: 10:30 - 12:00**

**Room: ARPOADOR**

**Abstract no.: 37509**

**A NOVEL COMPUTER-ASSISTED NAVIGATIONAL TEMPLATE  
COMBINED WITH ILIZAROV FIXATOR FOR ELDER RIGID CCF**

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Treatment for elder rigid congenital clubfoot (CCF) is challenging. The aim of this study was to attempt to increase the accuracy as well as to avoid damaging the physis by use of three-dimensional computer-aided design. Between July 2011 and August 2013, we described a novel method for installing the fixative rods into the tibia, fibula, calcaneus and metatarsal bone accurately on the Ilizarov principle of tension-stress combined with the limited release of soft tissue operations. 8 patients with rigid CCF underwent computed tomography (CT) preoperatively. The mean age was 9.8 years, ranging from 7 to 12 years. Three-dimensional models of distal leg was reconstructed by use of MIMICS software. The 3D models were then processed by imageware software. A template that best fitted the precise position for rods installment was "reversely" built from the 3D model. The template was manufactured by a rapid prototyping machine. The deformity were gradually corrected according to the Ponseti technique. The mean duration of traction were 52 days, then removed the external fixator and maintained with plaster for 4 weeks. After 10 to 21 months' follow-up, none of the serious complications such as neurovascular or physis injuries occurred. The patient-specific template technique with Ilizarov technique for correcting elder CCF is a safe, easy to use, can simplify the surgical process, and correct deformities highly accurately.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers II**

**Time: 10:30 - 12:00**

**Room: ARPOADOR**

**Abstract no.: 38003**

**MID-TERM FOLLOW-UP OF THE ACHILLES TENDON REPAIR AFTER PERCUTANEOUS SECTIONING IN CLUBFOOT**

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**Introduction:** The Ponseti method has become the gold standard treatment for clubfoot, the and an essential element is the correction of the equinus deformity through the complete sectioning of the Achilles tendon. Despite good clinical evidences of an adequate repair process, there are still concerns regarding the tendon healing. The purpose is to study the Achilles tendon after percutaneous sectioning in a mid-term follow up, by means of clinical evaluation and ultrasonography. **Methods:** After the approval of the ethical committee, seven patients from a previous study underwent a clinical and ultrasonographic evaluation of the Achilles tendon. All patients had a complete tendon sectioning under ultrasonographic control before 2009, with a follow-up from five to seven years post-tenotomy. Physical evaluation subjectively assessed the clinical aspect of the Achilles tendon and the level of force. The ultrasonography examination evaluated the tendon thickness, echogenicity, tendon fibrillar pattern, adhesions and peritendinous structures. Bilateral evaluation was performed and the non-affected side was used as comparative group. **Results:** All patients had a mild tendon thickening with a normal level of force. There was no triceps insufficiency. The ultrasonographic evaluation showed a slight hypoechoic tendon thickening, but with a complete restoration of the fibrillar pattern. The anterior margin has a mild irregular convex surface which may suggest some tendon adhesion to the adipose tissue. **Conclusion:** After five to seven years post-tenotomy, the calcaneous tendon showed a complete repair process suggesting a predominantly intrinsic repair Mechanism.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers II**

**Time: 10:30 - 12:00**

**Room: ARPOADOR**

**Abstract no.: 36493**

**ILIZAROV EXTERNAL FIXATION FOR MANAGEMENT OF SEVERE RELAPSED CLUBFEET IN OLDER CHILDREN**

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**Background:** Although the standard treatment of clubfoot deformity is conservative by serial casting techniques, relapses are not uncommon. Management of relapsed clubfoot deformity in older children is an orthopedic challenge. There is a growing interest in management of such complex deformities using the Ilizarov technique. **Methods:** In this study, the Ilizarov frame was used to correct severe relapsed clubfoot deformities in older children, whom underwent previous surgical interventions. 42 relapsed clubfeet were included. The Dimeglio classification was used for clinical assessment of the relapsed feet pre-operatively as well as post-operatively. **Results:** After an average follow-up period of 4.6 years, and according to the Beatson and Pearson numerical assessment, favorable results (excellent or good) were found in 37 feet, while poor results took place in only five feet. **Conclusion:** Based on the final clinical and radiographic results, the Ilizarov technique could be considered as a good management alternative for such severe deformities.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers II**

**Time: 10:30 - 12:00**

**Room: ARPOADOR**

**Abstract no.: 36623**

**ANALYSIS OF COMPLICATION AFTER SURGICAL TREATMENT OF THE CLUBFOOT**

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Introduction : The treatment of congenital clubfoot is relatively difficult and connected with possible complication. After the era of Ponseti conservative treatment the number of cases that required surgical intervention significantly decreased. Material: IN the years 1966 - 2012 754 clubfeet were operated with the use of different surgical methods, which included posterior release with TAL, postero-medial release (Mc Key method) and subtalar full release - Cincinnati incision. The mean age at the day of surgery was 17.5 months (from 7 month to 7 years). The mean FU was 21 years ( from 2 to 35 years). Results: There were 111 complications in 49 feet. Those complication was divided by intra operatively and post operatively. The intraoperative complications included injury of the anatomical structure of the foot, early infection and not adequate bone reduction during surgery. Postoperative complications included problems with wound healing, skin necrosis, K-wire migration and recurrence of deformation. with problem to wore the standard shoes. Co9nclusions : The surgical treatment of congenital clubfoot is difficult and connected with an acceptable rate of complication. The proper surgical technique and good planing before surgery is a key to obtain a good and long lasting functional and clinical results.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers II**

**Time: 10:30 - 12:00**

**Room: ARPOADOR**

**Abstract no.: 37745**

**CLUBFOOT TREATMENT: OUTCOMES OF MINIMAL CINCINNATI  
INCISION. 23 YEARS FOLLOW UP**

Veronica ABDALA, Catalina PAROT, Eduardo TAMBLAY, Rodrigo  
LEOPOLD, Cristian CONTRERAS  
Hospital Dr. Luis Calvo Mackenna, Santiago (CHILE)

Introduction: Outcomes of clubfoot surgery by minimal approach are analyzed. A simple posterior release can be performed by a mini Cincinnati incision and, if necessary, "a la carte" surgery performed in more severe cases, avoiding the complications of larger exposures. Methods: 58 patients (79 clubfeet) were treated from 1989 to 2012 and followed up from 2 to 23 years. All feet were classified using the Dimeglio's scale and had cast treatment by the Ponseti method on the first days after birth. When clinical correction of metatarsus adductus and cavus was achieved and talus was reduced, X-ray were taken to see if talo-calcaneal axes had reached the normal angles. If so, a posterior release was performed. Patients who did not achieved the radiological axes correction needed "a la carte" procedure by the same minimum surgical approach. Results: All patients achieved anatomical correction in the first surgery demonstrated by X-rays. The results were very good and good in 89% with only 3 relapses: one was diagnosed as a Charcot-Marie-Tooth neuropathy, the second had a lipoma of the filum terminale and in the third one the cause still remains unknown. We had no scar complications. No physical therapy, orthoses or special shoes were used. Conclusion: If we follow carefully the indications for this surgery we can achieve very good results with a minimum incision avoiding the severe consequences of a relapsed clubfoot.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers II**

**Time: 10:30 - 12:00**

**Room: ARPOADOR**

**Abstract no.: 38249**

**PONSETI METHOD IN THE MANAGEMENT OF NEGLECTED AND RELAPSED CLUBFEET IN CHILDREN OLDER THAN TWO YEARS**

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**Purposes:** Evaluation of the effectiveness of Ponseti method in the management of neglected and relapsed clubfeet in children older than 2 years of age. **Patients and Methods:** starting from October (2009) to October (2012), thirty children (50 feet) with 8 neglected and 42 relapsed clubfeet were treated at our university hospital. There were: 20 boys (66.7%) and 10 girls who (33.3%), with ratio (2:1). Their age ranged from 2 to 9 years old, with mean age (5 years). The idiopathic Clubfeet were 21 feet (70%) (14 males and 7 females), Six were diagnosed as neurogenic (20%), (3 male and 3 female), one male was arthrogryptic (3.3%), one male was myopathic (3.3%) and one male had a post-surgical relapse (soft tissue release). All patients were evaluated clinically using Pirani scoring system and radiologically using x ray measuring the talo-calcaneal angle. The ponseti method of manipulation and casting was used for correction of all deformities except for equines and dynamic supinations, after all components of the deformity we had to do either tenotomy or TATT to correct the equinus and or the dynamic supination. **Results:** The results were excellent in 27 children (90%) while poor in 3 cases after minimal follow up of 2 years. **Conclusion** Manipulation and casting should be used firstly for neglected and relapsed clubfeet before any surgical interference as excellent results could be achieved. The Ponseti method, followed by tibialis anterior transfer is successful method that used to correct recurrent deformity in relapsed and neglected clubfeet.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers II**

**Time: 10:30 - 12:00**

**Room: ARPOADOR**

**Abstract no.: 37527**

**TREATMENT OF RELAPSED RIGID IDIOPATHIC CLUBFOOT IN ELDER CHILDREN BY THE PONSETI METHOD COMBINED WITH ILLIZAROV TECHNIQUE**

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This study presented the clinical and radiographic outcomes of 12 feet (8 patients) with relapsed idiopathic clubfoot that were treated with a combination of Ponseti method and the Illizarov technique. 12 feet (8 patients) were treated with ponseti technique in our institute from Jun 2008 to Aug 2011. The children aged 3-12 years (average, 5.6 years) at the initial treatment time and were followed up by an average of 27.6 months (range, 11-49 months ). All children have accepted the ponseti cast under intravenous or combined with general anesthesia for 2 or more times (average, 6.5 times; range, 3-12 times). Then the Illizarov frame was applied and with gradual distraction by 1 surgeon postoperatively. Distraction proceeded at 1 mm/d, divided into four 0.25 mm increments. At last, we used customized Orthosis-shoes to maintain the corrected feet shapes. All cases achieved a plantigrade foot, better walking ability, and parental satisfaction with the results. Clinical and radiographic assessment were undertaken at the final follow-up, and the mean Laaveg-Ponseti score of the 12 feet was 80.1. Postoperative radiographic measurements revealed values that can be considered as close to normal. Ankle joint range of motion increased from a mean of 12° (range, 8-17°) preoperatively to 23° (range, 19-30°) at final follow-up. These cases suggested the Ponseti method combined with Illizarov technique are beneficial for the treatment of relapsed idiopathic clubfoot.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers II**

**Time: 10:30 - 12:00**

**Room: ARPOADOR**

**Abstract no.: 37163**

**EVALUATION OF NEGLECTED IDIOPATHIC CTEV MANAGED USING JESS**

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Background: A retrospective study evaluating the clinico-radiological results of children suffering from neglected CTEV, managed with Joshi's external stabilization system (JESS). Material and Method: A total of 31 subjects (45 feet) were reviewed between Jan 2007 to Jan 2014. A total of 21 subjects (30 feet) being idiopathic were included for the study. Correction was done using the basic principle of JESS: differential distraction histiogenesis. All were evaluated clinically, radiologically, podogramically and by Catterall Pirani scoring system, both before and after correction. Results: Severity of the deformity and clinical correction was assessed using the Pirani score. All subjects achieved good clinical results as per Pirani score, which was statistically significant. Normal range of radiological angles were obtained. The pre and the post correction difference in the foot bi-malleolar angles (FBA) on podograms were statistically significant. Radiological evaluation showed progressive improvement in talo-calcaneal Index (TC index) and the talus-1st metatarsal angle. Subjects showed significant improvement in terms of functional status and satisfaction levels. Complications such as pin tract infection, edema, clawing of toes, distraction jamming, pin loosening were observed. Conclusion: Over all in most of the Idiopathic Neglected CTEV feet, JESS proves to be a worthwhile deformity corrective procedure.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers II**

**Time: 10:30 - 12:00**

**Room: ARPOADOR**

**Abstract no.: 37646**

**COMPARISON OF THE SHORT-TERM AND LONG-TERM RESULTS OF THE PONSETI METHOD IN THE TREATMENT OF IDIOPATHIC PES EQUINOVARUS**

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Purpose Congenital club foot is one of the most common birth defects involving the musculoskeletal system. At present two methods are used for the treatment of this deformity: French and Ponseti method. The purpose of this study was to compare the short-term (up to three years) and long-term (three to seven years) results of treatment with the Ponseti method. Methods A total of 195 consecutive infants (143 boys and 52 girls) with idiopathic club foot treated with the Ponseti method in the period of 2005–2012 were included in this study; the total number of feet was 303. The severity of the foot deformity was classified according to Diméglio. When relapse occurred up until three years of age, we started with the casting again. If conservative treatment was unsuccessful we proceeded to surgical treatment. Results Primary correction was attained in all cases. Surgical correction of relapses was performed in 30 % of patients according to the Ponseti method (re-tenotomy of the Achilles tendon and transposition of the tibialis anterior) and in 70 % by alternative techniques. The number of relapses indicated for surgery increased with increasing period of follow-up: whereas in patients where the treatment started already in 2005 relapses occurred in 72 %, in patients included in 2011 the number of recurrences only reached 3 %. Conclusions It follows from our results that it is impossible to cure all club feet with casting, tenotomy of the Achilles tendon and transposition of the tibialis anterior only.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers III**

**Time: 14:00 - 15:30**

**Room: ARPOADOR**

**Abstract no.: 38315**

**MANAGEMENT OF CLUBFOOT IN CHILDREN AGEING 1-3 YEARS  
OLD USING PONSETI METHOD**

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Background: The Ponseti technique is rapidly becoming the most widely practiced method for treatment of congenital clubfeet in infants. It is an easy technique to learn and, when applied accurately, yields excellent results. Materials and methods: The current study included 25 children (38 feet) with average age 16.3 months and average of duration of follow up 13.5 months that was treated by using the techniques and principles described by ponseti and evaluated by pirani scoring system. Results: In the current study 92% of patients achieved full correction but 2 patients (8%) require extensive surgery (posterior and medial release). Conclusion: The use of ponseti method in management of club foot in older children (1-3) years gives good results.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers III**

**Time: 14:00 - 15:30**

**Room: ARPOADOR**

**Abstract no.: 37853**

**OUTCOME EVALUATION IN PONSETI CLUBFOOT TREATMENT BY DIFFERENT MATERIALS**

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**Purpose:** The purpose is to evaluate the short-term outcome using soft cast (SC) and Plaster of Paris (POP) in Ponseti clubfoot treatment. **Methods:** Of 40 consecutive patients (68 feet) treated using the Ponseti method in four-year period, we randomized into two groups, POP and SC, based on medical record number. Minimum follow up was 2 years. All had Dimeglio severity score at pretreatment and final evaluations. Percutaneous Achilles tenotomy was performed in those with sagittal plane score of more than 2 points. Questionnaires were collected at each clinic visit to monitor the complications and parent satisfaction. Standing radiographs of the foot were taken at age two. We used independent t-test for statistical analysis with  $p < 0.05$  as significant. **Results:** 18 patients (27 feet) completed POP, and 22 patients (41 feet) received SC. The mean baseline and final severity scores of the 2 groups were not significantly different. The incidence of Achilles tenotomy was significantly lower in the SC group than the POP group (57% vs 80%). Questionnaire revealed higher scores for cast tolerance, durability, and parent satisfaction in the SC group. Radiographic measurements showed no significant difference in foot correction. **Conclusion:** This study supports the use serial casting with SC for clubfoot. There was higher parent satisfaction and less percutaneous Achilles tenotomy in the SC group. With less padding and skin tight soft casting, provides better feeling of the foot in cast. Hence, a better correction may ensue. There was no significant difference in outcomes and recurrence in both groups.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers III**

**Time: 14:00 - 15:30**

**Room: ARPOADOR**

**Abstract no.: 37140**

**CLUBFOOT LITERATURE: A TREND TOWARDS PONSETI METHOD TREATMENT? - LAST 16 YEARS**

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Ponseti method is an effective treatment for congenital clubfoot and radically decreases the need for extensive corrective surgery. Medical literature also follows health professional preferences. Introduction Ponseti method is a safe and effective treatment for congenital idiopathic clubfoot and radically decreases the need for extensive corrective surgery. Posteromedial releases are less performed in the latest years, and this study investigates if medical literature also follows health professional preferences. From 1997 to 2013, all papers indexed by Pubmed under the keyword "clubfoot" were selected and sorted by year and subtitle: Ponseti, surgical, imaging, genetics, conservative treatment, recurrences, prenatal diagnosis, external fixation, pathology, epidemiology and syndromes. The abstract and article were read to make sure they belonged to each category. 319 papers were selected and sorted out. The average number of publications under "clubfoot" a year was in average 29 (15 to 44). The number of Ponseti treatment publications in the previous 9 years summed up (24) was lower than the number of publications about Ponseti in the last 2 years of the study. (26). The number of publications about surgical clubfoot treatment including posteromedial releases has not similar increase. The curve of number of publications per year on Ponseti treatment shows a trend for increase, while surgical treatment curve does not show this behaviour. Data on number of publications show increased academic interest for Ponseti clubfoot treatment reflecting what happens in clinical practice around the world.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers III**

**Time: 14:00 - 15:30**

**Room: ARPOADOR**

**Abstract no.: 37148**

**PONSETI METHOD IN COMPLEX FEET**

Monica NOGUEIRA, Paulo KANAJI, Alessandro FELIX, William FERREIRA, Roger FROSSARD  
HSPE, São Paulo (BRAZIL)

Complex clubfeet are a challenge for Ponseti Method Treatment. They were described in the literature, and consist of short fatty feet, with a deep plantar crease, short and hyperextended first ray, cutaneous alterations as edema and eritema, like a sympatethic dystrophy. Etiology is not clear, but many cases occur after manipulation and applications of casts in an inadequate manner, with pronation. Frequently the feet slips of the cast and cutaneous alterations get worse. The Ponseti Method approach in complex feet include different hand positioning for resistant cavus correction, less abduction and very criterious moulding. Methods: This is a retrospective study of 245 patients with clubfeet treated from 201 to 2011, and identification of 27 patients with complex feet. 63% of patients had already had previous treatment. The average number of casts is 5, varying from 1 to 12. No patient with complex feet had undergone posteromedial release. Conclusion: Complex feet are a challenge for Ponseti Method Treatment and modifications of Method lead to good results and can avoid extensive surgery in those difficult feet.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers III**

**Time: 14:00 - 15:30**

**Room: ARPOADOR**

**Abstract no.: 37657**

**MINI-OPEN CLUBFOOT SURGERY IN COMPLIANCE WITH PONSETI PRINCIPLES**

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This study analyzes surgical indications for resistant clubfeet, surgical techniques and results. 20 patients (32 resistant clubfeet) were included in the study. Ponseti method was a start-up therapy in most of cases. The indications for surgery were persistent internal foot rotation, lack of dorsiflexion. All feet were evaluated by ultrasound, X-ray and MRI before surgery. The basic pathologic findings included low values of tibionavicular distance, abnormality of talar body-neck angle and incorrect values of lateral tibio-calcaneal angle on radiographs in maximum dorsiflexion. Clubfoot surgery via mini-medial and/or mini-Cincinnati approaches was performed. The following basic Ponseti principles were taken into consideration: no tendon lengthening excluding Achilles tendon, no attempts to make simultaneous intraoperative correction in the full anatomic position and no pin fixation. Navicular was gently mobilized for further lateral translation, posterior ankle joint capsulotomy was performed and calcaneofibular ligament was dissected. Postoperative cast was changed every week with gradual foot correction into external rotation and dorsiflexion. Then abduction braces were used. Results: the average patient's age at the time of follow-up was 6 years. 30 feet had Pirani 0 points and only 2 feet had Pirani 0,5. The dorsiflexion value increased significantly in all feet, lateral tibio-calcaneal angle changed on average by 14°. Ankle joint mobility measured by radiographs was on average 22°. Tibionavicular distance increased in all feet at least by 4 mm, amounted to 16 mm on average. Conclusion: mini-open clubfoot surgery significantly improves the results for resistant clubfeet and do not lead to reduction of foot mobility.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers III**

**Time: 14:00 - 15:30**

**Room: ARPOADOR**

**Abstract no.: 38363**

**COMPARISON OF KITE AND PONSETI METHODS**

Ken N KUO<sup>1</sup>, Jimmy HO<sup>2</sup>, Ting-Ming WANG<sup>3</sup>, Kuan-Wen WU<sup>3</sup>, Shier-Chieh HUANG<sup>3</sup>

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**Introduction:** The casting of the clubfoot had been evolved from Kite method to Ponseti method. The purpose of this study is to compare the outcomes between two methods in one institution simultaneously. **Materials and Methods:** From 2003 to 2008, two pediatric orthopaedic services in one institution treated 55 patients with 88 idiopathic clubfeet. One service continued using Kite's casting method consisted of 58 feet, and other service employed Ponseti casting method consisted of 30 feet. The Kite group had AFO orthosis following the casting. Ponseti group were followed by Dennis-Browne brace. There was a minimum of 5 year follow-up. **Results:** In Kite's casting group, 24 feet were able to obtain good correction while 34 feet required subsequent postero-medial release at an average age of 10 months. Among them, 11 feet had subsequent split anterior tibialis tendon transfer (SPLATT) at a mean age of 5 years. In Ponseti serial casting group, all had percutaneous Achilles tenotomy at an average age of 13 weeks. In subsequent follow up, 3 feet required SPLATT for dynamic deformity at a mean age of 3 years. We categorized the results as good, fair and poor. In Kite group, it was 41%, 40%, 19% respectively, and in Ponseti group, it was 90%, 7%, 3% respectively. **Discussion:** This is the study of two methods in one institution at the same period of time by two different pediatric orthopaedic services. It is an additional evidence that Ponseti method works well in management of congenital clubfoot deformity.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers III**

**Time: 14:00 - 15:30**

**Room: ARPOADOR**

**Abstract no.: 37767**

**A REPORT ON THE TREATMENT OF CONGENITAL CLUBFEET WITH PONSETI METHOD IN ASSIUT - A TWO-YEAR FOLLOW-UP STUDY**

**Nariman ABOL OYOUN**

**Department of Orthopaedic Surgery, Assiut University Hospital, Assiut (EGYPT)**

Since 2006, 408 documented patients (640 clubfeet) were treated with Ponseti method by the same surgeon at the Department of Orthopaedic Surgery, Assiut University Hospital in Egypt. 133 patients (99 males/34 females) with 213 feet (111 right/102 left) were fully corrected, received an abduction brace, and were followed up for an average period of  $2.2 \pm 1.3$  years, and a minimum of one year. 159 clubfeet (74.6%) were idiopathic, while 18 (8.5 %) were associated with Arthrogryposis, 12 (5.6%) with MMC, 6 (2.8%) with sacral agenesis. Mean Pirani Score was  $4.8 \pm 1$ . Mean age at first visit was 4.1 months. 140 feet (65.7%) had no previous treatment. 57 feet (26.8%) had previous casts, while 10 feet (4.7%) were recurrent deformities after surgery. Tenotomy was performed in the clinic in 148 feet (69.5%). A posterior release was needed in 4 feet (1.9%). Average number of visits before bracing was 4. 88 feet (41%) required remanipulation, 23 (10.3%) underwent Tibialis Anterior Tendon Transfer, and two needed double midfoot osteotomy. Outcome was satisfactory in 187 feet (87.8%). A lateral foot radiograph was done in maximum dorsiflexion in 96 feet (45.1%) to document hindfoot dorsiflexion. Tibio-calcaneal angle was significantly less in feet that underwent Achilles tenotomy ( $65^\circ$ ) than in those that didn't ( $77^\circ$ ),  $p < 0.005$ . Based on recorded radiographic measurements in 96 clinically corrected clubfeet, we now consider and recommend that Achilles tenotomy be considered in almost all clubfeet. We managed to approach a 100% rate of tenotomy in the latest 50 clubfeet in this series.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers III**

**Time: 14:00 - 15:30**

**Room: ARPOADOR**

**Abstract no.: 38285**

**PONSETI INTERNATIONAL ASSOCIATION IN CHILE: WHAT ARE WE IN AND WHERE ARE WE GOING**

Macarena MOROVIC<sup>1</sup>, Directorio PIA CHILE<sup>2</sup>, Ximena AGURTO<sup>2</sup>,  
Daniel FODOR<sup>3</sup>, Sebastián OYARZÚN<sup>4</sup>

<sup>1</sup>PIA Chile, Valdivia (CHILE), <sup>2</sup>PIA Chile, Talca (CHILE), <sup>3</sup>Hospital Villarrica, Villarrica (CHILE), <sup>4</sup>Hospital Valdivia, Valdivia (CHILE)

Chilean territory has a population about seventeen million people. Each year are born more than 240.000 children and clubfoot represents between 0,6% and 1,29% of this number. Population is distributed in fifteen regions which confers a great geographic dispersion caused by the particular shape of Chile. Nowadays almost 100% births has professional attention, giving more effective preconception and perinatal screening, and allowing a sooner evaluation by orthopaedist surgeon. Despite these facts, Ponseti technique for the treatment of clubfoot is not being performed in all the territory because of the lack of knowledge and the lack of permanent practice of it. These particular situations are seen in all the country, but are more notorius in smaller regions with sporadic cases of clubfoot. Our objectives are to show the statistics of clubfoot in Chile and their regions, to inform the rutinary performing of Ponseti technique in clubfoot treatment, to propose the ways for establishing Ponseti technique as the gold standard for treatment Clubfoot in Chile, and generate diffusion of Ponseti International Association principles in Chile.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers III**

**Time: 14:00 - 15:30**

**Room: ARPOADOR**

**Abstract no.: 37139**

**WHAT HAVE WE LEARNED AFTER PONSETI BRAZIL PROGRAM?**

Monica NOGUEIRA

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After knowing about the good reproducibility and good results of Ponseti method for clubfeet treatment, (casts for 4-7 weeks, followed by a percutaneous tenotomy and use of an abduction brace) a group of brazilian orthopaedic surgeons idealized and participated in a standardized national program to teach Ponseti technique in 21 different cities in Brazil. From January 2007 to December 2008, a total of 21 Ponseti symposiae were organized, in a standardized fashion. The symposium consisted of a two day program, with lectures, application of casts practice, and discussion of clinical cases brought by local orthopaedic surgeons. Those trained doctors answered a questionnaire before and after the symposium. 556 orthopaedic surgeons were trained - about 7% of the 8000 orthopaedic surgeons from Brazil. Orthopaedic surgeons stated that they had treated about 4905 babies altogether the year before with other methods, including an extensive surgery. 17% did not know the technique by the time of the symposium. 88% reported they were able to treat children with Ponseti technique after the symposium. 94% of those reported the symposium changed their way of treating clubfeet. However, from all the participants, only 7% of those actually practice the method in reference centers. This program represented a good educational tool towards the first step to eradication of the clubfeet deformity in our country; in terms of medical education in Ponseti Method, we conclude that courses are not the adequate tool for training in Ponseti Method and a new educational model is needed, like mentorship

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers III**

**Time: 14:00 - 15:30**

**Room: ARPOADOR**

**Abstract no.: 38505**

**PRELIMINARY EVALUATION AFTER RIGOROUS  
IMPLEMENTATION OF PONSETI METHOD FOR CORRECTION OF  
CLUBFOOT. EXPERIENCE AT THE CLINICAL HOSPITAL OF THE  
MEDICAL SCHOOL AT THE UNIVERSITY OF SÃO PAULO**

Patricia MORENO GRANGEIRO, Bruno Sérgio FERREIRA MASSA,  
Túlio DINIZ FERNANDES, Roberto GUARNIERO

Institute of Orthopedics and Traumatology - Clinical Hospital of the  
Medical School at the University of São Paulo, São Paulo (BRAZIL)

Clubfoot care has had a shift from surgical to nonoperative treatment in a more widely manner since Ponseti technique has been proven to bring effective results in obtaining flexible, free of pain and functional feet, with a less costly intervention. In order to guarantee good results, the technique has to be done carefully and a lot of attention to details is needed in the setting of a clinic aiming to deliver excellence of care. Besides medical knowledge and proper technique, the treatment final success is based on effective parent education and adherence to brace use. We present the results of clubfoot treatment after implementation of rigorous measures on the Ponseti method in the process of reorganizing the clubfoot clinic at the Clinical Hospital of the University of São Paulo. During the period of August 2012 to February 2014, 58 patients (92 feet) were treated. The mean age of initiation of treatment range from 2 weeks to 5 years. The average number of casts before tenotomy was 5.4 and 88% of the feet needed percutaneous calcaneus tenotomy. Good brace adherence was observed in 56 patients and 2 had poor adherence. There were 3 relapses that were treated with repeated casting and tenotomy. There were four drop-outs in the reported period. Clinical evaluation, details about the implementation of the clinic and the assurance of brace use were recorded. The Ponseti method provides an excellent outcome at follow up in the treatment of congenital idiopathic clubfoot when performed in a strict manner.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers III**

**Time: 14:00 - 15:30**

**Room: ARPOADOR**

**Abstract no.: 38975**

**COMPARATIVE STUDY BETWEEN TWO TYPES OF ABDUCTION ORTHOSIS IN THE TREATMENT OF CONGENITAL IDIOPATHIC CLUBFOOT**

**Luiz Carlos RIBEIRO LARA**

**., . (BRAZIL)**

Congenital idiopathic clubfoot (CIC) is the main malformation of the musculoskeletal system. It must be treated at the earliest possible, right after birth. Currently, there is a consensus about the use of the Ponseti method because of its less invasive treatment. Goal: To analyze and compare the effectiveness between two types of abduction orthosis for the foot, Denis-Browne type (traditional) and Dobbs proposal (dynamic), regarding the deformities correction maintenance and recurrences prevention. Method: Retrospective study with a survey of medical records concerning children carrying CIC. 28 patients were evaluated in a total of 43 feet, divided into two groups. Group 1 – 16 patients treated with traditional equipment in a total of 24 CIC's with average use time of 3,52 years and a minimum of two years. Group 2 – 12 patients treated with dynamic equipment in a total of 19 CIC's with average use time of 2,62 years and a minimum of two years. The statistical analysis compared the categorical variables between the groups using the ANOVA test. A significance level of 5 % (  $p - \text{value} \leq 0,05$  ) was adopted. Results: In group 1 (traditional orthosis), the recurrence was found in 02 feet (8,33%), and in group 02 (dynamic orthosis), 01 foot (5,26%). Comparing the effectiveness between the orthoses, there was no significance. The groups were homogeneous to these variables: Dimeglio classification, gender, side, laterality and recurrence; resulting in no statistical difference between the groups. Discussion: Ponseti emphasizes in his studies the abduction orthosis use period is a very important stage for the correction maintenance of CIC. He also noticed that 78% of the patients, who did not adhere to the use of orthosis, presented deformities recurrence, against 7% of those who used it properly. It's a common complaint, from the children's relatives,

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers IV**

**Time: 16:00 - 17:30**

**Room: ARPOADOR**

**Abstract no.: 37506**

**CORRECTED APPEARANCE DOES NOT INDICATE THE EXCELLENCE IN OUTCOME MEASURE OF CLUBFOOT MANAGEMENT: WHAT SHOULD BE CONCERNED?**

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This study was designed to evaluate functional outcome of idiopathic clubfoot management using Ponseti method respectively as primary treatment in neonate (Group I), in cases of relapse from previous treatment using Ponseti method (Group II) and relapse from extensive surgery (Group III). Three rating systems for outcome measure, i.e. Laaveg and Ponseti, ICFSG and the authors' systems, were employed when the patient was older than 7 years meanwhile it was at least one year after termination of bracing. Four patients with 7 feet were included in Group I, 5 patients with 9 feet in Group II, and 9 patients with 12 feet in Group III. More casts were used in Group III than in Groups I and II. Groups I and II had the excellent results in all their feet except for 2 feet from one patient while 3 feet were rated as excellent, 8 as good and 1 as fair in Group III with Laaveg and Ponseti system. In Group III, eight feet were rated as good and 4 as fair with ICFSG system. All the 12 feet were rated as good with the authors' system. No matter which system was employed, Group III had the worse outcome than Groups I and II. These three systems had the poor consistency in outcome measure for Group III. Ponseti method was good in treating clubfoot relapsed from extensive surgery. However, corrected appearance does not indicate good recovery of function. It is proposed that ICFSG system provide more objective and comprehensive evaluation.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers IV**

**Time: 16:00 - 17:30**

**Room: ARPOADOR**

**Abstract no.: 37971**

**FEASIBILITY AND BARRIERS OF TREATING CLUBFEET IN FOUR COUNTRIES**

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<sup>2</sup>SteppingStonesBali, Singaraja (INDONESIA)

The Ponseti treatment provides in over 95% of the cases a foot which is completely functional and pain free when started before the walking age. The purpose of the present study is to elucidate why neglected clubfeet still exists despite the availability of a highly (cost)-effective treatment. A qualitative study with 51 semi-structured interviews was conducted in four countries: the Netherlands, South Africa, Argentina and Indonesia with both parents of children with clubfoot and practitioners treating clubfoot. The topics discussed with the parents were the conceptions of the cause of clubfeet, received information, accessibility, financial aspects, and social stigma. With the practitioners the focus of the interviews was the treatment protocol and finance. The earlier parents were informed about the clubfoot and the treatment, the earlier treatment was started. In countries where parents believed in a medical cause for the clubfoot, treatment was started earlier than when the parents believed the cause was not medical, but parents gave for example a religious reason. At all places treatment was paid by the government, insurance or charity. Nevertheless the cost of transport and missed working days formed a barrier, over 25% of the monthly income was not uncommon. The lower the income, the more prevalent neglected clubfeet were. We found a difference in social economic status between, but also within countries. These are problems we need to address when making effective treatment for clubfoot widely available for every child to diminish the burden of neglected clubfoot.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers IV**

**Time: 16:00 - 17:30**

**Room: ARPOADOR**

**Abstract no.: 38211**

**PIA LAT, NETWORKING LEARNING BY EXPERIENCE SHARING**

Macarena MOROVIC<sup>1</sup>, Directorio PIA LAT<sup>2</sup>, Dalia SEPULVEDA<sup>2</sup>,  
Monica NOGUEIRA<sup>3</sup>, Daniel FODOR<sup>4</sup>, Sebastian OYARZUN<sup>1</sup>

<sup>1</sup>Hospital Base de Valdivia, Valdivia (CHILE), <sup>2</sup>PIA LAT, Santiago (CHILE), <sup>3</sup>PIA LAT, Sao Paulo (BRAZIL), <sup>4</sup>Hospital de Villarrica, Villarrica (CHILE)

Introduction: Web-based seminars were developed by PIA Latinamerica during 2013. Material: We analyzed their length in time, the participants, the countries and the topics of each session. Results: We did a total of four sessions, with an average of 25 participants, from an average of 4 countries. Conclusions: In a geographically dispersed community as Latin America, we think web-base education and the use of different information technologies are a valuable instrument to keep our community together and working the Ponseti method as it should be.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers IV**

**Time: 16:00 - 17:30**

**Room: ARPOADOR**

**Abstract no.: 37109**

**THE PREVALENCE OF DEVELOPMENTAL DYSPLASIA OF THE HIP IN IDIOPATHIC CLUBFOOT: A SYSTEMATIC REVIEW AND META-ANALYSIS**

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<sup>1</sup>Hamad Medical Corporation, Doha (QATAR), <sup>2</sup>University of London, London (UNITED KINGDOM)

**Purpose** There is conflicting evidence in the literature whether there is an association between Developmental Dysplasia of the Hip (DDH) and idiopathic clubfoot. The aim of our study was to systematically review the literature and determine the prevalence of DDH in idiopathic clubfoot. **Methods** We searched several databases from 1946 to 2014 for any cross-sectional or observational studies that determined the prevalence of DDH in idiopathic clubfoot. We performed a meta-analysis using random effects model to pool the prevalence of DDH in idiopathic clubfoot. We also investigated the radiological modality utilized to diagnose and treat DDH in idiopathic clubfoot. **Results** Eleven studies were eligible for the meta-analysis, with a total of 2234 children with idiopathic clubfoot including 66 with DDH. The pooled prevalence estimate of DDH in idiopathic clubfoot was 3.9% (95% CI, 1.8% to 8.2%). There was substantial amount of between study heterogeneity ( $I^2=88\%$ ,  $p<0.001$ ) which showed that most of the heterogeneity was due to variability between the studies rather than chance variability. Sensitivity analysis showed that the pooled prevalence estimate was 3.5% (95%CI: 1.1% to 10.8%) and 3.8% (95%CI: 1.0% to 13.7%) in studies with ultrasound as the imaging modality of diagnosis and treatment with a harness respectively. **Conclusion** The cumulative evidence at present does not indicate an association between DDH and idiopathic clubfoot. The overall pooled prevalence of DDH in idiopathic clubfoot is similar to the general population. Therefore, we do not recommend routine screening for DDH in idiopathic clubfoot.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers IV**

**Time: 16:00 - 17:30**

**Room: ARPOADOR**

**Abstract no.: 38952**

**DOES SEX MATTER IN TERMS OF RESPONSE TO CLUBFOOT  
TREATMENT**

**Matthew B DOBBS**

**., . (UNITED STATES)**

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers IV**

**Time: 16:00 - 17:30**

**Room: ARPOADOR**

**Abstract no.: 38954**

**TREATMENT OF SYNDROMIC CLUBFOOT**

**Matthew B DOBBS**

**., . (UNITED STATES)**

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers IV**

**Time: 16:00 - 17:30**

**Room: ARPOADOR**

**Abstract no.: 37392**

**EVALUATION OF EPIDEMIOLOGICAL AND GENETIC RISK FACTORS ASSOCIATED WITH IDIOPATHIC CONGENITAL TALIPES EQUINOVARUS IN AN INDIAN POPULATION**

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R.N.Cooper municipal general hospital, Mumbai (INDIA)

Birth prevalence of CTEV varies by Race/ ethnicity ,gender ,rank of pregnancy, birth weight, type of delivery, gestational age, maternal and paternal age , seasonal variation . Objectives of this study was to collect the epidemiological data in the idiopathic CTEV in children and their parents, to correlate epidemiological findings with idiopathic CTEV ,to study MTHFR C677C>T gene polymorphism in idiopathic CTEV cases and their parents and to establish epidemiological and genetic risk factors associated with idiopathic CTEV. The study included 150 patients and was designed as an epidemiological descriptive case series and case- parent triad linkage genetic study on South Indian population. In current study genetics as well as uterine restriction appears to play a role in causation of disease. This study also shows the importance of epidemiological factors for severity of disease. As the folic acid supplementation during index pregnancy is very small and as folic acid has role in causation of disease as evident by protective role of MTHFR 677T polymorphism in our study there is need of fortification of food with folic acid and national level programmes for increasing awareness of folic acid use during index pregnancy. To conclude our study is first study to show MTHFR gene polymorphism and its protective role in ICTEV in an Indian population and further Studies series from different geographical and ethnic groups are essential for elucidating both the genetic and epidemiological factors involved in the aetiology of this common development disorder.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers IV**

**Time: 16:00 - 17:30**

**Room: ARPOADOR**

**Abstract no.: 37894**

**PEDOBAROGRAPHIC ANALYSIS OF YOUNG ADULTS WITH IDIOPATHIC CLUBFOOT TREATED USING COMPREHENSIVE CLUBFOOT RELEASE OR PONSETI METHOD: A LONG TERM FOLLOW-UP**

Ken KUO<sup>1</sup>, Adam GRAF<sup>2</sup>, Peter SMITH<sup>2</sup>, Sahar HASSANI<sup>2</sup>, Ann FLANAGAN<sup>2</sup>, Joseph KRZAK<sup>3</sup>, Gerald HARRIS<sup>2</sup>

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Introduction: Comprehensive surgical release and the Ponseti method have both been used to improve function in individuals with clubfoot. Pedobarography is a commonly used tool to noninvasively and quickly assess foot function in this population. This study aims to compare long-term results of surgical release and the Ponseti method using pedobarograph analysis. Methods: Pedobarographic data was collected from three groups during comfortable walking. There were 24 treated with comprehensive surgical release (Surgical-Group), 18 with Ponseti method (Ponseti-Group), and 48 controls (Control-Group). Assessment parameters include peak pressure, subarch angle and duration of foot segment loading (hindfoot, midfoot, forefoot). Results: Subarch angle was greatest in the Surgical-Group signifying an abducted forefoot or increased midfoot contact area associated with pes valgus. Peak pressures revealed high values in the medial midfoot for the Surgical-Group but low peaks in the medial forefoot compared to the Ponseti and Control groups. The duration of loading the forefoot was reduced in the Surgical-Group and increased in the midfoot and hindfoot compared to the Ponseti-Group. Discussion: Both treatment groups had several differences in dynamic pedobarographic measures compared to the Control-Group. The greatest differences were in the midfoot. The Surgical-Group had higher midfoot pressures and loading duration compared to the Ponseti-Group. The presence of increased medial midfoot loading could indicate more frequent overcorrection and/or diminished medial longitudinal arch. The Ponseti-Group more closely resembles the normal foot morphology and forces. Future studies can explore the correlation of foot morphology with quality of life outcome measures.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers IV**

**Time: 16:00 - 17:30**

**Room: ARPOADOR**

**Abstract no.: 37119**

**SPLIT TIBIALIS ANTERIOR TRANSFER CORRECTS RESIDUAL DYNAMIC METATARSUS ADDUCTUS FOLLOWING PONSETI MANAGEMENT OF IDIOPATHIC CLUBFOOT**

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Background: Following management of clubfoot, dynamic metatarsus adductus may develop due to supination action of tibialis anterior. Patients and methods: This prospective study was performed in the orthopaedic department of our university hospital between January 2010 and December 2012. 15 children (21 feet) who had received Ponseti management for congenital talipes equinovarus were treated by split tibialis anterior transfer for the management of dynamic metatarsus adductus. There were 10 males. The mean age at surgery was 28.9 months. The mean preoperative Dimeglio score was 7.8. The mean follow up was 23.1 months. Our hypothesis was that Split tibialis anterior transfer effectively corrects dynamic metatarsus adductus following Ponseti management for congenital talipes equinovarus. The lateral half of the tendon was transferred under the extensor retinaculum to the cuboid. Results: All transferred tendons healed successfully to their new sites of attachment. The mean Dimeglio score improved to 1.9. The clinical appearance of all feet was improved according to the criteria of Garceau. There was no loss of correction. None of the operated feet had any relapse. There were no major complications observed during the period of follow up. Conclusion: Split tibialis anterior transfer effectively corrects dynamic metatarsus adductus following Ponseti management for congenital talipes equinovarus.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers IV**

**Time: 16:00 - 17:30**

**Room: ARPOADOR**

**Abstract no.: 36684**

**SURGICAL TREATMENT OF CONGENITAL RECURRENT CLUBFOOT FOR CHILDREN OF 2-3 YEARS OLD**

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Minsk (BELARUS)

Nowadays principles of early conservative treatment of patients with congenital clubfoot are acceted by orthopedists around the world. However, treatment of relapses, severe and atypical forms of this disease is still less efficient and more traumatic. In our approach to treatment we used the ""a la carte"" principle, proposed by Professor Henri Bensahel. To correct a significant adduction of a forefoot, we use a small incision in distal part of a shin to perform the intramuscular lengthening of tibialis posterior, flexor digitorum longus and flexor halucis longus. Dissection of plantar aponeurosis also should be performed. After a subluxation in talo-navicular joint is fixed, we insert a K-wire via scaphoid bone to the head of the talus bone. To correct a rigid equinus deformity of a foot, we combine achillotomy in conjunction with closed bringing down of calcaneus by simultaneous traction of the bone through the K-wire that fixed in clevis. Treatment can be supplemented with the transposition of tibialis anterior. Foot is fixed in dorsiflexion position and forefoot abduction. In 4 weeks the bandage and k-wire get removed. Several casts should be used with 7 days interval in certain cases. We treated 28 patients (41 feet) with recurrent clubfoot. Age of patients: 2-3 years. The observation period: 4 years. 25 patients (37 feet) showed good result and 3 patients (4 feet) showed satisfactory result. Less traumatic technique allows to avoid damage to vessels that participate in blood supply to foot bones. It also reduces the risk of severe complications.

**Date: 2014-11-21**

**Session: International Clubfoot Congress - Free Papers IV**

**Time: 16:00 - 17:30**

**Room: ARPOADOR**

**Abstract no.: 36685**

**CHARACTERISTICS OF BLOOD SUPPLY OF THE ANKLE (TALUS) AREA FOR 3-4 YEARS OLD CHILDREN WITH CONGENITAL CLUBFOOT**

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Minsk (BELARUS)

Today's gold standard of conservative treatment of congenital clubfoot in infants implies low-impact methods, such as Ponseti technique and French functional method. Nevertheless surgical approaches are still extremely aggressive and traumatic to the different structures of the foot. This study evaluated dopplerographic parameters of arterial blood flow to the ankle area in ten 3-4 years old children with recurrent clubfoot after the surgery treatment. We used the method of color duplex sonography for examination of a. tibialis anterior, a. dorsalis pedis, a. tibialis posterior, a. peronea and their tarsal branches. During our study we found the reduction of peak (Vmax), medium (Vmed) and minimum (Vmin) blood flow velocity by 30-50%, compared with the normal standard, combined with increased resistive index (RI) and a decrease in the diameter of the studied clubfoot feet arteries, with certain individual characteristics for each patient. Results indicated presence of dysplastic changes in main arteries and their branches in the ankle and talus areas. It means that state of blood vessels, their anatomical integrity and a functional reserve are extremely important. In our opinion, specific characteristics of blood supply in the ankle and talus areas in children with clubfoot should be taken into consideration during the choice of both surgical approach and a method of treatment.

**Date: 2014-11-21**

**Session: Trauma: SOFCOT Symposium - Fractures Distal Femur**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 37505**

**FUNCTIONAL OUTCOME OF DISTAL FEMUR INTRAARTICULAR FRACTURES MANAGED WITH ANATOMICAL CONTOURED LOCKED PLATES**

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**Introduction:** Fractures of distal femur still remain a challenge for the orthopedic community considering the need to meticulously reconstruct the articular surface and achieving good functional outcome. We evaluated the results of osteosynthesis for complex intra-articular distal femoral fractures using locking compression plating. **Methodology:** One hundred and twenty six distal femoral fractures were reconstructed in one hundred thirteen patients from June 2007 to March, 2013. There were 91 males (103 knees), 22 females (23 knees) and the mean age was 28.1 years (range = 18-71 years). The fractures were classified according to AO/ASIF classification for fractures of distal femur. All the patients were followed for a minimum of 1 year (mean = 2.1 year; range = 1-5.7 year). **Results:** There were 73 (58%) C3, 33 (26%) C2, 20 (16%) C1 fractures. The average operative time was 98 min (range = 73-156 min). 98 fractures united radiologically with a mean union period of 16 weeks (range = 8-21 weeks). Eight fractures had no attempt to union and were treated with bone grafting at the end of 16 weeks. The average range of motion was 115° (range = 40°-140°). 8 patients had deep infection that required implant removal and had decreased ROM. All these patients were compound fracture initially. **Conclusion:** Treatment with locked screw plate construct gives a reliable and versatile osteosynthesis for distal femur fractures, though the problem of delayed union in these fractures is still a big challenge. Extra care is essential in cases with compound fracture.

**Date: 2014-11-21**

**Session: Trauma: SOFCOT Symposium - Fractures Distal Femur**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 37044**

**TREATMENT OF FLOATING KNEE INJURIES BY SIGN IM NAILS**

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Purpose: Floating knee injuries are common fracture pattern in high energy trauma in which there is fracture of ipsilateral femur and tibia. This study was designed to evaluate the effectiveness of SIGN-Nail in treating floating knee injuries. Methods: There were 14 patients in whom nailing was done after they had sustained floating knee injuries. The average age of patients was 26.3 years (Range: 20years to 50 years). There were 13 male patients and 1 female patient. All nails were passed using standard technique with hand reaming and without using bone-graft or image intensifier. The patients were followed-up for minimum of 9months. Patients were evaluated by Karlstrom and Olerud Functional score. Results: The patients were evaluated for infection, radiographic parameters, range of movements, time to weight bearing (partial and complete) and complications or revision surgery (if needed). One patient developed surgical site infection. Two revision surgeries were done. All patients had greater than 90 degrees flexion at the knee joint and were full weight bearing at final followup. Conclusion: SIGN nails are effective in treating floating knee injuries. In our study, Type I injuries had similar results as IIb injuries. Better functional outcomes were seen in this study. Patients with distal tibia fractures were associated with poor functional outcomes.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous**

**Time: 14:00 - 15:30**

**Room: FLAMENGO**

**Abstract no.: 38144**

**IONIZING RADIATION DOSIMETRY IN ORTHOPAEDICS: IS IT RELATED TO THE TRAINING GRADE OF THE SURGEON?**

Ravi MALLINA<sup>1</sup>, Siddiqui ATHAR<sup>2</sup>, Vijayaraj RAMASAMY<sup>2</sup>, Feroz DINAH<sup>2</sup>

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**Introduction:** The use of fluoroscopy is at its peak with the advent of minimally invasive techniques. The current aim of the study is to evaluate three parameters of ionizing radiation dosimetry: dose area product (DAP), radiation duration, and skin entrance dose (SED), and correlate these parameters with various levels of Orthopaedic training. **Methods:** During October 2012 to February 2014, dosimetry data was prospectively collected for 4 common Orthopaedic procedures: dynamic hip screw fixation, intramedullary femoral nailing for 3-part extracapsular fractures, cannulated screw fixation of intracapsular hip fractures, and ankle fracture fixation. DAP (mGy/cm<sup>2</sup>), SED (mGy), and radiation duration measured in seconds was directly obtained from the image intensifier software (GE Group, USA). Grade of the Orthopaedic Surgeon performing the procedure was classified as junior, intermediate and senior. Parameters of ionizing radiation was analysed using Mann-Whitney U test and Spearman correlation coefficient. **Results:** A total of 334 trauma procedures were used for final data analysis. DAP, SED and radiation duration for all the 4 procedures had a direct correlation with the grade of surgeon. However, higher values were noted amongst senior trainees performing cannulated hip screw fixation. Lowest values of all three parameters were noted among the junior grade, when the trainee performed the procedure under supervision. The current study provides us with parameters which may be useful to judge the dexterity of the orthopaedic trainee at various levels of surgical training, and if validated can be incorporated in the Procedure Based Assessment (PBA) section of Orthopaedic Surgery training Curriculum.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous**

**Time: 14:00 - 15:30**

**Room: FLAMENGO**

**Abstract no.: 37427**

**THE EFFECT OF SURGICAL EXPERIENCE ON THE AMOUNT OF RADIATION EXPOSURE FROM FLUOROSCOPY DURING DYNAMIC HIP SCREW FIXATION. CROSS-SECTIONAL DESIGN (2007 - 2012)**

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Queens Medical Centre, Nottingham (UNITED KINGDOM)

Introduction: The primary aim is to determine the effect of surgical experience on the amount of radiation exposure from fluoroscopy during dynamic hip screw fixation (DHS). Methods: Our sample consisted of all hospital admissions for extracapsular proximal femur fractures to our institute between 2007-2012. Information about the patient's age, date of surgery, complexity of the fracture pattern, grade of the operating surgeon and the total radiation dose post DHS fixation were recorded. Analysis of variance techniques (ANOVA) was applied to assess differences in radiation levels between grades of surgeon. Results: There were a total of 1203 patients with a mean age of 81.3 years (range 21-105 years) during the study period. The grade of surgeons were divided into 5 groups: group 1- Senior House Officers and Clinical Fellows (21.4%), group 2- SpR year 1 and 2 (19.3%), group 3- SpR year 3 and 4 (14.9%), group 4- SpR year 5 and 6 and Trauma Fellows (32.7%), group 5- Consultants (11.7%). There was a statistically significant difference between the trainees as a whole and consultants for all fracture types ( $p = 0.009$ ) and between the junior most Sprs (group 2) and Consultants for all fracture types ( $p = 0.037$ ). Conclusion: This study has demonstrated that the level of surgical experience does influence the amount of radiation exposure from fluoroscopy during DHS fixation. Surgical trainees should not ignore the potential harmful effects of radiation and be equipped with the knowledge on how to keep the radiation exposure as low as possible.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous**

**Time: 14:00 - 15:30**

**Room: FLAMENGO**

**Abstract no.: 38267**

**USAGE OF THYROID SHIELDS DURING ORTHOPAEDIC PROCEDURES INVOLVING FLUOROSCOPY - ARE WE PROTECTING OURSELVES?**

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Bradford Royal Infirmary, Bradford (UNITED KINGDOM)

**Aim:** To assess adherence to the Trust's 'Ionising Radiation Regulations Local rules for the use of diagnostic x-rays' stating that a thyroid shield should be used by all staff in the controlled area. **Method:** An unannounced direct observational audit of 30 acute and elective orthopaedic theatre lists using fluoroscopy. Total number of personnel in theatre, their job role, usage of thyroid shield and whether they were within the 2 metres operational controlled area was recorded. **Results:** In total 243 people were observed. Only 20% of staff in theatre was using a thyroid guard. Among these 89% of radiographers, 18% of surgeons, 8% of nurses and 2% of anaesthetists wore a thyroid shield. Within the controlled 2 metre radius 35% wore a thyroid shield. We also found that there was inadequate number of thyroid shields provided although this did not contribute to the lack of their usage. **Conclusions:** Radiation exposure is a concern in orthopaedic theatres. There is a poor adherence to the Trust protocol. Therefore, staff should be educated about radiation risks and encouraged to wear personal protective equipment. The hospital trust should also provide adequate supply of thyroid shields in theatres.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous**

**Time: 14:00 - 15:30**

**Room: FLAMENGO**

**Abstract no.: 37564**

**PLATELETS: POTENTIAL MODULATORS OF T REGULATORY CELL ACTIVITY AFTER TRAUMA?**

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Introduction: Severe injury causes rapid activation of CD4<sup>+</sup> T regulatory cells (Tregs), the mechanisms regulating the activation remain unclear. Recent evidence suggests that platelets play a protective role after trauma. The objective of this study was to examine whether CD4<sup>+</sup> Tregs and platelets interact following trauma. Methods: The burn injury model in mice was employed. C57/Bl6 mice were either treated with a platelet-depletion antibody or with an isotype-control-antibody. Two hours following burn injury or sham-treatment, draining lymph nodes (LN) and spleen (SPL) were harvested. Measurement of Protein kinase C- $\theta$  (PKC- $\theta$ ) expression and phosphorylation via phospho-flow cytometry was used to show the early activation of CD4<sup>+</sup> Treg cells and non-Treg cells following trauma. Results: Burn injury induces activation in Tregs more than in non-Tregs, derived from LNs. The phosphorylation of PKC- $\theta$  tends to be increased following burn injury as compared to sham treatment in wild-type mice treated with an isotype control Ab. Interestingly, platelet depletion seems to induce an augmented activation of Tregs following burn injury. Of note, Tregs derived from the SPL did not show increased expression or phosphorylation of PKC- $\theta$  following burn injury. Conclusion: Rapid activation of CD4<sup>+</sup> Tregs, but not of CD4<sup>+</sup> non-Tregs, takes place following burn injury in mice. The activation of Tregs is limited to the draining LNs. Our data suggests a potential difference in Treg activation following injury when platelets are absent. Platelets might be potential regulators of Treg activation in the early phase after trauma.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous**

**Time: 14:00 - 15:30**

**Room: FLAMENGO**

**Abstract no.: 37138**

**THE DESIGN AND IMPLEMENTATION OF CLINICAL PATHWAYS  
AIMED AT IMPROVING THE TREATMENT OF HIP FRACTURES IN  
THE ELDERLY; THREE YEAR RESULTS FROM A LARGE U.K.  
CENTRE**

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SRINIVAS**

**Birmingham Heartlands Hospital, Birmingham (UNITED KINGDOM)**

Introduction: With an increasingly elderly population and soaring costs of the health care across the western world, the implications of treating hip fractures in the elderly are huge. The U.K. National Health Service has introduced a strategy, known as Best Practice Tariff, which aims to improve quality of care by offering hospitals an economic incentive if certain markers of quality are met. Methods: Following the publication of this tariff, the trauma service at our centre was restructured with the aim of both obtaining these markers of quality and improving patient care. This reorganisation involved recruitment of further anaesthetic personnel, structured collaboration with the geriatric medical team, prioritising theatre resources for hip fracture patients, daily multidisciplinary ward meetings aimed at early rehabilitation and discharge, regular audit and education of junior medical team in the rapid optimisation of pre-operative patients. Results: Over the three year study period the number of cases fully compliant with the Best Practice Tariff improved four fold. The proportion of patients undergoing surgery within 36 hours increased from 38% to 72% and the 30 day mortality rate reducing from 15% to 5.2%. Discussion: The implementation of clinical pathways has improved compliance with Best Practice Tariff and the experience gained at our centre is discussed. Further the merits of such incentive programmes and their relevance in health care management are analysed in this paper.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous**

**Time: 14:00 - 15:30**

**Room: FLAMENGO**

**Abstract no.: 38270**

**TEMPLATING IN NECK OF FEMUR FRACTURE PATIENTS: A SIMPLE RECOMMENDATION TO HELP MEET BEST PRACTICE TARIFF**

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**Aim:** To establish the incidence of re-xray for templating, and subsequent delay in surgery for neck of femur (NOF) patients meeting criteria for total hip replacement (THR). With templating fast becoming the gold standard for joint replacement and trauma surgery, re-xray is a potential for delay in the 36 hour best practice tariff set by NICE. **Method:** A retrospective analysis of data (may2011-apr2013) was carried out. Inclusion criteria set were patients with NOF fractures undergoing total hip replacement. The data was examined for incidence of re-xray for templating, whether templating was undertaken, time elapsed from injury to surgery and intra-operative complications. **Results:** 55 out of 665 patients underwent total hip replacement. 13 patients had to be sent for re-xray, 7 of which (53.8%), exceeded the 36 hour best practice tariff. Out of 23 patients who had templating performed, 11 patients did not have a specific template xray taken. **Conclusions:** The requirement for re-xray poses a potential cause for delay in surgery and therefore threatening the chance of meeting best practice tariff. At £3600 per patient, even if this helps in only a few cases it would be economically appealing to change practice. Our free and simple recommendation is to place a template ball for all patients undergoing xray for suspected NOF fracture. This has already been started as a new radiology protocol. **Discussion:** Apart from making economical sense, this also avoid repeated radiation exposure, avoid causing pain with repeated transfers and prevent per-operative complication by provide better pre-operative planning.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous**

**Time: 14:00 - 15:30**

**Room: FLAMENGO**

**Abstract no.: 36508**

**NEW TECHNIQUE FOR OBTAINING BONE GRAFT USING REAMER IRRIGATOR ASPIRATOR BY RETROGRADE PASSAGE THROUGH THE NON UNION SITE IN CASES OF DISTAL FEMUR NON UNION**

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The aim of this study to assess the possibility of passing the Reamer Irrigator Aspirator (RIA) through the non union sites in cases of distal femur to avoid the complications and discomfort associated with using a separate entry site for RIA. Methods: Between 2009 and 2013, all patients who had distal femur non union and who were treated by RIA bone grafting were included in the study. The scar tissues were excised with mobilization of the non union. The distal part was angulated into varus then the guide wire was passed from the non union site laterally. The primary outcome measures were the ability to obtain the bone graft, perioperative complications, secondary surgical procedures, and radiographic union. Results: Five patients had RIA retrograde through the non union site. The mean age of these patients was 40.4 yrs (range, 22-66). Mean reamer size was 13.4 mm (mode, 14 mm), producing an average volume of 30 mL bone graft. Concomitant procedures include double plating in four cases and lateral plating with medial screws in one case. No Fractures (intra or post operative) happened. Conclusion: Retrograde RIA passage through the non union site in cases of distal femur non union can be achieved reproducibly. It has the advantage of avoiding the discomfort and pain at a separate entry point. It also avoids the complication of over reaming of the femoral canal.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous**

**Time: 14:00 - 15:30**

**Room: FLAMENGO**

**Abstract no.: 36470**

**INTRAMEDULLARY BONE GRAFT HARVEST USING REAMER IRRIGATION ASPIRATION SYSTEM: A CASE SERIES**

Amr ABDELGAWAD<sup>1</sup>, Brian WATERMAN<sup>2</sup>, Shaunette DAVEY<sup>2</sup>, David MAXFIELD<sup>1</sup>, Enes KANLIC<sup>1</sup>

<sup>1</sup>Texas Tech University Health Science Center, El Paso (UNITED STATES), <sup>2</sup>William Beaumont Army Medical Center, El Paso (UNITED STATES)

Introduction: Autogenous iliac crest bone graft (ICBG) has been considered the gold standard for the bone grafting, however, this procedure is associated with high incidence of long term post operative pain and possible other complications like hematoma and infection. This study was done to evaluate the efficacy and complications of intramedullary bone graft harvesting using the Reamer-Irrigator-Aspirator (RIA) in the treatment of the nonunions and bone defects. Patients: Between 2009-2012, 24 consecutive patients with nonunions (tibia, n=14; femur, n=6; humerus, n=3) or significant bone defects (talus, n=1) undergoing intramedullary bone graft harvesting by a single surgeon were included. A diverse cohort by sex (15 males, 9 females) and age (mean 37.8 years; range, 15-66) was identified, with 16 and 7 patients sustaining open and closed fractures, respectively. Intramedullary harvest from the femur or tibia using RIA was performed with adjunctive fixation. Rates of perioperative complications, secondary surgical procedures, and union were assessed. Results: At mean 10.1 months follow-up, 3 donor-site complications occurred (12%), including 2 fractures (9%; femoral fracture requiring intramedullary nail fixation, nonoperative tibial fracture), and 1 reamer failure with retained hardware. Eighteen patients (75%) progressed to radiographic union. Mean reamer size was 13.7 mm (mode, 14.0 mm), producing an average volume of 39.4 mL (range, 15-90 mL) bone graft. Conclusion: Rates of donor-site complication and postoperative fractures (12% and 9%, respectively) are higher than that previously described. While RIA of complex extremity nonunions results in predictably high rates of union, patients should be counseled extensively about fracture risk.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous**

**Time: 14:00 - 15:30**

**Room: FLAMENGO**

**Abstract no.: 38397**

**PREOPERATIVE PLANNING OF DIFFICULT ARTICULAR FRACTURE SURGERY**

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Computer program for preoperative planning of difficult articular fractures is presented. The program consists of three closely integrated tools, 3D viewing tools, segmentation tools and reduction fixation tools. Data of real fracture in DICOM format is used. First 3D model is made and the segmentation is carried out, where each fracture fragment is made as an individual object. In virtual reduction each fracture segment can be moved in all three planes and its pivot point of rotation can be also changed. After reduction, the fixation can be made and intraoperative imaging can be simulated. The plan of automatically contoured plates can be drawn and printed in 1:1 scale. All the steps can be performed on regular personal computer by a surgeon. Data for 3D printing of possible custom made implants and jigs can also be obtained from the software in corresponding format. We use the software routinely in acetabular, proximal tibial, distal femur and distal tibia fractures. Some instructive cases will be presented. The presented computer program is an easily usable application, which brings significant value and new opportunities in clinical practice, understanding of the fracture, teaching and design of new implants and jigs.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous**

**Time: 14:00 - 15:30**

**Room: FLAMENGO**

**Abstract no.: 38454**

**PHOTODYNAMIC BONE STABILIZATION - NEW HORIZON IN FRACTURE TREATMENT**

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**Introduction** The IlluminOss-Photodynamic-Bone-Stabilization-System is a novel, minimally-invasive method for intramedullary bone stabilization. The system consists of a thin wall PET-balloon mounted on a 3mm diameter flexible catheter, a "cure-on-demand" photodynamic fluid monomer and a light-source. In the procedure, the balloon-catheter is inserted through a small pathway in the bone. Fixation is achieved by infusing the liquid monomer into the balloon-catheter spanning the fracture site. Upon activation of the light (436 nm wavelenght) the monomer is polymerized into a hard polymer within 400-600 seconds. The polymer conforms tightly to the contours of the intramedullary canal, providing immediate stabilization with longitudinal strength and rotational stability. Extensive studies have shown the biocompatibility of the system. **Material and Methods** Between 01/2010-10/2013 76 patients were operated with the implant. 14 metacarpal-fractures, 19 forearm-fractures, 43 humeral fractures and 4 distal fibula-fractures were treated (10 pathological, 2 delayed unions/implant failure). Most had poor bone quality (osteoporosis/malignancy). 5 patients had prior surgery. **Results** From 76 patients with mean age of 77,35 years (15 – 100) 52 had follow up. 98% of the fractures showed consolidation. DASH-Score: 24,5, the Constant-Score 68,3. We saw 4 complications (1 temporary radial-nerve-palsy, 2 implant-failures, 1 fistula without bacterial contamination). 3 implants had to get removed. **Conclusion** The system is characterized by a simple minimal-invasive-procedure, rotational stability, high reduction-force, early onset of mobilization of the fractured limb, and increasing of stability while using additional locking screws and/or additional plate fixation, which is especially convincing in poor-bone-quality-fractures.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous**

