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## Abstract Book

# JAM Sessions

#### Abstract no.: 47604 PROFESSIONAL SOCCER PLAYERS' RETURN TO PLAY AND PERFORMANCE AFTER ACHILLES TENDON RUPTURES

J. Turner VOSSELLER, David TROFA, Peter NOBACK, Christopher AHMAD, Justin GREISBERG

Columbia University Medical Center, New York (UNITED STATES)

Introduction: Most Achilles tendon ruptures are sports-related; however, no study has examined the impact of surgical repair for complete ruptures on professional soccer players. Our purpose was to examine the return-to-play (RTP), playtime, and performance of professional soccer players following Achilles tendon repair. Methods: Union of European Football Associations and Major League Soccer athletes who sustained a primary complete Achilles tendon rupture treated surgically between 1989 and 2014 were identified via public injury reports. Demographic information and performance-related statistics were recorded for the season before and two seasons after surgery. Results: Of 29 athletes screened, 23 met inclusion criteria. 19 (82.6%) athletes with an isolated Achilles rupture were able to RTP. Players who ruptured their Achilles tendon had played professionally for an average 8.3 years. Among athletes that successfully returned to play, game participation averaged 83.6% (p>0.05) and 76.1% (p=0.049) of the total games played the season prior to injury at 1 and 2 years post-operatively, respectively. Minutes played at 1 and 2 years post-injury was 77.1% (p>0.05) and 65.1% (p=0.024), respectively. There was no difference in games started or goals scored at 1 or 2 years post-injury compared to the index season. Conclusions: An Achilles rupture is a rare yet devastating injury among professional soccer players; however, 82.6% of professional soccer players in Europe and America are able to RTP after surgical treatment. Professional athletes that do RTP have statistically significant reduced playtime 2 years after surgical management.

#### Abstract no.: 48596 COMPLICATIONS FOLLOWING ARTHROSCOPIC SURGERY OF THE HIP: A SYSTEMATIC REVIEW OF 36,761 CASES

Naoki NAKANO<sup>1</sup>, Laughter LISENDA<sup>1</sup>, Thomas L JONES<sup>2</sup>, David LOVEDAY<sup>3</sup>, Vikas KHANDUJA<sup>1</sup>

<sup>1</sup>Department of Trauma and Orthopaedics, Addenbrooke's Hospital, Cambridge University Hospitals NHS Foundation Trust, Cambridge (UNITED KINGDOM), <sup>2</sup>School of Clinical Medicine, University of Cambridge, Cambridge (UNITED KINGDOM), <sup>3</sup>Department of Trauma & Orthopaedics, Norfolk and Norwich University Hospital, Norwich (UNITED KINGDOM)

Introduction: Arthroscopic surgery of the hip has grown immensely recently and has now become an established technique for the treatment of many pathologies in and around the hip. The technique requires specialised instrumentation as well as a skilled surgeon, has a steep learning curve, and is not without complications. The aim of this review was to assess the prevalence of complications following this procedure from all the past literature. Methods: In accordance with the PRISMA guidelines, two reviewers searched the online database (PubMed (Medline), EMBASE, and Google Scholar) for literature related to complications of hip arthroscopy. The research question and individual study eligibility criteria were established a priori. Studies reporting on complications of open or mini-open hip surgery and also combined arthroscopic surgery and cadaver studies were excluded. Results: 276 studies with a total of 36,761 hips experiencing 1,222 complications (3.32 % of the cases) met the inclusion criteria for this systematic review. The mean age of the patients was 36.7 years, and the mean BMI was 25.7 kg/m2. FAI and labral tears were the two most common diagnoses treated. Neuropraxia (pudental and the lateral femoral cutaneous nerve) and iatrogenic chondral and labral injury were the two most common complications recorded. Conclusions: The results suggest that arthroscopic surgery of the hip is a relatively safe procedure with a low risk of complications. Most of the complications are minor and can be avoided by careful attention to detail whilst positioning the patient and whilst establishing portals.

#### Abstract no.: 48225 ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: IS THERE A RELATION BETWEEN TOURNIQUET PRESSURES AND POST-OPERATIVE PAIN?

Mohammed ELRAKAYBI Saudi German hospital, jeddah (SAUDI ARABIA)

Introduction: Tourniquet is known to be implicated as a factor causing post-operative pain, the purpose of this study is to find if there is any relation of tourniquet pressures to the degree of post-operative pain and the doses of analgesia required to achieve pain relief. Patients and methods: A double blind study was conducted on a total of 100 patients that underwent arthroscopic ACL reconstruction solelyover a period time of 60 minutes. The patients was divided equally into groups A and B: tourniquet pressures were adjusted and documented by the assistant surgeon to 250 mmHg and 350 mmHg, respectively. Scheduled postoperative medications were given including acetaminophen and diclofenac for each group. Rescue narcotics were available as required. Pain scores on a visual analogue scale(VAS-10) and the timing and dosage of all analgesic medications as well as the narcotics in the form of meperidine were prospectively gathered as a part of custommade pain report in the hospital electronic medical record. Results: The average pain score for each group post-operatively significantly differed, 2.5 for group A and 4.2 for group B, p=0.00045. The dosing frequency of narcotics was statistically less for group A, 4.1 COMPARED TO 9.2, P=0.00034. Conclusion: Lower tourniquet pressures proved to lessen the degree of post-operative pain thus reducing the total analgesic and narcotic consumption. This significantly improved patient satisfaction and allowed for earlier involvement in the post-operative rehabilitation program.

Abstract no.: 48031 CLINICAL AND ELECTROPHYSIOLOGICAL ASSESSMENT OF INFRA-PATELLAR BRANCH(ES) OF SAPHENOUS NERVE INJURY DURING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION USING OBLIQUE INCISION FOR HAMSTRING GRAFT HARVEST: PROSPECTIVE STUDY Hira NAG, Mohamad ASJAD, A SRIVASTAVA, C S YADAV AIIMS, New Delhi (INDIA)

Introduction: Arthroscopic reconstruction of anterior cruciate ligament (ACL) using hamstring graft is a well-known procedure but not without complications. Common complication is injury to the infrapatellar branch of saphenous nerve (IPBSN) causing loss of sensation around knee, causing poor patient satisfaction. IPBSN injury post ACL reconstruction depends upon the incision for the hamstring graft, least due to obligue incision. Objectives: To assess clinically and electro-physiologically the IPBSN injury, after ACL reconstruction using oblique incision for hamstring graft harvest. Patients and methods: 50 patients that underwent arthroscopic ACL reconstruction using oblique incision for hamstring auto-graft. All were evaluated preoperatively and postoperatively at 3 and 12 weeks for determining IPBSN injury, area and degree of sensory loss. Patient satisfaction after surgery is compared to non injured IPBSN. Results: IPBSN injury found in 12/50 patients. Clinical and electrophysiological data correlate. Difference in length of skin incision between injured and non-injured IPBSN patients was found to be statistically significant (p=0.0043). No association was found between type of ACL reconstruction (Single vs Double) and IPBSN injury (p=1). No association between ACL only and ACL with associated procedure, with IPBSN injury (p=0.317). Difference in the satisfaction score between patients with injured and non-injured IPBSN was also found to be statistically significant (p=0.02). Conclusion: IPBSN injury is a common complication following ACL reconstruction. Oblique incision for graft harvest results less IPBSN injury. Incidence of IPBSN injury of this study is is discussed. Preoperative counseling for this complication is suggested for better patient satisfaction.

#### Abstract no.: 47709 INFECTION AFTER ACL RECONSTRUCTION SURGERY: INCIDENCE, RISK FACTORS AND ITS MANAGEMENT

Munish SOOD<sup>1</sup>, Ravi GUPTA<sup>2</sup>, Anubhav MALHOTRA<sup>2</sup>, Gladson DAVID<sup>2</sup>, Mukta RAGHAV<sup>2</sup>

<sup>1</sup>command hospital chandimandir 134107, Chandigarh (INDIA), <sup>2</sup>Government medical college and hospital, Chandigarh (INDIA)

Background: The incidence and risk factors of infection after anterior cruciate ligament reconstruction surgery (ACLRs) and the protocol to treat it has not been established. Aim: To study the incidence, clinical outcome, and risk factors of infection after ACLRs. Methods: The data of 1388 arthroscopic ACLRs performed at our centre was analyzed. The post hoc analysis of patients with symptoms of infection was performed. All these patients had been investigated with arthrocentesis, serum CRP and ESR. Various factors were also evaluated. At final follow-up, the patients were evaluated with visual analogue scale (VAS). Lysholm knee score evaluation and Tegner activity level. Results: 23 out of 1388 patients presented with symptom of infection. In nine patients, culture did not show any growth and started improving immediately after the arthrocentesis and oral antibiotics. These patients were labelled as aseptic effusion / low virulence infection. In remaining, 14 patients, there was no clinical improvement after arthrocentesis and oral antibiotics. Five patients improved with injectable antibiotics while nine patients underwent surgical debridement. The history of intra-articular steroid injection before ACLRs was a significant infection risk factor for developing the infection (p-value, 0.001). At a mean follow-up of 2.8 years, the mean VAS improved to 1.18±0.99 from 6.2±2.3. The mean Lysholm knee score and mean Tegner's level of activity at the final follow-up were 79.2+/-10.52 and 4.8 +/-2.30 respectively. Conclusion: The incidence of infection was 1.65%. The step-ladder approach of injectable antibiotics, surgical debridement and debridement of graft in refractory patients yielded satisfactory results.

#### Abstract no.: 47394 METHODICAL ERROR IN ACL-RECONSTRUCTION DUE TO A POSSIBLE ROTATION OF THE GRAFT AROUND THE SCREW

Christoph OFFERHAUS<sup>1</sup>, Jürgen HÖHER<sup>2</sup>, Maurice BALKE<sup>2</sup>, Steffen HECK<sup>3</sup> <sup>1</sup>HELIOS-Spital Überlingen / SPORTSCLINIC COLOGNE, Überlingen (GERMANY), <sup>2</sup>SPORTSCLINIC COLOGNE, Köln (GERMANY), <sup>3</sup>HELIOS-Spital Überlingen, Überlingen (GERMANY)

Introduction: Interference screws are the most widely used devices for graft fixation in ACL-Reconstruction. While the absolute position of the tunnel has been defined anatomically, the ultimate graft position within the tunnel after fixation has not been well addressed in the literature. Using interference screws, graft rotation around the screw can occur during femoral fixation, which changes the final position of the graft within the tunnel. Methods: In a prospective study, 107 patients (54 right and 53 left knees) underwent ACLreconstruction with a hamstring tendon autograft. Bone-tunnels were drilled trough an anteromedial portal in 125° knee flexion. Femoral fixation of the graft was performed with a standard right-thread-screw in all cases. Postoperative laxity was compared between right and left knees. Results: The findings of this study revealed that there was a significantly higher postoperative ap-Laxity in the group of left knees with a grade 0 Lachman test (A) in just 64% of the cases compared with 87% in the group of right knees. These findings were approved by instrumented testing with an 1,8mm side-to-side-difference in left knees compared with 1mm in right knees. Conclusion: The only use of standard right-thread interference screws for femoral fixation in the mirror-inverted situation of right and left knees may produce a methodical error in ACL-reconstruction. Due to a possible rotation of the graft around the screw, the final position of the transplant may vary, whereby anterior translatation of the operated knee is significantly affected

#### Abstract no.: 46827 MICROFRACTURE, MOSAICPLASTY AND AUTOLOGOUS CHONDROCYTE IMPLANTATION IN ARTICULAR CARTILAGE LESIONS OF KNEE: A SYSTEMATIC REVIEW OF LEVEL I & II STUDIES Alok AGGARWAL Ganesh Ortho Trauma & Medical Centre, Delhi, INDIA, Delhi (INDIA)

PURPOSE: The treatment of articular cartilage lesions of knee remains challenging, with no consensus among standard procedures viz. microfracture (MF), mosaicplasty (OAT) and autologous chondrocyte implantation (ACI) for various lesions. This is high time to review, assess and report on the current status of Level I and II (mid-term to long-term) studies on these techniques. METHODS: A systematic literature search was conducted in November 2016 for Level I and II studies using PubMed database. All the studies comparing atleast two of these three standard procedures in isolated cartilage lesions from January 2011 to October 2016 were selected. RESULTS: Five (three long term and two mid-term) studies viz. three randomized controlled trials and two prospective comparative studies (all from different centres) with minimum follow-up of 5 years (range: 5-10.4 years) evaluating these treatment techniques in 364 knees were selected. One study each compared OAT (mosaicplasty) with MF, OAT (mosaicplasty) with MF in athletes, ACI with MF, ACI with OAT, and one study compared all three procedures. All studies documented improvement in clinical outcome when compared with preoperative status. At 10 years, almost comparable results were reported in all studies, however no study included control group. In larger lesions, ACI was significantly better than MF, and OAT resulted in higher rate of return to sports and maintenance in athletes compared to MF. CONCLUSIONS: MF is a comparatively easy and affordable procedure, making it a reasonable first line treatment. OAT-mosaicplasty in athletes and ACI in larger lesions are preferred over other two techniques.

#### Abstract no.: 46345 NEW INSIDE-INSIDE TECHNIQUE FOR ARTHROSCOPIC MENISCAL REPAIR

Alper ALPER KEBUDI Private Tekden Hospital Istanbul, Istanbul (TURKEY)

Arthroscopic inside-inside meniscal repairs do need some special equipment and stability questioned about these. A new inside-inside technique developed does not need any special equipment other than standard arthroscopic equipment.

#### Abstract no.: 48530 MISS-TLIF ASSISTED BY QUANDRANT OR PIPELINE TUBE SYSTEM FOR THE MANAGEMENT OF LUMBAR SPONDYLOLISTHESIS Jiancheng ZENG

West China Hospital of Sichuan University, Chengdu (CHINA)

PURPOSE: To evaluate the clinical effects of Minimally invasive transforaminal lumbar interbody fusion(MISS-TLIF) assisted by Quandrant or Pipeline tube system for the management of lumbar spondylolisthesisMRTHODS: From October 2008 to February 2011, 21 patients suffering from lumbar spondylolisthesis were treated by minimally invasive transforaminal lumbar interbody fusion(MISS-TLIF) assisted by Quandrant or Pipeline tube system and percutaneous or mini-open pedicle screw fixation. The surgery effects were evaluated according to Oswestry disability index(ODI) and Visual analogue scale(VAS). The results of Interbody fusion were evaluated by postoperative X-ray and three-Dimensional CT.RESULTS: The average VAS scores of all the patients were 7.5, which reduced to 2.6 three months after the surgery and to 1.5 six months after the significant differences operation. which had preoperatively and postoperatively(p<0.01). The average ODI scores of all the patients were 63.7, which reduced to 21.3 three months after the surgery and to 13.6 six months after the operation, which also had significant differences preoperatively and postoperatively(p<0.01). There were no permanent nerve root impairment and infection.CONCLUSIONS: Minimally Invasive Spine Surgery-Transforaminal Lumbar Interbody Fusion(MISS-TLIF) assisted by Quandrant or Pipeline tube system is a safe , effective and minimally- invasive way for the management of lumbar spondylolisthesis, which has the advantages of less injury, less blood loss, faster rehabilitation. The key point of successful surgery is choosing your patients properly.

#### Abstract no.: 48390 CO-RELATION OF CLINICAL VS MRI VS OPERATIVE FINDINGS IN PROLAPSED INTERVERTEBRAL LUMBAR DISC - A PROSPECTIVE STUDY OF 30 CASES

Tarun KUKREJA, Ashutosh SINGH Dr DY Patil Medical College, Pune (INDIA)

Purpose: To study cases of suspected lumbar intervertebral disc prolapse. To evaluate the accuracy of clinical diagnosis and MRI by confirming it with intra-operative findings. Methods: Thirty patients with low-backache with or without radiculopathy, neurodeficit, claudication pain between the ages of 21-70 years were evaluated. Males and females both were equal in number 15(50%). Results: Out of 30 cases, 13 patients had positive neurological findings, on MRI total 41 discs were seen but during surgery only 40 discs were detected. Majority of cases were seen in 31-50 years of age. Predominant leg pain was 36.6%, backache was 6.67%, both was in 26.67%. 13(43.3%) cases had neurodeficit in which sensory loss in 2(15.4%), motor loss in 5(38.5%) and both were seen in 6(46.1%) cases. Reflexes were reduced in 4(13.3%) cases, knee jerk in 1, ankle jerk in 1 and both in 2 cases. Out of 40 discs seen on MRI 29(70.7%) were of protrusion type, 8(19.5%) were of extrusion and and 4(9.8%) were sequestration types. Conclusion: In our study, clinical examination concluded 48.4% accuracy and MRI was 97.5% sensitive as comparison to intraoperative findings, which is most significant and appropriate. There appears to be a strong correlation between the MRI and intraoperative finding. MRI had a distinct advantage in diagnosis of PIVD, But clinical examination is of paramount importance. The diagnosis of lesion should be confirmed only after correlating findings of investigation. MRI should be the primary investigation in diagnosing lumbar disc prolapse on account of its better positive predictive value.

#### Abstract no.: 47406 FENESTRATED PEDICLE SCREWS AND CEMENT AUGMENTATION IN PATIENTS WITH BONE SOFTENING

Mahmoud ABOUSAYED Cairo university hospitals (Kasr-alainy), Cairo (EGYPT)

Background: This prospective study was designed to evaluate the middle-to long-term purchase of cement-augmented fenestrated pedicular screws in patients with poor bone quality due to osteoporosis, infection and/or tumours. The growing number of surgical procedures performed in the spine has highlighted the problem of screws loosening in these patients. Patients and methods: From May 2015 to January 2016, 25 patients with a poor bone stock condition underwent posterior stabilisation by fenestrated pedicle screws and PMMA augmentation. Pain improvement and long-term clinical outcome were assessed by visual analogue scale (VAS) score and Oswestry low back disability questionnaire (Oswestry disability index ODI). Implant stability was evaluated by plain radiography. Complications were evaluated in all cases. Results: All patients were clinically and radiographically followed up for a mean of 12.84 months. VAS scores and ODI questionnaire showed a statistically significant reduction in pain and improvement in the quality of life. No radiological loosening or pulling out of screws were observed. Cement leakage occurred in five cases. Conclusion: Fenestrated screws and cement augmentation provided effective and lasting purchase in patients with poor bone quality. The only clinical complication strictly related to PMMA screw augmentation did not require further surgery. Keywords: Fenestrated pedicle screw, Polymethylmethacrylate, Osteoporotic bone.

#### Abstract no.: 46951 DO WE HAVE CLEAR CRITERIA REGARDING SPINAL INSTABILITY IN DEGENERATIVE STENOSIS OF THE LUMBAR SPINE?

Stipe CORLUKA<sup>1</sup>, Vide BILIC<sup>2</sup>, Stjepan DOKUZOVIC<sup>3</sup> <sup>1</sup>KBC Sestre milosrdnice, Kerestinec (CROATIA), <sup>2</sup>KBC Sestre milosrdnice, Zagreb (CROATIA), <sup>3</sup>KB Dubrava, Zagreb (CROATIA)

Spinal instability has been a topic of debate over the past several decades. Newer research has improved our understanding of spinal instability in cases of spinal trauma and spinal tumours. However, the idea of spinal instability in degenerative disc disease and degenerative lumbar spinal stenosis still remains incompletely defined. The purpose of this report is to raise awareness to the critical lack of evidence regarding a clear definition of spinal instability in degenerative diseases of the lumbar spine. We conducted a review of prospective randomized clinical trials of the past fifteen years and concluded that there remain serious methodological inconsistencies and a lack of objective criteria in the definition of spinal instability in degenerative stenosis of the lumbar spine.

#### Abstract no.: 46605 DOES INCREASING AGE DETER OUTCOMES OF SPINAL INTERBODY FUSION IN ELDERLY? COMPARATIVE CLINICO-RADIOLOGICAL RESULTS OF SINGLE LEVEL TLIF IN YOUNG VS. ELDERLY AT 2 YEARS FOLLOW-UP.

Ankit PATEL, Vishal KUNDNANI Bombay Hospital & Medical Research Centre, Mumbai (INDIA)

Study Design: Restrospective Aim: To evaluate outcome of TLIF in elderly (>65) & compare them with control population (<65) & study the effects of age on complications and final outcomes. Methods: 142 pateints with TLIF for stenosis with degenerative Spondylolisthesis at L4-5/L5-S1 level with >24 month follow up were included and subdivided into study group and control group. Clinico-radiologic Parameters, comorbidities, evaluated preop and post operatively (VAS/ODI/ASA). Intraop parameters, Postop complications, Infection evaluated and final outcome assessed using Wang's and Bohlmans criteria. Results: 21 patients in study group whereas 5 in control group were ASA Gr ≥3. Statistical difference in Blood loss, avg surgical time & LOS noted among two groups & study group took a little longer (3.4 weeks) to obtain pain free status than control (2.6 weeks). Both groups showed significant improvement in ODI and VAS values with group B showing slightly better outcome but with no statistical significance (p>0.05). General postoperative issues not affecting final outcome were common in study group. 84% pts in study group and 87% in control group showed excellent to good outcomes. Conclusion: Our study found that neither advanced age nor the use of supplemental instrumentation increased the rate of peri-operative complications in elderly patients undergoing TLIF for lumbar spinal stenosis associated with instability. Medical comorbidities may need long term pre-operative optimization for optimal intra-operative and post-operative results. Increasing age should not be used as a criterion to avoid decompression and fusion (TLIF). Keywords: Elderly, Fusion, TLIF, Stenosis, outcomes

#### Abstract no.: 46531 HADS BRIEF SCORE CAN PREVENT UNNECESSARY SPINAL PROCEDURES

Andreas VEIHELMANN<sup>1</sup>, Florian BECK<sup>2</sup>, Christof BIRKENMAIER<sup>3</sup> <sup>1</sup>RULAND-KLINIKEN, Ludwigs-Maximilians-University of Munich, Bad Herrenalb (GERMANY), <sup>2</sup>Sportclinic Stuttgart, Stuttgart (GERMANY), <sup>3</sup>Ludwig.Maximilians-University of Munich, Campus Grosshadern, Munich (GERMANY)

Introduction: it is well established that many patients with CLBP have accompanying anxiety disorders or depression (ADD). This study was performed to evaluate whether the Hospital Anxiety and Depression Scale (HADS) brief test, which takes only 4-5 minutes to fill in and 30 seconds to assess, is able to detect within a minimum of time patients with the above concurrent diagnoses. Methods: 88 patients with CLBP and sciatica were enrolled in this study, 3 were lost to follow-up. All completed HADS prior to examination. Indications for minimally-invasive spine-interventions (MIS) were made by experienced surgeon blinded to the result of the HADS. Before, 3 and 6 months after intervention VAS and ODI were recorded. Different MIS-Procedures were performed. Results: At 6 months in the subgroup with a high-risk of ADD, VAS and ODI improved 0.9 ±0.68 and 7±4.3, whereas in the low-risk subgroup VAS + ODI were significantly reduced 2.5 ±0.7 res. 13.5±3.3. There was a significant difference in the improvement of VAS (p < 0.003) and ODI (p < 0.05) between high- and low-risk HADS groups. Discussion: In a selected group of CLBP patients, the easy-to-administer HADS appears to reliably predict the outcome of MIS, probably due to the detection of somatoform comorbidities. Most alarming is the probable fact that in our study 30 patients were invasively treated without effect. This has impact because of unnecessary surgery being performed and because of increasingly limited healthcare funds.

