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POSTER SESSIONS

Arthroscopy

P1

RESULTS OF ARTHROSCOPIC TREATMENT OF FEMORO-ACETABULAR IMPINGEMENT

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Introduction: The femoro-acetabular impingement (FAI) is a new hip pathology. It can be treated with open or arthoscopic surgery.
Objectives: To prospectively evaluate the outcomes of arthroscopic treatment and to evaluate the influence of arthritis on results.
Methods: We prospectively evaluate 62 patients (68 hips). The mean age was 37 years (range 17-64) at a mean follow up of 49.6 months. We evaluate the patients with the modified Harris Hip score (mHHS) and with the Hip Outcome score for daily (HOS ADL) and sports activities (HOS SPT) pre and postop. The pre, immediate postop and latest follow-up X-rays were also collected. The patients were divided in 4 group according to the Tonnis grade. Then the clinical results were analyzed comparing the grades 0 and 1 with the grades 2 and 3.
Results: We found an increase of more than 20 point in all the scores between preop and latets follow-up mean values: 63.04 vs 82.71at mHHS; 62.63 vs 85.65 at HOS ADL and 47.08 vs 69.14 HOS SPT ($p<0.05$). In group of Tonnis 0-1 the 90.91% of patients had good or excellent results (mean mHHS 90.64, l'HOS ADL 90.45, l'HOS SPT 80.55), in the group of Tonnis 2-3 only 42.11% (53.81% if we consider only Tonnis 2) of patients had good or excellent results (mean mHHS 68.95, HOS ADL 76.78, HOS SPT 48.25). Moreover in the group Tonnis 2-3 there were no statistically significant difference in preop and postop scores at latest follow up. In the postop X-rays we found a good correction of α-angle under 55° but in patient with Tonnis 3 al latest follow up there was a increase in α-angle due to new head osteophytes (mean α-angle 80.67°, range 68°-90°). Five patients (7.3%) had a total hip arthroplasty at a mean 3 years postop.
Conclusions: The results of arthroscopic treatment of FAI are influenced by the arthritis grade. Very good results are found in patients with Tonnis 0 or 1, whereas only about 50% of patients in Tonnis 2 and 16% in Tonnis 3 had a significant improvement in clinical scores.

P2

HETEROTOPIC OSSIFICATION PROPHYLAXIS WITH CELECOXIB IN HIP ARTHROSCOPY FOR FEMOROACETABULAR IMPINGEMENT

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Introduction: Heterotopic ossification (HO) is a complication of hip arthroscopy, its incidence ranges from 8.3 to 44% in case of none postoperative prophylaxis. Nonsteroidal anti-inflammatory drugs (NSAIDs) prophylaxis reduces the incidence of HO to 0-5.6%.
Objectives: The aim of this study was to evaluate the effect of a COX-2-selective NSAID on prevention of heterotopic ossification after arthroscopic treatment of femoroacetabular impingement (FAI).
Methods: A consecutive series of 71 patients arthroscopically treated for FAI was retrospectively evaluate. Prophylaxis was not performed for the first 35 patients (control group), then prophylaxis with Celecoxib 400 mg once a day for 3 weeks was started for the other 36 (treatment group). For each patient X-rays exams, Harris Hip Score (HHS) and Hip Outcome Score (HOS) were collected. Mean follow-up was 35 months.
Results: There was a statistically significant reduction in HO in the treatment group ($p<0.05$ usingFisher exact test); 7 cases (20.0%) of HO were found in the control group; 4 were male and 2 female (one bilateral). One case (2.7%) was found in the treatment group and it was female. According to the Brooker's classification in the control group 4 were stage 1, two stage 2 and one stage 3; in the treatment group the only case was stage 1. In these patients the mean HHS score was 88.2, the mean HOS was 88.2 for daily activities and 76 for sport activities. No complications due to the prophylaxis were reported.
Conclusions: HO is a not rare complication of hip arthroscopy with none or minimal clinical and functional significance, advanced stage may be associated with more complaints. Celecoxib seems effective in reducing incidence and grade of HO after hip arthroscopy.

P3

FEMOROACETABULAR IMPINGEMENT: RADIOGRAPHIC EVALUATION OF EVOLUTION OF RISK FACTORS IN ASYMPTOMATIC PATIENTS

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Introduction: Femoroacetabular impingement (FAI) has become a well-recognized entity predisposing towards acetabular labral tears and chondral damage, and subsequently development of osteoarthritis of the hip.
Objectives: Aim of our study is to evaluate the evolution of FAI radiological risk factors and the appearance of clinical symptoms in young adults that have never referred any symptoms before.
Methods: We selected 44 patients (ranging from 20 to 40 years of age) who performed in our hospital in 2006 an abdominal TC for abdominal trauma or nonspecific abdominal pain. These patients were no known to have any history of hip-related problems. We investigated the bone abnormalities predisposing towards FAI (center edge angle, acetabular version angle, crossover sign) in the TC scans. This data was compared with the results obtained from the TC study of the same patients from 2009 to 2012. The patients underwent clinical hip exams from 2011 to the present date.
Results: The 88 hip joints from 44 patients with no history of hip problems demonstrated that 38% of the joints (24 patients) had at least one morphologic aspect predisposing towards FAI. The majority of the findings were bilateral. 11 patients in this group of 24 with risk factors for FAI performed other TC scans in a period running from 2009 to 2012, and underwent clinical hip exams from 2011 to today. The following conclusions regarding these 11 patients were established: The hip joint striken by positive risk factors worsened, None became bilateral and so the healthy hip joint remained just as healthy, the result of the clinical exam was negative except for a single patient.
Conclusions: Out of the 44 patients there wasn't development of the number of risk factors during follow up. All the patients were negative at the clinical examination and none of them present functional impairment of the hip joints.

P4

OS ACETABULI AND FEMORO-ACETABULAR IMPINGEMENT: ETIOLOGY, INCIDENCE AND TREATMENT

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Introduction: The Os acetabuli is a nonfused bony fragment of the anterior or anterosuperior margin of the acetabular rim; its etiology has been discussed for a long time. In some cases may be an unfused secondary ossification centers of the acetabulum.
In acetabular dysplasia an overloading can lead to a stress fracture of the acetabular rim.
Objectives: The purpose of this study is to verify the percentage of the os acetabuli and the treatment undertaken in a group of patients with diagnosis of FAI underwent hip arthroscopy.
Materials and methods: Between September 2009 to March 2015, 295 hips in 282 patients (13 bilaterals) undergone hip arthroscopy at our Institution with FAI diagnosis.
Our research of the os acetabuli was performed using radiological examinations and operation reports. Other procedures were performed during arthroscopy:

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debridment or repair of the labrum, femoral osteoplasty, acetabular rim trimming, microfractures, sinoviectomy, chondral flap stabilization.
Results: In 10 patients an os acetabuli was reported. All patients were male, had CAM or mixed FAI and the mean age was 30 years. In 9 patients detected os acetabuli were removed; one case presented a big os acetabuli so a stabilization with a 4 mm screw and washer was performed. All patients with diagnosis of os acetabuli had a lesion of the labrum; it was refixed with 2,3 mm reabsorbable anchors, even the one with the stabilization of the os acetabuli. In all patients a femoral osteoplasty was performed. In 5 cases microfractures were needed.
Conclusions: Os acetabuli is certainly associated with CAM type FAI and to male gender. Probably its etiology is microtraumatic. The removal seems to be the best treatment option in the majority of the patients. In some cases, when the bony fragment is too big to be removed and could lead to an instability of the hip, the best treatment option seems to be a stabilization to prevent a worsening of symptoms and instability.

P5
HIP ARTHROSCOPY IN OBESE, A SUCCESSFUL COMBINATION?
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Background and purpose: Discussion persists about the outcome and results of hip arthroscopy in obese patients. Last few years hip arthroscopy gained popularity and it's questionable if obese patients can reach similar results after surgery compared with non-obese. To our knowledge is this the first systematic review of literature about hip arthroscopy and obesity.
Methods: We searched the Pubmed/Medline database for literature and included 2 studies which compared the outcome of hip arthroscopy between different BMI groups. We extracted and pooled the data. For continues data a weighted mean difference was calculated, for dichotomous variables a weighted odds ratio (OR) was calculated using Review Software Manager. Heterogeneity of the included studies was calculated using I^2 statistics.
Results: Data was extracted from 2 studies. In the Obese group there was significant more conversion to total hip replacement or resurfacing hip replacement (OR = 2,21, 95% CI 1,07-4,56) and more re-arthroscopy (OR = 4,68, 95% CI 1,41-15,45). Any reoperation occurred more often in the obese group (OR = 2,87, 95% CI 1,53-5,38). In the Non Arthritic Hip Score (NAHS) obese scored lower than the non-Obese group (10,9 (-14,6-7.1)). For the modified Harris Hip Score the score is -6,6, according to the MCID this difference is clinically relevant.
Conclusions: Regarding a higher chance of needing a re-operation and lower subjective outcome scores obesity appears to have a negative influence on the outcome of hip arthroscopy.