**Time: 14:00 - 15:30**

**Room: FLAMENGO**

**Abstract no.: 37023**

**LONG-TERM OUTCOME AFTER SURGICAL TREATMENT OF EXTENSOR MECHANISM RUPTU**

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All patients surgically treated at our Level I Trauma Center for quadriceps tendon ruptures (QTR) or patella tendon ruptures (PTR), within a time frame of 15 years, and with a follow-up period of at least 3 years, were enrolled in this retrospective analysis. To assess their long-term outcomes the „Single Assessment Numeric Evaluation (SANE)“, „Reduced WOMAC Function Scale“, „Knee Society Clinical Rating System (KSS)“, and the „Oxford Knee Score (OKS)“ were used. 136 ruptures met the inclusion criteria (93 QTR, 43 PTR), six times more males than females were affected. Patients in the QTR-group were significantly older (61.1y/43.2y); 7.8% in the QTR- and 12.5% in the PTR-group suffered from wound healing disorders/infections resulting in a need of surgical revision in 42.9% vs. 80% of these cases ( $p<0.05$ ). In the QTR-group 7 patients sustained a re-rupture compared to none in the PTR-group ( $p<0.05$ ). 62.3% of all patients were available for clinical evaluation. The mean follow-up period was 10.3 years in the QTR-group and 9 years in the PTR-group. In both groups comparable outcomes (good to excellent) were revealed; SANE: 88.5/93.3; WOMAC: 95.7/98.3; KSS-Knee: 93.1/91.4; KSS-Function: 89.7/96.4; OKS: 14.6/13.1. Patients with a re-rupture in the QTR-group had a significantly worse outcome in all scores despite the KSS-Knee ( $p\leq 0.004$ ). This could not be seen with infections ( $p>0.30$ ). In the PTR-group patients with an infection showed a significant inferior outcome in the SANE ( $p=0.003$ ) and WOMAC ( $p=0.008$ ) compared to those without a complication, whereas only a trend could be detected in the other scores.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: FLAMENGO**

**Abstract no.: 38017**

**DELAYED NAILING IN OPEN FRACTURES TIBIA**

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(INDIA)

Purpose: to assess the clinical outcomes of unreamed interlocking nailing in open fractures of tibial shaft who presented late or operated late; to evaluate the complications; and to determine whether a delay in the surgery (unreamed nailing) in open fractures of tibia affects the outcome. Methods: Retrospective study of 157 cases of open fractures (grade I-73, grade II-45, grade IIIA-22, grade IIIB-17) debridement and unreamed nailing were done. Three groups categorised according to interval between injury and surgery. Group 1: those operated < 12 hrs, group 2: 12-24 hrs, group 3: >24 hrs. Group 1 had 69 cases(grade I- 31, grade II-18, grade IIIA-12, grade IIIB-8). Group 2 had 36 cases(grade I-23,grade II-9, grade IIIA-3,grade IIIB-1)and group 3 had 52 cases (grade I-19,grade II-18,grade IIIA-7,grade IIIB-8). Results: Union was seen in 128 patients (81.5% cases). Infection was seen in 16 cases (10.2%). Group 1 had 4 cases, group 2 had 4 cases, group 3 had 8 cases. The union rate was 85.5% in group 1, 80.6% in group 2 and 76.9% in group 3. In 3 cases nail removal was done due to infection. In group 3 (grade IIIB), even though implant was broken in 3 cases, none of them had infection. Conclusions: Trauma and surgery interval has shown no significant effect on the final outcome. It was found that debridement and unreamed interlocking nailing in tibia is still a good option even in those patients who were operated late.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: FLAMENGO**

**Abstract no.: 36603**

**ILIZAROV TECHNIQUE FOR THE OF INFECTED NON UNION OF THE FEMUR IN ADULTS**

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**Aim of the study:** The study aimed to assess the results of the applications of Ilizarov technique in treatment of infected femoral nonunion. **Methods:** 20 patients with infected femoral nonunion were managed using Ilizarov technique. The main age was 37.45 years, only one female. 10 patients with diaphyseal, 2 with proximal metaphyseal and 8 patients with distal metapyseal nonunion. All patients had previous operations, The mean number of previous operations was 1.95(SD, 1.050; range, 1-5)operations. Techniques adopted were acute compression in 5 patients, acute shortening in 13 patients and acute shortening and distant corticotomy in 2 patients: one proximal and one distal. Clinical and radiographic evaluation was performed. **Results:** The bone results, functional results, and complications of these patients were evaluated. The mean time between injury and the application of the frame was 10.15(SD, 8.798; range, 3-35)months. The mean follow-up period was 26.65 (SD, 15.849; range, 6–60) months. The mean frame-keeping period was 8.03 (SD, 2.774; range, 5–14) months. The mean limb length discrepancy was 1.45 (SD, 1.134; range, 0–3) cm. Bony union was achieved in all except two patients. From 32 true complications, 4 were defined as minor and 28 as major. **Conclusion:** Despite high rate of complications, the Ilizarov technique was found to be effective in the treatment of infected femoral nonunion as it allowed simultaneous treatment of bone loss, nonunion, infection and deformity.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: FLAMENGO**

**Abstract no.: 37569**

**THE EPIDEMIOLOGY AND VARIABILITY OF CARE OF LONG BONE OSTEOMYELITIS IN A SAFETY NET INSTITUTION**

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Our goal was to describe the epidemiology of osteomyelitis OM as well as the variability in its diagnosis and treatment. We conducted a retrospective study of adult patients treated for long bone OM from January 2012-2014. Patients with diabetic foot infections, incomplete records, or lost to follow-up were excluded. Infection recurrence was defined as need for surgical intervention >60 days after index procedure. Demographic, diagnostic, treatment, and outcome data were collected and analyzed using Fisher t-test. After exclusion criteria, 76 patients (50 males, 26 females) were included for analysis. Mean age was 48.77 years (range: 22- 90), with 51 lower and 25 upper extremities, and 20 (26.3%) open fractures. Thirty-four patients (44.7%) were smokers, 1 (1.3%) HIV positive, 13 (17.1%) homeless, 12 (15.8%) diabetic, and 44 (58%) had a history of substance abuse. Eighteen patients (23.6%) underwent MRI scan and 41 (53.9%) bone biopsy, with the remainder diagnosed clinically. Mean number of surgeries performed per patients was 3 (range: 1-15), 41 patients (53.9%) underwent hardware removal (of which 7 (17.1%) developed a recurrence and 5 in 35 who didn't (14.3%) developed a recurrence [p=0.74]), 36 (47.3%) wound VACTM placement, and 20 (26.3%) had local antibiotic therapy. Intraoperative cultures were not associated with recurrence. Our study highlights the heterogeneity of long bone OM patients, as well as the lack of standardization of both diagnostic and treatment approaches. Our aim is to utilize this data as a platform to develop diagnostic and treatment algorithms for the management of long bone osteomyelitis.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: FLAMENGO**

**Abstract no.: 37125**

**VERSATILITY OF THE SURAL FASCIOCUTANEOUS FLAP FOR SOFT-TISSUE COVERAGE**

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We retrospectively evaluated 19 patients in which 20 distally based sural fasciocutaneous flaps were performed (in one case the flap was performed bilaterally), between 2007 and 2013. Time from injury to flap elevation averaged nine months (range, 0 to 36). Defect size averaged 9 x 6 cms. The defects were located in the distal third of the tibia in 4 cases, around the ankle in 12 cases and at the hind foot in 4 cases; 18 were posttraumatic, and two resultant from oncologic resections. Fifteen patients were male. Patient's age averaged 39 years. Three patients were diabetic. Eight patients had active infection. VAC was used before flap elevation in nine cases. Cement spacers with antibiotics were placed under the flap in three cases. Follow-up averaged 16 months. All soft-tissue defects were successfully covered. Donor site closed primarily in 12 cases, and full thickness skin graft was needed in eight. Three flaps had superficial partial necrosis. In one patient with chronic calcaneous osteomyelitis successful soft-tissue coverage was achieved, but the bony infection persisted and had an amputation. In the remaining seven cases with infection the soft-tissue lesion closed and the infection cured. Hospital stay after flap performance averaged 3 days. Sural flaps do not need any special microsurgical expertise, and their hospital stay is significantly shorter compared to free flaps. The reverse sural flap is a versatile flap that has shown being useful for the restoration of adequate coverage of soft-tissue defects around the distal tibia, ankle and hind foot.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: FLAMENGO**

**Abstract no.: 37202**

**PARASCAPULAR FREE FLAP IN LIMB RECONSTRUCTIONS**

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There are multiple flap options that can be used to cover extremities soft-tissue defects. We retrospectively evaluated sixteen parascapular fascio-cutaneous free flaps used for reconstruction of severe post-traumatic soft-tissue loss affecting the extremities. Eight lesions were located in the upper extremity and eight in the lower extremity. All patients were male. Time from injury to coverage averaged 8 days (range, 1 to 26). Patient's age averaged 36 years (range, 19 to 56). All patients had exposed tendons, seven had associated fractures at the area of soft-tissue loss, and five had neurovascular pedicles that needed coverage. The flap was combined with a scapular flap in one case, and with a latissimus dorsi flap in two cases. Flap diameter averaged 25 x 11 cms. The donor site closed primarily in all cases. Fifteen flaps survived without complications; and one 56 year old diabetic patient, in which a combined (parascapular and latissimus dorsi) flap was performed, the parascapular flap necrosed while the latissimus dorsi flap survived. All patients were satisfied with the aesthetic result. The parascapular flap is a versatile flap that can be tailored to reconstruct a wide variety of defects in the extremities. The donor site can be closed primarily, is discrete and has minimal donor morbidity. The conjoint flaps can be used for reconstruction of large defects or two different defects at the same time, and using the same vascular pedicle.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: FLAMENGO**

**Abstract no.: 37131**

**INFECTED TIBIAL NON-UNION WITH BONE LOSS, A COMMON PROBLEM WITH MANAGEMENT CONTROVERSY**

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Background: Post-traumatic tibial non-union in association with infection is a real surgical problem. When tibial shortening occurs and soft tissue (especially skin) complications are added to this problem due to multiple surgical procedures to solve the first problem, this is one of the heaviest complications in bone-joint surgery. Patients and methods: Twenty five tibial non-united fractures;(8-65y),complicated with infection ,shortening (4-9 cm.) and skin or other soft tissue complications; following repeated surgeries(2-5 previous operations) were subjected to debridement of the soft tissues at the non-union site with excision of bone ends till healthy bone (adding more shortening). Mono-planer external fixators were applied to all cases; compression was applied to fracture site, and distraction-callotasis principle was performed at a proximal (or distal) corticotomy. Results: Bone healing was achieved in 24 cases (96%) in 12 – 28 weeks (mean of 18.2 weeks). Infection was eradicated in 22 cases (88 %); all were united. The mean length gained was 7.7 cm (6to12.5 cm). Satisfactory results were obtained in 22 patients (88%) and unsatisfactory results in 3 patients(12 %).No major complications were encountered; There have been no refractures or loss of length. after a follow-up of 2.3 years (range 2 - 4 y). Conclusion: mono-planer devices when applied properly and combined with proper debridement can give a high success rate in achieving bone healing , eradication of infection and correction of shortening in tibial non-union associated with infection and shortening.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: FLAMENGO**

**Abstract no.: 38110**

**IPSILATERAL FIBULAR TRANSPOSITION IN THE TREATMENT OF COMPOSITE TIBIAL DEFECTS USING A MODIFIED HUNTINGTON PROCEDURE**

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**Introduction:** Management of large tibial bony defects associated with soft tissue problems is a challenging orthopaedic condition. Management options include free or pedicled vascularized fibular transfers, or segmental bony transfer of the tibia; however, these require prolonged durations to attain union and intact soft tissue coverage. **Material and Methods:** This was a prospective study of nine patients with composite bony defects of the tibia. Eight cases were traumatic and one case after osteomyelitis. Four cases had massive skin and soft tissue defects, while the remaining five cases had severely scarred adherent soft tissues that prohibited distraction osteogenesis. All cases were managed by ipsilateral transfer of the fibula, as a modification of Huntington's technique. The fibula was osteotomized according to the level needed, transferred to the lateral surface of the tibia and internally fixed. Thereafter, fixation of the fibula was augmented by a neutralization Ilizarov fixator. Weight-bearing and frame removal was delayed till radiological evidence of union. Protective below knee orthosis was advised for a further 3 years. **Results:** Weight bearing was achieved at a mean of 7 months. The range of frame application was 4-8 months. Follow up was for a mean of 40 months. In the four patients with soft tissue defects, the transferred fibula and its attached muscles required only partial-thickness skin grafts. **Conclusions:** Ipsilateral fibular transposition is a valuable option as a salvage procedure for patients with large tibial defects accompanied by massive soft tissue loss, or adherent scarred overlying skin preventing bone transport.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: FLAMENGO**

**Abstract no.: 37207**

**MASQUELET TECHNIQUE FOR THE TREATMENT OF OPEN TIBIAL FRACTURES WITH BONE DEFECTS**

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Introduction: Open tibial fractures are often associated with bone defects. Masquelet proposed a method combining induced membranes by placing antibiotic cement spacers and then placing cancellous bone. We report our experience over a period of six years. Methods: Retrospective case series of open tibial fractures with bone defects greater than 2 cm. from 2004 to 2010. In all cases, a staged reconstruction technique was performed according to Masquelets technique. Results: 17 patients. Mean age 32 years. 8 Gustilo IIIA, 8 Gustilo IIIB and 1 Gustilo IIIC. Follow up averaged 25 months. External fixator was used initially. As definitive treatment, intramedullary nail was used in 12 cases, locked plates in 4 cases, and external fixator in one case. Iliac crest cancellous bone autograft was used, in 6 cases allograft was added (greater than 4 cm.defects). 10 cases required rotational or free flaps. The average size of the bone defect was 5 cm. (Range, 2-17 cm.). 5 patients required reoperations for atrophic nonunion. Time to bone healing 12 months (range 3 to 36). 3 cases presented superficial infections. At last follow up, no patients reported signs of instability or pain at the fracture site. Conclusion: The concept of the induced membrane is a well established method for reconstruction of bone defects. They promote vascularisation and corticalisation of cancellous bone, and it delivers growth and osteoinductive factors. However, no prospective or comparative data are available. Further studies need to be performed for a better assessment and indication of Masquelets technique.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: FLAMENGO**

**Abstract no.: 37904**

**IS THE HIP FRACTURE MORTALITY INFLUENCED BY THE TIME OF ADMISSION IN REHABILITATION CENTER?**

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Introduction: After hip replacement procedures, patients require some form of rehabilitation. The goal of a rehabilitation program after hip fracture is to maximize function to allow the person to return to their prior activity level. It is well known that patients with hip fractures are common old, with several comorbidities and with high mortality rate in first postoperative year. Objectives: To determine if time of admission in rehabilitation center have influence on mortality in patients with hip fracture who underwent hemiarthroplasty. Methods: In the period from 2009-2011 we followed 73 female patients with hip fracture who underwent hip hemiarthroplasty. 41 patients were discharged to the rehabilitation unit direct from the surgery department and 32 patients were admitted to the rehabilitation unit not earlier than one month after discharging to the home. The study is gender and comorbidities adjusted. All patients began the rehabilitation immediately post-operatively ( range of motion, strengthening and conditioning exercises). One year after surgery procedures we evaluated mortality rate in those two groups Results: The first year mortality rate was significant higher ( $p < .05$ ) in patients who were discharged direct to the rehabilitation unit ( 18%) ,comparing group with delayed (11%). the rehospitalisation rate were significant higher in the first group ( $p < .05$ ). Conclusions: our study showed that delayed admission to the rehabilitation center is associated with lower mortality rate. This can be explained by better functioning and positive impact of home conditions on the recovery

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: FLAMENGO**

**Abstract no.: 37607**

**ACUTE KNEE INJURIES: ARE WE EXPOSING OUR PATIENTS TO UNNECESSARY RADIATION? A RETROSPECTIVE STUDY**

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Introduction: Acute knee injuries are a common presentation to any Accident & Emergency department. We attempt through our retrospective study to assess the number of unnecessary radiographs in acute knee injuries in a district general hospital setting. Objectives: To assess the number of unnecessary knee radiographs done in patients presenting with acute knee injuries. Methods: A retrospective Observational study was done to look at the acute knee injury patients presented to Dumfries & Galloway Royal infirmary A&E from August 2011 till August 2013. We assessed the following parameters; sex, age, mechanism of injury, weight bearing status and incidence of fractures in patients subjected to plain radiograph. Results: During the 2 year study period, 947 patients presented with acute knee injury. 54% of those were males. The mean age at presentation was 32.8 years. Regarding the mechanism of trauma, 51% sustained a twisting injury, 30% blunt trauma and 19% presented after a fall. 21% of patients were unable to weight bear in A&E, 49% were able to weight bear and patients were able to weight bear but with a limp in 30% of cases. Of the 947 patients, 599 underwent radiography of the knee, but only 54 patients (9%) were found to have fractures which were reported by a consultant radiologist. 545 patients underwent radiograph of the knee that did not show any fractures with unnecessary patient exposure to radiation. Conclusions: A highly sensitive and specific decision rule needs to be implemented to limit the number of radiographs in acute knee injuries.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Miscellaneous II**

**Time: 16:00 - 17:30**

**Room: FLAMENGO**

**Abstract no.: 36701**

**METAL IONS FROM ORTHOPAEDIC IMPLANTS: A CROSS-SECTIONAL STUDY**

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Metal-on-metal (MOM) bearings were reintroduced in 1988, to reduce wear and osteolysis in total hip arthroplasty. Since the reports of adverse reactions to metal debris related to some specific type of implants it was suggested that elevated concentrations of cobalt and chrome in the blood may predict early failure of MOM hip replacements and the necessity of revision. The relationship between metal ions levels, clinical and imaging findings is not fully understood yet. The purpose of the study was two-fold: to determine whether there is any significant difference in metal ion levels and functional outcomes among 28 mm. heads metal-on-polyethylene bearings, 28 mm. heads MOM implants and larger than 32 mm. heads MOM implants and secondly to assess whether these data would be predictive of implant impending failure. Methods: In an observational cross-sectional study, three total hip systems were assessed. Patients were evaluated by means of the Harris Hip Score, radiologically and biochemically. Statistical analysis was performed on collected data to identify any differences between the groups. Results: Outcomes were similar in all groups. Abnormal plasma metal ions found in 12% of the larger heads group were associated with the "run-in-wear" phase, which could not be considered predictive of failure. Conclusions: In this series, no association was detected regarding metal ion levels, patient clinical status, femoral head size and implant type ( $p > 0.05$ ). Metal ions screening should be carefully used in conjunction with clinical and imaging evaluation.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Soft Tissue & Patella**

**Time: 08:30 - 10:00**

**Room: LAGOA**

**Abstract no.: 38024**

**FIXATION OF OSTEOCHONDRAL PATELLAR FRACTURE AFTER PATELLAR DISLOCATION WITH TRANSPATELLAR SUTURE FIXATION**

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**Introduction:** The osteochondral fractures of patella are generally seen together with acute patellar dislocations. Their diagnoses are difficult with plain radiographies and are frequently missed in clinics. Their treatment can be difficult, if they are small and chondral fractures. The aim of this study was to present the favorable clinical results of transpatellar suture technique in the treatment of patellar osteochondral fractures. **Methods:** Between March 2007 and May 2009, three patients consulted to our clinics with the complaint of acute patellar dislocation were included in this study. After their initial evaluation and prompt reduction, they were diagnosed as osteochondral fracture of patella with direct XR and computed tomography. They were treated surgically. The fractured pieces were too small and thin for screw fixation in all three patients. After standard medial parapatellar arthrotomy, fragments were fixed with "transpatellar suture technique". Medial retinacular augmentation and capsule repair were also done. Postoperatively, the patients were allowed for full-weight bearing with knee brace. 90 degrees and full flexion were obtained after 6 and 12 weeks postoperatively, respectively. **Conclusions:** After two years of follow-up, the physical examination, radiography and computed tomography yielded that the lesions were healed well and the patients returned back to their pre-injury activity levels. The osteochondral fractures of patella are rarely seen and can be missed in clinics. For the fractures with small and thin osteochondral fragments, this study revealed that transpatellar suture fixation is an efficient treatment method without need of any screw and its removal.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Soft Tissue & Patella**

**Time: 08:30 - 10:00**

**Room: LAGOA**

**Abstract no.: 38307**

**RECONSTRUCTION OF THE MEDIAL PATELLOFEMORAL  
LIGAMENT IN PATELLAR OBJECTIVE INSTABILITY**

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**Introduction:**Our purpose was the clinical and radiological evaluation of 30 patients who underwent reconstruction of the medial patellofemoral ligament, with a minimum follow-up of one year.**Material and Methods:**30 patients operated on between January 2009 and December 2012 were evaluated. Clinical assessment was based on the Kujala score, and radiological evaluation was based on the Caton index angle Merchant and Laurin angle. In all patients was used autologous graft (tendons of the hamstrings) for reconstruction. In each case the need for procedures that were considered necessary (Elmslie-Trillat vast and external repair among others) was evaluated.**Results:**Clinically was achieved stability without recurrence in any patients. The Kujala score had a mean value of 85 one year after surgery.**Radiological results** demonstrate improved rates of patellar misalignment, specifically the angle of patellar weighbridge (postoperative mean values: 1 Caton, Merchant angle of -6 ° and angle Laurin Index of 7.8°).**conclusion:** The patellar instability is a multifactorial problem and the surgical treatment should be individualized and directed to correct the anomalies present in each patient. Although isolated MPFL reconstruction is beneficial, we believe that if any significant trochlear dysplasia, high patella or excessive TA-GT surgical treatment should also be directed to correct them. The results were encouraging and are confirming that this procedure can and should be performed routinely.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Soft Tissue & Patella**

**Time: 08:30 - 10:00**

**Room: LAGOA**

**Abstract no.: 37686**

**OUTCOME AFTER MPFL-RECONSTRUCTION USING DOUBLE-STRANDED GRACILIS TENDON AUTOGRAFT WITH OR WITHOUT TIBIAL TUBERCLE OSTEOTOMY FOR PATELLAR INSTABILITY WITH A MEAN FOLLOW-UP OF 4.1 YEARS**

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Introduction: soft-tissue reconstruction is most frequently performed for lateral patellar instability in patients with mild trochlear dysplasia. The aim of the study was, to analyse postoperative outcome after medial patellofemoral ligament (MPFL) reconstruction with and without tubercle transfer especially in terms of functional outcome, and sports participation. Preliminary data are reported. Methods: 64 female and 16 male patients (85 knees, 31.1 +/- 9.9 years) were prospectively analysed 4.1 years (range 1.0 to 15.5) after double-stranded MPFL-reconstruction using gracilis tendon autograft. Tibial tubercle osteotomy was performed in 31 cases of increased tibial tubercle trochlear groove distance (>20mm) and / or patella alta (Caton-Deschamp Index >1.2). Kujala score and a subjective knee-function questionnaire were received from all patients. Results: No patellar dislocation occurred after surgery and 78% of the patients did not fear recurrent instability during sports activity. Kujala score increased in 80% of the patients from 48.8 to 74 points ( $p<0.001$ ) and on a scale of 1 to 7 (from maximal to no impairment) participation in sports increased from 3.5 to 5.2 postoperatively ( $p<0.001$ ). No significant difference was found between MPFL-reconstruction only and combined with tibial tubercle osteotomy. Conclusion: In patients with a mild trochlear dysplasia, MPFL reconstruction is a safe surgical procedure to successfully improve patellar stability. Knee function and physical activity can be improved.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Soft Tissue & Patella**

**Time: 08:30 - 10:00**

**Room: LAGOA**

**Abstract no.: 38498**

**RECONSTRUCTION OF SUPERFICIAL MEDIAL COLLATERAL LIGAMENT ONLY VERSUS CONCOMITTANT RECONSTRUCTION OF POSTERIOR OBLIQUE LIGAMENT FOR MEDIAL KNEE INSTABILITY: COMPARATIVE STUDY**

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The purpose of this prospective study was to evaluate the functional outcome of isolated superficial medial collateral ligament (MCL) reconstruction and the concomittant reconstruction of superficial MCL and posterior oblique ligament (POL) in patients with medial knee instability. The study was performed on two groups of patients . The first group (A)consisting of 15 patients , underwent superficial MCL reconstrucion only that was done in a minimally invasive technique using a distally based semitendinosus with or without gracilis tendons looped to be pulled inside a tunnel in the medial femoral condyle and fixed by interference screw, there free end was then sutured to the base of the graft. The second group (B),consisting of 15 patients underwent reconstruction of both superficial MCL and POL . The procedure was carried out using the same technique as in group A but the free end of the graft was pulled into a tunnel in the posteromedial aspect of the tibia to reconstruct the POL and fixed using interference screw. Both groups followed the same rehabilitation protocol and were followed up for 6 months postoperatively. Both groups were compared regarding preoperative and postoperative evaluation according to Lysholm and IKDC scoring systems as well as preoperative and pistoperative stress valgus x-ray to assess the difference in the degree of gapping of the medial compartment in millimeters in relation to the normal side. The results were obtained, statistically analyzed , compared between the two groups and further discussed in details.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Soft Tissue & Patella**

**Time: 08:30 - 10:00**

**Room: LAGOA**

**Abstract no.: 38272**

**CLINICAL OUTCOME OF PATELLAR AND QUADRICIPITAL TENDON RUPTURE AFTER SURGICAL REPAIR WITH ANCHORS**

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**Objectives:**The usual treatment of ruptures of the extensor system is the reinstatement through transpatellar tunneling, usually associated with cerclage discharge. The aim of this study was to determine the functional outcome and rate of complications of treatment of ruptures with suture anchors.**Material and methods:**12 patients operated between May 2008 and December 2010 were evaluated, comprising 13 tendons (patellar 6 and 7 quadricipitals). All patients underwent tendon reinsertion with suture anchors and with associated cerclage discharge in three of them. Postoperatively, patients were immobilized with DePuy splint for a mean period of 5 weeks. We conducted a retrospective analysis of the results, based on functional scores Lysholm, Kujala, Tegner activity scale and measurement of ROM. Complications were also recorded.**Results:** After six months, all patients had no limping or difficulty walking. The functional results were excellent in 10 patients (11 tendons) with average Lysholm score of 98, Kujala 98.17 and average mobility 0 ° - 155 °. In one case the result was worse (78 Lysholm, 68 Kujala, Tegner mobility 0-110 ° and 4 vs 5 pre-injury). There was re-rupture, and there was need for reoperation in two patients for the extraction of cerclage wire, with dehiscence of the suture in one case.**Conclusion:**Treatment of this injury in the acute phase is crucial. The reinsertion of tendon with anchors is not only technically easy, but also minimally invasive. This study demonstrates that the use of anchors is safe enough to allow early mobilization, reflected in good functional results.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Soft Tissue & Patella**

**Time: 08:30 - 10:00**

**Room: LAGOA**

**Abstract no.: 37836**

**IMMEDIATE POST-OPERATIVE PAIN RELIEF AFTER KNEE ARTHROSCOPY: BUPIVACAINE VS BUPIVACAINE AND MORPHINE COMBINATION. A RANDOMISED CONTROL STUDY**

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**Aim:** To evaluate the analgesic effect of intra-articular injection of bupivacaine alone or a combination of bupivacaine and morphine following arthroscopy of the knee joint. **Methods:** In a prospective, randomized study, 34 (42 knees) patients who required elective knee arthroscopy were assigned to two groups: Group A consisted of 18 patients (24 knees) who received bupivacaine (0.5%, 10cc) alone and Group B consisted of 16 patients (18 knees) who received a combination of bupivacaine (0.5%, 10cc) and morphine (1mg). Analgesic effect was evaluated by pain intensity (visual analogue scale) and analgesic requirements during the first four, eight, twelve and twenty-four hours post-operatively. **Results:** At 24 hours following the operation, the visual analogue scale score and the analgesic requirements were significantly higher in Group A compared to Group B ( $P < 0.01$ ,  $P < 0.01$ , respectively). Two patients in-group B complained of nausea in the first twelve hours. **Conclusion:** We conclude that a combination of bupivacaine and morphine is more effective in management of immediate post-operative pain and therefore helps in very early mobilisation. We therefore recommend the use of intra-articular injection of a combination of bupivacaine and morphine following knee arthroscopy.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Soft Tissue & Patella**

**Time: 08:30 - 10:00**

**Room: LAGOA**

**Abstract no.: 37677**

**FUNCTIONAL OUTCOME AFTER TROCHLEOPLASTY IN PATIENTS WITH HIGH-GRADE PATELLOFEMORAL DYSPLASIA - A 8.4 YEAR FOLLOW-UP STUDY**

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Introduction: Patients with supratrochlear spur in high-grad trochlear dysplasia require trochleoplasty to prevent further lateral patellar dislocation. Mid- to long-term follow-up for functional outcome and sports participation has not been reported in literature. Preliminary data are reported. Methods: 29 patients (33 knees, 23 females, 30.1 +/- 6.7 years) were prospectively analysed 8.4 years (range 1.9 to 14.1) after trochleoplasty. Kujala score and a subjective knee function questionnaire were received from all patients. Results: No recurrent patellar dislocation was reported, however two patients reported at least one episode of lateral patellar subluxation. Subjective stability without fear of re-dislocation was mentioned by 78.8% of the patients (26 out of 33). On a scale of 1 to 7 (from maximal to no impairment in sports activity) participation in sports increased from 3.3 to 4.8 postoperatively ( $p < 0.01$ ). Kujala score increased significantly from 56.6 to 74.3 ( $p < 0.01$ ). No anterior knee pain was reported in twelve knees (36.4%) prior to surgery. After surgery, 6 complained of discomfort while climbing stairs and while kneeling, and 4 while sitting. Conclusion: Central deepening trochleoplasty is a safe procedure to restore patellar stability in patients with high-grade trochlear dysplasia. Satisfactory knee function and sports participation can be achieved up to 8 years after surgery. However, pain is difficult to predict and might emerge postoperatively.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Soft Tissue & Patella**

**Time: 08:30 - 10:00**

**Room: LAGOA**

**Abstract no.: 37080**

**LONG-TERM OUTCOME AFTER SURGICAL TREATMENT OF EXTENSOR MECHANISM RUPTURES**

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All patients surgically treated at a Level I Trauma Center for quadriceps tendon ruptures (QTR) or patella tendon ruptures (PTR), within a time frame of 15 years, and with a follow-up period of at least 3 years, were enrolled in this retrospective analysis. To assess their long-term outcomes the „Single Assessment Numeric Evaluation (SANE)“, „Reduced WOMAC Function Scale“, „Knee Society Clinical Rating System (KSS)“, and the „Oxford Knee Score (OKS)“ were used. 136 ruptures met the inclusion criteria (93 QTR, 43 PTR), six times more males than females were affected. Patients in the QTR-group were significantly older (61.1y/43.2y); 7.8% in the QTR- and 12.5% in the PTR-group suffered from wound healing disorders/infections resulting in a need of surgical revision in 42.9% vs. 80% of these cases ( $p<0.05$ ). In the QTR-group 7 patients sustained a re-rupture compared to none in the PTR-group ( $p<0.05$ ). 62.3% of all patients were available for clinical evaluation. The mean follow-up period was 10.3 years in the QTR-group and 9 years in the PTR-group. In both groups comparable outcomes (good to excellent) were revealed; SANE: 88.5/93.3; WOMAC: 95.7/98.3; KSS-Knee: 93.1/91.4; KSS-Function: 89.7/96.4; OKS: 14.6/13.1. Patients with a re-rupture in the QTR-group had a significantly worse outcome in all scores despite the KSS-Knee ( $p\leq 0.004$ ). This could not be seen with infections ( $p>0.30$ ). In the PTR-group patients with an infection showed a significant inferior outcome in the SANE ( $p=0.003$ ) and WOMAC ( $p=0.008$ ) compared to those without a complication, whereas only a trend could be detected in the other scores.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Soft Tissue & Patella**

**Time: 08:30 - 10:00**

**Room: LAGOA**

**Abstract no.: 37604**

**TOTAL PATELLECTOMY IN KNEES WITHOUT PRIOR ARTHROPLASTY: A SYSTEMATIC REVIEW**

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Introduction: Total patellectomy is a radical procedure, and is only used as a last resort. The functional results reported in the literature are contradictory. The purpose of this review of the literature is to evaluate the functional outcome that can be expected after total patellectomy. Methods: The systematic review was conducted in accordance with the PRISMA statement criteria using the PubMed/MEDLINE database, the EMBASE database, the Cochrane library databases, and the OVID database. Patellectomies were performed either alone or in conjunction with reinforcement of the extensor mechanism ; they were longitudinal or transverse . Analysis was first descriptive and then comparative, based on medians. Results: Research identified 394 articles, of which 31 have been included in this review, describing a total of 1416 knees with a mean follow-up of 7 years. The mean percentage of outcomes judged good or excellent per article was 68.8% (min-max: 29-100%). The complication rate identified was 20.3% (7.6% without calcifications). The functional outcome was considered better in the group undergoing reinforcement of the extensor mechanism (median of percentages per article at 93, IQR = [74-95] versus 67 [55-79] in the group patellectomy alone). Total patellectomy gives good or excellent results in 85% of cases if reinforcement is performed with a longitudinal excision.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Soft Tissue & Patella**

**Time: 08:30 - 10:00**

**Room: LAGOA**

**Abstract no.: 37921**

**MID-TERM RESULTS OF ISOLATED PATELLO-FEMORAL JOINT REPLACEMENT: A UK DGH EXPERIENCE**

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Introduction: Isolated patello-femoral joint arthritis(PFJA) is seen in 9% of symptomatic patients aged >40years and three-fourths of them are women. Our objectives were to report a single surgeon's clinico-radiological results and outcomes of isolated patello-femoral joint replacements(PFJR) with survival analysis at five years. Methods: 21 patients (4males &17females) with symptomatic PFJA refractory to conservative treatment who underwent PFJR against stringent inclusion/exclusion criteria formed the study cohort. The mean age at PFJR was 63.4 years (range 51-79 years). All patients had standard AP / lateral and skyline view radiographs and completed outcomes questionnaires (OKS & KSS) pre and post-operatively. The improvements in outcome scores, ability to use the stairs and all untoward events / complications were diligently recorded. Revision of PFJR for any reason was considered as end-point for survival analysis. Results: The mean follow-up was 5 years (range 4-7.83 years). The mean improvement in OKS and KSS was 17.3 and 21.4 respectively. The ability to use stairs improved from 1.6 to 3.0 (scale of 0-5). One patient underwent revision to total knee replacement(TKR) due to progression of medial compartment osteoarthritis(MCOA) at 5 years. One patient underwent MUA for stiffness. There was one superficial infection that was treated by oral antibiotics. Conclusions: PFJR is associated with excellent survival results (95.24%) and functional outcomes in a select group of patients suffering from PFJA at mid-term. Progression of arthritis may warrant conversion to a TKR and indications for bicompartamental vs. TKR for symptomatic MCOA are unclear and forms ground for further research.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Soft Tissue & Patella**

**Time: 08:30 - 10:00**

**Room: LAGOA**

**Abstract no.: 38062**

**FUNCTIONAL OUTCOMES FOLLOWING QUADRICEPS AND PATELLAR TENDON RUPTURE REPAIR WITH THE LARS LIGAMENT**

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**Introduction:** We present functional outcomes in patients with quadriceps and patellar tendon repairs augmented with the LARS ligament for closed traumatic and atraumatic extensor mechanism failures of native knee joints. Our postoperative functional rehabilitation programme is introduced. **Methods:** 20 knees were treated with LARS from 2008 to 2013. 17 patients (19 knees) were available for follow up. 13 had quadriceps tendon rupture (of which, one chronic, and two re-ruptures), one bilateral quadriceps tendon rupture, one right quadriceps tendon rupture and left patellar tendon rupture, one patellar tendon rupture and one distal pole patella fracture dislocation after a primary osteosynthesis. Postoperative rehabilitation involved early protected motion with a knee brace and restricted (but gradually increased) range of motion over the first five weeks, and brace free ambulation thereafter. At a mean follow up of 2.9 years, clinical assessment, postoperative Lysholm knee score, occupational and sport activity levels pre- and post injury were recorded. **Results:** There was one (5.3%) traumatic re-rupture at three months, but no instances of infection or implant related soft tissue irritation. The Lysholm score was 93 (68-100), with good/excellent results in 78% of knees and fair in 22%. 11% of the patients obtained an inferior pre injury level of activity. Five knees had a residual extension lag of 5° and one knee had a residual extension lag of 20°. **Conclusion:** LARS augmentation allows the majority of patients an early and safe return to pre injury level of activities, especially in cases of tissue degeneration, bilateral ruptures and re-ruptures.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Revision & Unicompartimental**

**Time: 14:00 - 15:30**

**Room: LAGOA**

**Abstract no.: 37969**

**THE USE OF FEMORAL AND TIBIAL METAPHYSEAL SLEEVES  
FOR BONE DEFECTS IN PRIMARY AND REVISION  
ARTHROPLASTY**

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WATERS

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Bone loss in the distal femur and proximal tibia is frequently encountered in both complex primary and revision knee replacement surgery. Metaphyseal sleeves provide enhanced fixation in managing such defects. We present our results in 48 patients (50 knees) with a mean follow up of 24 months (9 to 42). There were 1 primary and 49 revision cases. All were graded Type II or III using the Anderson Orthopaedic Research Institute (AORI) grading system of both femoral and tibial defects. In 24 cases both tibial and femoral sleeves were used, in 20 tibia alone and 6 femoral alone. All knee radiographs at final follow-up showed no evidence of loosening. Two knees subsequently underwent manipulation under anaesthesia. One subsequently developed Complex Regional Pain Syndrome. No femoral or tibial sleeves were revised. The improvement in Oxford Knee Scores was from a mean 22 (12 to 38) to 38 (12 to 45) Our early results show encouraging results with this revision knee arthroplasty system when dealing with metaphyseal bone loss in both the femur and tibia.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Revision & Unicompartimental**

**Time: 14:00 - 15:30**

**Room: LAGOA**

**Abstract no.: 38276**

**1 TO 20 YEAR SATISFACTION STUDY OF 352 MEDIAL UNICOMPARTMENTAL KNEE REPLACEMENTS FROM AN INDEPENDENT CENTRE**

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Introduction: Oxford Unicompartimental Knee Replacement (UKR) is an option for the treatment of medial compartment osteoarthritis for over three decades. Our aim was to evaluate our 20-year results with focus on patients' satisfaction. This is an important outcome measure, however there is a lack of data regarding long-term satisfaction. Methods: All consecutive Oxford medial UKR performed between 1993 and 2012 were retrospectively reviewed. One general orthopaedic surgeon performed all procedures in a District General Hospital. Patients were assessed using a questionnaire investigating patients' satisfaction, knee function, general health and Oxford Knee Score. Results: 352 consecutive UKRs (66 Phase 2, 286 Phase 3) were performed on 287 patients (65 bilateral procedures, 125 male, 162 female patients). 234 patients were alive and 53 deceased at the time of our investigation. The average age at surgery was 68.4 years (40–89). Mean follow up was 10.1 years (1–20). 84% of patients were happy or very happy with the outcome of the procedure, 14% rated it "ok" and 2% were never happy. Average satisfaction score on a visual analogue scale (0-100) was 87. Patients were satisfied or very satisfied regarding improvement in function in 88% and regarding improvement in pain in 91% of the cases. 86% would undergo surgery again and 96% would recommend surgery. Regarding expectation prior to UKR and outcome of surgery 85% stated that their "expectations were met", 5% "expectations not met" and 10% did not have any expectations. Conclusion: Our results demonstrate excellent long-term satisfaction with the procedure.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Revision & Unicompartmental**

**Time: 14:00 - 15:30**

**Room: LAGOA**

**Abstract no.: 38529**

**TRABECULAR METAL CONES IN REVISION TOTAL KNEE ARTHROPLASTY SHORT TERM CLINICAL AND RADIOGRAPHIC OUTCOMES**

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**Purpose:** Traditional methods to date for management of major bone deficits in revision total knee arthroplasty (TKA) have been less than ideal. The purpose of this study is to prospectively analyze the early term results using highly porous trabecular metal cone implants for major bone deficit reconstruction in TKA revision. **Methods:** The study group includes 29 patients (10 women, 19 men, average age of 70 years) that had undergone TKA revision surgery with trabecular metal cone (femoral and/or tibial) implants between June 2006 and October 2011. A total of 16 femoral and 17 tibial cones were implanted. Indications for revision surgery included: aseptic loosening/wear, staged reimplantation after infection, as well as periprosthetic fracture. The indications for use of a trabecular metal cone implant were type 2B and type 3 bone defect according to the Anderson Orthopedic Research Institute classification. All the patients were prospectively followed with clinical and radiological evaluation. **Results:** At an average follow-up of 33 months (range, 13 to 73 months) the mean Knee Society Score improved from 42 preoperatively to 81 at last follow-up, a statistically significant improvement of 39 with a 95% confidence interval of 30,9 – 47,7 ( $p < 0,0001$ ). Radiological follow-up revealed no evidence of loosening or migration of the constructs. No evidence of complications was noted in correlation with the use of trabecular metal cones. **Conclusions:** Trabecular metal cones are an efficient and effective option for dealing with significant bone deficits at an average of 33 months follow-up.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Revision & Unicompartmental**

**Time: 14:00 - 15:30**

**Room: LAGOA**

**Abstract no.: 38036**

**UNICOMPARTMENTAL KNEE ARTHROPLASTY AS DEFINITIVE  
TREATMENT FOR TRICOMPARTMENTAL ARTHRITIS IN  
OCTOGENARIANS**

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Background: Unicompartmental knee arthroplasty (UKA) has a limited longevity, needing eventual conversion to total knee arthroplasty (TKA). It is a temporizing procedure in select active young patients with unicompartmental osteoarthritis (UCOA). A possible alternative indication is as definitive treatment of tricompartmental osteoarthritis (TCOA) in the very elderly patient. We analyzed the results of UKA in a series of 45 octogenarians with TCOA (predominant medial UCOA). Methods: 45 octogenarian patients with TCOA (predominant medial UCOA) underwent UKA (19 bilateral) from January 2002 to January 2012. Clinico-radiological assessment was done 3 monthly (first year), then yearly till last follow-up (average, 72mths, range 8-128mths). Results were evaluated using Knee Society scores (KSS), satisfaction index (VAS) and orthogonal radiographs (for loosening, subsidence, lysis or implant wear). Re-surgery (any cause) was considered failure. Results: Four patients (6 knees) died due to medical conditions, two patients (3 knees) were lost to follow-up. These were excluded from the final analysis. All but two patients were pain-free and performing well at final follow-up. Indications for re-surgery (2 failures) were: medial femoral condyle fracture needing fixation in one patient (subsequent conversion to TKA at 2 years), and progression of arthritis and pain in one patient (revision to TKA at 6 years). Conclusions: UKA is a less morbid procedure compared to TKA. Results of 96.4% implant survival rates and 94.9% good or excellent outcomes in our series of UKA match results of series of UKA and TKA in high-volume centers worldwide. UKA can successfully manage TCOA in octogenarians.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Revision & Unicompartmental**

**Time: 14:00 - 15:30**

**Room: LAGOA**

**Abstract no.: 37248**

**MEDIUM-TERM OUTCOME AFTER SURGERY WITH STEMMED TOTAL KNEE ARTHROPLASTIES: NO DIFFERENCE IN IMPLANT FAILURE WHEN USED PRIMARY OR AS A REVISION**

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(Introduction:) We wanted to study implant survival and functional outcome of patients operated with a constrained condylar knee (CCK) or a rotating-hinge implant (RH) as a primary or a revision total knee arthroplasty (TKA). (Patients and methods:) We evaluated clinically and radiographically 65 surgical procedures with a mean follow-up time of 5 (2-9) years (n=39 CCK and n=26 RH). (Results:) The mean age at the index operation was 68 (SD 12) years. There were 24 primary TKAs due to instability and 41 revision TKAs mostly due to aseptic loosening. Overall, there were 12 failures (19%), including 8 re-operations due to deep infections. The 5-year survival rate with re-operation as the endpoint was 82% (95% CI 72-99). Radiolucent lines on either the femoral or the tibial side were seen in 36 cases. When comparing the cases operated as a primary with a revision TKA, there was no difference concerning function, health related quality of life, or survival. However, after primary TKA, the patients had less pain ( $p=0.03$ ) and a higher proportion was very satisfied or satisfied ( $p=0.02$ ). (Interpretation:) Although a high rate of severe complications were observed, the majority reported an improved function after surgery regardless if it was a primary or a revision TKA. We found narrow radiolucent lines mainly on the tibial side in nearly half of the cases, however none was loose radiographically. Overall patient satisfaction was high as well as health related quality of life and a minority had problems with persistent pain.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Revision & Unicompartimental**

**Time: 14:00 - 15:30**

**Room: LAGOA**

**Abstract no.: 37602**

**OBESITY HAS NO ADVERSE EFFECT ON THE OUTCOME OF UNICOMPARTMENTAL KNEE ARTHROPLASTY AT A MINIMUM FOLLOW-UP OF 7 YEARS**

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Introduction : The significance of weight in the indication of unicompartimental knee arthroplasty (UKA) is unclear. Our hypothesis was that weight does not affect the long-term survival rate of UKAs. Methods : We completed a retrospective study of a cohort of 212 UKAs at a mean follow-up of 12 years (range: 7-22). The population was divided according to BMI (Body Mass Index) (above or below 30) and weight (above or below 82 kg). A Kaplan-Meier survivorship analysis was performed and 10-year survival rates were compared between the various sub-groups. Multimodal regression analysis determined the impact of the various theoretical contraindications on the long-term survival rates of UKAs. Results : Ten-year survival rates were very similar in all the groups (93.5% for weight $\geq$ 82 kg; 92.5% for weight< 82 kg; 92% for BMI $\geq$ 30 and 94% for BMI<30). Multimodal regression analysis revealed that weight plays a part in reducing the risk of revision (relative risk = 0.387 (p=0.662)). The results relating to clinical outcomes were not statistically significant. This study confirms that weight does not influence the long-term survival rates of UKAs.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Revision & Unicompartmental**

**Time: 14:00 - 15:30**

**Room: LAGOA**

**Abstract no.: 38262**

**ALL-POLY TIBIAL COMPONENT IN UNICOMPARTIMENTAL KNEE ARTHROPLASTY: A PROSPECTIVE STUDY WITH 14 YEARS MINIMUM FOLLOW-UP**

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Introduction: Aim of this prospective study is to present the results of an omogeneous series of cemented UKR using an all- poly tibial component at a minimum follow-up of 14 years. Materials and Methods: 53 patients who underwent to a medial UKR were prospectively included in the study. The mean follow-up has been 13.4 years. 32 were females and 21 males with a mean age of 76 years. All the patients did not complain a painful patello-femoral joint with no major joint laxity. Pre-operative mechanical axes was 173°. Pre and post-operatively all the patients were assessed using both IKS score and GIUM score. Results : 43 patients were available at a minimum follow-up of 14 years . At the latest follow-up the mean IKS score was 89.3, the functional score was 78.9 and the GIUM score was 77.8. Two cases were revised because a femoral component fracture in the oldest cases and 3 cases were revised because painful tibial component . The mean flexion achieved at the latest follow-up was 123°. Radiolucency was observed in 52% of tibial component even without any clinical symptoms, with a mean worsening of 2° of the mechanical axes compared to the post-operative assessment.. The Kaplan-Meier survival rate was 89.8%. Conclusions: Our Kaplan-Meier survival rate was worse compared to other authors with shorter follow-up and assessing both medial and lateral implants. However our results demonstrated a survivorship at least similar to total knee replacement but with better functional results even at a long follow-up

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Revision & Unicompartmental**

**Time: 14:00 - 15:30**

**Room: LAGOA**

**Abstract no.: 36864**

**CLINICAL AND RADIOLOGICAL OUTCOME OF TWO REVISION KNEE PROSTHESIS - A RANDOMISED, PROSPECTIVE, AND CONTROLLED STUDY**

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Introduction: Implantation of a hinged total knee prosthesis is indicated for ligamentous instabil knee arthroplasties. The clinical outcome of this kind of surgery is still very controversial. Our aim of this investigation was the analysis of the clinical and radiological outcome of two types of hinged revision knee prosthesis. Method: In this randomised, consecutive, prospective, and controlled study we enrolled 52 patients with instabil knee arthroplasty for revision-TKA (Aesculap EnduRo vs. Link SL knee prosthesis). The average follow-up was 13.8 months. For clinical evaluation we used the Oxford Knee score (OKS), the Knee Society score (KSS), the SF-36, and the VAS. Results: Surgeries were performed on average 49 months after index TKA. The patients achieved 35.5 points in the OKS for the EnduRo and 33.2 points for the LINK SL ( $p>0.05$ ). We evaluated a significant higher level of 136.5 points in the KSS for the EnduRO compared to 119.5 points for the LINK SL. Levels of persisting pain were equal in both groups. In the SF-36 score patients achieved for the physical outcome 36.3 points (LINK SL) and 37.1 points (EnduRo) ( $p>0.05$ ). For the psychic outcome 51.7 points were achieved in the EnduRo group and 52.1 in the Link SL group ( $p>0.05$ ). No radiolucent lines were found in any of the cases. The re-revision rate was 2 %. Conclusion: In this first randomised and prospective study for revision hinged prosthesis the outcome of the patients revealed good clinical and radiological results. Long-term follow-up will give valuable results in future.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Revision & Unicompartmental**

**Time: 14:00 - 15:30**

**Room: LAGOA**

**Abstract no.: 36542**

**FAILED UNICOMPARTMENTAL KNEE ARTHROPLASTY: AN ANALYSIS OF 471 CASES**

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This retrospective study was performed to determine the main causes for early and late failures of UKA. Between January 2000 and March 2012, all patients treated for a failed medial UKA in the authors' institution were retrospectively reviewed. A total of 471 patients were identified, and causes of failure were analyzed based on the medical records and radiographs at the time of revision. The cohort included 161 males and 310 females, with a mean age of 67.7 years (range, 42-91 years; SD=10.1) at the time of revision. The mean time from index arthroplasty to revision surgery was 6.1 years (range, 0.1-27.9 years; SD=5.6). 254 cases (53.9%) failed within five years after primary implantation, and 108 cases (22.9 %) failed after ten years. The major reason for failure was the development of other compartment arthritis (39.5%), followed by aseptic loosening (25.4%). Of importance, the mean time to failure after UKA was 6.1 years, with more than 50% of failures occurring within the first five years post-operatively.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Revision & Unicompartmental**

**Time: 14:00 - 15:30**

**Room: LAGOA**

**Abstract no.: 36510**

**COMPARISON WITH MINIMUM 30 YEARS FOLLOW-UP BETWEEN HIGH TIBIAL OSTEOTOMY, UNICOMPARTMENTAL JOINT REPLACEMENT, AND TKA PERFORMED IN PATIENTS YOUNGER THAN 50 YEARS**

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In patient younger than 50 years the decision is difficult whether to perform high tibial osteotomy (HTO), unicompartmental joint arthroplasty (UKA) or total knee arthroplasty (TKA) to get better survival and functional outcome with a followup of 30 years. 138 HTO, 30 UKA, and 50 TKA (age 42 years, 25 to 50 years) operated between 1973 and 1982 were evaluated with a minimum 30 years followup (30 to 40). 8 knees (with HTO) had no revision, and 39 other knees were without TKA after one revision with repeat osteotomy; The 91 other knees operated with HTO had only one revision for TKA. The 80 patients operated first with UKA or TKA required one revision TKA for 44 knees, two revisions for 28 knees (with 4 infections and deaths), and three revisions for 8 knees (with one amputation). Therefore the 80 patients operated first with UKA or TKA received with revisions a total of 204 arthroplasties at 30 years followup. Loosening was the most common cause of revision surgery, while infection appeared to be the greatest risk to success of re-revision operation. With as endpoint the first revision, the 20-year survivorship 50% for HTO, 0% for UKA, 35% for TKA; and the 30-year survivorship 6% for HTO, 0% for UKA, 0% for TKA. With as endpoint the second revision for any reason, the 30-year survivorship 100% for HTO, 0% for UKA, 35% for TKA. Beginning by an HTO remains the safest way to reach 30 years FU with only one arthroplasty.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: LAGOA**

**Abstract no.: 37057**

**PROPOSAL FOR CLASSIFICATION OF ANGULAR DEFORMITIES OF THE KNEE IN BLACK AFRICAN CHILDREN**

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**Abstract Introduction:** Angular deformities of the knee in children are the main complaints in our hospital service and accounts for 13.2%. Several classifications have been proposed in the past. However, there is no known clinical classification that enables to typify the deformities in the entire varus and/or valgus. The present study aimed to propose a simple classification that can be used even by non-specialists like in African milieu. **Materials and methods:** We reviewed the clinical records of 2711 children with deformities of the knee that were followed up in our centre during 10 years. Clinical and radiological angular measurements of the knees were analyzed. **Results:** There were 1512 boys for 1119 girls, with an average age of 3.5 years. Out of this, 58.79% presented with genu valgum (Type I) and 30.35% presented with genu varum (type II). A combination of genu valgum and genu varum accounted for 10.84% of the deformities (type III). This was however sub classified based on the affected side, age and severity. **Discussion:** Our results are discussed in the light essentially few African studies published on the subject. The present classification which has the advantage of being simple and thus easily understandable is also helpful in treatment.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: LAGOA**

**Abstract no.: 37412**

**BONE STRUCTURE VALUE AND JOINT SPACE WIDTH - A NOVEL  
TECHNIQUE OF ANALYSING OSTEOARTHRITIS IN THE KNEE**

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Osteoarthritis (OA) is a group of mechanical abnormalities involving degradation of joints, including articular cartilage and subchondral bone. As for the knee, the golden standard to diagnose OA is based on the joint space width (JSW) and secondary subchondral changes like osteophytes, cysts and sclerosis. Yet, assessments based on JSW require a proper positioning of the patients prior the X-ray, improper positioning may affect the measured results. We introduced a new factor in diagnosing OA, the bone structure value (BSV). This parameter analyses the microarchitecture of subchondral bone by fractal analysis (Hurst factor) and is invariant to positioning. It converges with the condition of subchondral bone. Using a new radiological system (i3A) we analysed a cohort of 430 digital X-rays of right/left knees and formulated following question: "Is the fractal analysis of the subchondral bone microstructure related to osteoarthritis reflected in the JSW and patient's metadata? ". This report summarizes first attempts to automatically discriminate OA and healthy patients by comparing JSW, BSV, age and BMI. There is a significant correlation between JSW and BSV in the subchondral areas as well as age and increasing BMI. This is the first report in analysing JSW and BSV in osteoarthritic and non arthritic knee joints indicating novel parameters in the development of OA to determine riskanalysis and documentation of OA progression. Implementation of this innovative method will help to get more reproducible results in follow-up studies of OA treatment and to give new insights in the development of degenerative diseases.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: LAGOA**

**Abstract no.: 38205**

**LONG TERM RESULTS AFTER MACI IN A JUVENILE LEUKAEMIA PATIENT WITH HUGE STEROID-INDUCED CARTILAGE DEFECT OF THE KNEE**

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**Introduction:** In patients with acute lymphoblastic leukaemia (ALL) the application of corticosteroids is a major component of therapy, however, can be associated with development of bone diseases such as osteonecrosis (ON). **Methods:** A 13.5-year-old female was diagnosed with ALL and treated with a chemotherapy series according including high-dose corticosteroids. ALL was treated successfully, however, the patient complained of progressive pain and loss of function of the right knee. MRI scans revealed massive ON involving the distal femur and the proximal tibia (14 cm<sup>2</sup> cartilage defect). Arthroscopy with consequent antegrade and retrograde bone drilling of involved areas was performed. Five months after initial surgery, a bone scan showed vital bone remodelling, indicating that it was appropriate to plan matrix assisted autologous chondrocyte implantation (MACI) using Hyalograft. **Results:** Five and ten-years follow-up showed continuous clinical improvement, the Lysholm score improved from 45 before surgery to finally 99, Tegner`s activity score from level 1 to level 5 at final follow-up. MRI showed a solid cartilage layer covering the medial femoral condyle with no changes comparing five and ten-years follow-up. The patient is unlimited in daily activities and moderate sports. **Conclusion:** We present for the first time long-term results in such a case. The described procedure is technically feasible and it was beneficial for the treatment of this young patient. Our long term MRI findings confirmed lasting cartilage regeneration. We believe that MACI has potential to treat massive cartilage loss in young patients with severe ON, especially to avoid early total knee arthroplasty.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: LAGOA**

**Abstract no.: 37423**

**CORRECTION OF POPLITEAL PTERYGIUM SYNDROME BY  
ILIZAROV EXTERNAL FIXATOR**

**Md Mofakhkharul BARI**

**NITOR, BIO CENTRE, DHAKA (BANGLADESH)**

Introduction: Popliteal pterygium syndrome is rare congenital anomaly characterized by a web like skin formation in the Popliteal area leading to fixed flexion contracture. This may be due to-Dermatogenic, Desmogenic, Myogenic, Osteogenic, Neurogenic, Primary treatment goals are improvement in functional extension, hygiene independence and cosmesis. Reported treatment options are anterior femoral stapling, supracondylar extension osteotomy, femoral shortening and Ilizarov external fixator. Material & Method: We report 8 cases with severe webbing causing FFD of both knee joints ( ages ranged from 3-14 years). One 14 years old boy presented to us with severe right sided webbing causing FFD of knee with 8cm shortening ( 3cm femur, 5cm tibia fibula), his daily activities were limited a movement was only by crawling or jumping. He used to walk upright. We corrected his deformity using gradual soft tissue distraction with Ilizarov fixator for 120 days. After correction of the deformity, we lengthened his tibia fibula; immediately after removal of Ilizarov fixator he was in plaster for four weeks. Conclusion: Correcting Popliteal pterygium syndrome with Ilizarov method is good choice in managing this difficult problem.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: LAGOA**

**Abstract no.: 38531**

**USE OF A BIPOLAR SEALER FOR HEMOSTASIS DURING REVISION TOTAL KNEE ARTHROPLASTY**

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Orthopädische Klinik Markgröningen, . (GERMANY)

**Introduction:** Several techniques have been adapted to minimize blood loss and blood transfusions in an attempt to mitigate post-operative complications following revision total knee arthroplasty (TKA). We evaluated the effectiveness of a bipolar sealer for hemostasis during aseptic and septic revision TKA. **Methods:** A total of 80 aseptic and septic patients undergoing revision TKA were included in this study. An equal number of prospective subjects in the aseptic and septic group (n=20) were treated with an RF energy bipolar sealer (Aquamantys 6.0 (AQM), Medtronic, USA) and these subjects were compared to a matched historic control group treated with a standard diathermy. Septic patients were on a compulsory antibiotic regimen for 3 weeks during hospitalization. Surgery time, hemoglobin and hematocrit change, blood loss, blood transfusions, and length of hospital stay were recorded. **Results:** No differences were seen in the operative time, postoperative hemoglobin and hematocrit levels, and the number of patients requiring transfusions. When AQM was used during aseptic TKA, the hospital stay decreased by 3.1 days (p=0.004) compared to the diathermy control group. In septic TKA subjects, calculated blood loss by the Gross method was lower when compared to the diathermy control patients (2031±720ml vs. 2654±986ml, p=0.0172). **Conclusions:** The use of AQM in aseptic or septic revision TKA may impact hospital stay and overall calculated blood loss. AQM may have beneficial hemostatic effects in select groups of patients undergoing revision TKA surgery.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: LAGOA**

**Abstract no.: 38521**

**ARTHRODESIS KNEE WITH ILIZAROV EXTERNAL FIXATOR**

**Harshad Mohanlal SHAH**

**M. S. Ramaiah Medical College and Hospitals, Bangalore (INDIA)**

Introduction: Arthrodesis is a surgery that can be performed in several methods. Ilizarov method has an edge over them. Material and methods: We have treated 22 patients (14males and 8females) with Ilizarov external fixation for arthrodesis done in 23 knee joints. The minimum age has been 19 years and the maximum 79 years averaging 41 years. There were 11 patients with septic arthritis, 4 Giant Cell Tumor, 2 burns contracture, 1 soft tissue sarcoma, 3 crush injury of the knee joint, 2 infected arthrodesis. Arthrodesis was done for all patients and of these; 9 patients also had their limbs lengthened. Results: In one patient with septic arthritis knee joints we had poor results. Hence amputation was performed due to uncontrolled infection. We have had good results in assessments in remaining 19 patients where arthrodesis and limb lengthening is achieved where required, 1 patient is awaiting fixator removal, 1 patient lost for follow up. Advantages noted when these patients were treated with the Ilizarov method were stable fixation, less pain, early mobilization and weight bearing, correction of deformity, limb lengthening and less incidence of nonunion. Conclusion: Though arthrodesis can be successfully performed by various methods Ilizarov method surpasses other methods of treatment as due to its obvious advantages.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: LAGOA**

**Abstract no.: 37309**

**ACTIVE TUBERCULOSIS OF KNEE- IS IT REALLY A CONTRAINDICATION FOR TOTAL KNEE ARTHROPLASTY?**

Chandrashekhar YADAV, Sanjay YADAV, Nishikant KUMAR, Samarth MITTAL, Swapnil SINGH, Amrut Raje DIWAKAR  
all india institute of medical sciences, new delhi (INDIA)

**Introduction:** Association of tuberculosis and total hip replacement (THR) is described with or without anti-tubercular treatment (ATT) cover but total knee arthroplasty (TKA) in active disease in single stage is uncommonly reported. We wish to share our clinical experience in such a case. **Case study:** A 22 year old male presented with pain and swelling of left knee for 7 months. It was drained at local health facility with sinus development. Tuberculosis was diagnosed by clinico-radiological and histo-pathological examination and anti-tubercular treatment (ATT) was started. Sinus healed but disabling pain and knee stiffness with flexion deformity persisted. Radiographs revealed destructive osteoarticular arthritis with periarticular osteopenia. Debridement followed by TKA in single stage was done with posterior stabilized implant. Postoperative period was uneventful. Histopathological analysis confirmed chronic granulomatous synovitis with caseation necrosis suggestive of mycobacterial infection. After a total of 1-year, ATT was discontinued and patient was disease free. **Conclusion:** Single stage prosthetic knee joint arthroplasty can be safely performed under adequate ATT coverage in active disease provided response to medical treatment is good. Patient counseling regarding compliance with ATT and postoperative protocol is important in ensuring success. Also, risk of disease flare up should be kept in mind.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: LAGOA**

**Abstract no.: 36678**

**COMPARISON OF PATIENT OUTCOMES FOLLOWING PROSTHETIC KNEE REPLACEMENT USING A VARIETY OF KNEE PROSTHESS: A TEN-YEAR STUDY**

**Bassel EL-OSTA**

**Croydon University Hospital, London (UNITED KINGDOM)**

Background: There are several prosthetic knee designs currently in use. There are however very few studies comparing long-term functional outcomes between patients using different models of knee prosthesis in elective knee replacement. . Method: In this study, we used the validated Oxford Knee Score (OKS) to retrospectively compare the outcomes of a total of 1635 patients who had an elective total knee replacement in a large District General Hospital, using fifteen different models of knee prosthesis, over a ten-year period. Results: The average scores reported by all patient groups showed significant improvement by three months post-operatively (pre-operative mean score 15.8, post-operative mean score 39.4,  $p < 0.05$ ), and remained similar for all models of prosthesis used over the total ten-year period. Conclusion: Based on the OKS as an assessment tool, we report no significant difference in long-term functional outcomes for this group of patients following an elective knee replacement, regardless of the type of prosthesis used.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: LAGOA**

**Abstract no.: 36649**

**TEN YEAR RESULTS OF THE ALL-POLY MONOBLOCK TIBIA IN A PATIENT POPULATION WITH HIGH FLEXION POSTURES AS PART OF THEIR ROUTINE ACTIVITIES OF DAILY LIVING (ADL)**

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**Welcare Hospital, Vadodara (INDIA)**

Over the last few decades, the All-Poly Monoblock Tibia has been relegated to a minimum use in the major healthcare systems of the western world. The main reason for this has been the perception that this component is inferior in its ability to withstand stresses, leading to widespread use of the modular metal-backed tibial component despite a higher cost. The author works in India, where the society is still highly price-sensitive and takes value for money very seriously. Further, the routine ADL of the Indian population requires them to adopt high flexion postures such as cross-legged sitting and squatting. The author has used the All-Poly Tibia extensively, which is the most economical of tibial components. Further, he has developed a surgical technique which has resulted in his patients achieving high flexion in more than 75% cases. This paper presents the 10 year results of a series of 500 cases of Primary TKR in which All-Poly Monoblock Tibia had been used. All the patients had cross-legged sitting activity as part of their ADL, thus presumably generating significant pressures on the joint surfaces. Of the original 500 cases, we could follow up 434 cases. We report a 96% survival rate of the implant in this series. There was not a single aseptic plastic failure. The message being conveyed in this paper is that All-Poly Tibia is a very cost-effective solution in routine Primary TKRs, and is able to deliver excellent long-term results even in high stress situations like cross-legged sitting activity.