#### Abstract no.: 48316

#### POSTERIOR ONLY APPROACH FOR LUMBAR PYOGENIC SPONDYLITIS WITH SHORT INSTRUMENTATION AND PROLONGED SUCTION DRAINAGE

Suk-Hyun HONG<sup>1</sup>, Choi SEUNG MYUNG<sup>2</sup>, Yong-Min KIM<sup>1</sup>, Kook-Jong KIM<sup>1</sup> <sup>1</sup>Department of Orthopaedic Surgery, College of Medicine, Chungbuk National University, Cheongju (SOUTH KOREA), <sup>2</sup>Department of Orthopaedic Surgery, College of Medicine, Chungbuk National University, Cheongju (SOUTH KOREA)

Several methods of posterior surgical treatment for pyogenic spondylitis have been reported, there have been few reports regarding the efficacy of posterior only approach with short instrumentation including even inflamed segment. To assess the efficacy of posterior only approach with short instrumentation and prolonged suction drainage in managing lumbar pyogenic spondylitis. Thirty-three patients with lumbar pyogenic spondylitis who underwent posterior decompression and lumbar interbody fusion with short instrumentation including the inflamed segment and cathter drainage were enrolled. Clinically infection control (ESR and CRP normalization time) and onset of ambulation were reviewed. Also achievement of fusion and changes of sagittal alignment were investigated radiologically. In all the 33 cases, infection was controlled successfully without any recurrence. There was no breakage of implant. Postoperative interval to normalization of ESR was average 69.4 days and CRP was 25.4 days respectively. Ambulation was started at average 5.8 postoperative days. Successful interbody fusion was confirmed radiologically in all the cases at a mean of 5.4 months. Sagittal angle of fixed segment was average 6.9 degrees of lordosis before operation, which became more lordotic to 11.5 degrees just after operation, but decreased to 4.7 degrees of lordosis at the final follow-up. Actually final sagittal alignment was almost same as preoperative status (P=0.24). By achieving favorable clinical and radiological results, short instrumentation and prolonged suction drainage with posterior only approach seemed to be an effective method in managing lumbar pyogenic spondylitis.

#### Abstract no.: 47006 DIFFUSION TENSOR IMAGING OBSERVATIONS IN POTT'S SPINE

Anil JAIN<sup>1</sup>, Nikhil JAIN<sup>2</sup>, Ns SAINI<sup>3</sup>

<sup>1</sup>University College of Medical sciences, Delhi, ghaziabad (INDIA), <sup>2</sup>University College Med Sci Gtb Hosp, delhi (INDIA), <sup>3</sup>formerly INMAS, delhi (INDIA)

Introduction: Diffusion Tensor Imaging (DTI) observations correlate with neural deficit and prognosticate neural recovery in cervical trauma/spondylotic myelopathy. DTI observations are not described for TB spine with/without paraplegia. we correlated DTI parameters with clinical course in TB spine with/ without paraplegia. Methods: 49 patients of spinal TB, 15 without, 34 with paraplegia were enrolled. DTI was performed before and 6 months after treatment. Fractional anisotropy (FA), Mean diffusivity (MD) and tractography were studied. Changes in FA and MD at and below the site of lesion (SOL) were compared to above SOL (unpaired t-test). Pre-treatment and post-treatment values were compared (paired t-test). Pearson correlation was used to correlate DTI parameters with neurological score while tractography images subjectively. Results: Mean FA above SOL was significantly different (p value 0.04) than at and below for both groups but at versus below the SOL was significant(0.01) with paraplegia. Mean FA, MD above SOL was taken as control. FA was not significantly decreased at the SOL in patients with paraplegia . Significant decrease (p=0.02) in FA at the SOL compared to pre-treatment was seen at 6 mos post-treatment. Moderate positive correlation (r =0.49) between FA and neural score after 6 months of treatment was found. Tractography images were inconsistent with severity of paraplegia and neural recovery. Conclusion: The epidural collection and organized inflammatory tissue precludes accurate assessment of diffusion characteristics of cord in TB spine. FA and MD could not differentiate between various grades of paraplegia. Tractography was not found useful in paraplegics.

Abstract no.: 46454 IS THERE ANY RELATION BETWEEN SURGICAL SITE INFECTION FOLLOWING ELECTIVE SPINAL SURGERY AND POOR ORAL HEALTH? Babak MIRZASHAHI<sup>1</sup>, Arghavan TONKABONI<sup>2</sup>, Roya DOOSTI<sup>3</sup> <sup>1</sup>joint reconstruction research center, TUMS, tehran (IRAN), <sup>2</sup>TUMS, Tehran (IRAN), <sup>3</sup>tums, tehran (IRAN)

Introduction and Objectives: Surgical site infection (SSI) is the most common hospitalacquired infection occurring postoperatively. Despite antibiotic prophylaxis, improved surgical techniques and postoperative care, post-surgical site infections still occur. The aim of this study is to investigate any relayionship between SSI after elective spinal surgery and poor oral hygin. Methods: This case-control cross-sectional study was conducted on patients over 18 years of age who were candidates for elective spinal surgery. Questionnaires were filled out for patients via an interview.Demographic information of patients was also collected. Oral and dental examinations were performed using DMFT (D: decayed, M: missing, F: filled, T: total and PUFA (P: pulp, U: ulcer, F: fistula, A: abscess )indices. The data were analyzed using Fisher's exact test for periodontal disease and history of oral infection, and Mann Whitney test for caries, oral hygiene, DMFT and PUFA. Results: A total of 78 patients who were candidates for elective spinal surgery were evaluated; out of which, 70 were negative and eight were positive for SSI. There were 59 females (75.6%) and 19 males (24.6%). Caries (P=0.016) and periodontal disease (P=0.049) were significantly correlated with SSI. No significant association was noted between PUFA and SSI (P>0.05). Of all, 65 (83.3%) had a history of previous infection. Of patients positive for SSI, half of them had a history of dental abscess (P=0.023). Conclusion: A significant association exists between SSI following elective spine surgery and caries, gingivitis/periodontitis and history of dental abscess.

#### Abstract no.: 48082 THE IMPACT OF TYPE OF SCREW ON KYPHOTIC DEFORMITY CORRECTION AFTER SPINE FRACTURE FIXATION- CANNULATED VERSUS SOLID PEDICLE SCREW

Abduljabbar ALHAMMOUD, Mahmood ARBASH, Ashik PARAMBATHKANDI, Abdul Moen BACO Hamad Medical Corporation, Doha (QATAR)

Introduction Spine fractures resulting from many causes particularly falls and RTA.Many advocates are in the favor that pedicle fixation is comparatively a safer procedure when compared to the risk factor at a non-pedicle counterpart. Open surgery has limitations like blood loss, elongated post-operative pain and disability. Minimal incision techniques were, therefore, a 'looked-for' advancement. Pedicle screw can be Polyaxial cannulated or Monoaxial solid. Our aim is to find out if the screw design differences will affect the correction of the deformity after fixation of spine fractures Methods Retrospective study of all pedicle screw fixation for spine fracture in Hamad General Hospital, Qatar. The use of cannulated screws (CS) and solid screws (SCS) during the two surgical modes (OPEN) and (MISS) are considered for the study. Results 172 cases with TL fracture underwent to pedicle screw fixation (Open vs MIS)either with CS or SCS. 142 male and 28 female, average age 36.1, 100 open and 72 MIS, 76 solid and 96 cannulated. The average pre/intra/post operative kyphotic angle is respectively 18.9, 7.4 and 8.1 degrees and an average 13.08 degree angle reduction is quantified with solid screws and 8.96 degrees with cannulated screws. Average height reduction in the pre-operative and post-operative stages shows a wide difference which indicates a successful height gain after surgery, and it is supported statistically while performing ANOVA (p < 0.05) in solid group comparing to cannulated one procedure performed Conclusion Solid screws are found to be more superior in increased correction of kyphotic angle and the height of the fractured vertebra.

#### Abstract no.: 47066 DECOMPRESSION ONLY OR DECOMPRESSION WITH CONCOMITANT FUSION IN DEGENERATIVE SPONDYLOLISTHESIS: A SHORT- AND LONG-TERM OUTCOME

Dike RUAN, Qing HE, Lisheng HOU Department of Orthopaedic Surgery, Navy General Hospital, China, Beijing (CHINA)

Introduction: This study is to investigate the necessity and efficacy of stabilization or fixation after posterior decompression for lumbar degenerative spondylolisthesis. Method: Subjects were patients indicated for decompression for lumbar canal stenosis at the L4/5 due to lumbar degenerative spondylolisthesis. After providing informed consent, patients were divided into two groups: decompression only (D group); and decompression with concomitant fusion (DF group). A comparative study JOA score, ODI, VAS, SF36 results, and X-ray, CT scan and MRI findings was performed. Result: Fifty-six consecutive patients, 28 in D group and 28 in DF group, were followed. All patients were available in 2 years follow-up and only 47 patients were available at final follow-up. Clinical outcome of excellent and good was 89.8% in D group and 90.2% in DF group at 2 years follow-up respectively(P>0.05), and the data was 76.5% and 84.2% at 6.8 years follow-up respectively(P<0.05). There was no significant difference between pre- and post-operative radiographic evidence of spondylolisthesis degree, disc height and sagittal motion. Discussion: At the two year follow- up no significant differences were observed between the D and DF patients in terms of pain and function. For present study, patients with predominant leg pain showed significantly more improvement in terms of leg pain with both of D and DF group at short- and long-time follow-up. The present results showed that decompressive laminotomy alone is an effective surgical method in the management of lumbar degenerative spondylolisthesis with spinal canal stenosis.

#### Abstract no.: 46902 RADIATION REDUCTION OF MINIMALLY INVASIVE TRANSFORAMINAL LUMBAR INTERBODY FUSION WITH LOCALIZATION SYSTEM IN OVERWEIGHT PATIENTS

Guoxin FAN<sup>1</sup>, Qingsong FU<sup>2</sup>, Jingjie ZHANG<sup>3</sup>, Shisheng HE<sup>4</sup> <sup>1</sup>Shanghai Tenth People's Hospital, Tongji University School of Medicine, Shanghai (CHINA), <sup>2</sup>Ningbo No.2 Hospital, Ningbo (CHINA), <sup>3</sup>The 175 Hospital of PLA, Southeast Hospital Affiliated to Xiamen University, Xiamen (CHINA), <sup>4</sup>Shanghai Tenth People's Hospital, Tongji University School of Medicine, shanghai (CHINA)

Introductions: Minimally invasive transforaminal lumbar interbody fusion (MITLIF) has been well validated in overweight or even obese patients, which has been indicated to be correlated with higher radiation exposure. This prospective multicenter study aimed to investigate the efficacy of a novel lumbar localization system for MITLIF in overweight patients. Methods: Included patients received localization system in Group A, while others underwent conventional methods in Group B. The primary outcomes were the effective radiation dosage to the surgeon and the exposure time. The novel localization system mainly consists of preoperative locator and screw-assisted device. Results:A total of 62 overweight patients were in Group A, and another 64 patients were in Group B. The effective dosage was 0.0217±0.0079mSv in Group A and 0.0383±0.0104mSv in Group B (p<0.001). The fluoroscopy exposure time was 26.42±5.91s in Group A and 40.67±8.18s in Group B (P<0.001). The operation time was 175.56±32.23min and 206.08±30.15min (P<0.001). The preoperative localization time was 4.73±0.84min in Group A and 7.03±1.51min in Group B (P<0.001). The screw placement time was 47.37±10.43min in Group A and 67.86±14.15min in Group B (P<0.001). Moreover, the pedicle screw violation rate was 0.35% (1/283) in Group A and 2.79% (8/287) in Group B (p=0.020). Conclusions: The study indicated that the localization system could effectively reduce radiation exposure, exposure time, operation time, preoperative localization time, and screw placement time in overweight patients undergoing MIS-TLIF, which could be another practical option for minimizing potential radiation hazards.

#### Abstract no.: 48525 TREATMENT OF LUMBAR SPINAL STENOSIS BY PERCUTANEOUS ENDOSCOPIC INTERLAMINAR DECOMPRESSION

Jiancheng ZENG West China Hospital of Sichuan University, Chengdu (CHINA)

radiation exposure time, fast recovery after surgery and clear view

Objectives To assess the clinic results of percutaneous endoscopic interlaminar decompression for lumbar spinal stenosis. Methods From January 2014 to August 2014, 126 patients with lumbar spinal stenosis accepted percutaneous endoscope interlaminar decompression. The mean age was 65.8 years old (range: 46-83 years ). There were 82 males and 44 females, including 73 stenosis in L4-5 and 53 stenosis in L5-S1. Preoperatively and at the follow-up, Visual Analogue Score (VAS), Oswestry Disability Index (ODI) and modified MacNab were applied to evaluate clinical outcomes. Results All the patients had a average follow up of 14.5 months (range: 12-20 months). Average operation time is 61.4±12.6min, and average intraoperation time is 0.5±0.3s. 126 patients with intermittent claudication, lumbocrural pain, decreased feeling and muscle strength all have different degrees of improvement. In preoperation and postoperative 1 day, 1 month, 3 months, 6months, and 12months, waist pain VAS score respectively are 6.00±1.46, 3.81±0.75, 1.88±1.15, 0.81±1.05, 0.63±0.62, 0.25±0.45, and leg pain VAS score respectively are 7.88±0.81, 2.88±1.45, 2.13±1.02, 1.38±0.62, 0.88±0.62, 0.81±0.54, and ODI score , not involving postoperative 1 day, respectively are 47.63±9.91, 38.4±10.46, 26.75±6.88, 13.81±5.95, 9.19±6.04. Difference of lumbocrural pain scores and ODI scores in preoperative and postoperative multi-period was statistically significant (P<0.01). With evaluation to clinical effect in 12 months after surgery by modified MacNab. the fineness rate was 90.5%. Conclusions Percutaneous endoscopic interlaminar decompression have advantages in little trauma and bleeding, short intraoperative

#### Abstract no.: 47791

A COMPARISON OF PERCUTANEOUS VERTEBROPLASTY AT HYPEREXTENSION POSITION AND PERCUTANEOUS KYPHOPLASTY FOR TREATMENT OF OSTEOPOROTIC KüMMELL'S DISEASE Yong FAN<sup>1</sup>, Jianan ZHANG<sup>2</sup>, Qining WU<sup>3</sup>, Jinpeng DU<sup>3</sup>, Dingjun HAO<sup>3</sup> <sup>1</sup>Department of Spine Surgery, Hong Hui Hospital, Xi'an Jiaotong University College of Medicine, xi'an (CHINA), <sup>2</sup>Department of orthopaedics, Xi'an NO.3 Hospital, The third Fengcheng road, Xi'an (CHINA), <sup>3</sup>Department of Spine Surgery, Hong Hui Hospital, Xi'an Jiaotong University College of Medicine, Xi'an (CHINA)

Objective: To compare and evaluate the safety and efficacy of percutaneous vertebroplasty(PVP) at hyperextension position and percutaneous kyphoplasty(PKP) for treatment of osteoporotic Kümmell's disease. Methods: A retrospective analysis 35 patients with osteoporotic Kümmell's disease from January 2013 to January 2015, 22 underwent PVP at hyperextension position and 13 underwent PKP. Intraoperative blood loss, bone cement injected and operation cost were compared. Compared the VAS score and vertebral Cobb angle at the preoperation, 2 days after operation, and the final follow-up. Compared the ODI score of preoperation and the final follow-up. Results: No significant difference in gender, age, course of disease, bone mineral density (BMD), mean follow-up time and blood loss between the two groups (P >0.05). In the costs of operation, PKP group was significantly higher than PVP at hyperextension position group (P < 0.05). Two groups of postoperative ODI score, VAS score and Cobb angle were significantly improved compared with preoperation (P < 0.05), Eventhough the correction of Cobb angle in PKP group was slightly better than PVP at hyperextension position group, there were no significant differences between two groups (P >0.05). At the final fellow up, the Cobb angle was increased in both groups, but there was no significant difference (P >0.05). There was no significant difference of bone cement leakage rate between the two groups (P> 0.05). Conclusion: For the treatment of Kümmell's disease, PVP at hyperextension position and PKP are both safe and effective, but PVP at hyperextension position is more economical, can be used as a preferred way of operation.

#### Abstract no.: 47083 LONG-TERM FOLLOW-UP RESULTS OF PERCUTANEOUS ENDOSCOPIC LUMBAR DISCECTOMY Sang Soo EUN ., . (SOUTH KOREA)

Open lumbar microdiscectomy (OLM) has been considered the gold standards in the management of lumbar disc herniation (LDH) for their favorable outcomes in long-term follow-up. Nowadays, percutaneous endoscopic lumbar discectomy (PELD) is gaining recognition. However, greatest limitation is the lack of long-term follow-up outcomes. Authors investigate the long-term outcomes of PELD in terms of clinical, radiographic findings and revision surgery rate. Sixty two patients who underwent PELD 10 years previously were contacted for follow-up. Clinical parameters such as the visual analog scales for the back and legs (VAS-B and VAS-L, respectively) the Oswestry disability index (ODI), and radiographic findings such as the disc-height ratio and change in the difference between flexion and extension were recorded and compared to the preoperative values. For 62 followed patients, 38 met our inclusion criteria (35 transforaminal, 3 interlaminar). Excluded were, 6 patients(9.4%) who underwent revision open lumbar microdiscectomy at same level and 17 patients(26.6%) who underwent lumbar spine surgery at other levels. The average follow-up period was 11.22 (±0.83) years. For the remaining 38 patients who had no further surgery, the postoperative VAS-Back (2.53 ± 1.98), VAS-Leg (1.82  $\pm$  1.92), and ODI (12.69  $\pm$  11.26) were significantly different from the pre-operative values (8.45  $\pm$ 1.52, 7.40  $\pm$  3.04, and 55.33  $\pm$  24.63, respectively; all p = 0.01). The average disc-height ratio was 81.54% of the original disc height. There was no evidence of instability after long-term postoperative follow-up. PELD has favorable longterm outcomes.

#### Abstract no.: 48194 POSTERIOR LONG SEGMENT PEDICLE SCREW FIXATION FOR UNSTABLE THORACOLUMBAR FRACTURES WITH INCOMPLETE SPINAL CORD INJURY Syed Shahidul ISLAM NATIONAL INSTITUTE OF TRAUMATOLOGY AND ORTHOPAEDIC

REHABILITATION, Dhaka (BANGLADESH)

Introduction: Thoracolumbar junction is the mechanical transition zone which predispose to failure. Surgical treatment is needed for unstable fractures. Aim is to obtain the most stable fixation by fixating as few vertebrae as possible. Review of the literature showed that SSPF alone led to implant failure and re-kyphosis in the long-term with moderate-tosevere pain. Study design: Prospective study. Objective: To evaluate the outcome after long segment pedicle instrumentation in unstable fractures of the thoracolumbar spine with incomplete neurological deficits. Material & Methods: 120 patients of unstable thoracolumbar fractures with incomplete neurological deficits who underwent long segment pedicle screws & rod fixation and fusion from January 2010 to June 2016 at National Institute of Traumatology and Orthopaedic Rehabilitation (NITOR) Dhaka, Bangladesh. Mean age was 33.3 years (range 14-55 years). Leading cause of fracture was fall from height. According to the ASIA impairment scale 15 patients had B, 75 patients had C, 27 patients had D and 3 patients had E scale. The mean follow-up was 15 months. Result: The result was evaluated with modified Denis. Excellent is 29.17% good in 45.83% fair in 18.33% & poor in 6.67%. Neurological recovery of one or more ASIA Impairment Scale was seen in all patients. Implant failure in 2 patients & no other significant complications except some degree of correction loss. Conclusion: LSPF for unstable thoracolumbar fracture with incomplete neurological deficit achieves adequate fixation and gives satisfactory results.

#### Abstract no.: 46624 THE PATHOLOGICAL MECHANISMS UNDERLYING LUMBAR DISTRACTION SPINAL CORD INJURY BASED ON WU'S NOVEL MODEL Ji WU, Chao ZHENG General hospital of air force, Beijing (CHINA)

BACKGROUND CONTEXT: A reliable experimental model of distraction spinal cord injury (SCI) was established to successfully simulate gradable and replicable distraction SCI. However, further research is needed to elucidate the pathological mechanisms underlying distraction SCI. PURPOSE: The aim of this study was to investigate the pathological mechanisms underlying lumbar distraction SCI in rabbits. STUDY DESIGN: An animal laboratory study. METHODS: Using a self-designed spine distractor, the experimental animals were divided into a control group and 10%, 20%, and 30% distraction groups. Pathological changes to the spinal cord vessels in the early stage of distraction SCI were identified by perfusion of the spinal cord vascular with ink, production of transparent specimens, observation by light microscopy, and observation of corrosion casts of the spinal cord microvasculature by scanning electron microscopy. Malondialdehyde (MDA) and superoxide dismutase (SOD) concentrations in the injured spinal cord tissue were measured after 8 h. RESULTS: With an increasing degree and duration of distraction, the spinal cord microvessels were only partially filled and spasms until rupture and hemorrhage were observed. The MDA concentration increased and SOD concentration decreased in the spinal cord tissue. CONCLUSIONS: Changes to the internal and external spinal cord vessels led to spinal cord ischemia, which is a primary pathological mechanism of distraction SCI. Lipid peroxidation mediated by free radicals took part in secondary pathological damage of distraction SCI.

#### Abstract no.: 46153 EFFICACY OF VIRTUAL REALITY IN UPPER LIMB REHABILITATION IN PERSONS WITH SPINAL CORD INJURY – A PILOT RANDOMIZED CONTROLLED TRIAL

Suryakant SINGH<sup>1</sup>, Somya PRASAD<sup>2</sup>, Ruby AIKAT<sup>3</sup> <sup>1</sup> Indian Spinal Injuries Centre, New Delhi (INDIA), <sup>2</sup>Indian Spinal Injuries Centre, new delhi (INDIA), <sup>3</sup>Indian Spinal Injuries Centre, New Delhi (INDIA)

Introduction: The use of virtual reality has gained importance in the rehabilitation sector over the last few years. The Nintendo Wii® has the potential to encourage upper limb function while participating in an interesting and engaging activity, which is important in long-term interventions, such as spinal cord injury. Hence, the purpose of this study was to compare the efficacy of virtual reality intervention (using Nintendo WiiTM) along with conventional Occupational Therapy with Conventional Occupational Therapy alone in improving upper limb function in Spinal Cord Injury. Methods: 22 subjects with spinal cord injury participated in the study. They were randomly assigned to two groups. Group-I received 30 minutes virtual reality intervention (using Nintendo Wii®) and 30 minutes of conventional therapy whereas, Group-II received conventional therapy only for 30 minutes, 3 days a week for four weeks. All subjects were assessed at baseline, 2 weeks, 4 weeks and at 6 weeks follow-up. Data analysis was done using the Independent sample T-test. Results: After four weeks of intervention period, there was no significant difference revealed between the groups in improving hand function. The mean scores were higher for Group-I in comparison to Group-II with a higher percent change (31.5% in CUE and 51.7% in BBT) in Group-I at p≤0.05. Conclusion: This study concluded that virtual reality along with conventional therapy produces similar results in upper limb function as conventional therapy alone.

#### Abstract no.: 48531 ACUTE SPINE TRAUMA ABOVE THE AGE OF 90 YEARS – ANALYSIS OF MORTALITY AND MORBIDITY

Anna Carolina RIENMUELLER<sup>1</sup>, Ehab SHIBAN<sup>2</sup>, Paulina ROTHLAUF<sup>3</sup>, Jens LEHMBERG<sup>3</sup>, Bernhard MEYER<sup>3</sup>

<sup>1</sup>Department of Neurosurgery/Klinikum rechts der Isar/TUM and Department of Orthopaedic Surgery/Medical University Vienna, Vienna (AUSTRIA), <sup>2</sup>Department of Neurosurgery/Klinikum rechts der Isar/TUMosurgery, Munich (GERMANY), <sup>3</sup>Department of Neurosurgery/Klinikum rechts der Isar/TUM, Munich (GERMANY)

Introduction: As the population is constantly getting older but hale, hospital admission after trauma for patients above the age of 90 will be constantly increasing. Methods: We performed a retrospective analysis of all patient above the age of 90 years, hospitalised with acute spine trauma at a tertiary neurosurgery department between 2014 and 2016. Morbidity and Mortality in hospital, at 30 and 90 days as well as Kaplan- Meier-Survival-Analysis was documented, between treatment strategies and gender were tested using the log rank test. Level of significance was set to p<0.05. Results: 48 patients (36 women, 12 men), with a mean age of 92 (range 90-101), suffering from high energy trauma, were analysed. We found 39 cervical fractures, 3 thoracic and 5 acute lumbar spine compression fractures. In the cervical spine 5 fractures of C1, 27 fractures of C2 and 7 fractures of the lower cervical spine were found. 65% of patients were treated surgically. Age-adjusted Charlson index was 92,8. In hospital mortality was 8%. At 30-days after trauma 28% of patients had died independent from treatment strategy. At 90-days, mortality was 34.5%. No significant difference was found between treatment strategies and gender (p = 0.69). Discussion: Mortality, in hospital and at 30-days post trauma, for patients suffering from spine trauma above the age of 90-years is high, although patients are age-appropriate healthy before admission. Survival is independent from treatment strategy and gender. New strategies for prediction of mortality and morbidity as well as treatment must be defined.