P6
IS THERE ANY BENEFIT WITH HIP ARTHROSCOPY IN TÖNNIS 2 HIP CASES? RESULTS OF 3 YEARS EXPERIENCE
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Introduction: About five decades ago, Murray speculated that there might be a relationship between and a subtle abnormality of the femoral neck, which he called "tilt deformity". Later, Solomon and Harris described it as "pistol grip" deformity. The concept of femoroacetabular conflict is in clinical use since 1996 and it has long been speculated about its influence in the etiology of primary/idiopathic hip osteoarthritis. These lesions are radiographically classified after Tonnis and according to the decrease of the joint line. Bearing this in consideration Tonnis 0 and 1 are considered stages pre-arthrosis and Tonnis 2 arthrosis injury. Literature is peremptory in referring that the conservative surgery in this stadium (Tonnis 2) does not deliver good results. However, with the growth of hip arthroscopy and its role in minimum invasive treatment of this pathology, the question is if it won't be beneficial for the patient to treat symptoms, improving hip mobility with a low morbidity technique, rapid recovery even if there is no interference in the progression towards the hip osteoarthritis.
Objectives: Present the clinical results of patients with Tonnis 2 hip after being submitted to arthroscopic treatment with out-inside technique and try to predict the evolution and progression of that kind of lesion to hip osteoarthritis.
Methods: From May 2011 to May 2014 (3 years), the senior author operated on 15 patients with Tonnis 2 hips. The exclusion criteria were defined as: procedure performed by another surgeon, loss to follow-up, hips classified in Tonnis 0, 1 or 3. All patients underwent a surgical treatment following the out-inside arthroscopic technique. The procedures included the osteocondroplasty of the femoral head and acetabular rim, the repair of the labrum ruptures through reinsertion with anchors or regularization/labrum resection or osteochondral non-viable fragments. All patients were evaluated and submitted to clinical evaluation, radiologic and subjective satisfaction.
Results: The average age was 42.9 years (21-59 years). 7 patients were male and 8 female. The average follow-up was of 8.1 months (1-18 months). Labrum sutures were made with anchors in 7 cases (46.6 percent), femoroacetabular osteocondroplasty as an isolated act in 4 cases (33.3%), labrum debridement and/or resection in 3 cases (20%) and total hip arthroplasty conversion in the same surgical time in 1 case (6.6 percent).
Conclusions: Although the actual value of the impact of this conservative surgery at this stage of the disease is not yet established, it is permissible to think that in short medium term we may offer symptomatic relief and additional free time of arthroplasty to these patients. The authors conclude that the arthroscopic treatment on hips Tonnis 2 is beneficial because its results are substancial in symptomatic improvement and in gain of hip range of motion. It has very good or excellent results in 86.6% of patients in short/medium term with a minimally invasive technique, with low morbidity. However, further investigation will be needed to developed in order to conclude the therapeutic validity of arthroscopy in these patients.

P7
ARTHROSCOPICALLY ASSISTED TREATMENT OF TIBIAL PLATEAU FRACTURES
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Introduction: The arthroscope has long been recognized as a useful aid in the management of intraarticular fractures. The goal of surgical treatment of tibial plateau fractures is a perfect reduction of the articular surface secured with stable fixation.
Objectives: To asses the role of arthroscopy in the surgical treatment in tibial plateau fractures and to compare reductions obtained under arthroscopic control to those obtained under fluoroscopic control.
Methods: Between 2009 and 2014, in our department were treated 23 patients with tibial plateau fractures by reduction under arthroscopic control and osteosynthesis with screws ± washers. According to Schatzker classification there were: 8 patients with fractures of type I, 9 pacients with fractures of type II and 6 patients with fractures of type III. The average age at the moment of surgery was 44.5 years (range, 33-68). There were 7 women/16 men. The clinical results were compared to those of a similar group of 23 cases treated by reduction under fluoroscopic control and screw osteosynthesis. The average period of follow-up was 2.2 years (range, 1.2 years-3.2 years).
Results: At one year postoperatively the average HSS Knee Score was 92 in the arthroscopy group and 89 in the fluoroscopy group. During arthroscopy, 4 meniscus tears were observed and partial meniscectomy was performed. There were no intraoperative or postoperative complications in either group. Radiological postoperative controls showed a better positioning of the screws in the fluoroscopic group.
Conclusions: At one year post surgery, the results of the 2 techniques were similar. The advantages of arthroscopy are lavage and removal of hematoma, treatment of concomitant soft tissue injuries to ligaments/meniscus and a better visualization of the articular surface and this way a better control of reduction. A combination of arthroscopic and fluoroscopic control should be the optimal solution, but this association is sometimes difficult to manage.

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Primary Conservative Surgery

P8

RE-ORIENTATION ROTATIONAL ACETABULAR OSTEOTOMY FOR OSTEOARTHRITIS OF THE HIP SECONDARY TO ACETABULAR DYSPLASIA

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Introduction: Although conventional rotational acetabular osteotomy (RAO) is indicated to obtain sufficient acetabular coverage for acetabular dysplasia, femoro-acetabular impingement has been reported (after operation. Re-orientation rotational acetabular osteotomy (Re-RAO) is aimed to achive ideal acetabular coverage with avoiding excessive or retroverted aceatabular orientation. The purpose of this study is to report clinical results and to clarify usefulness of the operation.
Methods: The Rotation of acetabulum around the Z axis and Y axis was simulated preoperatively to achieve 20-25degree of anatomical anteversion and 0 degree of acetabular roof obliquity (ARO) by 3D computer aided design software. The osteotomy was performed according to the preoperative simulation.
Objectives: Patients with osteoarthritis of the hip joint who underwent Re-RAO and followed for more than 1 year were enrolled in this study. There were 68 patients, 59 females, 9 males. The mean age at operation was 41.8 ± 9.2 y.o. Clinical evaluation with JOA score and acetabular coverage, acetabular orientaion and degenerative changes were evaluated in radiographs.
Results: The mean JOA score increased (70 to 91 points). The ARO was improved (22 degrees to 2 degrees) and the Sharp angle was improved (50 to 39 degrees). Cross-over sign seen in 32% preoperatively and posterior wall sign disappeared after operation. Joint space narrowing was improved in 3 hips by R-RAO. Sixty hips were no changed and 5 deteriorated. Progression of degenerative change was associated with aging and preoperative degenerative change.
Conclusions: Re-RAO proved to give an aduquate acetabular coverage with avoiding excessive and retroverted aceatabular orientation. This study indicated that Re-RAO with assuming preoperative simulation and subsequent rotation resulted in an ideal ideal acetabular coverage with avoiding excessive or retroverted aceatabular orientation.

P9

A CALCIUM SULFATE/CALCIUM PHOSPHATE BIOCERAMIC IN THE TREATMENT OF OSTEONECROSIS OF THE FEMORAL HEAD: KINETICS OF REMODELING AND CLINICAL RESULTS

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Introduction: Recently a new calcium sulfate ($CaSO_4$)/calcium phosphate ($CaPO_4$) composite graft was engineered to enhance its bone forming properties for the treatment of bone defects.
Objectives: The purpose of this study was to analyze the clinical results and kinetics of resorption and new bone formation of this bioceramic, measured by quantitative computed tomography (QCT), in 14 hips with osteonecrosis of the femoral head (ONHF), treated with core decompression and backfilling of the core tract with the bioceramic.
Methods: We prospectively evaluated the results of a series of 14 hips in 12 patients with ONFH treated at with core decompression and injection of a $CaSO_4$/$CaPO_4$ composite.
All patients were followed up clinically and radiographically. A first QTC was taken within one week of the surgery, and a second scan after a with a minimum of 3 years follow-up.
The quantitative analysis of the core tract was performed by determine the mean-ray attenuation as expressed in Hounsfield units (HU), in a trabecular bone region of interest (ROI).
Results: We were able to review all the 14 patients with a mean follow-up of 41 months. The average preoperative HHS was 64 points (range, 45-87), and the average score at the latest follow-up was 88 points (range 53-100). The mean HU in the immediate post-operative period was 1567 (Range 1378-1656), which was a density similar to dense cortical bone. The mean HU at 3 years follow-up strongly decreased to 673 (p<00,1) (Range 376-948), very similar to the density of trabecular bone. Visual analysis of the CT scan were consistent with the numeric data and demonstrated degradation of the ceramic material with new trabecular bone invasion of the core tract.
Conclusions: The quantitative and qualitative CT scan data of this series indicates that this ceramic resorbs over a moderate timeframe and the gradual resorption of the graft within the defect provides an ideal environment for the direct new bone growth. that propagates across the defect.

P10

3D HIP DYNAMIC SIMULATION: IS IT USEFUL TO OPTIMIZE SURGICAL TREATMENT OF FEMORO-ACETABULAR IMPINGMENT?

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Introduction: Although the diagnosis of femoroacetabular impingment is mainly clinical, X-rays and MR images with and without contrast are fundamental to localize labral tears and establish a strategy of treatment. Recently the use of 3D reconstructions and dynamic simulation studies these models are emerging as useful elements in the quantification and localization of CAM and PINCER deformity.
Objectives: The aim of this study is to demonstrate the validity of 3D model reconstruction to plan the correct strategy of treatment of FAI and DDH
Material and methods: Between 2013 and 2015 25 hip dynamic analyzes were performed with 3D reconstruction; all patients presented groin pain of recent onset. A pattern of 10 standardized hip movements was used to detect impingment. Alpha angle, femoral offset anterior and posterior acetabular coverage and acetabular versions were registred. The findings were compared with X-rays to determine the definitive treatment
Results: 3D reconstruction radically changed surgical technique in 2 cases, from arthoscopic to safe hip dislocation because of posterior inferior pincer type impingment. In 4 patients a subspine impingment was demonstrated. In 2 patients, the study showed no abnormalities but subsequently intraoperative alterations, possibly attributable to conflicts were identified by hypermobility or hiperlaxity. In 1 patient the 3D study confirmed a ischiofemoral impingment.
Conclusions: 3D simulation is useful in confirming the presence of impingement; it also helps to define a model corresponding exactly to the impingment area improving the resection accurancy. Depending on the surgeon's experience, it could be useful to choose the most suitable technique for each specific case.

P11

FEMOROACETABULAR IMPINGEMENT TREATMENT USING ANTERIOR MINI-OPEN APPROACH. SHORT-TERM RESULTS

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Introduction: Femoroacetabular impingement (FAI) was recently proposed to describe a range of abnormal anatomic relationships in the hip joint that can produce an early osteoarthritis, especially in young and active patients. In most cases, FAI is produced by bone deformities or alterations in the femoral head orientation or femoral head-neck junction (CAM impingement), acetabulum (PINCER impingement) or both.
FAI treatment includes three main techniques: Open surgical dislocation technique, anterior mini-open approach and hip arthroscopy.
Objetives: Purpose of this work is to evaluate the clinical results in our first series of patients with FAI treated with anterior mini-open approach at a minimum follow up of 1 year.
Methods: We have prospectively analysed 27 patients with FAI surgery by anterior mini-open approach. 16 patients were men and 11 women. The mean age was 36,1 years (18-48 years). The mean follow up period was 18 months (12-36 months). 9 patients had CAM impingement, 2 PINCER and 16 mixed impingement.
All patients were evaluated with the scales SF-36, WOMAC and NAHS. Deformity correction and progression of the osteoarthritis grade were evaluated too.