**Date: 2014-11-21**

**Session: Knee: Free Papers - Knee Miscellaneous I**

**Time: 16:00 - 17:30**

**Room: LAGOA**

**Abstract no.: 38000**

**USE OF BARBED SUTURE IN CAPSULAR CLOSURE OF KNEE ARTHROPLASTY- OUR EXPERIENCE**

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**ALL INDIA INSTITUTE OF MEDICAL SCIENCES, NEW DELHI (INDIA)**

Background- Closure of wound in knee arthroplasty is of utmost importance for successful results. An inappropriate closure leads to catastrophic wound complications. Use of running barbed suture instead of traditional closure is associated with better closure, decrease surgical time and reduced infection rate. Objective- To confirm the purported benefits of the capsular closure with barbed suture 1. decreased closure time 2. decreased postoperative infection rates 3. decreased needle handling hence less needle prick injury Method- We started using barbed suture (QuillTM, Angiotech) from Jan. 2011 in primary and revision TKA cases. We retrospectively analyzed the first 500 cases of primary and revision (440 and 60 respectively), operated between Jan 2011 to November 2012, followed up for a minimum of 6 months. Wound closure time, infection rates and the incidence of needle stick injury were noted and compared with the parameters concerning the same surgical team prior to initiation of Barbed suture. Functional scoring was done by knee society score preoperatively and 6 weeks postoperatively. Results- Water tight closure of the capsulotomy wound could be achieved in all the cases. Use of running barbed suture is associated with decrease closure time by 3-4 min., decrease in infection rate, and decrease needle prick injury. There was no difference cosmetically. However, breakage of suture occurred in 5 (1%) cases during the wound closure. Conclusion- Use of barbed suture is recommended in knee arthroplasty closure in view of decrease closure time, decrease wound complication rate and less needle prick injury.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Lower Extremity**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 38520**

**COMPLEX TIBIAL CONDYLAR FRACTURES TREATED BY ILIZAROV EXTERNAL FIXATOR**

**Harshad Mohanlal SHAH**

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Introduction: Complex tibial condylar fractures are associated with complications, more so after surgery. Material and methods: Complex tibial plateau fractures were treated by Ilizarov external fixator in 61 patients. Treatment included only by Ilizarov / Hybrid external fixation (34), with screws (16) ,with Bone grafting(18) & with Bone marrow infiltration (12) . The Ilizarov external fixator was removed after 3 months to 8 months. Results: Average follow-up period was 16 months. All fractures, but one, united in an average of 14 weeks. Range of motion of knee in all patients was reasonably good with respect to the grade of fractures. Mild Fixed Flexion Deformity of Knee with restriction of motion beyond 90/1000 was as expected. One non – union was successfully treated by bone grafting. Pin tract infections were mainly seen in the Condylar Ilizarov wires as movements of knee joint was recommended at the earliest. No infection at the fracture site, septic arthritis or neurovascular complications was seen. Conclusion: Ilizarov external fixator for complex tibial plateau fractures offers the advantage of minimal invasive interventions with a high level of functionality since the early post-operative period. Ilizarov external fixator is an ideal method of treatment for these fractures when extensive dissection and internal fixation may produce more problems due to trauma to the soft tissue, deficiency of bone stock and bony comminution. Less gross complications are the best advantages. Hence, more and more of these fractures are being treated by External Fixation of various types across the world.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Lower Extremity**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 36520**

**MANAGEMENT OF HIGH-ENERGY BICONDYLAR TIBIAL PLATEAU FRACTURES BY MINIMAL INTERNAL FIXATION AND THE ILIZAROV FRAME. THE KNEE FUNCTION**

**Mohamed HOSNY**

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Background: management of comminuted bicondylar tibial plateau fractures remains a challenge to orthopedic surgeons. Methods: This is a retrospective study performed at an academically supervised level III, trauma center, in which percutaneous and /or limited open internal fixation and an Ilizarov frame were applied for displaced bicondylar high-energy tibial plateau fractures, (Schatzker types V and VI, and Orthopedic Trauma Association types C1, C2, and C3). There were fifty-five patients in this study and they were followed for a minimum of three years. Completion of the Iowa knee score, and the Short Form-36 (SF-36) General Health Survey, were a must. Results: After healing none of the studied patients needed a secondary reconstructive procedure. The knee motion ranged between 15° of extension to 155° of flexion, with an average of 88% of the total arc of the contralateral knee. The average Iowa Knee Score was 94 points (range, 65 to 100 points), at the final follow-up visit. Twenty-eight patients rated their outcome as excellent; seventeen, as good; and ten, as fair. All the studied patients returned to their previous original works. Thirty-five of them were performing strenuous labor. At the final follow-up visit, there were arthrosis grade-1 in the x-rays of twenty five patient, grade-2 in ten, grade-3 in two, and no evidence of arthrosis was found in eighteen X-rays (grade-0). Compared with the radiographic appearance 3 years after surgery. Conclusion: Patients suffering from high-energy bicondylar tibial plateau fractures could be safely treated by minimal internal fixation and Ilizarov external fixation.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Lower Extremity**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37882**

**POSTEROMEDIAL TIBIAL CONDYLE - A KEYSTONE FRAGMENT IN  
COMPLEX TIBIAL PLATEAU FRACTURE FIXATIONS**

**Sanjeev BHANDARI**

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Introduction : Till recently, the importance of posteromedial tibial condyle in stable fixation of complex tibial plateau fractures was not well-addressed. Now with easy availability of 3-D CT scans even at peripheral centres in developing countries like India, pathoanatomy of these fractures is well-delineated and proper posteromedial or posterior buttressing of this keystone fragment has led to improved outcome, without late varus collapse. Methods : We reviewed past cases where this posteromedial fragment fracture was not properly fixed and the resulting varus collapse and / or procurvatum in many of these cases led to undesirable end-results. In last 5 years, we have performed 3-D CT scans in 82 cases of Schatzker type 4 to 6 closed tibial plateau fractures – Type 4 -38 (46.3%), Type 5 -32 (39%) and Type 6 -12(14.6%). Accordingly, only posteromedial plating with lateral to medial cannulated cancellous screws for Type 4 & for Type 5 and 6, lateral simple or locking plate with the addition of posteromedial or posterior buttress plate was performed. Results : 69 patients (84.1%) got excellent to good results with < 5° deformity and average 115° knee flexion without extensor lag, 12 patients (14.6%)- mostly type 6 comminuted fractures, had fair results with obvious angular deformity or less than 90° flexion. One patient had deep infection and final poor result. Conclusion : In complex intraarticular proximal tibial fractures, understanding fracture geometry by CT images and proper fixation of all important posteromedial tibial condyle yields good results.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Lower Extremity**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37852**

**TO DETERMINE THE CLINICO-RADIOLOGICAL AND GENERAL HEALTH OUTCOME OF SURGICALLY TREATED SCHATZKER TYPE V AND TYPE VI TIBIAL PLATEAU FRACTURES AT TERTIARY CARE TRAUMA CENTRE: A PROSPECTIVE STUDY**

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Schatzker type V and type VI tibial plateau fractures are the most common to be encountered at the tertiary care centre. If the fractures are managed by the skilled orthopaedic surgeon with an adequate knowledge and expertise, can have better outcome in these fracture pattern. The purpose of this study was to assess the functional and radiological outcome and its impact on general health outcome in Schatzker Type V and Type VI tibial plateau fractures and also to assess the factors having an impact on their final outcome. All the patients with closed Schatzker's type V and VI tibial plateau fractures underwent radiographic study including CT scan. Surgical approach was dependent upon the fracture pattern. After adequate reduction of the articular surface, fractures were fixed with lag screws and or with a plate. All patients were followed up to assess the ROM, IOWA clinical scores and Radiographs. SF-36 score was used to assess the General health outcome. 40 patients with mean age of 40.85 years were studied. The Mean range of motion and IOWA knee score at the last follow up was 123.9 degrees and 90.2 respectively with good radiological outcome. There was a lack of correlation between the radiological score and IOWA knee score. The SF-36 scores showed a statistically significant improvement in all the eight domains. The management of high energy tibial plateau fractures is a challenge to the treating surgeon. However, clinico radiological results are good if the surgery is performed by the expert trauma surgery team.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Lower Extremity**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37624**

**MINIMUM 10 YEAR FOLLOW-UP AND OUTCOMES FOLLOWING  
OPERATIVE FIXATION FOLLOWING TIBIAL PLATEAU FRACTURES**

Aisling Ursula NIC AN RÍOGH, Gandhi Nathan SOLAYAR, Fintan John SHANNON

University College Hospital, Galway (IRELAND)

**Objectives:** We analysed the long-term (minimum 10 year) functional and radiological outcome following surgical treatment of tibial plateau fractures. **Method:** We performed a retrospective review of all patients who underwent operative management of tibial plateau fractures from the time radiological records were initiated till 2003. We excluded patients who did not have complete records from the time of injury. We identified 72 patients during this time – 30 females and 42 males. All fractures were classified according to the Schatzker classification. Schatzker type 2 was the commonest pattern. Patients were followed up with questionnaires and x-rays of the knee. Long term functional (HSS – Knee), patient satisfaction and radiological (Ahlbäck) scores were obtained and analysed. **Results:** 25% of patients had radiographic evidence of osteoarthritis at their last follow up. 8% of patients subsequently underwent a total knee replacement on the same side. HSS scores ranged from 15 to 92 with a mean of 76. 83% of patients were satisfied with their primary operation. **Conclusion:** Long term results following operative management of tibial plateau fractures remains good.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Lower Extremity**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37042**

**CURATIVE EFFECTS ANALYSIS ON THE SURGICAL TREATMENT FOR TIBIAL AVULSION FRACTURE OF THE POSTERIOR CRUCIATE LIGAMENT WITH DOUBLE-ROW SUTURE-BRIDGE TECHNIQUE**

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Introduction: Observe the curative effects on the surgical treatment for tibial avulsion fracture of the posterior cruciate ligament with double-row suture-bridge technique. Methods: The postero-medial approach and technique of double-row suture-bridge was applied for tibial avulsion fracture of the posterior cruciate ligament in 16 cases. The time of surgery, complications and X-ray photographs were analyzed. Pre- and post-operative knee joint function and stability was evaluated according to Lysholm scoring scale system. Results: Length of surgery ranged from 45 to 60 minutes, all incisions healed well and the vascular nerve injury and DVT was not found in all cases. Patients were followed from 4 to 12 months and X-rays showed that satisfactory reduction and bony healing was achieved in all cases. The average post-operative Lysholm score was  $93.5 \pm 2.4$  points. Conclusion: The postero-medial approach, with its safe and rapid exposure, and the technique of double-row suture-bridge, with its secure fixation and low probability of complications, may be suitable for the treatment of tibial avulsion fracture of the posterior cruciate ligament and can get good recovery with proper and timely functional exercises.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Lower Extremity**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 36950**

**DO WE REALLY NEED RETROPATELLAR NAILING IN PROXIMAL THIRD TIBIA FRACTURES?**

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**Purpose:** Proximal third fractures of the tibia can be difficult to nail using conventional technique. Common problems include valgus malalignment, antecurvation and posterior shift of the distal fragment. Methods of avoiding these pitfalls include semi-extended knee, retropatellar approach, provisional plating. The aim of our study was to refine the technique of closed interlocking nailing in fractures of the proximal tibia introducing fixator-assisted technique. **Methods:** 104 closed interlocking nailings were performed in 98 patients in 62/104 proximal tibia fractures (23 open) and 42/104 nonunions after other treatment modalities. All nailings were performed using a flat radiolucent table, in conventional knee flexion in all but one case of pre-existed knee stiffness in extension. Reduction was obtained and maintained by a pre-assembled distractor consisted of two half-rings connected with three telescopic rods. Spatial control over the proximal fragment was gained by two K-wires inserted in coronal plane. Frame application required 10-15 minutes. Transmedullary (poller) K-wires were used for additional control of nail passage. **Results:** Healing was reached in all cases, in 9/104 of them after secondary procedures in open and/or high energy injuries with low healing potential. Malunions which required surgical correction occurred in 3/104 cases and were caused by loss of fixation by two locking screws of conventional type nails. **Conclusion:** simple and reproducible fixator-assisted technique provides low invasive nail insertion in knee flexion as in midshaft fractures. It renders unnecessary retropatellar approach, semi-extended position, extended incision, use of reduction clamps or provisional buttress plating.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Lower Extremity**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37546**

**MANAGEMENT OF DISTAL METAPHYSEAL TIBIA FRACTURES WITH THE SIGN INTRAMEDULLARY NAIL IN THREE DEVELOPING COUNTRIES**

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Background: Surgical Implant Generation Network (SIGN) intramedullary nail is designed for use in low resource settings. Our purpose was to evaluate its use in distal metaphyseal tibia fractures. Methods: Data from the SIGN online surgical database was reviewed for all AO/OTA 43A fractures treated with SIGN nail at three hospitals in three developing countries. Patient demographics, clinical information about the fracture and surgery, and postoperative outcome information were collected. Patients without a recorded post-operative visit were excluded from the analysis. Results: Between February 2009 and October 2013, 160 patients with 162 fractures were included. Average age was 35.3 years  $\pm$  13.1. 79% were male. Mean time to surgery was 4.1 days. Rate of fracture union was 97.3%. Average time to union was 105 days. Open reduction of closed fractures was performed in 51 fractures. 93% of fractures had an associated fibula fracture, but only twelve (7.4%) underwent fixation. Acceptable alignment ( $< 5^\circ$  deformity) was found in 83% (n=134) fractures. Patients with open fractures accounted for 63% of total complications (p=0.001) and 86% of infections (p=0.0004). Valgus was the most common deformity overall. Complications included three nonunions (1.8%), fourteen infections (8.6%), and revision surgery in ten fractures (6.2%). Conclusion: Distal metaphyseal tibia fractures can be managed successfully with the SIGN nail with excellent union rates and low complication rates comparable to outcomes from developed countries. Open reduction of closed distal tibia fractures in developing settings is safe and effective. Malalignment, especially valgus, is more common in fractures with same-level fibula fractures.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Lower Extremity**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 36600**

**MANAGEMENT OF SIMPLE (TYPES A AND B) CLOSED TIBIAL SHAFT FRACTURES USING PERCUTANEOUS LAG-SCREW FIXATION AND ILIZAROV EXTERNAL FIXATION IN ADULTS**

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**Purpose** Although intramedullary fixation of closed simple (type A or B) diaphyseal tibial fractures in adults is well tolerated by patients, it is associated with some complications. This study evaluated the results of managing these fractures using percutaneous minimal internal fixation using one or more lag screws, and Ilizarov external fixation. **Methods** This method was tested to evaluate its efficacy in immediate weight bearing, fracture healing and prevention of any post-immobilisation stiffness of the ankle and knee joints. This randomised blinded study was performed at a referral, academically supervised, level III trauma centre. Three hundred and twenty-four of the initial 351 patients completed this study and were followed up for a minimum of 12 (12–88) months. Patient ages ranged from 20 to 51 years, with a mean of 39 years. Ankle and knee movements and full weight bearing were encouraged immediately postoperatively. Solid union was assessed clinically and radiographically. Active and passive ankle and knee ranges of motion were measured and compared with the normal side using the Wilcoxon signed rank test for matched pairs. Subjective Olerud and Molander Ankle Score was used to detect any ankle joint symptoms at the final follow-up. **Results** No patient showed delayed or nonunion. All fractures healed within 95–129 days. **Conclusions** Based on final clinical and radiographic outcomes, this technique proves to be adequate for managing simple diaphyseal tibial fractures. On the other hand, it is relatively expensive, technically demanding, necessitates exposure to radiation and patients are expected to be frame friendly

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Lower Extremity**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 36682**

**CONSTRUCTION AND BIOMECHANICAL PROPERTIES OF POLY-AXIAL SELF-LOCKING ANATOMICAL PLATE BASED ON THE GEOMETRY OF DISTAL TIBIA**

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Our study aims to provide scientific and empirical evidence for the clinical application of poly-axial self-locking anatomical plate. 80 human tibias from live adults were scanned by spiral CT . Several anatomical indices were analyzed including the length of twisting segment on the lateral surface of the tibia, the twisting angles of various twisting segments and the anteversion angle of the lateral surface of the tibia. The twisting angles of lateral tibia surface were found to be different in various segments of the distal tibia. Differences on gender and body height of individuals were also observed in the twisting and anteversion contour of the tibia. The poly-axial self-locking anatomical plate was constructed based on the geometry of the distal tibia. Biomechanical tests were performed using axial loading, 4-point bending and axial torsion loading fresh in fracture fixation models of cadaver tibias. Compared to conventional anatomical locking plate, the poly-axial self-locking anatomical plate of the distal tibia provides a better fit to the geometry of the distal tibia of domestic population. The insertion angle of locking screws can be regulated up to 30°. Its biomechanical properties were comparable to those of conventional anatomical locking plate for clinical application. This study assesses the geometry of the distal tibia of Chinese people and provides variable locking screw trajectory to improve screw-plate stability through the design of a poly-axial self-locking anatomical plate for individuals suffered distal tibia fracture.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Lower Extremity**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 36797**

**OPEN REDUCTION AND INTERNAL FIXATION OF NEGLECTED PILON FRACTURES**

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**Introduction:** The majority of Pilon fractures were caused by high-energy trauma, accompanied with compromised soft tissue condition and even poly trauma. It was not rare, in less developed areas of China, that the Pilon fractures were not treated properly in emergency conditions. Some of them were even neglected, which led to clinical challenges in subsequent management. We aimed to investigate the outcome of delayed open reduction and internal fixation of neglected Pilon fractures. **Methods:** In this retrospective study (between January 2009 and December 2012), patients with neglected Pilon fractures were included who fell into the following criteria: did not receive definitive fracture reduction and fixation until at least 4 weeks after fracture, without infection, and with a postoperative follow-up longer than 12 months. All the patients received well-planned surgical reduction and/or intra-articular osteotomy, internal fixation and autograft. **Results:** Totally 13 cases were included. The average time before definitive surgery was 9.6 weeks (4 to 24 weeks) after fracture. Anatomical and functional reduction was achieved in 6 and 4 cases respectively according to Burwell-Charnley score. At an average follow-up of 16.5 months (12-24 months), all the fracture healed successfully without implant failure or infection. Good or excellent outcome (AOFAS score) was achieved in 7 cases. Four cases developed osteoarthritis at the end of the follow-up, and one of them received ankle arthrodesis. **Conclusion:** The neglect of Pilon fracture increased the difficulty of subsequent surgical management. Good or excellent outcome could be achieved in patient with less articular comminution.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Femoral Neck Fractures**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37928**

**GANZ SURGICAL DISLOCATION FOR MANAGEMENT OF PIPKIN FRACTURE DISLOCATIONS; RESULTS OF A PROSPECTIVE TRIAL**

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**Purpose:** To describe our results with open reduction and internal fixation/fragment excision of Pipkin fracture dislocations performed using Ganz surgical dislocation. **Methods:** 28 patients with type I/II Pipkin fracture dislocation reduced within 6 hours of injury were included. The head fracture was addressed by surgical dislocation with a mean delay of 2 days (0 – 4 days). Irreducibility and non-concentric reductions necessitated urgent surgery. 26/28 patients were assessed at a mean follow up of 44 months (36 – 54 months) for clinical, radiological and functional outcome. **Results:** There were 22 type II and 6 type I fractures. 26 fractures were fixed using 2.4 mm headless screws. The infra-foveolar fragment was excised in 2 patients. There was no osteonecrosis. All fractures and osteotomies had united. Associated postero-superior labral injuries were present in 14 patients and was repaired with suture anchors. Degenerative arthritis was seen in 2 patients. 1 patient had symptomatic impingement. Heterotopic ossification (grade II) was seen in 3 patients. The mean Merle D'Aubugine score was 16.5 (14 – 18) and the mean Oxford hip score was 42.65 (38 – 48). Patients with associated labral injuries and degenerative arthritis had significantly lower clinical and functional scores ( $P < 0.05$ ). **Conclusion:** Safe surgical dislocation provides satisfactory results in Pipkin fracture dislocations. The incidence of osteonecrosis is not increased in patients undergoing early joint reduction. Associated labral injuries can have a significant impact on joint function.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Femoral Neck Fractures**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 38258**

**BIOMECHANICAL ANALYSIS OF OSTEOSYNTHESIS IN UNSTABLE FEMORAL NECK FRACTURES**

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**Introduction:** Unstable femoral neck fractures are serious injuries that are associated with high rates of complications. The lack of consensus on the best fixation method for this type of fracture led us to conduct this study. **Objectives:** To statistically analyse the results obtained in the biomechanical tests of four methods for the fixation of unstable femoral neck fractures using synthetic bones, and to compare these results with a control group. **Methods:** Twenty-five polyurethane bones divided into five groups: group1, fixation with cannulated screws in the form of an inverted triangle; group2, fixation with divergent cannulated screws; group3, fixation with dynamic hip screws and anti-rotational screws (DHS); group4, fixation with dynamic condylar screws (DCS) and group5, control group. In the groups 1,2,3 and 4 prior osteotomy was performed in the femoral neck at an angle inclination of 70° in relation to the horizontal axis to simulate an unstable. **Results:** Kruskal–Wallis ANOVA revealed a significant difference among the groups ( $p=0.0006$ ). Dunn's multiple comparison test at a 5% significance level revealed that the maximum force in group 3 was significantly greater than that in all other groups, whereas the maximum force in groups 4 and 5 was significantly greater than that in groups 1 and 2. **Conclusion:** Among the types of osteosynthesis used in this study, the results of those with a lateral plate support (DHS and DCS) were more similar to those of the control group. Moreover, all groups evaluated exhibited some degree of rotational desviation; however, this desviation was smaller in group 4.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Femoral Neck Fractures**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37847**

**TREATMENT STRATEGY FOR UNDISPLACED FEMORAL NECK FRACTURE BASED ON DYNAMIC MRI POSITIVE ENHANCEMENT INTEGRAL COLOR MAPPING**

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**INTRODUCTION:** Undisplaced femoral neck fractures are usually managed with osteosynthesis, however, some cases result in non-union or late collapse. Interruption of perfusion may occur even in undisplaced fractures. Dynamic MRI positive enhancement integral color mapping (PEICM) clearly demonstrates femoral head perfusion after femoral neck fracture. Femoral head perfusion was classified into 3 types according to the shade of the color of PEICM. Type A indicates normal flow, Type B indicates decreased flow and Type C indicates no flow. We evaluated the rates of non-union and late collapse in each type of perfusion to assess accuracy of PEICM and to verify the treatment strategy for undisplaced femoral neck fracture. **MATERIALS AND METHODS:** Sixty-five patients with undisplaced femoral neck fractures participated in this prospective study. All patients underwent PEICM with a 1.5-tesla MRI unit before surgery and were classified into Type A, Type B and Type C. All patients underwent osteosynthesis with 3 cannulated cancellous screws. Rates of non-union and late collapse were calculated in each type. **RESULTS:** Sixteen patients were classified into Type A, 43 patients were classified into Type B and 6 patients were classified into Type C. Non-union rates of Type A, Type B and Type C were 0%, 9% and 67%, respectively. Late collapse rates of those were 0%, 7% and 50%, respectively. **CONCLUSION:** PEICM precisely detected femoral head perfusion. Primary hemiarthroplasty should be considered in patients of Type C even if they had undisplaced fractures.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Femoral Neck Fractures**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 36596**

**SECOND NECK OF FEMUR READMISSIONS FOLLOWING AN INDEX SURGICALLY TREATED NECK OF FEMUR FRACTURE**

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Introduction: Contralateral second neck of femur fractures (NOF#) are said to be associated with increasing morbidity and mortality when compared with the index surgically treated NOF#. Few studies have reported on outcome following second NOF# but only included small numbers. One large study reported on outcome of these patients but excluded young patients. This study reports on rates of contralateral second NOF# following index surgically fixed fracture. Methods: Consecutive review of 4206 patients via hospital and national NOF# database over an 11-year period. Two periods database entry periods were identified: pre-national hip database and national hip database. Only patients presenting pre-national database (Group I) were studied to account for long-term follow up and reproducibility of data. Group II was defined as refractured cases. Results: Group I (median age: 82 years) requiring inpatient surgical fixation for NOF # over an 8-year period demonstrated a 4.9% (N207) contralateral second NOF# rate (Group II; median age: 85 years); 21 of these within one month. Subgroup analysis of the Group I and II failed to demonstrate any statistical difference in AMT ( $p=0.49$ ), ASA grade ( $p=0.22$ ), pre-op mobility ( $p=0.42$ ) and discharge destination ( $p=0.61$ ). Concordance between fracture type and site demonstrated that 35 patients who had an extra-capsular fracture first time had similar fracture on the contralateral side. Median survival was 677 and 477 respectively for both groups (no significant difference). Conclusion: This study demonstrated rising incidence of second contralateral NOF#, however, a similar outcome to the index NOF# was noted.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Femoral Neck Fractures**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 38492**

**TREATMENT OF FEMORAL NECK FRACTURES WITH DHS**

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Carbonera BOSCHIN<sup>3</sup>, Ramiro Zilles GONCALVES<sup>2</sup>, Rodrigo Py  
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Introduction: The present research performs a study of DHS and its correlation to age, sex, time elapsed from fracture to surgery, quality of reduction, Garden classification and the position of screw and avascular necrosis. Methods: a prospective study was carried out with 96 patients with subcapital neck fractures. All patients underwent surgery with closed reduction and internal fixation with DHS. Patients age, sex, time elapsed from fracture to surgery, quality of reduction, Garden classification and the position of screw and avascular necrosis were the evaluated parameters. Results: the average age at the onset of fracture was 52.8 years (+/- 14.3). There were 58.3% male and 41.7% female. Considering Garden classification for femoral neck fractures, 60.4% were Garden IV, 26.0% were Garden III and 13.6% were Garden II. Almost half patients (52.1%) had fractures on the right hip and 47.9% on the left one. Only 1.0% of patients were operated in the first 24h, whereas 57.3% were operated between 1 day to 7 days after fracture, and 41.7% were operated after one week. Good reduction were archived in 97.9% of patients. Nonunion were observed in 3.1%, and were treated with valgus intertrochanteric osteotomy, all of them achieving successful healing. Avascular necrosis were observed in 16.6% of patients. The positioning of screw into the femoral head presented statistical significance in correlation to necrosis. Conclusions: The incidence of necrosis in patients under 50 years-old is twice higher than patients over 50 years-old, and the displacement is a predictor factor regarding osteonecrosis.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Femoral Neck Fractures**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 38425**

**A REVISIT TO DHS COMPLICATIONS: DHS (DYNAMIC HIP SCREW) IS MORE ECONOMICALLY BENEFICIAL IN MID-TERM FUNCTIONAL OUTCOME BASIS IN FRACTURE NECK OF FEMUR TREATMENT. : A SRI LANKAN STUDY WITH COMPARED TO COHORT IN UNITED KINGDOM**

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In orthopaedic trauma, Femur neck extra capsular fracture fixation with DHS (dynamic hip screw) is one of the commonest surgeries. It is a low cost, less time consuming procedure but associated with surgical complications. Objective: Analyse the late surgical complications associated with DHS surgery in related to their functional outcome and pain at the end of post-operative 1st year. Methodology: Prospective cohort study of N= 216. Patients were reviewed at the end of post - operative 01 yr. Harris Hips Score (HHS) used to assess the functional outcome. We included the previously mobile patients with fractures comes under AO classifications (31A-31A3). Pathological fractures excluded. Results: 73.16% identified of having some complication. Collapse of the intertrochanteric ridge 37.50%, collapse of the trochanteric region 18.05%, collapse of sub trochanteric region 33.33% and collapse of femur neck 15.27%. Varus malunion in 5.55%. Screw migration in 6.94%. Pain significant in 5.54% patients and functional mobility restricted to indoors in 18.05%. Surgical site infections were 2.31%. Results were compared with cohort in U.K. Conclusion: Only 10.26 % cases required a corrective surgery. In DHS surgery, implants are less costly, less time consuming and can be perform by a trained middle grade surgeon .Most of the DHS surgical complications can be manage without a further surgical intervention. So DHS surgery is a more economically sound surgery in short term and long term basis, when compare to other available new procedures which need expensive implant, more surgical time and surgical expertise.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Femoral Neck Fractures**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 38232**

**OUTCOMES IN FRACTURE NECK OF FEMUR PATIENTS IN AN INDIAN SETTING**

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**Objectives:** To determine the morbidity and mortality outcomes of patients presenting with a fractured neck of femur in an Indian setting. Peri-operative variables related to unfavourable outcomes were identified to allow planning of intervention strategies for improving peri-operative care. **Methods:** We performed a retrospective observational study of 235 consecutive adult patients admitted to an Indian metropolitan tertiary care hospital with fractured neck of femur between 2010 and 2012. The main outcome measures were 30-day and one-year mortality rates, major complications and factors influencing mortality. **Results:** The majority of patients were elderly, female and had multiple comorbidities. Multiple peri-operative medical complications were observed, including pre-operative hyponatremia (21%), post-operative hypoxia (14%), anaemia requiring blood transfusion (36%), re-admission within 30 days of discharge (12%), acute renal impairment (8%) and myocardial infarction (4%). Mortality rates were 5% at 30 days and 12.5% at one year. **Conclusions:** Results from an Indian metropolitan tertiary care hospital confirm the persistently high morbidity and mortality in patients presenting with a fractured neck of femur. Efforts should be aimed at medically optimising patients pre-operatively and early surgery. This study provides planning data for future interventional studies.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Femoral Neck Fractures**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 38088**

**DUAL MOBILITY ACETABULAR (TRIPOLAR) CUP: A REALISTIC SOLUTION FOR PATIENTS WITH FRACTURE NECK OF FEMUR**

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Introduction: According to current NICE (National institute for health clinical excellence) guidelines in the UK a large proportion of fracture NOF patients meet the requirements to have a total hip arthroplasty (THA). Dislocation rate of THA can be as high as 20% for patients with fracture NOF. Numerous techniques have been adopted to minimise the risk of dislocation. The use of dual mobility (tripolar) acetabular components is one such strategy with a proven track record in the literature. Objectives: To assess the dislocation rate in patients with fracture NOF treated with dual mobility (tripolar) THAs in our unit. Method: Retrospective study analyzing clinical notes and radiographs for dislocation rate, cup inclination, and limb length discrepancy. Results: A total of 17 patients with fracture NOF were treated with biarticular THAs during a 3½ year study period, with an average follow up of 22 months. Mean cup inclination was 42°, with mean limb length discrepancy of 3.4 mm. All patients mobilized comfortably without the use of walking aids. There have been no dislocations in our study group to date. Conclusions: This small series has excellent results, with a 0% dislocation rate, in treating fracture NOF patients with dual mobility (tripolar) acetabular cups. This is comparable to larger studies in the literature. Dual mobility cups provide a valuable option to decrease dislocation risk without increasing polyethylene wear rate. This is a safe, effective technique with a proven advantage to reduce dislocation risk in patients undergoing THA for fracture NOF.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Femoral Neck Fractures**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 38013**

**BIPOLAR HEMIARTHROPLASTY IN ELDERLY WITH FEMORAL NECK FRACTURE USING ANTERIOR APPROACH: FASTER REHABILITATION, LESS COMPLICATION**

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Introduction: Femoral neck fractures in elderly patients are frequent and represent a great health care problem. Traditionally, hemiarthroplasty for these patients were associated with greater risk of dislocation and complication. The purpose of this study was to investigate if bipolar hemiarthroplasty for elderly patients with femoral neck fracture through an anterior approach was associated with better outcome and less complications comparing to standard posterior approach. Methods: During period of January 2010 and January 2013, we did 45 bipolar hemiarthroplasty in 45 elderly patients with femoral neck fracture. We then compared this group patients with 45 sex and age matched patients who receive hemiarthroplasty through posterior approach. Results: The mean age of patients were 73.4(62-92 years) in anterior approach group. There were 21 male and 24 female in each of the study and control groups. Patients in control group receive higher amount of blood transfusion. In addition, dislocation rate and infection were significantly higher in posterior approach group. Finally, patients in anterior approach had significantly lower postoperative hospital stay and ambulated earlier. Conclusions: Bipolar total hip arthroplasty via anterior approach is a viable option for elderly patient with femoral neck fracture. It is associated with lower complication rate, hospital stay and faster rehabilitation.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Femoral Neck Fractures**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37706**

**DISPLACED FEMORAL NECK FRACTURES IN THE ELDERLY:  
TOTAL OR PARTIAL REPLACEMENT?**

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Introduction: There's no consensus about optimal surgical treatment of displaced femoral neck fracture (DFNF) in elderly patients, but strong evidence exists in favour of primary arthroplasty. Objective: Assess and compare functional outcomes, complications/mortality rates in a series of elderly patients (>65years) with DFNF submitted to Hemi or Total Hip Arthroplasty (THA), according to Rogmark's pre-operative scoring system. Methods: Retrospective cohort study that included all DFNF in elderly patients submitted to Hemiarthroplasty (Rogmark  $\leq 15$ ) or THA (Rogmark  $> 15$ ) between January/1998 and December/2012. We assessed: Gender; Age; Mechanism of injury; Associated fractures; Comorbidities; Rogmark's score; Time to surgery; Post-Operative admission; Gardner Classification; Complications; Mortality rates; Harris Hip Score (HHS); Barthels index (BI) pre and post-operative. Results: Hemiarthroplasty group: 50 patients (40♂; 10♀); mean age 82,6years; mean Rogmark's score 10,66. THA group: 33 patients (26♂; 7♀); mean age 71,6years; mean Rogmark's score 19,38. Type IV Gardner classification was the most frequent in both groups. Mean HHS was 62,1 in Hemiarthroplasty group and 80,13 in THA group, with significant difference between groups ( $P=0,01$ ). Mean BI was statistically different ( $P=0,02$ ) in Hemiarthroplasty group (11,55/11,36), with no statistic difference in THA group (19,5/18,4). 1 deep infection and 2 dislocations occurred in Hemiarthroplasty group and 1 dislocation in THA group. Mortality rate (1year post-operative) was 15% in the Hemiarthroplasty group, with significant difference between groups ( $P = 0.01$ ). Conclusion: Hemiarthroplasty is indicated in low life expectancy patients. THA is more effective in pain relief and functional outcome of active patients with longer life expectancy.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Femoral Neck Fractures**

**Time: 14:00 - 15:30**

**Room: BOTÂNICO**

**Abstract no.: 37746**

**HIGHER MORBIDITY AND MORTALITY AFTER FEMORAL NECK FRACTURE IN PATIENTS WITH CHRONIC LIVER FAILURE**

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Introduction: Patients with chronic liver failure (CLF) are more likely to develop osteoporosis secondary to altered bone metabolism. The purpose of this study was to evaluate if liver failure is associated with a higher risk of complication after hip fracture surgery. Methods: Patients with closed femoral neck fracture were identified from the Nationwide Inpatient Sample database, and CLF patients were identified using the Elixhauser comorbidity set (2002-11). There were 128,700 closed hip fracture patients, of which 1539 had CLF. Operative fixation consisted of hemiarthroplasty, internal fixation, or total hip arthroplasty (THA). Patients managed with more than one intervention were excluded. Statistical analysis was performed using multivariate logistic regression. Results: Patients with CLF sustained femoral neck fractures at younger ages (67.9 years $\pm$ 12.8) compared to patients without CLF (78.3 years $\pm$ 12.9,  $p < 0.001$ ). CLF patients with femoral neck fractures were more likely to be male (47.8%) compared to non-CLF patients (29.8%,  $p < 0.001$ ). Both patient populations were more likely to receive a hemiarthroplasty as surgical fixation, followed by internal fixation and THA. Patients with CLF had higher mortality than those without liver failure ( $p < 0.001$ , OR 2.12, 95%CI 1.56-2.90), greater risk of transfusion ( $p < 0.001$ , OR 1.60, 95%CI 1.41-1.83) and wound complications ( $p = 0.01$ , OR 1.64, 95%CI 1.11-2.41). The length of stay for CLF patients was median 6 days, which was significantly longer than non-CLF patients (median stay 5 days,  $p < 0.001$ ). Conclusion: Patients with CLF sustain femoral neck fractures at a younger age, and have higher morbidity and mortality. Extra precaution should be taken when managing this patient population especially with regards to blood and wound management.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Proximal Femur**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 36786**

**THE LIFE AND THE FUNCTIONAL PROGNOSIS OF OLDEST-OLD PATIENTS OVER 100 YEAR-OLD WITH THE HIP FRACTURE**

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Introduction: The population of centenarians in Japan has been reached more than 50,000 since 2012. The aim of this study was to assess the life and the functional prognosis of the hip fracture in this age group. Methods: Forty patients, aged over 100, were carried to our institution due to hip fractures from 2008 to 2013. The mean age at injury was 101.1 years (range, 100 to 106). We performed hemiarthroplasty for 78%, hook pin fixation for 11% of the femoral neck fractures, and Gamma nailing for 96% of the trochanteric fractures. Full weight bearing was provided on the next day of the surgery. The life and functional prognosis were evaluated compared with 133 patients, under 99 year-old, retrospectively. Results: Survival rates at 3, 6 and 12 months after surgery were 87%, 61% and 39%. The rates in non-surgery group were 78%, 44% and 33%. The factors affecting mortality after surgery were Total Protein<5.9mg/dl, Ejection Fraction<49%, and the ability of independent walking before the injury. The rate of patients who had walked with or without devices before injury was 77% and 42% after surgery. Barthel Index at 2 weeks and 3 months after surgery were significantly correlated, and the scores also significantly related to the survival period. The predictors of reduced scores were PO<sub>2</sub><60mmHg, PCO<sub>2</sub>>44mmHg (arterial blood gas), and Ejection Fraction<55%. Conclusion: The surgical treatment and the early postoperative ambulation for centenarians with the hip fracture were effective to keep their lives and activities of daily living.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Proximal Femur**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 36790**

**APPLICATION OF LOCKING PLATE IN THE MANAGEMENT OF  
INTERTROCHANTERIC FRACTURE WITH A COMMUNUTED  
LATERAL WALL: MID-TERM RESULTS**

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Introduction: An intact lateral wall was proven essential for the postoperative stability of intertrochanteric fractures, while the lateral wall comminution might increase the risk of implant failure when the fracture was fixed with dynamic compression devices and even proximal femoral nails. We aimed to investigate the efficacy of locking plate fixation in the management of intertrochanteric fracture with a comminuted lateral wall. Methods: We retrospectively reviewed the patients with intertrochanteric fractures treated in our institution between December 2009 and May 2012. The patients were included who fell into the following criteria: confirmed in CT images to present a comminuted lateral wall, received locking plate fixation, and with a postoperative follow-up longer than 18 months. The patients were fixed either with the locking plate for contralateral distal femur ( 14 cases) or with the locking plate for proximal femur (10 cases). Delayed weight bearing was recommended since 6 weeks postoperatively. Results Totally 24 patients with 24 hips were included with an average follow-up time of 26.4 months. All the fracture healed successfully without implant loosening or screw cut-out at the end of the follow-up. Good or excellent fracture reduction was achieved in 91.7% of the patients according to the modified Baumgaertner criteria. The Harris hip scores (HHS) ranged from 62 to 86 (71.4 in average). Conclusion: Fixation using locking plate resulted in high union rate, fair to good functional outcome, and low incidence of implant failure for intertrochanteric fractures with a comminuted lateral wall in mid-term follow-up.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Proximal Femur**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 37233**

**37233. DOES VITAMIN D DEFICIENCY INFLUENCE FUNCTIONAL OUTCOME IN GERIATRIC HIP FRACTURES?**

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Introduction: Our 'Integrated Care Pathway' for geriatric inter-trochanteric fractures, has shown significant functional recovery in activities of daily living. However we do not know if Vitamin D levels pre-operatively have an influence on the functional recovery. The objective of the study is to determine if patients with Vitamin D deficiency pre-operatively have poorer functional outcomes. Methods: Patients surgically treated for an intertrochanteric fractures were divided into Group A (Deficient Vitamin D) and Group B (Normal Vitamin D). Charlson's Comorbidity Index (CCI) score and nutritional parameters including Haemoglobin, Albumin and adjusted Calcium levels were recorded. Modified Barthel Index (MBI) scores were used as a measure for functional recovery for the following intervals; pre-fall, discharge, 6 months and at 1 year follow up. Results: The mean age (A: 79.7 years, n=45; B 83.0 years, n= 126) was statistically different. However, the mean CCI (A: 9.42, B: 10.13), Haemoglobin (A: 12.4, B 11.1), adjusted Calcium (A: 2.39, B: 2.38) and mean Albumin (A: 33.6, B: 33.0) were not significantly different. The MBI scores were not significantly different at pre injury (A: 91.5, B: 89.4), at discharge (A: 55.7, B: 58.9), at 6 months (A: 70.9, B: 79.4) and at 1 year (A: 75.8, B: 79.4). Conclusions: We conclude that Vitamin D deficiency has no significant influence on functional recovery in an Integrated Care Pathway, although patients who had a normal vitamin D level pre-operatively had higher functional scores and improvement (A: 82.8%, B: 88.9%) at 1 year.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Proximal Femur**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 37742**

**MINI-OPEN REDUCTION IN INTRAMEDULLARY NAILING OF THE INTERTROCHANTERIC FRACTURES**

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Background: In most cases of the intertrochanteric fractures closed reduction during surgery can be obtained. But in some fractures open procedure should be performed. To decrease the soft tissue injury minimally-invasive techniques has gained popularity. So the aim of our study was to determine the potential of the mini-open reduction in the surgical treatment of the intertrochanteric fractures. Methods: Prospective cohort study of 52 patients underwent intramedullary nailing for intertrochanteric fractures between Dec 2012 and Dec 2013. In all cases traction table was used for reduction of the fractures. Closed reduction was achieved in 32 cases (61,5%). Open procedure has been performed in 6 cases (11,5%). In last 14 cases (27%) different types of mini-open procedure was done: manually or instrumentally through anterior stab incision or lateral mini approach in the place of the head screw insertion. Target outcome analyzed: duration of surgery, blood loss, number of the C-arm shots, need for transfusion, quality of postop reduction, postoperative complication rate. The mean term of final outcome assessment was  $5,5 \pm 2,7$  month (3-12 month). Results: The quality of the postoperative reduction was higher and radiation exposure was lower after open reduction in comparison with closed, but closed group have had advantage in low duration of surgery and blood loss. Mini-open group was characterized the high quality of the postoperative reduction as open group, but lower duration of surgery, blood loss, need for transfusion as closed group. Conclusion: Mini open reduction can successfully substitute the open procedures during nailing intertrochanteric fractures.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Proximal Femur**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 38495**

**TREATMENT OF FEMORAL NECK NONUNION USING PAUWELS" OSTEOTOMY**

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**Introduction:** The objective of this research is to evaluate the treatment of pseudarthrosis of the femoral neck using Pauwels osteotomy. **Methods:** We prospectively evaluated 41 patients with pseudarthrosis of the femoral neck treated by Pauwels osteotomy. Patients were evaluated by demographics, fracture classification, as proposed by Garden, type of fixation, pseudoarthrosis time, mechanical assessment and post-operative complications, especially in regards to avascular necrosis and conversion to total hip replacement. **Results:** the study included 22 male patients and 19 female, with mean age of 42.4 years, with 10.4 years of follow-up. The vast majority of patients were treated with cannulated screws (43.9%), had a neglected fracture (31.7%), DHS (17.1%) or with other methods. Most fractures presented Garden III (39.0%) or IV (56.1%). When considering treatment, DHS was used in 63.4% of patients and slide plate in 24.4%. The abductor moment decreased on average 12.5%, offset decreased by 45.1% and cervico-diaphyseal angle in 10.4%. Only 14.6% of patients progressed to total hip arthroplasty. **Conclusions:** biological alternative (Pauwels osteotomy) was responsible for a high consolidation rate (90.2%). When considering follow up of 10.4 years, only 14.6% of patients progressed to total hip arthroplasty.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Proximal Femur**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 37597**

**EXCHANGE NAILING FOR FEMORAL DIAPHYSEAL FRACTURE  
NON-UNIONS**

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The aim of this study was to identify risk factors for failure of exchange nailing for femoral diaphyseal fracture non-unions. The study cohort comprised 40 patients with femoral diaphyseal non-unions treated by exchange nailing. The mean age of the patients at exchange nail surgery was 37 years. The median time to exchange nailing from primary fixation was 8.4 months. The main outcome measures were union, number of secondary fixation procedures required to achieve union and time to union. Univariate analysis and multiple regression were used to identify risk factors for failure to achieve union. Multiple causes for non-union were found in 14 (35.0%) cases, with infection present in 12 (30.0%) patients. Further exchange procedures were required in nine (22.5%) cases, one patient (2.5%) required the use of another fixation modality, to achieve union. Union was ultimately achieved in 35 (94.5%) patients. The median time to union was 9.4 months after the exchange nail procedure. Univariate analysis confirmed that cigarette smoking and infection were predictive of failure ( $p < 0.05$ ). Multi-regression analysis found that Gustilo-Anderson grade, presence of dead bone or a gap and infection were predictive of exchange nail failure ( $p < 0.05$ ). Exchange nailing is an effective treatment for aseptic femoral diaphyseal fracture non-union. Patients with infection required more than one procedure. Smoking, infection and the presence of dead-bone or a gap at the fracture site were associated with an increased risk of further fixation surgery.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Proximal Femur**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 37743**

**HIGHER MORTALITY AND LENGTH OF STAY AFTER HIP FRACTURE IN CHRONIC RENAL FAILURE PATIENTS**

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Introduction: Chronic renal failure (CRF) is associated with loss of bone mineral density and osteoporosis, which can lead to an increased risk of hip fracture. The purpose of this study was to evaluate if renal failure patients, with or without dialysis, are associated with a higher risk of complications after hip fracture. Methods: The Nationwide Inpatient Sample (NIS) database was queried for patients with closed femoral neck fractures, as defined by ICD-9 code 820.08, and CRF using the Elixhauser comorbidity set. There were 68,750 hip fracture patients, 7,906 that had CRF but not on dialysis and 1,148 patients with CRF who received dialysis (CRFD). Statistical analysis was performed using multivariate logistic regression. Results: Patients with CRF were more likely to develop sacral decubitus ulcers ( $p=0.001$ , OR 1.55, 95%CI 1.19-2.02) and require transfusion ( $p<0.001$ , OR 1.46, 95%CI 1.36-1.56) compared to those without CRF. CRFD patients had greater wound complications ( $p=0.02$ , OR 1.84, 95%CI 1.12-3.03), greater surgical site infections ( $p<0.001$ , OR 2.74, 95%CI 1.68-4.47), and more DVTs ( $p=0.03$ , OR 1.70, 95% CI 1.04-2.77) than those without CRF. In-hospital mortality was higher in CRF patients than those without CRF ( $p<0.001$ , OR 1.68, 95%CI 1.43-1.96) and higher still in CRFD patients ( $p<0.001$ , OR 5.10, 95%CI 3.83-6.80). Patients without CRF had shorter LOS while patients with CRFD had longer LOS regardless of surgical intervention. Conclusion: Hip fractures patients with CRF, especially those on dialysis, have higher morbidity, mortality, and LOS compared to patients without CRF. We recommend caution when managing this patient population as longer LOS and increased complications are

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Proximal Femur**

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**Room: BOTÂNICO**

**Abstract no.: 37949**

**OUTCOME OF HIP FRACTURE SURGERY IN PATIENTS WITH POOR PRE-FRACTURE MOBILITY**

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Introduction: Hip fractures are common with a UK incidence of 70,000 cases and total healthcare costs of over £2 billion per year. Mortality rates of 10% at 30 days and up to 30% at 1-year have been reported. We wanted to assess the outcome of hip fracture surgery in patients with reduced pre-fracture mobility as this has not been exclusively studied previously. Methods: We retrospectively reviewed 168 hip fracture patients with reduced pre-fracture mobility (wheelchair bound, bed bound, walking with two aids or a frame) who underwent hip fracture surgery at our institution between 2008 and 2013 using case notes, discharge letters, outpatient clinic letters and laboratory test results. Measured outcomes included 30-day renal, cardiac and respiratory morbidity as well as 30-day and 1-year mortality. Results: Our study comprised 27% males and 73% females with a mean age of 82 years. The 30-day chest infection, acute renal failure and acute coronary syndrome rates were 26%, 7.7% and 4% respectively. In the wheelchair and bed bound group, 30-day and 1-year mortality rates were 11.8% and 52% respectively whilst in the two aids and frame group, 30-day and 1-year mortality rates were 4.34% and 39.70% respectively. Conclusions: Our study highlighted increased 30-day and 1-year morbidity and mortality rates following hip fracture surgery with notable high rates of respiratory and renal complications in patients with reduced pre-fracture mobility. We would recommend pre and post-operative optimisation with orthogeriatric review, chest physiotherapy and intravenous fluid hydration to reduce complication rates and improve morbidity and mortality.

**Date: 2014-11-21**

**Session: Trauma: Free Papers - Trauma Proximal Femur**

**Time: 16:00 - 17:30**

**Room: BOTÂNICO**

**Abstract no.: 36929**

**RADIOGRAPHIC EVALUATION OF FIXATION OF UNSTABLE  
INTERTROCHANTERIC FRACTURES WITH SHORT PROXIMAL  
FEMORAL NAIL ANTI-ROTATION (PFNA) IN THE ELDERLY**

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**Objective:** To study outcomes of the elderly patients who sustained an unstable intertrochanteric fracture treated with PFNA. **Methods:** 135 cases were collected from a Singapore general hospital from a period of December 2009 to Jun 2011. Only elderly patients aged 65 and above with unstable intertrochanteric fracture who underwent internal fixation via short PFNA were selected. Variables were collected via operating theatre manual records and computerized patient support system (CPSS)/ electronic records. **Results:** There were 51 (37.8%) males and 84 (62.2%) females in this study. The mean age of patients was 81.30. 119 (88.1%) of cases were classified AO type 2 fractures. 94 (69.6) cases achieved normal alignment post-operatively, 36 (26.7) cases achieved varus alignment while 5 (3.7%) achieved valgus alignment. 115 cases (85.2%) of helical screws in the femoral head are in zone 5, which is appropriate. Average time to radiographic union is 106.93 days. The tip-apex distance was  $\leq 25\text{mm}$  in 112 cases (87.5%) and  $>25\text{mm}$  in 16 cases (12.5%). 91 (67.4%) cases achieved good adequacy of reduction. 32 (23.7%) cases achieved satisfactory adequacy of reduction. Complications developed include lateral migration of helical screw (17 cases), screw cut-out (3 cases), intraoperative fracture (1 case), peri-prosthetic fracture (2 cases), and non-union (2 cases). Appropriate positioning of helical screw in femoral head (zone 5) leads to higher probability of good/satisfactory adequacy of reduction ( $p=0.005$ ). **Conclusion:** Good positioning of the helical screw, near normal alignment post fixation and achieving good or satisfactory reduction leads to higher union rates and lower complications.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 38070**

**THE CLASSIFICATION OF MTP JOINT PLANTAR PLATES INJURIES: PARAMETERS OF HISTORY AND PHYSICAL EXAMINATION**

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Background: Although plantar plate tears are relatively common, they are still often missed in the initial physical exam. The purpose of this study is to find the best clinical parameters to define and grade the plantar plate injuries. Materials: Sixty-eight patients (100 MTP) were graded arthroscopically according to Anatomical Classification for plantar plate tears and divided into five groups (0 to IV). Their medical records were reviewed, correlating the incidence of each parameter to the respective group. These were: use of high heels, sports trauma, acute pain, local edema, Mulder signal, increased interdigital space, pain on the corresponding metatarsal head, ground touch, MTP “drawer” test, toe purchase and toe deformities. Results: There was no statistically significant association between the grade of injury and: high-heeled shoes; sports trauma; metatarsal head pain; Mulder sign; pronation deformity; toe deviation in transverse and sagittal plane, though their combination (cross-toe) showed significantly correlation. The positive correlation to the severity of tears was found in: acute pain on onset; progressive widening of the interdigital space; loss of “ground-touch”; positivity of the MTP joint drawer test; reduction of the “toe purchase” test and toe supination deformity. Conclusions: The “drawer test” presents as the most reliable and accurate tool to classify and grade the plantar plate lesion, followed by ground touch and rotational deformities. It is possible to improve the accuracy of diagnosis as well as the prediction of the Anatomical Grade of plantar plate tears by means of the combination of both clinical history and physical examination data.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37875**

**RATIONALE FOR SURGICAL TREATMENT OF LESSER MTP JOINT  
PLANTAR PLATE TEARS: A STUDY OF 100-MTP JOINTS  
PROSPECTIVELY TREATED**

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<sup>1</sup>UNIFESP, sao paulo (BRAZIL), <sup>2</sup>St. Alphonsus Foot and Ankle Clinic,  
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Background: Instability of the lesser metatarsophalangeal joints (MTP) is a common cause of deformity and pain. The purpose of this study was to prospectively evaluate the surgical outcomes for the different grades of plantar plate tears and propose a treatment rationale. Methods: Sixty-eight patients (100 MTP joints) were prospectively enrolled and graded according to Anatomical Grade System for plantar plate tears. Based on this classification the appropriate surgical procedure was chosen as follows: Grades 0 and I, thermal shrinkage with radio frequency; Grades II and III, direct reinsertion of the plantar plate; Grade IV, flexor-to-extensor tendon transfer. All surgical procedures were associated with a Weil metatarsal osteotomy. Evaluations were performed before and after surgical treatment with a mean follow-up of 2 years (12 ~ 36 months), using clinical and radiological parameters: AOFAS Lesser MTP-IF Scale; Visual Analogic Pain Scale (VAS); ground touch; joint stability and toe purchase. Results: The analysis of the clinical parameters demonstrated a significant improvement of all groups ( $p < 0.0001$ ) after surgical treatment, but Grade IV group presented lower VAS variation and fair AOFAS score (72 points). All groups improved regarding physical exam parameters, but Grade I, III and IV tears presented proportionally less stable MTP joints following surgery, lower proportion of normal postoperative toe purchase and ground touch. All groups showed a significant improvement regarding the studied radiographic parameters. Conclusion: All operatively treated patients had significant improvement with regards to subjective and objective parameters. Grades I, III and IV presented inferior results when compared to Grades 0 and II.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37704**

**WEIL OSTEOTOMY AND FLEXOR TO EXTENSOR TRANSFER FOR IRREPARABLE PLANTAR PLATE TEAR: PROSPECTIVE STUDY**

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Instability of the lesser metatarsophalangeal joints (MTP) is a common cause of deformity and pain. When the plantar plate cannot be restored to reconstitute the normal plantar restraint of the MTP joint, flexor to extensor transfer can be used to prevent floating toe and residual instability of these joints. Method: Sixty-eight patients (100 MTP joints) were prospectively enrolled and graded according to Anatomical Grade System for plantar plate tears. Eleven patients (17 MTP joints) were treated with a flexor-extensor tendon transfer combined with a Weil osteotomy to restore the joint stability. We analyzed the length of symptoms, the location and magnitude of pain. The AOFAS forefoot score was used to evaluate pre and postoperative results. The joint instability was measured using the metatarsophalangeal "drawer" test. Results: The mean follow-up was 24.5 months. The mean VAS score preoperatively, was 7.7 and postoperatively was 2.29. The mean AOFAS improvement was 46.3 points (26-68) and it was statistically significant ( $p < 0.0001$ ). Eight patients (72%) presented a toe touching the ground after the surgery, and seven patients (63%) presented a positive toe purchase. Conclusion: Although it may be associated with some residual deformity, the Weil osteotomy with flexor to extensor tendon transfer is an effective and safe procedure for the treatment of extensive and irreparable plantar plate tears, with some residual instability.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37663**

**PATHOGENESIS OF AVULSION FRACTURE OF THE BASE OF THE FIFTH METATARSAL BONE: A CADAVERIC STUDY**

Mohamed Altayeb MUSSA, Tarek EL-GAMAL, Tamer SWEED, Euan Robert Boyd STIRLING, Ihsaan ALHADAD, Javed SALIM, Patricia ALLEN

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Background: Three different fracture patterns are described; diaphyseal, tuberosity avulsion and Jones fracture. Material: 16 human cadaveric feet were dissected (32 feet). Results: Peroneus brevis tendon had a strong broad-based structure attached to the dorsolateral surface of the tuberosity of the fifth metatarsal bone. Peroneus tertius had a weaker attachment on the superior surface of the metatarsal diaphysis. In all specimens lateral cord of plantar aponeurosis extended from calcaneus to the plantar surface of the tuberosity of the fifth metatarsal bone as a firm band. In all specimens fibres of plantar aponeurosis were seen blending with the fibres of Peroneus brevis tendon and attaching to the tuberosity as a broad and strong structure. In 10/16 specimens a strong and broad slip from the Peroneus longus was observed attaching to the plantar surface of the fifth metatarsal bone medially. Conclusions: The pathogenesis of avulsion fractures proximal to the tuberosity seems to be related to the violent pull of the strong and extensive structure formed by the converging fibres of lateral cord of plantar aponeurosis and the Peroneus brevis tendon. The current consensus that this fracture is caused by the avulsion force of Peroneus brevis tendon alone seems unlikely to be true.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37660**

**RADIOLOGICAL AND CLINICAL EFFECTS OF OPERATIVE TREATMENT ON CALCANEUM FRACTURES**

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Displaced intra-articular fractures of the calcaneum remain a therapeutic dilemma. Comparing the different types of calcaneal fractures, the treatment is still a controversy where many advocating both operative as well as conservative treatment. There is no consensus on the system to be used among orthopedists. We encounter a large number of calcaneal fractures (about 100/ year) at our hospital. The main aim of the study was to recognize if there is any statistically significant post-operative change in the radiological (Bohler's angle) features for calcaneal fractures, study the defined clinical outcomes after operative treatment and to identify whether operative treatment for calcaneal fractures results in reduced clinical symptoms. All patients that underwent operative treatment for intra-articular calcaneum fractures between June 2011 - June 2012 were followed for one year for the assessment of the defined outcomes. Two independent observers assessed the patients and evaluated the post operative radio-graphs. Descriptive statistics were used to summarize all demographic and clinical characteristics of the patients. Quantitative variable means between pre and post-operative groups were compared using paired t-test or Wilcoxon signed rank test as appropriate. Association between two or more categorical variables were assessed using appropriate Chi-square test. The interobserver reliability was measured using the Fleiss kappa while the intraobserver reproducibility was measured using the Cohen's kappa statistics. P values <0.05 are considered as statistically significant. We were able to find statistically and clinically significant results in terms of predefined radio-graphic and clinical outcomes through our study.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 36676**

**EVALUATION OF MANAGEMENT OF THE DISPLACED INTRA-ARTICULAR CALCANEAL FRACTURES (DIACF) SANDERS TYPES II AND III BY USING MINIMALLY INVASIVE SINUS TARSI APPROACH**

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Introduction: Classically the extensile lateral approach has been used for complex DIACF, while limited open procedures was advised for only simple Sanders' type II fractures. Methods: Open reduction using the limited lateral sinus tarsi approach and internal fixation using screws only was studied in 33 patients with unilateral isolated simple DIACF with a mean age of 35 years (15 type II patients and 18 type III patients). All patients were evaluated both clinically and radiologically. Results: With a mean follow-up period of 28.8 months (range 12-53 months), no cases of failure of reduction or displacement of hardware were detected. The mean AOFAS was 91.73 points while the mean MFS was 95.09 points. Twenty-eight patients were able to resume their pre-injury level of work while the remaining five refrained to sedentary jobs. The mean pre-operative Bohlers' angle was  $2.8^{\circ}$  (range from  $-38^{\circ}$  to  $24^{\circ}$ ) while postoperatively it was  $19.4^{\circ}$  (range  $5^{\circ}$  to  $49^{\circ}$ ). There was no statistically significant difference when comparing the results (AOFAS p-value 1.00, MFS p-value 0.81) between Sanders' type II and III fractures. One patient had postoperative superficial wound infection. Seven patients complained of prominent screw heads. Complex regional pain syndrome occurred in seven patients and was treated successfully at six months duration. Conclusion: The limited open sinus tarsi approach can be used successfully to treat displaced Sanders type II and III fractures. It allows for adequate visualization and reduction. Fixation by screws only is also sufficient. It also clearly avoids the major wound complication problems.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 36414**

**COMPARISON OF THE MIPO METHOD IN CALCANEAL FRACTURE  
TREATMENT VERSUS PLATE FIXATION - A 5 YEAR REVIEW**

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Introduction: A study to compare the results of minimally invasive CRP/SF( closed reduction and pin / screw fixation) vs. open reduction and plate fixation (ORPF) of the calcaneal fractures. Methods and materials: Between April 2009 and December 2013, 279 patients were treated in our institution with calcaneal fractures. Only 160 patients were followed up due to employment regulations. We used the Sanders classification of the calcaneal fractures. All patients who were smokers, diabetic, had vasculopathy or non-compliant underwent CRSF. Non weight bearing mobilization was indicated for all patients. Results: From the 160 patients, 28 (17.5%) had multitrauma, and 11 (6.88%) who suffered bilateral calcaneal fracture. 71 (44.38%) patients were treated conservatively, and 89 (55.62%) underwent surgery. Among those patients who underwent surgery, 57 (35.63 %) fractures were pinned or underwent CRSF, and 32 (20%) patients underwent ORPF. The best postoperative results were noticed with the patients who had extraarticular and Sanders type I fractures. The Böhler angle was corrected easily with those patients who underwent CRSF using the reduction instrument (Zadravec ligamentotaxis theory), but the articular surface reduction was better in those who underwent ORPF. Radiation time lower to CRP/SF. 2 mm posterior facet articular surface step had similar postoperative functional results. There were 5 (3.1%) postoperative superficial wound healing complications but not infections, but none with those patients who were treated with CRP/SF. Conclusion: Clinical/ambulation better with CRP/SF. Functionality no difference between the two methods. There is a need of rigid criteria of selection between the two methods

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 36481**

**CALCANEAL NAIL (C-NAIL)**

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The authors present the first clinical results in treatment of calcaneal fractures using a newly developed calcaneal nail (C-NAIL). In their presentation the authors describe the clinical study, the indication for the minimal-invasive operation and explain in detail the surgical procedure using this new method. Calcaneal nail C-NAIL allows for a minimal-invasive approach and high stability with low risk of infection. Methodik: The fragments are fixed with seven or less screws, two sustentacular screws, three lateral screws and two superior screws. The underlying principle of the operation is the fixation of a fractured calcaneus with a nail which is introduced by stab incision after initial anatomic reduction of the posterior facet. The nail with the attached aiming device is inserted into the drilled hole. Two screws in the sustentacular fragment determine the correct position of the nail in the calcaneal bone. Since 2011 to end of 2013 was performed in department of traumatology in Pardubice, Czech Republic and in department of traumatology in Dresden, Germany 77 cases. Four weeks after surgery, all patients were examined radiologically and after half year the AOFAS scores were evaluated. Outcome scores were between 65 and 100 points, with an average score of 94,0 points. Conclusion: C-NAIL is minimal-invasive system that allows for high primary stability, early functional aftertreatment with improved hindfoot motion and reduced probability of the risk of infection. In our practice, smokers, insulin non-dependent diabetics and the patients with high age are no contraindication to surgery by C-NAIL.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37322**

**TALAR HEAD INJURIES: A SYSTEMATIC REVIEW AND SUGGESTED ALGORITHM OF TREATMENT**

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Introduction: Talar head fractures are rare injuries, accounting for 5-10% of talar bone injuries. Its rarity contributes to the lack of structure and clarity in management of this injury. We present a systematic review of the available literature reporting cases of talar head fractures. Methods: A search of Medline, EMBASE, AMED, Google Scholar and web of knowledge search engines using the keywords “Talar head injuries”, “Talar head fractures” and “Talus fracture” was performed on 1st July 2013. Of 45 published studies that were identified by means of a literature review, six case reports met the inclusion criteria and were included for review. The paucity of data precluded data synthesis and instead a narrative synthesis is provided. Results: The commonest mechanisms of injury were road traffic collisions and boarding injuries. Four cases were managed surgically with open reduction and fixation using either cancellous screws or Steinman pins. Two surgical cases were complicated by avascular necrosis but only one underwent revision surgery. Of the two cases managed non-operatively both united but one required osteotomy and bone grafting for a malunion. A suggested algorithm of treatment is presented based on studies reviewed. Conclusion: Talar head fractures are rare but a paucity of published data currently restricts an evidence based approach to management.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37403**

**STRIPPED SCREWS DURING ANKLE FRACTURES  
OSTEOSYNTHESIS DO NOT INFLUENCE THE FINAL OUTCOME**

Stamatios PAPADAKIS, Anastasios KOUTROUFINIS, Nikitas SCHIZAS,  
Panagiotis LEPETSOS, Panagiotis ANASTASOPOULOS, Athanasios  
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**INTRODUCTION:** Lateral plating of the fibula is the standard method of fixation in surgically treated ankle fractures. During fixation, stripping of the distal screws is common. **OBJECTIVES:** The evaluation of stripped screws during lateral plating of the fibula and their influence on the final outcome. **METHODS:** The study -which is the first clinical one to our knowledge-, included 136 patients with surgical fractures of the ankle. Patients presenting any evident factors inhibiting fracture healing as well as cases with open fractures were excluded. Fibula was reduced anatomically and fixed by a 1/3 tubular plate placed laterally. Proximal screws had bicortical purchase while distal screws had only unicortical. Screws with a reduced purchase during insertion were left in place. Numbers were assigned for the plate screws, placed in sequential manner from one to ten, from distal to proximal and was recorded which of them had reduced purchase during placement. Postoperative, patients were immobilized in a below knee plaster for 6 weeks. Further evaluation was performed after 3 and 6 months postoperatively. **RESULTS:** Proximal bicortical screws had satisfactory purchase. Distal unicortical screws, Nr1, Nr2 and Nr3 presented reduced purchase in 36%, 63% and 21%, respectively. Postoperative there were no serious complications and all fractures healed uneventfully. Delayed unions occurred in 4 cases and were treated by prolonged immobilization. **CONCLUSION:** Screws with reduced purchase in the distal holes of the fibula plate do not compromise the success of the osteosynthesis.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle**

**Time: 08:30 - 10:00**

**Room: GLÓRIA**

**Abstract no.: 37137**

**A KEY TO SUCCESSFUL TALAR SHIFT REDUCTION IN ANKLE FRACTURES**

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Introduction: Previous studies have shown that even minimal talar displacement results in significant increase in intra-articular contact stress. Prompt, good reduction minimizes pre-operative swelling and facilitates early surgical intervention. To achieve this, sometimes multiple or unsatisfactory manipulations are performed, creating patient discomfort and gravitating tissue oedema. We propose modification to generally recognized technique of ankle manipulation and immobilization. Technique: With patient lying on unaffected side, injured leg is supported under the thigh and calf with ankle left to rest freely. One of the surgeon's hand supports the calf while other is placed distal to lateral malleolus manipulating the foot into internal rotation whilst preventing posterior subluxation. Back-slab is applied with ankle in its natural resting position. Methods: Patients with acute ankle fracture and talar shift. 12 female, 6 male, mean age 55. Discussion: Natural resting position of the ankle is in plantar flexion and inversion not neutral or dorsiflexion. In dorsiflexion, the widest, anterior part of talus engages with the mortise. Given the disruption of anatomical arrangements, lack of fibular buttress and the presence of fracture haematoma, maintenance of congruent joint in dorsiflexion is difficult. With gravity-aided manipulation, hind foot is naturally inverted. CFL ligamentotaxis distracts fibular fracture facilitating length restoration and allowing talus to shift medially. Relaxation of the gastrocnemius-soleus complex is not required. In our series, patients avoided multiple manipulations and did not require any additional sedation or analgesia. Definitive fixation was performed on average within 1.8 days (14 ORIFs, 1 hind foot nail, 3 conservative).