#### Abstract no.: 47767 SURGICAL OPTIONS FOR THE TREATMENT OF KUMMELL'S DISEASE Xingkai ZHANG, Yu LIANG, Wenjian WU, Peng CAO Shanghai Jiaotong University School of Medicine Ruijin Hospital, Shanghai (CHINA)

Objective: Kümmell's disease is a clinical syndrome with progressive severe thoracolumbar pain. Delayed cement displacement was reported for Kümmell's disease treated with cement augmentation alone. Internal fixation combined with cement injection was recommended, however, there is no standard single effective treatment for this particular condition. This paper propose selection criteria for two surgical methods (kyphoplasty alone versus short segmental fixation combined with vertebroplasty), and evaluate the clinical efficacy of 2 procedures. Methods: Between January 2010 and January 2014, we retrospectively reviewed 29 patients experiencing Kümmell disease without neurological deficits. 14 patients with posterior ligament complex(PLC) injury or kvphotic angle>20 degree underwent short segmental fixation combined with vertebroplasty, 15 patients without PLC injury and kyphotic angle<20 degree underwent kyphoplasty alone. Improvement of visual analog scale(VAS) and ODI scores at final follow-up were compared between two groups. Patients were followed up for 25 months on average. Results: For the KP group, the final improvement of VAS score were 81±9%, final improvement of ODI score were 79± 8%. For fixation + VP group, the improvement of VAS score were 82±10%, improvement of ODI score were 81±8%. Improvement of VAS and ODI scores had no significant difference between two groups (P>0.05). Conclusion: This study showed that integrity of PLC and kyphotic angle were paramount in surgical

This study showed that integrity of PLC and kyphotic angle were paramount in surgical selections for Kümmell's disease. If indications are properly chosen, both balloon kyphoplasty alone and short segmental fixation combined with vertebroplasty were safe and effective.

#### Abstract no.: 48122 CORE NEEDLE BIOPSY IN MUSCULOSKELETAL TUMOURS. DIAGNOSTIC BREVETY AND ACCURACY IN A NATIONAL REFERENCE CENTRE

Pedro CARDOSO<sup>1</sup>, João ESTEVES<sup>2</sup>, João ROSA<sup>2</sup>, André COELHO<sup>2</sup> <sup>1</sup>Orthopaedics Departement - Centro Hospitalar do Porto, porto (PORTUGAL), <sup>2</sup>Orthopaedics Departement - Centro Hospitalar do Porto, PORTO (PORTUGAL)

An accurate biopsy is essential in the work-up of bone and soft tissue tumours, as well as its morbidity and the time necessary to initiate treatment. Authors present a retrospective analysis of image-guided percutaneous biopsy in a National Reference Centre. 406 coreneedle biopsies were analysed. Bone lesions were guided by computerized tomography (252) or fluoroscopy (82) and soft tissue lesions by ultrasonography 72). All procedures were executed by the same team. The time between the first consultation and the biopsy result was determined. There were no complications. The avarage time to get the histological result was 41 days for all lesions. In sarcomas the time was 22 days (6-36) and in 50% only 12 days. Diagnostic yield was 94,40% for bone lesions and 94,44% for soft tissue (p=0,9896). Diagnostic accuracy was 98,95% for bone and 97,05% for soft tissue (p=0,0908). Concerning malignancy, sensibility was 100%, specificity 98,33%, positive predictive value 98,54% and negative predictive value 100%. The capacity of establishing a correct diagnosis was 98,95%, excluding malignancy 95,73% and the possibility of initiating treatment was 93,33%. The time should be improved as showed by the possibility of getting biopsy results in 12 days in half of the cases. Diagnostic yield and accuracy in soft tisseue were not inferior to those in bone lesions which is remarkable as we get much more imaging information about bone tumours. The high sensibility and specificity assure that this procedure is reliable and enables the initiation of treatment.

#### Abstract no.: 48034 INFLUENCE OF COLD ATMOSPHERIC PLASMA (CAP) ON CYTOKINE EXPRESSION IN HUMAN OSTEOSARCOMA CELLS

Denis GUEMBEL<sup>1</sup>, Lasse WIEN<sup>2</sup>, Nadine GELBRICH<sup>3</sup>, Matthias NAPP<sup>4</sup>, Martin BURCHARDT<sup>5</sup>, Axel EKKERNKAMP<sup>6</sup>, Matthias STOPE<sup>5</sup> <sup>1</sup>University Medicine Greifswald, Germany, Greifswald (GERMANY), <sup>2</sup>Dept. of Trauma and Reconstructive Surgery, University Medicine Greifswald, Germany, Greifswald (GERMANY), <sup>3</sup>Dept of Trauma and Reconstructive Surgery, University Medicine Greifswald, Greifswald (GERMANY), <sup>4</sup>Dept. of Trauma and Reconstructive Surgery, University Medicine Greifswald, Greifswald (GERMANY), <sup>5</sup>Dept. of Urology, University Medicine Greifswald, Greifswald (GERMANY), <sup>6</sup>Dept.of Trauma and Reconstructive Surgery, University Medicine Greifswald, Greifswald (GERMANY)

Introduction: Human osteosarcoma (OS) is the most common primary malignant bone tumor in adolescents and young adults. Current therapy consists of a multimodal approach including radical surgical resection, neo-adjuvant chemotherapy and radiation. CAP consisting of an ionized inert carrier gas (argon) has been shown to exert antiproliferative effects on OS cells in vitro. The aim of this study was to analyse CAP effects on the immediate tumor environment, cell-cell interactions and systemic processes through cytokines. Methods: Cells of two OS cell lines (U2-OS, MNNG) were treated with CAP for 10 s (U2-OS) and 20 s (MNNG) and incubated at SCC (37°C, 5% CO2). Argon treated cells served as control. Expression levels of 84 cytokines were analyzed and quantified by means of PCR. Changes in expression levels of -50% or +100% were considered significant. Results: Of 84 cytokines, 10 in U2-OS (C5, CCL5, CNTF, CXCL1, IL-18, IL-1A, IL-1B, IL-22, NODAL, THPO) and 8 in MNNG (CSF1, CSF3, CXCL1, IL-22, IL-23A, MSTN, TGFB2, VEGFA) were influenced by CAP. Expression of a total of 15 cytokines was upregulated, whereas only VEGFA (expressed in MNNG) was reduced. Overexpression of IL-22 and CXCL1 was seen in both cell lines. Conclusion: The cytokines regulated by CAP influence proliferation, immune modulation and chemotaxis in target cells. In addition, cytokines can interfere with tumor angiogenesis and metastasis development. Our results confirm a modulating effect of CAP on cell-cell interactions and tumor microenvironment. Thus, CAP represents a promising treatment option especially for chemoresistant cancer entities.

#### Abstract no.: 47250 THE IMPACT OF SARCOPENIA ON TREATMENT FOR MALIGNANT BONE AND SOFT TISSUE TUMOR IN

Yoshitaka BAN<sup>1</sup>, Manabu HOSHI<sup>2</sup>, Naoto OEBISU<sup>2</sup>, Yasuyuki SYOJI<sup>3</sup>, Hiroaki NAKAMURA<sup>2</sup> <sup>1</sup>Saiseikai Senri Hospital, osaka (JAPAN), <sup>2</sup>Dept. of Orthopaedic Surgery, Osaka City University Graduate School of Medicine, Osaka (JAPAN), <sup>3</sup>Saiseikai Senri Hospital, Suita (JAPAN)

[Introduction] We have a higher proportion of the elderly in Japan so-called 'super aging society'. Sarcopenia was defined as the age-associated loss of skeltal muscle mass and function and was reported to be associated with poor prognosis in some types of cancers. This study aimed to determine the impact of sarcopenia on treatment for malignant bone and soft tissue tumor of elderly patients. [Methods] A retrospective, single-center review of 38 patients aged 65 or older who were treated for malignant bone and soft tissue tumor between 2008 and 2016 was conducted. Sarcopenia was assessed by manually measuring the cross-sectional area of the both of psoas muscles on a single slice from preoperative CT scan at the level of the third lumber vertebra. We categorized sarcopenia less as psoas muscle index(PMI)<5.7 cm<sup>2</sup>/m<sup>2</sup>. We compared operation time, length of hospital stay, overall survival(OS), drainage interval, disease-free survival(DFS)

and perioperative complications between sarcopenia and non-sarcopenia group. [Results

**]** Sarcopenia was present in 20 patients(52%). There were no significant differences between sarcopenia and non-sarcopenia group in operation time(161 min VS 131 min), drainage interval(3.5 days VS 1 day), length of hospital stay(29 days VS 22 days), OS(45 months VS 27months) .In contrast, there were significant differences in DFS(20 months

VS 27 months, p=0.02) and perioperative complications(p=0.03). [Conclusion] Sarcopenia affects DFS and perioperative complications. In super aged society like Japan, sarcopenia is possible poor prognostic marker on treatment for malignant bone and soft tissue tumor.

#### Abstract no.: 46276 RECONSTRUCTION OF THE ANKLE AFTER WIDE RESECTION OF DISTAL FIBULA TUMORS: CASE SERIES AND REVIEW OF THE LITERATURE Mohammed ALRUMAIH

Al-Imam Muhammad Ibn Saud University, Riyadh (SAUDI ARABIA)

Introduction: Involvement of the distal part of the fibula by benign aggressive and malignant tumors remains to be a challenge for the treating surgeon. Due to rarity of the condition reconstruction techniques vary, with variable results. Malignancies of the distal third of the fibula carry a better prognosis than proximal lesions. Case Presentation: We report 2 cases, all of them having Ewing's sarcoma in the distal fibula. We investigated them systemically and locally by doing X-ray, CT Scan, MRI and Bone scan. We did for them wide resection of tumor. The ruminant of tendons of the peroneus longus, peroneus brevis, and flexor halluces longus were cut and they were used to reconstruct for the lateral aspect of the right and left ankle using suture anchors. K-wires were used to do temporary arthrodesis. Outcome: The last MRI was done. It showed there is altered signal intensity of the soft tissue with post-contrast enhancement. However, there is no evidence of soft tissue mass lesion. According to the last follow up after six months post-operative, it showed no valgus deviation, normal ankle motion, mobilizing full weight bearing with splint assistant during physical examination. Conclusion: Overall, the rarity of the condition makes it difficult to choose which technique to be advantageous over the other. A step wise approach would limit and narrow your options and a decision based on several factors should be addressed such as type and nature of the tumor, site ,age of patient and involvement of growth plate.

#### Abstract no.: 46206 ACCELERATED PONSETI METHOD: A MORE CONVENIENT TECHNIQUE FOR PATIENTS IN THE DEVELOPING WORLD AND MISSIONARY ORTHOPEDISTS Alaa Azmi AHMAD

Annajah medical school, -Ramallah (PALESTINE)

Purpose: This study aims to investigate the short-term outcomes of a proposed accelerated Ponseti method by which, manipulations, 5 castings and Achilles tendon tenotomy are implemented in a week. Methods: This study included 10 patients with 14 severe congenital idiopathic clubfeet treated by 5 an accelerated Ponseti method. The method involves manipulation of the deformed foot, and 1st casting in one day, with the 2nd, 3rd, 4th, 5th castings in the 4th, 5th, 6th, 7th day post- manipulation. After the 4th cast removal, Achilles tenotomy was performed with subsequent three-week casting for all patients. Nonparametric tests were used for comparing the Pirani scores before starting the treatment and after removal of final cast. Differences were considered significant at Pvalue <0.05. Results: Four patients had bilateral club foot deformity. Average age at treatment was 54.8 days (range 8-150 days). All patients, who had severe congenital idiopathic club feet with a Pirani score of 6, underwent the accelerated Ponseti technique. After removal of the three-week cast, the scores median was 0.5, (range 0-1.5), indicating a correction of the deformity in all patients (p value=0.001) without experiencing any shortterm complication. Conclusions: The accelerated Ponseti method was found safe and effective in the short-term for treating severe clubfoot deformity. The significant shortening of treatment timeframe will allow missionary orthopedists to finish the needed castings in shorter duration, and lessen the burden on 19 the patients in countries with limited resources

#### Abstract no.: 48159 TSF FOR TIBIAL FRACTURES IN CHILDREN AND ADOLESCENTS -MAJOR TRAUMA CENTRE EXPERIENCE

Rajkumar THANGARAJ<sup>1</sup>, Dave HAUGHTON<sup>2</sup>, Mounir HAKIMI<sup>2</sup>, Emmanouil MORAKIS<sup>2</sup>, Ibrar MAJID<sup>2</sup>, Farhan ALI<sup>2</sup> <sup>1</sup>Royal Manchester Children hospital, CMFT NHS trust, Birmingham (UNITED

KINGDOM), <sup>2</sup>Royal Manchester Children hospital, CMFT NHS trust, Manchester (UNITED KINGDOM)

Unstable tibial fractures in children and adolescent patients provide a challenge in treating unstable tibial fracture. TSF is a viable option when other modalities of management are limited. Retrospective case series to assess the outcome of management of unstable tibial fractures in paediatric patients with TSF was performed. 38 TSF had been applied for 37 patients (M:F=22:13, mean age 11.8 years, range 6 - 15 years) for unstable tibial fractures between 2012 and 2016. 17 were closed tibial fractures and 21 were open tibial fractures. Statistically significant difference existed between the open and closed tibia fractures in the union time, number of procedures, pin site infection rate. Combined average period of healing was 20.4 weeks +/- 3.1 at 95%CI [median value 18.1, range 9.0 - 56.4, SD 9.7] with closed tibial fractures healing at a mean of 16.1 weeks +/- 2.3 at 95%CI [median value 15.6, range 9.0 - 26.7, SD 4.8] and open tibia fractures healing at mean of 23.6 weeks +/- 4.6 at 95%CI [median value 21.4, range 10.4 - 56.4, SD 10.8]. 12 patients (31.5%) [3 closed and 7 open tibial fractures] had pin site infection requiring intravenous antibiotics, pin change or debridement. 5 patients had mild LLD, 2 had mild residual deformity, 1 had re-fracture treated in cast while 1 patient required re-application of TSF for non-union. We feel that TSF can be considered as a safe option for primary management of unstable tibial fractures in children and adolescents.

#### Abstract no.: 46182 RESULTS OF APPLICATION OF GUIDED GROWTH FOR LLD TREATMENT

Sergei SERDJUCHENKO, Alexander BELETSKI, Aleh SAKALOUSKI, Andrei DZEMIANTSOU

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

Leg length discrepancy (LLD) is the great physical defect which, as a rule, has progressing character and conduct to secondary deformations of a spine and a pelvis. Materials and methods. Concerning LLD 115 patients have been operated. We used staples, plate for guided growth, locking plate for guided growth and high durability plate. Results. The results are estimated at all patients. Mean decrease of LLD was 1,1 sm per year when operated femur, 0,5 sm per year when operated tibia and 1,6 sm per year when femur and tibia were operated. We had not any infections complication. No premature physis closure took place. In 3 patients with staples and in 1 with plates we observed failure. In cases, where we operated tibia, varus deformity was observed in 10 patients. Conclusion. LLD Treatment with stapling is very effective and simple method. It has many advantages such as: immediate weight bearing after operation, pain lessening, good cosmetic result and short period staying at the clinic. When staples are used migration and sometimes failure still remain a problem in some cases. Plate is simpler in usage. It has not tendencies to migration and has more safety factor. The nearest results have shown that the plate has no disadvantages in comparison with staples and in most cases usage of plate has better result.
# Abstract no.: 48049 MANAGEMENT OF TRAUMATIC POSTERIOR HIP DISLOCATION IN CHILDREN- OUR RESULTS IN 5 CASES.

Kingsley Dotcher DOKU University of Cape Coast School of Medical Sciences, - (GHANA)

Background: Traumatic posterior hip dislocation in children is rare, occurs with minor trauma and has high risk of avascular necrosis (AVN) of the femoral head if reduction is not done within 4-6 hours. Neglected traumatic dislocations are those presenting after three days. Objective: To find out if our method is effective and beneficial to the children. Patients & Methods: Case 1: An eleven year old boy with traumatic posterior left hip dislocation, ten days after minor trauma while playing. Closed reduction attempted under general anaesthesia (GA) but unsuccessful. Heavy skeletal traction was applied for four days then successful closed reduction under GA. Case 2: A seven year old boy, minor trauma playing football, presented twelve days later. Case 3: A fourteen year old boy, jumped off a four foot wall, landed awkwardly, presented a week later. Case 4: Twelve year old boy, twisted the leg playing football, presented two weeks post injury. Case 5: 13 year old boy, jumped a small gutter, presented two weeks later. Radiographs confirmed posterior dislocation of the hip with no fractures in all the cases. The last four reduced with skeletal traction and reduced. Results: All dislocations reduced, closed with minimal further trauma or iatrogenic complications. Conclusion: No AVN to date but long term follow up needed. Correspondence to Dr Kingsley Doku MSc (Orth.), FRCSI, MBBS: Email: kdoku3460@yahoo.com, k.doku@uccsms.edu.gh Senior Lecturer, UCCSMS, Consultant Trauma & Orthopaedic Surgeon, CCTH

### Abstract no.: 48459 MORPHOMETRIC EVALUATION OF OCCIPITAL CONDYLE: DEFINING OPTIMAL TRAJECTORIES AND SAFE SCREW LENGTHS FOR OCCIPITAL CONDYLE-BASED OCCIPITOCERVICAL FIXATION IN INDIAN POPULATION.

Aju BOSCO<sup>1</sup>, Ajoy SHETTY<sup>2</sup>, Prakash VENUGOPAL<sup>3</sup>, Rajasekaran SHANMUGANATHAN<sup>4</sup>, Rishi KANNA<sup>4</sup>

<sup>1</sup>Department of Spine Surgery, Ganga Hospital, Coimbatore, India, Tiruchirappalli, Tamilnadu (INDIA), <sup>2</sup>Department of Spine Surgery, Ganga Hospital,Coimbatore, India, Coimbatore (INDIA), <sup>3</sup>Department of Radiology,Ganga Hospital, Coimbatore (INDIA), <sup>4</sup>Department of Spine Surgery, Ganga Hospital, Coimbatore, India, Coimbatore (INDIA)

Introduction: Limitations of occipital squama-based occipitocervical fixation (OCF) led to the development of two novel techniques of occipital condyle(OC) based OCF. We have analyzed the feasibility, safety, limitations and defined the metrics of OC-based OCF in Indian population. Methods: Computed tomographic (CT) morphometric analysis was performed on OC of 70 Indian adults. Feasibility of placing a 3.5mm-diameter screw into the OC was investigated. The safe permissible trajectories without hypoglossal canal or atlantooccipital joint compromise were examined. Safe screw lengths and trajectories for placement of OC screws and C0-C1 transarticular screws were measured. Results: The average screw length, safe sagittal and medial angulations for OC screws were 19.85+/-2.26mm, upto 6.44+/-2.37 degrees cranially, 31.12+/-2.96 degrees medially, respectively. Twenty-seven percent of population could not accommodate an OC screw.Safe sagittal angles and screw lengths for C0-C1 transarticular screw insertion(48.9+/-5.66 degrees cranial,26.68+/-2.91mm for junctional entry technique;36.7+/-4.57 degrees cranial,31.6+/-2.66mm for C1 arch entry technique), showed significant differences in comparison with other populations. Discussion: Ours is the first study to examine the feasibility of OC-based OCF in Indians and to define safe trajectories and screw lengths for the same. The metrics of OC-based OCF showed significant differences as compared to other populations. Due to smaller dimensions of occipital squama in Indians, these techniques may have a higher application rate. However, they are technically demanding and have a learning curve. Hence, preoperative CT including 3D-CT-angiography evaluation is imperative to avoid complications resulting from aberrant bony and vascular anatomy.Conclusions:Occipital condyle could be a viable alternative option for OCF. The data presented, would serve as a valuable reference-quide in placing these screws safely under fluoroscopy.

Abstract no.: 46410 DOES RADIATION EXPOSURE VARY DEPENDING ON THE EXPERIENCE OF THE SURGEON DURING INTRAMEDULLARY NAILING OF THE FEMUR AND TIBIA ? – A PROSPECTIVE RANDOMIZED STUDY Bhaskara Kanakeshwar RAJA, Sudipto PATRA, Rajasekaran SHANMUGANATHAN Ganga Hospital, Coimbatore (INDIA)

Introduction: The aim of this study was to determine whether there was a variation in total radiation exposure to the entire theatre team caused by fluoroscopy during intramedullary fracture fixation of shaft of long bones with respect to surgeon's skill and experience. Methods: Operating surgeons were divided into 3 different groups based on their years of experience ; Group 1-Zero to three years of orthopaedic training; Group 2-three to five years of orthopaedic training: Group 3-More than five years of orthopaedic training. 248 long bone fractures - 139 tibia shaft fractures and 109 femur shaft fractures- were included in this study. Total fluoroscopy time and radiation exposure were calculated on surgeon, assistant surgeon and scrub nurse using personal dosimeter around the neck over the lead apron. Results: Mean time of fluoroscopy in minutes per operation was 2.9,2.3,1.9 for femur and 1.6,1.4,1.3 for tibia in groups 1,2 and 3 respectively. Mean accumulated dose of radiation exposure in micro Sieverts to surgeon, assistant surgeon and scrub nurse taken together was 73.5,51.7,41.4 for femur and 9.1,8.5,8.2 for tibia in groups 1, 2 and 3 respectively. After analysis of variance, differences between categories were found to be statistically significant for total time of fluoroscopy and mean accumulated dose in femoral fractures with no statistical significance in tibia fractures. Conclusion: Use of radiation is more consistent and standardized with an experienced surgeon especially for the intramedullary nailing of femur fractures where radiation exposure was inversely proportional to the experience of the surgeon.

Abstract no.: 47481 SHORT-TERM CLINICAL AND RADIOLOGICAL OUTCOMES FOLLOWING ANATOMICAL TOTAL SHOULDER ARTHROPLASTY USING SELF-REINFORCING, SHORT-STEMMED PROSTHESIS AND LESSER TUBEROSITY OSTEOTOMY Ali BAKKAI Entabeni Hospital, Durban (SOUTH AFRICA)

Background: Anatomical total shoulder arthroplasty (TSA) has become a common procedure to treat osteoarthritis of glenohumeral joint with an intact rotator cuff. The aim of our study is to assess the short-term clinical and radiological outcomes, as well as the effect of repairing the subscapularis to the stem following lesser tuberosity osteotomy (LTO). Materials and methods: This is a retrospective review of the clinical outcome of the patients who underwent total shoulder arthroplasty (TSA) using lesser tuberosity osteotomy (LTO). Surgical outcome was assessed using the range of motion, visual analog scale (VAS) score, and American Shoulder and Elbow Surgeons (ASES) score. Clinical examination, ultrasonography, and x-rays were used to assess the subscapularis function healing of lesser tuberosity osteotomy, its effect on the stability of the stem. Results: Twenty-three patients were included in this study with an average follow-up of 11 months. The mean age of the patients were 66(49-82), with 14 patients being a male (61%) and 9 are female (39%). The indication for surgery was osteoarthritis in 21 patients (91%) and post-traumatic avascular necrosis in 2 patients (9%). The complications included calcar split, radial nerve, musculocutaneous nerve palsy, and stiffness. At the last follow-up, the 23 patients showed clinically and radiological signs of lesser tuberosity healing, with no effect on the stability of the stem. Conclusion: Total shoulder replacement using lesser tuberosity osteotomy is a safe procedure, heals in a predictable manner, with no effect on the stability of the prosthesis. Keywords: shoulder replacement, subscapularis, osteotomy, osteoarthritis

# Abstract no.: 46632 VALIDATION OF NOVEL OSTEOTOMY DEVICE FOR HUMERUS IN SHOULDER ARTHROPLASTY

Pratul JAIN

Ginni Devi Orthopaedic Hospital, Jaipur (INDIA)

Introduction: In shoulder arthroplasty, original head geometry restoration is of utmost importance for recovering and improving the function. In this study, we aim to validate a novel osteotomy device that has been designed on posterior referencing. Materials and Methods: A Microscribe 3D-X digitizer was used to collect data and Rhinoceros NURBS modelling software were used for reconstruction of data. Inclination angle, retroversion angle, head height and radius of curvature of the articular surface of the head were analyzed both pre-operatively and post-operatively with prosthetic head. Results: A mean decrease of 0.01 degrees in the inclination angle (138.5 ± 11.9 degrees) when compared to the inclination of the original head (138.5±8.9 degrees) which is statistically significant (p>0.05). Further, the osteotomy increased the retroversion of the prosthetic head by 3.5 degrees from 24.6 ± 11.3 degrees to 28.1 ± 12.8 degrees. This difference was statistically not significant (p>0.05). The prosthetic head measured a mean  $18.8 \pm 1.3$  millimetres compared to a mean of  $18.7 \pm 2.1$  millimetres, a mean difference of 0.06 millimetres which was not statistically significant (p>.05). The difference between radii of curvature of the original head (24.8 ± 2.5 millimetres) and prosthetic head (24.8 ± 1.7 millimetres) was found to be statistically insignificant (p>0.05). Discussion: Novel osteotomy restores an accurate humeral head geometry as evidenced by the results which shows no significant difference (p>0.05) between original head and prosthetic head geometry. Conclusion: The novel osteotomy using posterior referencing technique was able to restore the normal head geometry.