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Results: The average score on the WOMAC scale increased from 55 preoperatively to 76 at the last control (p<0.05). The NAHS score improved from 49 to 79 points (p<0.05). SF-36 dimensions "physical functioning" and "bodily pain" also increased by 26 (43 to 69) and 33 points (26 to 59) respectively (p<0.05).
5 patients (18%) developed a meralgia paresthetica that was resolved in less than a year. One patient required prosthetic replacement for progression of his osteoarthritis. One patient developed heterotopic ossifications.
Conclusions: FAI treatment by mini-open approach is a safe and reproducible procedure. This technique allows correction of anatomical abnormalities and obtains satisfactory clinical outcomes in a cohort of young patients, improving their quality of life regarding to pain, mobility and function.

P12

1 YEAR FOLLOW-UP OF 100 PATIENTS AFTER ARTHROSCOPIC ASSISTED MINI-OPEN APPROACH FOR THE TREATMENT OF FEMOROACETABULAR IMPIGEMENT

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Introduction: Surgical treatment of femoroacetabular impingement (FAI) is becoming worldwide accepted, mainly because of improvement in clinical results and quality of life in preliminary studies. The primary goal of surgical treatment is to increase joint clearance and decrease destructive forces being transmitted through the joint. The bernese school introduced about twenty years ago the safety dislocation approach. By the years hip arthroscopy developed very properly. Nevertheless because of some limitation of those techniques in 2002 a combined arthroscopic and open procedure (AAMOA) was used and shows promising results.
Objectives: Clinical and radiological results of minimum 1 year follow-up of 100 patients after AAMOA.
Material and methods: Between 09/2012 bis 11/2013 100 patients were treated by means of AAMOA for FAI treatment. There were 56 female and 44 male, the mean age was 33.5 years (range 14-65), 6 of them were elite athletes. The patients completed both the Hip Disability and Osteoarthitis Outcome score (HOOS) and the Western Ontario and McMaster Osteoarthritis (WOMAC) score preoperatively and at postoperative follow up. Their specific level of activity was specified using the University of California, Los Angeles (UCLA)- activity score. Furthermore the patients were subdivided in 3 groups (A,B,C) (osteoarthritis grade Tönnis grade 0, 1 and 2).
Follow-up time was 12 month. In 64 patients labral refixation was performed. The HOOS-Score significantly changed from 59.6 ± 13.4 to 94.4 ± 5.4 (p<0,001) as well as the Western Ontario and McMaster Osteoarthritis (WOMAC)-Score 64.3 ± 12.6 to 91.4 ± 8.4 (p<0,001). The mean UCLA activity score changed significantly from 5.8 ± 1.9 auf 8.2 ± 1.3 (p<0,001). Significantly lower results (p<0,001) in all three scores were observed in a higher preoperative osteoarthritis grade (group C) than in groups A+B.
The preoperative alpha-angle changed significantly from 84,3° ± 20,3 to 46,7° ± 6,2 (p<0,001) postoperatively.
Conclusions: Patients with higher osteoarthritis grades (Tönnis2) show significantly inferior results than patients with early changes of hip arthritis (Tönnis 0 and 1). Nevertheless, the AAMOA is a reproducible procedure to treat femoroacetabular impingement. Our 1 year results show promising and comparable clinical and radiological results to hip arthroscopy and in conclusion can be used as an alternative, reproducible technique for the treatment of FAI.

P13

SPORTS ACTIVITY AFTER TRIPLE PELVIC OSTEOTOMY (TÖNNIS AND KALCHSCHMIDT TECHNIQUE) FOR THE TREATMENT OF RESIDUAL HIP DYSPLASIA

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Background: Pelvic osteotomies are performed to prevent the progression of osteoarthritis and its associated pain due to adult hip dysplasia, particularly for young patients with no or low grade osteoarthritis. There are no data available concerning levels of sporting activity before and after triple pelvic osteotomies (TPO). Therefore, the aim of this study was to provide comprehensive data on levels of sporting activity and the subjective outcome of patients after this complex operation.
Hypothesis: Patients can return to a higher level of sports activity after triple pelvic osteotomy.
Methods: Between 2003 and 2011 we performed 116 triple pelvic osteotomies, using the Tönnis technique on 91 patients. There were 59 females and 18 males; the mean age at operation was 26 ± 3.9 y. The patients completed both the Harris Hip Score (HHS) and the Hip Osteoarthritis and Outcome Score (HOOS) preoperatively and at postoperative follow up. Their specific level of activity was specified using the UCLA activity score. Each patient rated their hip movement and overall satisfaction preoperatively and at postoperative follow up using a visual analogue scale for sporting activity, physical fitness level, and the level of pain experienced while performing their sport.
Results: The mean follow up was 6.2 ± 1.4 y. The mean HHS changed significantly from 63.3 ± 15.6 preoperatively to 90.1 ± 10.8 at follow up (P<0.001). The mean HOOS changed significantly from 52.9 ± 20.1 to 82 ± 17.1 at follow up (P<0.001). The mean UCLA activity score changed significantly from 4.8 ± 2.1 to 7.7 ± 1.4 at follow up (P<0.001).
Conclusions: Patients achieved a higher level of sports activity postoperatively. The postoperative level of participation in sports was superior with a shift from low- to high-impact activities.
What is known about this subject: Triple pelvic osteotomy is a common treatment for residual hip dysplasia. Data concerning the progression of osteoarthritis are available.
What this study adds to existing knowledge: Patients' quality of life is significantly improved and sports activity reaches superior levels with a shift from low to high impact activities.

P14

PLATELET-RICH-PLASMA INJECTIONS FOR THE TREATMENT OF RESISTANT TROCHANTERIC PAIN

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Introduction: Platelet-Rich-Plasma (PRP) contains and releases a high concentration of activated platelet derived growth factors which is believed to stimulate the body's natural healing response in areas of inflamed tissue. PRP injections are used in many tendinopathies and inflammatory conditions, for example lateral epicondylitis and patella tendonitis but there is a lack of clinical studies and trials in the treatment of trochanteric pain.
Objectives: To examine whether PRP injections improve symptoms of resistant trochanteric pain and evaluate its effects in relation to quality of life and daily activities.
Methods: The prospective study included 85 patients with gluteal tendinopathy or trochanteric bursitis (confirmed by MRI or ultrasound) that was resistant to steroid therapy and physiotherapy. All patients received PRP injection in theatre by a single surgeon. PRP was prepared using a standardised technique. Patient demographics were documented. Pain scores (0-10), EQ-5D Health Domain, Utility and VAS scores, Hip Disability and Osteoarthritis Outcome Scores (HOOS) were recorded pre and post PRP injection.
Results: The mean age was 60 (27-83), male to female ratio 1:4 and BMI 26 (20-35). Duration of symptoms ranged from 3-120 months. 20% of patients reported moderate and 78% severe symptoms. Pain scores decreased from 8.1 pre-injection to 4.6 post-injection (p<0.0001). 69% of patients had a successful outcome (Excellent/good/satisfactory). Both EQ-5D Utility and EQ-5D VAS scores improved after the PRP injection and the proportion of reported level II and III problems decreased significantly for each of the EQ-5D dimensions at the last follow up (p<0.001). HOOS scores increased significantly (p<0.01) in all groups after treatment.
Conclusions: The use of PRP injections for resistant trochanteric hip pain has shown promising results and good outcomes in both subjective and objective scoring. PRP injections should be considered in the management of this condition.

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P15

A CASE REPORT OF EXTRA-SPINAL SCIATICA SECONDARY TO PATHOLOGY AT THE FEMORAL NECK

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Introduction: Sciatic symptoms are commonly reported to GPs, A&E doctors and Hospital Specialists. The vast majority of patients who report sciatic symptoms are likely to have impingement of the nerve roots at the level of the vertebral foraminae secondary to disc prolapse or spinal stenosis. More rarely the pathology responsible for the symptoms may lie outside the spine. Due to the lack of recognition of these extra-spinal causes of sciatic pain there is often a delay before diagnosis and expenditure of time and money on unnecessary investigations.
Case report: We report a case of sciatic nerve impingement secondary to bony osteophyte formation at the femoral neck in a young fit and well male patient with a history of open reduction of his native hip for traumatic dislocation 30 years ago. The key differentiating feature on clinical examination was paradoxical improvement of pain on deep hip flexion. After radiographic and MRI evidence of a bony lesion at the femoral neck an operation to excise the lesion via an open antero-lateral approach to the femoral neck under general anaesthestic was undertaken as a day case procedure. The patient made a full recovery from surgery and returned to clinic at an interval of 6 weeks to report that he had experienced a full resolution as his symptoms and was delighted with the outcome. Histological examination revealed on exostosis of the femoral neck.
Discussion: Our case highlights a rare pathology of exostosis at the femoral neck. Only following careful history taking did it become apparent that the feature of improvement in pain with deep flexion at the hip was inconsistent with more common presentations of sciatica. Once the diagnosis was established in this case – surgical intervention lead to a rapid resolution in symptoms. Based on our experience we believe this case represents a valuable lesson to clinicians who assess patients with these symptoms. When a patient presents with these symptoms the clinician should attempt to exclude readily treatable causes.