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Deformities**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 38279**

**CLINICAL AND RADIOLOGICAL RESULTS OF MODERATE HALLUX VALGUS TREATED PERCUTANEOUSLY BY M1 ISHAM-REVERDIN AND P1 AKIN OSRTEOTOMIES**

Jean Louis ROUVILLAIN, Pierre CARRET, Chafiq ZEKHNINI  
LA MEYNARD UNIVERSITY HOSPITAL, FORT DE FRANCE  
(MARTINIQUE)

Introduction : The aim of this study is to evaluate the radiologic and clinical results at two year FU minimum of moderate hallux valgus treated percutaneously by M1 Isham-Reverdin and P1 Akin osrteotomies. Material and methods It is a retrospective study of 57 feet operated between 2003 and 2011. The inclusion criteria were : moderate hallux valgus with angles M1-M2  $<15^{\circ}$ , M1-P1  $<40^{\circ}$ , mobile and congruent joints. Results Mean FU was 35 months (24-82). M1-P1, M1-M2, DMAA, DM2A, and P1-P2 angles were improved. The mobility of M1-P1 joint was decreased. More on dorsal ( $20^{\circ}$ ) than plantar flexion ( $10^{\circ}$ ). But 90% of the patients were satisfied. The Kitaoka score improved from 60 to 90/100. Complications as superficial skin burns and metatarsalgia were noted. Discussion This is very significant improvement for M1-P1 and DMMA angles. The M1-P1 joint stiffness is very well tolerated. The perioperative pain was decreased compared to a conventional surgical approach.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Deformities**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 38019**

**A COMPARISON OF CHEVRON AND LINDGREN-TURAN  
OSTEOTOMIES IN MODERATE HALLUX VALGUS**

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Introduction: Hallux valgus is a common deformity and many surgical techniques have been described for operative treatment. This study aims to compare two known techniques in moderate hallux valgus: Chevron and Lindgren-Turan osteotomies. This study has been designed as a prospective, randomized and single blinded. Methods: After getting a permission from local medical ethics committee of our hospital; 66 female patients (32 Lindgren-Turan and 34 chevron group) were included in this study. Operative procedures have been performed by two surgeons and patients were followed up by another researcher who did not see the roentgenograms and who did not know which procedure has been performed. The mean followup was 26 months. Results: Statistical analyses indicated that there was no significant difference between two groups, regarding American Orthopaedic Foot and Ankle Society's clinical rating system and Painful Foot Evaluation scale of Maryland University scores. The sole significant difference was shorter surgery time of the Lindgren-Turan group comparing with chevron group. Conclusion: In moderate hallux valgus deformity both of the chevron and Lindgren-Turan osteotomy techniques are effective, safe and reliable techniques for clinically and radiologically. Due to the shorter surgery time and simple application technique Lindgren-Turan osteotomy seem to be a suitable option for operative treatment of moderate hallux valgus deformity.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Deformities**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 38090**

**EARLY RESULTS OF MODIFIED SCARF OSTEOTOMY FOR TREATMENT OF HALLUX VALGUS**

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Introduction: Although scarf osteotomy was described by Meyer in 1926, it was popularized by Weil and Barouk. It is indicated for treatment of moderate and severe degrees of hallux valgus. We are describing a modified scarf osteotomy for hallux valgus correction. Methods: We present early results of modified scarf osteotomy in 12 patients with mean follow up of 12 months, with radiographs and clinical scoring. In this osteotomy we cut medial wedges from the distal and proximal cuts of the scarf osteotomy. This gives the advantage of simultaneous correction of DMAA in addition to correction of the hallux valgus angle and the intermetatarsal angle. Results: Mean preoperative and postoperative AOFAS(American Orthopaedic Foot and Ankle Society ) scores were 69.6 and 81.7 respectively. Mean preoperative and postoperative DMAA were 19.3 and 12.3 respectively. Conclusion: modified scarf osteotomy is a reliable method for treatment of hallux valgus with added advantage of correction of DMAA.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Deformities**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37849**

**A REPRESENTATIVE REPRODUCIBLE CADAVERIC MODEL FOR HALLUX VALGUS, AND THE DEVELOPMENT OF NOVEL DYNAMIC MANAGEMENT STRATEGIES**

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**Introduction** Hallux valgus deformity is the result of a progressive alteration in the mechanical axis of the first ray of the foot, that results in several deformities: metatarsus primus varus, hallux valgus, a bony prominence of the metatarsal head, first ray pronation, subluxed flexor and extensor tendons, and an attenuation of the crista retaining the sesamoid, attenuation of the medial capsule, and the development of an adventitial bursa. **Objective** The objective of this study is to reproduce the mechanical aetiological factors of HV in a normal foot and to produce the characteristic anatomical changes associated with this condition. **Methods:** A cadaveric normal adult foot is used. A four step technique is used. The 1st ray is then dissociated from the 2nd by division of the Lis Franc's ligament. A metal spring is used to produce a metatarsus primus varus. The attenuated medial capsule is simulated by performing a distally based capsulotomy. Finally the Flexor hallucis Longus is identified, and a suture attached to this tendon is used to apply tension of 10N along the anatomical path of the tendon and this reproduces the characteristic features of HV. **Results:** The technique described above produces a deformity that has the features of Hallux Valgus. The model has two stable positions and hallux readily toggles between anatomical and valgus positions. We have developed a model of HV from a normal cadaveric foot. We feel that such a dynamic model is a sounder basis for developing novel techniques for deformity correction.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Deformities**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37543**

**ANATOMY BASIS AND CLINICAL SIGNIFICANCE OF VARIOUS TYPES OF ABDUCTOR HALLUCIS SUPERIOR MARGIN ARTERIAL ARCADES**

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Introduction: The aim of this study was to group arteries of arterial arch at the superior margin of the abductor hallucis muscle according to their constitutes and provide anatomical basis for reverse bifoliated flap based on it. Methods: The constitute, track-way and distribution of the artery, which supply the medial pedis flap, the medial plantar and the medial tarsal flap, especial the arterial arch at the superior margin of the abductor hallucis muscle were observed and analyzed on 81 lower limbs cast specimens and 2 fresh feet specimens. Results:According to their constitute, arterial arch at the superior margin of the abductor hallucis muscle can be classified into 3 types: i) type I, It was constituted mainly by the branch of anterior medial malleolus artery and (or) the medial tarsal artery. ii) type II, It was constituted mainly by the superficial branch of the medial plantar artery; iii) type III, It was constituted mainly by the branch of anterior medial malleolus artery and the branch of medial tarsal artery anastomose with the superficial branch of the medial plantar artery. Conclusion: According to the constitute of arterial arch at the superior margin of the abductor hallucis muscle can be classified into 3 types: The type of anterior medial malleolus artery and medial tarsal artery, the type of superficial branch of the medial plantar artery and the type of mixed. For the type mixed, 2 subtypes can be classified according to the different anastomosis of the artery.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Deformities**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 36798**

**THE CHRONOLOGICAL CHANGE IN PLANTAR PRESSURE DISTRIBUTION DURING WALKING IN A HALLUX VALGUS CASE THAT UNDERWENT THE LAPIDUS ARTHRODESIS**

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**Introduction:** We herein report on our case in which plantar pressure distribution during walking prior to and following surgery was measured with respect to a hallux valgus case that underwent modified Lapidus arthrodesis and an investigation was carried out into the chronological change thereof. **Methods:** The subjects were 20 cases and 26 feet that underwent modified Lapidus arthrodesis, with an average age at the time of surgery of 63.1 years old. Regarding measurement, the plantar was divided into the six areas, with power, maximum pressure, as well as mean pressure measured in all areas. The evaluation items were power, maximum pressure, mean pressure, hallux valgus angle (HVA), intermetatarsal angle (IMA), and AOFAS hallux scale. **Results:** The plantar pressure chronologically increased in the inner forefoot area and hallux area regarding each item of power, maximum pressure, as well as mean pressure following surgery. Moreover, a tendency was observed for the range of body sway to become narrower following surgery compared to prior to surgery. The average HVA improved from 42.0° prior to surgery to 13.7° one year following surgery, while the average IMA improved from 17.5° prior to surgery to 9.8° following surgery. The average AOFAS hallux scale improved from 56.5 points prior to surgery to 92.6 points following surgery. **Discussion:** These results suggest that improved foot shape by modified Lapidus arthrodesis improves load in the inner forefoot area and hallux area, thereby stabilizing the gait by applying sufficient load inside focusing on the hallux line during walking.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Deformities**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 36656**

**TOEFITPLUS - FIRST MTP JOINT REPLACEMENT-MID-TERM RESULTS**

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**Introduction:** In mid-term retrospective study we present clinical results with implantation of the total Toefit-Plus endoprosthesis in the treatment of severe degenerative changes of the first MTP joint. **Methods:** From March 2006 to November 2010 we implanted 23 total Toefit-Plus endoprostheses. We followed 22 patients, 19 women and 3 men, with an average age of 55 years. The mean duration of follow-up was 54 months. Indication for surgery was hallux rigidus. Clinical outcomes were evaluated by VAS questionnaire and Kitaoka score. The first follow-up period was on average 2,3 years post surgery, the second follow-up period on average 4,6 years post surgery. **Results:** The mean pre-operative Kitaoka score was 45, in the first follow-up period was 76, and in the second follow-up period was 66. The mean value of the VAS questionnaire was 7 points before surgery, 2 points in the first follow-up period and 4 points in the second follow-up period. Average range of motion at the first MTP joint was 20° before surgery, 46° in the first follow-up period, and 35° in the second follow-up period. The most frequent complications included osteolysis around the phalangeal component, stiffness of the joint, and progression of pain. Revision surgery was required in 18,2% patients. **Discussion:** We achieved encouraging short-term outcomes, however, in the final assessment there was an alarmingly high rate of complications. **Conclusion:** At the present time we have discontinued indicating total endoprosthesis of the first MTP in the treatment of hallux rigidus.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Deformities**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37455**

**OUTCOME OF FIRST TARSMETATARSAL JOINT FUSION WITH SMALL FRAGMENT T-PLATE AND AN INTER-FRAGMENTARY COMPRESSION SCREW IN TREATMENT OF HALLUX VALGUS**

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**Problem Description:** Fusion of 1st TMT joint has been indicated in hallux valgus when there is hypermobile first ray or arthritis of 1st TMT joint. Fusion by the original Lapidus procedure has been associated with high failure rates and increased incidence of non-union. The purpose of this study is to present the clinical outcome of 1st TMT fusion in patients using a standard small fragment t-plate and an inter-fragmentary compression screw. **Material and methods:** This is a retrospective case series study on 30 patients (35 feet) who were treated by fusion of 1st TMT using a standard small fragment t-plate and an inter-fragmentary compression screw. Functional evaluation of patients was done using AOFAS hallux metatarsophalangeal- Interphalangeal scale. **Results:** The mean follow up was 34 months ( $\pm 6$  STD). Hallux valgus angle decreased from  $35.2^\circ$  preoperatively to  $14.2^\circ$ . The intermetatarsal angle was also reduced from  $16.3^\circ$  to  $7.5^\circ$ . Patient satisfaction was 87.8%. The AOFAS score showed statistically significant improvement from 65 points ( $\pm 4.7$  STD) to 90 points ( $\pm 3.8$  STD). Two patients showed local skin problems that healed with conservative treatment. One patient suffered from secondary hallux rigidus. None of the involved patients presented with non-union. **Conclusion:** 1st TMT joint fusion with the technique described provided statistically significant improvement in clinical and functional outcome with no reported cases of non-union.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Deformities**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37124**

**FIVE YEARS POST COMPRESSION ARTHRODESIS IN INFECTED  
DIABETIC CHARCOT ANKLE JOINT**

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Background: Charcot ankle joint is a real surgical challenge because of the resistance of infection, presence of deformity and instability that – in many instances - makes amputation inevitable. Patients and methods: Twenty patients (44 – 69 y.) with actively draining sinus(es) (over than 1y. duration) from unstable, deformed (moderate to severe) diabetic Charcot ankle joints; were operated upon. All were giving a history of previous multiple drainage or soft tissue debridement procedures 2 to 5 times (3 in average). All patients were treated by a one stage intervention in the form of radical debridement of the infected ankle bone and soft tissues followed by ankle compression arthrodesis by a modified Charnley's device. Results: Twelve patients (60%) showed solid (bone) union, with infection eradication in 9 (45%) of them. Five patients (25%) had stable (fibrous) nonunion with infection eradication in only 3 (15%) of them. Two patients (10%) showed complete failure of the procedure in the form of unstable nonunion with persistence of infection. The remaining one patient (5%) had no residual infection but still with unstable nonunion. Average time for bone healing was 14w. (12-23w.). There was no late reactivation of infection after a follow up of 5 years (4.5 - 6.5 y.). Conclusion: Combined joint debridement and compression arthrodesis is a successful method of limb salvage in infected diabetic Charcot ankle joints; obtaining a total satisfactory stable ankle in 85% of patients (with 60% solid union); and infection eradication rate of 65%.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Deformities**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 36781**

**MANIPULATION AND STEROID INJECTION TO TREAT PAIN AND STIFFNESS FOLLOWING FIRST RAY SURGERY**

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**Aim:** To determine the effectiveness of manipulation under anaesthesia and local steroid injection to treat pain and stiffness of the first metatarsophalangeal joint following surgery for hallux rigidus and hallux valgus. **Methods:** Patients were identified who had undergone surgery for hallux rigidus or hallux valgus and subsequently were treated with manipulation and steroid injection for pain and stiffness of their joint. Patient records were reviewed to determine the range of movement of the joint prior to and following treatment. Manchester-Oxford Foot questionnaires were sent to patients to evaluate symptoms post-operatively. **Results:** In total 17 patients developed stiffness of their first metatarsophalangeal joint following hallux rigidus surgery and 7 patients, following hallux valgus surgery. The median range of movement of the joint improved following manipulation by 40 degrees in the hallux rigidus group ( $p < 0.001$ ) and 35 degrees in the hallux valgus group ( $p < 0.01$ ). At subsequent follow up the range of movement was still improved by 15 degrees in the hallux rigidus group ( $p = 0.013$ ) and 17.5 degrees in the hallux valgus group (not significant). The majority of patients reported none or only rare limitations to activities such as walking, work or recreational activities on post-operative questionnaires. **Conclusions:** Manipulation under anaesthesia and local steroid injection is an effective way of treating pain and stiffness of the first metatarsophalangeal joint following first ray surgery and results in an improved range of movement and few limitations to activity post-operatively. This may help to postpone or avoid more radical surgery such as joint fusion.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Reconstruction**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 37780**

**FIFTH METATARSAL FRACTURES NON-UNION: OUR INSTITUTIONAL EXPERIENCE AND A REVIEW OF THE LITERATURE**

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**Background:** The aim of this study was to present the incidence, and evaluate the safety and efficacy of the management of symptomatic fifth metatarsal non-unions. **Methods:** This is a case series of patients treated in our institution for isolated fifth metatarsal symptomatic non-union following failure of non-operative management. **Results:** Over a 7-year period, forty-one patients (mean age 33.3 years, range 9 to 66), out of 2940 (1.39%) with fifth metatarsal fractures treated in our institution developed a painful non-union. Seven out of 2268 (0.6%), 22 out of 168 (13.1%) and 12 out of 504 (2.4%) Type I, II and III fractures respectively, developed a symptomatic non-union. Twenty-six of them had cannulated screw fixation, 12 underwent ORIF and three fragment excision. In nine patients there was a residual gap following reduction and autologous bone graft was used to augment the fixation. The mean time to healing was 14.4 weeks (range 6 to 106 weeks). The most common complication was prominent metalwork (seven patients); in six of them the metalwork was removed and the symptoms improved, whereas one patient refused any further procedures. At the time of union all but the patients who had a second operation, reported that they had returned to their previous everyday activities. **Conclusions:** Surgical management of symptomatic 5th metatarsal non-unions is a safe and efficient procedure. We recommend either excision or fixation depending upon the fracture size, closed intramedullary screw fixation and ORIF for non-unions of Type I, II and III fractures respectively.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Reconstruction**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 37609**

**EVALUATION OF EXCISION OF PAINFUL ACCESSORY NAVICULAR BONE THROUGH A SPLIT IN THE TIBIALIS POSTERIOR TENDON**

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An accessory navicular bone is a congenital anomaly caused by aberrant ossification . Usually asymptomatic , Occasionally these become symptomatic with manifestations as acute or chronic pain at the medial aspect of the foot. Foot and ankle pain secondary to accessory navicular bone is being of increasing frequency because of the increase of interest in sports activities. 25 patients have accessory navicular bone complaining of pain at the medial side of the foot and ankle and radiographs revealed type two accessory navicular, in the period between July 2011 and July 2013 , underwent excision of the accessory navicular bone through a split in the tibialis posterior tendon and suture of the split after removal of the accessory bone. A splint was applied for 4 weeks in all cases. The age ranged between 18 and 32 years , 16 cases were females and 9 cases were males . All cases evaluated preoperative and postoperative with the American Orthopaedic Foot And Ankle Society Ankle –Hind foot Scale(AOFAS). The follow up period ranged between 6 months to 24 months. All patients could return to the full activity in a period ranged from 8 to 12 weeks

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Reconstruction**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 38340**

**HISTOLOGICAL EVALUATION OF CALCANEAL TUBEROSITY  
CARTILAGE - A PROPOSED DONOR SITE FOR OSTEOCHONDRAL  
AUTOLOGOUS TRANSPLANT FOR TALAR DOME  
OSTEOCHONDRAL LESIONS**

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HAMILTON, James CALDER

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KINGDOM)

Osteochondral Autologous Transplant (OATs) as a treatment option for Osteochondral lesions (OCLs) of the talar dome frequently uses the distal femur as the donor site which is associated with donor site morbidity in up to 50%. Some studies have described the presence of hyaline cartilage in the posterior superior calcaneal tuberosity. We aimed, in this cadaveric study, to histologically evaluate 12 osteochondral plugs taken from the posterior superior calcaneal tuberosity and compare them to 12 osteochondral plugs taken from the talar dome. In the talar dome group, all samples had evidence of hyaline cartilage with varying degrees of GlycosAminoGlycans staining. The average hyaline cartilage thickness in the samples was 1.33 mm. There was no evidence of fibrocartilage, fibrous tissue or fatty tissue in this group. In contrast, the Calcaneal tuberosity samples had no evidence of hyaline cartilage. Fibrocartilage was noted in 3 samples only. We believe that the structural differences between the talus and calcaneum grafts render the posterior superior calcaneal tuberosity an unsuitable donor site for OATs in the treatment of OCL of the talus.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Reconstruction**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 38107**

**SINUS TARSI- A PROPRIOCEPTIVE ORGAN**

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The aim of this study was to identify the neurohistological nature of the subtalar tissues in an attempt to clarify the mechanism of action of sinus tarsi implants used for correction of flexible flatfeet. From twenty six patients (mean age 29 year, 14 male and 12 female) soft tissue material was excised from the sinus tarsi during operative intervention in the foot for different indications. The excised tissues were studied histologically with different staining methods. The histological examination revealed the presence of large amount of neural elements (mechanoreceptors) together with abundant elastic fibers in all of the excised subtalar tissues. Our findings suggest that the sinus tarsi is a neurosensitive elastic organ which in turn may explain that the postoperative improvements with the use of subtalar implants in patients with flexible flat feet are not only mechanical in nature but there is also a proprioceptive information mechanism present in the sinus tarsi.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Reconstruction**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 37347**

**SUBTALAR ARTHROEREISIS IS A USEFUL ADJUNCT IN THE SURGICAL TREATMENT OF ADULT FLEXIBLE FLATFEET**

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**Introduction:** The purpose of this study was to evaluate early results with insertion of the subtalar arthroereisis implant as an adjunct procedure for adult flexible flatfeet in the Singaporean population. **Materials and Methods:** Eighteen patients with stage IIb posterior tibial dysfunction underwent surgical treatment between September 2010 and December 2012. All 18 patients were subjected to the same surgical reconstruction recipe. Prospective data was collected using the America Orthopaedic Foot and Ankle Society (AOFAS) hindfoot-ankle score, the SF-36 outcome score and the VAS score for pain. Preoperative and postoperative standing radiographs were analyzed to determine radiographic correction of the deformities. The Wilcoxon signed rank sum test was utilised to evaluate the functional scores and radiological angles. **Results :** The average follow-up was 20.31 months ( range, 13-23 ). AOFAS scale improved from a preoperative average of 47.2 to an average of 61.6 at 1 year. 6 out of the 8 component scores of the SF-36 had significantly improved. (  $p < 0.05$  ). Significant improvements in talonavicular uncoverage angle and Meary's angle were noted. The VAS score for pain improved significantly in 81% of patients. **Conclusion :** Subtalar arthroereisis is a useful adjunct in the surgical reconstruction of Stage II adult flatfeet with good radiologic deformity correction and patient satisfaction. There however, remains a high incidence of sinus tarsi pain (19%). A randomised study comparing the efficacy of this procedure against the lateral column lengthening procedure is warranted before its true therapeutic effect in the adult population can be established.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Reconstruction**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 36745**

**CORONAL ATTACHMENT AREA AS A NEW PARAMETER FOR THE EVALUATION OF PLANTAR FASCIA**

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The purpose of this study is to analyze coronal attachment area as a new parameter for the evaluation of plantar fascia and compare the possible related factors between this new parameter and the plantar fascia thickness. A total of 100 healthy individuals who had ankle magnetic resonance (MR) imaging were analyzed for this study. The homogeneity of the study group was statistically confirmed. The attachment length of the plantar fascia on coronal plane and the thickness of the plantar fascia on sagittal plane were measured from MR images. A specially designed modeling was used in order to calculate the insertion area (mm<sup>2</sup>) of the plantar fascia on coronal plane. The weight, height, body mass index (BMI) and time spent on foot for the individuals were recorded and the outcomes were statistically analyzed in order to understand if any correlation exists between these parameters and MR findings. As a result, the mean plantar fascia attachment length on coronal plane and mean plantar fascia thickness were 33,2 mm (range:20-50 mm) and 4,08 mm (range:2-7mm), respectively. Mean coronal attachment area was 271,2 mm<sup>2</sup> (range:106-447 mm<sup>2</sup>). Coronal attachment area showed more correlation with body weight and BMI than that of plantar fascia thickness. On contrary, it had no significant correlation with height and time spent on foot. In conclusion, weight and BMI had a significantly more positive impact on coronal attachment area. So calculating the coronal attachment area can be used as a useful diagnostic tool for plantar fascia related diseases.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Reconstruction**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 37446**

**RESULTS OF A PROSPECTIVE STUDY OF 71 TOTAL ANKLE ARTHROPLASTIES (TAA) WITH A 3 YEAR FOLLOW-UP**

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Introduction : TAA and tibiotalar arthrodesis are the main alternatives in the surgery of ankle arthrosis, and each of these procedures keeps ardent defenders. Some surgeons underscore the definitive result and the well-known good results of arthrodesis on pain relief. Others favour the preservation of motion, which prevents the overuse of the adjacent joints, improves functional outcomes with no need to wait for fusion that can be difficult to obtain. We report the results of a prospective study on 71 TAA performed since 2007 by surgeons without link with pharmaceutical industry, and including their learning curves. Materials and methods : Two surgeons in two centers performed 71 SaltoTM prosthesis with mobile-bearing polyethylene between June 2007 and September 2013. The cohort was composed of 24 women and 47 men, mean age 61 (27-85). Results : The survival rate at follow-up was 97%. The postoperative AOFAS score was 89 points (31-100) at follow-up, showing an improvement of 57 points. Bone cysts were detected in 11 cases (16%). One cutaneous flap was performed for scar necrosis. An evolutive bone cyst was grafted. One revision for malposition of a talar component was performed. One prosthesis was removed and converted to arthrodesis with bone graft. One calcaneal osteotomy was performed for a progressive varus deformity of the hind foot. Conclusion : TAA is a tricky procedure that provides excellent results, as shown by the good survival rate and functional outcomes of our study. The bone cysts (16%) remain a matter of concern.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Reconstruction**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 37454**

**ANKLE ARTHRODESIS : A COMPARATIVE STUDY BETWEEN LOCKING PLATES AND SCREW FIXATION**

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Introduction : In open ankle arthrodesis, debate remains as to which fixation devices should be used. The purpose of this study was to compare clinical and radiographic outcomes of a cohort of 51 ankle arthrodesis with anatomical locking plates or screw fixation. Materials and Method : between 2007 and 2013, we performed a multicentric, comparative study of a series of 51 ankle arthrodesis in 49 patients. The mean age at the time of procedure was 50 (26-90). TibiaXys™ locking plates (Integra) have been used 26 times and compression cannulated screws 25 times. The surgical approach was anterior in all cases. Radiographic and clinical outcomes were evaluated at a mean follow-up of 29 months (15-76). Results: Fusion was obtained in 49 cases (96%). Two nonunions were observed with screw fixation. In the 49 remaining cases, complete radiographic fusion was observed at mean 5.7 months (1.8-16), but faster with plates with an average fusion at mean 4.9 months (1.9-11). One revision with bone graft and plate was performed on a nonunion. Patient with nonunion reached satisfactory outcome after screws removal. The clinical AOFAS score improved from 26.7 to 71 points with no significant difference between the two groups. Conclusion: Open ankle arthrodesis is a reliable procedure with satisfactory outcomes. Fusion occurs faster with anatomical locking plates than with compression screws. From now on, we choose to perform ankle arthrodesis with anatomical locking plates.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Reconstruction**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 37934**

**THE FOOTPRINT OF THE ACHILLES TENDON- A CADAVERIC STUDY**

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Ten fresh frozen cadaveric leg specimens were dissected to identify the different Achilles tendon fascicles insertion footprint on the calcaneum in relation to their corresponding muscles. All specimens showed a similar pattern of fascicle insertion into the different facets of the calcaneal tuberosity. These can be divided into a superficial part and a deep part. The superficial part of the insertion is made by tendon fascicles from the medial head of the gastrocnemius muscle which fan out and insert over the entire width of the inferior facet of the calcaneal tuberosity. In one specimen, this insertion had continuity with the plantar fascia in the form of periosteum. The deep part of the insertion is made of fascicles from the soleus tendon which insert mainly on the medial aspect of the middle facet of the calcaneal tuberosity while the lateral head of the gastrocnemius tendon fascicles insert mainly on the lateral aspect of the middle facet of the calcaneal tuberosity. This new description of the Achilles insertion footprint may allow a detailed understanding of the function of each muscular part of the gastrosoleous complex. This has potential significant clinical relevance in the treatment of Achilles pathologies around the Achilles insertion region.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Reconstruction**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 36751**

**"MINI-OPEN" REPAIR OF ACUTE TENDO ACHILLES RUPTURE,  
LONG TERM 5 YEAR FOLLOW UP**

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Background: Operative fixation of acute tendo-achilles ruptures remains controversial. Standard surgical exposure is associated with and increased risk of wound breakdown and infections. The mini-open technique was developed to minimise these risks and provide anatomical reduction/apposition of the tendon rupture. Methods: We present a retrospective case series of 27 patients who were treated operatively for acute Achilles tendon rupture in the hands of 1 surgeon, between 4-6 years post operatively, using Achillon instrumentation. Post operatively they were treated with an air cast boot and 3 wedges, bringing the foot into neutral by 6 weeks followed by a rehabilitation programme. The patients were contacted via telephone and consent was obtained. The complications, Leppilahti score and ATRS score were then calculated. Results: 2 patients underwent a further operation (one for a retained suture and another for a re-rupture in an uncompliant patient), in total there were 2 re-ruptures (another patient sustained a partial rupture which was treated conservatively). There were no patients who sustained a wound problem or infection (other than the patient already mentioned). There were 3 patients who complained of ongoing altered sensation in the sural nerve distribution, and 4 who had paraesthesia post operativeley that completely resolved within 3 months. There were no DVT/PE reported and the average Leppilahti score was 85.7/100 (excellent outcome) and ATRS 93.3/100 (excellent outcome). Conclusion: This study shows that the mini-open technique can be used successfully to treat acute tendo-Achilles ruptures with excellent long term outcome.

**Date: 2014-11-21**

**Session: Foot & Ankle: Free Papers - Foot & Ankle Reconstruction**

**Time: 14:00 - 15:30**

**Room: GLÓRIA**

**Abstract no.: 38087**

**RECONSTRUCTIVE SURGERY OF PATIENTS WITH CONGENITAL ANOMALIES OF THE LOWER LIMB MANAGED BY TRANSOSSEOUS OSTEOSYNTHESIS**

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Introduction: Surgical treatment of congenital anomalies still remains intractable task of medicine, and in many cases, amputation is the only option. Method and material: The present work is based on the experience of treatment of 378 patients (441 limbs), aged from 1,5 to 62 years, with congenital abnormality of the lower limbs in Islamic Republic of Iran, Iraq, Great Britain and Azerbaijan. The pathology was combined with shortening, deformity, pseudoarthroses, subluxation or dislocation and mal-development of lower limb tendons. In the majority of cases (72,7%) they had concomitant character. In 91% of patients the patients underwent multiple surgical interventions that exacerbated the further treatment of their category because of rough changes of soft tissues and destructive alterations on the bones and tendons of the limb, including chronic osteomyelitis. In 37,9% of cases the patients were suggested the amputation. 18 patients were unable to move independently. In 81 cases the patients used different orthotic devices as walking aids. I have applied the methods of bloodless transformation with Ilizarov device and surgical intervention with stabilizing compression and distraction osteosynthesis in these patients. Also, I have used reconstructive – corrective osteotomies with simultaneous or gradual correction and lengthening of lower limb segments. Results: The evaluation of treatment results was conducted considering the kind of pathology and its degree at the moment of treatment start and in all cases the patients and we assessed it positively. Conclusion: Thus, the application of sparing, limb-salving effective methods allows for restoration of static and dynamic functions of the limb.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Revision**

**Time: 08:30 - 10:00**

**Room: COPACABANA**

**Abstract no.: 36615**

**REVISION HIP ARTHROPLASTY USING CEMENTLESS MODULAR LONG FEMORAL STEM WITHOUT BONE GRAFT**

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Introduction: Modularity in cementless femoral revision permits independent fitting of the diaphysis and metaphysis; correct adjustment of length, offset, and version to facilitate the reconstruction of the proximal femur and to offer ultimate clinical performance. Materials: In the period between October 2009 and October 2013, a prospective study was conducted involving forty cases in Beni Sueif university hospital and El Helal Hospital in Cairo who underwent revision hip arthroplasty using modular cementless long femoral stem were 31 males and 9 females with average age 62.72 years. The follow up of the patients ranged from 18 months to 48 months with a mean period of an average of 38 months. All hips were assessed clinically and radiologically at 6 weeks, 3 months, 6 months and 1 year then every six months. Results : Two patients were lost during follow up. Clinically Harris hip score were excellent in twenty four hips, good in eleven hips, fair in three hips and no poor results. Radiologically, it showed subsidence more than 3 mm. in one hip. There were signs of acetabular loosening in one patient. Two hips required revision. Two patients had DVT and femoral fracture occurred in two patients. Conclusion: From the current study we can conclude that the use of modular cementless fully porous and or hydroxyapatite coated femoral stem with or without distal cross-locking screws is a golden solution for a more biological and easier defects for both simple and complex defects ,provided that there is enough diaphyseal contact.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Revision**

**Time: 08:30 - 10:00**

**Room: COPACABANA**

**Abstract no.: 38414**

**LONG-TERM OUTCOME OF THE ACETABULAR CUP REVISION SURGERY: TEN- TO THIRTY-YEAR FOLLOW-UP**

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The aim of the present study was to analyze the clinical and radiographic outcomes, and Kaplan-Meier survivorship of patients with aseptic loosening THA who underwent acetabular revision surgery. We reviewed consecutive 101 patients (120 hips; 10 men 11 hips; 91 women 109 hips; age at surgery, 66 years, range, 45-85) who underwent acetabular revision surgery, at a follow-up period of 16.1 years (range, 10-30). Acetabular bone defects were classified according to the classification of the AAOS based on the intraoperative findings as follows; type I [segmental deficiencies] in 24 hips, type II [cavity deficiency] in 48 hips, type III [combined deficiency] in 46, and type IV [pelvic discontinuity] in 2. Generally, the implant which was chosen for acetabular reconstruction was cement or cementless acetabular cup for the AAOS type I acetabular defects, cementless cup, or cemented cup with reinforcement device for type II, cemented cup with reinforcement device for type III. Harris Hip score improved from  $42.5 \pm 7.8$  before surgery to  $76 \pm 16.2$  points at follow-up. Using aseptic loosening as the endpoint, the Kaplan-Meier survival rates at the end point were 79% in cemented cup, 72% in cementless cup, and 79% in using the reinforcement device. However, the survival rates at 5 years were 95% in cemented cup, 87% in cementless cup, and 87% in reinforcement device, respectively. In cases of acetabular revision using cementless cup or reinforcement device, initial insufficiency cases were present, and they had an influence to the long-term survival rates.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Revision**

**Time: 08:30 - 10:00**

**Room: COPACABANA**

**Abstract no.: 37221**

**FATE OF UNREVISED SOCKETS FOLLOWING FEMORAL STEM ONLY REVISION IN TOTAL HIP ARTHROPLASTY**

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Aseptic loosening of total hip replacement (THR) components account for a significant proportion of patients needing revision arthroplasty. Increased operative time and morbidity, bone stock loss and potential complications makes the decision, in the absence of prosthetic infection, to remove a well fixed socket during femoral revision surgery, a difficult one. **AIM:** To assess the long term outcome and survival of the retained sockets following stem only revision. **METHODS:** Retrospective review of 102 consecutive patients who underwent femoral stem only revision of their Charnley low friction arthroplasty between January 1990-December 2012. Data was collected to latest clinical follow-up and socket revision for any reason was end point for survival analysis. Most common primary diagnosis was osteoarthritis. Average age at primary surgery was 51yrs (range 18-82) and at stem only revision was 64yrs (33-88). All had Charnley cups with 22.225mm inner diameter and Charnley stems with 22.225 mm head. Most common indication for initial stem revision was loose stem (n=66). Socket stability at femoral stem revision was tested intra-operatively by manual loading and traction. Average duration from primary surgery to initial stem only revision was 13yrs (1-30). Average duration of follow up from primary surgery to latest review was 18.5yrs (range 3-34) and from stem only revision to latest follow-up was 5.5yrs (1-17). **RESULTS:** 89 (87.25%) patients had well functioning socket at an average follow-up of 5.5yrs (1-17yrs) from initial stem only revision. 13 (12.75%) patients had subsequent revision surgery. Only two patients had socket revision for aseptic loosening (7yrs and 11yrs later). **CONCLUSION:** Retaining a well fixed socket with isolated stem revision does not predispose to significant problems in the socket in longterm.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Revision**

**Time: 08:30 - 10:00**

**Room: COPACABANA**

**Abstract no.: 36778**

**RETENTIVE CUPS FOR REVISION DUE TO INSTABILITY ARE ASSOCIATED WITH A LOW RATE OF RE-REVISIONS DUE TO DISLOCATION WITHOUT INCREASING OTHER RISKS**

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LACHANETTE

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We hypothesized that a retentive cup would reduce the risk of re-revision due to dislocation after revision THA. Therefore we compared two groups of patients who had recurrent dislocations and abnormal acetabulum and/or femoral anteversion measured on CT scan. In group 1, 60 THA cup revisions due to recurrent dislocations and employing a specific retentive cup (Groupe Lepine) were performed from 1989 to 2009 without changing the orientation of the femoral stem . In group 2, 60 THA revisions were performed with change of the orientation of the components with abnormal position. The surgical approach was posterior in both groups. Kaplan-Meier survival analysis was performed with re-revision due to dislocation as the primary endpoint and re-revision for any reason as the secondary endpoint. For patients with retentive cups, the cumulative risk of dislocation was 1% at one month, 2% at one year. For patients of group 2 (changes of orientation of the components), the cumulative risk of dislocation was 10% at one month, 25% at one year, with re-revision in 10 patients employing a retentive cup that stopped further dislocation. There was no subsequent re-revision for any other reason than dislocation performed in group 1 and 4 performed in group 2. The risk of re-revision due to dislocation after insertion of retentive cups during revision THA performed for recurrent dislocations appears to be low. Since most dislocations occur early after revision THA, we believe that this device adequately addresses the problem of recurrent instability without increasing other complications

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Revision**

**Time: 08:30 - 10:00**

**Room: COPACABANA**

**Abstract no.: 37073**

**HARRIS HIP SCORE IS RESPONSIVE AND PREDICTS REVISION RISK AFTER PRIMARY TOTAL HIP ARTHROPLASTY**

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Objective: To examine the clinically meaningful change thresholds, responsiveness and predictive ability of the Harris Hip Score (HHS). Methods: We included a cohort of patients who underwent primary total hip arthroplasty (THA) and responded to HHS preoperatively and/or at 2- or 5-year post-THA. Minimal clinically important improvement (MCII) and moderate improvement were defined using a patient global question as an anchor. Responsiveness was examined using effect size (ES) and standardized response mean (SRM) using the pre- to post-operative change. Predictive ability was assessed by examining the association of absolute or change (pre-post) HHS scores at 2- and 5-years with the risk of subsequent revision THA. Results: 2,667 patients completed baseline HHS; 1,036 completed both baseline and 2-year and 669 both baseline and 5-year HHS. Mean age was 64 years. MCII and moderate improvement thresholds for HHS ranged 15.9-18 points and 39.6-40.1 points, respectively. ES for HHS was 3.12 and 3.02 at 2- and 5-years; respective SRM was 2.73 and 2.52. Compared to patients with HHS scores of 81-100, patients with HHS scores <55 at 2- and 5-years had higher hazards (95% confidence interval) of subsequent revision, 4.34 (2.14, 7.95; p<0.001) and 3.08 (1.45, 5.84; p=0.002), respectively. Compared to an improvement of >50 points in HHS score from preoperative to 2-years post-THA, lack of improvement/worsening or 1-20 point improvement were associated with increased hazards of revision, 18.10 (1.41, 234.83; p=0.02); and 6.21 (0.81, 60.73; p=0.10), respectively. Conclusions: HHS is responsive to change and predictive of revision after primary THA.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Revision**

**Time: 08:30 - 10:00**

**Room: COPACABANA**

**Abstract no.: 38411**

**A MULTI-CENTER STUDY EVALUATING THE REASONS FOR REVISION OF ASR HIP IMPLANTS**

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**Introduction:** The ASR hip system was recalled due to adverse tissue reaction. The purpose of this multicenter study was to review revision rates and reasons for revision of ASR hip replacement. **Methods:** Demographic and surgical data was provided to this multi-center study from 10 clinical centers in six different countries. **Results:** The overall revision rate for the entire cohort of 2918 hips was 18% with an overall revision rate for ALTR of 8%. Of the revision cases, 45% were for ALTR or had the presence of ALTR observed at the time of surgery. Of the non-ALTR revisions, the overall revision rate for cup loosening was the highest at 7.1%. Sepsis and stem loosening each accounted for 1% of the overall revision rate. The average Co and Cr blood ion levels of the revised patients were higher at each center than the average for the non-revised patients, though there was a significant overlap between the two groups. There was considerable variation in the overall revision rate between centers, 5-30%. The revision rate for ALTR was similarly broad, 0-32%. The overall revision rate of ASR XL hips was 23% while that of ASR hips was 8%. A multi-variant analysis of this data is currently being performed. **Discussion:** There was considerable variation between centers in the overall revision rate of this particular MOM implant system and the incidence of ALTR was similarly broad. Interestingly, the overall revision rate of the ASR XL hips was significantly higher than the ASR resurfacing hips.

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**Session: Hip: Free Papers - Total Hip Arthroplasty Revision**

**Time: 08:30 - 10:00**

**Room: COPACABANA**

**Abstract no.: 37897**

**RESULTS OF USE OF STRUCTURAL ALLOGRAFTS IN REVISION  
TOTAL HIP REPLACEMENT**

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Patients with failed hip replacement often present with large bone defects and Structural Allografts are often required to address these bone defects. There is considerable apprehension about using massive skeletal allografts in these situations due to the fear of infection. 25 patients with failed THA were treated with a revision THA using a structural allograft. The mean follow-up was 8.5 (5-11) years. The mean Harris Hip Score improved from 34 points preoperatively to 76 points at the last review. There was no failure in 21 patients, whereas one patient presented with recurrent infection and underwent a Girdlestone resection arthroplasty as definitive treatment. 3 patients presented with failure of allograft and underwent a rerevision. There was no loosening or osteolysis around the femoral stems and acetabular cup at the time of final follow up in the 24 cases where the procedure was successful. Our results support the use of massive allografts in treatment of bone defects in patients with failed Total hip replacement.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Revision**

**Time: 08:30 - 10:00**

**Room: COPACABANA**

**Abstract no.: 37696**

**FOUR-YEAR RESULTS FOLLOWING COMPOSITE BONE GRAFTING (CBG) TECHNIQUE FOR PRIMARY TOTAL HIP REPLACEMENTS (THR) WITH PATIENT OUTCOME SCORES: PROSPECTIVE SINGLE CENTRE STUDY**

Sheethal Prasad PATANGE SUBBA RAO, Gurdip CHAHAL, Mazin Saad IBRAHIM, Krishaiah KATAM, Trevor LAWRENCE  
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The senior author developed a technique for impaction grafting of acetabulum in revision hip surgery involving 2 stages of cementation. Initially, a thin layer of a composite of cancellous graft and cement is impacted onto solid acetabular bone stock and is allowed to harden. The acetabular component is then cemented into the composite shell. We now report the use of this technique in primary THRs when the acetabular bed is very sclerotic or of a protrusion pattern. Our results including patient outcome scores, radiographic survivorship and revision rates are presented. A Prospective, single centre study was conducted between 2009-2013. Modified Short Form WOMAC scores were used and analysed using Wilcoxon Signed-Rank test. Latest x-rays were assessed for implant migration, osteolysis, and loosening. A total of 23 hips in 21 patients with Median age 64 (range 39-84) were reviewed. 3 were CDH, 2 AVN, and 18 primary OA. Median head size 28 (28-32) mm, median neck 44 (37.5-50) mm. WOMAC pain scores improved significantly from pre-op, 14(95%CI 13-16) to 8(6-14) at 1-year, and 4 (2-7) at final follow-up ( $p<0.001$ ). WOMAC function scores improved pre-op 20(95%CI 18-23), to 14(11-19) at 1-year and 8(5-11) at final follow-up ( $p<0.001$ ). Total WOMAC improved from pre-op 35 (95% CI 30-39) to 26(21-34) at 1-year, and 8 (5-11) at final follow-up ( $p<0.001$ ). X-rays showed no signs of loosening, migration or osteolysis without any revisions encountered. CBG is an effective technique for patients with acetabular defects which is reproducible with significant improvement in patients' reported outcomes.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Revision**

**Time: 08:30 - 10:00**

**Room: COPACABANA**

**Abstract no.: 36626**

**SYSTEMIC TITANIUM ION RELEASE IN MODULAR NECK TOTAL HIP ARTHROPLASTY**

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Corrosion in modular taper connections of total joint replacement has become a hot topic in the orthopaedic community and failures of modular systems have been reported. The objective of the present study was to determine in vivo titanium ion levels following cementless total hip arthroplasty (THA) using a modular neck system. A consecutive series of 173 patients who underwent cementless modular neck THA was evaluated retrospectively. Titanium ion measurements were performed on 67 patients using high-resolution inductively coupled plasma-mass spectrometry. Ion levels were compared to a control group comprising patients with non-modular titanium implants and to individuals without implants. Although there was a higher range, modular-neck THA (unilateral THA: 3.0 µg/L (0.8-21.0); bilateral THA: 6.0 µg/L (2.0-20.0)) did not result in significant elevated titanium ion levels compared to non-modular THA (unilateral THA: 2.7 µg/L (1.1-7.0),  $p=0.821$ ; bilateral THA: 6.2 µg/L, (2.3-8.0),  $p=0.638$ ). In the modular-neck THA group, patients with bilateral implants had significantly higher titanium ion levels than patients with an unilateral implant ( $p<0.001$ ). Compared to healthy controls (0.9 µg/L (0.1-4.5)), both modular THA (unilateral:  $p=0.029$ ; bilateral  $p=0.003$ ) and non-modular THA (unilateral:  $p<0.001$ ; bilateral:  $p<0.001$ ) showed elevated titanium ion levels. The data suggest that the present modular stem system does not result in elevated systemic titanium ion levels in the medium term when compared to non-modular stems. However, more outliers were seen in modular-neck THA. Further longitudinal studies are needed to evaluate the use of systemic titanium ion levels as an objective diagnostic tool to identify THA failure.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty - Miscellaneous**

**Time: 10:30 - 12:00**

**Room: COPACABANA**

**Abstract no.: 38150**

**EFFECT OF FIXED SPINAL DEFORMITY ON FUNCTIONAL PELVIC ORIENTATION FROM STANDING TO SITTING**

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**Introduction:** Accurate and reproducible cup positioning is one the most important technical factors that affect the outcomes of total hip arthroplasty (THA). The aim of this study was to assess the change in pre-operative sagittal pelvic tilt from standing to sitting, and analyze the effect of change in sagittal pelvic tilt on acetabular anteversion and abduction angles. **Material and Methods:** Between July 2011 and October 2011, 68 consecutive unilateral THAs were implanted in 68 patients with a mean age of  $71 \pm 6$  years old. All cases were performed by a single surgeon via the posterolateral approach. Radiographic evaluation included standing anteroposterior (AP) and lateral pelvic radiographs, and sitting lateral pelvic radiograph, measuring functional pelvic obliquity and sagittal standing and sitting pelvic tilt. Post-operative functional anteversion and abduction angles were assessed by EBRA software. **Results:** There was no dislocation at minimum 2-year follow-up. 25% (17 patients) had fixed LS deformity. In all of the flexible pelvises, there was a posterior tilt from standing to sitting with increase in functional anteversion. The change in tilt from standing to sitting was significant in the flexible pelvis group as compared to the fixed pelvis group. **Discussion:** There is a significant change in pelvic tilt from standing to sitting, especially in patients with flexible spine, where the functional anteversion increases with sitting. The patients with fixed pelvis have significantly less anterior sagittal tilt in standing (less anteversion) with less posterior sagittal tilt in sitting.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty - Miscellaneous**

**Time: 10:30 - 12:00**

**Room: COPACABANA**

**Abstract no.: 38040**

**THE INFLUENCE OF HIP-SPINE SYNDROME IN THE RESULTS OF HIP ARTHROPLASTY**

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Introduction: After a successfully completed total hip arthroplasty (THA) does not rarely progresses clinic lesions of vertebral segment. As is known, the alliance "hip - spine" in most cases is a common symptom. Objectives: The aim of the study was to investigate the frequency of occurrence and dynamics of hip-spine syndrome after THA. Methods: We examined 834 patients before THA with x-ray, Harris Hip Score, Oswestry questionnaire and VAS . Results: 1. Found the incidence of hip-spine syndrome in 834 patients preparing for THA, which amounted to 28%. 2. Determine the dynamics of hip-spine syndrome in 97 patients before and after THA . To analyze the results of patients with hip-spine syndrome were divided into groups: with high (1 group) and low (2 group) grade degenerative changes in the lumbosacral spine and coxarthrosis. In 77% of patients of the 1 group, a significant enhancement of low back pain with disease progression. In 85% of cases the patients in 2 group there was regression of lumbar pain. Conclusions: THA at unexpressed changes of the lumbar spine significantly reduces pain in the lower back by restoring the biomechanics of the zone. However, with the express prior lesions of the lumbar spine is deteriorating state of health, the progression of pain and dissatisfaction expressed by patients THA. If you have a confirmed during a survey of the destruction of the lumbar spine in many cases be the first step to raise the question of operative treatment in this area of the back.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty - Miscellaneous**

**Time: 10:30 - 12:00**

**Room: COPACABANA**

**Abstract no.: 36822**

**RECURRENT DISLOCATION POST TOTAL HIP ARTHROPLASTY IN A FUSED LUMBAR SPINE SEGMENT- IMPORTANCE OF DYNAMIC STUDIES AND PREOPERATIVE ASSESSMENT**

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The concept of safe zone in Total Hip Arthroplasty (THA) with regard to acetabular cup placement in the coronal and sagittal axis is well established. Influence of the lumbosacral axis on the acetabular component in a normal spine and with spinal pathology largely varies. Pelvis compensates for spinal deformity and this must be taken into account during cup placement. Hip-spine relations must therefore be better investigated in planning total hip arthroplasties. We report a case that presented to us with recurrent dislocations post THA in a fused lumbar spine segment. Patient was subjected to Kinematic simulation analysis using CT and radiographs to see for dynamic movements of the pelvis and change of the acetabular version and inclination with change of posture. Outcome analysis showed that patient was an anterior pelvic rotator with tendency for the prosthesis to dislocate posteriorly even though the cup was in an acceptable position for a normal patient. The cup was revised to allow more inclination and anteversion. Patient at 1 year follow up had no redislocations with good functional outcome. We attempt to highlight the importance of preoperative workup and dynamic assessment in such cases with fused spinal segment. Keywords - Recurrent, dislocations, Kinematic, fused lumbar spine

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty - Miscellaneous**

**Time: 10:30 - 12:00**

**Room: COPACABANA**

**Abstract no.: 38041**

**SIMULTANEOUS BILATERAL TOTAL HIP REPLACEMENT IN  
ACHONDROPLASIA**

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SRIVASTATA

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Achondroplasia is a genetic condition, a bone growth disorder that results in abnormally short stature. We present a 45 years old male patient with Achondroplasia (height 112cm) and disabling osteoarthritis of both the hips. He had dysplasia of both the hips with deformed femora as well. He was treated by simultaneous bilateral total hip replacement. We had a specific preoperative planning, choice of implants, surgical technique and post-operative rehabilitation. At the end of 12 months follow up time, both the hips are functioning well with free of pain and improved walking ability of the patient.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty - Miscellaneous**

**Time: 10:30 - 12:00**

**Room: COPACABANA**

**Abstract no.: 37890**

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

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Bony ankylosis in Ankylosing Spondylitis present several exclusive challenges in its management. We retrospectively reviewed 45 patients (90 hips) who underwent bilateral cementless total hip arthroplasty for bony ankylosis in ankylosing spondylitis. Clinical assessment was done using the Harris Hip Score. Radiographic analysis was done. Kaplan-Meier survivorship analysis was also done at 5 and 10 years using the revision for the removal of femoral component, acetabular component or both due to any cause as the end point. The mean age of the patients was 30 years. The mean duration of follow up was 7 years (3-10 years). The average preoperative Harris Hip Score of 44 improved to 80 post operatively. A dislocation occurred in 8 hips and sciatic nerve palsy in six hip. Heterotopic ossification was seen in 15 hips. Kaplan-Meier survivorship analysis with revision as end point revealed 98.8% survival at 5 years and 85.8% survival at 10 years follow up. Although Bilateral Cementless THA in bony ankylosis in ankylosing spondylitis is a technically demanding surgery, it is successful as well as provides patients with increased mobility.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty - Miscellaneous**

**Time: 10:30 - 12:00**

**Room: COPACABANA**

**Abstract no.: 38009**

**SIMULTANEOUS QUADRUPLE JOINTS REPLACEMENT IN A PATIENT WITH DISABLING JUVENILE RHEUMATOID ARTHRITIS**

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**Introduction:** Juvenile Rheumatoid Arthritis (JRA) is an important cause of diminished function and immobility for the patients at early age. Despite appropriate pharmacologic management, some patients require joint replacement surgeries for secondary osteoarthritis. Patients with both hip and knee involvement are terminally disabled and have to be depended on others unless any major step is taken ahead. **Materials and Methods:** We present a case of 47 years old male with JRA who was gradually disabled and bed ridden for more than a year before presenting to us. He underwent simultaneous quadruple joint replacement (both hips and both knees). The postoperative period was uneventful. He was kept on DVT prophylaxis, close vital monitoring. In bed mobilization was done on second post operative day, bed to chair transfer on 14th day. He walked his initial steps with walker and knee brace on 16th day before discharge. **Results:** At recent 12 months follow up, the patient is able to walk without support and lead his independent life for his activities of daily living. **Conclusion:** Relief of pain and improvement in function is the utmost requirement in patients with disabling polyarthritis. Quadruple joint replacement is the quickest way to put the patient back on feet. One stage accomplishes a lot to quick rehabilitation, avoiding inordinate delay in stages due to interval complications and psychological benefits to the patient. However proper patient selection is mandatory and institutional support is vital. **Key words:** Quadruple Joint Replacement, Juvenile Rheumatoid Arthritis

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty - Miscellaneous**

**Time: 10:30 - 12:00**

**Room: COPACABANA**

**Abstract no.: 36491**

**RESULTS OF MANAGEMENT OF BILATERAL DDH CASES.  
PEARLS AND PITFALLS. A LONG-TERM FOLLOW-UP STUDY.**

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**Patients & methods:** Between Jan. 1981 and May 2009, there were 51 bilateral cases of DDH, (102 hips). The age of the patients ranged between 2 and 10 years old. Inclusion criteria included bilateral DDH cases not operated upon before, a minimum follow-up period of 5 years post-operatively. Femoral shortening was performed in all but 3 cases, (2 years old cases). Salter innominate osteotomy was performed in 41 cases, (82 hips), and Dega acetabuloplasty was performed in 10 patients, (20 hips). **Results :** The postoperative follow-up period ranged between 5 - 30 years, with a mean of 20 years. Favorable clinical outcomes were reported in 61.7%, while unfavorable results took place in 38.3% of the cases. There were many complications recorded, including, Pain, osteoarthritis, limb length discrepancy, avascular necrosis, residual acetabular dysplasia, and many minor complications as well. 10 of the studied 51 patients had another surgery during the follow-up period, and were considered as failure. **Conclusion:** Bilateral DDH is even more difficult to treat. Symmetrical results are required and are aimed for, but sometimes not achieved. The older the age of the patients the more difficult and more challenging is the surgery. All the major complications occurred in children older than 6 years in this study. **Significance:** We support the opinion that bilateral DDH should not be reduced above the age of 6 years, and that those cases should be treated with extreme caution by the same experienced surgeon.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty - Miscellaneous**

**Time: 10:30 - 12:00**

**Room: COPACABANA**

**Abstract no.: 37783**

**ARE DISLOCATIONS FOLLOWING HIP HEMIARTHROPLASTY A PREDICTOR OF INCREASED MORTALITY?**

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**Purpose:** The aim of our study was to evaluate the incidence, characteristics and mortality risk of patients sustaining a dislocation of a hip hemiarthroplasty. **Methods:** This is a case series of patients that presented in our institution with one or more episodes of hip hemiarthroplasty dislocation within two years from the initial hip operation. **Results:** Over a 3-year period, out of 881 hip hemiarthroplasties performed in our institution, 31 patients (10 male) had at least one episode of dislocation. The mean age at time of first dislocation was 81.6 years (median 81.5 years, range 65 to 95). The average time between the hemiarthroplasty and the first dislocation was 32.5 weeks (median 3.3 weeks). During the same period of time, we identified the patients who died during their initial hospitalisation following the hip hemiarthroplasty operation. Out of a total of 81 patients, seven had sustained a dislocation. The two groups (dislocation versus no dislocation) were matched in terms of gender, length of hospital stay and comorbidities. Age was found to be significantly lower in the dislocations group ( $p=0.02$ ). Although there was a trend that patients in the dislocation group died closer to their initial hip operation, it was not statistically significant ( $p=0.06$ ). The RR of mortality following a dislocation whilst still in hospital was 2.30 (95% CI 1.14 – 4.65). **Conclusion:** This study demonstrates that dislocations in the immediate post-operative period following a hip hemiarthroplasty represent a predictor of increased mortality. In particular, the in-patient mortality was increased more than two-fold.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty - Miscellaneous**

**Time: 10:30 - 12:00**

**Room: COPACABANA**

**Abstract no.: 38171**

**CO-MORBIDITIES AFFECTING RISK OF DEATH DURING HIP HEMIARTHROPLASTY SURGERY: COMPARISON OF CEMENTED AND UNCEMENTED PROSTHESIS**

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**INTRODUCTION:** Hip hemiarthroplasty surgery is the mainstay of treatment for intracapsular neck of femur fractures. Literature widely supports cemented prosthesis over uncemented for various outcomes. The aim of this study was to assess the rates, causes and potential risk factors for perioperative mortality in the two groups. **METHODS:** Retrospective data including a cohort of 546 consecutive patients treated with a hemiarthroplasty (cemented = 320; uncemented = 226). All relevant details were recorded by review of clinical coding dataset. Causes for intraoperative and perioperative mortality within 48hours were reviewed and cox regression analysis was undertaken to identify preoperative risk factors. **RESULTS:** Of all the patients operated with a hemiarthroplasty (n=546) thirteen (4.06%) patients died in the cemented group while there were two (0.8%) deaths in uncemented group. Most common cause was an intraoperative cardiac event (53.8%). Using univariate analysis to compare the two groups there was a statistically significant difference in the incidence of active cardiac disease ( $p<0.001$ ), chronic respiratory disease ( $p=0.049$ ), preoperative white cell count ( $p=0.019$ ) and the number of individual comorbidities ( $p=0.012$ ). In the cemented dataset a multivariate Cox model showed female gender (HR 8.8,  $p=0.037$ ), active cardiac disease (HR 31.4,  $p=0.001$ ) and a history of multiple comorbidities (HR 4.6  $p=0.047$ ) to be the strongest preoperative predictors of increased risk of perioperative mortality. **CONCLUSION:** Multiple co-morbidities are high risk factors in patients undergoing hip hemiarthroplasty surgery which need careful medical assessment preoperatively with a view to optimise the surgical outcome.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty - Miscellaneous**

**Time: 10:30 - 12:00**

**Room: COPACABANA**

**Abstract no.: 37348**

**HYPOTENSION FOLLOWING TOTAL JOINT ARTHROPLASTY IS COMMON AND INCONSEQUENTIAL**

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**Introduction:** The purpose of this study was to evaluate the incidence and risk factors of postoperative hypotension following total joint arthroplasty (TJA). **Methods:** One hundred consecutive primary and revision TJA cases performed at a single institution between July 2012 and August 2012 were retrospectively reviewed. Demographics, comorbidities, antihypertensive medications, laboratory results, vital signs, and postoperative complications were recorded for each patient. Hypotension defined as a greater than 20 point drop in systolic blood pressure during postural changes or preoperative to the postoperative course or absolute systolic blood pressure less than 90 mmHg was recorded. Multivariate logistic regression analysis was utilized. Complication rates and length of stay were compared between patients with and without postoperative hypotension. **Results:** Fifty-one patients met our definition of postoperative hypotension however, this dissipated over time; 37% postoperative day (POD) 1, 25% of patients on POD 2 and only 2% on POD 3. There were 53 females and 47 males with a mean age of 62.7 years at the time of surgery. Increased blood pressure at patients' pre-admission testing and lower postoperative systolic BP in the PACU were independent predictors of postoperative hypotension. Transfusion rate was higher in patients with postoperative hypotension. **Discussion:** Prolonged hypotension was infrequent and not associated with cardiac or significant postoperative complications. Patients with poorly controlled hypertension are most at risk. Proper identification and management of these "at risk" patients may decrease the rate of unnecessary postoperative blood transfusion administration.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty - Miscellaneous**

**Time: 10:30 - 12:00**

**Room: COPACABANA**

**Abstract no.: 36616**

**INCREASING COMPLEXITY OF PATIENTS UNDERGOING PRIMARY TOTAL HIP ARTHROPLASTY IN THE U.S.: A TOTAL JOINT REGISTRY STUDY**

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**Introduction:** A significant increase in utilization of total hip arthroplasty (THA) has been noted, but it's unclear how patient characteristics are changing over time. Our objective was to examine the time-trends in key demographic and clinical characteristics of patients undergoing primary THA. **Methods:** We used the data from the Mayo Clinic Total Joint Registry from 1993-2005 to examine the time-trends in key patient characteristics including demographics (age, body mass index (BMI)), underlying diagnosis and medical (Deyo-Charlson index) and psychological comorbidity (anxiety, depression) of patients undergoing primary THA. Chi-square test and analysis for variance were used, as appropriate. **Results:** The primary THA cohort consisted of 6,168 patients with 52% women. Over the 13-year study period, the mean BMI increased by 1.6 kg/m<sup>2</sup> (28.0 to 29.6), Deyo-Charlson index increased by 22% (0.9 to 1.1) and mean age decreased by 0.7 years (65.0 to 64.3) ( $p < 0.01$  for all). Compared to 1993-95, significantly more patients (by >2-times for most) in 2002-05 had: BMI  $\geq 40$ , 2.3% vs. 6.3%; depression, 4.1% vs. 9.8%; and anxiety, 3.4% vs. 5.7%; and significantly fewer had an underlying diagnosis of rheumatoid/inflammatory arthritis, 4.2% vs. 1.5% ( $p < 0.01$  for all). **Conclusions:** Patient demographics, comorbidity and underlying diagnosis have rapidly changed in primary THA patients over 13-years. Studies of primary THA over long study periods should take these rapidly changing patient characteristics into account.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Minimal Invasive Surgery**