#### Abstract no.: 47734 THE CONCEPT AND VALUE OF BICEPS RELOCATION IN DIAGNOSIS OF SHOULDER INSTABILITY

Joanna WALECKA<sup>1</sup>, Przemyslaw LUBIATOWSKI<sup>1</sup>, Jan DLUGOSZ<sup>2</sup>, Jakub STEFANIAK<sup>1</sup>, Leszek ROMANOWSKI<sup>3</sup>

<sup>1</sup>Rehasport Clinic; Department of Traumatology, Orthopaedics and Hand Surgery, University of Medical Sciences in Poznan, Poznan (POLAND), <sup>2</sup>Rehasport Clinic, Poznan (POLAND), <sup>3</sup>Department of Traumatology, Orthopaedics and Hand Surgery, University of Medical Sciences in Poznan, Pozna (POLAND)

Clinical and biomechanical testing help in objective evaluation and decision making of the return to sport or heavy labor following shoulder surgery. Recovery may run differently in various instability cases (anterior vs posterior) and procedures (labral repair vs Latarjet procedure). Aim of the study was to evaluate the recovery of range of motion (ROM) and isokinetic parameters following surgical treatment for shoulder instability. Study was based on 67 patients operated in 2014-2017 for shoulder instability. Anterior instability was addressed by labral repair in 38 and by Latarjet procedure in 11 patients. Posterior instability was addressed by labral repair in 18 patients. ROM was evaluated preoperatively, at 8,14 and 24 weeks postoperatively and isokinetic testing at 14 and 24 weeks. Full range of flexion and abduction was achieved at 14 weeks following operation. External rotation (ER) was regained at 24 weeks, however it was significantly lower in Latarjet group. Isokinetic parameters improved over time, however some deficits in ER measures remained (8-12% at lowest, 33-55% at highest velocities). Posterior instability group had significantly better results comparing to others, especially Latarjet. Lowest values were recorded for Latarjet patients: internal rotation movement (larger deficits, lower peak tork/body weight- p<0,05). All groups, except Latarjet patients improved internal rotation isokinetic parameters between 3 and 6 months follow-up. Full strength and ROM recovery is possible within 6 months for posterior labral repair. Patients treated for anterior instability with both labral repair and coracoid transfer take longer to fully recover. Latarjet procedure provided lowest parameters in ER and strength/endurance testing.

#### Abstract no.: 47571 CHANGES IN ACTIVITY OF THE SHOULDER STABILIZING MUSCLES AFTER LATARJET PROCEDURE

Sebastian ZABIEREK<sup>1</sup>, Marcin DOMZALSKI<sup>2</sup>, Joanna KOWALSKA<sup>2</sup> <sup>1</sup>Department of Orthopedic and Traumatology. Medical University of Lodz, Łódź (POLAND), <sup>2</sup>Department of Orthopedic and Traumatology. Medical University of Lodz, Lodz (POLAND)

Latarjet procedure is a well-known stabilization technique, that treat recurrent anterior shoulder instability. According to its principles with a transfer of muscles attached to the coracoid process, we wanted to investigate the activity of the muscles relevant to shoulder stabilization. Examination compared 18 healthy shoulders to 18 shoulders after Latarjet procedure. Surface electromyographic electrodes were placed on the biceps brachii and infraspinatus muscles. The muscular activity was analyzed during following movements: shoulder flexion, external rotation at 0 and 90 degrees of shoulder abduction. Analysis of biceps activity showed statistical significance of rest activity of the biceps but there were no differences during the movement, neither of the muscle voltage, nor of the time of muscle activity. The rest biceps activity during shoulder flexion was lower than on the uninjured side. The analysis of infraspinatus muscles showed statistical significance of rest activity of infraspinatus during the movement of external rotation form Abd0 - the infraspinatus activity was higher comparing to the uninjured side. During external rotation at Abd90, the infraspinatus activity on the operated side was significantly higher comparing to the other side, regarding mean muscle voltage during the movement and the time of muscle activation. Transfer of the coracoid process changes the activation patterns of biceps brachii. A higher level of infraspinatus activation during external rotations make us suspect that dynamic stabilization from rotator cuff muscles must be more effective on the operated side due to the surgery.

#### Abstract no.: 47934 KIENBÖCK'S DISEASE - MEDIUM AND LONG-TERM RESULTS AFTER RADIAL OSTEOTOMY

Marta Sofia SANTOS SILVA<sup>1</sup>, Pedro SERRANO<sup>1</sup>, Sérgio FIGUEIREDO<sup>2</sup>, Alexandre PEREIRA<sup>1</sup>, Miguel TRIGUEIROS<sup>1</sup>, César SILVA<sup>1</sup> <sup>1</sup>Centro Hospitalar do Porto, Porto (PORTUGAL), <sup>2</sup>Hospital Leiria, Porto (PORTUGAL)

Introduction: Kienböck's disease is a pathology of undetermined etiology, in which there is avascular necrosis of the lunate bone. Patients present pain, swelling and stiffness of the wrist. These symptoms do not necessarily correlate with radiological findings. Methods: Between January 1993 and January 2014, 33 patients, with stage II and III Kienböck's disease (Lichtman's classification) submitted to radial osteotomy were evaluated. The mean age was 36.2 years (16-68). The dominant limb was affected in 63.6% of patients. The mean follow-up was 8.2 years (2 - 22). Pain was assessed using the Visual Analogue Scale (VAS) and the functional status through the range of motion (ROM), grip strength, DASH score and Mayo Wrist score. Results: There was a significant improvement in pain, ROM and grip strength in the postoperative period. The mean DASH score was 15.1 points and the Mayo wrist score was 83.1 points. Most patients returned to work, were satisfied with the result and would repeat surgery. There were no major complications. Radiographically there was no progression in the collapse of the lunate. Conclusion: Restoration of vascularization, delay to progression of arthrosis and prevention of carpal collapse are the main objectives in the treatment of Kienböck's disease. The role of radial osteotomy in the treatment of this pathology is not fully understood. In this study, after radiological osteotomy the patients improved clinically and functionally, they returned to their professional activity and there was no radiological progression of the disease (collapse of the lunate and consequent arthritis of the wrist).

#### Abstract no.: 46866 COLLAGENASE INJECTIONS FOR DUPUYTREN'S CONTRACTURE: 3-YEAR TREATMENT EFFECT DURABILITY

Isam ATROSHI<sup>1</sup>, Jesper NORDENSKJÖLD<sup>2</sup>, Anna LAURITZSON<sup>3</sup> <sup>1</sup>Clinical Sciences Lund University and Orthopedics Hässleholm-Kristianstad, Lund (SWEDEN), <sup>2</sup>Lund University and Hässleholm hospital, Hässleholm (SWEDEN), <sup>3</sup>Hässleholm Hospital, Hässleholm (SWEDEN)

Collagenase injections for Dupuytren's contracture (DC) have good short-term efficacy but durability is uncertain. We conducted a prospective cohort study of Collagenase injections in 86 consecutive patients (92 hands, 126 fingers) with active extension deficit (AED) ≥20° in a metacarpophalangeal (MCP) or proximal interphalangeal (PIP) joint. All treated hands except 4 received one treatment only. A hand therapist measured extension deficit before, 5 weeks and 3 years after injection. At 3 years, 3 patients were deceased and 2 had undergone fasciectomy (preoperative contracture values used in the analyses). Thus, 3year outcomes were available for 83 (97%) of patients (120 fingers). Mean AED for MCP joints was 43° before injection, 8° at 5 weeks and 12° at 3 years, and for PIP joints 29°, 11° and 20°, respectively. Between the 5-week and 3-year measurements, AED worsened by  $\geq 20^{\circ}$  in 17 MCP (14%), 28 PIP (23%), and either joint in 41 fingers (34%). Of the joints with  $\geq 15^{\circ}$  pretreatment contracture, complete correction (passive extension deficit 0°-5°) was seen in 73% of MCP and 35% of PIP joints. No adverse events were observed at 3 years. Patients reported being very satisfied with treatment results in 39 hands (44%), satisfied in 20 hands (23%), neutral in 12 hands (13%), and dissatisfied in 18 hands (20%). Three years after Collagenase injections for DC, improvement was maintained and patients were satisfied in two-thirds of the treated hands. Complete contracture correction was achieved in 3 of 4 MCP joints but in only third of the PIP joints.

# Abstract no.: 48173 MANAGEMENT OF FOREARM BONE GAP NON-UNIONS BY ILIZAROV TECHNIQUE

Md Mofakhkharul BARI Bari Ilizarov Orthopaedic Centre, Dhaka (BANGLADESH)

Purpose of the study: Proper treatment of forearm bone gap non-union should achieve both biological stimulation of the bone and elastic mechanical stability. The use of Ilizarov technique enhance the healing of a non-union providing osteogenic, osteoconductive and an optimal stability of Ilizarov fixation. We retrospectively reviewed 26 patients affected by forearm bone non-union and treated with Ilizarov fixation. Materials and Methods: 26 patients were treated for gap non-unions of forearm bones with Ilizarov compression distraction device from 2000 to 2015 in BARI-ILIZAROV ORTHOPAEDIC CENTRE. Results: All the difficult non-unions healed in a mean of 7 months ranging from 5 to 12 months. At the latest follow up forearm function were satisfactory. Conclusion: The Ilizarov compression distraction device is a fantastic tool in promoting the healing of forearm non-unions, even the bones are very atrophic. Keywords: Forearm bone non-union, Distraction osteogenesis, Ilizarov technique.

#### Abstract no.: 48292 RADIOLOGICAL OUTCOME OF PERCUTANEOUS K WIRE FIXATION VERSUS ORIF IN SIMPLE INTRAARTICULAR DISTAL RADIUS FRACTURES

Velmurugesan P<sup>1</sup>, Devendra AGRAHARAM<sup>2</sup>, Dheenadhayalan JAYARAMARAJU<sup>3</sup>, Rajasekaran SHANMUGANATHAN<sup>3</sup> <sup>1</sup>Ganga hospital, coimbatore (INDIA), <sup>2</sup>Ganga hospital, Coimbato (INDIA), <sup>3</sup>Ganga hospital, Coimbatore (INDIA)

Introduction: Fracture of the distal radius is a common injury. Both K wire and volar plates are frequently used implants for AO type 23-C1 and AO type 23-C2 fractures. Aim is to compare the radiological outcome of percutaneous K wire fixation and ORIF in distal radius fractures, to weigh the radiological outcome to the cost incurred in both treatment methods and to analyse poor reduction and late changes in the radiological outcome. Methods: We performed a retrospective review of radiographs of patients with distal radius fractures treated with, ORIF or CRPP in AO type 23-C1 and AO type 23-C2 for a period of two years (June2013-June 2015). Radial inclination, radial length and palmar tilt were measured in preoperative films, immediate postoperative films and at 3 months follow-up. Results: Though there is no difference in efficacy of both methods in maintaining radial length and radial inclination there is statistically significant better hold of palmar tilt by ORIF treatment (p value in difference of preoperative and immediate postoperative palmar tilt is 0.04 and that in 3 month follow up is 0.005). k wire fixation is much cheaper compared to ORIF. Poor reduction was achieved in 24% of K wire group, whereas it is lesser (16%) in ORIF group. Conclusion: ORIF has got better ability in holding palmar tilt both in immediate and final follow up. Cost difference is considerably higher in ORIF group. An initial good reduction and stable fixation should be aimed at to prevent late collapse.

# Abstract no.: 47364 RELATIONS WITH THE POSTOPERATIVE REDUCTION POSITION AND GRIP STRENGTH IN THE DISTAL RADIUS FRACTURES INCLUDING THE VOLAR ULNAR FRAGMENTS

Haruhiko YOSHINARI Kaisei hospital, Kagawa, Sakaide (JAPAN)

Background: Lunate facet in distal radius joint, as a keystone, provides a main support for axial load in functional position of wrist. Our primary interest is to clarify the relationship between lunate facet fragment and postoperative outcomes in distal radius fracture, and whether adequacy of its fragment has an influence on postoperative outcomes. Methods: We conducted retrospective study of distal radius fracture with lunate facet fragment of 55 patients in our institution. General outcomes were evaluated according to AO/OTA classification types, postoperative x-rays assessments with adequacy of reduction (according to Radial Inclination (RI), Volar Tilt (VT), Ulnar Variance(UV), and joint gap or step off>1mm(JGS+)),Range of motion of forearm(ROM),Grip strength,DASH score,and complications(carpal instabilities, secondary displacement). And we compared difference between 2 groups who has an adequate reduction or not. Results: In 55 cases, average age is 61 years old. Types of fracture were B1 1 case, B3 2 cases, and C1 24 cases, C2 8 cases. C3 20 cases.Adequacy of reduction were RI 20°(JGS+:20.1°,-:20°), VT 6°(JGS+:6.1°,-:6°), UV 0.5mm(JGS+:0.49mm,-:0.49mm).10 cases are JGS (+).Average ROM were pronation 75°(JGS+:78°,-:75°), eversion 86°(JGS+:87°,-:86°), extension 46.9°(JGS+:47.6°,-:46.5°), flexion 53.1°(JGS+:53°,-:52.5°).Loss of grip strength has in 44% (JGS+:60%, -:40%). Average DASH score was 25.0 point (JGS+:38.9 point, -:22.7 point).As complication, only carpal instability (VISI) was seen in 3 cases (JGS+:1 case,-:2 cases). Discussion: Distal radius fracture with lunatefossa fragment tended to loose grip strength and specially inadequate reduction leads to poor functional outcome. Because lunatefossa fragment is keystone

Abstract no.: 47296 AN INNOVATIVE MODE OF CLOSED REDUCTION AND PERCUTANEOUS PINNING ALONE FOR THE TREATMENT FOR ALL TYPES OF FRACTURES OF DISTAL END OF RADIUS. Anilkumar VIDYADHARAN SEMALK HOSPITAL, OTTAPALAM, KERALA STATE (INDIA)

Introduction: I had started my innovative surgical technique of CMR&PINNING for the treatment for # DER since 1999 along with the existing mode of other treatments such as POP, ORIF & External Fixation. Objective: To create a new mode of CMR& PINNING which can be used as a stable fixation for all types of #DER including comminuted and intraarticular fractures. Methods: It is a prospective study of 200 cases over a period of 4 years from 2013 to 2016. Even though I am presenting the data of the last 4 years, I had done > 700 cases of CMR & percutaneous pinning since 1999 with several modifications. Age =18 to 84 and grouped it into three groups. Closed reduction done by traction & countertraction technique by surgeon and 2 assistants. Two triangles are created by crossing 6 kwires in 2 plains without skin incision by stabilizing the DRUJ. No wire protruding outside the skin, allows full range of finger movements wrist movement from the 1st POP day except Supination, pronation. The chance of residual deformity is reduced by the scaffolding action of the crossed k-wires forming 2 triangles in 2 plains by encircling the comminuted metaphysical fragments and by stabilizing the intra-articular fragments. Results: The results are evaluated on the basis of functional, radiological and cosmetic aspect. Over all- result comes to 92.5% with a split up of 96% for group-1, 91% for group-2, 81% for group-3. Conclusion: The new mode of fixation stabilises the DRUJ and prevent metaphysical collapse, Radial shortening, -ve ulnar variance.

#### Abstract no.: 48673 COMPARISON OF MINIMALLY INVASIVE APPROACHES IN PRIMARY TOTAL HIP ARTHROPLASTY: GLUTEUS SPARING MODIFIED ANTEROLATERAL VERSUS DIRECT LATERAL APPROACH Laszlo MECS, Ernest NAGY, Kalman TOTH University Szeged, Department of Orthopaedics, Szeged (HUNGARY)

INTRODUCTION: Minimally invasive total hip arthroplasty (THA) is a common procedure with multiple surgical approach techniques. This study compared clinical results of minimally invasive THA using the gluteus sparing (GS) modified anterolateral approach versus the direct lateral (DL) approach. The GS technique minimize the strain of the abductor muscles and nervus gluteus superior. METHODS: Two patient groups received minimally invasive THA implantations (October 2014 to September 2016) using either the GS modified anterolateral technique (115 patients) or the DL approach (115 patients). Examinations performed: Visual Analog Score (VAS), Oxford hip score (OHS), abductor muscle strength, pre and post-surgery (day 3-6, 6 weeks, 3, 6 months, and 1 year). We also examined surgical blood loss volume, average operative time (AOT) and hospital average length of stay. RESULTS: Average follow-up time 18.2 months (minimum 6 months). There was no difference between groups mean age, sex, type of OA or prosthesis implant type used. The GS groups VAS (days 3 and 6) and OHS at 6 weeks and 3 months were significantly better, but at 6 months both groups results were similar. The GS groups abductor muscle strength was stronger up to 6 months, with less blood loss (294 ml) and significantly decreased hospital stay, but increased AOT (88.2 minutes). CONCLUSIONS: The THA GS operative technique minimizes abductor muscle and reduced superior gluteal nerve strain, thus leading to better 6 month post-op results: excellent abductor function, decreased soft tissue trauma, decreased blood loss, faster post-op recovery and reduced hospital stay.

#### Abstract no.: 48563 ACETABULAR RESTORATION IN REVISION TOTAL HIP ARTHROPLASTY UTILIZING GAP II Afshin TAHERIAZAM

Tehran Medical Sciences Branch, Islamic Azad University, Tehran (IRAN)

Background: Major bone loss of acetabulum can criticize the revision hip arthroplasty. The Graft Augmentation Prosthesis (GAP) has been designed particularly as an implant for revision acetabular reconstruction. Previously we reported the outcomes of using GAP II in a limited number of patients. In current study, we increased the sample size and the outcomes were investigated in more number of patients underwent revision THA using GAP II. Methods: There were 307 patients underwent revision THA in patients using GAP II cages. All patients classified as 3a or 3b of Paprosky classification and type III bone loss according to the system of the American Academy of Orthopedic Surgeons (AAOS). Results: There were 221 men (71.99%) and 86 women (28.01%) with an average age of  $51.3 \pm 21.7$  years (range, 35–86 years). The MHHS improved significantly at the last follow-up compared with the preoperative MHHS (P<0.001). The mean MHHS was 40 (range, 29-44) preoperatively and 92 (range, 86-95) at the last follow up. There were no major intraoperative complications during acetabular reconstruction. Conclusion: Our findings showed that using GAP II acetabular cage in the restoration of acetabulum in hip revision surgery is significantly desirable.

#### Abstract no.: 48430 GEOGRAPHICAL VARIATIONS IN POST-OPERATIVE PATIENT REPORTED OUTCOMES AFTER TOTAL HIP ARTHROPLASTY IN SWEDEN

Ola ROLFSON<sup>1</sup>, Göran GARELLICK<sup>2</sup>, Linnea OLDSBERG<sup>3</sup>, Ingrid Osika FRIBERG<sup>3</sup>, Anke SAMULOWITZ<sup>3</sup>, Nemes SZILARD<sup>1</sup>

<sup>1</sup>Swedish Hip Arthroplasty Register, Institute for Clinical Sciences, Gothenburg University, Gothenburg (SWEDEN), <sup>2</sup>Swedish Hip Arthroplasty Register, Institute for Clinical Sciences, Gothenburg University, Göteborg (SWEDEN), <sup>3</sup>Department of Public Health and Social Medicine, Sahlgrenska Academy, University of Gothenburg, Gothenburg (SWEDEN)

Health care on equal terms is a cornerstone in the health care system in Sweden. Irrespectively of age, gender or residence all Swedish citizens are entitled to health care and expect the same good treatment and outcome. Total hip arthroplasty (THA) is considered a success story in Sweden with high implant survival rate and restored healthrelated quality of life. Administratively, health care in Sweden is local self-governed by 21 counties, and each and every one need to provide good health care for its residents. In this longitudinal registry study of 36 235 Swedish THA patients, operated between 1th of January 2008 and 31th of December 2012, we assessed the possible geographical variations in 1 year follow-up patient-reported outcome measurements (PROMs): EQ-5D index, EQ VAS, Pain VAS and Satisfaction VAS. We observed county level differences in both pre-operative and post-operative patient-reported outcomes (PROs). The results showed that the differences observed in pre-operative PROs could not explain the differences observed in post-operative PROs even after adjustment for patient-related (age, gender, BMI) and socioeconomic (marital status, education attainment and income) factors. We observed genuine deviation from the expected PRO levels, indicating that other factors might influence the outcome after THA. Likely structural differences in indication for and patient follow-up have an influence on PROs after surgery. With standardization of indication for surgery at hospital levels likely we will observe a decrease in geographical variations in post-operative health-related guality of life. Possible differences will likely be related to patient demographics.

### Abstract no.: 48252 THE FATE OF PELVIC OBLIQUITY AFTER TOTAL HIP ARTHROPLASTY Kee Hyung RHYU<sup>1</sup>, Semin LEE<sup>2</sup>, Young Soo CHUN<sup>1</sup>, Yoon Je CHO<sup>2</sup> <sup>1</sup>Kyung Hee University Hospital at Gangdong, Seoul (SOUTH KOREA), <sup>2</sup>Kyung Hee University Hospital, Seoul (SOUTH KOREA)

This study was performed to classify the pelvic obliquity (PO) observed in the patients with end-stage unilateral hip diseases, and to investigate the change of it after primary total hip arthroplasty (THA). Among 677 unilateral primary THA between June 2006 and December 2014, 119 patients who have PO  $\geq$  3° confirmed in scanography were enrolled. Patients were classified into three groups; Group A (n=8) includes suprapelvic causes, Group B (n=28) included intrapelvic, and Group C (n=81) included infrapelvic. PO was measured in scanography taken before the operation and compared with that of one year after THA. The average age of the patient was 56 years. Sixty-two were men and 57 were women. Recovery was noted in 60%, 64% and 42% of the patients in each group (p = 0.04). There were no significant differences among the groups in averages of PO before and after the operation (p = 0.60 and 0.22) and the averages of corrected degree (p = 0.39). Group A showed no significant changes after THA (p = 0.114), whereas Groups B and C showed significant angular improvement (p = 0.002 and 0.004, respectively). Pelvic obliquity can be changed after THA, regardless of its cause; however, it was not complete. Suprapelvic PO showed recovery in some patients, but the degree of change was insignificant. Although the correction was significant, the number of recovered patients was least in Infrapelvic PO. Intrapelvic PO showed significant changes both the number of recovered patients and degree of correction.