Pediatrics

P16

LONG-TERM OUTCOMES FOLLOWING TRIPLE PELVIC OSTEOTOMY FOR LEGG-CALVES-PERTHES DISEASE

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Introduction: Legg-Calves-Perthes Disease (LCPD) is a condition of childhood involving avascular necrosis and remodeling of the femoral head. Management requires optimisation of the femoral head coverage in order to preserve sphericity and control remodeling. Triple pelvic osteotomy (TPO), femoral osteotomy, or a combination of the two may be required.
Objectives: We determined the medium to long-term survival of patients with LCPD who have undergone a Birmingham Interlocking TPO.
Methods: A retrospective review of a single surgeon's series of patients having had a pelvic osteotomy between 1999 and 2012 was performed. Only patients under the age of 12 were included. A total of 22 patients were identified and survivorship was charted through evaluation of medical records and radiographs. The end point was hip arthroplasty. Ethical approval was sought in order to contact patients where there was incomplete data.
Results: 24 TPOs were performed in 22 patients with LCPD. The age range was 6-12 years (mean 8.7 years). 18 patients were male and 4 female. Three patients required hip arthoplasty, two in the form of a Birmingham Hip Resurfacing (BHR) at 3 and 8 years post TPO and one in the form of a total hip replacement (THR) at 12 years post TPO. The three patients who had arthroplasty developed worsening of symptoms with features of secondary osteoarthritis. The remaining 21 hips did not need conversion to arthroplasty at a mean follow-up of 10.95 years and the maximum follow-up was16 years. A Kaplan Meier survival curve demonstrated an 83.5% survival at 16 years.
Conclusions: This study demonstrates the effectiveness of the TPO in the management of LCPD with 83.5% survivorship at 16 years. A larger series of patients and longer follow-up are needed to clearly verify this effectiveness.

P17

MODIFIED DUNN OSTEOTOMY THROUGH SURGICAL HIP DISLOCATION IN SLIPPED CAPITAL FEMORAL EPIPHYSIS

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Introduction: Surgical procedures with use of traditional techniques to reposition the proximal femoral epiphysis in the treatment of slipped capital femoral epiphysis are associated with a high rate of femoral head osteonecrosis. Therefore, most surgeons advocate in situ fixation of the slipped epiphysis with acceptance of any persistent deformity in the proximal part of the femur. This residual deformity can lead to secondary osteoarthritis resulting from femoroacetabular cam impingement.
Objectives: The objective of this study is to report the functional as well as the radiological outcome of modified Dunn osteotomy through Ganz surgical hip dislocation in patients with moderate and severe slipped capital femoral epiphysis (SCFE).
Methods: This prospective case series study included thirty-one patients (32 hips) with stable chronic slipped capital femoral epiphysis after capital realignment with a modified Dunn procedure. There were 26 males and 5 females. The mean age was 14 years (11-17). The duration of symptoms before the operation ranged between 1-26 months with mean of 8.42 month. The mean follow up was 16 months (7-40) month. The mean preoperative Alpha angle was 99.970 (87° to 109°). The mean preoperative Slip angle was 56° (87°-109°). The mean preoperative Harris Hip score was 67.91 (61-74), mean WOMAC score 64.03 (54-72) and mean Merle d'Aubigne score 12.09 (11-14).
Results: Twenty-seven patients, (28 hips) had excellent clinical and radiological outcomes with respect to hip function and radiographic parameters. Four patients had fair to poor clinical outcome including 2 patients who developed AVN, one case of deep infection and a case of limited flexion. The mean postoperative Alpha angle was 47° (25-60), with mean correction of 53° (p 0.000). The mean postoperative slip angle of the femoral head was 12° with mean correction of 44° (p 0.000). The mean postoperative flexion was 104.34 (30-130). The mean postoperative internal rotation in 90° flexion was 40 (10-50). The mean post operative external rotation in 90° flexion was 45 (15-60). The mean postoperative HHS was 96.3 (65-100) with mean correction of 28.5 (p 0.000). The mean postoperative WOMAC score was 97 (72-100) with mean correction of 33 (p 0.000). The mean postoperative Merle d'Aubigne score was 16.8 (10-18) with mean correction of 4.8 (p 0.000).
Conclusions: The management of SCFE with modified Dunn osteotomy through Ganz surgical hip dislocation allows the restoration of more normal proximal femoral anatomy by complete correction of the slip angle, such that probability of secondary femoroacetabular impingement and osteoarthritis may be minimized. The complication rate from this procedure in our series was low; along with satisfactory functional and radiological outcome.

Basic Science

P18

A NOMOGRAM FOR COMPARATIVE ASSESSMENT OF HIP FUNCTION

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Introduction: A multitude of hip function scores are used to report outcomes in clinical studies, which tends to restrict the comparison of clinical outcomes. The present study attempts to provide an equating relationship between Harris hip score, WOMAC Index and Oxford hip score.
Methods: 75 patients attending the hip arthroplasty clinic were asked to complete the Harris hip score (HHS), Oxford hip score (OHS) and WOMAC Index (WOMAC). Rasch analysis was used for comparative analysis of all three scores. Initially, the Harris hip score was used as a reference frame to generate person measures. The WOMAC Index function score and Oxford hip

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score were subsequently added to the analysis. Measures from this analysis were used to generate a comparative equation for three scores. Comparative equations from above analysis were used to calculate WOMAC Index and Oxford hip score using Harris hip score a baseline. The calculated scores were used to construct a nomogram. WINSTEPS® software was used for analysis.
Results: Equating Harris hip score and WOMAC Index resulted in the following equation-: WOMAC Index = 2.84 - Harris hip score*0.432. Both instruments had a correlation of -0.43 and disattenuated correlation of -0.59. According to above indicators there was some degree of measurement error. Analysis of Oxford hip score with Harris hip score as a reference frame resulted in the following equation-: Oxford hip score = 0.411 + Harris hip score*0.793. This analysis showed a higher correlation of 0.79 and the disattenuated correlation was 1.0. The scale units for nomogram were adjusted according to the difference in variance of each score.
Conclusions: The equations from analysis reflect the scoring systems of individual scores. The numeric functional unit of Harris hip score and WOMAC Index is inverse whereas Oxford hip score and Harris hip score are direct. This is similar to the routine clinical assessment and substantive for the above analysis. This study is the first attempt to compare and equate hip function scores. The results can be helpful for a quick clinical comparison and for comparing large studies using different outcomes. This study (N = 75) is an initial attempt to compare functional scores and an increase in sample size will result in more robust assessment and generalization.

P19
GAIT ANALYSIS FOR EVALUATION OF PATIENTS UNDERGOING TOTAL HIP ARTHROPLASTY (THA): COMPARING DIFFERENT SURGICAL TECHNIQUES AND RELATED CLINICAL AND FUNCTIONAL OUTCOMES
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Introduction: Evaluation scores, as Harris hip score, are easy to use to check patients treated with total hip arthroplasty but often prove themselves to be inaccurate to thoroughly asses the functional outcome in the patient with prosthesis.
Today Gait Analysis could represent the most important tool to evaluate the functional changes and biomechanical effects induced by hip surgery. Furthermore Gait Analysis could represent the gold standard to assessing pre-operatory objectives, modifying rehabilitation strategies and evaluating the different biological and functional impact of every specific surgery techniques, namely the way they impact on the post-surgery period, especially in young and active patients.
Materials and methods: Fifteen patients, between 48 and 63 years of age (average 55.5) were treated with primary total hip arthroplasty (THA). They were tested using an optoelectronic 3-D movement-analysis device (Milan, Italy). The relevant phases analysed are the following: pre-operatory (T0); 3 months (T1) and 6 months (T2) postoperatively.
Five patients were treated with Smith-Petersen exposure technique, five with Hardinge lateral exposure technique, and 5 with Moore postero-lateral exposure technique.
The evaluation process was aimed at assessing the various levels of recovery of motility. In order to achieve this goal the following motor tasks were tested: I) two-speed linear path (fast and comfortable); II) lateral path; III) squatting; IV) sit-to-stand.
The relevant parameters are:
Space-time parameters, kinematic joint parameters, dynamic joint parameters, muscle activations (rectus femoris, vastus lateralis, gluteus maximus, gluteus medius, erector spinae, biceps and tensor fascia lata).
Discussion: We maintain that there exist a remarkable difference between the different surgical techniques in the precocious functional recovery, such difference is often underestimated by the most common evaluation scales, which do not accurately quantify the biomechanical impact on the relevant muscular groups in the hip cinematic.
Results: According to our results we can say that Smith-Petersen exposure technique, which avoids not only cutting the muscle planes, but also has the biological impact lower negative, promotes a positive functional outcome in young and active patients who have undergone surgery for the treatment of degenerative hip arthritis

P20
ACETABULAR SHELL DEFORMATION AS A FUNCTION OF STIFFNESS AND BONE STRENGTH
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Introduction: Deformation of modular shells is of much interest for surgeons and manufacturers. Initial fixation is achieved through press-fit between shell and acetabulum with the shell mechanically deforming upon insertion. Shell deformation may adversely influence the assembly process of modular systems as well as the durability and tribology.
Objectives: The aim of the study was to depict shell deformation as a function of bone and shell stiffness.
Methods: The stiffness of the generic shells was experimentally measured using a two-point load setup. Cadaver lab deformation measurements were done before and after insertion for 32 shells with 2 wall thicknesses and 11 shell sizes using the ATOS Triple Scan III (ATOS) optical system. Multiple deformation measurements per cadaver were performed stepwise increasing the reamed acetabulum by at least 1 mm. From the deformations, the resulting forces on the shells and bone stiffness were calculated in each point at the rim of the shell.
Results: Radial stiffness for shells with 3 mm wall thickness ranged between 6257 N/mm and 2920 N/mm, with 4 mm wall thickness it ranged between 14341 N/mm and 6875 N/mm. The radial shell deformation ranged between 3 µm and 187 µm. The resulting maximum radial forces acting on the shells ranged between 26 N and 916 N.
From these values, a bone stiffness [N/mm] at the point of the maximum deformation has been calculated. Adding the bone stiffness and the shell stiffness using the equation for serial springs, one obtains a positive correlation between total stiffness and maximum deformation.
Discussion: The measured values are within the same order of magnitude previously published. The large variations of resulting maximum forces exhibit the need to further investigate shell deformation using commercial shell systems. The calculated bone stiffness at the point of the maximum deformation seems to be a valid predictor for expected shell deformation, but this also needs more data.