**Time: 10:30 - 12:00**

**Room: LEBLON**

**Abstract no.: 38497**

**EXPOSURE OF THE SURGICAL STAFF TO IONIZING RADIATION IN THE COURSE OF SURGICAL ORTHOPAEDIC PROCEDURES**

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**Objective:** The objective of this study was to assess the exposure of the orthopaedic staff to fluoroscopic ionizing radiation through orthopaedic surgical procedures. **Material and Methods:** From January to July 2012, it was determined the ionizing radiation dose on the orthopaedic surgical team (PGY1: assistant; PGY2: second surgeon; PGY3: first surgeon) with dosimeters placed at anatomical regions (dorsal region, gonadal region under the protective apron, gonadal region over the protective apron, thyroid region, chest under the protective apron, chest over the protective apron). Forty five hip osteosynthesis procedures were performed due to transtrochanteric fractures (AO 31-A2.1). **Results:** The thyroid region received around 0.86 mSv of radiation, the chest area received around 1.24 mSv and the genital region around 2.15 mSv ( $p=0.25$ ). The PGY1s received around 1.99 mSv radiation; the PGY2s received around 4.51 mSv and the PGY3s received around 6.33 mSv ( $p=0.33$ ). There was no record of radiation on dosimeters placed below the protective apron or located on the back of the surgical staff. **Conclusions:** The members of the surgical team closer to the fluoroscope (PGY3 and PGY2) received higher radiation doses than those located remotely (PGY1). The anatomical areas located below waist received a higher dose of ionizing radiation (gonadal region). The results underscore the importance wearing the protective aprons, which are effective in preventing radiation that may reach vital organs of the medical team.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Minimal Invasive Surgery**

**Time: 10:30 - 12:00**

**Room: LEBLON**

**Abstract no.: 38338**

**ARE ORTHOPAEDIC SURGEONS' PROGENY AT RISK FROM INCREASED OCCUPATIONAL EXPOSURE TO IONIZING RADIATION?**

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**Introduction:** The increasing use of fluoroscopy means that the risk of ionizing radiation to Orthopaedic surgeons' offspring must be re-examined. X-ray exposure is known to increase cancer risk in dentists, cardiologists, and orthopaedic surgeons. Numerous studies highlight the need for closer monitoring of radiation exposure to the surgeon in Orthopaedics, but there are very few examining the incidence of congenital abnormalities in children of surgeons. **Methods:** We surveyed all Orthopaedic Registrars and Consultants at a single centre in the UK for incidence of congenital malformations or childhood cancers. **Results:** Out of 22 surgeons, four surgeons reported having progeny with a significant medical disease. Incidence was highest among Orthopaedic Registrars, with 3/12 (25%) reported congenital malformations in their progeny in the absence of consanguinity. There were two cases of Autism coexisting with congenital heart defects, one case of early-onset Primary Biliary Cirrhosis and one case of severe learning difficulties (n=4). **Conclusions:** We hypothesize that increasing use of occupational ionizing radiation exposure to the orthopaedic surgeon could play a role in increased risk of congenital abnormalities in their progeny. This survey provides anecdotal evidence that this issue needs re-examining. We suggest a nationwide survey of all Orthopaedic surgeons and comparison of birth defect incidence with the national average and incidence in other surgical specialties.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Minimal Invasive Surgery**

**Time: 10:30 - 12:00**

**Room: LEBLON**

**Abstract no.: 36930**

**SURGEON AND PATIENT RADIATION EXPOSURE ON PERCUTANEOUS TRANSPEDICULAR APPROACH - COMPARISON OF 3 DIFFERENT FLUOROSCOPY TECHNIQUES**

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**Introduction** Percutaneous approach of vertebral pedicles has been used in several minimally invasive procedures such as kyphoplasty, vertebroplasty and pedicle screw instrumentation. The pedicle percutaneous approach requires additional use of fluoroscopy increasing cumulative dose absorbed by surgeon. The goal of this study was to evaluate the surgeon and patient radiation exposure using three different fluoroscopy techniques keeping the same workflow: Technique A – Standard c-arm; B – C-arm with additional L-arm; C – Bi-plane of 2 c-arms, considering one of them with L-arm. **Material and Method.** The study was performed in nine male adult's corps and the vertebral segments were selected from T9 to L5. The vertebral pedicles (n=162) were randomly selected according to fluoroscopy technique. The vertebral pedicles were percutaneous accessed according to the current technique to perform kyphoplasty. The surgeon and patient radiation dose were accessed for each procedure. The results were compared using Analysis Of Variance (ANOVA) – P value  $\leq 0.05$  **Results.** The mean radiation dose of patient showed no significant different with the use of the three different techniques. The mean radiation dose of surgeon was lower when comparing technique B and C to technique A. **Conclusion** The radiation dose of the surgeon can be reduced with the use of the L-arm. Even though the patient dose does not vary when using different techniques, the surgeon dose can be reduced approximately three times when using techniques B and C.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Minimal Invasive Surgery**

**Time: 10:30 - 12:00**

**Room: LEBLON**

**Abstract no.: 37033**

**CLINICAL STUDY OF LUMBAR DISC ANNULAR REPAIR VIA  
MISCREOENDOSCOPIC DISCECTOMY (MED) PROCEDURE**

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Introduction: Discogenic low back pain may arise from acute tears or fissures of the Annulus fibrous (AF) and from focal defects of the AF. Annulus repair (AR) technique is the most straightforward solution by suturing of the annular defect. Methods: We retrospectively evaluated the clinical outcomes of 45 patients with lumbar disc herniation (LDH), who received lumbar discectomy with annular repair via MED since 2011 in our hospital, comparing to 49 patients of LDH who underwent only MED procedure. Operative time, surgical complications, and the rate of recurrent herniation were documented. Oswestry disability index (ODI) and back pain and leg pain Visual analog scale (VAS) were documented. Results: In AR group, of the 45 patient, 24 patients were male, 21 female; in control group, 26 female and 23 male. Average Age was 35.90 in AR group and 39.07 in control group. Average follow-up time was 18 months (from 12 months to 24 months). In AR group, of 45 cases, AR of 30 cases was done by single-suture annular repair methods, 8 cases by two parallel-suture annular repair methods, and 7 cases by two crossing-suture repair methods. But no difference of VAS and ODI was found between the control group and AR group. For complications, no dura tear, disc infection, spinal canal hematoma, and recurrent lumbar protrusion occurred after AR. No recurrence of lumbar disc herniation was found in AR group during follow up period of time, in contrast to 2 cases of recurrence of LDH in control group.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Minimal Invasive Surgery**

**Time: 10:30 - 12:00**

**Room: LEBLON**

**Abstract no.: 37039**

**THE CLINICAL STUDY OF TREATMENT OF DEGENERATIVE LUMBAR SPINE STENOSIS BY MODIFIED UNILATERAL APPROACH FOR BILATERAL DECOMPRESSION UNDER ENDOSCOPIC DECOMPRESSION PROCEDURE**

**Qingchu LI, Dadi JIN, Hao ZHANG**

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Introduction: Micro-endoscopic discectomy offers a good option for the treatment of degenerative lumbar diseases. But it is used in the surgical treatment of lumbar stenosis is limited. Methods: We retrospective evaluate the clinical outcome of 296 cases of lumbar spine stenosis, operated by modified unilateral approach for bilateral decompression via Micro-endoscope procedure from 2003 to 2013. Of all 296 cases, 215 cases were single level disease treated with unilateral endoscopic discectomy and bilateral nerve root decompression, and 81 cases two levels disease. Xray/CT/MRI were done preoperatively and postoperatively to evaluate the surgical outcome. VAS/Nakai criterion were used to evaluate the clinical outcome. Results: The mean operative time was 51 minutes; the average blood loss was 41 ml; skin incision length averaged 2.3cm. For complications, 7 cases had dura tear, 1 case wrong level. No nerve root injury and postoperative infection occurred. Postoperative CT/MRI showed improved imaging criteria for spinal stenosis. Average follow up was 60 months. There was significant difference of the average low back pain/leg pain VAS between preoperative and postoperative. Excellent and good rate was 88.3% by Nakai criterion at the final follow up.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Minimal Invasive Surgery**

**Time: 10:30 - 12:00**

**Room: LEBLON**

**Abstract no.: 38260**

**MINIMAL INVASIVE VS. STANDARD APPROACH IN TOTAL KNEE 2 YEAR COMPARISON**

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Introduction: Since year 2010 minimal invasive approach in total knee surgery was introduced at our Department. This is said to be much more patient friendly procedure and it is promoted for last few year as better option for total knee. Objectives: The goal of this prospective study was to compare the results for patients with MIS (midvastus) approach compared to standard total knee approach, and to find answer for ourselves is it new golden standard in total knee surgery. Methods: We analysed postoperative data for all patients operated at our department within 24 months regardless age, sex and surgeon. There were total of 152 patients (106 standard, 46 MIS). There is group of 16 patients that had previous surgery on opposite knee done with standard approach by single surgeon as a control group. Analysed parameters were: time consuming, incision length, blood loss, pain during early rehabilitation, ROM during postoperative rehabilitation in hospital, ROM at the end of rehabilitation and subjective comparison with previous surgery. Results: Results of this study show that patients operated using MIS approach had easier early postoperative rehabilitation achieving higher flexion, had less blood loss and smaller incision. There was no significant difference in time consuming between these two procedures. Patients with previous total knee procedures felt less pain and had much more comfort during early postoperative rehabilitation. Conclusions: Our results showed that minimal invasive total knee approach provided faster postoperative rehabilitation, patients had less blood loss, less pain and higher ROM at the end of rehabilitation.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Minimal Invasive Surgery**

**Time: 10:30 - 12:00**

**Room: LEBLON**

**Abstract no.: 37474**

**SURGICAL TREATMENT OF DISTAL FEMORAL FRACTURES:  
COMPARISON BETWEEN MINIMALLY INVASIVE PLATE  
OSTEOSYNTHESIS USING LOCKING COMPRESSION PLATING  
AND OPEN LOCKING COMPRESSION PLATING WITH OR WITHOUT  
BONE GRAFT**

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**INTRODUCTION:** Distal femoral fractures are difficult to treat and associated with many complications. The aim of this study was to compare the outcome of minimally invasive plate osteosynthesis and open locking compression plating with or without bone grafting for distal femoral fractures in a study group of 60 patients. **METHODS:** From November 2012 to February 2014, 60 patients with distal femoral fractures were divided into 2 groups. There were 31 patients in MIPO group and 29 in open LCP group. MIPO group had 22 male, 9 female with mean age 42 years comprising 14 typeA, 10 typeB and 7 typeC fractures. Open LCP group had 23 male 6 female with mean age 33.5yrs comprising 10 typeA, 3 typeB and 16 typeC fractures. Clinical and functional outcome assessed by knee society score on follow up after 6, 12 and 24 weeks. **RESULTS:** Mean operating time was 70 minutes in MIPO and 65 minutes in open LCP group. Mean time for fracture consolidation was 2.5 months in MIPO and 3.7 months in open LCP. 3 patients in open LCP group had bone grafting. After follow up 30 patients from MIPO group & 25 from open LCP group had good or excellent outcome. 1 patient in MIPO group had implant failure and underwent revision surgery. In open LCP group 2 cases each of superficial infection and knee stiffness were reported. **CONCLUSION:** MIPO LCP when compared with open procedure although is not distinctively superior reduces the time taken for fracture consolidation and the number of complications.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Minimal Invasive Surgery**

**Time: 10:30 - 12:00**

**Room: LEBLON**

**Abstract no.: 37168**

**PERCUTANEOUS FEMORAL OSTEOTOMY WITH IM ROD**

Peter STEVENS, Christian GAFNEY, Heather FILLERUP

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**Introduction:** Rotational osteotomy of the femur is the treatment of choice for persistent and symptomatic femoral anteversion (or retroversion). The typical amount of rotational correction needed is 300 (+/- 100), in order to properly align the knee, relative to the hip. While some surgeons still prefer plate (or blade plate) fixation, the evolution of length stable, trochanteric entry, intramedullary rods avoids the risk of osseous necrosis, minimizes quadriceps disruption, while offering smaller scars and more rapid recovery. Our purpose is to elucidate the timing and technique of percutaneous femoral rotational osteotomy, while also reporting outcomes and related complications. **Methods:** This is a retrospective review of a standardized technique, employed by a single surgeon, using the same implant to correct femoral torsion. We reviewed 44 patients with 66 rotational osteotomies, demonstrating that this form of fixation, without need for postoperative casting or splinting, offers earlier weight-bearing, more rapid recovery, and a safe alternative to plates. We measured pre and postoperative weight-bearing radiographs of the legs, including the center head to trochanteric tip distance (Y offset), scrutinizing the femoral head for necrosis. **Results:** Of 66 osteotomies, 64 healed primarily and 2 required rod revision (Vit. D deficiency). Importantly, we did not identify osseous necrosis of the femoral head or compromise of the femoral neck height. We observed a perplexingly frequent (14%) incidence of broken screws (10:1 were distal). The pattern of failure was analyzed, culminating in revised screw design. The results of this re-engineering effort will be tracked and reported.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Minimal Invasive Surgery**

**Time: 10:30 - 12:00**

**Room: LEBLON**

**Abstract no.: 37622**

**MINIMALLY INVASIVE PLATE OSTEOSYNTHESIS (MIPO) BY ANTERIOR APPROACH - A VIABLE OPTION FOR DISTAL HUMERAL SHAFT FRACTURES PRODUCED BY ARM WRESTLING**

Paul Dan SIRBU, Razvan ASAFTEI, Grigore BEREA, Tudor PETREUS, Rares SOVA, Paul BOTEZ

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**Introduction.** The unusual distal humeral shaft fractures produced by arm-wrestling were successfully treated either by conservative approach or by open reduction and internal fixation. The aim of this prospective study is to evaluate the safety and feasibility of minimally invasive plate osteosynthesis (MIPO) by anterior approach in these fractures. **Methods.** We have operated 9 fractures type 12-B1/AO and 4 fractures type 12-A1/AO using two limited distal and proximal approaches. A moulded narrow 4.5 mm classic or DCP plate with 10-14 holes was inserted from distal to proximal and fixed onto the shaft with at least 2 proximal and 2 distal screws, after indirect close reduction. Rehabilitation started immediately. All patients were followed for at least 12 months. The operating time, radiation exposure, postoperative complications, time to fracture union, the Constant-Murley score for shoulder and Mayo Elbow Performance Index (MEPI) were recorded. **Results.** The mean operating time was 69.2 minutes with an average X-ray exposure of 20 seconds. All fractures healed within a mean time of 9.84 weeks with no primary or secondary bone grafting. No implant failures or septic complications occurred in the study group. 5 fractures healed with an angulation in various up to 5 degrees. At the last follow-up, the functional results were excellent according to Constant-Murley score for shoulder and MEPI score for elbow. **Conclusions.** For the distal third humeral shaft fractures, MIPO by anterior approach represent the optimal approach, regarding safety and feasibility, faster rate of union and better functional results compared to conservative techniques.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Minimal Invasive Surgery**

**Time: 10:30 - 12:00**

**Room: LEBLON**

**Abstract no.: 37337**

**TREATMENT OF COMMINUTED FRACTURES OF THE PROXIMAL HUMERUS IN OLDER PATIENTS WITH MINIMAL INVASIVE INTERNAL FIXATION**

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Medicine, SHANGHAI (CHINA)

**Objective:** To study the method of treatment of comminuted fractures of the proximal humerus in older patients with minimal invasive internal fixation with AO LPHP and to evaluate its clinical effects. **Methods:** There were 29 patients (13 males, 16 females) with displaced proximal humerus fractures, which were all injured from trauma. All patients were surgically treated with minimal invasive internal fixation with AO LPHP. The cases with obvious osseous defects of the head of humerus were filled with bone, and the cases with impaired rotator cuffs were sutured through the positioning holes in AO LPHP with the non-absorbable thoracic bone sutures. The shoulder joints' functional exercises of all the cases were begun gradually on the first day after operation. **Results:** All the 29 cases were followed up. According to the Neer hundred-mark system score, the joint function of shoulder was excellent in 16 cases, good in 8 cases, fair in 4 cases and poor in 1 case. The excellent and good rate was 83%. The avascular necrosis of the humeral head occurred in 1 case (3%).

**Conclusions:** The method of treatment of comminuted fractures of the proximal humerus in older patients with Minimal Invasive internal fixation with AO LPHP can provide adequate stability of the shoulder to bear the early functional exercisers.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Road Trauma Safety**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 38190**

**IMPLEMENTING A TRAUMA REGISTRY IN DONETSK, UKRAINE:  
INITIAL STEPS AND ANALYSIS**

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Tarek RAZEK<sup>1</sup>

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Background: Injury is a leading cause of global mortality. Little hospital based data has been published in resource limited settings describing injury epidemiology. Our goal was to implement an electronic trauma registry in Ukraine. Methods: After the completion of an all hazards risk assessment for the Euro 2012 soccer championships, one of the identified areas for improved preparedness included the implementation of a trauma registry. The data was collected in paper form at the Donetsk Research Institute of Traumatology and Orthopaedics. The nursing personnel was asked to fill out a one page form which includes demographic, geographic location information, the Kampala score, cause/mechanism of the injury, anatomic and physiologic information, and outcome for each patient. An iPad app, *iTraumaRegistry*, was also developed to improve the efficiency of the data collection. We deployed the app at the institute to test the feasibility. Results: Serious injury victims were mostly male (68%), with a mean age of 38 years old, and college educated. Falls were most common injury mechanisms. The mean Kampala score was 11. Injuries were usually fractures (90%), closed (82%). 92% of patients who presented to the ED, mostly arriving by ambulance or private vehicle, ended up being hospitalized. Conclusion: The implementation of an electronic trauma registry in Ukraine proved feasible. The registry forms an essential component of trauma system development and will form the foundation of education, injury prevention programs. It will help guide future policy to address the significant burden of injury as well as better disaster management plans.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Road Trauma Safety**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 37144**

**THE EFFECT OF IMPLEMENTING REGIONAL TRAUMA NETWORKS ON TRAUMA WORKLOAD AND TRAINING OPPORTUNITIES IN THE U.K SETTING**

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Introduction: Regional trauma networks (RTN) were established following reports of considerable disparity in quality of care and survival between centres. Variation in the number of cases treated and the specialist services available were thought to be the main contributing factors. RTNs are based on major trauma centres that receive the vast majority of severe trauma whilst surrounded trauma units treat less severely injured patients. This study aims to assess the impact RTNs have had on the trauma workload and training opportunities for junior staff at our trauma unit. Methods: All trauma admissions from 1st April 2011 until 1st April 2013 were retrospectively identified. The RTN was implemented on the 1st April 2012 and the study group was split into pre- and post RTN groups. The reason for admission, patient demographics, length of stay and need for surgical intervention were obtained from computerised records. Results: A total of 3,777 patients were admitted under the trauma team during the study period, similar numbers were seen in the two study groups. The number of polytrauma patients admitted, defined as Injury Severity Score >16, were comparable between the groups (34 pre and 36 post RTN). Procedures commonly performed by orthopaedic trainees remained similar between the two periods; distal radius fixation (116 pre and 139 post RTN), hip fracture (426 pre and 430 post RTN) and ankle fixation (156 and 174 post RTN). Conclusion: Early results show that workload and training opportunities have not been adversely influenced by the introduction of RTN.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Road Trauma Safety**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 37549**

**THE HEALTH IMPACTS OF A NEW ROAD TRAFFIC LAW ON MOTORCYCLE INJURIES AND FATALITIES IN LAGOS, NIGERIA**

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Introduction: Motorcycle-related injuries (MCRI) have assumed predominance in Road Traffic Injuries (RTI) in low income countries. Objectives: to assess the health impacts of a new legislation on the prevalence and outcome of MCRI. Methodology: Two years prospective study in a Nigerian hospital representing one year before and after the traffic law was analysed for demography, regions injured and outcome of the motorcycle-injured patients. Results: Some 4,342 RTI patients with 1,710 (39.4%) motorcycle-related injuries (MCRI): 1,234 MCRI patients (49.6%) out of 2,489 RTI in the first year and 476 (25.7%) out of 1,853 RTI in the second year were seen. Motorized 4-wheel (M4W) vehicles increased from 917 patients in the first year to 1,037 in the second (13%); tricycle-related injuries (TCRI) from 89 to 127 (42%), while truck-related injuries from 33 to 48 patients (45%). Proportionately, M4W vehicle injuries were 917 of 2,489 RTI patients (36.8%) but 1,037 out of 1,853 (56%) patients in the first and second years, respectively. For TCRI, the proportion went up from 3.6% to 6.9%. Regional injuries also dropped by 57%, 65% and 53% among MCRI in head, lower limbs and upper limbs, respectively. Death rate reduced by 100% from 12 to zero and from 22 to seven among patients brought in dead among MCRI in the first and second years, respectively. Conclusions: This new law banning motorcyclists from only the highways recorded significant reductions in injury morbidity and mortality but concomitant increases in M4W-related injuries suggest the need for greater implementation of general safety policies.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Road Trauma Safety**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 37180**

**EVALUATION OF THE EFFECTS OF STANDARDIZATION PROCESS OF SEVERE TRAUMA TREATMENT IN CHINA**

Xiaofeng YIN, Tianbing WANG, Yuhui KOU, Peixun ZHANG, Qingtian LI, Chungui XU, Jiuxu DENG, Bo CHEN, Zhenwei WANG, Baoguo JIANG

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**Objective:** This study investigates the efficiency of current severe trauma treatments in China and the effects of standardization processes in improving severe trauma treatments. **Methods:** This study was conducted in 12 hospital located in 12 geographically and industrially different cities in China. All these hospitals followed a standardization process on severe trauma rescue and treatments. Staff involved were trained under a general rule. A regional network (system) efficiently integrating pre-hospital rescue, emergency room treatments, and hospital specialist treatments was established. Treatment outcomes were compared between before and one year after the implementation of standardization processes. **Results:** The outcomes of a total of 74,615 cases of severe trauma were collected from 12 hospitals before the implementation of standardization processes. Among them, 21.09% patients had >16 of injury severity score (ISS). Serious traffic injuries accounted for 32.45% of the total trauma. There was no efficient cooperation and integration between different treatment services. The emergency response time, pre-hospital transit time, emergency rescue time, consultation call time, and mortality rate of patients were 24.24, 45.69, 6.38, 17.53 minutes, and 33.82%, respectively. Implementation of the standardization processes led to efficient integration and cooperation of different treatment services, and significantly reduced the emergency response time, pre-hospital transit time, emergency rescue time, consultation call time, and mortality rate of patients to 10.11, 22.39, 3.26 minutes, and 20.49 %, respectively. **Conclusion:** Staff training and standardization processes can significantly improve the treatment efficiency of severe trauma based on current personnel and organizations of severe trauma treatments in China.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Road Trauma Safety**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 37362**

**A PUBLIC HEALTH PERSPECTIVE OF ROAD TRAFFIC INJURIES INVOLVING SCHOOL STUDENTS IN BEIJING, CHINA: ANALYSIS OF EMERGENCY MEDICAL CENTER DATA FROM 2004 TO 2010**

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**Background:** Road traffic injuries (RTIs) pose significant burden at individual, family and societal levels. Children and adolescents are an important group affected by RTIs. Although measures have been taken to improve traffic safety among students, few investigations thus far have studied the pattern of the RTIs in this population. **Methods:** Records of 907 students, who suffered from RTIs in Beijing between 2004 and 2010, were analyzed. BEMC database included information about particulars of RTI victims, description of accidents, victims' type of road use, site and severity of the injury, and time of emergency response. Descriptive and categorical analyses of characteristics of RTIs were performed. **Results:** Compared to 2004-06, during the period of 2008-10 annual average of RTIs was much lower, and victims affected were younger with lower proportion comprised by adolescents. Analysis of car accidents revealed that proportion of accidents involving pedestrians was higher in 2004-06, while bicyclists accounted for larger proportions during 2008-10. Furthermore, number of RTI affected students increased with age, and adolescents were more likely to be involved than children. A higher proportion of RTIs among adolescent students resulted from car accidents and adolescents were more likely to be car occupants than children. **Conclusions:** This study revealed that car accidents, pedestrian victims, slight/medium trauma and occurrence around school time were major characteristics of RTIs among school students. Although incidences are declining, RTIs remain a serious concern and effective prevention measures, targeted specifically towards school students, are needed.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Road Trauma Safety**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 37162**

**CHANGES AND TRENDS OF PRE-HOSPITAL CARE DISEASES DURING TEN YEARS IN BEIJING EMERGENCY MEDICAL CENTER**

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<sup>1</sup>Department of Trauma and Orthopaedics, Peking University People's Hospital, Beijing (CHINA), <sup>2</sup>Beijing Emergency Medical Center, Beijing (CHINA)

**Objective:** This research investigates changes of diseases for pre-hospital care patients and services in Beijing Emergency Medical Center, aiming to optimize resource allocation and improve effects. **Methods:** All calling data for pre-hospital emergency from 2002 to 2012 in Beijing Emergency Medical Center was retrospectively conducted. The major types of diseases, population characteristics of first-aid were analyzed. **Results:** Demands for pre-hospital emergency medical service have increased by 174% in the past decade with rapid increase for people over 80. The top diseases in the burden of disease are general trauma, cardiovascular disease, coma and other injuries, which increased year by year. The disease growing fastest is mental and behavioural disorders associated with alcohol (2660%), followed by obstetrics/gynaecology emergency (881%). However, gas poisoning (-29%) and burn (-36%) decreases every year. The peak of patient number of related diseases is observed in major social events and emerging infectious diseases. The first aid depots have increased from 120 in 2002 to 139 in 2012. The urban radius of service was 5 km. The persons and vehicles serving pre-hospital care increased from 1,300 in 2002 to 1,600 in 2012, from 310 to 421, respectively. **Conclusions:** The personnel and allocation of pre-hospital emergency service do not catch up with the growth of demand. The resource and allocation needs to be improved according to patient groups and the changes of diseases.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Road Trauma Safety**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 37632**

**MANAGEMENT AND OUTCOME OF POLYTRAUMATIZED CHILDREN: TWENTY YEARS OF EXPERIENCE FROM A LEVEL I TRAUMA CENTER**

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Introduction: The polytraumatized child is very rare condition facing several challenges in treatment. Paediatric trauma is still the number one cause of death in children, exceeding all other causes of death combined. Methods: This study was performed as a retrospective data analysis including patients aged < 16 and ISS ≥ 16 who were treated between August 1992 und June 2013 at our Department. Statistical analysis focused on injury mechanism, GCS, ISS, AIS, GOS and clinical outcome of all patients. Results: 100 patients with a mean age of 9.5 years ± 5.0 were available for retrospective follow up (64 male, 36 female). The injury pattern was in 50% caused by traffic accidents, in 41% by a fall and other reasons in the remaining 9%. With an initial GCS of 7.2 and ISS of 32.7 patients were taken to our clinic. Injured organs were; 73, head (mean AIS 3.9), 78 thorax (mean AIS 3.4), 43, abdomen (mean AIS 3.4), 70, extremities (mean AIS 2.5), two, skin (mean AIS 1.5) and four, neck (mean AIS 4). 28 patients died with a mean ISS of 41.5. 62% of the patients reached a GOS of five after treatment. Conclusion: The polytrauma in children is a very rare disease mostly with severe injuries with a high morbidity and mortality. Caused by better security reasons polytrauma in children decreased over the last decades, nevertheless it is necessary to treat such patients in a specialised centre to secure good clinical outcome.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Road Trauma Safety**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 37358**

**COMPARISON OF ROAD TRAFFIC INJURY CHARACTERISTICS BETWEEN LOCAL VERSUS FLOATING MIGRANT PATIENTS IN A TERTIARY HOSPITAL BETWEEN 2007 AND 2010**

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Background: The aim of this study is to give a description of the road traffic injuries (RTIs) characteristics of floating migrant population by comparing with those of local residents in a harbour city of China. Methods: A population-based descriptive study was carried out between 2007 and 2010 with RTI patient records from the Fifth Center Hospital of Tianjin. We analyzed the demographics and general characteristics of RTI patients that were in the hospital during the four years. In order to compare the group differences between local resident patients and floating migrant patients, the distribution of their ages, diagnoses, severity of injuries, duration of inpatient stays, hospitalization cost were analyzed. Results: People between the ages of 16 and 55 were the most likely to suffer RTIs. The floating migrant patients between the ages of 16 and 45 had a higher incidence of accidents, while local resident patients between 46 and 55 had a higher incidence of accidents. Compared to local resident patients, floating migrant patients were more vulnerable to open injuries and severe traffic injuries. With the severity of injuries ranked from mild to severe, floating migrant patients had lower duration of inpatient stay, but higher hospitalization costs compared to local resident patients. Conclusions: Floating migrant patients had a different age distribution, severity of injuries, diseases, inpatient duration and hospitalization cost compared with local resident patients. Compared to local resident patients, floating migrants had a higher risk to RTIs and were more vulnerable to severer traffic accidents at lower ages.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Road Trauma Safety**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 37641**

**THE CONUNDRUM OF POLYTRAUMA IN SOKOTO, NORTH- WEST NIGERIA**

Muhammad OBOIRIEN, Solomon UKWUANI

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**INTRODUCTION:** The Management of Polytrauma remains a challenge in regions of sub-Saharan Africa. We sought to document our experiences with Polytrauma management in a resource poor setting. **METHODS:** It was a retrospective review of cases of Polytrauma managed at a regional trauma center in North-west Nigeria from January 2012 to December 2012. Trauma records of patients were retrieved and collated. Statistical analysis was done with SPSS 21 **RESULTS:** A total of 84 patients were seen with a mean age of  $29.34 \pm 14.82$ . There were 78 males and 6 females giving a male to female ratio of 13:1. Road traffic accidents were the commonest mechanism in 66(78.6%) patients while assault 6(7.1%), fall from height 6(7.1%), collapsed building 4(4.8%) were observed. Forty-two per cent of patients arrived at our facility 24hrs after the trauma while 10.7% arrived within an hour and 28.6% arrived after 6 hours. Head and extremity injuries were the commonly encountered with 71% and 65% respectively. The common injury combination observed were head/extremity 39%, head/facial 27.4%, head extremity/facial 27.4%, and head/chest 11.9%. Mortality was 9.5% and those with major and minor disability were 9.5% and 7.1% respectively. Duration of more than 1 hour of arrival at facility was statistically significant on mortality, while age, mechanism of injury, distance from health facility was not statistically significant on mortality. **CONCLUSION:** Measures aimed at improving road safety would help to reduce the incidence of Polytrauma. Efficient Pre-hospital care would ensure prompt arrival at designated health facilities.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Road Trauma Safety**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 38140**

**KNOWLEDGE OF GLASGOW COMA SCALE AMONG HEALTH CARE PROFESSIONALS CARING FOR HEAD INJURY PATIENTS**

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**Introduction** Traumatic head injury is primarily assessed using Glasgow Coma Scale (GCS). However, the GCS score is unreliable for correct assessment, especially with inexperienced users. The purpose of this study was to examine knowledge of hospital staff who observed head injury patients on ward and whether they understand what GCS is. A short straightforward scenario was given with a calculation of GCS score. **Methods:** A one sided questionnaire was used asking questions to Nursing staff and Doctors who are involved in assessing and observing GCS of patients following traumatic head injury. A short scenario was given and a breakdown of GCS components was required. **Results:** 6 junior nurses (JN), 10 senior nurses (SN), 4 junior doctors (JD) and 4 orthopaedic specialist trainees (SD) filled out the questionnaire. In knowing what different Components of GCS is 17% of JN, 60% of SN, 100% of JD, 100% of SD gave correct answers. In the short scenario provided assessing the GCS of a patient 16% of JN, 10% of SN, 0% of JD, 25% of SD gave correct answers. **Conclusion:** Doctors scored higher than Nurses with assessing the components of GCS. In scoring GCS scenario all health professionals were poor at scoring the accurate value and the breakdown of the components. This prospective study showed that majority of health professional looking after patients gave inaccurate assessments of GCS. This study indicates the need for education to reduce variability in GCS-Scoring. The GCS is an important score for clinical decision making and prognostication.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Road Trauma Safety**

**Time: 10:30 - 12:00**

**Room: BOTAFOGO**

**Abstract no.: 38111**

**IMPACT OF THORACIC TRAUMA ON THE DELAY OF SURGICAL INTERVENTION IN POLYTRAUMATIZED PATIENTS WITH SEVERE PELVIC INJURY**

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Introduction: The development and initial treatment of pulmonary complications is substantive in polytrauma treatment. Recent reports showed that acquisition of pulmonary complications is associated with elevated morbidity and mortality rates. The aim of our study was to investigate the causes and the effects of pulmonary complications. Methods: Data of 186 polytraumatized patients with severe pelvic trauma was retrospectively collected. 52 patients were separated into 3 groups: Group 1: immediate ORIF Group 2: ORIF within 7 days after admission Group 3: secondary ORIF, later than 7 days after admission Delay of operative treatment, duration of ICU stay, general stay in hospital and ventilator days were assessed. Circumstances leading to conservative treatment were evaluated. Attention was paid to the kind of pulmonary complication, complications of cardiac or abdominal origin, thoracic trauma and its AIS code. Results: Among the 52 operatively treated patients, 21 (40%) underwent secondary ORIF. In 60 % the instable respiratory situation was the cause. Pneumonia was the prevalent complication (69%). Lung contusion seems to be the most relevant injury for development of pulmonary complications and with a prevalence of 85% seemed to be an important contributory factor. After stabilisation of the respiratory situation these patients underwent ORIF 17 days in average after trauma. The length of the ICU stay, as well as of ventilator days was increased in secondary treated patients, especially in patients with pulmonary complications. Conclusion: Pulmonary complications seem to be the most relevant cause of delayed treatment of pelvic fractures in polytraumatized patients.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Elbow Trauma**

**Time: 12:30 - 14:00**

**Room: BOTAFOGO**

**Abstract no.: 36454**

**LOCKING PLATES IN DISTAL HUMERUS FRACTURES IN ADULTS**

**Rakesh GUPTA**

**PGIMS, Rohtak (INDIA)**

The treatment of multi-fragmentary, intra-articular fractures of the distal humerus is difficult, even in young patients with bone of good quality. Small distal fragment, comminution and diminished bone mineral quality makes stable joint reconstruction more problematic. Use of locking plates permits angular stability in fixation of these complex fractures. Forty-three consecutive adult patients with articular fractures of the distal humerus were treated by open reduction and internal fixation with AO distal humerus plate system and locking reconstruction plates. Forty patients were available for the final outcome analysis. As per AO classification, the distribution was A2 (2), A3 (4), B1 (1), B2 (1), C1 (14), C2 (7) and C3 (11). Forty patients were available for the final outcome analysis after a minimum follow up of one year (12-24 months). Follow up involved clinical & radiological evaluation and outcome measures included pain assessment, range of motion, and Mayo elbow performance score. Average age of the patients was 38.4 years (18-73 years). Clinical and radiological consolidation of the fracture was observed in all cases at an average of 11.6 weeks (9-14 weeks). Using the Mayo elbow performance score the results obtained were graded as excellent or good in 33 patients (82.5%). One patient had superficial infection, 4 had myositis ossificans. There were no cases of primary mal-position or secondary displacement, implant failure or ulnar neuropathy. Locking plate system appears to be effective in providing stabile fixation and facilitate early post-operative rehabilitation.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Elbow Trauma**

**Time: 12:30 - 14:00**

**Room: BOTAFOGO**

**Abstract no.: 36629**

**DO WE REALLY NEED OLECRANON OSTEOTOMY IN ALL TYPE C DISTAL HUMERAL FRACTURES**

Ashish KUMAR, Shah WALIULLAH

King George Medical University, Lucknow (INDIA)

Introduction: Type C distal humeral fractures are complex and challenging fracture to manage. Different approaches have been described to manage these fractures. Olecranon osteotomy is considered as gold standard for these fracture. We evaluated the functional outcome in management of distal humeral fractures treated by open reduction and internal fixation by distal Triceps tongue reflecting approach, along with criteria's for requirement of osteotomy. Method and Material: Total 32 patients with distal humeral fracture AO Type C, were taken. 28 were managed by distal Triceps tongue reflecting approach and internal fixation, while only four patient required osteotomy. Cases were followed up clinically as well as radiologically. Functional outcomes of patient were accessed in terms of Mayo Elbow Performance score (MEPS). Results: All patients were followed for a minimum of 39 months. All patients managed through triceps reflecting approach had shown union, 22 patients had shown good to excellent score, 5 patients had fair outcome while 1 had poor outcome. MEPS score at final recent follow-up was 86.4 patients had stiff elbow. No patient had loss of rotatory motion although 23% patients had loss of terminal range of flexion/ extension as compared to the normal side. The range of flexion was 124.0° (range 90°- 135°) and the mean arc of motion was 115.0° (range 85°- 130°). Conclusion: Triceps Reflecting approach can be used in management of most of the distal humeral fractures as it provides adequate visualization and reduction however fractures having comminution of trochlea and fractures involving anterior capitellum should not be attempt with this approach.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Elbow Trauma**

**Time: 12:30 - 14:00**

**Room: BOTAFOGO**

**Abstract no.: 36934**

**PRIMARY TOTAL ELBOW REPLACEMENT FOR THE TREATMENT OF DISTAL HUMERAL FRACTURES AND NEGLECTED DISLOCATIONS IN ELDERLY PATIENTS**

**Sandeep KANAKARADDI**

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Treatment of complex distal humeral fractures and Neglected Dislocations in older patients with osteopenic bone remains a major surgical challenge. Failure of fixation, Instability and prolonged painful rehabilitation are common with Osteosynthesis or Open Reduction. We report the results of 11 patients over 60 years of age who underwent semi-constrained sloppy-hinge total elbow arthroplasty (TEA) for complex distal humeral fractures and Neglected Dislocations. There were 10 women and 1 man with a mean age of 65 years. The mean duration of follow up was 2 years. The mean time from injury to operation was 3 days in Fracture Patients and 90 days in neglected dislocation patients. The average length of hospital stay was 11 days. The elbow flexion/extension and forearm pronation/supination arc of motion at 3 weeks averaged 140 degrees and 130 degrees respectively. The mean Mayo Elbow Performance Score (MEPS) was 90 points, equivalent to excellent result, at 3 months follow-up. Signs of non-progressive radiolucency were found in 5 out of the 11 elbows. In conclusion, TEA constitutes a viable treatment option for the complex distal humeral fractures and Neglected Dislocations in elderly patients with rapid rehabilitation and early and painless return to activities of daily routine. Careful patient selection, counselling and regular follow up evaluation are mandatory for achieving optimal results and eliminating the risks of mismanagement and early implant failure.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Elbow Trauma**

**Time: 12:30 - 14:00**

**Room: BOTAFOGO**

**Abstract no.: 37418**

**OLECRANON FRACTURES: OPERATIVE OR NON-OPERATIVE TREATMENT?**

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Introduction: Operative treatment is the most widely described method for treating displaced olecranon fractures. Due to surgical risks, and risks of failure in certain patients, non-operative treatment may be more suitable. Objectives: To compare the outcomes of operative versus non-operative treatment of displaced olecranon fractures. Methods: Retrospective analysis of all closed, displaced olecranon fractures over the last 3 years with minimal 6-month follow-up. These were grouped by age (<75 or ≥75 years) and treatment. The outcomes were reviewed (analogue pain score and QuickDASH). Results: 76 patients were identified. 36 underwent Tension Band Wiring (TBW), 11 of these were ≥75 years. 14 underwent open reduction internal fixation, and 24 were managed non-operatively; 17 of these were over ≥74 years. Those patients who underwent TBW in the younger age group had a mean pain score of 2.29, and QuickDASH of 11.99, versus 4.1 and 52.25 respectively in the older group. Those <75 managed non-operatively had a pain and function score of 3 and 8.79 respectively, versus 1.52 and 7.67 in the older group. Non-operative treatment in those aged ≥75 demonstrated significantly lower pain scores ( $p = 0.003$ ) and a better functional outcome ( $p < 0.0001$ ) compared to TBW fixation. There were 23 re-operations in the TBW group for either wire related, wound complications or removal, 7 of these were in the ≥75 years group. Conclusions: Non-operative treatment of displaced olecranon fractures in the older population is an acceptable treatment option, with low reported pain scores, and a reasonable residual function.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Elbow Trauma**

**Time: 12:30 - 14:00**

**Room: BOTAFOGO**

**Abstract no.: 37754**

**COMPARATIVE STUDY OF SURGICAL MANAGEMENT OF OLECRANON FRACTURES USING TENSION BAND WIRING TECHNIQUE WITH CANCELLOUS SCREW AND K WIRES**

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JJM Medical College, Davanagere (INDIA)

**INTRODUCTION:** Olecranon fractures are commonly seen due to fall on the elbow. Colton classification is used to evaluate them. This study compares the techniques of Tension Band Wiring with cancellous screws and Kirschner wires to assess the elbow joint motion and stability after both procedures. **MATERIALS AND METHODS:** In this study, done from November 2012 to March 2013, 20 cases of Olecranon fracture were studied with mean age of 47.5 years. 10 patients were treated by TBW with K wires and 10 by intramedullary cancellous screws. Post-operative follow up was done at 6, 12 and 24 weeks. Functional outcome was assessed by Mayo Elbow Performance Score. **RESULTS:** In TBW and Kwire group, 4 (40%) had evidence of union at 12 weeks, 4 (40%) at 14 weeks and 2 (20%) at 16 weeks. In Cancellous screw group, 14 (70%) showed evidence of union at 12 weeks and 6 (30%) at 14 weeks. 90% cases treated with Cancellous screws had arc of motion greater than 100 degree. 30 % cases in Kwire group had arc of movement from 50 to 100 degrees, compared to 10% in Cancellous screw. 3 cases had prominence of Kwire. In TBW with Cancellous screw, 80% (8) had excellent result, 10% (1) good and 10% (1) fair result. Contrastingly, TBW with Kwire had 50% (5) excellent, 30% (3) had good and 20% (2) had fair results according to Mayo score ( $p=0.36$ ). There is not much statistical significance between the two groups except hardware prominence and reduced arc of motion in the Kwire group.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Elbow Trauma**

**Time: 12:30 - 14:00**

**Room: BOTAFOGO**

**Abstract no.: 37329**

**ELBOW FLEXION EVALUATION AFTER MEDIAL GASTROCNEMIUS FREE MUSCLE TRANSFER OR LATISSIMUS DORSI MUSCLE TRANSFER IN TRAUMATIC BRACHIAL PLEXUS INJURY**

Frederico MORAES, Mario KUWAE, Ricardo SILVA, Celmo PORTO, Daniel MAGALHÃES, Matheus PAULINO  
Goias Federal University, Goiania (BRAZIL)

**OBJECTIVE:** Elbow flexion comparison between patients with brachial plexus traumatic lesion after standard surgical procedure latissimus dorsi transfer and medial gastrocnemius free muscle transfer. **METHODOLOGY:** Retrospective, convenience 13 patients, in Goias Federal University, from 2000 to 2010. Group 1 with seven patients (gastrocnemius), and six in group 2 (latissimus dorsi). Functional outcome: 1) range of motion (ROM) in elbow flexion, goniometry in degrees; 2) elbow flexion muscle power. Satisfactory results: 1) ROM: elbow flexion > 80°; 2) Power: elbow flexion > M3. Friedman, Wilcoxon and Kruskal-Wallis tests ( $p < 0,05$ ). **RESULTS:** Group 1 with average lesion time of 18, 4 months and group 2 of 26, 3 months. Mean age 32 years. Motorcycle accidents in 10 patients (70%). Elbow flexion Power M3 in group 1 with 7 patients (100%) and group 2 with 5 (83,3%) ( $p = 0,462$ ). Group 2 presented one patient (14%) with poor outcome M2. Elbow flexion ROM > 80° were found in group 1 at 6 patients (86%) and in group 2 at 3 (50%) ( $p = 0,1$ ). **CONCLUSION:** Medial gastrocnemius free muscle transfer had a better ROM and muscle power than latissimus dorsi transfer, but without a statistical significance. So, medial gastrocnemius free muscle transfer is a new surgical option in case other technics cannot be performed. **KEY WORDS:** Brachial plexus surgery; muscle transplant; gastrocnemius.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Elbow Trauma**

**Time: 12:30 - 14:00**

**Room: BOTAFOGO**

**Abstract no.: 37430**

**TREATMENT OF NEGLECTED ELBOW DISLOCATION USING ILIZAROV RING FIXATOR**

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Open reduction is the only manner by neglected elbow dislocation can be relocated. However immobilization necessary for maintenance of joint reduction inevitably to elbow stiffness. This complication may be overcome if early elbow motion is started after surgical reduction. However early range of motion should not cause redislocation. A hinged elbow Ilizarov external fixator has been shown to be capable of providing the needed joint mobility and at the same time maintenance of the reduction. Materials and Methods: In a series of 23 cases of neglected posterior elbow dislocation we did open reduction and application of a hinged Ilizarov external fixator; 2-4 days post-surgery, the hinged fixator is unlocked and the patients were started on range of motion exercises. At an average of 5 months follow up, the patients have and follow-up. The patients have an average arc of 115° and functionally all have excellent results. The hinged Ilizarov external fixator may also be used for more complicated instances such as fracture dislocation of the elbow and severely comminuted distal humeral fractures and extension and flexion contractures of the elbow. Placements of the hinges are very important. Conclusion: Ilizarov hinged external fixator is an excellent tool for neglected elbow dislocation.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Elbow Trauma**

**Time: 12:30 - 14:00**

**Room: BOTAFOGO**

**Abstract no.: 37647**

**THE EFFECT OF PLATELET-RICH PLASMA INJECTION ON LATERAL EPICONDYLITIS FOLLOWING FAILED CONSERVATIVE MANAGEMENT**

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Introduction: Platelet-Rich Plasma (PRP) injections contain supra-physiological quantities of growth factors which are implicated in tissue healing and have been used to treat lateral epicondylitis (LE). Aims: Our aims were to assess the effect PRP injection on pain and function in patients who suffer from severe LE where conservative management had failed and had thus been listed for surgery. Methods: We prospectively gathered data on 34 consecutive patients (18 women and 16 men). The mean age at operation was 45 years (range 33-60 years). The mean follow-up time was 26 weeks (range 6-114 weeks). We used the Arthrex ACP system for PRP preparation. To evaluate outcomes we used the Oxford Elbow Score (OES) and whether the patients had progressed to having surgery. Results: 30 patients (88.2%) showed an improvement in their OES. Three patients (8.8%) reported that their symptoms had progressed in severity following the injection. One patient had no change in symptoms. No patients suffered adverse reactions. Two patients had undergone an open release procedure and one had the injection repeated at the time of last follow-up. Comparison of pre- and post-op scores for function, pain and psychological-social domains indicated that scores were significantly improved following the PRP injection ( $P = < .000$ ). Pain and psychological-social scores were shown to improve over time ( $P = < .000$  and  $.001$  respectively). Conclusions: Our results show that a single injection of PRP improves pain and function in patients suffering from LE where conservative management has failed and would have otherwise required surgery.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Elbow Trauma**

**Time: 12:30 - 14:00**

**Room: BOTAFOGO**

**Abstract no.: 36858**

**VTE PROPHYLAXIS IN UPPER LIMB TRAUMA SURGERY - ALL JUST A STORM IN A TEA-CUP?**

Melinda Yun Ting HAU, Daniel BLYTH, Nicola WHEELER, Aashish GULATI, Clare WILDIN

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This study was undertaken to determine whether appropriate VTE risk-assessment and prophylaxis was carried out in upper limb trauma patients with respect to local and national guidelines. Retrospective analysis of patient data was undertaken. How many patients had pre-operative VTE assessments was determined, alongside whether patients were correctly identified as being at risk of VTE and if appropriate precautions were taken. Imaging modalities were reviewed to determine the incidence of VTE post-operatively. 50 (91%) patients had VTE assessments on day one. 30 (60%) patients were identified as being at risk of VTE. Of these, 90% had treatment in accordance with hospital guidance (mechanical and pharmacological prophylaxis) but 6.6% (n=2) received no mechanical prophylaxis and one patient received neither. Of the 25 patients who were assessed as not having a VTE risk, 60% (n=15) had combined operating and anaesthetic time >90 minutes. This risk was not identified during pre-operative assessment. 68% (n=17) of these 25 patients deemed to have low VTE risk received pharmacological and mechanical prophylaxis regardless. No patients had a VTE. It is unacceptable that only 90% of patients were assessed on day one when the risks of post-operative VTE are well known. Appropriate peri-operative measures were not always taken in patients identified as at-risk. Furthermore, patients identified as low risk are unnecessarily given LMWH. A lack of universally applicable guidelines may contribute to inaccurate assessment and varied prescriptions. Frontline doctors need to be educated about VTE assessment and prophylaxis for upper limb trauma surgery.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Elbow Trauma**

**Time: 12:30 - 14:00**

**Room: BOTAFOGO**

**Abstract no.: 37428**

**MANAGEMENT OF THE INTRA-ARTICULAR FRACTURES WITH ILIZAROV RING FIXATOR**

**Md Mofakhkharul BARI**

**Nitor, Bio Centre, Dhaka (BANGLADESH)**

**Introduction:** The Ilizarov circular external fixation method is appropriate for treatment of this complex fracture, especially when extensive dissection and internal-fixation are contra-indicated due to bony comminution or soft tissue compromise. Distal intra-articular fractures of tibia, also referred to as pylon fractures, constitute less than 1% of all fractures of the lower extremity and are difficult to treat. As with all intra-articular fractures, anatomic reduction and stable fixation is mandatory. The traumatized overlying soft tissue makes open techniques susceptible to wound complications. **Advantages of Ilizarov method:** - Possibility to extend the frame across the joint (tibial frame for the distal femur fractures, femoral frame for the tibial plateau fractures, foot from for the pylon fractures), -Greater frame stability allowing immediate joint mobilization in with partial weight bearing, -Respect of bone vascularity with less fragment devitalization. **Materials & Methods:** We report 38 lower femur, 48 upper tibia, and 16 pylon fractures from 1990-2012 in NITOR and different medical colleges of Bangladesh, age ranges from 16-65 years. **Result:** Union achieved in almost all the cases with movement of restriction in the knee and ankle. Union achieved with 28 excellent in femur, 8 good and 2 fair according to Kurgan criteria. 12 patients developed knee stiffness. In case of tibia 38 patients with excellent outcome and 10 patients with good union. Besides in pylon fractures union achieved in all the cases with ankle stiffness. **Conclusion:** Ilizarov method is very effective in case of intra-articular fractures with adequate reduction and stable fixation with meticulous intelligent follow-up.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Trauma Upper Extremity**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 38161**

**IN VITRO EVALUATION OF PERCUTANEOUS FIXATION  
TECHNIQUE ACCURACY FOR PROXIMAL HUMERAL FRACTURES**

Roberto IKEMOTO, Joel MURACHOVSKY, Luis NASCIMENTO,  
Rogerio SERPONE, Luiz ALMEIDA, Guilherme LIMA, Eric STROSE,  
Fernando LENDER  
ABC Medical School, Santo Andre (BRAZIL)

Background: Fractures of the proximal humerus occur more frequently in patients over 60 years old due to low-energy trauma and affect females more frequently (3:1). A plate with locked screw provides a more stable fixation than Kirschner wires (K wires) mainly in patients with osteopenia; although some authors have suggested that, in patients with osteoporosis, very rigid implants can destroy and erode the bone of the humeral head and that semi-rigid implants are a better option for load distribution in the bone-metal interface. There is no consensus on the best entry location of the wires in the humerus or the direction of the wires to reach an area of higher density to provide better head support and stability until consolidation. Hypothesis: Percutaneous fracture fixation, with K wires and without an external guide (free-handed technique), is imprecise in providing a stable wire configuration. Methods: Fifteen synthetic humerus bone models were used to evaluate wire position. Three different examiners, five times each, placed the pins the same way as a fracture fixation by percutaneous technique with three 2.5 mm K wires. Conclusion: The accuracy for positioning the 3 K wires in a position that leads to a stable mount for the fixation of the proximal humerus fractures is low (46.7%), being recommended to use an external guide for the introduction of these wires. Key-words: shoulder, fracture, proximal humerus, percutaneous fixation, closed reduction, k wires.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Trauma Upper Extremity**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 36819**

**OSTEOSYNTHESIS OF SHOULDER SURGICAL NECK FRACTURES  
WITH BLOCKING PLATE**

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Objective. To study results of osteosynthesis of surgical neck of shoulder with blocking plate. Materials and Methods. From May 2012 to December 2013 osteosynthesis of shoulder surgical neck with blocking plate (ChM) was held in 38 patients at the Department of Traumatology 5 of RITO. There were 12 men, 26 women. Road traffic injuries were noted in 13 cases, fall injuries were in 25 cases. The age of patients ranged from 16 to 76 years, it should be noted that the majority of victims were elderly people. All fractures were unilateral and closed. 19 patients received fracture of two parts, 14 received three parts, and 5 received four parts. Fixation of bone fragments was held using blocking plates with 3 holes. Results and discussion. The mean operative time was 40-110 minutes. Length of hospital stay was 5-11 days (average -  $6,5 \pm 1$ ). Immobilization of the upper limb was performed with triangular bandage for 3 days. In the future, the shoulder joint will be developed. There were no postoperative complications such as suppuration, metal migration. Clinical outcomes were assessed by Constant Shoulder Score at 3 months. 5 patients received bad results, 2 received satisfactory results, 9 received good results, and 22 received great results. It should be noted that poor results were obtained in patients with fractures of four parts. Conclusions. Blocking plate osteosynthesis for shoulder surgical neck stably fixed fragments and started early rehabilitation. Results of shoulder fracture osteosynthesis of four parts are bad.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Trauma Upper Extremity**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 36779**

**A STUDY OF INTERNAL FIXATION OF UNSTABLE PROXIMAL HUMERUS FRACTURES WITH THE PHILOS LOCKING PLATE IN THE INDIAN POPULATION**

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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: 80 cases (45 males, 35 females) with unstable fractures of proximal humerus treated from June 2011 to June 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 various 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: 2014-11-22**

**Session: Trauma: Free Papers - Trauma Upper Extremity**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 38027**

**FIXATOR-ASSISTED NAILING IN THE TREATMENT OF FRACTURES AND VARUS MALUNIONS OF THE PROXIMAL HUMERUS**

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**Purpose:** Fractures and malunions of the proximal humerus lead to functional impairment, especially limitation of abduction. Our aim was to develop a mini-invasive technique of correction of typical various deformity providing easy closed nailing. **Material and methods:** 40 patients with 2-part fractures (28/40) and malunions of the proximal humerus (12/40) were operated. The technique featured small wire temporary external frame with two k-wires in the humeral head for spatial control. In case of acute fracture it allowed to reach alignment and proper length. In case of malunions percutaneous osteotomy of the surgical neck was performed prior to fixator application, and alignment was reached acutely by the fixator. Then closed intramedullary nailing was performed through a stab wound. **Results:** the technique allowed to restore anatomy of the proximal humerus and avoid varus malalignment. Mini-invasive approach provided fast functional recovery. 32 patients were available for follow-up in 1 year. All fractures and osteotomies healed. Patients demonstrated significantly increased shoulder function and quality of life. **Conclusion:** presented technique provides easy and reproducible way of mini-invasive restoration of anatomy of the proximal humerus in fractures and in malunions. It results with low complication rate and good functional outcomes.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Trauma Upper Extremity**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 38188**

**HACKETAL TECHNIC IN HUMERUS DIAPHYSIS FRACTURE**

**Khaled HUSSEIN**

**Nini Hospital, Tripoli (LEBANON)**

Should we have to use an expensive materiel for the treatment of humerus diaphysis fracture? In 97 humerus diaphysis fracture treated in Lebanon from 2000 to 2013 I used to treat the diaphysis humerus fractures by Hacketal technic: introduction of multiple long pins posteriorly from olecrane fosseta to proximal part of humerus in different types of fractures, spiroidal fractures or transverse fractures. All fractures achieved consolidation from 4 to 8 weeks. This method is cheap way and good results with less complications and save muscles injuries.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Trauma Upper Extremity**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 38530**

**SALVAGE OF THE RADIAL HEAD IN CHRONIC MONTEGGIA FRACTURES IN ADOLESCENTS**

Thilak Samuel JEPEGNANAM, Abel LIVINGSTONE

Christian Medical College, Vellore (INDIA)

3 patients ages, 14 to 21, with a longstanding Monteggia fracture dislocation sustained in childhood, presented 5 to 7 years after injury with pain in the elbow and limitation of flexion. They all had changes of remodelling of the proximal forearm. They were treated with open reduction, ulnar osteotomy and radial shortening osteotomy. 2 patients required reshaping of the radial head. Annular ligament reconstruction was not performed. At a minimum follow up of 2 years, all had full flexion, extension and supination. Though pronation was limited, all were satisfied with the outcome. Radiologically, the radial head was well reduced. Though the limitation is the low number in view of its rarity, this is still of value because of the increased function. In conclusion, this procedure gives a reproducible result in a disabling injury.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Trauma Upper Extremity**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 36896**

**BIOLOGICAL FIXATION OF FOREARM BONE FRACTURES BY  
CLOSED INTRAMEDULLARY NAILING, EMPLOYING NOVEL  
DISTRACTOR ASSEMBLY**

**Sanjeev BHANDARI**

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Introduction: Closed intramedullary nailing of displaced diaphyseal forearm bone fractures is a more biological option than plating. A novel distraction assembly assists in making closed nailing more comfortable and predictable. Methods: 76 patients between 13 to 65 yrs. of age, having displaced forearm fractures were fixed internally by square nails between 2005 -2013. There were 4 cases of segmental fractures – two each of Radius and Ulna. A novel distractor assembly was used to give sustained traction during nailing, with manipulation by thumb or occasionally K-wires. Ulnar nailing was done by prograde side-entry technique. Postoperative above-elbow plaster slab was given for 3 weeks and then gradual use of the limb was encouraged till radiological evidence of bridging callus. Results: 7 cases (9.2%) required minimal opening of fracture to get reduction. The follow-up ranged from 8 months to 5 years (average 15 months). Early bridging callus was seen radiologically from 7 weeks till 16 weeks (mean 11.5 weeks) in 72 cases (94.7%). There were 4 cases (5.3%) of delayed union in ulna which united eventually by 9 months with bone marrow injection. There was no case of deep infection. Overall, 68 patients (89.5%) had excellent or good results, while 8 patients (10.5%) had fair results due to rotational malunion causing some supination-pronation restriction. Conclusion : Biological forearm fracture fixation by closed intramedullary nailing, employing novel distractor to give sustained traction without obstructing C-arm positioning, has distinct advantage of less tissue trauma and early union.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Trauma Upper Extremity**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 36651**

**IS MANIPULATION OF DISTAL RADIUS FRACTURES IN THE EMERGENCY DEPARTMENT BENEFICIAL?**

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Introduction: Distal radius fractures are common and manipulation in the emergency department under either block or sedation is common practice. However little evidence is available to support this practice and this study aims to assess how beneficial these procedures are. Methods: A retrospective review of all distal radius fractures presenting to our centre between April 2011 and March 2013 was performed. Those patients with a displaced distal radius fracture, according to Sarmiento's modification of Lidstrom's scoring system, were included. Patients were excluded if skeletal immature or if no manipulation was attempted in the Emergency department. Patient demographics were recorded and the fracture was graded according to the AO classification. The success of reduction after manipulation and evidence of fracture redisplacement during follow up was evaluated. Results: A total of 132 patients presented to our centre who fitted the inclusion criteria. The mean age was 62.4 years and 83% were female. According to the AO classification 45% were A2, 20% A3, 28% C1 and 7% C2 fractures. Although 94% of manipulated fractures were reduced into either a good or excellent position, 34% of these had redisplaced within 8 weeks with loss of radial length the most common reason for redisplacement. Factors associated with a higher risk of redisplacement were age, females and intra-articular fracture extension. Conclusion: A manipulation is initially successful in the majority of distal radius fractures, however around a third of fractures redisplace resulting in malunion. Elderly patients, females and intra-articular fractures are at higher risk of redisplacement.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Trauma Upper Extremity**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 37578**

**100 DISTAL RADIAL FRACTURES TREATED WITH A NEW NON-BRIDGING EXTERNAL FIXATION TECHNIQUE: EVALUATION OF THE RESULTS AT MINIMUM 4 YEARS OF FOLLOW UP**

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Distal radial fractures represent 17% of the fractures in Italy. Many techniques are available to treat these fractures. In 2008 we have started using a new fixation system; synthesis is guaranteed by two or more K-wires, these K-wires are connected with two radial pins by an external rod. This radial to radial system gives stability to the fracture and allows patients to move the wrist immediately. Removal of the system is after 35-40 days. Aim of this study is to demonstrate that the early good results are maintained at a 4 to 5 years follow up. We report results obtained for 100 DRFs with a minimum follow up of 4 years. Clinical assessment was performed every seven days until removal of external fixation system then at 2, 3, 6 and 12 months. Radiographic assessment was performed at 35 days, then at 3,6,12 months. Outcome was measured on the basis of ROM, grip and pinch strength, DASH and PRWE scores. All patients were re-evaluated after minimum 4 years. At 60 days after surgery 90% demonstrated excellent recovery. After 3 months 95% of patients demonstrated complete clinical and functional recovery. A high self-reported satisfaction score was obtained considering DASH and PRWE score. We observed a restricted number of minor complications. This non bridging device was proved to be an excellent tool in treating DRFs with a mini invasive approach and an early mobilization of the joint. Functional outcome was satisfactory at the time of implant removal, very good at 3 months' time and excellent at 6 months from surgery. The control at a minimum 4 years follow up showed a maintenance of these results over time.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Trauma Upper Extremity**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 38174**

**THE ARM TRACTION DEVICE - A NOVEL METHOD OF REDUCING COLLES' FRACTURE**

Ravi MALLINA, James HENDRY, Joshua JACOB, Vijayaraj  
RAMASAMY, Najab ELLAHEE

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**Introduction:** Closed reduction of distal radius fractures usually requires three assistants and conventional reduction methods significantly impinge on the Emergency Room resources which are already being limited with the European Working Time Directive. We describe an original technique of reducing Colles' fracture in the Emergency Room using the Arm Traction Device. It is designed to be used by a single operator and is a useful adjunct in achieving immediate and satisfactory reduction. **Materials and Methods:** This study was conducted prospectively between January 2010 and March 2013. Radiographic measurements: volar tilt, radial inclination and radial height were carried out on all patients at pre-reduction and post-reduction. For the analysis of position change from pre-reduction to post-reduction, a 2 tailed Student t test was performed, with a significance threshold of  $P = 0.05$ . All tests were conducted with commercial statistical software (SPSS version 13.0; SPSS Inc, Chicago, IL). **Results:** We included 140 consecutive patients (104 female and 36 male) with a mean age of 78.4 (53 years to 94 years) in the study. Using the arm traction device all three radiographic measurements were restored and maintained adequately following reduction of a Colles' fracture. There were no major complications noted. Fourteen patients required surgical intervention although initial radiographs were satisfactory. Our prospective study shows that we can use a single experienced operator to achieve a satisfactory reduction using the Arm Traction Device.