#### Abstract no.: 48174 PREDICTIVE FACTORS ON METAL-ION LEVELS IN METAL-ON-METAL TOTAL HIP ARTHROPLASTY

Maximilian KASPAREK<sup>1</sup>, Lisa RENNER<sup>2</sup>, Martin FASCHINGBAUER<sup>3</sup>, Wenzel WALDSTEIN<sup>4</sup>, Michael WEBER<sup>5</sup>, Friedrich BOETTNER<sup>6</sup> <sup>1</sup>Department of Orthopedics, Medical University of Vienna, Vienna (AUSTRIA), <sup>2</sup>Orthopaedic Department, Charité Universitätsmedizin Berlin, Berlin (GERMANY), <sup>3</sup>Department of Orthopedic Surgery, University Ulm, Ulm (GERMANY), <sup>4</sup>Department of OrthopedicsI, Medical University of Vienna, Vienna (AUSTRIA), <sup>5</sup>Department of Biomedical Imaging and Image-Guided Therapy, Medical University of Vienna, Vienna (AUSTRIA), <sup>6</sup>Adult Reconstruction & Joint Replacement Division, Hospital for Special Surgery, New York (UNITED STATES)

Although Metal-on-Metal (MoM) total hip arthroplasty (THA) and hip resurfacings (HR) have similar bearing surfaces and comparable wear rates, metal ion levels and risk of failure are higher for MoM-THA. The mechanism behind the increased metal ion levels in large head MoM-THA is not completely clear. The current study aims to identify predictive factors for increased metal ion levels in unilateral and bilateral large head MoM-THA in the long term. 99 Birmingham modular MoM-THA in 87 patients with metal ion levels at least 36 months after index procedure were analyzed. Mean follow-up time was 61.3 months (range 37 to 108) and the relationship of the following variables (gender, age, BMI, follow up time, UCLA activity score, cup inclination, femoral head size, bilateral surgery) on metal ion levels were analyzed with multivariate regression models. Multivariate regression analysis revealed that bilateral MoM THA surgery (p<0.001) had a positive predictive effect on cobalt serum levels while BMI had a negative (p=0.018). Female gender (p=0.012), activity (p=0.001) and bilateral MoM-THA (p=0.004) were positive correlated with chromium levels. Positive independent predictors for the cobalt-chromium-ratio in the multivariate analysis were overall follow-up time (p=0.004), bilateral MoM-THA (p<0.001) and femoral head size (p=0.007). The data of the current study suggest that patients with larger component size and bilateral MoM-THAs have an increased cobalt-chromium-ratio. MoM-THA patients with larger components and bilateral surgery might be at increased risk for adverse local soft tissue reactions secondary to corrosion.

#### Abstract no.: 48115 EARLY RESULTS IN ALMI TECHNIQUE FOR HIP ARTHROPLASTY – APPROACHING THE LEARNING CURVE

Razvan-Silviu CISMASIU<sup>1</sup>, Rares Mircea BIRLUTIU<sup>2</sup>, Victoria BIRLUTIU<sup>3</sup> <sup>1</sup>Clinical Hospital of Orthopaedics Foisor, Bucuresti - Sector 2 (ROMANIA), <sup>2</sup>Clinical Hospital of Orthopaedics Foisor, Bucharest (ROMANIA), <sup>3</sup>Lucian Blaga University of Sibiu, Faculty of Medicine, Sibiu (ROMANIA)

Total hip arthroplasty (THR) is nowadays the most used procedure in adult reconstructive hip, proving to be cost-utility efficient adjusted to patient life years. Minimally invasive techniques on hip proved to bring their contribution to faster rehabilitation and socioprofessional reintegration. True minimally invasive hip approaches are to be considered the anterior minimally invasive (AMI) and the antero-lateral minimally invasive (ALMI) approaches. Aim: Analyzing the learning curve outcomes of ALMI THA in dorsal decubitus in a prospective study on a continuous patient series during 5 years' period, compared with the same classic approach procedure. Method: We have enrolled all THA procedures starting 2011, both ALMI and classical AL approaches, dividing them in two main comparison groups. During the study analyze we focused on the following parameters: the perioperative blood loss, hospitalization, immediate radiological, functional and recovery outcomes, as well as follow-up procedure evaluation (scores, clinical tests). Results: ALMI THA technique proved to be a reliable procedure among hip arthroplasty techniques, showing encouraging and reproducible results even in a learning curve patient series. Nevertheless, care should be taken on patient's conditions and constitutional particularities. Conclusion: Use of ALMI THA is safe and preserves the abductor mechanism of the hip, ensuring a faster rehabilitation for the patient, showing among the other similar hip approaches a lower rate of complications - prosthetic dislocation. Muscle preservation and lower blood loss are also great advantages of the technique.

#### Abstract no.: 47950 AN EXPERIENCE OF REVISION SURGERY IN FAILED 92 METAL ON METAL HIP ARTHROPLASTIES

Rajesh BAWALE<sup>1</sup>, Srinivasa SAMSANI<sup>2</sup>, Anand JOSHI<sup>3</sup> <sup>1</sup>MEDWAY MARITIME HOSPITAL, LONDON (UNITED KINGDOM), <sup>2</sup>MEDWAY MARITIME HOSPITAL, GILLINGHAM (UNITED KINGDOM), <sup>3</sup>MEDWAY MARITIME HOSPITAL, Gillingham (UNITED KINGDOM)

Background: Revision surgery for failed metal on metal hip arthroplasty is often unpredictable, challenging and associated with poor outcomes due to soft tissue involvement. We reviewed all patients at our institution that had revision of failed metal-on metal total hip arthroplasty to determine (1) complications; (2) MRI correlation with intraoperative findings. Materials and Methods: We analysed the findings and outcomes of revision surgery in 92 failed MoM hip arthroplasties performed between 2009 and May 2016. All patients had clinical assessment, blood metal ion levels and cross-sectional imaging. Descriptive statistics had a non-normal distribution of data and non-parametric tests were used to summarize the data and compare between the reasons for failure and implant types. Results: Our study reviewed 92 patients (37 male, 55 female) patients with an average age 63.37 yrs (range 43 to 85 yrs). 63 patients were revised for established pseudotumors, 29 patients for pain, raised metal ion levels, aseptic loosening. Average follow up was 3.8 Yrs (range 2 to 6 yrs). Pre-op and Post-op Oxford hip scores were recorded. Complications - One dislocation, one deep infection and one intra-operative periprosthetic fracture. MRI had a sensitivity of 75% and a specificity of 83% for the presence of a pseudotumor observed intraoperatively. Conclusions: Routine surveillance of all MoM hip arthroplasty patients to identify early failures, knowledge of failure mechanisms, appropriate utilisation of theatre resources and early surgical intervention helps to achieve good clinical outcomes. Surgeons should be aware of the possibility of severe pelvic osteolysis often encountered intraoperatively.

#### Abstract no.: 47840 CAN PATIENT-REPORTED OUTCOMES PREDICT RE-OPERATIONS AFTER TOTAL HIP REPLACEMENT?

Ted ENEQVIST<sup>1</sup>, Szilard NEMES<sup>2</sup>, Erik BULOW<sup>3</sup>, Maziar MOHADDES<sup>1</sup>, Ola ROLFSON<sup>1</sup>

<sup>1</sup>Sahlgrenska University Hospital, Gothenburg (SWEDEN), <sup>2</sup>Swedish Hip Arthroplasty, Gothenburg (SWEDEN), <sup>3</sup>Swedish Hip Arthroplasty Register, Gothenburg (SWEDEN)

Introduction: Few patients are in need of re-operation after a total hip replacement (THR) and as a consequence many healthcare providers have abandoned routine follow-up in these patients. In some patients lack of follow-up might lead to severe consequences. The aim of this study was to examine the possibility to identify patients with an increased risk of re-operation after THR using patient-reported outcome measures (PROMs) reported at one, six and ten years post-surgery. Methods: The Swedish Hip Arthroplasty Register (SHAR) collects prospective observational data for THRs performed in Sweden. In 2002, SHAR started to register PROMs using the descriptive EQ-5D-3L-questionnaire, EQ-VAS, hip-pain VAS, Charnley-classification and at postoperative follow-ups satisfaction VAS. We excluded patients with unusual approaches, resurfacing prostheses and non-OA (osteoarthritis). Then relative survival risk was calculated and regression analyses was used to investigate associations between PROMs and re-operations. Results: At ten-year follow-up the survival rate was 95.5 % (95.3-95.8). Cox-regression modelling showed an association between all predictors, except EQ-VAS. The model had moderate predictive power, with a time-dependent AUC-value of 0.72. The predictive power was relatively constant up to ten years post-surgery. The observed and predicted re-operation differed only marginally. Conclusion: We have shown that PROMs after THR can be useful in predicting the need for future revision. Though, including other baseline information in the model may increase the predictive power. However, there is a delicate trade-off between model complexity and predictive power in the further work on developing a clinical application.

#### Abstract no.: 47669 SALVAGE OF A MONOBLOCK METAL ON METAL CUP USING A DUAL MOBILITY LINER: A 2-YEAR MRI FOLLOW-UP STUDY.

Maximilian KASPAREK<sup>1</sup>, Lisa RENNER<sup>2</sup>, Martin FASCHINGBAUER<sup>3</sup>, Wenzel WALDSTEIN<sup>1</sup>, Kilian RUECKL<sup>4</sup>, Friedrich BOETTNER<sup>4</sup> <sup>1</sup>Department of Orthopedics, Medical University of Vienna, Vienna (AUSTRIA), <sup>2</sup>Orthopaedic Department, Charité Universitätsmedizin Berlin, Berlin (AUSTRIA), <sup>3</sup>Department of Orthopedic Surgery, University Ulm, Ulm (GERMANY), <sup>4</sup>Adult Reconstruction & Joint Replacement Division, Hospital for Special Surgery, New York (UNITED STATES)

Introduction: Revision of failed modular metal on metal total hip replacement (MoM-THA) can be technically difficult. A dual mobility liner can help to salvage a well-fixed acetabular component. The current paper reports the clinical and radiographic outcome of revision of failed Birmingham modular MoM-THA using a dual mobility liner. Methods: The current study reports on 10 patients (3 female and 7 male) with 11 revision THAs. Patient underwent revision an average of 51 months (range 40-73: months) after index procedure. Mean follow-up after the revision was 31 months (range: 24-37 months) and all patients underwent an MRI with metal artifact reduction software (MARS) at least 2 years after revision to assess for local polyethylene wear and osteolysis. Results: The Harris Hip score improved from 88.2 (range 69-100) to 95.3 (range 86-100)(p=0.029). One patients had a one time dislocation within 7 days of surgery. No patient required additional surgeries. Radiographs showed no signs of component loosening and osteolysis and MRI imaging revealed no-evidence of polyethylene wear or osteolysis. Conclusion: A dual mobility liner in an existing Birmingham cup can provide excellent clinical and radiological short-term results without MRI evidence of increased polyethylene wear.

### Abstract no.: 47495 AN OUTCOME STUDY OF THE HYBRID TOTAL HIP REPLACEMENT AT THE GODEN JUBILEE HOSPITAL. GLASGOW, SCOTLAND - A 2 YEAR FOLLOW UP.

Sriganesh WALKAY<sup>1</sup>, Rahul TYAGI<sup>1</sup>, Rohit MAHESHWARI<sup>2</sup> <sup>1</sup>The Golden Jubilee Hospital NHS Trust. Glasgow ,Scotland., glasgow (UNITED KINGDOM), <sup>2</sup>The Golden Jubilee Hospital NHS Trust. Glasgow ,Scotland., Glasgow (UNITED KINGDOM)

Background: The Hybrid implants are effective choice for total hip replacement (THA) when compared to cemented or cement less implants with a survival rate 98.1%. Aim: To analyse vear outcome of hybrid hip replacement in Golden Jubilee Hospital. 2 Methodology:Retrospective observational study in 449 hybrid THA patients over one year period(2013). Review out come included patient demographics, implant type, oxford hip score, satisfaction rate, complication and revision. Complication rates were obtained from Scottish arthroplasty registry. Results- In 2013 eleven consultants performed 449 hybrid THA at the Golden Jubilee Hospital. There were 262 females and 186 males. The average age was 66.9yrs. The mean BMI was 29.8. In this cohort 43.9% were obese and 3.7% were morbidly obese. The majority of the implants were Trident Acetabular Cup and Exeter V40 stem(98.6%). In this study, 97.7 % of the patients were satisfied or very satisfied at two year. The mean oxford hip score pre and post operatively was 18.2 and 42.67 respectively( Low oxford hip score indicates severity). There were 6DVT/PE(1.3%), 5 Dislocations (1.1%),2 CVA(0.4%) and 3 Revisions(0.6%). Discussion-The Hybrid Implants are now considered an effective choice for THA with cumulative percentage probability of revision being 0.67% (0.63-0.72) at one year and 4.18% (3.82-4.56) at 11 years according to 14th report published by national joint registry of England, Wales and Northern Ireland. The Trident Cup and V40 Exeter stem was best performing implant among hybrid group. Conclusion-The Hybrid THA provides an excellent functional outcome and our revision rates 0.6% is comparable to the data published by National Joint Registry(UK).

### Abstract no.: 47388 IS ONE-STAGE BILATERAL TOTAL HIP ARTHROPLASTY A SAFE PROCEDURE FOR PATIENTS WITH AVASCULAR NECROSIS OF FEMORAL HEAD?

Afshin TAHERIAZAM<sup>1</sup>, Farshad SAFDARI<sup>2</sup> <sup>1</sup>Tehran Medical Sciences Branch, Islamic Azad University, Tehran (IRAN), <sup>2</sup>Bone, Joint and related tissues research center, Akhtar hospital, Shahid Beheshti University of medical sciences, Tehran (IRAN)

Introduction: Some surgeons are concerned about safety of stage bilateral total hip arthroplasty (BTHA). In current study, the outcomes and complications of one-stage BTHA through Hardinge approach was investigated in patients with avascular necrosis of femoral head. Methods: There were 72 patients with bilateral AVN of femoral head enrolled in current prospective study. The patients aged 32.3±6.2 years. All of the patients underwent one-stage BTHA. Beside of clinical and radiological evaluations, modified Harris Hip Score (MHHS) was completed for all of the patients. preoperatively and again postoperatively. Results: The mean operational time and hospital stay was 2.5±0.2 hrs and 3.7±1 days, respectively. After the operation Hemoglobin level decreased significantly (13.2±4.1 mg/dL Vs 8.2±2.7 mg/dL; p<0.001). There was no deep venous thrombosis, pulmonary embolism, infection, dislocation and periprosthetic fracture in our study. One patient developed unilateral heterotrophic ossification. The MHHS increased significantly from 45.7±10.2 preoperatively to 93±12.6 postoperatively (P<0.001). Conclusion: Based the findings of current study, one-stage BTHA through Harding approach is a safe and useful treatment for patients with femoral head avascular necrosis. However, long term studies are necessary.

# Abstract no.: 46654 UNCEMENTED TOTAL HIP ARTHROSPLASTY IN RECONSTRUCTION OF ACETABULAR DEFECTS IN POSTTRAUMATIC OSTEOARTHRITIS Stanislav BONDARENKO<sup>1</sup>, Volodymyr FILIPENKO<sup>2</sup>, Mandus AKONJOM<sup>2</sup>,

Ahmed BADNAOUI<sup>2</sup>

<sup>1</sup>Sytenko Institute of Spine and Joint Pathology, Kharkiv (UKRAINE), <sup>2</sup>Sytenko Institute of Spine and Joint Pathology, kharkiv (UKRAINE)

Background: to achieve a stable and long-term cup fixation in posttraumatic osteoarthritis with acetabular defects during THA is technically challenging. Aim: to retrospectively evaluate the clinical outcome of uncemented THA of posttraumatic osteoarthritis with defects of acetabulum. Material and methods: 33 patients (33 hips) with posttraumatic osteoarthritis developed after fracture dislocation of the hip underwent uncemented THA. Average age was 52.8 (30-72) years, 21 males and 12 females. 7 patients had segmental defects of superior and posterior walls of acetabulum; 23 patients had cavitary defects of superior, posterior and medial walls of acetabulum; and 3 patients had combined defects of medial wall of acetabulum. "Press-fit" cups were used in all cases. Structural autografts with screw fixation was used for reconstruction of segmental defects and cancellous autografts for reconstruction of cavitary defects. Results: The average duration of follow up was 3.9 (2.0-6.3) years. The Harris Hip Score improved up 32 to 84 points. Survival for aseptic acetabular loosening was 100 %. Bone autograft incorporation was observed in all cases. In 31 case (94 %) hip rotation center was restored. There were 3 cases of dislocations and one case of postoperative infection. Conclusion: uncemented THA with biological reconstruction of acetabular walls and restoration of hip rotation center is a viable treatment option in patients with posttraumatic osteoarthritis in the time of follow-up.

# Abstract no.: 46653 THE MANAGEMENT OF COMPLICATIONS AFTER TOTAL HIP AND KNEE ARTHROPLASTY IN NEPAL: WHERE DO WE STAND?

Kapil Mani KC, Dirgha Raj RC, Parimal ACHARYA, Bandhu Ram PANGENI, Arun SIGDEL, Suman Babu MARAHATTA Civil Service Hospital, Kathmandu (NEPAL)

Background: In the present context of Nepal where patients are barely ready to do primary total joint arthrplasty, it will be a difficult situation to convince the patients if they are landed into the complications. The purpose of this article is to analyse the possible complications and our attempts to treat these complications with existing facilities and man-powers in compromised economic situation. Materials and Methods: This was a retrospective descriptive analytical study performed in Civil Service Hospital. All the complications were noted from the patients individual files maintained in the hospital. The quantitative data were expressed in mean±standard deviation while numbers of complications were documented in percentage. Results: A total of 180 total hip and knee arthroplasty were performed in our hospital, out of these there were one case of deep vein thrombosis (DVT), 2 cases of deep infection, 2 cases of sciatic nerve injury in hip arthroplasty, one case of severe flexion contracture of bilateral knee, 2 cases of intra-operative femoral condyle fractures along with some minor complications. Conclusion: The field of arthroplasty is relatively underdeveloped subspecialty in our country because we do not have that much of trained manpowers and super specialty centers to tackle all kinds of complications after arthroplasty as well as to perform the revision arthroplasty smoothly. On the other hand it will be a huge economic burden to the patients and they will unable to afford the further treatment. Despite unfavourable situation, we are on the way of better treatment in this field.

# Abstract no.: 48568 GROSS TRUNNION FAILURE AFTER TOTAL HIP ARTHROPLASTY

Deepak GAUTAM, Rajesh MALHOTRA, Sahil GABA, Lokesh CHAWLA All India Institute of Medical Sciences, New Delhi (INDIA)

Introduction: The shift from monoblock designs to modular designs was a significant event in the evolution of total hip arthroplasty that allowed intra-operative fine-tuning of limb length, offset and the option of using different bearing material while retaining the same stem. Although the firm contact between trunnion and head is thought to be stable under mechanical loading conditions, it does have some problems. Mechanically assisted crevice corrosion can lead to the release of metal ions causing trunnionosis or mechanical complications such as disassembly or fracture. Materials: We present a series of 7 cases of failed total hip arthroplasties due to trunnion related complications. There were four cases of trunnionosis, three cases of trunnion fracture and one case of ceramic head fracture secondary to deformed trunnion. Duration between index surgery and revision surgery varied between 8 to 10 years. Results: All cases were managed with revision total hip replacement. All the cases are doing well except one who died died due to cobalt cardiomyopathy secondary to trunnionosis. Although there was no common factor identified which is predictive of these failures, the possible mechanism of gross trunnion failure in each case have been described. Conclusion: There is sparse literature regarding trunnion related complications. But as the number of patients getting modular hips increase, these complications are bound to increase. The limitations of trunnion must be understood and necessary steps should to prevent these complications. Further biomechanical research is needed to overcome these problems.

# Abstract no.: 48077 TOTAL HIP ARTHROPLASTY; ROLE OF SYNTHETIC ANTIFIBRINOLYTICS IN REDUCING INTRA-OPERATIVE AND POST-OPERATIVE BLOOD LOSS- A PROSPECTIVE STUDY.

Pankaj Kumar SHARMA

Post Graduate Institute Of Medical Sciences, Rohtak, BIKANER (INDIA)

Introduction: Several techniques minimize the likelihood of allogenic blood transfusion following the hip arthroplasty ie. Autologous blood donation, Intra-operative red cell salvage local anaesthesia, controlled hypotension and an antifibrinolytics. Tranexamic acid (TXA) is synthetic antifibrinolytic drug, similar to the prototypical synthetic antifibrinolytic drug, Σ-amino-caproic acid (EACA), considered to have ten times the potency of EACA. Dosing is 10–15 mg/kg loading dose, followed by infusion of 1 mg/kg/hr or repeated bolus dosing. The half-life of TXA is approx. 80 min. Material and Methods: The double blinded, placebo control hospital based prospective interventional study with 60 patients (<40 yrs. and >40 yrs.). Intra-articular injection injected (in control group included normal saline while in study group 1000 mg of tranexamic acid). Patients with age- 50±20 / gender- male or female Body mass index (18.5 to 24.9-SI Unit) /ASA Grading- Grade 1 and Grade 2 are included while patients with h/o severe lschemic diseases / pulmonary embolism/deep vein thrombosis/hepatic or renal failure, allergy to TXA/ bleeding disorders and those receiving anticoagulant therapy are excluded. Postoperative blood loss and time related changes were measured every two hours for twelve hours and at 24 hours and 48 hrs. Results: The M::F ratio in control group (1:1) and in study group (2:1). Significant differences were found in study group when compared with control group (P value <.05). Conclusion: Single dose of 1000 mg TXA given intravenously 5 minutes prior to cementless total hip arthroplasty is cost-effective and safe means of minimising postoperative blood loss.

# Abstract no.: 47479 VIDEO-ASSISTED WITH PISTON-LIKE PUSHER CORE DECOMPRESSION FOR THE TREATMENT OF AVASCULAR NECROSIS OF THE FEMORAL HEAD (AVN)

Alyaksandr MURZICH, Alexander BELETSKY Republican Scientific and Practical Centre of Traumatology and Orthopedics, Minsk (BELARUS)

AVN occupies a leading place in the structure of hip pathology in young patients of 20-45 years old. The goal of early treatment is to identify the causes of the disease, X-ray and MRI assessment, subclassification, choice of treatment algorithm. The aim: To improve known methods within existing equipment, technical capabilities and modern knowledge. Methods: From 2014 to 2016 we performed 26 core decompressions at ARCO stage I (4 cases), stage II B (10 cases), stage II C (10 cases), stage III (2 cases). On the guide wire we formed a canal in the neck with a cannulated cutter. The hollow rimer channel was prolonged until the onset of the necrosis, the graft was taken. The focus of necrosis was drilled and video-assisted debridement of the femoral head was made, tunneling with a spoke from the inside of the bone. The spongy bone extracted from the hollow rimer was inserted into the intraosseous canal to the necrosis zone percutaneously with the help of a piston-like pusher. Results: In 70% of patients was a decrease in the pain syndrome according to VAS from 5 to 3 points (by 40%). After 1 year a stable X-ray and positive clinical result were noted in 12 cases (46%), absence of progression of the existing collapse in 6 cases (23%), progression of collapse in 8 (31%), THR performed in 4 cases. Conclusions: Core decompression in the early stages of AVN improves the patients clinical condition and has a favorable effect on the disease prognosis.

#### Abstract no.: 48625 EVALUATION OF THE CLINICAL VALUE OF AN AUXILIARY POSITIONER FOR THE HELICAL BLADE IN PROXIMAL FEMORAL NAIL ANTI-ROTATION (PFNA).

Frank Yaw TAKYI-APPIAH<sup>1</sup>, Xiaopeng PU<sup>2</sup>, Xicheng LI<sup>3</sup> <sup>1</sup>HEBEI MEDICAL UNIVERSITY-HEBEI GENERAL HOSPITAL, SHIJIAZHUANG (CHINA), <sup>2</sup>HEBEI MEDICAL UNIVERSITY-HEBEI GENERAL HOSPITAL, Shijiazhuang (CHINA), <sup>3</sup>Hebei Gereral Hospital, Shijiazhuang (CHINA)

Objective: To analyze the accuracy of such an auxiliary positioner in actual clinical application. Methodology:40 patients with intertrochanteric fracture, were selected via the double-blind method and divided into control and observation groups each of 20 patients, thus Group A and Group B respectively. Group A, received conventional surgery by proximal femoral nail anti-rotation (PFNA) with Group B, receiving PFNA surgery with auxiliary positioner for the helical blade. The number of implantations, the duration of operation and the number of C- arm X-ray exposure were recorded and the accuracy of the positioner determined by measuring the angle of the helical blade axis offset from the central axis of the femoral head (deflection angle). Results: Group A had a range of deviation angle of 6.75° ± 3.24° and that of Group B was 2.80° ± 1.44°, thus Group B's deviation angle being lesser than Group A and the difference between the two groups was statistically significant (P < 0.05). Also, between the two groups, the number of implantations, the duration of operation and the number of C-arm X-ray exposure were significantly lower in Group B (P < 0.05). Conclusion: This auxiliary positioner allows for faster and more accurate implantation of the helical blade with fewer tries and it can significantly reduce the number of intraoperative C-arm X-ray exposure, effectively reducing the radiation damage to patients and health care personnel.