P21
RETRIEVAL ANALYSIS OF DUAL-TAPER HIPS HELPS UNDERSTAND WHY THEY FAIL
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Introduction: Modularity in total hip replacements provides surgeons with flexibility intraoperatively but increases the risk of corrosion at taper junctions and resulting adverse tissue reactions. We aimed to better understand the mechanism of failure of dual-taper hip implants by studying retrieved hips and correlating the findings to clinical data.
Methods: We analysed retrieved dual-taper hips of a popular design that was FDA approved and recently recalled. Stem-neck interfaces were assessed for: 1) severity of fretting and corrosion; 2) amount of material lost 3) location of damage; 4) composition of surface deposits.
A measurement method, including a roundness-measuring machine, was developed to quantify the severity of the damage in these tapers. With this method five longitudinal traces were taken on each round section of the taper surface at 45° increments to compute the relative depth of damage. These traces were normalised relative to unaffected surface of the taper and a sectional wear area was computed. Average area of these five traces provided a measure of surface damage for comparative purpose. The result obtained was normalised with time in situ. Body Mass Index (BMI) was normalised with the horizontal femoral offset.
Results: The stem-neck taper junctions had: 1) the highest median scores for fretting and corrosion for both for neck and stem surfaces; 2) material loss indicated greater damage on the male taper compared with female taper; 3) deepest areas of damage were on the inferior proximal and superior distal part of the necks, compatible with cantilever bending; 4) scanning electron

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microscopy with energy-dispersive X-ray spectroscopy revealed the presence of chromium orthophosphates. There was a positive correlation between severity of damage and BMI.
Conclusions: Fretting and corrosion scores were high at the stem-neck interface. The location of damage suggested a toggling of the modular neck component; this appears to be associated with patient BMI.

P22
BIOMARKERS OF EARLY STAGE OSTEOARTHRITIS
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Introduction: There are currently no biochemical tests for early osteoarthritis (eOA). Biomarkers that have been determined have not been successfully validated. Protein damage (PD) has been implicated in multiple conditions as a basis of pathogenesis. There is increasing study of this field with respect to OA.
Objectives: The objective was to quantify protein damage markers in patients with OA and rheumatoid arthritis (RA), determine a biomarker and attempt to validate it.
Methods: Samples were obtained from patient with either OA of the knee or known RA. The quantification of PD utilised gold standard liquid chromatography/tandem mass spectrometry (LC-MS/MS) to quantify damaged protein in blood plasma and synovial fluid. The findings were subject machine learning algorithms to discern utility of individual or combination of markers. These findings were then tested with a further group of samples to which the algorithm was blinded.
Results: An initial test set of 51 patients (including plasma samples from patients with eOA, early RA (eRA), non-sepcific synovitis (non-RA) and a control group) was subject to quantification techniques and from this a multi-class algorithm was formulated. A further set of data was then blindly entered from 129 patients across all disease groups and control into the multi-class algorithm to determine sensitivity and specificity. Of >20 data points per patient determined the following were the key components of the algorithm; age, sex, anti-CCP antibody status, citrullinated peptide (CP) and hydroxyproline (HP). With these data points the sensitivity and specificity of detecting patient with eOA was 73% and 87% respectively.
Conclusions: We present a multi-class diagnosis algorithm to meet the unmet clinical need for early-stage diagnosis and typing of arthritis. Combination of plasma CP, anti-CCP antibody and HP gave specific and sensitive detection of eOA, exploiting the discovery of CP in eOA.

Primary THA/RA

P23
PROBLEMS, OBSTACLES AND COMPLICATIONS IN MORE THAN 400 NAVIGATED MODULAR SHORT STEMS IN HIP ARTHROPLASTY
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Purpose: Aim of the study was to assess difficulties and adverse effects in more than 400 CAS THA using a short modular femoral stem to assess their incidence and to determine if this surgical procedure has to be considered as an high demanding surgical technique.
Materials and methods: 403 implants were followed for at least 6 months and included in the study. All the cases were divided in 3 series according to when the surgery had been performed to consider the evolution of the navigation process improvements/familiarity. All intraoperative problems, intraoperative obstacles and complications were registered. Adverse facts not directly caused by the surgical but derived by other conditions were excluded from the study.
Results: There were no differences in number of total problems/complications among the 3 series. Obstacles were statistically higher in earlier series where together with an higher incidence of navigation failures. We registered 8 cases of proximal femur fractures wit different distribution among the 3 groups. In 1 cases in group A we experienced an acetabular fracture. Surgical-time was longer in earlier series.
Conclusions: The authors registered both a higher rate in navigation failure and longer surgical time in the earlier series even because of less advance navigation systems and lower experience with CAS. However in whole series of more than 400 CAS THRs using a modular short femoral stem the authors could demonstrated no increased rate of complications compared to traditional techniques.

P24
MID-TERM FUNCTIONAL OUTCOME OF 36 MM METAL-ON-METAL TOTAL HIP ARTHROPLASTY (MoM THA) IN DISTRICT GENERAL HOSPITAL
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Introduction: In April 2010, the Medicines and Healthcare products Regulatory Agency (MHRA) issued an alert to its members concerning large-sized femoral head MoM THA. In addition, higher failure rate was noted in MoM stemmed prostheses in National Joint Registry (NJR).
We report the mid- term functional outcome of M-o-M THA in a district general hospital.
Objectives: To assess the mid- term functional outcome of M-o-M THA in a district general hospital.
Methods: Between 2005 and 2010, 288 MoM THAs were implanted in 269 patients in our institution. We report the functional outcome of these patients using clinical assessment, Oxford hip score, radiological assessment and metal ion levels. Kaplan-Meier analysis was calculated based on survival of the implants.
Results: A retrospective study of 288 MoM THAs were implanted in 269 patients. Female: Male = 141: 128. Mean age 73 years (37-92). Mean follow up was 5 years (2-7). Eighteen patients (5%) lost to follow up. There were 66 (22%) symptomatic patients. Metal ion levels were elevated (>7 ppb) in 18 (6%) hips. Mean Oxford Hip score was 36.9 (5-48) and mean cup inclination was 45° (32-66°). Revision THA were performed in 20 (6.68%) patients. Causes of revision THA were: Adverse Reaction to Metal Debris (ARMD) in 6 (30%) patients, infection in 5 (25%) patients, aseptic loosening in 5 (25%), 3 (15%) for hip instability, 1 (5%) for raised blood metal ions levels. Kaplan-Meier survival curve analysis was 68.9% at seven years.
Conclusions: The cumulative survival of 68.9% at 7 years based on Kaplan-Meier implant survival analysis. Revision rate of 6.68% (20) at 7 years. The commonest cause of revision THA was ARMD. We recommend that all patients with MoM THA undergo at least annual review with clinical and radiological examination for the duration of the longevity of the implant. We strongly advocate that all patients with MoM THR should be closely follow-up according to MHRA guidelines.

P25
SHORT TERM RESULT OF RECTANGULAR DOUBLE TAPER ROUND BACK STEM COMPARED WITH TRADITIONAL RECTANGULAR DOUBLE TAPER STEM
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Zweymuller stem has good long term result for total hip arthroplasty. Recently the new round back Zweymuller stem was launched for the purpose of the minimum invasive surgery.
Aim: We compare clinical results using the rectangular double taper round back stem (SL PLUS MIA, Smith and Nephew Japan, Tokyo) with those using the rectangular double taper stem (Alloclassic, Zimmer Japan, Tokyo).
Methods: We used 31 SL PLUS MIA and 66 Alloclassic stems for primary cementless total hip arthroplasty (THA). The mean age of patients in both groups at the time of the surgery was 66 ± 10. We operated on all THA using the modified Watson-Jones approach in the lateral position.
Results: The average preoperative Japan Orthopaedic Association score for SL PLUS (JOA hip score) was 45 points and the average preoperative JOA hip score for Alloclassic was 39 points. The postoperative JOA score for SL PLUS was 84 points. The postoperative JOA score for Alloclassic was 82. No stem subsidence over 2 mm was observed. There was no dislocation, deep vein thrombosis or deep infection in either group, and only one superficial infection for the Alloclassic stem.

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Conclusions: Both of two different shoulder shaped rectangular double taper stems showed acceptable clinical results at the short term follow up in patients.

P26

IS THERE A ROLE FOR A UNIQUE METAPHYSEAL FITTING CEMENTLESS SHORT STEM HIP REPLACEMENT

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Introduction: Short-stem total hip arthroplasty has been proposed as a bone-conserving procedure preferably for the younger and more active population undergoing total hip arthroplasty with ease of future revision. The Furlong Evolution stem is a next generation stem based on the well established HAC -cementless fixation philosophy of the Furlong hip system.
Objectives: In an RD approved prospective study, we evaluated clinical and radiological results in patients who underwent THA with a short, metaphyseal-fitting anatomic cementless Furlong Evolution stem with a zoned HAC coating.
Methods: We prospectively reviewed 194 consecutive patients (204 hips) who had Furlong evolution short stem. Independent reviewers reviewed all patients at regular intervals. Clinical and functional outcome was recorded using Harris hip score, Euroqol 5D and HOOS scores. Radiological review was done at 6 weeks, 6 months and yearly thereafter. The minimum follow up is 36 months.
Results: The mean age was 62.7 years. One patient had intra-operative fracture. No dislocations, clinical DVT in 4 pts, no infections. One pt had leg length discrepancy of 1.5 cm. Mean time to return to recreational sport was 19 weeks. There were 2 revisions. The Harris hip score improved from 61 (44-78) to 96 (SD:2.5). Metaphyseal trabecular streaming with periprosthetic bone remodelling was seen in 99% of stems. There was stem subsidence in 5 pts (4 into varus) within the first 6 weeks. Fine sclerotic lines were detected in Gruen´s AP zones 1 and 2 in 3 patient and clear cancellous bone compressions in zone 6 (97.5%). Offset was restored to within 5 mm in all patients.
Conclusions: This prospective study demonstrated the safety and stability of the Evolution femoral stem. Varus subsidence is a concern, which was observed in a few patients. Lessons were learnt on pre op planning, sizing, femoral preparation and based on this experience, instruments were modified for use across the patient range.