**Date: 2014-11-22**

**Session: Trauma: Free Papers - Trauma Upper Extremity**

**Time: 08:30 - 10:00**

**Room: FLAMENGO**

**Abstract no.: 37261**

**CLOSED REDUCTION AND K WIRING BY KAPANDJI TECHNIQUE  
FOR COMPLETELY DISPLACED PEDIATRIC DISTAL RADIUS  
FRACTURES**

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In completely displaced paediatric distal radius fractures, achieving satisfactory reduction with closed manipulation and maintenance of reduction with casting is difficult. Forty six completely displaced distal radius fractures in children aged between 6 and 14 years were treated by closed reduction and fixation. One or two intrafocal k wires were used to lever out and reduce the distal fragment's posterior translation and radial translation. One or two extrafocal k wires were used to augment intrafocal fixation. Post-op immobilization was done for 3 to 6 weeks, after which K wires were removed. Immobilization was done with short arm POP cast initially and later with removable wrist splint. Patients were followed up for a minimum period of 4 months. Near anatomical reduction was achieved easily with intrafocal leverage technique in all fractures. The mean procedure time for K wiring was seven minutes. Two and three k wires were utilized to fix radius respectively in 27 and 19 patients. Posterior intrafocal k wire was used in 34 cases; posterior and lateral intrafocal k wires were used in 12 cases. On follow up, there was no loss of reduction; remanipulation was not done in any case. All fractures healed and full function of the wrist and forearm was achieved. The kapandji intrafocal K wire technique consistently achieves easy and near anatomical closed reduction by leverage reduction method in completely displaced paediatric distal radius fractures. The casting duration can be reduced without fear of loss of reduction and good functional results can be obtained.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Miscellaneous II**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 37956**

**THE FATE OF MENISCI IN ACL DEFICIENT KNEE JOINTS**

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The purpose of the present study was to determine the relation between the incidence of meniscal injuries in ACL deficient knees and the time of surgery as well as to analyse the location of meniscal tears, whether medial or lateral, in acute versus chronic ACL deficient knees. We retrospectively reviewed 100 patients who underwent arthroscopic ACL reconstruction in our institute between January 2012 and September 2013. The incidence of meniscal tears was assessed and related to the time from injury to surgery. We divided the patients into an early group (surgery within 6 months of injury) and a late group (surgery more than 6 months after injury). There was a significantly higher incidence of meniscal tears in patients undergoing ACL reconstruction in the late group as compared to those in the early group (54.2% vs 26.8%). There was also a significant difference in the site of meniscal tear in both the groups. This was due to a large increase in medial meniscal tears in the late group. We concluded that the incidence of meniscal tears in ACL deficient knees increases with time and that lateral meniscal tear occurs more frequently in acute ACL injury while the incidence of medial meniscal tear increases with time. Key words: ACL deficiency; Meniscal tear; ACL reconstruction; knee.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Miscellaneous II**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 37304**

**IS THE MENISCAL REPAIR ASSESSMENT SCORE (MERAS) FOR EVALUATION OF MENISCUS REFIXATION RELIABLE?**

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**Objectives:** The aim was the evaluation of the healing success after primary meniscus refixation using 7-Tesla-MRI, and to compare clinical with radiological outcome using a new assessment tool for MRI-evaluation of the healing meniscus. **Methods:** This prospective study includes ten patients (eight male, two female) with a mean age of 30.1 years. Patients with a meniscal tear treated arthroscopically with meniscus refixation were included. Every patient was examined with a 7T-MRI six and twelve months postoperatively. The Meniscal Repair Assessment Score (MERAS), a new MRI scoring tool for evaluation of the sutured meniscus was created containing assessment of the femoral and tibial surface, associated meniscal findings and occurrence of other pathologies. Additionally, a clinical examination and an interview using a questionnaire containing clinical scores (KOOS, IKDC) was performed 6 and 12 months postoperatively. **Preliminary results:** All ten patients showed a mean MERAS Score of 66.6 (SD 12.7, maximum of 100) six months postoperatively, indicating good radiological outcome. The four patients who already performed the 12 months follow-up MRI measurement had a mean MERAS score of 68.0 (SD 14.8) six months postoperatively and of 65.0 (SD 12.3) twelve months postoperatively, representing a good radiological outcome at all times of follow-up. Similarly, the clinical scores showed good results at all times of follow-up. **Conclusion:** Meniscal refixation offers satisfying clinical and imaging results. The newly developed MERAS-Score allows a systematic analysis of the meniscal structure and is suitable for evaluation of the healing success after meniscal refixation.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Miscellaneous II**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 38250**

**IS THERE A DIFFERENCE IN MENISCAL GEOMETRY BETWEEN PATIENTS WITH NORMAL KNEES AND THOSE WITH MENISCAL OR LIGAMENTOUS INJURY?**

Damon GREENE<sup>1</sup>, Alex TEJANI<sup>1</sup>, Robert PIVEC<sup>1</sup>, Qais NAZIRI<sup>1</sup>, Bashir ZIKRIA<sup>2</sup>, William URBAN<sup>1</sup>

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**Introduction:** The purpose of our study was to explore any association between meniscal size and geometry in patients with meniscal injury and those with normal knees. **Methods:** We retrospectively reviewed MRI studies of 121 consecutive patients. These were separated into 3 groups: 1) with ACL rupture or injury with concomitant meniscal injury, 2) those with meniscal injury but intact ACL, and 3) those without any knee pathology. Using the sagittal view we measured the meniscal height, base, and slope of the lateral and medial meniscus at the anterior and posterior surface. **Results:** The mean measurements of meniscal height, width, and slope showed no statistically significant difference between patients with and without ACL pathology. However, group 3 (no knee pathology) had a significantly smaller area when compared to the remaining 2 groups in the anterior horn of the med. meniscus ( $F(2, 115) = 8.495$ ,  $p = 0.000$ ) and the anterior ( $F(2,113) = 8.229$ ,  $p = 0.000$ ) and posterior ( $F(2,116) = 4.565$ ,  $p = 0.012$ ) horns of the lateral meniscus. In the med. posterior horn ( $F(2,112) = 8.278$ ,  $p = 0.000$ ), group 3 had a significantly smaller area than group 1 but not group 2. **Conclusion:** We were unable to find any statistically significant difference in radiologic measurement of meniscal height or slope between patients who sustained anterior cruciate ligament and meniscal injuries, those with meniscal injuries alone, and those with no knee pathology. However, patients with no knee pathology had a significantly smaller cross sectional area than the other two groups.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Miscellaneous II**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 38334**

**KNEE ARTHROSCOPY IS BENEFICIAL TO MIDDLE-AGED PATIENTS WITH MENISCAL SYMPTOMS: A PROSPECTIVE, RANDOMISED, SINGLE-BLINDED STUDY**

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Background: There is no evidence that a knee arthroscopy is beneficial to middle-aged patients with meniscal symptoms. This randomised controlled trial aimed to determine whether an arthroscopic intervention combined with a structured rehabilitation programme would provide more benefit, than a structured exercise programme alone, for middle-aged patients with meniscal symptoms that have undergone physiotherapy. We also assessed whether age and symptom history might affect the outcome. Methods: 150 out of 179 eligible patients, aged 45 to 64, with no radiographic osteoarthritis, were randomised to: (1) A physiotherapy appointment within 2 weeks of inclusion that included instructions for a 3-month exercise programme (non-surgery group); or (2) the same as (1) plus, within 4 weeks of inclusion, knee arthroscopy for resection of any significant meniscal injuries (surgery group). The primary outcome was pain after 12 months, assessed with the pain subscale of the Knee Injury and Osteoarthritis Outcome Score (KOOSPAIN). Results: In the Intention-To-Treat analysis, pain at 12 months was significantly lower in the surgery than in the non-surgery group. The change in KOOSPAIN was significantly larger in the surgery than in the non-surgery group (between-group difference was 10.6 points of change; 95% CI: 3.4 to 17.7, p=0.004). The As-Treated analysis showed similar results. Age and symptom history (ie mechanical symptoms or acute onset of symptoms) didn't affect the outcome. Conclusion: Middle-aged patients with meniscal symptoms and no radiographic osteoarthritis, may benefit from arthroscopic surgery in addition to a structured exercise programme. Patients' age or symptom history didn't affect the outcome.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Miscellaneous II**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 38387**

**ARTHROSCOPIC DEBRIDEMENT AND LAVAGE FOR PRIMARY OSTEOARTHRITIS OF THE KNEE - THE DAVANGERE EXPERIENCE**

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CHANNAVEERIAH

JJM Medical College, Davangere (INDIA)

**Introduction:** Primary osteoarthritis of the knee is a disabling condition affecting a major chunk of the geriatric population all over the world. This problem has a higher incidence in a country like India due to lifestyle habits. The options available for dealing with this problem range from analgesics to Total Knee Replacement surgery.

**Aim:** To study the effectiveness of arthroscopic debridement and lavage as an economic option for primary Osteoarthritis of the knee. **Materials and methods:** Our study included 108 patients who were operated in the two hospitals attached to our institution. The patients were diagnosed with primary Osteoarthritis of the knee and were graded according to the Kellgren and Lawrence classification and all patients were of grade 1-3. The patients were followed up in the immediate post-operative period and at 1 month and 6 months. The functional improvement was quantified using the Cincinnati knee scoring system and the WOMAC scoring for the knee.

**Results:** Among the 108 patients operated, 96 patients (89 %) improved considerably with an almost 25 - 40 % increase in their WOMAC knee scores at 1 month follow up. The improvement in WOMAC scores for 12 patients was under 5 %. There were no complications associated with this procedure. **Conclusion:** This procedure gives significant functional improvement for the knee which is proved statistically. Thus this procedure is a very good economic option for patients in developing countries which can be done as a day care procedure.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Miscellaneous II**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 38350**

**KNEE ARTICULAR CARTILAGE RESURFACING USING SYNTHETIC SCAFFOLDS AND FRESH CHONDRAL AUTOGRAFTS**

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Introduction: Patello-femoral traumatic and degenerative focal cartilage lesions affect millions of people in the world. In addition to knee pain, these conditions have a significant impact in the limitations of the patients' lives. The goal of this study was to evaluate clinical, radiological, and histological outcomes of patello-femoral cartilage repair using a synthetic scaffold. Material and methods: Micro-fracture combined with the implantation of a bioresorbable synthetic scaffold in combination with autologous minced cartilage tissue was performed. Patients were evaluated pre-operatively and up to 48 months after surgery using subjective scores, physical examinations, MRI and ArthroSCAN. Biopsies were performed in 19 patients. Results: Ninety patients were treated with this combined technique. Seventy-nine patients were evaluated (average 24 months). Patients showed significant clinical improvements ( $p < 0.001$ ) in VAS score, decreasing from 5.8 to 2.5, in IKDC score changing from 35.1 to 55.5 and in WOMAC total score from 55.8 to 77.3 (transformed score). For the SF-36 score, the physical component in these patients significantly increased ( $p < 0.001$ ) from 31.6 to 39.4 and their mental component improved from 47.3 to 50.8. A hyper intensive cartilage signal and a good defect filling were evaluated by MRI and ArthroSCAN, with a strong histological evaluation. Conclusion: Microfracture combined with minced autologous cartilage and covering with a synthetic scaffold seems to be an effective treatment option for focal cartilage lesions of the knee.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Miscellaneous II**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 38282**

**FUNCTIONAL RESULTS AND SPORTS RETURN IN PATIENTS TREATED WITH OSTEOCHONDRAL AUTOGRAFT TRANSFER SYSTEM (OATS)**

David FIGUEROA, Rafael CALVO, Alex VAISMAN, Ximena AHUMADA, Francisco FIGUEROA, Sergio ARELLANO

Clinica Alemana de Santiago, Santiago (CHILE)

Osteochondral Autograft Transfer System (OATS) is a treatment option for cartilage lesions that offers restoration of hyaline cartilage anatomy and structure. Objectives: To evaluate the medium long-term functional results and return to sports in patients with full thickness cartilage lesions treated with OATS. Methods: Retrospective descriptive serie of 70 cases in 67 patients, 58 men, average age of 32 years (12-56) with clinical and imaging diagnosis of osteochondral full thickness defect classified according the International Cartilage Repair Society (ICRS) as grade 4, All patients were treated with OATS between 2006-2012, by the same surgical team. Demographic information, associated procedures performed simultaneously and prior surgery performed were registered. Functional evaluation was done with Lysholm and subjective IKDC Score. Return to sports was evaluated with Tegner Score preop and postop. Average follow up was 28 months (7-88). Results: 22% of the patients have had a prior surgery on the same knee. 73% had associated procedures performed simultaneously. The 68.6% of the patients returned to sports. Average preop Tegner Score was 4.1 (2-6); postop Tegner Score was 3.5 (1-6). 53.7% of the patients maintained or improved their sport level according to the Tegner Score. Average subjective IKDC Score was 88 points (23-100). Average Lysholm Score was 89 points (38-100). Conclusions: The OATS technique in patients with full thickness cartilage lesions of the knee has good functional results at medium long term follow-up, with a high rate of sports return; in half of the cases the return is to the same sports level.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Miscellaneous II**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 36777**

**PATELLAR TENDON PARTIAL TEARS (JUMPER'S KNEE) ARE ASSOCIATED WITH SIGNS OF PATELLAR INSTABILITY ON MR IMAGING**

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**Introduction:** Patellar tendon partial tears (PTPT) are an overuse condition and a potentially sports-career ending injury. Leg length differences and patella alta have been described to be associated with PTPT. The aim of the study was to compare patellofemoral characteristics on MRI in patients with and without PTPT. **Methods:** 47 MRIs of PTPT (30.8 +/- 11.4 years) were analysed for trochlear geometry (trochlear facet ratio (TFR), lateral inclination (LI), trochlear angle, and lateral condylar index (LCI)), patellar position (Patellatrochlear Index (PTI), Insall-Salvati (IS), Caton-Deschamp (CD), and Tilt), and tibial tubercle trochlear groove distance (TT-TG). 100 age and gender matched patients (29.3 +/- 9.3 years) served as controls (CG). **Results:** Measurements for trochlear geometry differ significantly between the PTPT and CG for LI (19.0° vs. 16.2°; p<0.05) and TFR (0.39 vs. 0.48; p<0.001), however not for LCI (p=0.61) and trochlear angle (p=0.92). TFR was pathologic in 55.3% of the patients with PTPT, and in 23% of the controls (p<0.001). The patella in PTPT is significantly higher than in controls (PTI: 0.32.6 vs. 0.37, p<0.001; and IS 1.19 vs. 1.10 p<0.02). In PTPT, PTI was pathologic in 31.9% (controls 11%, p<0.01) and for IS in 42.6% (controls 26%, p<0.05). The TT-TG distance is also increased (12.0mm vs. 10.1mm, p<0.01), however pathologic in only one patient. Overall inter-rater reliability was excellent using intra class correlation for single measures (p>0.9). **Conclusion:** PTPT is associated with patella alta, decreased medial trochlear facet and increased TT-TG. Further studies are needed to evaluate their clinical significance.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Sports Medicine**

**Miscellaneous II**

**Time: 10:30 - 12:00**

**Room: FLAMENGO**

**Abstract no.: 36525**

**ULTRASONOGRAPHIC EVALUATION OF HARVESTED PATELLAR TENDON IN FOOTBALL PLAYERS**

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**Introduction:** To investigate the structural changes of the patellar tendon following Bone-Patellar-Bone (BTB) autograft Anterior Cruciate Ligament (ACL) reconstruction. **Methods:** Thirty football players had undergone BTB autograft ACL reconstruction during the past year, and were examined at 10±2 SD months postoperatively. Each donor tendon was evaluated with an ultrasound and compared with the contralateral healthy one. The maximum anteroposterior (MAP) and maximum transverse (MT) diameters of the patellar tendon and associated defect were measured at its proximal, middle and distal thirds. The presence of vascular flow was examined with colour Doppler imaging. **Results:** The mean MAP diameter of the harvested tendon was significantly greater at all measured sites in comparison to the contralateral tendon ( $P<0.01$ ). There was no statistically significant difference between the mean MT diameters of the donor and healthy tendons ( $P>0.05$ ). The mean MAP diameter of the patellar tendon defect was 4.0±2.1 mm, 4.7±2.8 mm and 4.1±2.4 mm at the proximal, middle and distal third of the tendon respectively. Accordingly, the mean MT diameter of the defect was 3.3±2.2 mm (proximal third), 2.9±1.6 mm (middle third) and 2.1±0.9 mm (distal third). The vast majority (22) of tendon defects showed low echogenicity. No tendon exhibited any signs of neovascularization. **Conclusions:** Patellar tendons after BTB ACL reconstruction were characterized by increased thickness and mostly low echogenicity at the site of the defect. Signs of solid healing were evident by 12 months in a minority of patients. No inflammatory changes were observed in our asymptomatic subjects.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Conservative Treatment & Pain Management**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 38333**

**COMPARISON OF ACCURACY OF INTRAARTICULAR KNEE INJECTION BETWEEN MODIFIED ANTEROLATERAL AND SUPEROLATERAL APPROACHES IN THE PATIENTS WITH SYMPTOMATIC KNEE OSTEOARTHRITIS**

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**Introduction:** Intra-articular injection of knee joint is commonly used for therapeutic purpose in symptomatic knee osteoarthritis. To achieve the maximal potential therapeutic benefit, intra-articular injection of knee joint with various agents should be delivered directly into the intra-articular space. **Objective:** To evaluate the accuracy rate of two approaches (modified anterolateral, superolateral) of intra-articular knee injection in the patients with symptomatic knee osteoarthritis. **Methods:** The study group (106 knees from 44 patients) was randomized to receive two approaches of intra-articular knee injection with various agents & air. Post-injection radiograph was performed to verify the accuracy of injection. An 11-point visual analog scale (VAS), flexion contracture of knee, degree of osteoarthritis (OA) and body mass index (BMI) were recorded after injection. **Results:** The modified anterolateral approach was resulted in the higher pooled accuracy of 90.6% (95%CI, 82.4-98.6%) than superolateral approach 58.5% (95%CI, 44.7-72.2%). VAS from each approach was equal to 2.6. Flexion contracture of knee, degree of OA and BMI were non-statistically significant correlated with accuracy of knee injection. **Conclusions:** The modified anterolateral approach has 1.55 (95%CI, 1.21-1.97,  $P < 0.01$ ) times statistically significant higher success rate of injection than superolateral approach. The advantages of modified anterolateral approach are easily reproducible, more accuracy to access the joint and more comfortable for patients with knee flexion contracture. From the advantages of this approach, using the modified anterolateral approach of knee injection in clinical setting with the patient in supine with knee flexion position on the examination table is recommended to use.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Conservative Treatment & Pain Management**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 38330**

**MANAGEMENT OF OSTEOARTHRITIS KNEE JOINT BY VISCOSUPPLEMENTATION WITH NON ANIMAL STABILIZED HYALURONIC ACID: A RETROSPECTIVE STUDY IN 42 CASES**

**Ashok Kumar DAS**

**Calcutta Medical Research Institute, Kolkata (INDIA)**

Aim of Study: There are multifacetal management for OA in geriatric patients. The aim is to evaluate effectiveness of viscosupplementation with “non-animal stabilized hyaluronic acid” in OA knee-joint. Material methods: 42 patients (19:23::M:F), between 55-80 years with OA knee (grade I,II,III). With minimal various, included here. All fulfilled American rheumatism criteria, with radiographic evidence of OA and documented pain on weight bearing. Intra articular “Non animal stabilized hyaluronic acid” (NASHA), 60mg /3ml were given as single dose, may be repeated 6months after. Clinical assessment done at end of 2nd and 4th weeks, then every month for 6months, 1 year and yearly for 5years. The results assessed: pain on weight bearing, at rest and pain intensity (VAS), stiffness, joint scores, Ritchie’s Articular index score and “Patients global assessment of treatment results” also are assessed radiologically and arthroscopically. Results: 70% patients had pain-relief on walking, from 2nd weeks, with progressive decrease in pain by end of 8 weeks. 38 patients pain free at rest after 1st injection. Improvement of range of movement in 98% patients. Joint scores, RAIS and Functional disability scores improved in all patients. Patients’ global assessment was fair 10%, excellent 20% and good 70%. 2 patients developed rashes, another inflammation and one developed septic-arthritis in this series. Conclusion: Viscosupplementation with NASA is effective treatment-option for patient with whom oral medications are ineffective and arthroplasty unaffordable. This is cost effective, suitable for patient of 3rd world countries were sitting and squatting is basic demand in day today life.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Conservative Treatment & Pain Management**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 38305**

**COMPARITIVE EVALUATION OF PERIARTICULAR INFILTRATION OF ANALGESIA WITH FEMORAL NERVE BLOCK AFTER TOTAL KNEE ARTHROPLASTY - A PROSPECTIVE, RANDOMIZED CLINICAL TRIAL**

**Kaushik Reddy MADUGULA<sup>1</sup>, Ashok RAJGOPAL<sup>2</sup>**

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Introduction: TKA is painful procedure & adequate perioperative analgesia is crucial for successful outcome. Good perioperative analgesia following TKA facilitates rehabilitation by enabling early ambulation and initiation of physiotherapy. Methods: 101 consecutive patients undergoing bilateral primary TKA at our Institute for 3 months were included. Group I received intraoperative Periarticular infiltration of inj ropivacaine, ketorolac, epinephrine & clonidine and Group F received femoral nerve block. Outcome: Primary Outcome was assessed by calculating the mean opioid (morphine) consumption at the end of 24 hrs. Others include pain assessment by NRS at 6, 12 and 24 hrs & after first mobilization. Ability and time to hold the quadriceps tension and ROM is measured. Results: Morphine consumption was 8.25mg in Group I and 8.68mg in Group F. NRS score after 6, 12 & 24hrs was 3.4, 3.0 & 2.55 in Group I & 3.3, 2.6 & 2.5 respectively in Group F. NRS score after first mobilization was 3.8 in Group I and 3.9 in Group F (p=0.6). Ability to hold Quadriceps tension at 24 hrs was 5.69 sec in group I & 5.36 in group F (p=0.069). Knee ROM at 24 hours was 66.47 degree in group I and 66.70 degree in group F (p=0.6). Conclusion: We could not confirm whether that there was any clear superiority of periarticular infiltration of local anaesthetic over femoral nerve block. However infiltration may be considered the preferred option since it is cheaper and easier to perform than femoral nerve block. In addition infiltration involves the surgeon in alleviating postoperative pain.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Conservative Treatment & Pain Management**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 37970**

**TRANSFORAMINL EPIDURAL ETARNACEPT FOR TREATMENT OF PROLAPSED LUMBAR INTERVERTEBRAL DISC INDUCED SCIATICA**

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Introduction: Treatment of lumbar disc prolapsed is always remain a topic of discussion for conservative verses operative. The objective of the study is to study clinical response of transforaminal epidural Etanercept for lumbar prolapsed intervertebral disc induced sciatica. Method: Patients presenting to O.P.D and Emergency services of our hospital were screened for inclusion and exclusion criteria & suitable 75 candidates were enrolled in study. Patients received 2 transforaminal epidural injections of Etanercept 2mg, 2 weeks apart, and were assessed for efficacy at 2 week, 1 month and 3 months after the second injection. Primary outcome was based on Visual Analog Scale for leg (VASL) and back pain (VASB) and secondary outcome was based on Modified Oswestry back related disability index (ODI).Result: 75 of 82 enrolled patients completed study. Patients showed clinically and statistically significant ( $p<0.001$ ) reduction in VASL, VASB and ODI. There was no incidence of adverse events. Conclusion: transforaminal Epidural etanercept is promising and effective non-operative treatment for patients with sciatica and can obviate the need of surgery. But these results need to be supported by a randomised controlled trial

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Conservative Treatment & Pain Management**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 38084**

**POST-OPERATIVE PAIN ASSESSMENT AND MANAGEMENT IN CEREBRAL PALSY (CP) PATIENTS UNDERGOING HIP OSTEOTOMIES**

Joshua HYMAN, Nanfang XU, Hiroko MATSUMOTO, Anthony ESSILFIE, Evan SHEHA, David ROYE

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Introduction: Post-operative pain assessment and management is of importance following any surgical procedure. Adequate assessment is critical to optimize pain control in patients with CP. This study compares post-operative pain evaluation and management among patients with and without CP following hip osteotomies. Methods: A single-center retrospective cohort study identified 22 patients (aged 1-21 years) with CP undergoing hip osteotomies between 2008 and 2013 and 22 matched non-CP patients based on age, surgical procedure, and approach to post-operative pain management. Patients who received multiple methods of post-operative analgesia were excluded to allow for comparison by modality. The number of assessments conducted, highest pain score recorded each post-operative day (POD), and amount of adjuvant analgesics administered were collected for POD 0-4. Results: While evaluated significantly more often, 77% of CP patients were assessed using an observational tool, compared to 73% of non-CP patients who used a self-report pain scale. CP patients also received significantly more toradol on POD 3 following transition to oral analgesics. Conclusion: Patients with CP differed from their non-CP counterparts in both frequency and method of post-operative pain assessment. Since scores from observational assessment tools and self-report scales are not directly comparable, they can neither be used to account for variation in current pain management strategies, nor guide the development of best practice guidelines on post-operative pain management. Therefore, future research endeavours should be undertaken to correlate observational scales to self-report instruments, so that we will better understand and optimize post-operative pain assessment and management for patients with CP.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Conservative Treatment & Pain Management**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 36913**

**PHYSICAL THERAPY PROGRAM FOR THE MANAGEMENT OF CHRONIC MECHANICAL LOW BACK PAIN**

**Abdulrahman ALGARNI**

**King Saud University, Riyadh (SAUDI ARABIA)**

**Background and Purpose:** A physical therapy program that includes stretching exercises for tight muscles that reduce range of motion (ROM) and restrict the activities of daily living in patients with chronic low back pain is important. The present study was conducted to determine the effect of stretching the gastrocnemius muscles as part of a physical therapy program used to treat patients with chronic low back pain. **Subjects and Methods:** The present study included 20 chronic low back pain patients with a mean ( $\pm$  SD) age of  $32.8 \pm 6.68$  years (range 20 to 40 years of age), who underwent a six-week physical therapy program consisting of stretching exercises for muscles of the back, hamstrings, iliopsoas and gastrocnemius, and strengthening exercises for the abdominal muscles three times per week. The program also included postural instruction for the activities of daily living. Outcome measures included visual analogue scale scores to measure pain, tape measurement of fingertip-to-floor manoeuvres to assess ROM of trunk flexion, and the Oswestry disability index questionnaire for low back pain/dysfunction. **Results:** Study participants demonstrated significant differences in pain levels ( $p=0.0001$ ), ROM of trunk flexion ( $p=0.0001$ ) and Oswestry disability questionnaire index ( $p=0.0001$ ). **Conclusion:** The present study demonstrated the benefits of physical therapy and the importance of stretching the gastrocnemius muscles as part of a rehabilitation program for chronic low back pain.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Conservative Treatment & Pain Management**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 36943**

**HIP ABDUCTORS AND ADDUCTORS IN COMBINATION WITH QUADRICEPS AND HAMSTRINGS STRENGTHENING EXERCISES IN THE TREATMENT OF OSTEOARTHRITIC KNEE PATIENTS**

**Abdulrahman ALGARNI**

**King Saud University, Riyadh (SAUDI ARABIA)**

Background and Purpose: Hip abduction and adduction strengthening exercises may be critical in the prevention and rehabilitation of both overuse and traumatic injuries where the knee frontal plane alignment is considered to be important. The purpose of this study was to examine the effect of hip muscles strength on osteoarthritis (OA) of the knee. Subjects and methods: The study included 40 patients, age ranging from 45 and 60 years divided into 2 groups. The first group received hip abduction and adduction, quadriceps and hamstrings muscles strengthening exercises, stretching exercises of the hamstrings and the calf muscles. The second group received quadriceps and hamstrings muscles strengthening exercises, stretching exercises of the hamstrings and the calf muscles. The program was applied three times per week for a period of six weeks. Outcome measures were VAS to measure the severity level of pain, and Hand-held dynamometry is a tool used to measure maximum isometric strength of knee extension and flexion, and WOMAC scale to measure functional activity level. The measurement was done pre and post treatment. Results: There was a significant difference between two groups, where there was a significant difference in pain by VAS, muscle strength, pain by WOMAC, Stiffness, Physical Function, and Total WOMAC, where P-value as follow: 0.0001, 0.0001, 0.0001, 0.0001, 0.0001 and 0.004 respectively. Conclusion: Hip abduction and adduction strengthening exercises proved to be beneficial in the treatment of patients with knee osteoarthritis.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Conservative Treatment & Pain Management**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 37834**

**HUMERUS FRACTURES: NON-OPERATIVE TREATMENT ADVANTAGES**

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The modern operative orthopaedics offers the wide range for treatment methods including different approaches and different fixation methods of the humeral shaft fractures. That is the reason why the non-operative treatment loses its popularity all over the world. The results of operative treatment are not always satisfactory and the advantages of the non-operative treatment are underestimated – that's why we analyzed the results of the non-operative methods to determine its value. We analyzed 22 cases with isolated humerus fractures without neurologic disorders who underwent non-operative (Sarmiento) treatment from July 2012 to February 2014 in Moscow city hospitals # 17 and 31. First we applied plaster splints from MP joints to scapula, then after swelling regress we changed it to functional plaster circulatory splint in 15 patients and bandage in 7. The results revealed the axis restoration (less than 20o displacement) after the dynamic splint application though we didn't use traction. Every patient underwent clinical and radiological checkout every 2 weeks. After the plaster removal the patients started physiotherapy exercises. The fracture healing was assessed clinically (pain and pathological movements) and radiologically (periosteal callus). The functional rehabilitation was assessed at 10-12 weeks term. 21 patients showed radiological fracture healing by 7-10 weeks. 1 patient (70 years) showed non-union. 18 patients showed full functional rehabilitation, 3 patients showed slight painless functional restrictions and only 1 patient with non-union showed severe functional restriction with moderate pain. Thus non-operative treatment demands close and responsible interaction between patients and doctor but can offer better functional results.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Conservative Treatment & Pain Management**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 36914**

**CLINICAL RESULTS OF TRADITIONAL CHINESE SPLINT COMBINED WITH EARLY ACTIVE MICROMOTION TO TREAT HUMERAL SHAFT FRACTURES**

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Sichuan Orthopaedics Hospital, ChengDu (CHINA)

From December 2008 to September 2012, we treated 178 patients suffering the humeral shaft fractures with traditional Chinese splint combined with early active micromotion, 96 patients were male and 82 patients were female. The average age was 41.6y (17-73y), All were acute fractures, 68 cases were AO type A fractures, 77 cases were type B fractures and 33 cases were type C fractures. After successful close reduction, we stabilize the fractures with traditional Chinese splint and instructed the patients in the performance of active elbow flexion and extension exercises on the prefabricated platform to produce axial micromotion one week later. All fractures were healed except 11 cases, the fracture healed in less than 15 degrees of various angulation in 159 cases and anterior angulation in 152 cases. The limitation of motion were less than 12 degrees in shoulder and 8 degrees in elbow. This protocol have the advantage because of high union rate, low medical cost and high satisfaction; Early active micromotion not only can promote the fracture healing, still can make shoulder and elbow early functional exercise; Old age and obesity is a risk factor for treatment of humeral fractures.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Conservative Treatment & Pain Management**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 36876**

**BELOW KNEE CASTS AND VENOUS STASIS - DOES WEIGHT BEARING MAKE A DIFFERENCE?**

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Below knee cast immobilisation is associated with an increased risk of developing deep vein thrombosis secondary to venous stasis. Several national guidelines therefore recommend considering the use of chemical thromboprophylaxis in these patients. However when patients are permitted to weight bear in a cast or boot the effect on venous flow is unknown. We used duplex ultrasound to measure popliteal venous flow in healthy volunteers before and after immobilisation in a below knee cast or boot, whilst performing non-weight bearing, partial weight bearing (50% body weight) and full weight bearing exercises. There was no significant reduction in venous flow when full weight bearing either with or without immobilisation, provided the ankle was in a plantigrade position. Full weight bearing with the ankle immobilised in equinus, or partial weight bearing in all forms of immobilisation was associated with a significant reduction in venous flow. These results suggest that the efficiency of the calf muscle pump to promote venous return is influenced by both weight bearing status and muscle length. This has important implications regarding the provision of chemical thromboprophylaxis and demonstrates that ankle joint immobilisation should not be considered an independent risk factor for the development of deep vein thrombosis without an appreciation of weight-bearing status or ankle joint position.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Ligaments & ACL**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 37979**

**A PROSPECTIVE STUDY OF CLINICAL ASSESSMENT OF ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION USING LOW FEMORAL TUNNEL POSITION BY TRANS PORTAL TECHNIQUE**

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**Apollo Hospitals, Chennai (INDIA)**

**INTRODUCTION:** In anterior cruciate ligament (ACL) reconstruction, the transtibial (TT) technique often creates a non-anatomically placed femoral tunnel, which is a frequent cause of surgical failure and postsurgical knee instability. Several studies reported that drilling the femoral tunnel through an anteromedial portal yields a more anatomic tunnel position compared with the TT technique. **METHODS:** 50 patients who underwent ACL reconstructions using the transportal technique, from January 2011 to January 2012, comprised the study group. Patients aged 20 to 50years with an isolated ACL tear without a meniscal tear were included in the group **RESULTS:** Final assessment post-operative at end of 6 months was evaluated subjectively and objectively by clinical examination, modified Cincinnati knee rating scale (CKRS)74 and Lysholm knee scores. **CONCLUSION:** ACL reconstruction using low femoral tunnel position fixed by transportal fixation technique is a safe and effective method to restore the function of ACL.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Ligaments & ACL**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 37645**

**CLOSED-LOOP VERSUS OPEN LOOP ACL RECONSTRUCTION: A PROSPECTIVE, DOUBLE BLIND, RANDOMIZED CONTROLLED TRIAL**

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Introduction: Different techniques have been developed in order to improve the stability of ACL reconstruction. A study done by Prado (2013) showed that suturing all the limbs of soft tissue graft in a porcine model to produce a closed-loop graft enhanced the initial mechanical properties of tibial fixation by reducing slippage and improving load-to-failure resistance. The purpose of this study is to compare the outcome of ACL reconstruction using the open loop graft and closed-loop graft in terms of static stability and improvement in function and symptoms. Method: The study is a prospective, double-blind, randomized controlled trial. Patients who underwent primary ACL reconstruction were included, and randomly assigned to the closed-loop group and the open loop group. All knees were examined in the operating room before surgery, immediately after surgery, and at 3 and 6 months after surgery. Anterior knee laxity was measured using KT-1000 arthrometer. Subjective knee evaluation and function were assessed using IKDC 2000. Results: Immediate post-operative KT-1000 measurement showed significantly smaller anterior tibial displacement in the closed-loop group, and also at 6 months after surgery. However, no significant differences were noted between the two groups when post-operative measurements were compared to the pre-operative measurement and to the normal knee. IKDC scores were also the same for both groups on follow-up. Conclusion: Suturing all limbs of hamstring graft in ACL reconstruction to form a closed loop graft improved static stability and function immediately after surgery and on follow-up as much as when an open loop graft is used.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Ligaments & ACL**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 38057**

**IS BIGGER ALWAYS BETTER? THE INFLUENCE OF QUADRUPLE HAMSTRING AUTOGRAFT SIZE ON OUTCOMES FOLLOWING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTIVE SURGERY**

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University College Hospital, Galway (IRELAND)

Background: Size mismatch between the native anterior cruciate ligament (ACL) and quadruple hamstring autograft is of concern to some surgeons. This may lead to abandonment of the harvested hamstring grafts of smaller diameters. We postulated the null hypotheses that graft diameter size (in this study, represented by the femoral tunnel size) would not influence outcome following ACL reconstructive surgery. Methods: 165 patients with a minimum follow-up of 1 year post surgery were categorised into 2 groups: femoral tunnel diameter <7.5mm (range 6.0 – 7.5) and ≥ 7.5mm (range 7.5 – 11). Primary outcome was the number of patients requiring revision surgery. Secondary outcome measures included patient satisfaction, mean reduction in Tegner activity level and functional improvement via Lysholm and Lower Extremity Functional Score (LEFS) grading. Results: There were 81 and 84 patients in the <7.5mm and ≥7.5mm groups respectively. The mean Tegner reduction in the <7.5mm group was 1.5 compared to 1.2 in the ≥7.5mm group. Mean Lysholm scores at a minimum of 1 year was 82.4 and 82.3 with the mean LEFS score of 71 and 70.6 for both groups respectively. There were 6 revisions in the first group and 5 revisions in the second. There were no significant differences in primary (revision rate) and secondary outcome measures between our 2 groups. Conclusion: ACL grafts of smaller diameters (<7.5mm) do not result in inferior outcomes. This evidence may reduce the need for graft abandonment and/or the need to switch to bone-patella-tendon-bone autografts or allografts.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Ligaments & ACL**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 37664**

**PREDICTION OF SEMITENDINOSUS-GRACILIS GRAFT DIAMETER IN ADOLESCENTS AND CHILDREN: VALUE OF ANTHROPOMETRIC AND DEMOGRAPHIC MEASURES**

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**Purpose:** To evaluate if the anthropometric and demographic measures of patients under 18 years can be used to predict the diameter of semitendinosus-gracilis autograft in ACL reconstruction surgery. **Methods:** Retrospective series of 169 patients under 18 years (112 men/57 women, average age 15.7 years) who underwent to ACL reconstruction surgery with semitendinosus-gracilis autograft (STG). We recorded anthropometric measurements (weight-height-BMI), demographics (age-gender) and autograft diameter used. Correlation coefficients were used to determine the relationship between each anthropometric variable and the diameter of the graft and T-Student test to compare graft diameter by gender and age group (12-14 vs 15-17 years). P values <0.05 were considered statistically significant. **Results:** Correlation analysis showed a positive relation between weight and graft diameter ( $r=0.31$ ,  $p<0.0001$ ) and between height and graft diameter ( $r=0.48$ ,  $p<0.0001$ ). However, age and BMI did not correlate with graft thickness ( $r=0.05$  and  $p=0.461$ ,  $r=0.06$  and  $p=0.432$ , respectively). The median graft diameter in men was 8 (range 6-10) and 7 women (range 6-9), a difference that was statistically significant ( $p<0.0001$ ). Finally, it was noted that although patients between 15 and 17 years had a graft thicker than those between 12 and 14 years, this difference was not statistically significant ( $p=0.086$ ). **Conclusions:** The weight and height can be used as predictors of STG graft diameter in patients younger than 18 years who undergo ACL reconstruction. Moreover, women and children under 14 years old may have more often insufficient graft diameter, eventually requiring an unplanned augmentation of it.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Ligaments & ACL**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 38135**

**BACK TO SPORT AFTER ACL REPAIR**

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Objective: Healing of acute anterior cruciate ligament (ACL) ruptures has been recently introduced by means of dynamic intraligamentary stabilization (DIS) of the knee joint. We examined rehabilitation success and return to sport activity for patients treated with DIS repair. Methods: 50 patients treated with DIS were prospectively evaluated for rehabilitation success. Knee function was evaluated using the Hop-test; the average from two hops of the injured and healthy legs was utilized for calculation of the leg symmetry index. Maximum force was measured using an average of three legpress replications. After rehabilitation, anterior-posterior translation was measured in relation to the healthy knee, Tegner-scores were also measured. Results: 50 patients were included in the study. Mean age 25.4 years (range 18-49). Mean testing time was 20 weeks postoperatively (range 13-28). Mean limb symmetry index 92% (range 67%-111%). Mean excessive anterior-posterior translation compared to the healthy side was 1.8mm (range 0-3mm). Mean Tegner-score before injury based on patient history was 5.9 (range 4-10) and at the time of testing 5.6 (range 4-9). Mean patient satisfaction was 9.2 (range 8-10). 4 (8%) patients suffered a re-rupture during the first 12 postoperative months. Conclusion: Results demonstrate rehabilitation success in patients undergoing surgical DIS repair of the ruptured ACL. Return to the same level of sport activity is possible. The rate of re-ruptures is not higher than the rate after conventional reconstruction. Our results indicate that self-healing of the ACL using the DIS surgical approach provides successful recovery and restoration of physical function.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Ligaments & ACL**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 37524**

**FEMORAL TUNNEL WIDENING IN SINGLE BUNDLE ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: COMPARISON OF BIO INTERFERENCE SCREW, TRANSFIX AND TIGHT ROPE RT**

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**Introduction:** Tunnel widening after ACL reconstruction is dependent upon type of graft, fixation method and post-operative rehabilitation. We prospectively studied tunnel widening in cases of single bundle ACL (SBACL) reconstruction using quadrupled hamstring graft using Transfix, Tightrope RT and Bio interference screw. **Methods:** 63 patients of SBACL reconstruction were included in study and divided into 3 groups of 21 patients each based on femoral side fixation. In Group 1 fixation was done with Transfix, Group 2 with Tightrope RT, and Group 3 with Bio interference screw. Data of 20 patients in each group was available at 1 year follow up. Tunnel measurements were done on CT scan at 2 weeks, 6 months and 1 year. The diameters of the tunnels were measured perpendicular to the long axis of the tunnels on oblique coronal and oblique sagittal planes at 3 levels, aperture(A), widest part of tunnel(B) and just below suspension points / distal to tip of screw(C). **Results:** At 6 months and 1 year follow up there was no significant difference in tunnel widening between all the Groups. Widening at point A for Group 1,2,3 at 6 months and 1 Year follow up was 16.1% & 30.2%, 17.0% & 31.2%, 15.8 % & 29.7% respectively, at point B was 14.5% & 28.7%, 15.1% & 29.6%, 14.1% & 28.1% respectively and at point C was 13.8% & 23.4%, 15.1% & 23.8%, 13.2% & 22.5% respectively. Maximum tunnel dilatation was at aperture in all the groups and minimum at Point C.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Ligaments & ACL**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 37681**

**FOUR-YEAR RADIOLOGICAL RESULTS OF ARTHROSCOPIC TREATMENT OF CARTILAGE DEFECTS OF THE KNEE USING MICRODRILLING AND ATELLOCOLLAGEN GEL AS A SINGLE STAGE PROCEDURE**

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**Introduction:** We describe a single stage arthroscopic procedure for the treatment of articular cartilage defects in the knee. The novel procedure involves microdrilling and application of atellocollagen and fibrin gel. The aim of the study was to evaluate the 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 2-8cm<sup>2</sup>. The surgical procedure involved debridement of the lesion, microdrilling and application of atellocollagen and fibrin gel under CO<sub>2</sub> insufflation. All patients underwent morphological MRI, quantitative T2\*(T2-star)-mapping and d-GEMRIC scan; radiological assessment used the MOCART score. **Results:** At 4 year follow-up, the mean scores were as follows: the mean T2\* relaxation-times for the repair tissue and native cartilage were 28.8 and 29.7 respectively. • MOCART score for all lesions was 71.3. **Conclusion:** Our technique shows encouraging results at 4 year follow-up. The morphological MRI shows good cartilage defect filling and the biochemical MRI (T2\*-mapping) suggests hyaline like repair tissue.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Ligaments & ACL**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 37517**

**COMAPARISION OF SINGLE BUNDLE VERSUS DOUBLE BUNDLE  
POSTERIOR CRUCIATE LIGAMENT RECONSTRUCTION**

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Introduction: Anatomically Posterior cruciate ligament (PCL) has been found to have Anterolateral (AL) and Posteromedial (PM) bundles. PCL reconstructions have been largely aimed to replace the larger AL bundle. Some authors have suggested double-bundle reconstructions for more anatomical reconstruction, improved stability and restoration of knee biomechanics. Material and methods: From June 2010 to June 2011, 24 male patients with posterior cruciate ligament tear were randomly divided into two groups A and B of 12 patients each. Group A patients were taken up for single bundle PCL reconstruction while Group B patients were reconstructed with double bundle PCL reconstruction. The clinical outcome results were compared at 2 years follow up with IKDC, Lysholm scores and KT-1000 readings. Results: At 2 year follow up, Lysholm knee scores were  $82.1 \pm 5.6$  in Group A and  $80.7 \pm 8.1$  in the Group B ( $p > 0.05$ ), International Knee Documentation Committee knee score was 70.5% of patients in Group A and 74.6% of patients in Group B were in Grade A and B combined ( $p > 0.05$ ), in post-operative KT 1000 side-to-side difference residual increased laxity greater than 5 mm was 15% in Group A and 12% in Group B ( $p > 0.05$ ). Conclusion: There is no significant difference in clinical outcome of Single bundle compared to double bundle posterior cruciate ligament reconstruction.

**Date: 2014-11-22**

**Session: Sports Medicine: Free Papers - Ligaments & ACL**

**Time: 12:30 - 14:00**

**Room: FLAMENGO**

**Abstract no.: 37116**

**AUTOPLASTY OF POST-TRAUMATIC OSTEOCHONDRAL DEFECT OF PROXIMAL TIBIA**

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Application of the original method of autoplasty of the extensive osteochondral defect of the proximal tibia from the posterior femoral condyle is described. A patient was operated on for the malunion of the intra-articular fracture of the lateral condyle of the tibia with the impression of osteochondral fragments. Autoplasty of the osteochondral defect of the tibia was performed from the posterior parts of the femur condyle, using fixation by tension-locked K-wires. Osteotomy zone for obtaining a transplant may vary depending on the intensity of the cartilage covering and condyle curvature. The authors tried to exert minimum damage to the weight-bearing zones of the posterior femur condyle obtaining a sufficient size of the graft and zone of its coverage by the cartilage. The remote result was evaluated in a year and 10 months after the operation and revealed neither misalignment of a clinical axis of the extremity, nor knee instability, and its full extension. The patient performed full deep squats without any additional support. On the control radiograph the knee joint surface was congruent, the signs of loosening of metal implants were not determined. Remodelling of the posterior femur condyle in the form of contour smoothing in the zone of osteotomy was noted. The autoplasty technique used showed a high efficacy, and allowed to restore completely the function of the knee joint to the degree enabling participation in the sports activities.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Miscellaneous II**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37164**

**A MINIMALLY INVASIVE UNILATERAL POSTERIOR DECOMPRESSION AND INTERBODY FUSION WITH PERCUTANEOUS LONG ARM PEDICLE SCREW SYSTEM FOR LUMBAR DEGENERATIVE SPONDYLOLISTHESIS**

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**Object :** To analysis the clinical outcomes, safety, and efficacy of minimally invasive unilateral posterior decompression and interbody fusion using percutaneous long arm pedicle screw in patients with lumbar degenerative spondylolisthesis. **Methods :** 18 patients with lumbar degenerative spondylolisthesis underwent operation of percutaneous pedicle screw fixation and minimally invasive unilateral decompression and interbody fusion and followed-up for more than three month. The average time of each pedicle screw fixation, X ray exposure times, the blood loss of intraoperavie and post-operation, reduction ratio, hospitalization time, and complications were recorded, the comparison of preoperative and postoperative VAS and ODI score were also analyzed. **Results:** The average insertion time for each pedicle screws was  $15.38 \pm 5.61$ min, X-ray exposure times for each pedicle screw were  $4.99 \pm 2.65$  times, and intraoperative blood loss was  $92.73 \pm 26.16$ ml for each segment decompression. The vertebral body reduction ratio was  $85 \pm 5.6\%$ , the hospitalization time was  $6.8 \pm 2.5$  days. VAS score was  $8.26 \pm 0.81$  before operation,  $4.84 \pm 0.82$  and  $2.45 \pm 0.48$  in 3 days and 3 months post-operation respectively, ODI score was  $63.34 \pm 12.7$  before operation,  $46.39 \pm 8.94$  and  $32.76 \pm 5.23$  in 3 days and 3 months post-operation respectively, the VAS and ODI score was obviously decreased ( $P < 0.05$ ). No cases of nerve injury, leakage of cerebrospinal fluid, hematoma, wound infection and other complications were detected. **Conclusions:** The posterior unilateral decompression and fusion with percutaneous long-arm pedicle screw fixation system is a safe and feasible technique during degenerative spondylolisthesis surgery.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Miscellaneous II**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37246**

**AN ANALYSIS OF THE FAILED LUMBAR NON-FUSION SURGERY:  
PITFALLS OF THE DESIGN? MISINTERPRETATION OF THE  
DEVICES?**

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**Objectives:** Despite the fact that a myriad of devices have been developed with the purpose of achieving dynamic neutralization of the spine, there are now some doubts regarding the true efficacy of these devices. The aim of this study is to analysis of the causes of the failed lumbar non-fusion surgery. **Methods:** From Jan. 2004 to Aug. 2013, 21 cases suffer from failed lumbar non-fusion operation which sourced from our hospital and outpatients were analysed by pre-operation and post-operation image. These devices comprise total disc prosthesis, prosthetic nucleus replacement, posterior interspinous or inter laminar systems, systems with pedicular screws and prosthesis of the facets or posterior ligaments. **Results:** Pitfall of the devices, working life of the devices, wide application only based on early clinical results, insufficient surgical technique and mistake indications may cause the failure. It is possible that these are the reason why dynamic implants almost fail. It is crucial to comply with the indications to obtain good long-term clinical. The primary idea of device is sometimes modified by vendor and surgeon, clinical outcomes will not be satisfied. The properties of the biomaterial will affect the efficiency of devices. Biocompatibility is crucial for the implant longevity of the device. With time going, the spine will degenerate continuously, although implanted with device. The disc property and bone structure are very important for long-term outcomes. **Conclusions:** On the basis of this analysis, we can assert that dynamic neutralization systems seem to be hard to acclaim as universal, each has its limitations.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Miscellaneous II**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 36944**

**A COMPARATIVE STUDY OF CONSERVATIVE VERSUS SURGICAL TREATMENT FOR SPONDYLOLISTHESIS**

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Background: Degenerative spondylolisthesis is a common problem and cause of low back pain that cause restriction of daily activities, Objective: To compare conservative and surgical approaches in the treatment of spondylolisthetic patients and to determine the main indications for surgical treatment. Method: The present study included 40 patients divided into two groups. Group 1 (mean [ $\pm$  SD] age  $48.2 \pm 6.59$  years) followed a physical therapy program of exercise involving stretching exercises for the back, hamstring, gastrocnemius and iliopsoas muscles and strengthening exercises for the abdominal muscles. Patients attended three sessions per week for three months. Group 2 (mean age  $47.95 \pm 5.12$  years) underwent surgery involving only fixation of the slipped vertebra with the above and below vertebrae. Outcome measures were the lumbosacral angle, measured using a lateral loading X-ray view to detect any change in lordotic curve: range of motion of trunk flexion, measured using the fingertip to floor test and tape measurement; and pain severity, measured using a visual analogue scale. Results: There was a significant difference between p-e and post-intervention measures in the group 1, more so than in group 2 (pain,  $P=0.0000000001$ ; range of motion,  $P=0.00000000001$ ; lumbosacral angle,  $P=0.0000001$ ). Discussion and conclusion: A therapeutic exercise program may be recommended for spondylolisthetic patients as an alternative to surgical intervention, which is indicated only in cases involving bowel or bladder disturbances.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Miscellaneous II**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 36683**

**POSTERIOR LUMBAR INTERBODY FUSION USING AUTOGENOUS BONE, POLYETHER-ETHER-KETONE CAGE WITH AND WITHOUT BONE MARROW ASPIRATE IN LUMBAR SPONDYLOLISTHESIS: A PROSPECTIVE STUDY ON A SERIES OF 300 PATIENTS WITH A MINIMUM 1-YEAR FOLLOW-UP**

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Study Design: A prospective clinical study. Objective: To evaluate whether the fusion rate of autogenous bone chips and cage could be augmented by bone marrow aspirate in lumbar spondylolisthesis posterior fusion. Summary of Background. Data An in vivo animal study has indicated that BMA augments spinal fusion while the autogenous bone has no significance with the polyether-ether-ketone cage on the spinal fusion. Methods : Three hundred patients undergoing surgery for instrumented spondylolisthesis posterior fusion with decompression were randomized divided into 2 groups. Autologous iliac crest bone graft, autogenous laminectomy bone graft, polyether-ether-ketone cage were placed in posterior gutter (control), while an equal quantity of iliac crest bone graft, laminectomy bone graft, polyether-ether-ketone cage mixed with BMA were placed on contrast(test). Radiographic assessment was performed every 2 months (2–12 months). The statuses of fusion on the vertebra and the clinical outcomes and life quality were compared. Results: For the 150 patients in control group, 136(90.7%) exhibited bone fusion, and 137 (91.3%) presented evidence of fusion on the test group. The autogenous iliac crest bone graft, autogenous laminectomy bone graft and polyether-ether-ketone cage with and without BMA achieved a similar fusion rate and similar improvement of clinical outcomes and life quality ( $P>0.05$ ). Conclusion There was not enough evidence to conclude that BMA augments spinal fusion. Autograft bone chips harvested from the laminae and spinous processes during decompression surgery could be widely used.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Miscellaneous II**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 36972**

**RESULTS OF STAND-ALONE BONE GRAFT VERSUS BONE GRAFT WITH ANTERIOR CERVICAL PLATE FOR SINGLE LEVEL CERVICAL DISCECTOMY**

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Introduction: Anterior plating provides rigid construct and improves fusion rates in case of multilevel cervical degenerative disease. However there still remains a controversy regarding efficacy rigid anterior plating in single level disc prolapsed as compared to stand-alone bone graft .In this study we intend to compare and analyse the fusion rates and clinical outcome between bone graft alone and rigid plating in case of single level cervical disc prolapse. Materials and method: 60 patients were included in the study.30 patients were treated with autologous iliac crest bone graft and other 30 patients treated with anterior plating system (all patient with same company implant).All patients evaluated radiologically for fusion and clinical outcome at last follow up. The average follow up was 12 month. Clinical outcomes were assessed with the Cervical Spine Outcomes Questionnaire and Odom's criteria on last follow up. Results: Fusion rates and clinical outcome were comparable with both types of procedures at average 12 month follow up. There was no statistical difference. There were no intraoperative or postoperative complications. Conclusion: Fusion using autologous bone graft with or without plating does not make any difference in radiological or clinical outcome in case of single level disc discectomy.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Miscellaneous II**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 36837**

**THE IMPACT OF FUSION STATUS ON PATIENT'S SYMPTOMS, ASSESSED BY FUNCTIONAL COMPUTED TOMOGRAPHY SCAN (FLEXION AND EXTENSION POSITION) AFTER POSTERIOR LUMBAR INTER-BODY FUSION**

Keisuke TOMITA, Yasutsugu YUKAWA, Keigo ITO, Masaaki MACHINO, Taro INOUE, Jun OUCHIDA, Fumihiko KATO  
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Introduction: Posterior lumbar inter-body fusion (PLIF) is a popular procedure for treating lumbar canal stenosis with spinal instability. There are many reports concerning about clinical symptoms and result of fusion, however, lack of consensus in correlation between a patient's symptoms and the fusion status after PLIF. The purpose of this study was to demonstrate that fusion status affects the postoperative patient's symptoms. Method: A total of 264 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 computed tomography (CT) images in flexion-extension position. In CT images, a remaining clear zone or an uncertain bone connection constituted are considered as non-union. The patient's symptoms were evaluated at a year after surgery and final follow up using JOA scoring for lumbar spine diseases. Results: At final follow up, the union rate was 72.1% on functional CT scan. Patients who achieved inter-body fusion had significantly higher JOA score in low back pain and some other parameters than patients who could not obtain inter-body fusion. Conclusion: Our results indicate that postoperative inter-body fusion status could affect patient's symptoms. Therefore, precise assessment of fusion status is important and functional CT could be an appropriate tool for assessing fusion status after PLIF.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Miscellaneous II**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 36716**

**THE FATE OF PREEXISTED DEGENERATIVE ADJACENT SEGMENT AFTER LUMBAR POSTERIOR FUSION: A RETROSPECTIVE STUDY OF OVER FIVE YEARS FOLLOW-UP**

**Dike RUAN, Chao LI, Qing HE, Yong TANG**

**Department of Orthopaedics, Navy General Hospital, Beijing (CHINA)**

**INTRODUCTION:** The major controversy after lumbar fusion is the potential adjacent segment degeneration (ASDeg). This study aimed to evaluate the long-term radiological and clinical outcomes of the pre-existed adjacent discs degeneration after lumbar posterolateral fusion (PLF). **Methods:** A total of 102 patients who had undergone PLF for the degenerative disease for over five years were retrospectively reviewed. The University of California at Los Angeles (UCLA) grading scale was used to evaluate the discs degeneration grade. The VAS, ODI scores and SF-36 questionnaire were used to evaluate clinical outcomes. **Results:** The overall incidence of radiological ASDeg was 25.5%. For the cranial and caudal levels the incidence of ASDeg was 19.6% and 15.1% respectively. The incidence of ASDeg with one, two and three levels fusion were 15.8%, 26.3% and 50% respectively ( $P=0.008$ ). For the cranial level, in the preoperative UCLA A, B, and C grade groups, the incidence of ASDeg was 13.5%, 28.6% and 42.9% respectively ( $P=0.026$ ). Totally, the preexisted degenerative cranial discs were found high incidence of ASDeg than non-preexisted degenerative group. For the caudal level, there was no significant difference. At the final follow-up, the non-preexisted degenerative group showed better outcomes than the preexisted degenerative group. **Conclusions:** The adjacent segment discs with preexisted degeneration had more opportunity of advancing to further ASDeg as compared with the normal discs, and the degeneration of aging might be as a risk factor to promote the formation of ASDeg. The preexisted degenerative UCLA C grade adjacent discs might be involved into the fusion range.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Miscellaneous II**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 36715**

**THE BIOMECHANICAL STUDY OF INFLUENCE OF PRESERVING POSTERIOR LIGAMENTA COMPLEX TO THE ADJACENT SEGMENT AFTER LUMBAR FUSION: THE COMPARING OF DISPLACEMENT-CONTROL AND LOAD-CONTROL LOAD**

Dike RUAN, Chao LI, Qing HE, Yong TANG

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Introduction: The major controversy after lumbar fusion is the potential adjacent segment degeneration (ASDeg). Many factors have been confirmed to bring negative impact to the biomechanical motion of adjacent segment post lumbar fusion. This study aimed to evaluating the biomechanical impact of preserving the posterior ligamenta complex (PLC) during decompression to the adjacent segmental motion after lumbar posterolateral fusion (PLF) with two type of loading of displacement-control and load-control. Methods: Six fresh cadaver lumbar specimens were tested in the sequence of intact, L4-5 posterolateral fixation, L4-5 laminotomy with fixation and L4-5 laminectomy with fixation. With a special designed clamp, both displacement-control and load-control load were applied. Range of motion (ROM) of adjacent segment was measured. Results: In the condition of displacement-control, there was significant difference in the flexion motion ROM between the two groups, and there were also some difference in the motion of extension, lateral bending and rotation between the two groups, but the difference were not significant. In the load-control condition, there were no significant difference in the three dimensional motion between two groups. Conclusions: The motion change of adjacent segment post-fusion only occurred in the situation of displacement-control load. The damage of PLC was the injuring to the intact of spinal unit and preserving PLC could decrease the risk of further degeneration. Different loading method can bring different biomechanical outcome.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Miscellaneous II**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 38192**

**RADIOLOGICAL ASSESSMENT OF ADJACENT LEVEL  
DEGENERATION AFTER SINGLE LEVEL CERVICAL DISC  
REPLACEMENT**

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BOMMIREDDY, Zdenek KLEZL  
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Background: Cervical disc replacement is performed to maintain motion and prevent problems arising from adjacent level degeneration. Cervical disc replacement is still an evolving procedure. Aim: To assess adjacent level degeneration following single level cervical disc replacement. Methods: Retrospective review of our prospectively updated database. Notes we made about demographics, duration of follow up, post-operative imaging. Results: We recruited 43 patients who had single level cervical disc replacement. There were 29 males and 14 females. Average age of our patients was 44 (range 23-59). Average duration of follow up was 29 Months (range 0-71 Months). 2 patients had C4/C5 level, 25 patients had C5/C6 level and 22 patients had C6/C7 level replacement. Average range of motion at the replaced level at last follow up was 6.7. Total of 4 patients (9%) showed changes of degeneration at adjacent levels. Of these 3 showed changes at the proximal level and one at the distal level. Two cases had formation of new osteophytes and two had disc height reduction. 6 cases (13%) showed ossification at the replaced level. 4 had complete bridging of the space and the other two had between 25-50%. In only one of these 6 cases there was no motion at the replaced level. Conclusions: Our results show that at medium term follow up there is 9% radiological changes of adjacent level degeneration. Case matched controlled prospective trial may show whether this degeneration is just routine progression or accelerated by the cervical disc replacement surgery.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Miscellaneous II**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 38155**

**PATIENT-SPECIFIC TEMPLATING CAN DETERMINE THE SUITABILITY AND OPTIMAL PLACEMENT FOR LUMBAR TDR**

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Background: Patients enrolled in an FDA IDE trial for TDR were evaluated retrospectively for their anatomical suitability for TDR using finite element modelling (FEM). Implant placement and ROM achieved was evaluated and correlated to clinical outcome. Optimal implant size and placement was estimated to determine if the ROM could have been improved with pre-operative, patient-specific templating. Methods: Patients received the ProDisc-L implant (DePuy-Synthes, Raynham, MA), and were followed for 24 months. Clinical outcome was assessed using ODI. Individuals with the best and worst clinical outcome were evaluated. Geometry of the lumbar spine was segmented from CT scans and used to develop FEM of the operative FSU, and predicted ROM as limited by facet joints or device endplates. Predicted ROM was compared to measured data, and computational templating was performed to determine if ROM could be improved. Results: The patient with the best clinical outcome had a decrease in ODI score of 58 points and ROM of 5.5° (7.7° predicted) and the patient with the worst clinical outcome had a decrease of 22 points and ROM of 3.75 degrees (4.4° predicted). Templating showed that by placing the implant in an ideal location the estimated ROM increased by 0.1° for the patient with the best clinical outcome. However, for the patient with the worst clinical outcome, templating revealed that using a different implant size could have increased the total ROM by almost 50% to 6.4°. Conclusions: Had templating been performed pre-operatively clinical outcome may have been improved with ideal implant selection.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Miscellaneous II**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 38065**

**CLINICAL EFFECTIVENESS OF LUMBAR EPIDURAL INJECTION USING IMAGE INTENSIFIER COMPARING TO INJECTION WITH NO FLUOROSCOPY AND CONSERVATIVE TREATMENT FOR SPINAL DISC HERNIATION: A PROSPECTIVE, DOUBLE BLINDED, RANDOMIZED CONTROL TRIAL**

Athar Muniruddin SIDDIQUI<sup>1</sup>, Imam MOHAMED<sup>2</sup>, Ravi MALLINA<sup>1</sup>, Nikolai BRIFFA<sup>1</sup>, Vinay SINGH<sup>1</sup>, William BURGOYNE<sup>1</sup>

<sup>1</sup>Epsom & St Heliers' University Hospital NHS Trust, London (UNITED KINGDOM), <sup>2</sup>Elective Orthopaedic Center, London (UNITED KINGDOM)

**Introduction:** Lumbar epidural is an established procedure, which is commonly used to control pain in cases of disc herniation secondary to lumbar disc disease. We conducted the present study to evaluate the clinical effectiveness of lumbar epidural injection using image intensifier comparing to injection using loss of resistance technique with no fluoroscopy. We also evaluated the outcome of these patients with patients treated conservatively with opioid or other analgesia as a control group. **Material and Methods:** The current study was conducted as single center, prospective randomized controlled trial between April 2013 and October 2013 after seeking appropriate ethical approval in our institution. A sealed envelope containing the group allocation was opened by one of the research team on the day of procedure. Fifty-five patients were included in each group. A single clinician performed all procedures and the same combination of local anaesthetic and steroid were injected in all patients. Preoperative and postoperative visual analogue score (VAS) and Oswestry disability were obtained for each patient. **Conclusions:** There is a better outcome demonstrated in both injection groups when compared with control. The post-operative scores did not statistically differ significantly between fluoroscopic and loss of resistance groups. The final results of this trial question the efficacy and cost effectiveness of epidural injections using image intensifier and may be used as a reference to change the current practice within several hospitals as cost saving measure. **Level of Evidence:** 1.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Miscellaneous II**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 37801**

**ANALYSIS OF INFLUENCES BETWEEN PAIN MARKER AND EPIDURAL FIBROSIS FOR MULTIPLE REPEATED**

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Epidural fibrosis is one of the source of postoperative pain which is occurred by repeated surgeries. However, it was not known between epidural fibrosis caused by repeated spinal surgery and pain related protein which is released at the dorsal root ganglion that makes spinal pain syndrome. Using rat spinal surgery epidural fibrosis and adhesion model, we investigate the role of spinal epidural adhesion caused by repeated epidural fibrosis and we checked the dural thickness of the extent of epidural fibrosis and learn the proportional extent. We divided with 3 groups in repeated surgery S-D rat by 3 weeks interval. Group A was first spinal laminectomy surgery group, and group B was two repeated surgery which interval is 3 weeks and finally Group C is 3 repeated surgery group which interval is 3, 6, 9 weeks. And we sacrificed rat and checked dural thickness at each group and we gathered spinal cord and performed immunohistochemistry p38, ERK, JNK at each group. Finally we checked western blot to check the expression of phosphorylated ERK, p38, JNK. Each A, B, C group significantly increased the thickness of epidural fibrosis. By immunohistochemistry and western blot results of ERK and p38 expression was increased in serial control, A, B, C. But JNK expression increase from group A at a different pattern. By western blot, phosphorylation of ERK, p38 also increased in serial pattern control, A, B, C. Repeated epidural spinal surgery while increasing the thickness of the ganglion stimulation of pain-related factors causing pain.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Miscellaneous II**