#### Abstract no.: 47389 COMPARATIVE STUDY BETWEEN DYNAMIC HIP SCREW AND PROXIMAL FEMORAL MANAGEMENT NAIL IN THE OF PERITROCHANTERIC FEMORAL FRACTURES Virender KUMAR<sup>1</sup>, Ajay SHEORAN<sup>2</sup>, Mamta SINGHROHA<sup>3</sup> <sup>1</sup>PGIMS, Rohtak, Rohtak, Haryana (INDIA), <sup>2</sup>PGIMS, Rohtak, ROHTAK (INDIA), <sup>3</sup>Healthmap, PGIMS Rohtak, ROHTAK (INDIA)

Peritrochanteric fractures are devastating injuries having an enormous impact on the health care system and society. The management protocol includes early mobilization, rapid rehabilitation and quick return of individuals to preinjury status. Objectives: Comparative evaluation of effectiveness and strength of Long PFN and DHS in the management of peritrochanteric fracture and the advantages & disadvantages of these two internal fixations being used to treat similar kinds of fractures. Methods: A prospective comparative study, consisting a total of 80 adult patients with peritrochanteric fractures of the femur. Modified Harris Hip scoring system was used for evaluation of functional outcome, with a minimum follow-up period of 3.6 years. Results: Mean blood loss in DHS group was 265 ml while in PFN group it was 166 ml. the difference is significant and in accord to literature. Average Harris hip score for DHS group was 80.25 with excellent result in 25% cases, good in 30% cases, fair in 35% cases and poor in 10% cases. While in PFN group Harris hip score was 81.1 with excellent result in 20% cases, good in 40% cases, fair in 30% cases and poor in 10% cases. Conclusion: Though the compression hip screw is still the gold standard but recently techniques of closed intramedullary nailing have gained popularity because of fewer transfusion rates and significant prevention of shortening that might occur due to comminution and concentric collapse at the fracture site. However, in our study, the functional outcome was nearly same irrespective of implant used.

### Abstract no.: 46620 THE DESTRUCTIVE POWER OF CIRCUMSTANCE ON CONCURRENT POLIOMYELITIS & OSTEOMYELITIS

Delran ANANDKUMAR<sup>1</sup>, Ananthakrishnan RAGHUPATHI<sup>2</sup>, Ragai GADELRAB<sup>2</sup> <sup>1</sup>Cransley Hospice, Luton (UNITED KINGDOM), <sup>2</sup>Newham Hospital, London (UNITED KINGDOM)

Hip joint replacement in paediatric populations is avoided unless absolutely necessary. This decision is typically made on a clinical basis. The follow case report aims to show how social issues are an extremely prognostic indicator to be considered when deciding on surgical intervention. This case report is the first of its kind to highlight the pathology mentioned and the social determinants that were a causative agent in its development. This case revolves around a 46 year old Caucasian gentleman requesting hip arthroplasty. He aimed to improve his ability to work after the cessation of state benefits. Avascular necrosis and resulting natural arthrodesis were the causative pathologies, both secondary to chronic and untreated childhood osteomyelitis of the right hip in conjunction with poliomyelitis development. The dual involvement of poliomyelitis and osteomyelitis to the hip joint no doubt had a massive impact on final pathology and is a rarely documented phenomenon. From an early age this patient has faced difficulties integrating in society by factors that were out of his control. By the time he was old enough to lead an independent life, the damage had been inflicted both medically and psychologically through his earlier ordeals. By presenting this, it is hoped that clinicians will recognise the debilitating holistic effect that mechanical joint pathologies and neurological deficiencies can have on patients' lives with the view to reopen the discussion on when it is appropriate to surgically intervene in hip pathologies in children and especially where osteomyelitis and poliomyelitis is involved.

#### Abstract no.: 47962 RELATIVE SURVIVAL FOLLOWING ELECTIVE TOTAL IS HIP REPLACEMENT SPECIFIC? RESULTS FROM DIAGNOSIS Α NATIONWIDE SURVEILLANCE PROGRAM. Peter CNUDDE<sup>1</sup>, Ola ROLFSON<sup>2</sup>, John TIMPERLEY<sup>3</sup>, Anne GARLAND<sup>2</sup>, Kärrholm JOHAN<sup>2</sup>, Göran GARELLICK<sup>2</sup>, Szilard NEMES<sup>2</sup> <sup>1</sup>SHAR, Llanelli (UNITED KINGDOM), <sup>2</sup>SHAR, Gothenburg (SWEDEN), <sup>3</sup>PEOC, Exeter (UNITED KINGDOM)

Introduction: Despite the fact that total hip replacements (THR) are considered safe and successful in restoring mobility and reducing pain one should still consider the risks associated with surgery including the risk of dying. The purpose of this study was to describe and depict the long-term survival rate for a cohort of Swedish elective THR. We explored whether the survival rate was diagnosis specific and influenced by socioeconomic and surgical factors. Material and methods: Data from the Swedish Hip Arthroplasty Register linked to health and population databases were used. We identified 131,808 patients operated on between 1999 and 2012. Patient- and surgery-specific data in combination with socio-economic data were available for this analysis. We studied relative survival rate and used multivariable modeling proceeded with cox proportional hazards model in transformed time. Results: Patients with THR because of primary osteoarthritis had better relative survival than a matched population up to fourteen years after surgery, whereas THR performed for sequellae of childhood hip diseases had similar survival. Patients undergoing surgery for avascular necrosis, inflammatory arthritis and secondary osteoarthritis had a poorer relative survival. Comorbidities had a negative effect on the relative survival. Uncemented fixation was associated with better survival. This could at least be partly explained by lower age at the index operation. Higher Elixhauser comorbidity index, lower level of education and being widow or single have adverse effects on survival. Conclusion: The relative survival differed depending on diagnosis. Comorbidities and socioeconomic background influenced the survival of the patient.

#### Abstract no.: 47176 LIMPING FOLLOWING A PRIMARY TOTAL HIP REPLACEMENT; THE COMPARISON OF THREE SURGICAL APPROACHES Boonchana PONGCHAROEN

Thammasat university, Patumthani (THAILAND)

Introduction: Hip dislocation after primary total hip replacement (THR) is most common reason necessitating a THR revision. The posterior approach (PA) is particularly associated with hip dislocation following THR. As a result, the direct lateral approach (DLA) and modified anterolateral Watson-Jones approaches (mALWJA) have been increasingly adopted as a means to reduce hip dislocation. However, because it is necessary to cut the anterior portion of the gluteus medius muscle for good exposure in DLA, some studies have shown an increased incidence of post operative limping. Post total hip replacement (THR) limping rates is controversy issue. Therefore, we determine its incidence following PA, DLA, and mALWJA primary THR performed by a single surgeon. The purpose of this study to determine the incidence of limping following primary total hip replacement (THR) using a posterior (PA), direct lateral (DLA), or modified anterolateral Watson-Jones approach (mALWJA) performed by a single surgeon. Materials and methods: We have retrospectively reviewed 94 patients who had undergone 108 primary THRs to ascertain limping rates over at least 2 years as a function of the surgical approach. Results: Group I consisted of 26 patients (30 hips) with PA, group II consisted of 39 patients (41 hips) with DLA, and group III were 29 patients (37 hips) with mALWJA. There was no significant differences (p=0.23) in limping rates: 6.67%, 7.32%, and 2.70% for PA, DLA, and mALWJA, respectively. Conclusions: The three approaches had similar and low rates of post operative limping following primary THR.

#### Abstract no.: 48825 IS IMMEDIATE POST-OPERATIVE PHYSICAL THERAPY NECESSARY AFTER TOTAL KNEE ARTHROPLASTY?

Zachary POST<sup>1</sup>, Peter BOYLE<sup>2</sup>, Fabio OROZCO<sup>2</sup>, Rex LUTZ<sup>2</sup>, Max LIGAMFELTER<sup>2</sup>, Alvin ONG<sup>2</sup>

<sup>1</sup>Rothman Institute of Orthopaedics, - (UNITED STATES), <sup>2</sup>Rothman Institute of Orthopaedics, Egg Harbor Township (UNITED STATES)

It is accepted in the United States, Europe and Australia that some form of physical therapy is warranted following total knee arthroplasty (TKA). Overall, no consensus has been reached regarding the exact post-operative requirements for physical therapy (PT). We hypothesize that immediate post-operative PT is unwarranted and may be detrimental in forming arthrofibrosis and requiring the need for manipulation. The purpose of this study is to determine if immediate post-operative PT is necessary following TKA. We retrospectively reviewed 250 primary total knees in 208 patients performed by a single board certified orthopaedic surgeon between December 2015 and May 2016. One hundred thirty-four knees received PT after a 10-day delay and 116 received PT immediately. Although ASA score was significantly higher in the immediate physical therapy group, there was no difference in age, sex or BMI. No statistical significant difference was found in number of feet ambulated on post-operative day one, range of motion at six weeks and six months, or in manipulation rates. In our study we demonstrated that in today's cost conscious environment, practioners and patients can save by delaying physical therapy following total knee arthroplasty.

#### Abstract no.: 47074 DOES FINAL COMPONENT ALIGNMENT COINCIDE WITH ALIGNMENT OF THE BONE RESECTION SURFACES IN CEMENTED TOTAL KNEE ARTHROPLASTY?

Seung-Suk SEO<sup>1</sup>, Changrack LEE<sup>2</sup>, Muwon KIM<sup>1</sup> <sup>1</sup>Haeundae Bumin Hospital, Busan (SOUTH KOREA), <sup>2</sup>Busan Paik Hospital, Busan (SOUTH KOREA)

Purpose: To examine, whether the final component alignments coincide with alignment of the bone resection surfaces in cemented total knee arthroplasty(TKA), and to evaluate the factors affecting the alignment deviation. Methods: 276 knees who received navigationassisted TKA were retrospectively reviewed. The deviation between the alignment of bone resection surface and the final alignment of femoral and tibial components was measured. The factors that can affect alignment deviation of greater than 2°(outliers) were evaluated. These included age, gender, body mass index, bone mineral density(T-score), preoperative and postoperative mechanical femorotibial angle, preoperative and postoperative flexion contractures, and difference between medial and lateral gaps in knee extension or flexion. Results: Outliers consisted of 24 cases (8.6%) on the femoral coronal plane, four cases(1.4%) on the tibial coronal plane, and 48 cases(17.4%) on the tibial sagittal plane. In the coronal plane(femur and tibia), the outliers were associated with preoperative(p<0.001) and postoperative(p<0.001) flexion contractures; a difference of 3 mm or more between the medial and lateral gaps in knee extension(p<0.041); and a Tscore of less than -2.5(p<0.024). In the sagittal plane of the tibia, the outliers were associated with preoperative (p<0.001) and postoperative(p<0.031) flexion contractures. Conclusion: There was a significant deviation between the alignments of the resection surfaces and the final alignments of components. With larger preoperative and postoperative flexion contractures, there were more outlier risks. The outliers in the coronal plane were associated with a difference of 3 mm or more between the medial and lateral gaps in knee extension and poor bone quality.
# Abstract no.: 46460 KINEMATIC ALIGNMENT OF TOTAL KNEE ARTHROPLASTY Sang Eun PARK, Kugjin CHOI

Dongguk University International Hospital, Seoul (SOUTH KOREA)

Background: Recent studies reported that the kinematic alignment of an implant is more physiological than the traditional methods, and therefore results in better clinical outcomes. Purpose: The purpose of our study is to certify correlation between parameters of implant position and postoperative clinical outcomes after kinematic alignment of TKA. Materials and methods: We obtained all 32 patients with primary osteoarthritis who need surgical treatment. Active ROM (range of motion) and Passive ROM were checked at final visit to office with radiology. Clinical outcomes including post op active knee ROM, TRA (the angle between the perpendicular line to the TEA and Akagi's line), varus and valgus angle of the knee were also analyzed. Results: Clinical outcomes including post op knee scoring and ROM was improved. There were negative linear relationships between the femoral component rotation (internal and external) and active and passive range of motion after kinematic alignment of TKA. And we also found a negative linear relationship between the tibial rotation of the component and active and passive range of motion. And we also found a negative linear relationship between the gamma angle and active and passive range of motion. The gamma angle is most powerful predictive parameter of postoperative range of motion of the knee. Conclusion: The alignment of the component set into the kinematic alignment of the knee: internal rotation of femur implant with good gamma angle in sagittal plane will assure better clinical outcome; ROM and scores.

### Abstract no.: 48104 ANALYSIS OF ANTHROPOMETRIC DATA OF SOUTH ASIAN POPULATION WITH KNEE PAIN

Rajesh MALHOTRA<sup>1</sup>, Vijay KUMAR<sup>2</sup>, Mayur NAYAK<sup>2</sup>, Gaurav KANOGIYA<sup>2</sup>, Deep SRIVASTAVA<sup>2</sup>, Stephen MELLON<sup>3</sup>, David MURRAY<sup>4</sup>, Hemant PANDIT<sup>4</sup> <sup>1</sup>AIIMS, NEW DELHI (INDIA), <sup>2</sup>AIIMS, New Delhi (INDIA), <sup>3</sup>NDORMS, New Delhi (INDIA), <sup>4</sup>NDORMS, Oxford (UNITED KINGDOM)

There is an exponential rise in the need of total knee arthroplasty in India due to the increase in the demand for a better lifestyle subsequent to knee arthritis. Most of the design of TKA implants and its instrumentation are based on measurements of the western knee. Thus there is a need for better understanding of the anatomy of the Indian knee. In this prospective cross sectional study, patients with knee pain were enrolled. A standing scannogram was done which was assessed using a morphometric software. A total of 900 knees were analysed. On standing scannogram, 86.24% of the knee were in varus and 16.76% of the knees were in valgus. The mean hip-knee-ankle axis angle (HKA) was 174.46 degrees (136.85 -202.46 degrees). 88.43 % of the femur had a varus extra articular deformity out of which 84.07% of the femur had varus >2 degrees. The mean femoral vara was 3.86 degrees (21.97 -0.01 degrees). 67.30% of the of the tibia had varus extra articular deformity out of which 62.41% of the tibia had tibia vara > 2 degrees and the mean tibial vara was 2.56 degrees (17.58-0.01 degrees). The mean anatomical angle was 5.44 (3.54-7.28 degrees). The mean distal femoral valgus angle was 4.26 deg (1.76-9.64 degrees). The anthopometric measurements of the Indian knee would help in better understanding of the Indian knee so that it may help in better design of TKA implants in the Indian population.

## Abstract no.: 48072 RELATIONSHIP BETWEEN RADIOGRAPHIC GRADING OF KNEE OSTEOARTHRITIS AND FUNCTIONAL LIMITATION IN ELDERLY PATIENTS

Zenat Ahmed KHIRED prince norah university, Riyadh, Jazan (SAUDI ARABIA)

Background: The objective of this study is to find out the relationship between the Kellgren and Lawrence system for knee Osteoarthritis (OA) and the functional limitation in the daily activities in the elderly patients using WOMAC Questionnaire. Methods: This study was a cross-sectional study. The subjects were 160 patients (131 Females and 29 Males) who were diagnosed with knee OA at an orthopedic clinic using the Kellgren and the Lawrence system with no history of knee joint surgery. Outcome indices were functional limitations in 17 living activities (descending stairs, Ascending stairs, Rising from sitting, Standing, Bending to floor, Walking on flat surface, Getting in/out of car, Going shopping, Putting on socks, Lying in bed, Taking off socks, Rising from bed, Getting in/out of bath, Sitting, Getting on/off toilet, Heavy domestic duties, Light domestic duties) obtained from a WOMAC questionnaire. Results: A significant correlation with p value <1 was seen between increase in knee OA stages in x-rays and the severity of limitation in physical function.

#### Abstract no.: 46396

### : TO EVALUATE AND COMPARE THE EFFECT OF OZONE THERAPY WITH INTRA-ARTICULAR CORTICOSTEROIDS ON FUNCTIONAL QUALITY OF LIFE OF KNEE OA PATIENTS.

Shubhanshu Shekhar SHUBHANSHU SHEKHAR<sup>1</sup>, Anil Kumar Rai ANIL KUMAR RAI<sup>2</sup>, Saurabh Singh SAURABH SINGH<sup>2</sup>, G.N Khare G.N KHARE<sup>2</sup> <sup>1</sup>ERA's Lucknow Medical College, Noida (INDIA), <sup>2</sup>institute of medical sciences bhu, varanasi (INDIA)

A total of 100 Grade I/II knee OA patients were randomized into two groups – Group I (n=50): receiving intra-articular Prolozone (5% concentration O2-O3) and Group II (n=50): receiving intra-articular steroid (Dexamethasone) 2 ml respectvely. Both the groups were compared demographically, radiologically and functionally at baseline. Patients were followed up at 1, 4, 8 and 12 weeks intervals. Functional outcome was assessed in terms of WOMAC scores. Data was analyzed using SPSS 20.0, □2 and 't'-tests were used to compare the data. Result: At baseline mean WOMAC scores in Groups I and II were 62.48±6.80 and 64.68±4.77. In both the groups a decline in WOMAC scores was observed since week 1 itself. At week 12 Mean WOMAC scores were 23.42±7.64 and 34.30±5.24 respectively in Groups I & II. Statistically, the difference between two groups was significant statistically at all the follow up intervals except at baseline and week 4. Conclusion: Ozone therapy was found to have a better and sustainable positive effect on functional quality of life of knee OA patients. Key words: Ozone therapy, Prolozone, Corticosteroids, knee OA, dexamethasone

#### Abstract no.: 48831 QUALITY OF LIFE AFTER LARS RECONSTRUCTION FOR ACL TEARS: A PROSPECTIVELY PLANNED 12-YEARS FOLLOW-UP STUDY

Gerwin Alexander BERNHARDT<sup>1</sup>, Anna Verena KIEGERL<sup>2</sup>, Patrick SADOGHI<sup>2</sup>, Norbert KASTNER<sup>2</sup>, Matthias WOLF<sup>2</sup>, Andreas LEITHNER<sup>2</sup>, Gerald GRUBER<sup>2</sup>

<sup>1</sup>Department of Orthopedics and Trauma, Medical University of Graz, -(AUSTRIA), <sup>2</sup>Department of Orthopedics and Trauma, Medical University of Graz, Graz (AUSTRIA)

Background Rupture of the anterior cruciate ligament (ACL) is a common injury. The LARS (Ligament Advanced Reinforcement System) is a synthetic ligament made out of polyethylene terephthalate, which can be used for primary replacement of the ACL. Data of long term results after LARS ACL reconstruction are lacking. The aim of this study was to evaluate long-term results after LARS reconstruction of the ACL with focus on health related quality of life (HRQOL). Methods Forty-three consecutively operated patients (14 females) with a mean age of 40±11 who underwent primary ACL reconstruction using LARS were included. The minimum follow-up was 12 years. Patients' evaluation included physical examination and plain radiography as well as scoring of SF-36 for HRQOL, IKDC Score, Lysholm Score and Tegner Activity Scale. Results After 156±12 months there were in total 51% complications including 37% re-ruptures; 32% of patients had surgical revisions including second ACL replacement in 15%. The results in the scoring systems were guite satisfactory with a median Tegner of 4 (3-6), mean Lysholm of 91±9 and IKDC of 85±12. The results of the SF-36 were comparable to the results of the norm population. Conclusion To the best of our knowledge this is the first study of LARS ACL reconstruction cases with a minimum follow-up of twelve years. We found questionable clinical results in the long term. However, these results do not seem to influence scoring results and do not result in impaired HRQOL.

## Abstract no.: 48707 ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION BY HOURGLASS TECHNIQUE: A 12 YEARS EXPERIENCE

Mohammed ELRAKAYBI Saudi German hospital, jeddah (SAUDI ARABIA)

Introduction: The hourglass technique for anterior cruciate ligament reconstruction using the bone-patellar tendon-bone autograft has several functional and clinical advantages when compared to other techniques. This retrospective study aims to evaluate the outcome associated with implementation of such technique with two year follow-up period. Patients: 900 patients were operated from the period may 2002 till june 2014 using the same technique. All the patients were males. The ages ranged from 18 to 41 years, with a mean of 29 years. The cases in the study group comprised of 300 isolated torn ACL, 310 torn ACL with torn medial meniscus, 134 torn ACL with torn lateral meniscus, and 156 cases with torn ACL associated with tear in both menisci. All patients were assessed preoperatively clinically and via MRI. A transtibial femoral tunnel was performed in all cases with antegrade application of the graft and fixation of the graft to the tibial side using titanium screw. Fixation of the graft to the femoral end is by the hourglass technique where the graft would be press fit into the femoral tunnel WTH the need of any implants. Functional outcomes were assessed using the Lyshom and International knee documentation committee scores. Conclusion: This study proved that ACL reconstruction via the patellar tendon using the hourglass technique has several noted advantages in the form of initial perfect stability of the graft, minimal rate of laxity, allows early partial and full weight bearing, and is considered as a cost-effective procedure over the long term.

Abstract no.: 48416 COMPARISON OF SHORT AND NORMAL FEMORAL TUNNEL-GRAFT LENGTH OF HAMSTRING TENDON ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION : A CLINICAL AND FUNCTIONAL OUTCOME EVALUATION OF INTERMEDIATE TERM FOLLOW UP Thanachai THONGTANWORAPAT<sup>1</sup>, Bancha CHERNCHUJIT<sup>2</sup> <sup>1</sup>Department of Orthopedic Surgery, Faculty of Medicine, Thammasat University, nontaburi (THAILAND), <sup>2</sup>Department of Orthopedic Surgery, Faculty of Medicine, Thammasat University, Pathumthani (THAILAND)

Background : The minimum amount of hamstring graft in femoral tunnel required for successful incorporation is unknown. Smaller graft diameter is associated with increased risk of graft failure following anterior cruciate ligament reconstruction. For obtaining a larger diameter has increased the number of graft strand that expense of graft length. Sometime graft contact in femoral tunnel is less than 15 mm (short group). We hypothesize that no difference of functional outcome and clinical evaluation between short and normal femoral tunnel graft length of hamstring tendon ACL reconstruction of intermediate follow up. Material and Method : The retrospective cohort study and intermediate follow up (6 month-24 month). This study include 29 patients who underwent ACL reconstruction using hamstring tendon and endobutton fixation (March 2014 -September 2015). Result of short and normal femoral graft length of ACL reconstruction were assessed via stability index and functional outcome with Tegner Lysholm knee score, IKDC subjective score. Result : 15 patients in normal femoral graft length and 14 patients in short femoral graft length of ACL reconstruction using hamstring tendon. The clinical and functional outcome between short and normal femoral graft length in ACL reconstruction was no significant difference. Conclusion : Using short of femoral graft length can provide a good clinical and functional outcome of hamstring tendon ACL reconstruction of intermediate term follow up.

#### Abstract no.: 46584 DOES LATERAL MENISCAL ALLOGRAFT TRANSPLANTATION USING THE KEY-HOLE TECHNIQUE RESTORE THE ANATOMICAL LOCATION OF THE NATIVE LATERAL MENISCUS?

Seong-II BIN<sup>1</sup>, Jae Young KIM<sup>2</sup>, Sung Mok OH<sup>2</sup>, Sungwook CHOI<sup>3</sup> <sup>1</sup>Orthopaedic Surgery, Asan medical center,, Seoul (SOUTH KOREA), <sup>2</sup>Orthopaedic Surgery, Asan medical center,, seoul (SOUTH KOREA), <sup>3</sup>The scripps Research, Jeju national university, Jeju (SOUTH KOREA)

purpose: The purpose of this study is to compare the anatomical positions of the anterior horn(AH) and posterior horn(PH) between the preoperative lateral meniscus(LM) and postoperative meniscal allograft(MA) following lateral meniscal allograft transplantation(LMAT) using a key-hole technique Methods: Between 2012 and December 2014, 70 patients underwent LMAT using a key-hole technique. Anatomical positions of both horns in the native LM and in the MA were measured on magnetic resonance images(MRI). The percentage reference method described by Wilmes was used to measure the locations of both horns. Results: The mean delta value of absolute position of AH was 0.7±1.8 mm (95% CI, 0.3 – 1.1) in the coronal plane and 0.5±1.6 mm (95% CI, 0.2 -0.9) in the sagittal plane. The mean delta value of the absolute position of PH was 2.4±2.6 mm (95% CI, 1.8 – 3.1) in the coronal plane and -0.1±2.1 mm (95% CI, -0.6 – 0.4) in the sagittal plane. Therefore, the AH moved by mean 0.7 mm laterally and mean 0.5 mm anteriorly, the PH moved by mean 2.4 mm laterally and mean 0.1 mm posteriorly compared with preoperative position. Conclusion: The both horns showed relative postsurgical positional changes of < 5% of relative values and < 5mm of absolute values in both the coronal and sagittal planes. A key-hole technique in lateral MAT can reconstruct the lateral meniscus close to its native anatomical position by avoiding displacement of more than 5 mm in both coronal and sagittal plane.