P27

CEMENTLESS HIP ARTHROPLASTY WITH PROXIMAL FIXATION STEM: MID TERM RESULT OF 712 HIPS

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Objectives: We analyze the mid-term results of cementless metaphyseal press-fit straight stem with press fit cup in a series of 712 patients.
Methods: From year 2006 to 2014, 712 patients who received 712 PCL-Fin (Gruppo Bioimpianti, Peschiera Borromeo, MI) hip arthroplasty were followed and evaluated both clinically and radiologically. Pre-operative diagnosis was primary arthritis in 591 cases (86 bilateral), avascular necrosis of femoral head in 66 cases (4 bilateral), rheumatoid arthritis in 32 cases (8 bilateral), post-traumatic arthritis in 12 cases, other causes in 11 cases. Average age at time of surgery was 63 (range 38-85). Clinical and radiological follow up was performed at 3, 6 and 12 months after surgery and once a year afterwards. Clinical follow up included evaluation of pain, walking distance, range of motions. Harris Hip Score (HHS) was evaluated pre-operatively and at each annual follow-up. Radiological evaluation included evaluation of radiolucent lines, osteolysis and migration.
Results: 27 patients were lost at 1 year follow up due to reasons unrelated to their hips. 458 patients (620 hips) were evaluated at mean follow up of 58 months (range 12-96). The preoperative mean HHS of 45 (range 35-60) was increased post operatively to 87 (range 80-98). 97% of patients were satisfied or very satisfied with surgery's outcome. Complications were observed in 30 cases: 9 trochanteric fractures for technical error, no osseointegration of acetabular component (8 cases), septic arthritis (9 cases) and dislocation in the early post-operative period (3 cases). Signs of radiolucent lines were observed in 8 cases (acetabular component), no migrations or osteolysis were observed. No stress shielding was observed.
Conclusions: Trapezoidal profile of t-pore coating proximal portion and tapered distal portion of PCL stem prevents stress shielding effects. Its use with Fin cup allows good mid-term results encouraging additional future observation of our study group.

P28

A NEW TOOL TO QUANTIFY COMPLICATIONS FOLLOWING TOTAL HIP ARTHROPLASTY

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Introduction: It is essential to recognize the critical influence of the complications on post-operative function and satisfaction and evaluation of complications can give a more accurate measure of satisfaction. Complications reported by the operating surgeon are susceptible to bias. All complications of hip arthroplasty do not end in revision but they do have an effect on post-operative function. A feasibility study for developing a patient reported complication score is presented.
Materials and methods: 148 patients who underwent hip resurfacing arthroplasty were mailed a questionnaire to enquire if they had a complication and kind of complication. This was compared with the hospital records. Kappa (κ) statistic was used to assess degree of agreement between surgeon and patients. The surgeon reported method was considered as the accepted standard against which the patient reported method was evaluated for sensitivity and specificity, positive predictive value, negative predictive value and positive likelihood ratio. STATA 9.0 was used for analysis.
Results: There were eight complications. Fracture neck of femur accounted for 6 failures and infection and aseptic loosening one each. Patients accurately reported all complications except 2 cases where the patients did not report the complication. Both patients had a fracture within first four months after the procedure. The four patients who reported fractures accurately had the complication at average of 2.5 years after the procedure. There was complete agreement between patient and surgeon for infection and loosening but κ statistic for fracture was 0.79, indicating good agreement.
Conclusions: The results indicate that post-operative complications can be quantified using a patient reported outcome measure. This study has established that a patient reported complication score is a viable and realistic option to supplement hip function and satisfaction scores. The tool used in this study was very succinct and may have failed to capture a broad viewpoint of patients having complications after hip arthroplasty. The next step is development of a questionnaire with multiple items without medical terminology and technical jargon. The items will explore to identify latent traits associated with specific and general complications of hip arthroplasty.

P29

RELIABILITY AND ACCURACY OF MEASURING ANTEVERSION OF THE ACETABULAR CUP ON ANTERO-POSTERIOR AND LATERAL PLAIN RADIOGRAPHS

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Introduction: Acetabular cup malposition is associated with dislocation of the femoral head, limited range of motion, and increased polyethylene wear. There has been no single standardized measurement method for cup orientation in plain radiographs after total hip arthroplasty.
Objectives: The purpose of this study is to evaluate the reliability and accuracy of the two methods measuring anteversion on plain antero-posterior (AP) radiograph and lateral radiograph. In addition, we sought to determine the ischial tuberosity angle on lateral radiograph when the anteversion measured from lateral radiograph is best correlated with the anteversion from AP radiograph.
Methods: Between January 2005 and January 2012, 551 primary THAs were enrolled in this study. All of the procedures were performed using single type of cementless acetabular cup and two types of femoral component. There were 294 male and 257 female participants. We evaluated the reliability and accuracy among three methods for assessment of anteversion of the acetabular cup: (1) the PolyWare software, (2) Liaw's and (3) the Woo and Morrey methods. The values of the PolyWare software, which determines version of the acetabular cup via edge detection on AP radiograph of the

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pelvis, were regarded as the reference standard anteversion in this study. The intra- and inter-observer reliabilities of each measurement were estimated with intraclass correlation coefficient (ICC) values. All clinical information about patients and the results of the other observers were concealed.
Results: In our overall data, the mean anteversion of the acetabular cup using the PolyWare software was 22.05 ± 4.44°. While the PolyWare software and Liaw's methods were similarly precise, the Woo and Morrey method was significantly different from the PolyWare software or Liaw's method ($p<0.001$). All three methods showed excellent, reproducible ways of measuring acetabular anteversion with high ICC value (ICC>0.90). In 140 THAs, the anteversion from the Woo and Morrey method were almost the same within 1° compared with the anteversion from the PolyWare software. In this selected group, the mean ischial tuberosity angle on cross-table lateral radiograph was 26.2 ± 3.14°.
Conclusions: Our results show that Liaw's method on AP radiograph seemed to be accurate in measuring anteversion of the acetabular cup with the reference of the anteversion obtained from the PolyWare software. We found that the Woo and Morrey method was inaccurate as compared to the PolyWare software. However, when the qualified lateral radiograph was selected, the anteversion measured using the Woo and Morrey method thought to be relatively reliable.

P30
BONE CONSERVING "NECK-ONLY" STEM MINI-HIP REPLACEMENT - EARLY RESULTS IN A CASE-SERIES
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Introduction: The recent increase in enthusiasm for minimally invasive surgery and bone preservation has led to the evolution of implants with short, conservative, or neck-preserving stems. The Silent stem is unique as it is implanted into the femoral neck only.
Objectives: The senior author has introduced this implant into his practice in selected cases. We present early results.
Methods: Between August 2010 and September 2011 five patients (6 hips) were operated for severe hip osteoarthritis using Silent TM stem (DePuy, Johnson and Johnson). The Silent hip, launched in 2009, is a tapered press-fit implant designed to sit in the femoral neck without contacting the lateral cortex. All our patients were females, with an average age of 44 years (39-55). DEXA scan was used preoperatively in all cases to exclude osteopenia/osteoporosis. Posterior approach and a cementless Pinnacle cup was used, with a CoC bearing. 32 and 36 mm heads were used. All patients were followed up clinically (OHS and SF-12) and radiographycally for an average of 48 months (42-55 months).
Results: All patients showed significant improvements. OHS improved from 27 (25-32) to 47/48 in 4 cases and 48/48 in 2 cases. SF-12 improved from average 24.7 to 40.15. None of the patients had thigh pain. Radiographs showed no subsidence or coronal malalignment. 2 cases showed signs of neck remodelling, but there was no osteolysis.
Conclusions: With younger and more active patients needing hip arthroplasty, the option of short, neck-preserving stem seems to gain increasing interest. This is a single surgeon case-series with medium-term follow-up. Larger numbers of cases with long-term follow-up should be reported to fully understand the results of this stem. The surgical technique for insertion of this stem is technically demanding. However, based on our results we can affirm that Silent Hip is a safe and effective implant in patients with adequate femoral neck bone stock.

P31
TRIPLE INTRAOPERATIVE LEG LENGTH MEASUREMENTS TECHNIQUE FOR TOTAL HIP REPLACEMENT. RESULTS IN A CONSECUTIVE SERIES OF 812 HIPS
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Introduction: Asymmetrical leg lengths after total hip arthroplasty is the single most frequent cause for legal action against orthopaedic surgeons. Several techniques are described for intraoperative measurement of limb length. Most of them, however, do consider only the femoral side.
Objectives: Demonstrate that a triple leg length discrepancy intra operative measurements technique minimizes length inequality.
Methods: A total of 812 hips operated between 2005 and 2012 have been studied with a specific protocol developed to minimize the occurrence of leg length discrepancy (LLD). Sixty-nine percent of patients had an average preoperative shortening of the operated leg of 0,7 centimetres. Twenty-three percent had equal leg length and in 8% of patients the operated limb was longer before surgery.
A careful preoperative planning was implemented. This include standing AP pelvis x-rays, standing and supine clinical evaluation of leg length discrepancy and, most important, an assessment of patient leg length perception. This is a single surgeon series and all patient were operated in lateral decubitus with a number of different implants depending from bone quality and morphology.
During surgery, three different measurements of total length of the operated leg were repeated before draping, after draping, with the trial components and with the final components and the trial femoral head. All three methods of measurements are simple, quick and reproducible. The first, evaluates the distance between a skin stitch applied 10 cm above the greater trochanter and a second stitch applied on the greater trochanter. The second method estimates leg length at the tip of the patella with both legs in 20° of flexion and the operated leg parallel to the floor. The third method quantify tension of the fascia lata at the level of the greater trochanter.
Results: Postoperative leg length was determined with standing and supine clinical evaluation, with patient satisfaction and on postoperative x-rays. Average postoperative LLD for these 812 patients was 0,2 (-0,6 +1,5). Only 2 patients (0,2%) presented leg lengthening of more than 1 cm and only one was unhappy and required a shoe-raise having a LLD of 1,5 cm. This patient received a femoral component which was different from the devices commonly employed in our Institution and therefore possibly the reason of this event.
Conclusions: In our experience, the triple intraoperative leg length measurements technique it is helpful for minimizing limb-length inequality during THA. A perfect leg length may be better restored if more than one method of assessment is used during surgery.