**Time: 08:30 - 10:00**

**Room: BOTÂNICO**

**Abstract no.: 38012**

**ROLE OF POSTERIOR PEDICLE SCREW FIXATION WITH TRANSPEDICULAR DECOMPRESSION AND CHEMOTHERAPY IN THE TREATMENT OF THORACIC, LUMBAR AND THORACOLUMBAR SPINAL TUBERCULOSIS**

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Introduction: Surgical treatment of spinal tuberculosis is indicated only in patients with progressive neurological deficits or pain due to instability. In such patients, we intend to evaluate the role of a single stage posterior stabilization and transpedicular decompression with chemotherapy as a treatment alternative. Objectives: To analyze the functional outcome, neurological status and radiological outcome in patients treated by this procedure. Methods: 52 patients treated by this procedure from May 2009 to May 2012 were retrospectively analyzed for a minimum of 1 year follow up by using VAS and ODI scores for functional outcome, AIS grading for neurological status and X-ray and MRI evaluation for radiological outcome. Results: VAS and ODI scores showed an improvement in scores which was statistically significant. 87% of patients showed improvement in neurological status. The mean kyphotic angle was 20.6 degrees and the mean correction of kyphotic angle was 6.1 degrees at final follow up. MRI images showed resolution of abscess in all except 1 patient who had a recurrence of infection. Conclusion: Hence we would like to propose that a single stage posterior stabilization with pedicle screws and transpedicular decompression is a good alternative to treat thoracic, thoracolumbar and lumbar tuberculosis, along with the continuation of chemotherapy.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Deformities**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 37315**

**EFFECT OF PREOPERATIVE INDICATIONS CONFERENCE ON PROCEDURAL PLANNING FOR TREATMENT OF SCOLIOSIS**

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<sup>2</sup>Stanford University Medical Center, Stanford (UNITED STATES)

**Summary:** Preoperative indications conferences are often used by academic centers as both teaching tools and discussion forums for surgical planning. The purpose of this study is to determine the effect of such conferences on the intended plan of spine surgery and identify characteristics that increase the likelihood for change. **Methods:** Over 7 months, 101 planned paediatric scoliosis surgeries were presented at preoperative indications conferences with at least five attending paediatric orthopaedic surgeons present. Without knowledge of the operative surgeon's pre-conference plan, a consensus-based plan was finalized with input from those present. Differences between the two plans were classified as major (surgery cancellation, extension of fusion level  $\geq 4$  levels, change from fusion to growing based technique), minor (change of fusion levels  $< 4$  levels, addition of procedure [e.g. osteotomy]), or no change. **Results:** Of the 101 surgical plans, 44 were for index surgeries, 13 for revisions, and 44 for scheduled growing rod lengthening. The only major procedural change involved selecting a growing technique over the original planned fusion. For index surgeries, ten minor changes altered planned fusion levels an average of 1.3 (1-3) levels and added an osteotomy to one case. The overall rate of the change was 25% (11/44) for index surgeries, 7.69% (1/13) for revisions, and 0% for lengthening. **Conclusion:** While revision scoliosis surgery is often more complex, index surgeries for JIS/AIS were most likely to be influenced by preoperative indications conferences. This likely reflects the difficulty surrounding choosing levels of fusion, and the impact of consensus-based decision making.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Deformities**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 37400**

**C7-T1 ANTERIOR CLOSING WEDGE BONE-DISC-BONE  
OSTEOTOMY FOR THE TREATMENT OF CERVICAL  
HYPERLORDOSIS IN MUSCULAR DYSTROPHY: A NEW  
TECHNIQUE FOR CORRECTION OF A RARE DEFORMITY**

Kamil Cagri KOSE<sup>1</sup>, Islam CALISKAN<sup>1</sup>, Emre BAL<sup>1</sup>, Mustafa Erkan  
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**Introduction:** Previous reports of cervical osteotomy essentially have described opening wedge (extension osteotomy) for correction of severe flexion deformities. To the authors' knowledge, C7- T1 closing wedge osteotomy to correct hyperextension deformity due to muscular dystrophy in the cervical spine has not been described previously. To describe a new surgical technique with emphasis on the clinical results and the effect of osteotomy on sagittal balance, gaze angle and spinopelvic parameters. **Methods:** Four male patients aged 16, 16, 19 and 21 presented with cervical hyperlordosis due to Becker muscular dystrophy. There was upward deviation of forward gaze in all patients. Anterior closing wedge (bone-disc-bone) osteotomy of C7-T1 was performed followed with a posterior release correction and instrumented stabilization. The chin–brow angle was visualized with the aid of fluoroscopy during the operation. After closure and posterior fixation, patient was turned supine again and the osteotomy site was grafted and fixed with a plate to further strengthen the construct and to prevent any translation. **Results:** The gaze angles and both sitting and standing postures of the patients markedly improved. There was documented fusion at the osteotomy sites. The patients were free of complaints at the last follow-up **Conclusions:** Bone-disc-bone closing wedge osteotomy done at C7-T1 level is a technically demanding procedure but results in significant acute clinical and radiological improvement in patients with hyperextension deformity of the cervical spine.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Deformities**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 37396**

**NOVEL GROWTH INSTRUMENTATION IN SEVERE DEFORMITIES OF THE IMMATURE SPINE**

Barbara JENSEN<sup>1</sup>, Jonas JENSEN<sup>1</sup>, Jan Duedal RÖLFING<sup>1</sup>, Haisheng LI<sup>1</sup>, Ebbe Stender HANSEN<sup>1</sup>, Kristian Winther HØY<sup>1</sup>, Peter HELMIG<sup>1</sup>, Mads HENRIKSEN<sup>2</sup>, Cody Eric BÜNGER<sup>1</sup>

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Surgical management of severe spinal deformities in the immature spine should ensure a 3D deformity correction while preserving the longitudinal growth of the spine. To achieve these treatment outcomes we developed a double growing rod system with multiple growth tubes based on three platforms. Our aims were to 1) analyse sagittal and coronal curve correction and truncan height and 2) monitor adverse events. Material and Methods: 14 patients were treated with the system. They were followed from pre index surgery to post 2nd lengthening procedure. Mean follow-up time was 516 days (392-594), mean age at index surgery was 9.4 years (5-14) and mean scoliosis Cobb angle  $74.5 \pm 22.4^\circ$ . Underlying pathologies were: neuromuscular (n=5), idiopathic (n=2), osteogenesis imperfecta (n=1), Ewing sarcoma (n=1), myelomeningocele (n=1), syndrome related (n=4). Instruments were applied with pedicle screws or hooks on a cranial, apical and caudal platform using MIS. Deformity correction was achieved by distraction, derotation by applying apical compression and the sagittal contour was created outside the growth tube areas. Results: Index surgery resulted in a mean  $48 \pm 11\%$  scoliosis Cobb angle correction and a mean  $20 \pm 51\%$  kyphosis Cobb angle correction. There was no statistically significant change in lordosis Cobb angle. Truncan height, assessed as T1-S1, increased by  $5.4 \pm 1.8$  cm during the follow-up period. Adverse events were loosening of screws (n=1), assessed at planned procedure, and asymptomatic metal debris (n=3). Conclusion: Our double growing rod system has improved surgical management of severe spinal deformities. Improvements are warranted in order to reduce metal debris.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Deformities**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 38453**

**CLINICO-RADIOLOGICAL RESULTS OF MAGNET DRIVEN GROWING RODS (MDGR) FOR EARLY-ONSET SCOLIOSIS (EOS)**

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Introduction: Magnet driven growing rods (MdGR) have recently been approved for use by NICE-UK and FDA-USA for early-onset scoliosis (EOS). They avoid repetitive anaesthesia and guide in correction of scoliosis with growth. We report clinic-radiological results and complications of single surgeon's series of 24 pre-adolescent children treated by this novel implant. Methods: 10 boys and 14 girls aged <13years with EOS operated at a single institute by submuscular insertion of MdGRs and followed-up for at least one year were prospectively reviewed. The etiologies included idiopathic (5), congenital (4), neuromuscular (10) and syndromic (5). Single rod was inserted in 7 and dual rods in 17 patients. Cobb angle and T1-S1 length was recorded pre-op, immediate post-op and serial three-monthly follow-ups. All adverse events were critically evaluated and managed appropriately. Results: The mean age at surgery was 9.6years (range3.5-12.5years) and mean follow-up was 2.63years (range1-4years). The mean improvement in Cobb angle was at least 50% and average gain in T1-S1 length was 12.7mm. There was a statistically significant improvement in pulmonary function at 2years for early-onset neuromuscular scoliosis (6patients). There were three MdGR breakages and one superficial infection. One patient each had progression of scoliosis and proximal junctional kyphosis that was treated by extension of instrumentation to pelvis and revision surgery. One patient had definitive spinal fusion at 3years post MdGR insertion. Conclusions: MdGR is a very promising novel option in surgical treatment of EOS and is associated with lesser incidence of complications in comparison with published results of conventional growing rods and VEPTR in the literature.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Deformities**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 37041**

**EARLY RESULTS OF SHOULDER BALANCE AFTER SELECTIVE ANTERIOR CORRECTION AND FUSION OF LUMBAR SCOLIOSIS**

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Objective: To study the effect of selective anterior instrumented fusion of lumbar scoliosis on shoulder balance. Methods: Retrospective radiographic analysis of Standing X-ray films of 15 patients with lumbar scoliosis operated by anterior correction and fusion at preoperative, 3months, 6months & 12months postop. Spine and shoulder parameters were measured and analyzed, Correlation between changes in shoulder balance and changes in spine parameters were calculated. Results: Shoulder height parameters showed early change from positive to negative shoulder balance, Lumbar Cobb angle showed postoperative improvement. T1 tilt change was correlated to change in thoracic Cobb angle at 3 months postop. ( $r=0.515$   $p=.049$ ), CRCI was found to be correlated to difference between changes in lumbar Cobb angle and changes in thoracic Cobb angle,  $r=0.56$   $p$  value is 0.030, Correlation between Correction change ratio (ratio between changes in lumbar and changes in thoracic Cobb angles) and T1 tilt, FRA, CA and CPH was found significant with  $p$  value 0.008, 0.016, 0.011 & 0.012 respectively. Conclusion: Spontaneous Correction of shoulder balance after selective anterior fusion of lumbar scoliosis is the most probable after one year. Stiffness of the thoracic curve was shown to affect post op. immediate shoulder imbalance. Reversely, the flexibility of the thoracic curve was shown to be a major determinant in the shoulder re-balance, ratio between correction of lumbar curve and correction of thoracic curve may have a prognostic value in shoulder rebalance after anterior correction surgery. Clavicle angle has the best predictor for postoperative shoulder balance improvement.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Deformities**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 36814**

**RISK FACTORS FOR POSTOPERATIVE CORONAL DECOMPENSATION AFTER THE POSTERIOR OSTEOTOMIES IN ADULT SCOLIOSIS**

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**Objective:** To investigate the potential risk factors for post-operative coronal imbalance following osteotomy for rigid adult scoliosis. **Methods:** This study consisted of 63 patients who received osteotomy surgery, including Smith-Petersen osteotomy (SPOs) and Pedicle Subtraction Osteotomy (PSO), for rigid adult scoliosis. A group of 15 patients with post-operative coronal imbalance was identified, in whom C7 plumb line shift to the convex or concave side over 2cm on coronal plane occurred. The clinical data and surgical strategies were compared between groups to investigate the risk factors, including age, gender, etiology, Cobb angle, pre-operative coronal balance, pre-operative imbalance direction, T1 tilt, tilt of LIV, tilt of vertebrae below LIV, rotation of LIV, rotation of pelvis, disc degeneration at the unfused lumbar levels, fusion levels, screw density, surgical procedure, iliac screws, fusion to S1 and levels of LIV. **Results:** The average follow-up time was 4.1 years. The comparison between patients with and without post-operative coronal imbalance showed that post-operative coronal imbalance was observed in patients with older age ( $P=0.044$ ), longer fusion levels ( $P=0.033$ ), degenerative scoliosis ( $P=0.042$ ), pre-operative pelvic rotation ( $P=0.002$ ), larger tilt of LIV ( $P=0.012$ ) and LIV located below L5 ( $P=0.027$ ). All the six parameters were included into the logistic regression analysis, pelvic rotation ( $P=0.005$ ), large tilt of LIV ( $P=0.024$ ), and LIV located below L5 ( $P=0.031$ ) were finally identified as risk factors for post-operative coronal imbalance after osteotomies. **Conclusion:** Risk factors for postoperative coronal imbalance after osteotomies in adult scoliosis included pelvic rotation, large tilt of LIV, and LIV located below L5.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Deformities**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 36548**

**COMPARISON OF POSTERIOR CORRECTION RESULTS BETWEEN MARFAN SYNDROME SCOLIOSIS AND ADOLESCENT IDIOPATHIC SCOLIOSIS**

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**Aims :** To analyze whether there are differences of correction surgery in Marfan syndrome scoliosis (MSS) with that of adolescent idiopathic scoliosis (AIS). **Methods :** All the patients underwent posterior correction surgery. The radiographic data, operation duration, estimated blood loss, transfusion and correction were analyzed between the 2 groups. **Results :** Group MSS included 42 patients, 11 male and 31 female with an average age of 15.2 years old. Group AIS included 168 patients (ratio 1:4), 34 male and 134 female with an average age of 14.5 years old. Twenty-three patients in group MSS and 94 patients in group AIS followed up, with an average time of 18.4 months and 18.5 months, respectively. The mean coronal Cobb angle of the major curve before operation and at final follow-up, the correction rate, fusion level, operation duration, estimated blood loss (EBL) during operation, transfusion between the 2 groups were 60.4° and 57.5°, 14.6° and 15.2°, 76.4% and 74.1%, 11.5 vertebra and 11.0 vertebra, 4.6 hours and 4.0 hours, 845ml and 698ml, and 1151ml and 894ml, respectively. The age, gender ratio, curve type and coronal Cobb angle of the major curve were matched (all  $P>0.05$ ). Group MSS had a longer operation duration and more EBL compared with those of group AIS(both  $P<0.05$ ), while there was no significant difference in terms of fusion level, transfusion, coronal Cobb angle of the major curve at final follow-up and correction rate(all  $P>0.05$ ). **Conclusions :** When perform scoliosis correction, the patients with MSS had a more EBL, and longer operation duration than those of AIS patients, while the correction rate was similar.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Deformities**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 36793**

**THE RIB CONSTRUCT FOR TREATMENT OF SEVERE THORACIC KYPHOSIS**

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**Purpose:** One recent study identified thoracic kyphosis greater than 40 degrees as being a factor in higher complications rates for treatment of early onset scoliosis. We present results of successfully treating severe kyphosis with the rib construct for proximal fixation. **Methods:** Ongoing data collection of 7 patients with > 2 year follow-up. The rib construct was used for proximal fixation; with 2 down going hooks on ribs 2 and 3, and up going hooks on ribs 4 and 5. Distal fixation was variable, depending on the clinical assessment. Etiologies were VATER syndrome, Coffin Siris syndrome, Congenital, Spina bifida with diastematomyelia, ventilator dependent spastic quadriparesis, mitochondrial oxidative phosphorylation defect, and neurofibromatosis. All had prior spine surgery, 5 had prior thoracic fusion, 4 in situ, 1 instrumented. Age range at initial surgery from 5 to 16. 4 patients had T scores, range 2.7-6.9, average 5.0. **Results:** Follow up average 41 months. Average preop kyphosis 118.6, postop 74.8. Average preop scoliosis 77.7 degrees, postop 52.8. One death from unrelated cause 33 months postop. Complications included superior hook pull-out (4), which were replaced (3) or removed and did not affect result (1), one superficial infection, one deep infection requiring instrumentation removal, subsequently replaced 1 broken rod. 2 patients had exchange of 4.5 to 5.5 rods. 2/7 had no complications. **Significance:** The rib construct is effective for management of severe thoracic kyphosis, even when associated with prior fusion, and /or osteoporosis.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Deformities**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 38007**

**LONG-TERM RESULTS OF HEMIVERTEBRA TREATMENT IN CONGENITAL SCOLIOSIS**

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The total number of 442 patients with congenital scoliosis and hemivertebra treated in our department in the period from 1976 to 2013 was retrospectively evaluated. An average follow up is 17 years and 5 month. 1. Observation group (175 pts.) - the magnitude of the curves was at time of detection on average 44,1 degrees according to Cobb angle and 39,8 at time of last control. 2. Single bone fusion by posterior surgical approach (64 pts.) - an average time of surgery was 6,6 years, follow up was 14,2 years. The magnitude of the curves was at time of detection on average 44,1 degrees, 44,2 preoperatively, 34,4 postoperatively and 38,4 at time of last control. 3. Posterior surgical approach with instrumentation (141 pts.) - the time of surgery was 8,6 years, follow up was 12,6 years. The magnitude of the curves was at time of detection on average 61,1 degrees, 66,8 preoperatively, 40,9 postoperatively and 46,0 at time of last control. 4. Hemivertebrectomy and instrumentation (62 pts.) - the time of surgery was 11,2 years, follow up was 17,9 years. The magnitude of the curves was at time of detection on average 52,2 degrees, 64,9 preoperatively, 38,3 postoperatively and 39,0 at time of last control. Early detection, good timing and choosing of adequate surgical treatment type are the main factors of quality treatment results. All methods of surgical treatment led to the improvement in magnitude of the scoliotic curve. The best method seems hemivertebrectomy and instrumentation stabilization.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Deformities**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 38321**

**THE PITFALL OF INTRAOPERATIVE SPINAL CORD MOTOR FUNCTION MONITORING**

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**Background** During a surgery of spine and spinal cord, it is necessary to perform spinal cord monitoring to prevent spinal cord injury. Muscle evoked potential after electrical stimulation to the brain [Br(E)-MsEP] has been widely utilized. However, the optimal alarm point of Br(E)-MsEP remains unclear. The purpose of this study is to clarify the problem of spinal cord monitoring using Br(E)-MsEP. **Methods:** This study enrolled 157 consecutive patients undergoing spinal cord monitoring during spine and spinal cord surgery. The diagnoses of the patients were cervical myelopathy (113 cases), scoliosis (2 cases), thoracic spine disease (41 cases) and spinal cord tumour (one case). Br(E)-MsEP were utilized in all cases. Spinal cord evoked potential after electrical stimulation to the brain [Br(E)-SCEP] was added depend on the cases. In this study alarm point of Br(E)-MsEP was decrement of amplitude more than 70% of control level . The alarm point of Br(E)-SCEP was decrement of amplitude more than 50% of control level . **Results:** There was 1 true positive case. True negative case, false negative case and false positive case were 132, 0 and 24 respectively. One hundred percent of scoliosis and 31.6% of ossification of thoracic spine surgeries were false positive. However in 3 false positive cases Br(E)-SCEP was recorded concomitantly, Br(E)-SCEP showed no significant decrement of amplitude. **Conclusion** In the surgery of thoracic spine, there were relatively high rate of false positive cases of Br(E)-MsEP. Br(E)-SCEP should be recorded together with Br(E)-MsEP depending on the cases.

**Date: 2014-11-22**

**Session: Spine: Free Papers - Spine Deformities**

**Time: 10:30 - 12:00**

**Room: BOTÂNICO**

**Abstract no.: 36547**

**MANAGEMENT OF CHILDREN WITH COMPLICATED SPINAL DEFORMITIES IN COUNTRIES WITH MINIMAL RESOURCES**

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Introduction: It is conceded that complicated spinal deformity in underdeveloped countries presents specific obstacles, but these are often made into “using cheaper screws” and being cost effective. We can innovate ways to make the surgery have less operative and postoperative demands. This is precisely where hybrid construct comes in as a surgical choice that is used for complicated spinal deformity in developing country with minimal resources for more than 5 years now. Methods: 13 cases presented with severe spinal deformity, all previously surgically treated for scoliosis. The surgical management before the hybrid construct were 28 procedures done, 4 posterior fusion with instrumentation, 3 posterior fusion in situ, 2 anterior and posterior fusion in situ, 2 growing rods, 1 VEPTER, 1 posterior fusion and instrumentation with removal of the implants in same day. Results: Mean age at surgery with hybrid construct 10.5 years, with mean follow-up time 34 months, all were done with rib hooks proximally and pedicular or iliac screws distally. This means that preoperative thoracic scoliosis was 83 became 66, thoracic kyphosis 113 became 70, thoracolumbar scoliosis 60 became 40, thoracolumbar kyphosis 63 became 22. Complications, 8 complications were detected 2 infection, 1 proximal hook dislodgment, 1 implant exposure, 2 broken rod, 1 spinal stenosis, 1 died from non-surgical related cause. With this complex and demanding medical condition in developing countries, we think that hybrid construct may be a good and safe surgical option.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Computer Aided**

**Orthopaedics**

**Time: 08:30 - 10:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38404**

**QUALITY OF WEB-BASED INFORMATION ON MINIMALLY  
INVASIVE TOTAL KNEE ARTHROPLASTY**

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**Purpose:** To evaluate information available on the internet regarding minimally invasive total knee arthroplasty (TKA). **METHODS:** The 3 most popular search engines (Google, Yahoo, and MSN) were used to search the keyword 'minimally invasive knee replacement'. The top 50 websites from each search engine were evaluated for authorship and contents; duplicate websites were not double-counted. **RESULTS:** Of the 150 websites, 51% were authored by a hospital/university, 26% by private medical groups, 14% were news stories, and 9% were from orthopaedic industry sources. 73% offered the opportunity to make an appointment. 18% described the surgical technique, whereas only 9% explained patient eligibility. 25% described the risks, whereas only 3% made reference to peer-reviewed publications. >82% made specific claims regarding the advantages of minimally invasive surgery. **CONCLUSION:** Most websites providing minimally invasive TKA information were insufficient in terms of explaining surgical technique, patient eligibility, and associated risks.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Computer Aided**

**Orthopaedics**

**Time: 08:30 - 10:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38004**

**DESCRIPTION OF A KNEE KINEMATICS EVALUATION SYSTEM FOR LIGAMENT INJURIES BY OPTICAL TRACKING AND 3D COMPUTED TOMOGRAPHY**

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<sup>1</sup>Instituto de Ortopedia e Traumatologia, Hospital das Clínicas, Faculdade de Medicina da Universidade de São Paulo, São Paulo (BRAZIL), <sup>2</sup>Departamento de Engenharia Mecânica, Centro Universitário da FEI, São Bernardo do Campo (BRAZIL)

**Introduction:** Anterior cruciate ligament reconstruction is one of the most commonly performed orthopaedic surgeries. Unsatisfactory results may be due to the persistent instability of the knee and subsequent difficulty to return to prior physical activity. The anterior cruciate ligament insufficiency is represented by anterior tibial translation and rotational instability of the knee, evaluated by the "pivot-shift" test. Although very sensitive, the result of this test is subjective. The mechanized "pivot-shift" test has higher accuracy than the manual test. **Objective:** This study intends to describe and demonstrate the feasibility of a method for evaluating the knee kinematics through a CPM device, before and after ACL injury. **Methods:** The study was conducted on cadaver knee, in a mechanical model for the "pivot-shift" test evaluated by optical tracking associated with computed tomography. The 3D knee kinematic was obtained from markers fixed to the bones and its anatomical landmarks, by computed tomography, using a computational routine that is being improved to eventually become an open source program available for research. **Results:** This study demonstrates the feasibility of a protocol to measure knee rotation and translation with reproducible and objective (error less than 0.2 mm) tools. The mechanized "pivot-shift" test system is independent from the examiner allowing constantly the same angular velocity and 20 N tension throughout the movement. This study's clinical relevance is allowing inferences about "in vivo" behaviour of a knee with ACL injury and providing to future studies higher methodological quality for studying surgical techniques with grafts in relatively close positions.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Computer Aided**

**Orthopaedics**

**Time: 08:30 - 10:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37940**

**THE APPLICATION OF TELEMEDICINE IN ORTHOPEDIC SURGERY  
IN SINGAPORE: A PILOT STUDY ON A SECURE, MOBILE  
TELEHEALTH APPLICATION AND MESSAGING PLATFORM**

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**Introduction:** The application of telemedicine has been described for its use in medical training and education, management of stroke patients, urologic surgeries, paediatric laparoscopic surgeries, clinical outreach and the field of orthopaedics. However, the usefulness of a secure, mobile telehealth application and messaging platform has not been well described. **Objectives:** A pilot study to implement a secure form of communication between doctors in an orthopaedic clinical setting and determine their reactions to MyDoc, a secure, mobile telehealth application and messaging platform, designed and developed for doctors, by doctors. **Methods:** By replacing current methods of communication through various mobile applications and text messaging services with MyDoc, we gained feedback and determined user satisfaction with this innovative system from our orthopaedic department over a six week period. **Results:** A total of 25 questionnaires were answered. Almost all who filled in the questionnaire had positive responses and strongly agreed that MyDoc should replace current systems of peer to peer communication in the hospital. **Conclusion:** Potential uses of MyDoc are countless. With our pilot study having excellent results in terms of acceptance and satisfaction from doctors, the integration of a secure, mobile telehealth application and messaging platform, not only in the orthopaedic department but the hospital in general, has exciting and limitless potential, especially in order to comply with the soon to be implemented Personal Data Protection Act, expected to be adhered to by all Singapore hospitals by July 2014.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Computer Aided**

**Orthopaedics**

**Time: 08:30 - 10:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37887**

**THREE-DIMENSIONAL MODELS AND INDIVIDUAL IMPLANTS IN PATIENTS WITH SEVERE SPINE DEFORMITIES**

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Our objective was to describe our experience of application of three-dimensional (3D) models and individual implants for correction of different types of severe spinal deformities. Full-scale 3D models were custom-made for 15 patients: 5 patients with severe spondylolisthesis, 2 patients with upper cervical deformities, 1 patient with neurofibromatosis and lumbosacral deformity, 2 patients with paralytic scoliosis, 5 patients with congenital scoliotic. 3D models were fabricated using rapid prototyping (stereolithography) techniques from CT data. In all patients 3D models were used for planning surgery, including neural decompression and correction. Using models as a template in 9 patients individual implants were performed for fixation of spine after decompression and correction of deformity. In 2 patients with C1-C2 deformity and instability there were performed anterior C1-C2 fixation with individual plate after anterior transoral decompression. In one 9 years old patient with neurofibromatosis and secondary deformity and hypoplasia of sacrum due to neurofibroma and lumbosacral instability, and also in 2 patients with paralytic scoliosis with pronounced pelvic obliquity and with decompensation of trunk frontal balance we performed instrumental correction of deformity combining with lumbo-pelvic fixation by individual iliac plates. In 4 patients with grade III-IV L5 spondylolisthesis after posterior decompression, partial reduction and screw fixation we performed anterior L5-S1 fixation with individual plates and long threaded cages. The follow-up is 2 years with neurological restoration and stable fixation. Full-scale 3D models offer a useful tool in preoperative planning. 3D models can be used in performing individual implants in complicated cases.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Computer Aided**

**Orthopaedics**

**Time: 08:30 - 10:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37534**

**THE EFFECT OF ELECTRONIC MEDICAL RECORD SYSTEM IMPLEMENTATION ON COMPLICATION RATES IN ADULT SPINE DEFORMITY SURGERY**

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Introduction: Surgical treatment of adult deformity entails complex spine reconstruction procedures, with significant complication rates. Many academic hospitals have implemented electronic medical record systems (EMR), with error checking components, as part of QI initiatives to improve accuracy of care and communication throughout the care team. However, implementation of EMR also has the potential to complicate patient care. Methods: We retrospectively reviewed charts of adult patients who underwent spinal fusion >4 levels from 2006-2013. Complication rates pre- and post-implementation (2011) of an EMR were compared. All intraoperative, postoperative, and short- and long-term ( $\geq 2$  year) serious adverse events and complications were recorded. Results: The overall mean complication rate was not significantly reduced by EMR implementation (80.3% before and 76.4% after;  $p=0.28$ ). Postoperative UTI rate was 13.9% before and 15.2% after EMR implementation ( $p=0.38$ ). Superficial wound infection rate before and after EMR implementation was also not significantly different (9.0% and 4.2% respectively,  $p=0.14$ ). Conclusions: Implementation of an EMR system was not associated with overall changes in quality or safety of spine deformity surgery patient care, as evidenced by overall broadly-defined complication rate and nonsignificant changes in relatively common postoperative complications. EMR systems lay the foundation for efficient and effective programs to improve quality of care. Because implementation of an EMR system itself had no observable impact on the quality of complex spine surgery patient care, the benefits of this technology will likely be found in development of targeted systems and programs aimed at reducing the rates of individual complication categories.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Computer Aided**

**Orthopaedics**

**Time: 08:30 - 10:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36958**

**SME'S: CTRL E FOR EMERGENCY RESPONSE SYSTEM**

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This paper discusses our copyrighted (Indian -A.No.L-L56299/2013) Model for emergency response system. In developing world hospitals a huge challenge exists to provide adequate care, in emergency situations. Due to want of adequate and low cost solutions they lack such significant facilities. Our Model includes “electronic button” on the computer, when activated (by pressing Ctrl E on key board or Clicking on it), through quick selection options, identifies the threat and generates a response to the emergency situation and sends automatically text message to targeted & trained persons. Such threats are categorized into 5 situations – Cardiac, Physical, Biohazard, Fire and Sexual harassment threat. These are coded in colour – blue, black, green, red and pink respectively. When activated, the need, place and person are identified & registered. The text message generated send such details, enabling responders target the threat comprehensively and respond quickly to the site. There are different trained responders registered to provide the support urgently on receiving the text. This works through the hospital information system, routing through local network, and supported by the mobile phone text facility. It is installed in our Territory care hospital of 1229 beds, in each computer and being used as pilot project. The user can download it on their android mobiles. Hence this model for emergency response system is widely accessible, affordable, and precisely effective, especially for developing country hospitals, which are very low on resources.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Computer Aided**

**Orthopaedics**

**Time: 08:30 - 10:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36881**

**PROTOTYPE AUTOMATED DECISION SUPPORT SYSTEM FOR PERIOPERATIVE PATIENT OPTIMIZATION OF TOTAL HIP ARTHROPLASTY SURGERY: AN ALGORITHM**

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**Introduction:** Outcomes after major surgery depend on the overall perioperative optimization of the patient. Individual management of fluid and vasopressor infusions are crucial for the optimized fluid status and hemodynamic stability. However, this requires simultaneous evaluation of changes in several parameters. Development of Automated Decision Support (ADS) systems is therefore encouraged. **Objective:** The aim was to produce a PC based prototype ADS system for perioperative patient optimization in total hip arthroplasty (THA) surgery. **Methods:** We created a clinical algorithm based on current knowledge and joint consensus of orthopaedic surgeons and anaesthesiologists. One of the parts of this is a goal directed optimization algorithm which implies evaluation of hemodynamic and hemodilution responsiveness during stepwise fluid loading. According to a mini volume loading test (mVLT), further fluid loading is not any longer justifiable when plasma dilution is not any longer enhanced. Vasopressors are then considered. Red cell transfusion is considered if signs of anaemia persist after the optimisation. The algorithm was put in a software package in a laptop computer to generate appropriate intervention suggestions to the care provider. **Results:** The prototype ADS system for the patient optimization in THA surgery was created. **Conclusion:** Trials are needed to evaluate the safety and efficacy of the prototype. **Acknowledgement:** Funded by the European Social Fund under the Global Grant measure.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Computer Aided  
Orthopaedics**

**Time: 08:30 - 10:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36714**

**THE TERM LOCOMOTIVE SYNDROME ("LOCOMO")**

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In 2013, people aged 65 years or older accounted for 25% of Japan's entire population and the nation is facing many problems concerned of "super-aged society". The Japanese Orthopaedic Association has proposed the term locomotive syndrome ("locomo") to designate a condition of individuals in high risk groups with musculoskeletal disease who are likely to require nursing care. This paper describes the basic architecture of the evidence based exercise therapy system aided by robot for "locomo". 80 local volunteers aged 65 years or older were enrolled to this research. We assessed the 25 questionnaires and facial and verbal expression during the exercise with robot and animation video program. This robot body is controlled by pneumatic valves are directly controlled by Real Time High Speed Network and CC-Link. The application programs of KINECT make it possible to detect a skeleton for human body and verify the position from the ground and measure the duration for a minute. Animation video program gives aid to exercise, widely available on web site. In 87% of users have friendly feeling toward robot and 78% of users want to be supported by robot. 35 users were assessed by digital video about their facial and verbal appearance, 31 users had a smile and 21 users had a verbal reaction to the robot during the 2 minutes training. Meanwhile, nobody is smiling within the training with animation video program. This interactive robot system to communicate with patients can potentially aid exercise for "locomo" in the super aged Japanese society.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Quality of Life -  
Miscellaneous**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37943**

**FACTORS AFFECTING HEALTH RELATED QUALITY OF LIFE  
AFTER PELVIC FRACTURE**

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This study evaluates factors affecting clinical outcome and health-related quality of life (HRQOL) after pelvic fracture. Patients with pelvic fracture treated between 2000 and 2010 and had completed two years follow-up were evaluated clinically using Majeed score and their HRQOL was evaluated using short-form health survey 36 (SF-36). A total of 112 patients were enrolled. There were no effects of age and sex on Majeed score and SF-36. However, residual displacement at anterior or posterior pelvic ring was significantly affecting the clinical outcome ( $P=0.001$ ). If there is an acceptable reduction ( $<1\text{cm}$ ), clinical outcome is good irrespective of fracture pattern ( $P=0.528$ ) but associated injury carries a poor prognostic factor ( $P=0.006$ ). The average SF-36 Physical-Component Summary (PCS) score was 47.71 and SF-36 Mental-Component Summary (MCS) was 49.20. The functional level of general population in physical and mental domain was achieved in 48.23% and 65.3% patients following pelvic fractures respectively. On comparing HRQOL of patients with general population norm, the scores were significantly low in pelvic-fractured patients ( $P<0.0001$  for SF-36 PCS, 0.034 for SF-36 MCS). Residual displacement had significant negative effect on SF-36 PCS but not on SF-36 MCS. If acceptable reduction is achieved, associated injury and fracture pattern have no effect on HRQOL. Patients with pelvic fracture never regain their pre-injury functional level despite a good clinical outcome. Residual anterior or posterior pelvic displacement is the vital factor to influence the outcome. Although associated injuries affect the clinical outcome, it has no impact on HRQOL if an acceptable reduction is achieved.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Quality of Life -  
Miscellaneous**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37703**

**AMBULATION ABILITY IN THE DEMENTED ELDERLY AFTER HIP FRACTURE**

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In 2013, people aged 65 years or older accounted for 25% of Japan's entire population and demented elderly population is estimated 15% of senior persons. Ambulation ability in the demented elderly after hip fracture remains unknown. The purpose of this study was to evaluate the relationship between dementia and ambulatory ability at discharge from facilities for rehabilitation. 115 patients with hip fracture who could walk before injury from 2011 to 2013 were examined. There were 98 women and 17 men. Mean patients age was 83.6 years (66-99). Patients with new complications, trauma, with psychiatric disease were excluded. There were 52 patients with femoral neck fracture and 63 patients with femoral trochanteric fracture. These patients were divided into two groups by Hasegawa's dementia scale (dementia group and normal group). Demented person were accounted 62 patients (53.9%). We compared postoperative ambulatory ability (average 76.9 days after operation). Also, ambulatory ability was stratified into 5 levels (walking without any appliances, cane, small walker, walker, wheel chair) and ambulation status after operation was analyzed by FIM scales. FIM score after operation was lower in dementia group than in normal group both of femoral neck and trochanteric fracture. As for ambulatory ability, dementia group decline over two level down than normal group in the patients with femoral trochanteric fracture. There was no significant difference between the two groups in the patients with femoral neck fracture. Ambulation ability in the demented elderly after hip fracture decline in the patients with femoral trochanteric fractures remarkably.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Quality of Life -  
Miscellaneous**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37293**

**QUALITY OF LIFE AND FUNCTIONAL OUTCOMES OF FRAGILITY  
FRACTURES AT 12 MONTHS FOLLOW UP**

Andreea BANICA<sup>1</sup>, Josee DELISLE<sup>1</sup>, Cynthia GRAMMONT<sup>1</sup>, Pierre BEAUMONT<sup>1</sup>, Sylvain GAGNON<sup>1</sup>, Mario GIROUX<sup>2</sup>, Alain JODOIN<sup>1</sup>, G Yves LAFLAMME<sup>1</sup>, Stephane LEDUC<sup>1</sup>, Jean-Marc MACTHIONG<sup>1</sup>, Michel MALO<sup>1</sup>, Gilles MAURIS<sup>1</sup>, Hai NGUYEN<sup>2</sup>, Stefan PARENT<sup>1</sup>, Pierre RANGER<sup>1</sup>, Jean-Pierre RAYNAULD<sup>3</sup>, Dominique ROULEAU<sup>1</sup>, Yves TROYANOV<sup>1</sup>, Marc DORAIS<sup>4</sup>, Sylvie PERREAULT<sup>5</sup>, Julio FERNANDES<sup>1</sup>

<sup>1</sup>Hôpital du Sacré Cœur de Montréal, Montréal (CANADA), <sup>2</sup>Hôpital Jean Talon, Montréal (CANADA), <sup>3</sup>Institut de Rhumatologie de Montréal, Montréal (CANADA), <sup>4</sup>Statsciences, Notre-Dame de l'Île Perrot (CANADA), <sup>5</sup>Université de Montréal, Montréal (CANADA)

**Objectives:** Low energy fractures are defined as fragility fractures (FF). Multidisciplinary fragility fracture management programs (FFMP) help prevent subsequent fractures by promoting adherence and persistence to treatment. Our study aimed to assess quality of life, pain and disability in patients with FF at 12months follow-up (FU). **Methods:** We recruited 543 patients in our program, using Osteoporosis Canada Guidelines (2010) as standard of care. We compared outcomes at 12 months FU to baseline. We used DASH scores for upper limb fractures, Oswestry score for vertebral fractures and LEM score for lower limb fractures to assess functional outcomes. Pain and quality of life were evaluated with VAS and SF-12. **Results:** One hundred sixty-one women and 23 men completed a 12 month FU. Mean ages were similar ( $63.6 \pm 0.9$  and  $62.8 \pm 1.8$ , respectively). There was a significant improvement in upper limb fractures DASH scores ( $57.7 \pm 2.9$  to  $27.0 \pm 2.5$ ,  $p < 0.0001$ ), for patients with vertebral fractures Oswestry scores ( $37.1 \pm 7.6$  to  $22.6 \pm 6.7$ ;  $p = 0.03$ ) and lower limb fractures LEM scores ( $56.0 \pm 3.9$  to  $73.4 \pm 3.9$ ;  $p = 0.002$ ). SF-12 physical component scale (PCS) and mental component scale (MCS) improved significantly ( $38.9 \pm 0.8$  to  $43.3 \pm 0.9$ ;  $p < 0.0001$  and  $46.2 \pm 1.0$  to  $48.9 \pm 0.9$ ;  $p = 0.0085$ , respectively). VAS pain scores decreased ( $3.9 \pm 0.2$  to  $2.7 \pm 0.2$ ;  $p < 0.0001$ ). **Conclusion:** At 12 months, PCS and MCS scores improved, but not to normal Canadian standard scores. Pain was still present representing residual mild pain. Upper limb, lower limb and vertebral fracture patients' functional scores all improved. This study suggests that all fracture patients recovered a functional status

12 months post.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Quality of Life -  
Miscellaneous**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37031**

**VALIDATION OF HARRIS HIP SCORE IN ASIAN POPULATION**

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<sup>1</sup>Fortis Hospital, Chandigarh (INDIA), <sup>2</sup>AIIMS, Bhubaneswar (INDIA),

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Although the Harris Hip Score (HHS) is commonly used worldwide to assess the hip functional status, it has never been validated in Asian population. Present study was performed to assess if the hip function parameters of HHS is adequate to assess hip function for ADL of Asian population and for its validity, reliability and responsiveness. In a prospective study, 310 patients (432 hips) were evaluated by two observers using HHS as the joint specific outcome measure and Health Survey (SF-12v1) as generic health measure. The HHS was tested against SF-12v1 for content validity, convergent and divergent construct validity, criterion validity, test and retest reliability (reproducibility), inter-observer reliability (agreement), and internal consistency reliability. It was observed that 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 Asian. Several domains of HHS (total score, pain, function, gait, activities of daily living and deformity) showed ceiling effects. The SF-12v1 and HHS showed an acceptable level (0.04 at  $P < 0.010$ ) of construct validity and criterion validity (for total scores and function domain). The test and retest reliability and inter-observer reliability were excellent (Goodman-Kruskal Gamma nearly one). The internal consistency was also excellent with Cronbach's alpha coefficient of 0.743. 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 in Indian /Asian population.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Quality of Life -  
Miscellaneous**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38410**

**COMPARATIVE STUDY OF THE PREVENTION VENOUS  
THROMBOEMBOLISM (VTE) IN PATIENTS WITH RHEUMATIC  
DISEASES AND OSTEOARTHRITIS AFTER TOTAL KNEE OR HIP  
ARTHROPLASTY**

Evgeniy BYALIK, Alexey RYBNIKOV, Sergey MAKAROV, Tatyana  
RESHETNYAK, Mariya SEMENOVA, Mariya SATYBALDYEVA  
Nasonova Research Institute of Rheumatology, Moscow (RUSSIA)

Background: DVT of the lower limbs during operations knee and hip arthroplasty in patients with rheumatic diseases (RD) are observed in 7-27% cases. Objective: trace incidence efficiency and prevention of DVT in patients with RD and the control group of patients with osteoarthritis (OA) under comparable conditions. Methods: We studied 256 patients for the period 2012-2013.169-with RD,87-with OA.A distinctive feature of patients with RD was the presence of concomitant drug therapy for underlying disease.Thus,94.6%-received NSAIDs,88.1%-received DMARDs,42.6%-received glucocorticosteroids,22.5%-received biologic DMARDs. In the preoperative period incidence of DUS-confirmed DVT was in 11 patients (6.5%) with RD, most of which consisted of patients with systemic lupus erythematosus (SLE) and SLE + anti-phospholipid syndrome (APS)-7 patients (63.8%).They were old thrombosis under vessel recanalization. The study used the following anticoagulants: dabigatran etexilate, rivaroxaban, fondaparinux sodium,low - molecular-weight heparin. Patients with post-thrombotic venous disease of the lower extremities for 7 days prior to surgery in minimal doses taken low-molecular-weight heparin or fondaparinux sodium, on the 2nd day after surgery patients was transferred to oral anticoagulants. DUS was routinely performed preoperatively and on postoperative day 7,14, then 1 time a month. Time of observation was 3 months. Results: None of the patients with RD in early postoperative period DVT of the lower limbs were found. In the control group of patients with OA in early postoperative period identified 5 cases (5.7%) DVT of the lower limbs. In the perioperative period of clinically significant bleeding was not seen. Conclusions: Application of the above prevention of DVT of the lower limbs has been effective and convenient in the early postoperative period in patients with RD in replacement of large joints, but requires further study in patients with osteoarthritis.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Quality of Life -  
Miscellaneous**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36660**

**VIT D3 STUDY IN GREASTER TRIPOLI**

Mohamed Buajela RASHED, Jamal MAHMOUDI  
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Determination of vitamin D status in different age-groups in Tripoli area and neighbourhood of the country is necessary and has important implications for general health. The study was conducted to determine the prevalence of vitamin D deficiency among the ladies aged between 40 years and above with criteria of aching limbs of pre or post-menopausal syndrome, established osteoporosis, fracture neck of femur or vertebrae and those on hypothyroid treatments. In this cross-sectional study, (655) women—aged above 40years, who attended a single-consultation outpatient clinic, were selected. They were grouped to three groups; from 40yrs to 49 years, from 50 years to 59 years and the third group above 60yrs. Serum 25-hydroxy vitamin D (25-OHD), calcium and phosphorus and alkaline phosphatase concentrations were measured. Mild, moderate and severe vitamin D deficiencies were defined as 25-OHD values of 20-30 ng/mL, 10-20 ng/mL, and <10 ng/mL respectively. The median (range) concentrations of 25-OHD was 18 (1.5-117) ng/mL ( $p=0.05$ ). The overall prevalence of mild, moderate and severe vitamin D deficiencies among this group was 20%, 33.1%, and 44.9% respectively. The high prevalence of vitamin D deficiency in this area emphasizes the necessity of vitamin D supplementation as more exposure to sun is limited due to the type of clothing required by current law.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Quality of Life -  
Miscellaneous**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36424**

**THE OUTCOME OF ARTHROSCOPIC CAPSULAR RELEASE FOR  
THE MANAGEMENT OF FROZEN SHOULDER IN PATIENTS WITH  
DIABETES MELLITUS**

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KINGDOM), <sup>2</sup>Epsom & St. Heliers' University Hospital NHS Trust,  
London (UNITED KINGDOM)

**Introduction:** This study assess the functional and health-related quality of life outcome following arthroscopic capsular release (ACR) in patients with DM with a frozen shoulder and compare these to the outcomes of an age- and sex- matched cohort of patients without DM. **Methods:** 31 diabetic patients (the study group) and an identical number of age- and gender- matched non-diabetic patients (the control group) included in the study who had failed non-operative treatment for frozen shoulder and subsequently underwent an arthroscopic capsular release. Functional outcome was assessed using the Oxford Shoulder Score (OSS) and the Euroqol EQ-5D questionnaires pre-operatively and six months post-operatively. **Results:** Following surgery the OSS improved from 18 to 37 in both the diabetic and control groups ( $p < .0001$ ). In the diabetic group, Euroqol EQ-5D improved from 0.16 to 0.78 ( $p < 0.0001$ ) and in the control group 0.23 to 0.80 ( $p < 0.0001$ ). ACR also resulted a highly significant improvement in range of motion (ROM) in both groups. Preoperatively, patients had significantly reduced flexion in diabetic group but there was no difference postoperatively between two groups. **Conclusions:** This is largest series comparing the outcome of ACR alone in diabetic and non-diabetic with a frozen shoulder. Arthroscopic capsular release is an effective procedure that can improve quality of life, restore adequate function and ROM in diabetic patients with a frozen shoulder within 6 months after surgery. Rotation is unlikely to be fully restored and some pain may persist 6 months following surgery. This provides a framework to help guide preoperative counselling.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Quality of Life -**

**Miscellaneous**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36871**

**FROZEN SHOULDER, EFFECT OF MUA AS A CONSERVATIVE MEASURE**

Mohamed Buajela RASHED, Abdulrahman AL-ALLIM  
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A prospective study has been made of 66 patients with the frozen shoulder syndrome (as distinct from tendinitis, calcific deposits and frozen shoulders occurring with diabetes, post traumatic stiffness follow up for 18 months , always to their greatest recovery. There were three consecutive stages: pain, stiffness, and recovery. The stiffness stage was usually related to the duration of the recovery stage. A finding of, the longer the stiffness stage is, the longer is the recovery stage. In 19 patient's manipulation under general anaesthesia (MUA) and intra-articular injection 20.cc of 5% normal saline were performed to accelerate the recovery followed by intensive course of physiotherapy. The second shoulder in 12 patients became similarly affected, within 6 months after the first, and followed a similar time sequence to the first. After recovery, slight restriction of movement was found in 24 patients, but in only 3, all of long duration, was the restriction is very problematic. MRI, carried out on both shoulders in the 24 patients during the recovery stage, showed in the affected shoulder fewer rotator cuff defects than expected at this age. The duration of diabetes and the duration of shoulder symptoms were correlated.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Quality of Life -  
Miscellaneous**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37351**

**LEPTIN IS ESSENTIAL FOR THE DEVELOPMENT OF CALCIFIC  
ACHILLES TENDINOPATHY**

Liang WANG, Minjun HUANG, Zhongmin ZHANG, Qingchu LI, Dadi JIN  
Academy of Orthopaedics, Guangdong Province, Guangzhou (CHINA)

**Objectives:** To evaluate the effect of leptin on Achilles tendinopathy in ob/ob leptin insufficient mice by employing a new mice model. **Methods:** SPF ob/ob mice (n=40, 6-week old ) and SPF wild type mice (n=40, 6-week old ) have been employed as experimental group and control group respectively in the part 2 of this study. All mice were anesthetized and then the experimental group underwent midpoint Achilles tenotomy on the left hind limbs through a posterior approach under aseptic conditions. The incision was routinely closed with an interrupted 4-0 silk suture. At 12 weeks postoperative, the right Achilles tendon tissues from the soleus muscle attachment to the calcaneus insertional end point were harvested. H&E staining, Safranin-O and fast green staining, immunohistochemical staining have been conducted for the histological analysis. X-ray analysis and Micro-CT scanning have been accomplished for the radiological assessment. **Results:** Radiological analysis indicated no mineralization detected in bilateral Achilles tendon after 12 wk unilateral tenotomy in ob/ob mice. Histological assessment demonstrated fiber disorganization and hypercellularity in the contralateral Achilles tendon after 12 wk unilateral Achilles tenotomy in ob/ob mice. Mild blood vessel ingrowth could be also found in the contralateral Achilles tendon of ob/ob mice. There are large number of adipocyte infiltration in the paratendon tissue. IHC staining showed that COX-2, expression is relatively low in the experimental group compared to control group. **Conclusion:** Leptin expression defect may compromise calcific Achilles tendinopathy development in ob/ob mice and play an essential role in the endochondral ossification.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Quality of Life -  
Miscellaneous**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37352**

**COX-2 ACTIVITY IS ESSENTIAL FOR THE CALCIFIC ACHILLES  
TENDINOPATHY PATHOGENESIS**

Liang WANG, Minjun HUANG, Zhongmin ZHANG, Qingchu LI, Dadi JIN  
Academy of Orthopaedic, Guangdong Province, Guangzhou (CHINA)

**Objective:** To clarify the effect of selective COX-2 inhibitor celecoxib on Achilles tendinopathy and whether treatment dose and duration could modify its effect. **Methods:** A total of 80 male SD mice (6 wk old) were employed. All mice were anesthetized and underwent midpoint Achilles tenotomy on the left hind limbs through a posterior approach under aseptic conditions. The animals were randomly divided into eight groups (n =10). All animals was sacrificed at 12 weeks postoperative. The left Achilles tendon tissues were harvested. H&E staining, immunohistochemical staining have been conducted for the histological analysis. X-ray analysis and Micro-CT scanning have been accomplished for the radiological assessment. **Results:** Celecoxib treatment for 12 weeks postoperative could significantly reduce the incidence of heterotopic ossification and the volume of the ectopic ossification tissue after Achilles tenotomy in rat. Other treatment options in part 3 of this study could not significantly reduce the incidence of heterotopic ossification after Achilles tenotomy in rat compared to the positive control group and placebo group. Less volume of ectopic ossification tissue intra Achilles tendon has been detected in the 6 weeks group compared to 3 weeks group, of which is more than post 6 weeks group. Less volume of ectopic ossification tissue intra Achilles tendon has also been detected in the post 9 weeks group compared to 6 weeks group, of which is less than post 6 weeks group. **Conclusion:** COX-2 activity is essential for the calcific Achilles tendinopathy pathogenesis.

**Date: 2014-11-22**

**Session: Miscellaneous: Free Papers - Quality of Life -  
Miscellaneous**

**Time: 10:30 - 12:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37314**

**QUALITY OF LIFE AND PULMONARY FUNCTION IS DECREASED IN  
EARLY ONSET SCOLIOSIS (EOS) PATIENTS UNDERGOING  
CASTING; VALIDATING THE EARLY ONSET SCOLIOSIS 24 ITEM  
QUESTIONNAIRE (EOSQ-24)**

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Hasani SWINDELL<sup>1</sup>, Sumeet GARG<sup>2</sup>, James SANDERS<sup>3</sup>, Michael  
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Background: In previous work, the EOSQ-24 demonstrated construct and content validity, and responsiveness to change in patients undergoing surgery. The purpose of this study is to demonstrate criterion validity of the EOSQ-24 by testing its ability to detect changes in HRQoL, including pulmonary function, in patients with EOS undergoing casting treatment. Methods: 16 patients who completed PFTs and were rated for an EOSQ-24 within 12 days, and 72 patients that had undergone casting (average age at casting: 1.8y, 0.8 - 6.3) were identified from 2 multi-center EOS databases. 32 patients were rated for a pre-casting EOSQ-24 (average: 17.9 ± 30.2d. prior) and 53 patients had a post-index/in-cast EOSQ-24 (average: 292.9 ± 290.5d. after). Age-matched controls were identified for score comparison. Results: Patients with higher percent predicted values of FVC and FEV1 had significantly higher scores in EOSQ-24 sub-domains of Pulmonary Function, General Health, and Physical Function, and lower Fatigue/Energy Level. In patients undergoing casting, although all sub-domain scores except for Daily Living and Financial Burden were similar to norms at pre-casting visits, all sub-domain scores at post-casting visits were significantly worse than those of norms. Conclusion: This study demonstrates the criterion validity of EOSQ-24 and its ability to stratify clinical measures in patients with EOS. Compared to age-matched norms, EOS patients undergoing casting experience significantly lower HRQoL and higher parental and financial burden, despite having near normal pre-intervention EOSQ-24 scores. While casting is considered to have less impact on patients compared to surgical treatment, it still may require careful attention.

**Date: 2014-11-22**

**Session: Infection: Free Papers - Infection Non-Union**

**Time: 12:30 - 14:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38523**

**INFECTED NON UNIONS OF TIBIA TREATED BY ILIZAROV METHODS**

**Harshad Mohanlal SHAH**

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Introduction: Most of the long bones fractures are treated effectively but unfortunately a few shaft fractures get infected and end up as infected non-union. However when these occur they can be treated effectively with Ilizarov external fixator. Materials and Methods: In our study from 2005 - 2011, we have treated more than 200 patients of infected non-union of long bones at our hospitals. Retrospectively we analysed and 101 patients were available for follow up. Mean follow up period was 6 years. 93 of them were males and 8 were females, 60% of them were young males between 30-50 years. All long bones were treated with decreasing order of frequency tibia, femur, both bones forearm, humerus. Most common organism isolated was staphylococcus aureus. Ilizarov's concept for infected nonunion was used, "infection burns in the fire of regeneration." All patients were treated with Ilizarov external fixator, implant removal, debridement, excision of infected non-union, corticotomy monofocal bifocal longitudinal compression controlled osteogenesis, filling of cavities by newly formed tissue intercalary bone lengthening. Results and conclusion: Ilizarov external fixator is good for such difficult cases. Results are encouraging and it is recommended. Ilizarov helps in control of infection and union with minimal complications and early extremity use. After treating more than 200 cases of infected non-union of long bones we have prepared a protocol or guidelines for treatment of infected non-union of long bones and the same will be presented in the conference.

**Date: 2014-11-22**

**Session: Infection: Free Papers - Infection Non-Union**

**Time: 12:30 - 14:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36706**

**SEPTIC NON-UNION OF LONG BONES**

**R. C. Siwach SIWACH**

**BPS GMC for Women, Khanpur Kalan, Sonapat (INDIA)**

**INTRODUCTION:** Septic nonunion is a major and complex orthopaedic problem. It is one of the most challenging orthopaedic complications to manage. Persistent infection, shortening, bone loss, joint stiffness and disability complicate the non-union. **MATERIAL METHODS:** Hundred such patients (75 males and 25 females) have been treated for septic non-union in the last 15 years. The patients were first treated with a thorough debridement and removal of all necrotic and infected tissue. Once the soft tissue bed was healthy the non-union was stabilized with internal fixation like plate, simple I/m nailing, intra-medullary nailing impregnated with antibiotic cement or an external stabilizing system along with antibiotic beads left in situ. In tibia Huntington procedure was contemplated in 24 patients. **RESULT:** Fixation of the fracture following proper debridement ensured a healthy soft tissue bed for quick and uncomplicated fracture healing irrespective of the mode of stabilization chosen. We could achieve good to excellent results in more than 80 percent patients. **DISCUSSION:** The basic principal to be adopted for the treatment of infected nonunion must be thorough debridement to remove non-viable, inert, infected material and debris with a goal to convert a necrotic, hypoxic infected nonunion to a viable aseptic nonunion; followed by stabilization by external or internal fixation with bone grafting.

**Date: 2014-11-22**

**Session: Infection: Free Papers - Infection Non-Union**

**Time: 12:30 - 14:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 38522**

**COMPLICATIONS IN PATIENTS TREATED WITH ILIZAROV EXTERNAL FIXATOR**

**Harshad Mohanlal SHAH**

**M. S. Ramaiah Medical College and Hospitals, Bangalore (INDIA)**

Introduction: Ilizarov technique is a versatile system used to treat some of the most challenging conditions in orthopaedics and is associated with plethora of complications. Material and methods: A review of 526 cases of Patients in a wide spectrum of orthopaedic disorders treated on Ilizarov External Fixator method was done. Most commonly Fixator was applied to lower limb for various traumatic, infective, nonunion pathologies etc. Results: Majority of complications were pin tract infections, followed by loosening of pins. Equinus deformity was noted in 186 which was effectively tackled with more rigid Foot splint and foot fixation in 82 cases. Mobilization and bone healing was improved with innovative double decker foot orthoses in lengthening cases. Deformities were many involving tibia. 12 fractures were found which were treated with the same fixator. Limb length discrepancy post correction was found in majority of 120 patients but significant only in 8 patients. Clawing of toes seen in many treated successfully with K-wire fixation. In growing toe nail in 12 was treated with Zadeks excision. In Corticotomies, communication was seen in 8 of 124 cases, 7 were incomplete, infection in 8 patients, re-corticotomy done in 14. 10 patients discontinued treatment by removal. Amputation done in 6 femur & 6 tibia cases, 3 due to vascular complications and rest uncontrolled infection and patient compliance. One rare complication of Arterial aneurysm was successfully treated. Conclusion: Ilizarov method of treatment is efficient in variety of orthopaedics problems & has a long learning curve.

**Date: 2014-11-22**

**Session: Infection: Free Papers - Infection Non-Union**

**Time: 12:30 - 14:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37967**

**DISTRACTION HISTIOGENESIS FOR DIAPHYSEAL INFECTED NON-UNIONS USING RAIL ROAD FIXATOR**

**Rakesh SHARMA**

**Govt. Medical College, Amritsar (INDIA)**

Management of Infected non-unions is difficult due to presence of infections, deformity, shortening, and bone and soft tissue loss. Different treatment options are available with various plus and negative points. Distraction histiogenesis principle has the potential to treat these complications simultaneously. Ilizarov's method was the pioneer, but with lot of problems, like being cumbersome, heavy, loaded with complications and having long learning curve. Rail road System is uniplanar, easy to apply and principally as effective as Ilizarov's technique, but with a small learning curve. I am presenting a prospective study of 20 patients with infected non-unions of Tibia where bone gap was created by removing the dead and necrotic bone segment of the bone and treated on principle of distraction histogenesis using Limb Reconstruction System (LRS). Radical debridement followed by fixation with LRS, Corticotomy and lengthening was done. Average duration of LRS application was 9 months. We distracted the corticotomy site at the rate of .25mm/4 times a day till lengthening and docking of the gap segment was achieved. Average lengthening achieved was 8.5 cms. According to ASAMI scoring system, 48% had excellent result, 32% good result, 20% had fair result. Most common problem was pin track infection followed by pain and pin loosening. LRS is an alternative to Ilizarov fixation in the management of complex and infected nonunion of long bones. It is an excellent and easy method to treat bone gap due to any cause. It is less cumbersome to patient and more surgeon and patient friendly.

**Date: 2014-11-22**

**Session: Infection: Free Papers - Infection Non-Union**

**Time: 12:30 - 14:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36825**

**PROSPECTIVE RANDOMIZED COMPARISON OF RING VERSUS RAIL FIXATOR IN INFECTED GAP NONUNION OF TIBIA TREATED WITH DISTRACTION OSTEOGENESIS**

Rajesh ROHILLA, Roop SINGH  
PGIMS, Rohtak (INDIA)

Open fractures of tibia are often complicated with nonunion, infection, deformity, shortening, bone and soft tissue loss. The present prospective randomized study compares two different types of fixators in infected gap nonunions of tibia treated with distraction osteogenesis. Only those patients who had minimum of 3 cm gap after radical resection, minimum of 3 cm soft tissue loss and with active infection were included. 20 patients were treated with ring fixator system (group I) and 15 patients were treated with rail fixation system (group II). The mean bone gap was 7.8 in group I and 6.39cm in group II (NS). The mean wound size was 5cm X 2.5cm in group I and 4cm X 2.2cm in group II (NS). Closure of the wound was attempted by giving relaxing incisions. Fracture united primarily in 17 cases in group I and 12 cases in group II and with delayed bone grafting in 2 cases in each group (NS). One patient had premature removal of ring fixator in group I due to excessive pain. The transported bone carried overlying skin with it, thus, avoiding flap reconstruction. Superficial pin tract infection occurred in 5 patients in group I and two patients in group II. Equinus deformity developed in three patients in group I. Both fixator systems achieved comparable and reliable rates of union and functional outcome in infected gap nonunion of tibia. Pin tract infection rate was higher (but NS) in ring fixator. Patient compliance was better in rail fixation system.

**Date: 2014-11-22**

**Session: Infection: Free Papers - Infection Non-Union**

**Time: 12:30 - 14:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37529**

**RESULTS OF SURGICAL MANAGEMENT OF DISTAL METAPHYSEAL FRACTURES OF TIBIA USING HYBRID EXTERNAL FIXATOR**

**Mukhesh THANGAVEL, Prasanna ANABERU, Pradeep BASKARAN  
JJM Medical College, Davanagere (INDIA)**

**Background and Objectives:** The difficulty in treating the fracture of Distal Tibial Metaphysis is well known by all Orthopaedists. The Hybrid External Fixator seemed suitable for such fractures as they combine the advantages of Monolateral and Circular Fixation. Tensioned Wires provide improved fixation in small fragments and Osteoporotic bone. It allows early weight bearing and movement of ankle at all times. **Methods:** Twenty five patients with Distal Tibial Metaphyseal fractures were studied from June 2010 To July 2013 in our institution and followed up for a period of 6-10 months. **Results:** All the fractures consolidated with average of 13 weeks. All fractures resulted in good union. Three of the 5 compound fractures and 2 of the 20 simple fractures developed pin tract infections which were suppressed using antibiotics. Twelve patients had ankle stiffness. This was probably due to the patient in compliance to the physiotherapy regimen. Two cases had Malunion with an anterior angulation of 5 Degree but had a good ankle function. At 6 months, results were based on objective and subjective parameters by Ovadia and Beals. 12 (48%). Patients had Excellent outcome 7 (28%) had Good, 5 (20%) had Fair and 1(4%) had Poor outcome. Subjective parameters showed 21 (74%) Good to Excellent Results and 4 (16%) Patients with fair results. **Interpretation and Conclusion:** Hybrid External Fixator is Simple, Rapid and Straightforward application. Reduced surgical time, minimally invasive and adjustable. It has negligible complication and resulted in excellent results for this type of fractures.

**Date: 2014-11-22**

**Session: Infection: Free Papers - Infection Non-Union**

**Time: 12:30 - 14:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36611**

**OPEN FRACTURE & OSTEOMYELITIS MANAGEMENT**

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Open fracture & osteomyelitis management shares a common treatment protocol. Radical debridement & primary fixation of open fracture is the key in prevention of infection. Removal of contaminated, devitalized tissue and bone ends, leave a significant bone defect. These bone defects if left for future grafting results in fibrous tissue formation which is difficult to clear at the time of future grafting. Intramembranous grafting is a two-stage technique in which antibiotic cement spacer is used to fill the bone defect in first stage and soft tissue reconstruction is done. Foreign body reaction induces a membrane surrounding cement spacer, which acts as a stimulus for revascularization & consolidation of the bone graft, which is going to be grafted at a second stage. Antibiotic spacer not only induces a membrane but also adds to the stability of the fracture and releases high concentration of antibiotic locally, which may address the residual bacterial load. We have studied 15 cases, of which 9 were open fractures 6 were infections. All were managed with thorough debridement and immediate fixation. Bone defect created by debridement is filled with vancomycin bone cement. Adjacent joint mobilization was started immediately. After 6 weeks bone cement was removed and morselised autologous bone grafting of the cavity was done without disturbing the membrane. In all the cases we have achieved healing without an infection with 6 months average time of healing. All osteomyelitis cases were successful in eradicating infection at 8 months of follow up.