# Abstract no.: 48149 MANAGEMENT OF BONE GAPS BY ILIZAROV RING FIXATOR

Anirudha CHANDAK<sup>1</sup>, Varun SHAH<sup>2</sup> <sup>1</sup>Chandak Hospital and Research Institute, gwalior (INDIA), <sup>2</sup>Datta Meghe Institue of Medical Sciences, Wardha (INDIA)

Purpose: The study was to evaluate the effectiveness of application of Ilizarov ring fixator in the management of bone gaps due to infection, trauma or tumors. Methods: 23 patients with bone gaps were managed by Ilizarov ring fixator application. Bone segment transport was done in all the patients having bone defects either at first place or after their primary surgery by some other modality. Results: All fractures united and infection eradicated completely. There were 10 excellent, 7 good, and 5 fair and 1 poor results on the basis of bone result. Functional result was excellent in 6, good in 10, fair in 6 and poor in 1 patient, mean bone defect was of 8.5 cm (5 - 18). At the last review all but one patient were able to walk on their operated leg with or without an orthosis. Conclusion: We conclude that Ilizarov ring fixator is a reliable method of treatment of bone gaps. Our result compare favourably with those of the other Goldstrohm, Weiland, Paley. In our series, the functional result seems to be inferior to the bone result. However it should be emphasised that our series included many complicated cases. An excellent bone result even in a patient who has a severe infection does not guarantee a good functional result. Ilizarov considered this as an essential principle of his method, 12 of our patients were able to return to work during the treatment period.

# Abstract no.: 47814 JUDET'S QUADRICEPSPLASTY FOR KNEE EXTENSION CONTRACTURE

Md Mofakhkharul BARI Bari Ilizarov Orthopaedic Centre, Dhaka (BANGLADESH)

Background: Knee stiffness is seen after peri-articular knee fractures or fracture of the femur and upper tibia. Acquired knee extension contracture may be posttraumatic and secondary to knee surgery. Judet's Quadricepsplasty has been used for over half a century to manage this debilitating condition but even literature from our region is limited. Materials and Methods: We retrospectively reviewed the results of 36 cases of knee contracture managed with Judet's guadricepsplasty during the last years having a mean follow up of 20 months. Degrees of flexion of the operated knees pre-operatively and at last follow up recorded along with quadriceps strength, presence of extension lag and Outcomes were classified according complications. to Judet's criteria. Judet Quadricepsplasty: This is a proximally based quadriceps muscle slide that addresses all the elements of the knee contracture. It was popularized by Letournel. Stepwise release of the knee and quadriceps muscle. Step-I: Intra articular release. Step-II: MCL and medical capsular release Step-III: Rectus femoris release Step-IV: Quadriceps muscle slide Step-V: Fractional lengthening of fascia lata and anterior fascia of thigh. Results: The degree of flexioin increases from 10 degrees to (0-90 degrees). Mean quadriceps strength at follow up was 4.5 without extension lag. The outcome according to Judet's criteria last follow up was excellent in 25 patients, good in 9 patients and poor in 2 patients. Conclusion: By doing 5 steps surgery we can correct upto 900 flexion of knee extension contracture. It is a useful procedure to increase the range of motion of rigid knees.

Abstract no.: 47809 LIMB SALVAGE IN SEVERE OPEN FRACTURES OF THE TIBIA Md Mofakhkharul BARI Bari Ilizarov Orthopaedic Centre, Dhaka (BANGLADESH)

INTRODUCTION: Treatment of Grade IIIB of the tibia poses a challenge. We routinely use the Ilizarov fixator to treat all Grade IIIB fractures of the tibia, seldom resorting to plastic surgery for free flap cover. METHOD: Between January 2000 and January 2014, 65 patients with Grade IIB fractures with massive bone and soft tissue loss were treated using the Ilizarov. The average bone and soft tissue loss of these patients was 11 cm. Mean duration of treatment was 18 months. Complications occurred in 23 patients. Pin track infection occurred in 23 patients, 20 resolved with dressing and antibiotics whilst 3 patients required removal and reinsertion of the pins. 15 patients developed equinus, of this 6 developed equinus with clawing of toes and one of these had knee stiffness. The equinus was treated gradually with foot frame to a plantigrade foot resulting in a stiff ankle. Clawing of toes was treated surgically by acutely extending the toes and inserting axial K-wires leading to stiff ankle and toes. Results: 39 patients and excellent results; varus or valgus of less than 10degree. Knee range of motion at least 90degree with full range of motion of ankle and toes. Result was fair in 15 patients; nine had stiff ankle, 5 had stiff ankle and toes and one had stiff ankle, knee and toes. Conclusion: The Ilizarov showed effective method of treating Grade IIIB fractures of the tibia with massive bone and soft tissue loss.

## Abstract no.: 47738 ADDITIONAL TITANIUM MESH CAGE IN INDUCED MEMBRANE TECHNIQUE ACCELERATES HEALING AND FUNCTION DURING RECONSTRUCTION OF LONG BONE DEFECTS Ashok Sunil GAVASKAR

Parvathy hospital, Chennai (INDIA)

Induced membrane technique (IMT) is a 2 stage method that is used for treating long bone defects. The technique avoids the problems with external fixator frames, but patients often have to remain largely non-functional during consolidation. Our aim was to study whether addition of a titanium mesh cage can make patients more functional during the process of bony consolidation. 33 patients with lower limb segmental defects following acute traumatic bone loss/ infected nonunion treated with the IMT were prospectively followed. Group A - 19 patients were treated with IMT using IL nails/ LCPs and autologous bone grafts and group B - 14 patients were treated with IMT using IL nails with a overlapping titanium mesh cage filled with autologous bone grafts. Time to union, weight-bearing, return to work and lower extremity functional scale scores (LEFS) at 3,6 and 12 months were compared. Patients in group B were allowed weight immediately compared to 6.3 ± 1.6 months in group A. Radiological union (6.7 ± 1.6 months vs 8 ± 2.5 months, P < 0.001), time to return to work (3.3  $\pm$  1.2 months vs 5.6  $\pm$  1.8 months, P < 0.001) were significantly early in group B. The LEFS scores were significantly better in group B at 3, 6 and 12 months (P < 0.05). Addition of a titanium mesh cage makes the patient significantly more functional during defect consolidation as evident by better functional scores and early return to work. It also leads to early bridging of the defect

## Abstract no.: 47226 EXPERIENCE OF 1000 UNSTABLE TROCHANTERIC FRACTURES TREATED BY DHS & ELSHAFIE DYNAMIC DEROTATION (EDD) PLATE Mohamed ELSHAFIE Minia University, Minia (EGYPT)

Background: Half of trochanteric fractures are unstable, and in osteoporotic patients failure rate is as high as 20%. We propose that rotation of the proximal fragment around single axis screw is common mode of failure, as it leads to loss of contact medially. Use of Derotation screw alone has poor fixation in the lateral thin cortex, and if through trochanteric stabilization plate, it does not make a fixed angle, and can still rotate with the proximal fragment. Patients and Methods: A new plate has been designed that it overlies the proximal 2 holes of the DHS plate. Proximal extension of the plate has 9mm. tunnel for shaft screw. This makes a fixed angle while allowing dynamic compression by being parallel to the lag screw. Over 1000 patients with unstable trochanteric fractures have beenprospectively treated by DHS and the new plate. Demograhic data are presented and follow up duration was of minimum 1 year (1 - 12 years). A new classification concept of instability is proposed & compared to results. Results: Union rate and complications were comparable to results of overall trochanteric fractures treated by DHS in the literature, and better than similar groups of unstable fractures. The new classification method showed statistically significant correlation with results. Conclusion: Excellent clinical results with law failure rate confirm the hypothesis of improved mechanical efficiency of the Dynamic Hip Screw by the new Dynamic Derotation plate. We advice its use as addition to Dynamic Hip Screw in unstable trochanteric fractures.

## Abstract no.: 46884 DOES ACHIEVING THE 'BEST PRACTICE TARIFF' CRITERIA FOR FRACTURED NECK OF FEMUR PATIENTS IMPROVE ONE YEAR OUTCOMES?

Samuel WHITAKER<sup>1</sup>, Sohail NISAR<sup>2</sup>, Andrew SCALLY<sup>3</sup>, Graham RADCLIFFE<sup>2</sup> <sup>1</sup>Bradford Royal Infirmary, Leeds (UNITED KINGDOM), <sup>2</sup>Bradford Royal Infirmary, Bradford (UNITED KINGDOM), <sup>3</sup>University of Bradford, Bradford (UNITED KINGDOM)

Background: 'Best Practice Tariff' (BPT) criteria have been developed to improve perioperative care for hip fracture patients in the UK. This paper aims to explore the impact of BPT criteria on one-year outcomes. Methods: Anonymised data was acquired from the National Hip Fracture Database (NHFD) for patients presenting to Bradford Royal Infirmary with a fractured neck of femur during the period April 2011 to October 2015. Two study groups were defined: those that achieved the BPT uplift criteria, and those that did not. Three primary outcome measures were identified: one year survival, mobility status and residential status. Further analysis was performed to ascertain whether any individual BPT target significantly affected one-year outcomes. Results: 1370 cases were included, 751 (55%) of whom met the BPT criteria. The 1-year mortality rate for the BPT-achieved group was 32.2%, compared with 38% in the non-BPT group (risk reduction=9.3%, p=0.0264, CI 95%). Mobility status declined by at least 1 grade in 50.3% of the BPT-achieved group, compared with 60.3% of the non-BPT group (risk reduction=16.5%, p=0.0031, CI 95%). BPT achievement had no significant effect on residential status at one year. Multivariate analysis identified that post-operative Abbreviated Mental Test Score (AMTS) and falls assessment were significantly associated with reduced one year mortality. Similarly, both pre- and post-operative AMTS assessments resulted in greater potential to return to premorbid mobility level. Conclusions: Achieving the BPT requirements has a significant impact on one-year mortality and return to pre-morbid mobility level.

### Abstract no.: 46764 OUTCOME OF EXPERT TIBIAL NAIL IN META-DIAPHYSEAL FRACTURES OF TIBIA-A STUDY OF 50 CASES Ramchander SIWACH Pt. B. D. Sharma PGIMS, Rohtak (INDIA)

Background: Intramedullary nailing is effective and well-established method for the treatment of wide spectrum of tibial fractures. Nevertheless, the handling of metaphyseal, segmental and open tibial fractures remains challenging. Numerous modifications in nail and screw design have led to the development of the Expert Tibial Nail. It enables the surgeon to further extend the spectrum of fractures eligible for intramedullary nailing. Methods: A prospective study was conducted in 50 skeletally mature patients with unstable fractures of tibia. Thirty-two (64%) fractures were in lower 1/3rd , 15(30%) fractures in proximal 1/3rd of the tibia; and 3(6%) were segmental fractures. 34(68%) were closed and 16(32%) were open fractures 3(6%) Grade I, 7(14%) Grade II, 1(2%) Grade IIIA and 5(10%) Grade IIIB. Using trans/ para patellar approach expert tibial interlocking nail was done achieving fracture reduction by close methods or open method. Results: Results were assessed on the basis of Johner and Wruh criteria. Acceptable radiographic alignment, defined as <5 degrees of angulations in any plane, was obtained in forty six patients (92%). Forty-six (92%) of fracture united radio logically in average duration of 18.5 weeks. Complication included two (4%) delayed union, two (4%) non union, superficial infection two (4%) and one (2%) deep infection, screw back out in 1 (2%) and one (2%) screw breakage while dynamization. The overall functional outcome was excellent or good in 44 (88%) patients, fair in 2 (4%) and poor in 4 (8%). Conclusion: The Expert Tibial Nailing is a reliable alternative in meta-diaphyseal fractures of tibia.

## Abstract no.: 46496 RISK FACTORS FOR FIBULAR NAIL FAILURE IN THE MANAGEMENT OF UNSTABLE FRACTURES OF THE ANKLE JOINT Tom CARTER<sup>1</sup>, Samuel MACKENZIE<sup>2</sup>, Katrina BELL<sup>2</sup>, Marcus HOLLYER<sup>2</sup>,

<sup>1</sup>Edinburgh Trauma Unit, Royal Infirmary of Edinburgh, EDINBURGH (UNITED KINGDOM), <sup>2</sup>Edinburgh Trauma Unit, Royal Infirmary of Edinburgh, EDINBURGH Edinburgh (UNITED KINGDOM)

Background: Intramedullary fibular fixation provides secure fixation, high outcome scores and low complication rates. We assess radiographic failures to determine (1) failure frequency (2) radiographic risk factors for failure and (3) classification of failure modes. Methods: We identified 333 fibular nail cases over an 8-year period, with adequate digitally processed radiographs for analysis and a minimum follow up to fracture union. Demographic data, fracture classification, and detailed peri-operative radiographic parameters were recorded. Failed cases underwent scrupulous assessment. The primary outcome measure was failure of lateral malleolar fixation requiring revision. Results: There were 332 patients in total with 262 cases (79%) of supination-external rotation (SER) type fractures and 58 cases (17%) with syndesmotic injury. Mean radiographic follow up was 39.5 weeks (6-396 weeks). In 20 patients (6%) the construct failed prior to healing, requiring revision: loss of proximal locking screw fixation (n=4) and surgeon error (n=16). Poor implementation of non-weight-bearing mobilisation in patients with syndesmotic injuries was common (n=8). In five cases, intraoperative fluoroscopy demonstrated inadequate talar reduction or poor nail placement. In three cases, the proximal locking screw was not secured. Independent risk factors for failure were pronation-abduction type fractures (p=0.035), syndesmotic injury (p=0.006), poor intra-operative mortice reduction (p=0.045) and a proximally sited locking screw >20 millimetres above the plafond (p=0.003). Conclusion: Fibular nail fixation offers stable fixation whilst minimising soft tissue complications. This review has allowed us to understanding the failure modes better. Subsequently the manufacturer has changed the nail design providing interlocking screws to improve pullout strength.

## Abstract no.: 46316 IS THE INTERTROCHANTERIC FRACTURE EVOLVING? TRENDS IN THE ELDERLY POPULATION OVER A 10 YEAR PERIOD.

Jegathesan T

Tan Tock Seng Hospital, Singapore (SINGAPORE)

The objective of this study was to analyze possible trends in the morphology and demographics of intertrochanteric fractures of the hip in the elderly population, as well as surgical fixation patterns for these fractures between 2004 & 2013. A retrospective cross sectional comparison was undertaken for the first 100 consecutive elderly patients with intertrochanteric fractures admitted to our tertiary institution in the years 2004, 2007, 2010 and 2013. Fractures were classified via the Evans and AO classifications. Patient demographics and surgical data were collected via casenotes review. The overall mean age of the patients in the study was 80.5 years, with majority being of Chinese ethnicity (85.0%). There was no statistically significant trend among age, gender, ethnicity and comorbidities over the 10 year period. The main finding was a rise in the proportion of unstable intertrochanteric fractures. The proportion was 30% in 2004, 42% in 2007, 47% in 2010 and 62% in 2013. (p<0.0001) We also found a continued increase of unstable intertrochanteric fractures among patients in the "60-69" year old age group. With regards to patient outcomes, we uncovered an increasing trend towards early fracture fixation (p<0.0001), and a greater usage of intramedullary nailing devices in the treatment of such fractures in recent years. (p<0.0001) Intertrochanteric fractures in elderly patients have evolved into more complex fractures over the past ten years. This may likely to be due to our aging population, more severe osteoporosis as well as the development of osteoporosis at an earlier age compared to previously.

### Abstract no.: 48253 DEMOGRAPHICS AND RISK FACTORS FOR NON-ACCIDENTAL ORTHOPEDIC TRAUMA

R Justin MISTOVICH<sup>1</sup>, Julian GATTA<sup>2</sup>, Lakshmanan SIVASUNDARAM<sup>2</sup>, Anne NING<sup>2</sup>, Nikunj TRIVEDI<sup>2</sup>, Chang-Yeon KIM<sup>2</sup> <sup>1</sup>Case Western Reserve University School of Medicine, Cleveland Heights (UNITED STATES), <sup>2</sup>Case Western Reserve University School of Medicine, Cleveland (UNITED STATES)

Introduction: Childhood non-accidental trauma (NAT) is the second most common cause of death in children in the US. However, this condition is frequently unreported due to provider misdiagnosis or unawareness. Identifying risk factors for NAT may assist providers in identifying these vulnerable patients. While prior database studies have investigated NAT, these studies utilized data from as early as 1997, which may limit their relevance today. The purpose of this study was to utilize a more recent data sample to assess the current demographics and risk factors associated with NAT. Methods: A retrospective review of the Kid's Inpatient Database, a mandatory nationwide discharge database, was performed for the years 2009 and 2012. Patient and hospital characteristics were identified. Univariate and multivariate analysis were used to determine statistically significant independent risk factors for NAT. Results: In 2009 and 2012, 174,442 children were hospitalized for fractures, 2.07% (3,614) of which were due to NAT. The majority of NAT victims were Caucasian males less than one year-old, presenting to large, urbanteaching hospitals on weekdays. Lower extremity (femur, tibia/fibula, foot), clavicle, pelvis, and spine fractures were more likely to be as a result of NAT. Children with anxiety, attention-deficit, conduct, developmental, and mood disorders were more likely to experience NAT, while those with cerebral palsy and autism were not at an increased risk for NAT. Conclusion: NAT remains a persistent problem. Recognizing patient-specific risk factors and at-risk fracture patterns may help physicians better identify NAT victims.

#### Abstract no.: 47749

PLASTER CAST TREATMENT FOR DISTAL FOREARM FRACTURES IN CHILDREN: WHICH INDEX BEST PREDICTS RE-DISPLACEMENTS? Ilaria MORELLI<sup>1</sup>, Domenico RAVIER<sup>2</sup>, Valentina BUSCARINO<sup>3</sup>, Luca Maria SCONFIENZA<sup>3</sup>, Andrea SPREAFICO<sup>4</sup>, Domenico CURCI<sup>5</sup> <sup>1</sup>University of Milan - Paediatric Orthopaedics Unit, IRCCS Galeazzi Orthopaedic Institute, Milan, Milan (ITALY), <sup>2</sup>University of Milan - Trauma Surgery Unit, IRCCS Galeazzi Orthopaedic Institute, Milan, Milan (ITALY), <sup>3</sup>University of Milan - Diagnostic and Interventional Radiology Unit, IRCCS Galeazzi Orthopaedic Institute, Milan, Milan (ITALY), <sup>4</sup>University of Milan -Sports Traumatology and Arthroscopic Surgery Unit, IRCCS Galeazzi Orthopaedic Institute, Milan, Milan (ITALY), <sup>5</sup>Paediatric Orthopaedics Unit, IRCCS Galeazzi Orthopaedic Institute, Milan, Milan (ITALY)

Several studies presented radiographic parameters to evaluate short arm cast adequacy for pediatric distal forearm fractures. Hence, Cast, Padding, Canterbury, Gap, Three-point indices and the ulnar deviation angles (2°/3° metacarpal-radius) were introduced. This study aims to discover the best index in predicting in-cast re-displacements. 124 patients (97 males, 27 females) affected by distal forearm (42) or distal radial (82) fractures treated with short casts at Galeazzi Orthopedic Institute, Milan, were included. For each case, these indices were calculated, as well as the Displacement Angles on the after-reduction x-ray (DA0) and on the x-rays at 7 (DA7) and 30 (DA30) days after the trauma. Chisquare, Student T-test and logistic regression were used for the analysis. Forearm fractures have a higher risk of re-displacement than radial fractures (OR1.21, p<0.001). The increase of re-displacement in the antero-posterior (AP) and lateral views for forearm fractures showed respectively a positive Pearson's correlation (p0.037) and association (p0.045) with a high Gap Index. Regarding radial fractures, a high Cast index is associated with an increase of in-cast displacement in AP (p0.035). The main risk factors of redisplacement are: DA0 in AP>25° (p 0.003) and >15° in lateral view (p0.005) for forearm fractures; DA0>15° in lateral view for simple radial fractures (p0.003); high Cast (logistic regression OR 2842, p0.019), Padding (p0.034) and Canterbury (p0.002) indices for both forearm and radial fractures. Ulnar deviation angles and Three Point index were not related to re-displacements. An adequate reduction, followed by short casting according to these indices may prevent re-displacements.

### Abstract no.: 47179 CSPINE (CORRELATION OF SOFT TISSUE PROJECTION IN INJURED NECKS). A DESCRIPTIVE STUDY.

Jeannie MCCAUL<sup>1</sup>, Anria HORN<sup>2</sup>, Michael MCCAUL<sup>3</sup>, Stewart DIX-PEEK<sup>2</sup> <sup>1</sup>Department of Orthopaedic Surgery, Groote Schuur Hosptial, University of Cape Town, Cape Town (SOUTH AFRICA), <sup>2</sup>Department of Orthopaedic Surgery, Red Cross Children's Hospital, University of Cape Town, Cape Town (SOUTH AFRICA), <sup>3</sup>Centre for Evidence-based Health Care, Division of Epidemiology and Biostatistics, Department of Global Health, Stellenbosch University, Cape Town (SOUTH AFRICA)

In paediatric trauma, measured increase in soft tissue width on lateral cervical spine (Cspine) X-ray is often interpreted as swelling, raising C-spine injury suspicion. Defining swelling in absolute measurements is cumbersome - children's sizes vary. Evidence for potentially more consistent tools that measure soft tissue width as a ratio of vertebral body width is lacking. Clinical decision rules should be based on best available evidence to minimize patient harms and improve health outcomes. To determine whether consistent, measurable ratios exist for use as a simple diagnostic tool in assessing paediatric soft tissue swelling and C-spine injury, a pragmatic quantitative descriptive study sampled Cspine X-rays taken at Red Cross Children's Hospital for trauma. 71 non-intubated X-rays from 85 controls were used to identify a "normal" ratio, and was compared to 20 cases to determine diagnostic accuracy. The authors chose the two most consistent ratios (lowest standard error, for upper and lower C-spine). Provisional analysis shows mean C2 soft tissue width was 37.8% of C7 vertebral body (95% confidence interval (CI):33.8-41.8%) and C6 was 64.6% of C7 body(CI:60.9-68.2%). A Receiver Operating Curve calculation gave an empirical optimal cutpoint of 53.9% and 74.4% respectively. Using a practical cutoff of 55% at C2 and 75% at C6 yields specificity of 92.3% (CI:83-97.5%) and 81% (CI:70.4-90.2%), with negative predictive values of 90.9% (CI:81.3-96.6%) and 91% (CI:81.3-97.2%). Consistent ratios exist; however low sensitivity implies poor screening value. Low injury prevalence causes poor positive predictive value. Swelling may rule in injury in higher-risk populations.

### Abstract no.: 48338 ROLE OF BETA-TCP AS BONE AUTOGRAFT EXPANDER IN MANAGEMENT OF FEMUR FRACTURE WITH SEGEMENTAL DEFECT USING MASQUELET'S TECH Sandeep GUPTA GMCH,Sector-32,Chandigarh, Panchkula (INDIA)

We analyzed the use of bone graft substitute (Beta tri-calcium phosphate) as autologous bone-graft expander in management of femur fracture with critical segemental defect>5cm using masquelet's induced membrane technique.24 patients of segmental femoral bone defect of 5-12 cms managed with 2 stage masequelets technique were studied. Patients were divided in 2 cohorts i.e one (8patients) where only autograft was used and other cohort(16 patients)where autograft volume was inadequate and hence augmented using beta-TCP granules.All the patients were available for followup.Bony reconstruction was done using masquelets induced membrane technique.During 2nd stage bone-grafting procedure, defect was filled with iliac-crest autograft wherever possible. Autograft was augmented using beta-tricalcium phosphate granules in patients wherever the volume of harvested autograft was found to be inadequate .Primary outcome measure evaluated was bony union which was achieved in 87.5% patients (21/24 patients)with index bone grafting.3 patients showed lack of consolidation after first bonegrafting procedure. All 3 of these patient united after second bone-grafting procedure . All 3 of these patients were active smokers. Age .time to bone-grafting after 1st stage were not found to be significant factors affecting union.4 patients had recurrence of infection manifested by discharging sinus after union which settled after appropriate implant removal.We concluded that, masequelets technique is a highly effective technique of managing femur fracture with critical segmental defect equal to or >5cm.Beta-Tri-calcium phosphate is an efficacious and safe autologous bone graft expander which can be used with excellent results in this technique. Patients should be counseled regarding increased risk of requiring additional procedures for union if they are active smokers.