P32
WHAT ARE THE OPTIMAL BLOOD METAL ION THRESHOLDS FOR IDENTIFYING METAL-ON-METAL HIP REPLACEMENT PATIENTS WITH ADVERSE REACTIONS TO METAL DEBRIS?
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Introduction: Blood metal ions reflect *in-vivo* bearing wear following metal-on-metal (MoM) hip replacement, but the ion threshold for concern remains unknown.
Objectives: We assessed optimal blood metal ion thresholds for identifying adverse reactions to metal debris (ARMD) in MoM hip patients (hip resurfacing (HR) and total hip replacement (THR)), and the utility of the cobalt-chromium (Co-Cr) ratio for identifying ARMD.
Methods: This prospective study involved 598 (309 HRs/289 THRs) unilateral MoM hip patients undergoing whole blood metal ion sampling at a mean of 6.9 years. Patients were divided into ARMD (n = 46) and non-ARMD groups (n = 552). Metal ion parameters (cobalt, chromium, maximum cobalt or chromium (Max (Co, Cr)), and Co-Cr ratio) were compared between groups, and optimal metal ion thresholds for identifying ARMD were determined.
Results: All ion parameters were significantly higher ($p<0.0001$) in the ARMD group. Cobalt maximised the area under the curve (AUC) for HRs (90.5%), and THRs (79.6%). For HR, the cobalt AUC was significantly greater than the Co-Cr ratio AUC ($p = 0.0005$). For THR, the cobalt AUC was similar to the Co-Cr ratio AUC ($p = 0.8139$), but significantly greater than that for chromium ($p = 0.0004$) and Max (Co, Cr) ($p = 0.0161$). The optimal ion thresholds for identifying ARMD varied by implant design and metal ion parameter. The optimal threshold for HRs was a cobalt of 2.15µg/l (sensitivity 88.5%, specificity 84.5%, positive predictive value (PPV) 34.3%, negative predictive value (NPV) 98.8%) compared to 3.57 µg/l for THRs (sensitivity 80.0%, specificity 76.2%, PPV 20.0%, NPV 98.1%).
Conclusions: Blood metal ions were effective for identifying MoM HRs and THRs with ARMD. Optimal thresholds varied by implant design suggesting one ion threshold for concern is not appropriate. The high NPVs provide reassurance for asymptomatic patients below these thresholds, and could be used to rationalise follow-up resources. The Co-Cr ratio has a role in THRs but not HRs.

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THE OUTCOME OF HIP RESURFACING COMPARED TO NECK PRESERVATION SHORT STEM IN PRIMARY TOTAL HIP ARTHROPLASTY

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Introduction: Always more frequently young patient are subjected to hip implant arthroplasty: to preserve maximum bone stock hip resurfacing as well as hip neck preservation short stem allow for treating at the best quite severe primary or postraumtic OA**.**
Objectives: The purpose of this study was to evaluate the clinical and radiographic outcomes of hip resurfacing patients and compare them to neck preservation short stem primary total hip arthroplasty procedures performed during the same period of time in young active patients.
Methods: 120 consecutive men with a mean age of 49 years (range 19-60) and who had undergone 134 hip resurfacing arthroplasties between 2010 and 2013 were compared to 118 consecutive men (130 hips) with a mean age of 48years (range 33-55) who had undergone a neck preservation short stem primary total hip arthroplasty during the same time period. The mean follow-up was 42 months (range 24-60 ms) for both groups.
Results: In the resurfacing hip arthroplasty cohort, implant survivorship was 95% with three patients requiring a revision surgery for three femoral neck fracture and another for femoral head loosening. In comparison, implant survivorship was 99% in the neck preservation short stem total hip arthroplasty cohort, with 1 revision due to peri-prosthetic fracture which was successfully treated with a femoral component revision. In both cohorts, the mean post-operative Harris hip scores had improved to 96 and 94 points, respectively and were statistically similar. The resurfacing cohort had achieved a significantly higher mean post-operative Activity Score (6.7 versus 5 points). There were no differences in other complication rates between the two cohorts.
Conclusions: When patients meet the appropriate selection criteria in the hands of experienced and high-volume arthroplasty surgeons, hip resurfacing provides as well neck preservation short stem hip implant arthroplasty excellent results at short- to mid-term follow-up.

P34

HYDROXYAPATITE IN TOTAL HIP ARTHROPLASTY. OUR EXPERIENCE WITH A TITANIUM AND HYDROXYAPATITE DOUBLE-COATED CEMENTLESS STEM

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Introduction: Total hip arthroplasty (THA) could fail due to many factors and aseptic loosening is one of the most common. In order to achieve an effective osseointegration contact porous bearing surface were developed.
Objectivies: Aim of this retrospective study was to evaluate clinical and radiological mid-term outcomes of a porous titanium alloy/Hydroxyapatite double coating manufactured cementless femoral stem and to demonstrate the possibility to use this stem in different kind of femoral canals.
Methods: Between January 2008 and December 2012, 182 consecutive primary total hip arthroplasties (THAs) were performed using a porous titanium alloy/Hydroxyapatite double coating manufactured cementless femoral stem. 182 patients were examined and 136 were female (74.7%) and 46 male (25.2%); average age was 72 years old (26-92). Harris Hip Scores (HHS) and Womac Scores were collected. All X-Ray images were analyzed in order to demonstrate stem survival rate and subsidence.
Results: HHS was good or excellent in 85% and mean WOMAC score was 97.5 (73.4-100). No cases of early/late infection or periprosthetic fracture were noticed, with an excellent implant survival rate (100%) in a mean period of 40 months (24-84). 5 cases presented acute implant dislocation, 2 due to wrong cup positioning in a dysplastic acetabulum and 3 after ground level fall. Dorr classification of femoral geometry was used: 51 type A bone, 53 Type B and 78 Type C. Stem subsidence over 2 mm was considered as a risk factor of future implant loosening and was evidenced in 3 female patients with type C.
Conclusions: This data reported an excellent implant survival rate in a mid-term period with a rate of 1,64% of subsidence.
Radiological absence of pedestal has been accepted as sign of no excessive stress transmission to distal cortex due to its tapered diaphyseal region.
This double coating can be considered a valid choice with an excellent medium-term survival and encouraging subsidence results.

P35

RELIABILITY OF CERAMIC HIP COMPONENTS

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Introduction: Ceramic hip components are known for their superior material properties and longevity. In comparison to other materials commonly used, ceramics have a very low friction coefficient and a substantial fracture load. However, even though *in-vivo* fracture of ceramic ball heads are a relatively rare occurrence compared to other reasons for revision, they are of concern to the surgeon using ceramic components.
Objectives: The goal of this investigation was to evaluate the most probable causes for fracture and to quantify the influence of the metal taper contamination and damage, respectively.
Methods: An experimental set-up imitating an *in-vivo* loading situation was used to analyse different scenarios such as loading velocity, edge loading, and contamination of the metal taper that can lead to ceramic ball head fractures.
58 ceramic ball heads made of pure alumina were loaded until fracture under various conditions. Parameters under investigation were the inclination of the insert, the loading velocity, and the contamination of the interface between taper and ball head.
Results: The behaviour of the ball heads for the different scenarios showed a large variation. In case of edge loading, due to the reduction of load transfer area, the load required to fracture dropped significantly. The loading velocity had no measurable influence on this value. The largest effect on the fracture load had a contamination with osseous tissue and a damage of the metal taper. The fracture load decreases to approximately 20% compared to the value measured without the contamination.
Discussion: Perturbation of the interface of modular implants reduces the fracture load substantially. According to these findings, diligence for the implantation of ceramic hip components is recommended in order to ensure maximum stability of this interface. Otherwise, the consequently reduced friction or contact area of the ceramic/metal interface can result in fracture of the ceramic component.

P36

CLINICAL AND RADIOLOGICAL RESULTS AT 5 YEARS OF FOLLOW-UP WITH THE GTS SHORT STEM

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Introduction: Although uncemented stems have demonstrated excellent clinical and radiographic results in the long term, they could cause significant reduction of the trochanteric bone stock, long stem in the femoral shaft and stress shielding. GTS is a new short stem that aims to spare the trochanteric region and limit the invasion of the femoral canal in primary total hip replacement (THA).
Objectives: To evaluate the clinical and radiographic results of GTS at 5 years of follow-up.
Methods: From January to April 2010, 109 patients (M:F = 62:47) (115 hips) who underwent primary THA with a mean age of 58 years (range 20–80) were prospectively enrolled. Pre-operative diagnosis was primary osteoarthritis (75%), osteoarthritis secondary to hip dysplasia (17%), post-traumatic arthritis (4%), avascular necrosis of the femoral head (3%) and other (1%). The mean follow-up was 61.8 months (range 60–63). Survivorship analysis was performed with revision for any reason as the endpoint.
Results: The Harris Hip Score increased from 39.4 ± 5.4 pre-operatively to 97.3 ± 8.2 post-operatively ($p<0.0001$). No patient reported thigh pain or clicking/squeaking sounds coming from the prosthesis. Clinical picture after surgery was rated as very satisfactory and satisfactory by 76% and 17% of patients, respectively. At radiographic follow-up, no patients showed stress shielding. Cortical hypertrophy in the femoral shaft was detected in 1 (1%) hip. Heterotopic ossification was found in 11 (9%) hips, but none required surgical removal.