**Date: 2014-11-22**

**Session: Infection: Free Papers - Infection Non-Union**

**Time: 12:30 - 14:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37359**

**ORGAN-SAVING TECHNIQUES OF TREATING PATIENTS WITH CHRONIC OSTEOMYELITIS OF THE ANKLE AND HINDFOOT BONES**

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FSBI «RISC «RTO» of the RF Ministry of Health, Kurgan (RUSSIA)

The purpose of the present study is to analyze of the using the developed transosseous osteosynthesis techniques in order to save the foot and to recover the function for osteomyelitic total and subtotal involvement of hind foot bones. The process of treatment according to G.A. Ilizarov has been analyzed in nine patients at the age of 21-56 years with chronic osteomyelitis of talus and calcaneus, with purulent trophic ulcers. Osteomyelitis causes were the following: neurogenic (7 patients), posttraumatic (2 patients). Complex treatment included two stages: radical sequestrectomy was performed at the first stage and foot fixation with the Ilizarov fixator, in the favourable position for the wound healing, and antibiotic therapy for up to two weeks as well; at the second stage – reconstructive-and-restorative surgeries in order to fill bone defect. The results of treatment were followed up in the immediate (one month) and long-term (from one to six years) periods after the fixator dismounting. After treatment osteomyelitic process was stably stopped, weight-bearing recovered (five patients use special shoes and four ones – common shoes, three patients walk without additional supports, six ones use a stick), as well as hind foot shape maximally close to natural. Recurrence developed in one patient 4 months after treatment: trophic ulcer on the plantar surface due to inadequate foot loading. The ulcer healing was achieved conservatively. Trophic ulcer on the plantar surface of the calcaneal area developed in another patient 6 years after treatment. In this case the ulcer dissection and plasty was performed.

**Date: 2014-11-22**

**Session: Infection: Free Papers - Infection Non-Union**

**Time: 12:30 - 14:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 36590**

**ANTIBIOTIC LOADED CEMENT SPACER, A DIFFERENT APPLICATION AND IDEA**

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**Introduction:** Antibiotic loaded cement spacers are the gold standard in managing infected hemi or total hip arthroplasty in many centres. We applied a different, new, economic and reproducible method for spacers. **Methods:** Between June 2012 and September 2013 we managed 13 cases; 5 infection and 8 lower limb open fractures. After thorough debridement of the infected bone or neat tissue cleaning in open fracture we were always left with a gap. The idea is to put the doughy cement in a 50 ml syringe where a Steinmann pin is inserted in its core. The spacer's length was tailored according to the gap guided by the graded syringe. 3-4 gms of Vancomycin were put in an already loaded Gentamycin cement pack and the pin ends were inserted intra-medullary with or without an external fixator. Tissue cultures and swaps were taken from the field. After 6 weeks with antibiotic coverage, based on the culture and sensitivity results, laboratory CRP and ESR were done till normal and finally reconstruction of the defect in a clean field with a preserved tissue tether. **Results:** We had a clean field in 11 cases where we proceeded to a final reconstruction, 2 cases (infection) needed further debridement and re-application of the spacer for more 6 weeks, when laboratory tests were negative reconstruction took over. **Conclusion:** The new economic application of the antibiotic loaded cement spacer could be a solution for developing areas to cut short the budget other than the expensive ready-made spacers or beads.

**Date: 2014-11-22**

**Session: Infection: Free Papers - Infection Non-Union**

**Time: 12:30 - 14:00**

**Room: BARRA DA TIJUCA**

**Abstract no.: 37579**

**ESTIMATION OF LOCAL AND SYSTEMIC ANTIBIOTIC CONCENTRATIONS LEACHED FROM ANTIBIOTIC IMPREGNATED CEMENT BEAD CHAIN, COATED NAILS AND SPACERS USED FOR TREATMENT OF MUSCULOSKELETAL INFECTIONS**

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Introduction: Infection is a significant clinical problem in orthopaedic surgeries especially in developing countries like India and chronic infection can persist intermittently for years. After surgical debridement, systemic antibiotics are ineffective in achieving significant concentrations at the site of infection. Local antibiotic delivery from polymethylmethacrylate (PMMA) cement beads is the current gold standard method. Most of the current studies are in vitro and animal models. Our study aims at estimating the serum and local (seroma) concentrations of antibiotics leached from handmade antibiotic impregnated cement bead chain and coated nails used for treatment of musculoskeletal infections using high performance liquid chromatography and also to analyze the efficacy and related complications of implantation of antibiotic impregnated PMMA beads. Methods: We have used 20 gm of Gentamicin impregnated bone cement mixed with 1.5 gm of Vancomycin and 3 gm of Ceftriaxone to prepare beads or coated nails as our Local Antibiotic Delivery System (LADS) on 50 patients. Results: Show a significantly high local concentration of antibiotics compared to plasma concentration up to 30 days.

**Date: 2014-11-22**

**Session: Shoulder & Elbow: Free Papers - Shoulder girdle, Brachial Plexus**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 38513**

**LONGTERM RESULTS OF COMBINED ACROMIOCLAVICULAR AND CORACOCLAVICULAR RECONSTRUCTION USING NYLON TAPE**

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**Introduction:** The purpose of this study was to evaluate the Long term radiologic and functional outcomes of an anatomic reconstruction of both acromioclavicular (AC) and coracoclavicular (CC) ligaments in types III to V AC injuries using nylon tape and no metal hardware. **Methods:** A prospective case-series study was performed on 34 cases with types III to V AC injuries treated by anatomic reconstruction of the AC ligaments (anterior and superior) and CC ligaments (conoid and trapezoid) using nylon tape and no metal hardware. Clinical assessments, radiologic findings, and visual analog scale, American Shoulder and Elbow Surgeons, and Constant scores were recorded for all patients. After a minimum postoperative period of 5 years, all cases were re-evaluated and rescored. **Results:** The case-series study comprised 34 cases with types III to V AC injuries. After a mean follow-up period of 75 months (minimum, 60 months), the patients had a significantly improved mean visual analog scale score (from 6.4-0.7 points), American Shoulder and Elbow Surgeons score (from 25-91 points), and Constant score (from 21-91 points), with overall 91.2 % satisfaction. Radiographic superior displacement showed reduction from 13-2 mm whereas posterior displacement showed reduction from 5-2 mm, and both were statistically significant. The rate of return to the patients' pre injury jobs was 94.1%, and there was 1 case of recurrent subluxation. **Conclusions:** Combined anatomic reconstruction of both AC and CC ligaments using nylon tape by the described technique provides overall 91.2 % satisfaction, 94% radiologic reduction, and a low complication rate.

**Date: 2014-11-22**

**Session: Shoulder & Elbow: Free Papers - Shoulder girdle, Brachial Plexus**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37620**

**MINIMALLY INVASIVE ACROMIO-CLAVICULAR RECONSTRUCTION WITH POLYESTER SURGICAL MESH (LOCKDOWN™)**

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Background: The Lockdown™ synthetic graft has been licensed for acromio-clavicular joint (ACJ) reconstruction in Ireland since 2007. Thus far, there is no local literature regarding surgical outcomes following chronic acromio-clavicular dislocations in the Irish setting. Study: Retrospective review. Methods: We identified patients with chronic ACJ dislocations who underwent surgical reconstruction over a period of 7 years. Patient satisfaction, clinical outcome measures (Constant scores) and radiographic results were reviewed. Results: 16 patients (mean age: 38 years) underwent acromio-clavicular joint reconstruction using the Lockdown synthetic graft. Clinical and radiological outcomes were assessed with a mean follow-up of 3 years (range 1.2 – 7 years). The mean Constant score of 88. There was one case of failure with cut out of the distal clavicle (declined revision). There were no revisions in our cohort. 87% (14 out of 16 patients) remained satisfied with their procedure. Conclusion: The LockDown™ synthetic graft is a good option for the treatment of chronic acromio-clavicular dislocation. Osseous cut out is a complication possibly due to the measuring device of this implant.

**Date: 2014-11-22**

**Session: Shoulder & Elbow: Free Papers - Shoulder girdle, Brachial Plexus**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 36805**

**LONG-TERM OUTCOMES OF PATIENTS UNDERGOING ARTHROSCOPIC SUBACROMIAL DECOMPRESSION**

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Introduction: Arthroscopic subacromial decompression (ASD) is a popular and increasingly common procedure performed as day case surgery in most units. It has shown to have favourable outcomes in patients shortly after surgery. The purpose of our study was to determine and quantify the long-term outcomes of ASD. Methods: All patients undergoing ASD were prospectively recruited to this study. We collected basic data on age and sex of each patient. Each patient completed an Oxford Shoulder Score questionnaire prior to surgery, and then once post-operatively at a minimum of 64 months. Data was stored and analysed using Microsoft Excel 2010. Results: Data for 50 patients was analysed in this study. There were 26 males and 24 females. The mean age was 55.2 years. The mean pre-operative Oxford Shoulder score was 21.9 (range = 1 to 40), indicating moderate to severe shoulder arthritis. The mean Oxford Shoulder score at long-term follow-up (minimum of 64 months and maximum of 82 months) significantly improved to 37.9 (range = 10 to 47,  $p < 0.05$ ). Conclusion: Our study demonstrates that the benefits of ASD are not short-lived or temporary. Majority of our patients reported ongoing improved functional outcomes several years after they procedure.

**Date: 2014-11-22**

**Session: Shoulder & Elbow: Free Papers - Shoulder girdle, Brachial Plexus**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 38202**

**DISPLACED MIDSHAFT CLAVICLE FRACTURE IN ATHLETES - SHOULD WE OPERATE?**

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Displaced midshaft clavicle fracture in athletes – should we operate? Objective: To evaluate the treatment of middle third clavicle fractures using pre-contoured plate in athletes. Methods: In a retrospective revision, we evaluated 26 clavicle osteosynthesis in 25 patients who had an acute displaced midshaft fracture. All patients had submitted to acute intervention within five days after trauma. According to the Edinburgh classification we had 16 type B1 and 10 type B2. Mean age was 37 years (15-63 years), 20 patients were male and 5 female. All patients were professional or recreational athletes. Patients were treated by open reduction and internal fixation using pre-contoured clavicle plate. We used the same implant and technique in every case. Mean follow-up was 16.8 months (minimum 6 months). The average for sports returned was 45.6 days. Results: Clinical assessment was performed by UCLA score. The results were 24 (92.3%) excellent, 2 (7.7%) good and no bad result. All cases had fracture consolidation. We had only one complication (thrombosis of the subclavian vein with good response to conservative treatment), 2 patients required implant removal. Conclusion: Open reduction and plate fixation for fractures of the middle third of the clavicle promoted an early return to sport with the same previous level in majority of patients.

**Date: 2014-11-22**

**Session: Shoulder & Elbow: Free Papers - Shoulder girdle, Brachial Plexus**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37407**

**CLINICAL OUTCOME AFTER "ERECTA" SHOULDER DISLOCATIONS**

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Introduction: Inferior shoulder dislocation, or “erecta” dislocation, is an uncommon shoulder injury and often associated with fractures of the greater tuberosity, rotator cuff tear or neurovascular injury. The aim of this study was to evaluate the clinical outcome of patients who sustained an erecta shoulder dislocation. Material and methods: Between 1992 and 2012 all patients with inferior shoulder dislocation treated at this institution were included in this study. Demographic data, injury mechanism, type of reduction, duration of initial immobilization and associated injuries were analyzed. Two age groups were formed (<35a/>35a) to evaluate for possible age related differences in the pattern of associated injuries. Results: In patients younger than 35 years (7 patients) concurrent fractures were found in 3 cases, neurologic compromise in 2 cases and a supraspinatus tendon tear in one case. In patients older than 35 years (10 patients) a concurrent fracture about the shoulder was found in 6 cases, neurologic compromise in 3 cases and a rotator cuff injury in one case. However, all neurologic deficits recovered spontaneously within the first four weeks. Conclusion: The most common injuries associated with erecta dislocations are concurrent fractures about the shoulder, neurologic compromise and injuries to the rotator cuff. There were no age-related differences regarding the associated injuries.

**Date: 2014-11-22**

**Session: Shoulder & Elbow: Free Papers - Shoulder girdle, Brachial Plexus**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37328**

**CLINICAL ASPECTS OF PATIENTS WITH BRACHIAL PLEXUS TRAUMATIC INJURY AFTER SURGYCAL TREATMENT**

Frederico MORAES, Mario KUWAE, Ricardo SILVA, Celmo PORTO, Daniel MAGALHÃES, Matheus PAULINO  
Goias Federal University, Goiania (BRAZIL)

Objective: Evaluate clinical characteristics of adult brachial plexus traumatic injuries patients submitted to surgery. METHODOLOGY: Retrospective study with convenience 48 patients, treated at Goias Federal University from 2000 to 2010. Functional outcomes: 1- goniometry ROM of shoulder, elbow and wrist; 2- Power grade of shoulder, elbow and wrist; 3- limb sensibility; 4- VAS (0-10). Analysis with Friedman, t'Student, Qui-square, Wilcoxon and Kruskal-Wallis tests ( $p < 0,05$ ). RESULTS: Average age 30,6 years (14 to 59). Twenty (41,6%) were from capital, 18 (37,6%) hard workers and 29 (60,4%) by motorcycles accidents. Politrauma in 25 patients (52,1%). Average time to diagnose was 4,2 months and to surgery was 8,7 months. Thirty one (64,6%) with total brachial plexus injury. 24 (50%) axioniotmesis. Neural procedures in 39 patients (81,3%) and mio-tendinous surgeries in 18 patients. Shoulder ROM  $> 30^\circ$  present in 20 (41,6%) ( $p=0,001$ ). 13 (27,1%) had shoulder power  $> M3$  ( $p=0,001$ ). Elbow ROM  $> 80^\circ$  flexion present in 27 (56,2%) ( $p<0,001$ ). 22 had  $> M3$  elbow flexion ( $p<0,001$ ). Wrist extension  $> 30^\circ$  present in 22 (45,8%) ( $p=0,003$ ). 27 (56,3%) had wrist extension power  $> M3$  ( $p=0,002$ ). After treatment 45 (93,8%) presented with hipoesthesia ( $p=0,006$ ). Initial VAS was 4,5 (1,0-9,0) and final 3,0 (1,0-7,0) ( $p<0,001$ ). CONCLUSION: Traumatic brachial plexus lesions are more prevalent in young adult, men, from urban regions, hard workers, in motorcycles accidents, with politrauma, total plexus lesions and axioniotmesis. Neural procedures were more frequent, followed by mio-tendineous transfers. All functional outcomes had significant improvement, besides function is still distant from normal recovery.

**Date: 2014-11-22**

**Session: Shoulder & Elbow: Free Papers - Shoulder girdle, Brachial Plexus**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 36431**

**VARIATIONS OF TREATMENT IN SELECTED MID SHAFT SPIRAL FRACTURES OF THE HUMERUS AMONG SURGEONS WITH DIFFERENT SURGICAL EXPERIENCE - A SURVEY AT AN INTERNATIONAL AO COURSE**

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Introduction: Spiral fractures of the midshaft of the humerus can be treated non-operatively or in a variety of operative methods. Methods: Surgeons taking part in an international AO approaches and osteosynthesis course were invited to participate in a survey to assess the management modalities used for mid shaft humerus fractures. Results: Forty seven surgeons participated, 17 inexperienced (<3 years) and 30 experienced (>3 years). Within the inexperienced group only 2 surgeons opted for a conservative approach (12.5%) and the remainder for an operative fixation. Of the experience group of surgeons 12 (40%) opted for conservative and the remaining 18 opted for a surgical intervention. Eleven of the 18 (61%) opted for a nail and the remaining for plate fixation. Discussion: Midshaft spiral fractures can be treated in a variety of methods. In the experienced group of surgeons 40% treat these fractures non-operatively compared to 12.5% of junior surgeons. In the inexperience surgeons 93% would use an IM nail compared to 61% in the experienced surgical group. This may be due to recent trends in a higher use of IM nailing with the assumption of better rates of union or function, despite disruption of the rotator cuff. 39% of experience surgeons would choose ORIF using a DC or LC plate with 6 or 8 cortices on each side of the fracture to allow adequate fixation. On questioning these surgeons further, they preferred open reduction so that the radial nerve could be visualised.

**Date: 2014-11-22**

**Session: Shoulder & Elbow: Free Papers - Shoulder girdle, Brachial Plexus**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 36627**

**WEAR ANALYSIS ON RETRIEVED SHOULDER HEMIARTHROPLASTY**

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Hemi-shoulder-arthroplasty is an attractive treatment for shoulder arthritis in particular if the natural glenoid is still intact. However, comparing the clinical results of hemi- and total-shoulder-arthroplasty clearly shows lower survival for the hemi arthroplasty. One of the most common reasons for revision surgery is glenoid erosion, where the cartilage or bone is worn of. Aim of the current study was to analyse the metallic articular surface of retrieved hemi shoulder arthroplasty. We hypothesized that the surface roughness will increased due the articulation and that metallic wear is detectable on the implants. Twelve retrieved and three brand new hemi shoulder arthroplasty were included. The surface roughness (Ra, Rz, Rmax, Rsk) was measured on different sites of the surface. The implants were further measured using a coordinate-measuring-machine to gain information on volumetric wear and geometrical alterations. Compared to new implants the surface roughness on the retrievals was significantly increased. Although the roughness parameters within the retrieval group were generally higher at the center of the head compared to the edge, this difference was not significant. Apart from form deviations no volumetric wear was detectable on the heads. The current results indicate that the metallic articular surface changes in vivo and that the material is hurt due to the articulation against the softer cartilage or bone. Although it can't be finally clarified by that study, to what extend the higher roughness is taking part in the process of the clinically observed erosion of the glenoid, it can be assumed that an increased roughness is disadvantageous.

**Date: 2014-11-22**

**Session: Shoulder & Elbow: Free Papers - Shoulder girdle, Brachial Plexus**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37141**

**STEMLESS TOTAL SHOULDER ARTHROPLASTY; EARLY SURGICAL AND FUNCTIONAL RESULTS**

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**Introduction:** The new era of shoulder arthroplasty is moving away from long stemmed, cemented humeral components to cementless, stemless and metaphyseal fixed implants and to humeral resurfacing. The early clinical results and functional outcome of stemless shoulder arthroplasty is presented. **Methods:** A retrospective single-surgeon series of stemless shoulder prostheses implanted from 2011 to 2013 at our institution was evaluated. Perioperative complications, Theatre time and length of hospital stay (LOS) were recorded. Postoperative radiographic and clinical evaluation including measurement of joint mobility, the Oxford Shoulder Score (OSS), and Disabilities of the Arm, Shoulder and Hand (DASH) score by independent evaluators were made. **Results:** A total of 23 stemless shoulder arthroplasty were implanted in 22 patients. Mean age was 57.8 years. Mean follow up was 22 months (8-45). Symptomatic primary gleno-humeral osteoarthritis was the main indication for implantation (83%). None of the patients experienced periprosthetic fractures, glenoid notching, and implant loosening/migration. Mean OSS ( $44 \pm 6.0$ ) and mean DASH score ( $11 \pm 6.5$ ). Mean operative time was ( $88 \pm 16.0$  min) and mean length of hospital stay ( $1.1 \pm 0.82$  day). Active shoulder motion improved by (mean):  $30^{\circ}$  (95% CI 10-45) external rotation,  $67^{\circ}$  (95% CI 30- 100) forward elevation and  $54^{\circ}$  (95% CI 35- 90) Abduction. **Conclusion:** The implantation of stemless shoulder prosthesis in our institution offered good clinical results manifested by improved range of motion and favourable patient reported outcome measures. Although long term follow up is warranted, early results appear promising in young patients with symptomatic gleno-humeral osteoarthritis.

**Date: 2014-11-22**

**Session: Shoulder & Elbow: Free Papers - Shoulder girdle, Brachial Plexus**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37676**

**REVERSE SHOULDER ARTHROPLASTY IN SEQUELEAS OF COMPLEX PROXIMAL HUMERAL FRACTURE: REVIEW OF 63 CASES**

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Background: The purpose is to report the results of reverse shoulder arthroplasty (RSA) for failed initial conservative or osteosynthesis or hemiarthroplasty treatment performed for complex proximal humeral fracture. Material and Methods: Retrospective multicentric study of three groups of patients with a minimal follow up of 2 years: Group I (25 patients) initial fracture treated conservatively; Group II (25 patients) initial fracture treated by osteosynthesis and group III (13 patients) treated initially by hemiarthroplasty. Results: One patient was died and 5 were not reviewed. The mean Constant score increased from was 13.7 to 54.1(group I); 16.6 to 48.5 (group II) and 22.6 to 48.2 (group III). Active anterior elevation, external rotation, pain relief, degree of satisfaction and simple shoulder test were better in the group I than group II and III. The rate of complications was 38% in group III, 25% in group II and 20% in group I. The results were correlated to the pre-operative degree of stiffness, trophicity of the deltoid and the delayed between initial treatment and the RSA. Discussion and conclusion: RSA is a salvage procedure in sequel as of complex proximal humeral fracture but with less functional result that primary RSA and a higher rate of complications (20 to 38%). Function and motion are better if the initial treatment was conservative. Functional result is often limited with a mean active anterior elevation between 100 to 114° but with a constant gain regarding the pain.

**Date: 2014-11-22**

**Session: Shoulder & Elbow: Free Papers - Shoulder girdle, Brachial Plexus**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 38473**

**MEDIUM TO LONG-TERMS RESULTS OF A RANDOMISED CONTROLLED TRIAL TO ASSESS THE EFFICACY OF ARTHROSCOPIC SUBACROMIAL DECOMPRESSION VERSUS MINI-OPEN REPAIR FOR THE TREATMENT OF ROTATOR CUFF TEAR**

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**Purpose:** To determine if rotator cuff repair confers any advantage over arthroscopic sub-acromial decompression alone in the management of rotator cuff tear in the medium to long-term. **Methods:** Ethical approval was sought to follow-up 42 patients previously enrolled in a completed randomised-controlled trial comparing the outcome of ASAD versus mini-open cuff repair for the treatment of rotator cuff tear. 15 from the original 17 patients randomised to ASAD alone and 18 from the original 25 patients randomised to cuff repair were available for follow-up, with a mean age of 72 years and a range of 65 to 80. Each patient underwent follow-up Constant, ASES, DASH scoring, clinical and ultrasound examination by a blinded assessor. Mean duration of follow-up was 7 years with a range 5 to 11 years. **Results :** Those patients who underwent cuff repair showed better improvement in ASES, DASH and Constant scores compared to the decompression alone group at follow-up, but this was not statistically significant. 33% patients in the cuff repair group had a proven re-rupture on ultrasound; these patients had a lower overall Constant score ( $p<0.05$ ) compared to those with intact repairs. None of the patients from either group required arthroplasty surgery. **Conclusion:** There is no clear demonstrable benefit of cuff repair over decompression alone for the treatment of rotator cuff tears, in terms of ASES, DASH and Constant scores for pain, function and strength modules, but those undergoing cuff repairs may have more better improvement. Patients with intact cuff repairs fared better than patients whose repairs failed.

**Date: 2014-11-22**

**Session: Shoulder & Elbow: Free Papers - Shoulder girdle, Brachial Plexus**

**Time: 10:30 - 12:00**

**Room: GLÓRIA**

**Abstract no.: 37241**

**CORACICLAVICULAR TAPING METHOD FOR UNSTABLE DISTAL CLAVICLE FRACTURE**

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**INTRODUCTION:** Unstable displaced distal clavicle fractures are generally treated surgically due to high non-union rate. **METHOD:** From November 2010, fifteen patients (ten males and five females) with unstable distal clavicle fractures observed postoperatively for more than six months were surveyed. The mean age was 43 years old (range, 21-65). There were six type IIB and nine type V in Craig classification. Coracoclavicular ligaments were reconstructed using a 3-mm-wide non-absorbable ultrahigh-molecular weight polyethylene tape (Nesplon tapes: Alfresa, Japan). Interfragmentary fixation was performed using Kirschner wire or another non-absorbable suture (Nesplon tapes and/or 2/0 FiberWire: Arthrex, Germany). We assessed the results of this method at final follow up according to distal fragment length, union rate, union time, complication and functional outcome. Functional outcome was assessed using University of California-Los Angeles (UCLA) shoulder scale. **RESULT:** Mean distal fragment length was 13.2 mm. Bone union was achieved in all cases. Mean bone union time was 12.3 weeks. One had evanescent scapulohumeral periarthrititis, and one had shoulder pain related to Kirschner wire irritation. The mean UCLA shoulder scales was 34.3 (range, 31-35). **DISCUSSION:** The gold standard is not yet established about the surgical treatment of the unstable distal clavicle. Many different operative methods have been described. Surgical method using coracoclavicular reconstruction may not be generally recognized. But several studies reports high union rates and good functional outcome. We also obtained good results. **CONCLUSION:** Coracoclavicular taping method may be one of the good choice for unstable distal clavicular fracture.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Osteotomy**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 36492**

**THE EFFECT OF DEGA ACETABULOPLASTY AND SALTER INNOMINATE OSTEOTOMY ON ACETABULAR REMODELING MONITORED BY THE ACETABULAR INDEX IN WALKING DDH PATIENTS BETWEEN 2 AND 6 YEARS OF AGE: SHORT- TO MIDDLE-TERM FOLLOW-UP**

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**Introduction:** The surgical management of neglected developmental dysplasia of the hip (DDH) in walking children has always been a challenge to orthopaedic surgeons. **Aim of the work:** The aim of this study was to evaluate the short- to middle-term clinical and radiographic results of the management of DDH patients less than 6 years old. **Patients and methods:** Two of the most commonly used osteotomies, namely; Salter innominate osteotomy and the Dega acetabuloplasty, were used for all the selected cases. Special attention was paid to acetabular remodelling after concentric reduction, which was monitored by the acetabular index. That, in turn, was measured preoperatively, immediately postoperatively, every 6 months, and at the final follow-up examination. **Results:** The final overall clinical end results were favourable (excellent or good) in 93 hips (85.3 %). There was a marked improvement of the acetabular coverage during the follow-up period, which proved the good remodelling potential of the acetabulum for this particular age group after concentric reduction was achieved and maintained. **Conclusion:** Both osteotomy types were found to be adequate for the management of neglected walking DDH patients under the age of 6 years.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Osteotomy**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 36731**

**MEAN 12 YEARS FOLLOW-UP OF INCOMPLETE TRIPLE PELVIC  
OSTETOMY**

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Background: The aim of this study is to present the long term experience of incomplete triple pelvic osteotomy in acetabular dysplasia patients whose short term results were published previously and analyze the long term results compared with the other long term results. Methods: 26 hips of 24 patients who were treated with incomplete triple pelvic osteotomy by a single surgeon from February 1995 to October 2001 were retrospectively reviewed at an average of 12 years. Radiological evaluation was done on AP radiographs using CEA, AA, AI, AHI and lateralisation. Clinical and radiological scoring was performed using Harris scoring and Ömeroğlu scoring systems, respectively. Results: Significant improvement in all of the radiologic parameters were observed with a results 88.5% good radiologically and 100% good clinically with no significant progression in osteoarthritis and need to conversion to THA. Major complication rate was 11%. Retroversion was seen in 15.4% of the patients. Conclusion: Incomplete triple pelvic osteotomy is a safe choice in the treatment of acetabular dysplasia as it offers success in the clinical and radiological results also in the prevention of osteoarthritis as the final destination. These patients had no restriction of range of motion and had no femoroacetabular impingement in the physical examination during the last follow-up. After 12 years follow-up there is no progression in osteoarthritis in these hip joints.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Osteotomy**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 37589**

**PERIACETABULAR OSTEOTOMY TO ANTEVERT AND UNCOVER THE HIP IN PINCER FEMOROACETABULAR IMPINGEMENT**

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Introduction: Periacetabular osteotomy (PAO) can reorient the acetabulum to decrease pincer femoroacetabular impingement (FAI) caused by acetabular retroversion or global acetabular over coverage. We describe the early results of PAO to antevert and reduce femoral head coverage in symptomatic hips with pincer FAI not amenable to arthroscopic treatment. Methods: IRB approval was to obtain retrospectively review cases of pincer FAI treated with either 1) reverse PAO to decrease lateral and anterior femoral head coverage, or 2) anteverting PAO to correct acetabular retroversion. Pre- and post-operative WOMAC scores and radiographic measurements consisting of the lateral center edge angle (LCEA), Tönnis angle (TA), anterior center edge angle (ACEA), cross-over sign (COS), posterior wall sign (PWS), and ischial spine sign (ISS) were compared using student t-test, Wilcoxon signed-rank test, and exact binomial sign test. RESULTS: From 2004-2012, 23 hips (10 left, 13 right) in 17 patients (12 female, 5 male) underwent reverse or anteverting PAO. Average follow-up was 24.6 months. After reverse PAO, femoral head coverage significantly decreased (LCEA 42.9 to 32.3, TA -9 to 0.5, ACEA 46.6 to 40.0). After anteverting PAO, radiographic signs of retroversion (COS, PWS, ISS) significantly decreased. Both groups exhibited significantly improved post-operative pain and function, with total WOMAC scores improving from 37.3 to 23 after reverse PAO and 28.8 to 6.09 after anteverting PAO ( $p < 0.0009$ ). Discussion/Conclusion: Reverse and anteverting periacetabular osteotomies provide clinical and radiographic improvement in patients with symptomatic pincer FAI secondary to acetabular over-coverage or retroversion. Cartilage surface and acetabular retroversion with borderline dysplasia.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Osteotomy**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 37522**

**PERIACETABULAR OSTEOTOMY FOR THE TREATMENT OF COXARTHROSIS WITH HUGE CYSTS -PROSPECTIVE CONSECUTIVE SERIES WITH AN 11-YEAR MINIMUM FOLLOW-UP PERIOD**

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**Background:** Satisfactory intermediate and long-term results of periacetabular osteotomy for the treatment of advanced coxarthrosis have been reported. The purpose of this study was to examine the results of periacetabular osteotomy in patients with advanced coxarthrosis with huge cysts caused by acetabular dysplasia. **Methods:** We prospectively analyzed nine hips in nine patients treated for bone cysts larger than 1.5 cm who underwent the Bernese periacetabular osteotomy with bone grafts performed by a single surgeon. The average age of the patients at the time of surgery was 45.9 years, and the average duration of clinical follow-up was 14 years. The Japanese Orthopaedic Association (JOA) hip score was used and overall patient satisfaction with surgery was evaluated to assess hip function and clinical results. Plain radiographs were used to determine correction of deformity and progression of degenerative arthritis. **Results:** The mean pain score and the mean JOA hip score improved postoperatively. Radiographic analysis demonstrated consistent deformity correction and significant improvements in the AHI and anterior acetabular head index with no recurrence of the cystic lesion. Range of motion decreased and degenerative arthritis worsened in some cases with relative joint space narrowing and huge cyst. **Conclusions:** Periacetabular osteotomy for the coxarthrosis with huge cysts improves hip function and may prevent or delay progression of degenerative arthritis in most patients when the surgical indication and technique are appropriate.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Osteotomy**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 36658**

**CLINICAL RESULTS AND PROGNOSTIC FACTORS OF COMBINED VALGUS FEMORAL OSTEOTOMY AND CHIARI PELVIC OSTEOTOMY FOR ADVANCED AND TERMINAL-STAGE OSTEOARTHRITIS OF SEVERE ACETABULAR DYSPLASIA**

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**Purpose:** We review the clinical results and analyse the prognostic factors of combined valgus femoral osteotomy and Chiari pelvic osteotomy (VCO) for patients with advanced and terminal-stage osteoarthritis (OA) of severe acetabular hip dysplasia. **Methods:** The study group included 50 hips of 54 patients (five men, 45 women; average age at the time of surgery, 45.6 years). The minimum and average follow-up periods were 10 and 17.6 years, respectively. During the follow-up period, the preoperative Japanese Orthopaedic Association (JOA) hip score was used for clinical evaluation. The Kaplan–Meier method was employed to calculate the probability of survival of the VCO from the time of the operation until the endpoint of converted total hip arthroplasty (THA). We define some prognostic factors for the outcome as converted THA and a JOA score <60 points using the Cox proportional hazards model. **Results:** The mean preoperative total JOA score of 53 increased to 77 at 1 year postoperative. At 5 years postoperative, the mean total JOA score was 78, and it gradually decreased to 72 at 10 years postoperative. The survival rates were 83%, 60%, and 47% at 10, 15, and 20 years after the osteotomies, respectively. In the univariate analysis, some patients with a low acetabular roof obliquity degree had better postoperative results. **Conclusion:** VCO is one joint-preserving method for patients with advanced and terminal-stage OA of the hip.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Osteotomy**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 37621**

**TRIPLE OSTEOTOMY OF THE PELVIS FOR LEGG- CALVE-  
PERTHES-DISEASE: LONG TERM RESULTS**

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**Background:** The aim of the treatment of Legg-Calve-Perthes disease (LCPD) is to prevent hip osteoarthritis. Triple osteotomy of the pelvis (TOP) is now well documented. Most of the available studies report very good results although with only short or medium-term follow-up. Our hypothesis was that those results remain stable with time and consequently may lower the risk of subsequent osteoarthritis. **Objectives:** The primary study aims were to determine the 15-year survival and functional outcomes of this surgery. **Methods:** This study presents the results of a prospective cohort of patients with Legg-Perthes-Calvé disease (LCPD) operated with triple osteotomy of the pelvis (TOP) between 1989 and 2005. All procedures were performed by two surgeons experienced in performing TOP. Patients were followed-up regularly in the clinic. Outcomes of interest were survival at fifteen-years and functional outcome. TOP failure was defined as reoperation for any cause related to the hip. Functional outcome was determined using the Oxford Hip Score (OHS) questionnaire (healthy joint scores 12 and worst possible joint scores 60). **Results:** Forty five patients with a mean follow-up of 15.2 years (8 to 24) were included. At latest follow-up, two patients were lost to follow-up, and two required a surgical reoperation. Cumulative survival rate for all TOP was 95.3% (95% CI: 90.3% to 98.6%) at 15 years. Factors significantly associated with poor long-term results were the age at diagnosis and Green index. The mean OHS at latest follow-up was 14+/-4.5(range: 12- 40). **Conclusion:** TOP in LCPD provides satisfactory and reproducible long-term clinical results.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Osteotomy**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 36753**

**CEMENTLESS TOTAL HIP ARTHROPLASTY WITH TRANSVERSE SUBTROCHANTERIC SHORTENING OSTEOTOMY IN CROWE TYPE IV HIGH DISLOCATED HIPs: 4-22 YEARS FOLLOW UP**

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**Introduction:** The purpose of this paper is to evaluate the functional and clinical results of the developmental high dislocated hips after subtrochanteric transverse shortening osteotomy fixed axially and rotationally by cementless femoral stem and the acetabular component placed into the anatomical location. **Methods:** In a retrospective study, we evaluated the results and complications of eighty-nine consecutive primary cementless total hip arthroplasty in seventy nine patients (seventy-five female and four male) all of whom had Crowe IV high dislocations. The arthroplasty was performed in combination with a subtrochanteric transverse shortening osteotomy and Zweymüller femoral stem without any fixation instruments for the osteotomy site and with placement of the acetabular component at the level of anatomic hip center. The follow up is 4-22 years. **Results:** The mean Harris Hip score increased from 26,07 points preoperatively to 88.67 points at the time of final follow up ( $p<0.01$ ). **Conclusion:** subtrochanteric shortening osteotomy and cementless total hip arthroplasty for the treatment of developmental dysplasia and dislocations of the hip were associated with high rates of successful fixation of the femoral component and the acetabular site. The osteotomy site has a healing potential within the 8-12weeks' time without any complications. The mean Harris hip score was 88,67points. The complication rate is higher than that associated with primary total hip arthroplasty for the degenerative arthritis.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Osteotomy**

**Time: 08:30 - 10:00**

**Room: LAPA**

**Abstract no.: 37937**

**SAFE SURGICAL DISLOCATION AND PHYSEAL OSTEOTOMY FOR TREATMENT OF MODERATE AND SEVERE SLIPPED CAPITAL FEMORAL EPIPHYSIS (SCFE)**

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**Introduction:** In situ fixation of the SCFE remains the gold standard for treatment of SCFE. In moderate and severe cases, the residual deformity leads to secondary femoroacetabular impingement and subsequently early osteoarthritis. **Methods:** Twenty-four patients (24 hips) with moderate (12 hips) and severe (12 hips) chronic stable SCFE were treated with safe surgical hip dislocation and trasphyseal osteotomy (modified Dunn osteotomy). The mean age was 14.26 years. The study reviewed the clinical status and radiographs made at the time of surgery, as well as the intraoperative findings. Subjective outcome was assessed using the HHS and the WOMAC questionnaire. **Results:** With a mean follow up of 16.2 months, twenty-one patients had excellent clinical and radiographic outcomes. Two patients had good outcome. One patient developed AVN. The mean slip angle of the femoral head was 55.6 preoperatively and was corrected to a mean normal value of 12.2 (p value 0.000). Anatomical or near-anatomical reduction was achieved in all cases. **Conclusions:** The treatment of slipped capital femoral epiphysis with the modified Dunn procedure allows the restoration of more normal proximal femoral anatomy by complete correction of the slip angle, such that probability of secondary femoroacetabular impingement and osteoarthritis may be minimized.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Complications**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 38472**

**A BIOMECHANICAL EVALUATION OF VANCOUVER TYPE B1 FEMORAL PERIPROSTHETIC FRACTURE FIXATION USING A PURPOSE-DESIGNED PLATING SYSTEM**

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Introduction: Femoral periprosthetic fractures around a well-fixed femoral implant are challenging to treat successfully. Different methods of fixation for these fractures have demonstrated mixed success rates. Research using these newer systems is required to inform Orthopaedic surgeons which configuration of fixation provides sufficient stability to prevent fixation failure. Objective: To evaluate the stiffness, strain, and mechanical behaviour of four different configurations of femoral periprosthetic fracture fixation around a well fixed prosthesis. Methods: Four different configurations using the NCB system to fix femoral periprosthetic fractures around a stable cemented collarless, polished, tapered femoral stem (CPT, Zimmer) were prepared using composite synthetic femora. Constructs tested had increasing degrees of cement mantle intrusion from none (cables-only) to six bicortical locking screws in the proximal fragment. Constructs were loaded in three modes, then cyclically loaded in axial compression, and post-cycling loading to determine the overall stiffness and maximum load to failure. Results: Pre-cycling mechanical testing produced erratic results however, after cycling, ""bedding in' of the prosthesis into the cement mantle occurred and there was a reliable correlation observed. Bicortical locking screws in the proximal fragment inferred the greatest construct stiffness, particularly in torsion. A trend was observed with progressive decrease in cement mantle intrusion. The cables-only construct was deemed to be the least stiff and unsatisfactory for fixation stability. Conclusion: Polyaxial bicortical locking screws that breach the cement mantle and bypass the femoral stem leads to greatest construct stiffness. Cables-only fixation does not provide sufficient stability to prevent excessive displacement and should be avoided.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Complications**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 38339**

**EARLY EXPERIENCE OF NCB (NON-CONTACT BRIDGING) PERIPROSTHETIC PLATE IN COMPLEX PERIPROSTHETIC FRACTURES OF TOTAL HIP REPLACEMENT (THR) AND TOTAL KNEE REPLACEMENT (TKR)**

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Introduction: Periprosthetic fracture around hip and knee arthroplasty is an ever increasing problem due to the ageing population in the UK. Objectives: To evaluate the clinical outcome and early experience of NCB polyaxial locking plates in periprosthetic fractures of THR and TKR. Methods: Between January 2011 and July 2012, 12 cases complex periprosthetic fractures of THR and TKR were prospectively reviewed. There were 3 males and 9 females with mean age of 80.7 years old (range: 70 to 88) with an average follow-up of 10.2 months (range: 7 to 16). Vancouver and Rorabeck classifications were used to characterise fractures around THR and TKR respectively. All patients had clinical, radiographic assessment and patient's satisfaction survey at 6 weeks, 3 months, 6 months and 1 year post-operatively. Results: There were 12 cases of periprosthetic fracture of THR (Vancouver C (n=6), Vancouver B2 (n= 2), Vancouver B1 (n=3) and 1 case of periprosthetic fracture of TKR (Rorabeck II (n= 1). There were 3 cases of interprosthetic fracture of the femur. One case of non-union was reported with subsequent failure of the plate. The remaining 11 patients demonstrated clinical and radiological union of fractures at latest follow-up and made a full return to pre-injury level of activities. No cases of infection or other complications were noted. Conclusions: The early experience and clinical outcome of this prospective study suggest that NCB periprosthetic plate is a viable option for complex periprosthetic fractures around THR and TKR.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Complications**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 38306**

**PERIPROSTHETIC AND COMPLEX PROXIMAL FEMORAL FRACTURE MANAGEMENT WITH A CANNULATED HIP NAIL PROSTHESIS- THE CANNULOK HIP**

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**Introduction:** We report the successful management of both unstable periprosthetic fractures and proximal femoral shaft fractures with ipsilateral hip arthritis treated with a hydroxyapatite coated, modular, distally locked implant. The implant was conceived over twenty years ago and initially was cemented, but for the past twelve years has a cementless option. Its unique features allow hip reconstruction and fracture fixation simultaneously. **Objectives:** We reviewed three parameters 1. Fracture union 2. Time to fracture union. 3. Complications. **Methods :** 16 Patients , 4 men and 12 women , mean age 76 years (62 – 89 years) had the operation for either Vancouver BI-1, B2-2, B3-5 or C- 2 fractures or after failed proximal fracture fixation, Dynamic Hip Screw fixation -2 and Proximal Femoral Nail fixation-1 or as primary surgery in 3 fractures with concomitant hip arthritis . The periprosthetic group had previous hemiarthroplasties - 4 and total hip arthroplasties- 6. **Results:** All the fractures even in multiply operated hips were united at an average time of 6 months (4-11 months).The implant design allowed early rehabilitation even in an elderly population group with the ability to treat several pathologies or injuries simultaneously. Its modularity with large femoral heads reduces the risk of dislocation. There have been no complications but some of the patients have subsequently been lost after fracture healing due to death from unrelated causes. **Conclusion:** We recommend the use of this novel implant in complex proximal femoral fracture and periprosthetic fracture cases.

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**Session: Hip: Free Papers - Total Hip Arthroplasty Complications**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 38043**

**ALGORITHM FOR MANAGEMENT OF SUPRACONDYLAR PERIPROSTHETIC FEMORAL FRACTURES: WHEN IS BIOLOGICAL PLATING FEASIBLE?**

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Introduction: Comminution, bone loss and osteoporosis make supracondylar periprosthetic femoral fractures difficult to treat. Open reduction internal fixation (ORIF) usually necessitates additional bone grafting to prevent delayed union. Biological plating using minimally invasive surgical (MIS) technique is possible occasionally, and minimizes morbidity. However, good patient selection and technique are paramount. Base on the results of our series, we have defined an algorithm to successfully treat each case. Methods: Thirty-one patients with comminuted periprosthetic distal femoral fractures were operated over 6-years (Oct 2006 – Sep 2012). All were fixed with the Synthes™ distal femoral locking compression plate (DF-LCP). Seventeen underwent ORIF with primary bone grafting, while fourteen were treated by closed reduction and internal fixation (CRIF) using biological techniques. Clinico-radiological follow-up was recorded up to an average 42 months. Results were assessed. Average time to union for the group was 5.6 months. Patients of OR group took longer (average, 6.4 months) than CR group (average, 4.6 months). Three patients of OR and one in CR group had poor results. Average knee scores were higher for CR group at 6 months, but nearly identical at 12 months, with similar eventual ROM. Discussion: Locked plating of comminuted periprosthetic distal femoral fractures permits stable rigid fixation and early mobilization. Biological plating minimizes morbidity and may obviate need for primary bone grafting. Based on our results, a new classification system and treatment protocol was developed.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Complications**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 36961**

**LOCKED NAILING AS STEM LENGTHENING IN PERIPROSTHETIC FEMORAL FRACTURES**

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**Purpose:** Current treatment of fractures around hip implants has focused on locked plating in well-fixed stems, and revision arthroplasty if the stem is loose. Conventional approach results with high complication rate. 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:** 51 patients were treated in 2007-2014 with the technique. There were 17/51 Vancouver B1 (5 cemented), 14/51 B2 fractures (2 cemented), 13/51 B3 (3 cemented) and 7 cases of Vancouver C (4 cemented). 14/51 patients had failures after previous surgical treatment. We designed and used a modification of an industrial solid titanium femoral locked nail. Its design reproduces femoral bow and provides tight fit of the distal part of the femoral stem. **Results:** 39/51 patients were available for follow-up in 1 year – all fractures healed, two of them after secondary procedures. Loose uncemented stems (14/39) demonstrated stem reintegration, cemented (4/39) were scheduled for elective revision after either screw or stem breakage. Major complications (4/51) include two cases of deep infection, and two cases of stem breakage at the level of junction. **Conclusion:** The technique can be an effective solution in acute periprosthetic femoral fractures of any type as well as in nonunions and malunions near femoral stems. In cases of loose uncemented stems this approach renders formal revision unnecessary.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Complications**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 37855**

**A COMPARISON OF RESULTS OF REVISION HIP ARTHROPLASTY  
DONE FOR PERIPROSTHETIC INFECTION DUE TO GRAM  
NEGATIVE AND GRAM POSITIVE BACTERIA**

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The treatment of patients with infected hip arthroplasty due to gram negative bacteria is challenging. The records of all patients presenting with infected hip arthroplasty were reviewed. The outcome of patients with gram-negative infections were compared with patients with gram positive infections. 60 hips with infected hip replacement were treated in 2 stages using an antibiotic impregnated spacer between Jan 2007 and Jan 2012. 42 had a gram +ve infection whereas 18 patients suffered from gram -ve infection. The mean duration of follow-up was 42 months (range 24-80 months). Average Harris hip score improved from 36 before surgery to 88 at final follow-up in the gram positive group and from 28 to 84 in the gram negative group. The mean interval between the first and second stages was 10 weeks (range 6-20 weeks) in gram- positive group and was 18 weeks (range 10-26 weeks) in gram-negative group. Of the 42 hips with gram-positive infection, 38 were successfully converted to THA whereas resection arthroplasty was done in 4 cases. In the 18 hips with gram- negative infection, 11 hips were successfully revised to THA whereas resection arthroplasty was done in 7 hips. 5 patients with a gram +ve infection and 8 patients with gram -ve infection required more than one debridement before conversion to THA. There was a recurrence of infection in 2 patients with gram positive infection and 4 patients with gram negative infection. Gram negative periprosthetic infections have a poorer outcome compared to gram positive infection.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Complications**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 36875**

**BACTERIAL ADHERENCE TO DIFFERENT COMPONENTS OF TOTAL HIP PROSTHESIS IN PATIENTS WITH PROSTHETIC JOINT INFECTION**

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**Purpose:** The purpose of our study was to evaluate and quantify the bacterial adherence on different components of total hip prosthesis. **Methods:** The bacterial load of 80 retrieved hip components from 24 patients was evaluated by counting of colony-forming units (CFU) dislodged from the components surfaces using the sonication culture method. **Results** Microorganisms were detected in 68 of 80 explanted components. The highest bacterial load was detected on the polyethylene liners, showing a significant difference of the distribution of CFUs between the liner and the metal components (stem and cup). Staphylococcus epidermidis was identified as the pathogen causing the highest CFU count in sonication culture, especially from the polyethylene liner. **Conclusions:** The results of our study confirm that the sonicate culture of the retrieved liners and heads, revealing the highest bacterial loads are reliable and sufficient for pathogen detection in the clinical diagnostic routine.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Complications**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 36466**

**CEMENTED MODULAR REVISION STEMS IN SEPTIC REVISIONS WITH PROXIMAL FEMORAL RESECTION AT PJI. RESULTS AFTER TWO YEARS**

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Helios Endo Klinik, Hamburg (GERMANY)

In prosthetic joint infections excessive resection of bone may be required. The results of septic revisions with the resection of proximal femur and reconstruction with a cemented modular hip revision system are presented. 61 patients at the average age of 71 years were operated between 01/2011 and 06/2013, all patients had a PJI and were treated with septic hip revision. A cemented modular femoral stem (MP© modular stem, W. Link, Hamburg, Germany) was inserted in each case. End-points of the study were recurrence of the infection, revision of the implants and postoperative dislocation. 53 patients underwent one stage septic revision, 8 patients were revised two-staged. In all cases a resection of proximal femur by horizontal femoral osteotomy was performed. 23 patients had an infection with *S. epidermidis*. 26 patients had a mixed infection. In all cases antibiotic therapy was carried out by local antibiotics in PMMA bone cement and intravenously. The duration of the antibiotic therapy was at  $17 \pm 8.6$  days. 41 patients were followed up with a mean follow up time of  $13.5 \pm 10$  months. One patient had a recurrent infection and one patient died 5 days after surgery due to unknown reason, they were considered as failures. All together 39 of 41 patients (95.1%) could be successfully treated by the described method. Postoperative dislocation occurred in 7 cases, 3 patients underwent an open reduction. In ten cases other minor revisions were performed. A revision due to aseptic loosening was not performed, implant associated complications were not observed.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty Complications**

**Time: 10:30 - 12:00**

**Room: LAPA**

**Abstract no.: 38078**

**RISK OF MAJOR ADVERSE EVENTS AND MORTALITY FOLLOWING TOTAL JOINT ARTHROPLASTY IN PATIENTS WITH CORONARY STENTS VERSUS CORONARY ARTERY BYPASS GRAFT**

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**INTRODUCTION:** There is a paucity of literature about outcome of total joint arthroplasty (TJA) in patients with history of coronary revascularization including angioplasty/stent or coronary artery bypass graft (CABG). This study evaluates perioperative complications and mortality in these patients and investigates how perioperative arrhythmia may affect their in-hospital outcome. **METHODS:** We used the Nationwide Inpatient Sample data from 2002 to 2011. Using the Ninth revision of the International Classification of Disease (ICD-9-CM) codes, we identified patients with a history of coronary revascularization and compared in-hospital complications in these patients with controls (no history of coronary revascularization). **RESULTS:** Cardiac complications occurred in respectively 1.06%, 0.95% and 0.82% of cases with prior CABG, coronary angioplasty/stent and controls. Using multivariate analysis, history of coronary revascularization was not associated with a higher risk of cardiac complications. However, myocardial infarction (MI) occurred significantly higher in CABG (odds ratio (OR): 1.24,  $p=0.001$ ) and angioplasty/stenting (OR: 1.96,  $p<0.001$ ) groups compared to the controls. Prior coronary revascularization didn't increase the risk of non-cardiac complications and mortality. Cardiac complications occurred in 5.36%, 8.48% and 0.28% of patients with atrial fibrillation (AF), other arrhythmias and no arrhythmia. AF was an independent predictor of all complications. Other dysrhythmias were also independent predictors of mortality and all complications except for renal complications and surgical site infection. **CONCLUSION:** Prior coronary revascularization didn't increase risk of in-hospital mortality and complications (except for MI) after TJA. We also found perioperative cardiac arrhythmia, particularly AF, to be an independent predictor of in-hospital adverse events.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Impingement**

**Time: 12:30 - 14:00**

**Room: LAPA**

**Abstract no.: 36543**

**ELEVEN-YEAR RESULTS OF THE ANATOMIC HA-COATED CFP  
STEM IN PRIMARY TOTAL HIP ARTHROPLASTY**

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There is a paucity of intermediate term results relating to short stem prostheses. The current study represents the longest follow-up results of the CFP prosthesis to the authors' best knowledge. Between January 1999 and December 2000, all total hip arthroplasty patients (n = 149), treated with this anatomic neck preserving stem in the authors' institution were enrolled in this study. After a mean follow-up time period of 11.2 years 117 patients were available for the follow-up examination. The mean HHS increased in a statistically significant fashion from 53 to 93 (range 53-98). Overall, revision surgery was required in 11 patients (9.4 %). While in five cases (4.3 %) the exact indication for the implant revision remained unclear (these patients operated upon in other hospitals). In five cases (4.3%), implant-associated complications occurred. Consequently, the overall implant-associated survival rate was 95.7% in our consecutive series, excluding all patients that were lost to follow up. The survival rate for the femoral component was 98.3% and for the acetabular component 98.3%. The current study's data suggest that the CFP implant, used in young patients undergoing primary total hip arthroplasty, is safe and provides excellent results after 11 years.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Impingement**

**Time: 12:30 - 14:00**

**Room: LAPA**

**Abstract no.: 37533**

**CEMENTLESS TOTAL HIP ARTHROPLASTY: A BILAYER COATING TO ENSURE CUPS SURVIVAL RATE AS WELL THAN STEMS**

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Introduction: For uncemented THA addition of a hydroxyapatite layer is used in France for nearly 30 years. Survival rate of symmetrical straight stems with hydroxyapatite stabilized by corner effect is good (> 95% at 10 years), however survival rate of cups is usually less than 85%. To support osseous fixation a titanium under-layer under hydroxyapatite coating makes it possible to obtain a surface landscape that will serve as an “anchoring volume” for newly formed bone. Methods: An exploratory study with 150 consecutive THA from June 2001 to March 2005 was done. Radiological and clinical endpoints were evaluated at maximum follow up. Results: With an average follow-up of 65 months, no fixation failure was demonstrated from a clinical standpoint. Only 5 revisions were observed, due to infection (1), dislocation (2), neck fracture (1) and impingement (1). Improvement of average PMA score was very significant (from 9.5 to 17.8,  $p < 0.05$ ). For stems, the mean Engh score was 23.2. For cups, no migration and no loosening according to Engh criteria were observed. Radiological parameters collected in our study demonstrated an equivalent survivorship of stems comparing to literature and no difference between stems and cups. So in medium-term, a bilayer coating is clinically effective at providing reliable and reproducible cementless tertiary fixation that begins when hydroxyapatite is resorbed as well for acetabula cups and stems and could ensure stability even when mechanical locking is not predominating.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Impingement**

**Time: 12:30 - 14:00**

**Room: LAPA**

**Abstract no.: 37817**

**TOTAL HIP ARTHROPLASTY IN SICKLE CELL DISEASE PATIENTS  
IN A DEVELOPING COUNTRY - A 6 YEAR REVIEW**

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Osteoarthritis secondary to avascular necrosis of the femoral head is a common presentation in patients with Sickle cell disease. Functional limitations that result from this often require Total Hip Arthroplasty (THA) to improve outcome. Hip scores are used to assess functional outcome after THA, by comparing pre-operative and post-operative scores. This was a retrospective study, aimed at assessing the functional outcome after Total hip Arthroplasty in patients with sickle cell disease within a 6 year period (January 2008 and December 2013). Patients' biodata, symptomatology, surgical approach and details, functional status and complication were recorded. Pre-operative and Post-operative functional hip scores were assessed using the Harris Hip Score. Primary outcome measure was Harris Hip score measured at 6 and 12 weeks. A total of 29 total hip arthroplasty in 24 patients with sickle cell disease was reviewed. The age range was 18 - 42 years, with a male to female ratio of 0.6:1. Approach to the hip was 52% for direct lateral and 48% for posterior approach. Superficial surgical site infection was recorded in 8 patients, while 2 patients had posterior dislocation. Post-operative Harris Hip Score was excellent in 20%, and good in 60% of cases with a mean assessment at 12 weeks. The post-operative functional outcome, measured by the Harris Hip score, was satisfactory in 80% of cases.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Impingement**

**Time: 12:30 - 14:00**

**Room: LAPA**

**Abstract no.: 38048**

**GOOD STABILITY AND BONE REMODELLING FOR STEMS WITH ELECTROCHEMICAL DEPOSITION OF HYDROXYAPATITE UP TO 5 YEARS**

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Background: Hydroxyapatite (HA) coating of uncemented femoral stems has long been utilized as an adjunct to facilitate bone ingrowth. There are different methods to apply the HA layer, all creating coatings with different characteristics. HA coating applied by electrochemical deposition ("Bonemaster") has the advantage that additional bioactive substrates may be added. We have conducted a randomized controlled study comparing Taperloc stems with both conventional plasmasprayed HA coating and Bonemaster. 2 years results were published in 2011, which showed less bone resorption in Gruen zone 1 for Bonemaster. We present now the 5 year Radiostereometry (RSA) and Dual Energy X-ray Absorption (DEXA) results for these patients. Material and methods: 55 patients were randomized to Taperloc uncemented stem with either BM or HA proximal coating. All received SHP cemented PE cup and 28mm CoCr head. We followed the patients clinically, with RSA and DEXA. Results: Bone resorption was greatest in Gruen zone 7 for both groups. BM stems showed higher internal rotation and various rotation at 5 years ( $p>0.05$ ). After subtracting the initial movement at 3 months, there were no significant differences. Discussion: We could not detect any differences in the measured parameters at 5 years. The migration pattern showed stable implants, indicating that BM is a safe alternative to plasma sprayed HA. The additional advantage of the new coating is the possibility to add other bioactive substrates to the stem to prevent loosening or infection.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Impingement**

**Time: 12:30 - 14:00**

**Room: LAPA**

**Abstract no.: 38164**

**THRS FOR FRACTURE NECK OF FEMUR**

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We currently offer total hip replacements for intracapsular fractures of the hip according to NICE guidelines in the UK. We at our institution, looked through our fracture neck of femur database between 2011-2013 to identify the number of THRs performed for fracture neck of femurs and report their short term outcome including complications. 8% of all intracapsular fractures underwent THRs. There were 28 hybrid and 34 uncemented THRs performed by Consultants and senior trauma surgeons. The implants used were Exeter/Trident or Corail/Pinnacle hips. The majority of these operations were performed in a dedicated Trauma Theatre within 48hrs of admission. The mean age was 75 with a range from 45-85 years. Most of these patients were ASA 2 or ASA 3. All the patients were assessed by our dedicated Orthogeriatric Physician within 24 hrs. 85% of patients returned to their own home or sheltered housing and the rest were referred to a rehabilitation unit. The average length of stay was 8 days ranging from 3 to 12 days. There were no infections or dislocations but 4 patients had leg length discrepancies, 4 tendelenburgh gait and one HO with a stiff hip. There was one death due to unrelated cause at 1 year. There were no readmissions or revision surgery at 1 year follow-up. We conclude that Total hip replacement appears safe to perform by trained orthopaedic surgeons for fracture neck of femur in the short term. Cemented or uncemented THRs did not significantly influence the outcome of these patients.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Impingement**

**Time: 12:30 - 14:00**

**Room: LAPA**

**Abstract no.: 38051**

**CEMENTED OR CEMENTLESS HEMI-ARTHROPLASTY FOR FRACTURE NECK FEMUR IN ELDERLY PATIENTS WITH MULTIPLE CO-EXISTENT COMORBIDITY: RESULTS AND ANALYSIS IN A CASE-MATCHED SERIES**

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Background: An elderly patient of fracture neck femur with multiple co-existent medical morbidity needs early mobilization. Cemented and cementless hemi-arthroplasty have been offered traditionally. We report a head-to-head analysis of mortality, morbidity and results of both types of treatment in a case-matched series of 120 patients. Methods: 150 elderly patients with femoral neck fractures were operated from Jan 2006 to Dec 2012. Their mean age was 81 years, and all had multiple co-existent medical comorbidity. Sixty-one underwent cementless (group A), and 69, cemented (group B) bipolar hip arthroplasty. Both groups were compared over an average 48 month follow-up. Peri-operative mortality and morbidity were analyzed. Results: 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. There were 4 dislocations in group B (2 of which needed revision), without any other major intra- or post-operative surgical complications (infection, fracture, acetabular protrusion). Stem subsidence was seen in 4 cases in group A. No patient from group A needed revision for any cause. Discussion: Peri-operative mortality, and post-operative dislocation (with higher revision rates) was higher with cemented stems in our series, while minor surgical complications were more common with cementless stems. The appropriate method (cemented or cementless) depends on both patient co-morbidity and surgeon expertise.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Impingement**

**Time: 12:30 - 14:00**

**Room: LAPA**

**Abstract no.: 38428**

**USE OF THE SCANNER TO DEFINE A CORONAL PLAN FOR THE DESIGN OF A FEMORAL PIVOT**

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Introduction: Uncemented stems need a good mechanical primary fixation and a good biological secondary fixation. Primary fixation is better with a straight, quadrangular stem than with an anatomical stem. In order to reproduce the center of the hip, the femoral neck anteversion must be taken into account so we determined a coronal plan going through the femoral neck and the center of the head. The aim of the study is to calculate with a CT scan the anatomical metaphysis of the femur and design a new range of straight stems. Material and methods: 205 CT scanners with 3D reconstruction were done on hips without osteoarthritis (151 male, 54 female). Mean age was 68.5 years (35-93). A coronal plan was defined going through the center of the femoral head and axis of the medullar femur. 5 levels were selected at 12,5 mm, 50 mm, 70 mm, 90 mm and 120 mm from the center of the head, to calculate the volume, the mediolateral and anteroposterior lengths. Diameter of the head, femoral offset and flare index were also measured. Results: the mean femoral diameter was 47.7mm (38-56), the mean femoral offset was 44mm. The mean flare index was 4.68 (2.71-7.86). From all the data, 10 stems were designed. Some comparable data was similar to those in the literature. Conclusion: Our study is the first to use a coronal plan corrected with CT scan to evaluate the proximal anatomy of the femur and design a new range of implants respecting the femoral anteversion.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Impingement**

**Time: 12:30 - 14:00**

**Room: LAPA**

**Abstract no.: 38138**

**RADIOGRAPHIC FEMOROACETABULAR IMPINGEMENT IN AN ASYMPTOMATIC POPULATION: A PROSPECTIVE ANALYSIS**

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Introduction: Femoroacetabular impingement (FAI) describes the impingement of the femoral neck on the acetabular rim and has been implicated in the development of hip osteoarthritis. The underlying association is unknown. There is a paucity of data on its prevalence and subsequent long term follow-up of these individuals to assess for progression to symptomatic osteoarthritis. Objective radiographic assessment includes the  $\alpha$ -angle, which measures the asphericity of the femoral head. Patients and Methods: Patients undergoing CT scans of the pelvis for investigation of non-musculoskeletal pathology are prospectively recruited. Prior to scanning, participants complete a questionnaire to assess for symptoms of hip pathology. Images are subsequently assessed by three authors and this includes measurement of  $\alpha$ -angles. Results: By the time of presentation we will have analysed the images of over 500 individuals and therefore 1000 hips, assessing for morphological indicators of FAI including  $\alpha$ -angles. Discussion and Conclusion: Previous work<sup>1</sup> has reported a prevalence of 14.88% in men and 5.56% in women of radiographic evidence of FAI in an asymptomatic population although this was a retrospective analysis. Our cohort will be the largest group of prospectively recruited individuals regarding assessment for radiological evidence of FAI. This will give insight into the morphology of the hips of these asymptomatic individuals, as well as the distribution of variables including  $\alpha$ -angle. Our goal is to gain a better understanding of FAI and its role in the etiology of osteoarthritis. References: 1: Parvizi et.al The prevalence of cam-type femoroacetabular deformity in asymptomatic adults. JBJS Br 2011; 93-B:1303-7.

**Date: 2014-11-22**

**Session: Hip: Free Papers - Total Hip Arthroplasty & Impingement**

**Time: 12:30 - 14:00**

**Room: LAPA**

**Abstract no.: 37514**

**CHANGES IN THE BONE MINERAL DENSITY AROUND CEMENTLESS FEMORAL IMPLANTS FOLLOWING TOTAL HIP ARTHROPLASTY: COMPARATIVE ANALYSIS BASED ON 2 MODELS**

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**Objective:** To investigate the changes in bone density over time following total hip arthroplasty (THA) using 2 cementless stem models. **Subjects and Methods:** We examined 86 patients (99 joints) who underwent initial THA. The average age at surgery was 62 years. The most common underlying disease was hip osteoarthritis (76 joints). The CLS type AI HIP SYSTEM was used in 42 patients (45 joints; AI group) and the Zweymuller type Duetto SI stem was used in 44 patients (54 joints; SI group). Bone mineral density (BMD) was measured using dual-energy X-ray absorptiometry at 2 weeks; 5 months; and 1, 2, 3, and 4 years postoperatively. In each Gruen zone, the BMD ratio was measured relative to the BMD at 2 weeks postoperatively as the standard. Moreover, BMD ratio were statistically analyzed between 20 joints of the AI group and 33 joints of the SI group, wherein BMD was continuously measured for  $\geq 2$  years. **Result:** BMD ratio at zone 2, 3, 4, and 6 in the AI group were significantly higher than those of the SI group. Although no significant difference in BMD ratio was observed in zone 1 and 5, the BMD ratio in zone 7 were significantly higher in the AI group than in the SI group ( $P=0.042$ ). **Conclusion:** Stress shielding was milder in the AI group than in the SI group. The results indicated that the AI HIP SYSTEM has a better physiological load transfer mechanism.