## Abstract no.: 46984 FUNCTIONAL OUTCOMES OF PRE-CONTOURED CLAVICULAR LOCKING PLATE FIXATION FOR DISPLACED MIDSHAFT CLAVICLE FRACTURES IN ADULTS.

Bandhuram PANGENI, Dirgha Raj RC, Parimal ACHARYA, Kapil Mani KC, Arun SIGDEL, Suman Babu MARAHATTA Civil Service Hospital, Kathmandu (NEPAL)

Background: The treatment of displaced clavicle fractures remains controversial. Most of the fractures in the past were successfully managed by conservative treatment, however treatment has inclined more towards the operative fixation nowadays because of quick recovery and patients do not require to wear the clavicular brace for prolonged time. The aim of our study is to assess the functional outcomes and complications after operative treatment for midshaft clavicle fractures. Methods: This was a retrospective cross sectional analytical study done in Civil Service hospital from Jan 2012 to Feb 2016. 150 patients with midshaft clavicle fractures who were surgically treated with pre-contoured clavicle locking plate were evaluated postoperatively according to Constant score, Disability of the Arm, Shoulder, and Hand (DASH) score and plain radiographs for functional and radiological outcomes with a minimum follow up of 12 months. Results: There were 92 (61.33%) males and 58 (38.66%) females in our study. Mean hospital stay was 7.37days ± 1.12SD days. Average time taken to heal the fracture was 14.92±1.48SD in weeks. Mean Constant and DASH score were 86.60±4.10SD and 17.75±1.45 SD respectively. Six patients had nonunion. Three patients had superficial skin infections in the early postoperative period. There were no deep infections. Conclusions: Precontoured clavicular locking plate is a safe and effective treatment for displaced midshaft clavicular fractures with operative indications. Patients of operative group have better functional outcomes than conservative group and they can return to their normal work at earlier as compared to the non-operative groups.

## Abstract no.: 48086 FRACTURES OF THE CAPITULUM: ABOUT 15 CASES Nadhir MERAGHNI<sup>1</sup>, Riad BENKAIDALI<sup>2</sup>, Abdelrezak CHOUITI<sup>2</sup>, Mohamed KIHAL<sup>2</sup>, Zoubir KARA<sup>2</sup> <sup>1</sup>Orthopedic Department, CHU Mustapha Bacha, Algiers (ALGERIA), <sup>2</sup>Orthopedic Department, CHU Mustapha Bacha, algiers (ALGERIA)

Introduction: fractures of the humeral capitulum are rare injuries. The authors report a retrospective study of 15 cases. Methods: between 2005 and 2013, twelve females and three males with a mean age of 38 years (range: 18-78 years) were operated. According to the classification of Bryan and Morrey, twelve fractures were classified as type I and three type II. Fracture was diagnosed within 24 hours of injury excepted one case where the fracture was neglected. All patients were operated. The surgical techniques used were screw fixation in fourteen cases and Kirschner wires in one case. Most patients were mobilized in 3 weeks time. All patients were clinically and radiologically assessed. Results: patient outcome was assessed subjectively by scoring the patients residual symptom of pain and their overall satisfaction of the treatment received. Objective assessment was performed using the Mayo Performance Index (range of motion, assessment of functional status, pain and stability of the joint) 9 patients were rated as excellent; 3 as good and 2 as poor because of absence of functional rehabilitation. There were no instances of infection or avascular necrosis. Discussion: diagnosis of this fracture is often missed. Anatomic reduction, stable internal fixation and early post-operative mobilisation leads to best results and can avoid complications which are primarily avascular necrosis, degenerative arthritis and heterotopic ossification. Conclusion: fractures of the capitulum are rare and often lead to significant disability by limiting elbow motion. Capitellar fractures frequently require internal fixation to restore the anatomic integrity of the elbow joint.

### Abstract no.: 47539 CHANGES IN THE ANKLE JOINT AND HINDFOOT ALIGNMENT FOLLOWING VARUS DEFORMITY CORRECTION OF THE KNEE WITH TOTAL KNEE ARTHROPLASTY

Bi O JEONG<sup>1</sup>, Chungsoo HAN<sup>2</sup>, Yoonje CHO<sup>3</sup>, Hyuk JUNG<sup>3</sup> <sup>1</sup>Department of Orthopaedic Surgery, College of Medicine, Kyung Hee University, - (SOUTH KOREA), <sup>2</sup>Department of Orthopaedic Surgery, Collegel of Medicine, Kyung Hee University, Seoul (SOUTH KOREA), <sup>3</sup>Department of Orthopaedic Surgery, College of Medicine, Kyung Hee University, Seoul (SOUTH KOREA)

Purpose: The purpose of this study is to analyze the changes in ankle and hindfoot joint alignment when mechanical axis alignment is corrected by correction of varus deformity of the knee with total knee arthroplasty (TKA). Materials and methods: 375 knees that underwent TKA for primary osteoarthritis with varus deformity were prospectively studied. The degree of varus deformity of the knee joint was measured in standing long leg anteroposterior views taken before and 6 months after TKA. Ankle and hindfoot alignment was evaluated in standing ankle joint anteroposterior views and hindfoot alignment views taken before and 6 months after operation. Results: The mean mechanical angle of the knee changed from varus 10.6±5.1° before operation to varus 0.1±3.2° after operation. Talar tilt changed significantly from 0.3±2.0° to 0.0±1.6°, implying a varus change of the ankle joint (P=0.002). All of the evaluated hindfoot alignment parameters demonstrated a significant varus change (P<0.001), as the heel ratio changed from 0.2±0.2 preoperatively to 0.3±0.2 postoperatively (P<0.001), the heel angle changed from 11.4±7.0° preoperatively to 5.0±7.4° postoperatively (P<0.001), and the heel distance changed from 10.5±6.6mm preoperatively to 6.4±6.4mm postoperatively (P<0.000). Conclusions: Alignment in the ankle joint and the hindfoot both changed to a varus trend after correction of varus deformity of the knee. Such changes in ankle joint and hindfoot alignment are considered to be due to the compensatory changes following alterations in lower limb alignment. Therefore, it is necessary to consider subsequent alteration of ankle joint and hindfoot alignment before surgical correction of knee joint alignment.

## Abstract no.: 46241 METATARSUS ADDUCTUS AND HALLUX VALGUS Wolfgang WILLAUSCHUS, Felix HUETTNER alphaMED Bamberg, Bamberg (GERMANY)

Introduction: 1989, Trepal pointed out in his publication "Hallux valgus and metatarsus adductus: the surgical dilemma" that the combination of a hallux valgus with a metatarsal adductus represents a hardly solvable problem: During the correction of the metatarsal adductus, the surgeon suffers from adduction Of Metatarsalia 2 and 3 guickly reach the anatomical limits; then again a single subcapital correction of Hallux valgus deformity is not sufficient. The solution is a proximal osteotomy with correction of the metatarsal bones 2 and 3 as well as a Lapidus arthrodesis. Methods: From 2009 to 2016, 28 patients were operated with this entity in our facility. The follow-up averaged 46.78 months. Results: The MT 1/4 angle was reduced from an average of 47.2 ° to 10.1 °. The Hallux valgus angle could be reduced from 57.6 ° to 14 °. The AOFAS score was improved from an average of 39.3 preoperatively to 73.5 points postoperatively. 79.4% of the patients would let themselves be operated again. The overall assessment of the intervention was estimated as an average of 1.6 in school grades (German 1-6, 1 is best). One patient got a deep wound infection with the need for multiple revisions and soft tissue coverage. In summary the Lapidus arthrodesis of the TMT 1 joint in combination with proximal correction osteotomies of the metatarsalia 2 and 3 to spot-on the adductal miscarriage, represents a good and viable solution to the problem of hallux valgus in the same metatarsal adductus.

Abstract no.: 47114 EFFECTS OF NEUROMUSCULAR ELECTRICAL STIMULATION AND STRAIGHT LEG RAISE TEST ON DEEP VENOUS BLOOD FLOW IN THE LOWER EXTREMITIES: PROPHYLAXIS FOR VENOUS THROMBOEMBOLISM IN PATIENTS WITH LOWER EXTREMITY PARALYSIS

Kiyoshi TOZAKI<sup>1</sup>, Kazuki KAJI<sup>2</sup>, Koji TSUDA<sup>3</sup>, Miki SAKAMOTO<sup>3</sup>, Naonobu TAKAHIRA<sup>3</sup>

<sup>1</sup>Kitasato University East Hospital, Sagamihara (JAPAN), <sup>2</sup>Kitasato University Institute Hospital, Tokyo (JAPAN), <sup>3</sup>Kitasato University School of Allied Health Sciences, Sagamihara (JAPAN)

Introduction: Venous thromboembolism (VTE) is a fatal pathological condition that occurs when a thrombus from the lower extremity travels through the pulmonary circulation and causes pulmonary artery embolization. Venous stasis resulting from lower limb paralysis is a common risk factor for VTE. Neuromuscular electrical stimulation (NMES) directly acts on a paralyzed muscle; therefore, we hypothesized that NMES applied to the triceps surae would activate the calf pump to reduce venous stasis. We aimed to compare the role of NMES and the straight leg raise (SLR) test as thromboprophylactic methods. Materials and Methods: Ten healthy males (age, 22.6 ± 1.0 years) participated in the study. NMES was applied to the triceps surae at an intensity that caused slight muscle contraction. SLR was defined as elevation of the lower extremity with the knee extended. The distance between the calcaneus and surface of the bed was maintained at 30 cm. NMES and SLR test were conducted for 10 min. We measured maximum velocity (Vmax) and flow volume (FV) in the superficial femoral vein at rest and after applying NMES or SLR using pulsed Doppler ultrasonography. Results: NMES increased Vmax and FV significantly compared with values at rest. Vmax increased significantly with SLR, but FV did not. Additionally, the rate of increase of FV after NMES was significantly higher than that after SLR, but the Vmax did not show a remarkable change. Conclusion: NMES and SLR promote venous flow in the lower extremities-NMES particularly is more effective than SLR.

#### Abstract no.: 48829 LONG TERM QUALITY OF LIFE AFTER SURGICAL TREATMENT OF HALLUX RIGIDUS USING HEMICAP®

Gerwin Alexander BERNHARDT<sup>1</sup>, Isabella NOMJUWEIT<sup>2</sup>, Matthias LUGER<sup>2</sup>, Martin ORNIG<sup>2</sup>, Lukas HOLZER<sup>2</sup>, Andreas LEITHNER<sup>2</sup>, Roman RADL<sup>2</sup> <sup>1</sup>Department of Orthopedics and Trauma, Medical University of Graz, -(AUSTRIA), <sup>2</sup>Department of Orthopedics and Trauma, Medical University of Graz, Graz (AUSTRIA)

Introduction: This study aimed to present health related guality of life (HRQOL) data after first metatarsal head-resurfacing using HemiCAP® in patients with Hallux Rigidus (HR) in the long-term. Methods: Ten patients with a mean age of 54±5 years were treated with partial arthroplasty using HemiCAP® after diagnosis of HR. Mean postoperative follow-up time was 9±0.5 years. Postoperative satisfaction, function and QOL were scored according to the Foot And Ankle Outcome Score (FAOS) with a factor of 100 indicating the best possible result. General HRQOL was measured additionally using the 36-Item Short Form Health Survey (SF-36). Furthermore, patients were asked about their general satisfaction with the procedure. Results: The mean summary score for FAOS was 90±16. In detail the FAOS for pain was 89±22, for symptoms 93±16, for function in daily living 97±8, for function in sports 88±21 and 84±23 for specific foot and ankle related HQOL. The norm based mean scores (50) for the summary scales of SF-36 were 51±15 for the MCS and 48±8 for the PCS. The subscale results ranged between 58±25 (vitality) and 83±13 (physical function). Eight out of ten patients (80%) were satisfied and would repeat the procedure again. One patient had the implant removed due to persisting pain during movement. Conclusions: This is the first study showing HRQOL results after treatment of HR with HemiCAP® in the long-term. Our results show that operative treatment of HR with HemiCAP® seems to be a useful and satisfactory therapy option, both in terms of function and HRQOL.

## Abstract no.: 46491 PUBS - THE CURIOUS CASE OF URINARY DISCOLORATION Vishesh KHANNA, Mathew VARGHESE ST STEPHENS HOSPITAL, NEW DELHI (INDIA)

Introduction: a change urinary colour is alarming for any individual. It is extremely uncommon to find purple-coloured urine. Few reports exist on this infrequent symptom in an orthopaedic patient. We describe a recent case of purple-coloured urine in a catheterized patient. Methods: a 23-year-old male presented to our hospital with flexion deformities of the knees and hips. He was a known case of Pott's paraplegia with bladder and bowel involvement. His knees and hips had been operated previously. Interestingly, his uro-bag consisted of purple-coloured urine. This had him confused and worried. He was admitted for investigations and deformity correction. Results: urine was alkaline (8.0), positive for nitrates, amorphous phosphates, and penicillin-sensitive enterococcus fecalis. Urinary protein, glucose, esterase, bilirubin, ketones, blood, urobilinogen, leukocyte esterase, ketones, blood were absent. A differential diagnosis of alkaptonuria, porphyria, urinary tract infection (UTI) with hemoglobinuria, and drug-induced urinary discoloration was made. None of the laboratory results or clinical features were consistent with any of these. After reviewing literature, a diagnosis of purple urine bag syndrome (PUBS) was suggested. A rare entity first reported in 1978, PUBS is signified by an alarming purple urinary discoloration usually seen in elderly and chronically debilitated patients with longterm, indwelling catheters. Infections with sulphatase and phosphatase-containing pigment-producing bacteria [indirubin(red) and indigo(blue)] turns urine purple. Characteristically, urine is alkaline. Contrary to its frightening appearance, this syndrome can be easily treated as a UTI with a catheter-change and antibiotics. Our patient's symptoms resolved with conservative treatment and he was asymptomatic at 2-year follow-up.

## Abstract no.: 47745 VARIATION IN THE DURATION OF RECUMBENCY POSTSPINAL ANAESTHESIA IN RELATION TO THE OCCURRENCE OF POSTDURAL PUNCTURE HEADACHE

Elkanah Ayodele ORIMOLADE<sup>1</sup>, Samuel OLATEJU<sup>2</sup>, Joseph MEJABI<sup>2</sup>, Adedapo ADETOYE<sup>3</sup>, Chiedu IKEM<sup>3</sup>, Oluwadare ESAN<sup>3</sup> <sup>1</sup>Obafemi Awolowo University, ILE-IFE (NIGERIA), <sup>2</sup>Obafemi Awolowo University, Ile-Ife (NIGERIA), <sup>3</sup>Obafemi Awolowo university, Ile-ife (NIGERIA)

Postdural puncture headache (PDPH) is still a major complication of spinal anaesthesia. Duration of recumbency has been considered as a factor in the occurrence of PDPH. This study aimed at looking at the incidence of PDPH among two groups of patients that had six and twelve hours of recumbency post-spinal anaesthesia. Patients age 15 years and above with lower limb pathologies that required surgery under Spinal anaesthesia were prospectively recruited into two groups: group A patients had 6hours of recumbency post spinal anaesthesia while group B had 12hours. Data on the occurrence of PDPH among the two groups was collected. All patients had dural puncture with either 23G or 25G spinal needles. Eighty two patients were studied with mean age of 44.4 years. The M: F was1.8:1. Thirty-six patients had 6hours of recumbency whereas 46 patients had 12 hours recumbency. The incidence of PDPH in the patients studied was 6.1% with an average Numerical Rating Score of 6. There was no significant difference in the incidence of PDPH following either 6 or 12hours of recumbency. Hence 6hours of recumbency from the time spinal anaesthesia is administered in the theatre is as safe as 12hours.

### Abstract no.: 47712 KINGS ELECTIVE ORTHOPAEDIC CENTRE (KEOC): OUR EXPERIENCE OF 1000 HIPS AND KNEES IN THE GIRFT ERA. Donald OSARUMWENSE<sup>1</sup>, Mohamed FAROOK<sup>2</sup>, Patrick LI<sup>2</sup>

<sup>1</sup>Kings College Hospital, London (UNITED KINGDOM), <sup>2</sup>Kings College Hospital, LONDON (UNITED KINGDOM)

Introduction: Specialist Orthopaedic Units (SOU) are being formed across the United Kingdom as recommended by the GIRFT (Getting it Right First Time) report. With dedicated resources and expertise, performing large volume of joint replacements, the aim is to deliver the highest standards of care and excellent patient outcome. Methods: we present our results and outcomes of 1044 primary total hip (THR) and total knee (TKR) replacements performed at the KEOC, including demographic, complications and patient related outcome measures (PROMS) data. Results: There were 535 TKRs and 509 THRs. 636 were women and 408 men. Mean age was 68years(17-93). Transfusion rate was 1.3%. Mean length of stay (LOS) was 3.2days. 90 day VTE rate was 0.8% (6 DVT and 2 PE). 90 day mortality rate was 0.001%. There were 15 (1.4%) superficial skin infections (SSI) and 3 (0.3%) deep infections (PJI) of which one patient had a 2 stage revision and other two were managed with Debridement Antibiotics and Implant Retention(DAIR). Overall Oxford Hip Score (OHS) was 43 while the overall Oxford Knee Score (OKS) was 39. Conclusion: Our results shows that our deep infection rates are well below the national average of 1-4%. This along with a low blood transfusion rate and LOS could translate into significant savings for the trust in the long run. This is in keeping with the core principles of GIRFT in providing cost effective but excellent patient outcomes. Implication: Our results are encouraging we are striving to make this centre a benchmark for newer SOUs

### Abstract no.: 47424 ACCURACY OF PEDICLE SCREW INSERTION BY AIRO® INTRAOPERATIVE CT IN COMPLEX SPINAL DEFORMITY ASSESSED BY A NEW CLASSIFICATION BASED ON TECHNICAL COMPLEXITY OF SCREW INSERTION

Ajoy Prasad SHETTY<sup>1</sup>, Manindra BHUSHAN<sup>2</sup>, Rajasekaran S<sup>1</sup> <sup>1</sup>ganga hospital, Coimbatore (INDIA), <sup>2</sup>ganga hospital, coimbatore (INDIA)

Introduction: AIRO intraoperative CT increases the accuracy of screw placement in complex spinal deformity. Morphology based pedicle classification system will allow uniform assessment of difficulty for screw insertion in different clinical scenarios and various navigation system. We aimed to develop a classification based on the technical complexity and to evaluate the performance of AIRO® CT navigation system based on this classification in complex spinal deformity. Material and Methods: 455 pedicle screws in 31 complex spinal deformity correction surgeries were prospectively analyzed for performance of AIRO mobile CT based navigation system. Pedicles were classified according to increasing complexity of insertion from type 1-5. Analysis was performed to estimate the accuracy of screw placement and time for screw insertion. Breach greater than >2mm were considered for analysis. Results: 455 pedicle screws were inserted [T1-T6: 116; T7-T12: 171; L1-S1: 165; Ilium: 3]. The average Cobb's angle was 68.3° (60°-104°). Only type 2 and more complex pedicles were assessed (type 2: 242; type 3: 136; type 4: 77). Forty four pedicles in type 5 were unfit for pedicle screw insertion. Effective breach rate was 3.7% (17/455) resulting in 96.3% accuracy rate for pedicle screw placement. Twenty seven pedicle screw breaches were noted [Medial:10; Lateral:16; Anterior:1]. Average screw insertion time was 1.76 ± 0.89 minutes. Conclusion: Pedicles are classified into five types after taking into account - rotation, surface landmarks as well as pedicle dimension. In a select group of type 2 and above pedicles AIRO® navigation showed an accuracy rate of 96.3%.

## Abstract no.: 47706 MAKO ROBOTIC-GUIDED SURGERY IMPROVES POSTOPERATIVE RECOVERY AND LENGTH OF HOSPITAL STAY FOLLOWING UNICOMPARTMENTAL KNEE ARTHROPLASTY.

Babar KAYANI<sup>1</sup>, Sujith KONAN<sup>2</sup>, Fares HADDAD<sup>2</sup> <sup>1</sup>University College London Hospital, Watford (UNITED KINGDOM), <sup>2</sup>University College London Hospital, London (UNITED KINGDOM)

The Mako robotic system uses preoperative computerised tomography and dynamic referencing to guide intraoperative bone resection and implant positioning. The use of this technology in unicompartmental knee arthroplasty (UKA) is associated with improved implant positioning and alignment but it is not known how this affects postoperative recovery and hospital stay. The objective of this prospective study was to compare postoperative clinical recovery and discharge between patients undergoing conventional jig-based Oxford UKA and Mako robot-guided UKA. This study included 54 patients with symptomatic medial compartment osteoarthritis. Preoperative computerised tomography was used to confirm diagnosis and plan implant size and positioning in all patients. A total of 66 UKAs were performed by a single-surgeon using the standard anteromedial approach between October 2015 and February 2017. Surgical intervention included 34 consecutive jig-based Oxford UKAs followed by 32 consecutive Mako robotic UKAs. All patients received the same postoperative rehabilitation programme. Mako robotic UKA was associated with reduced postoperative pain score on the visual analogue scale (P<0.05), analgesia requirements at postoperative days 1-3 (P<0.05), time to knee flexion to 90 degrees (P<0.05), hours of inpatient physiotherapy (P<0.05), and duration of hospital stay (P<0.05) compared to conventional jig-based Oxford UKA. There was no difference between the two groups relating to wound breakdown, ambulation distance or use of ambulatory aids at discharge. This study shows that Mako robotic-guided UKA improves postoperative recovery, clinical and functional outcomes, and reduces length of hospital stay compared to conventional jig-based Oxford UKA.

## Abstract no.: 47704 IMPROVED IMPLANT POSITIONING AND LOWER LIMB ALIGNMENT IN MAKO ROBOTIC-GUIDED UNICONDYLAR KNEE ARTHROPLASTY COMPARED TO JIG-BASED OXFORD UNICOMPARTMENTAL KNEE ARTHROPLASTY.

Babar KAYANI<sup>1</sup>, Sujith KONAN<sup>2</sup>, Fares HADDAD<sup>2</sup> <sup>1</sup>University College London Hospital, Watford (UNITED KINGDOM), <sup>2</sup>University College London Hospital, London (UNITED KINGDOM)

Unicompartmental knee arthroplasty (UKA) is an established and highly effective treatment for osteoarthritis but is associated with higher revision rates compared to total knee arthroplasty. Implant positioning in UKA has been identified as an important prognostic factor for implant survival and time to revision surgery. The Mako robotic system uses preoperative computerised tomography and dynamic referencing to guide intraoperative bone resection and obtain optimal implant positioning. The objective of this prospective study was to compare the accuracy of implant positioning and lower limb alignment between conventional jig-based Oxford UKA and Mako robotic UKA. This study included 54 patients with symptomatic medial compartment knee osteoarthritis. Preoperative computerised tomography was used to plan implant size and positioning in all patients. A total of 66 UKAs were performed by a single-surgeon using the standard anteromedial approach. Surgical intervention included 34 consecutive jig-based Oxford UKAs followed by 32 consecutive Mako robotic UKAs. Postoperative weight-bearing radiographs were used to assess implant positioning and alignment. Mako robotic UKA was associated with improved lower limb alignment (P<0.05), femoral implant alignment in the coronal (P<0.05) and sagittal planes (P<0.05), tibial implant alignment in the coronal plane (P<0.05), reduced posterior femoral component overhang (p<0.05), and reduced medial tibial overhang (P<0.05) compared to conventional jig-based Oxford UKA. There was no difference between the two groups relating to sagittal alignment of the tibial component. This study shows robotic assisted UKA is associated with improved accuracy of implant positioning and lower limb alignment compared to conventional jig-based Oxford UKA.