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Varus positioning (3°–5°) of the stem was reported in 14 (13%) hips. Intraoperative peri-prosthetic fractures were reported in 2 (2%) hips. At 5 year of follow-up, the cumulative survival rate was 98.3%. One (1%) stem was revised because of aseptic loosening, and one (1%) because of dislocation.
Conclusions: GTS stem provides excellent clinical and radiological findings in patients undergoing primary THA at minimum 5 years of follow-up.

P37
MID-LONG TERM FOLLOW-UP RESULTS WITH A NEW RESURFACING TECHNIQUE WITH A "HYBRID" MID-HEAD FEMORAL PROSTHESIS
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Introduction: Theoretical benefits supporting metal-on-metal hip resurfacing include to provide an anatomical reconstruction with low risk to change the offset and length of the lower limb, to preserve the femoral bone stock, to prevent wear and hip dislocation. However, resurfacing technique is affected by high rates of failure in the mid-long term.
Objectives: To evaluate the clinical and radiographic results and survivorship of a new resurfacing technique with a "hybrid" mid-head femoral prosthesis.
Methods: From December 2002 to November 2006, 79 patients (M:F = 60:19) (83 hips) who underwent hip resurfacing with a mean age of 51.5 years (range 25-79) were prospectively enrolled. All patients received a Durom cup and a "hybrid" mid-head femoral implant. The term "hybrid" indicates two fixation techniques: the mid-head was cemented, whereas the ultra-short stem was uncemented to provide a biological fixation. Survivorship analysis was performed with revision for any reason as the endpoint. Five patients were lost to follow-up. The mean follow-up was 8.7 years (range 8-9.6).
Results: The Harris Hip Score increased from 39.7 ± 7.6 pre-operatively to 93.8 ± 8.7 post-operatively ($p<0.0001$). At radiographic follow-up, a femoral neck thinning was detected in 7 out of 78 (8.9%) hips. In all patients, the thinning was mild and stable over time, and no additional management was required. Heterotopic ossification was found in 15 out of 78 (19.2%) hips, but only one patient required surgical removal. At a mean of 8.7 years, 4 out of 78 hips were revised for aseptic loosening (n = 2), periprosthetic fracture (n = 1), and severe heterotopic ossifications (n = 1). Cumulative survival was 94.9% for all patients.
Conclusions: Hip resurfacing with a "hybrid" mid-head femoral implant provides excellent clinical and radiological findings in patients undergoing primary total hip arthroplasty in the mid-long term follow-up.

P38
MINIMUM 3 YEAR FOLLOW UP RESULTS OF THE HMAX STEM AND DELTA PF CUP IN THE MANAGEMENT OF PRIMARY OSTEOARTHRITIS OF THE HIP FROM A SINGLE SURGEON IN ENGLAND
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Introduction: We report on a cementless, monoblock stem, with a rectangular cross sectional area, made of a Titanium alloy (Ti6Al4V) with a Hydroxyapatite (HA) coated macro-textured surface HMAX (LIMA Corporate). This was combined with a titanium HA coated press fit cup, Delta PF (LIMA Corporate). We report our use of this new combination.
Objectives: To review outcomes of our initial experience at minimum of three years with the new stem and cup combination.
Methods: We reviewed 326 patients who underwent total hip arthroplasty (THA) using this uncemented system. All were performed over a period of four years at Northampton General District Hospital and BMI Three Shires Hospital. There were 179 females and 147 males with a mean age of 59.7 (range 31-92) years. All procedures were either performed or directly supervised by the senior author through a posterior approach. Operative indications included primary osteoarthritis, avascular necrosis, and aseptic necrosis of the femoral head. The cup sizes ranged from 44 mm to 62 mm in diameter. Baseline Oxford and Harris Hip scores were performed pre-operatively and at the final follow- up. Operative details were recorded along with post-operative complications. Patients were followed- up clinically and radiologically for a period of 6 to 36 months. Outcomes were compared to a cohort of the same surgeons patients utilising a similar stem and cup combination from a different manufacturer for a similar period of time.
Results: Review of patient reported outcome measures (PROMS) revealed the average post-operative hospital stay was 3.1 days. The mean Oxford Hip score increased from 16 pre-op to 41 at the latest follow- up. There were 4 superficial wound infections post operatively, one settled with oral antibiotics but the remaining 3 required wound washout and subsequently made a full recovery. There was one dislocation treated with closed reduction. There were three cases of stem subsidence, one at 3 months following a fall requiring revision to a cemented stem, the second and third at 2 and 4 months follow- up not requiring revision. All three were due to undersized femoral stems. Results were comparable to a cohort of a different prosthesis used by the same surgeon for a similar period of time.
Conclusions: Uncemented hip arthroplasty using HMAX Stem with the Delta PF cup provides excellent results in the short term. Change to a new stem requires additional learning even in experienced hands. Outcomes however are not affected for patients and satisfaction was high. Further long-term follow-up is essential to validate the use of this implant; however, these early results encourage continued use.

P39
ARE SHORT STEM ABLE TO PREVENT THIGH PAIN IN TOTAL HIP ARTHROPLASTY?
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Introduction: Cementless short stems in Total Hip Arthroplasty (THA) had been introduced to preserve bone stock and to reduce soft tissue damage. Proximal load transfer in absence of distal fixation should reduce the risk of thigh pain.
Persistent thigh pain may be a source of dissatisfaction and disabling pain requires the revision of the implant.
Objectives: The purpose of this study was to report the prevalence of thigh pain in a consecutive series of 405 short stems THA.
Methods: Between 2002 and 2011, 405 truly short stems were performed in our division using four different short prosthetic models: 3 models related to neck sparing and one metaphyseal implant. All patients were reviewed a minimum one year of follow up to evaluate the presence of thigh pain. All implants were performed by the same senior surgeon by the same lateral approach as described by Hardinge. Harris Hip Score (HHS) and Visual Analogue Scale (VA P38S) score were performed preoperatively and postoperatively. Standard radiograph were assessed preoperatively and postoperatively and at 3, 6 and 12 months. Alignment and intraoperative and postoperative complications were evaluated.
Results: Minimum follow up was of 1 year. Pain improved statistically from and no patient referred presence of thigh pain. HHS statistically improved from preoperative postoperative (p value <0,001).
Two revisions were performed due to one aseptic loosening and one septic loosening.
No case of dislocation, subsidence or evidence of periprosthetic osteolysis were observed.
Conclusions: The strength of this study is that several types of truly short stem are used in patients with a wide range of age (32-88 year old). The main limitation of this study is the short term of follow up; but it was sufficient to evaluate thigh pain which typically appears within 6 months post operatively. Short stem avoiding the canal invasion seems to actually reduce the prevalence of tight pain in postoperative course of THA.

P40
RELIABILITY OF COMPUTER ASSISTED NAVIGATION IN LIMB LENGTH DISCREPANCY AND OFFSET EVALUATION IN TOTAL HIP REPLACEMENT
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Background: Limb length discrepancy after total hip arthroplasty (THA) is one of the possible complications of suboptimal positioning of the implant

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and cause of patients dissatisfaction. Computer assisted navigation become affirmed in last years for THA surgery and it is also used for the evaluation of the intra-operative limb length discrepancy.
Objectives: The aim of this study is to verify the reliability of a navigation system in intraoperative evaluation of limb lengthening and offset compared with manual technique.
Methods: Forty patients who underwent a THA in our institution were enrolled in this study. Twenty patients were evaluated with pre operative manual planning and treated with hand positioning of femoral stem. Twenty Patient were evaluated with preoperative manual planning and treated with Computer assisted navigation system. Radiological and clinical follow up was made at 1, 3, 6 and 12 months postoperative to assess any mismatch of implant, complications and clinical results that was measured with Harris Hip Score.
Results: In the evaluation of limb length and offset in group A there wasn't significance difference between pre and postoperative measurements obtained with manual planning. Also in group B there wasn't a significance difference between the measurement obtained intraoperative with computer assisted navigation and the one obtained after surgery and preoperative with manual planning. In any case we noted a limb length discrepancy in this series. No statistically significance difference was noted between the two groups in relations to the others parameters investigated.
Conclusions: Based on our study the computer navigation system is simple and reliable for the evaluation of limb length discrepancy and offset in total hip replacement. This Navigation system can offer to the surgeon a valid intraoperative information that can reduce possible errors in stem positioning and can reduce rate of length discrepancy.

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DISTAL FIXATION IN TAPERED WEDGE-SHAPED CEMENTLESS STEM LEADS TO REDUCED BONE INGROWTH AND INCREASED STRESS SHIELDING FOR DDH PATIENTS

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Introduction: Tapered wedge-shaped cementless (TW) stems have been widely used for several years. The concept of fixation in TW stem is wedge-fit fixation at the medial to lateral planes in the proximal metaphysis. Developmental dysplasia of the hip (DDH) has anatomical abnormality, such as excessive femoral anteversion, narrow femoral cavity, or proximal-distal mismatching. Therefore, fixation patterns of TW stem are various in DDH patients.
Objectives: We evaluated relationship between the fixation pattern of TW stem and bone reactions in DDH patients.
Materials and methods: One hundred seventy hips in 158 patients were performed total hip arthroplasty with tapered wedge-shaped cementless stem (CTi-II: Corin, Cirencester, UK) between 2005 and 2009. There were 136 females and 22 males. The average age at operation was 65 years old. The average body mass index was 23.7 kg/m^2. Primary diagnosis was secondary osteoarthritis due to DDH in all patients. The average follow-up term was 75 months (60-108 months). Femoral canal shapes were normal in 132, stove-pipe in 22 and champagne-flute in 16 hips. Bone qualities were type A in 28, B in 131 and C in 11 hips. We performed radiographic estimation bone reactions. The cortical contacts of stem were evaluated in the coronal, sagittal and axial views in three-dimensional computed tomography. According to the cortical contacts of stem, stem fixation patterns were classified by medial to lateral (ML), flare (FLR) and distal (DST) fixation.
Results: Any radiolucent lines were not observed on the porous surface of stem. Radiolucent lines on the non-porous surface were seen in 21% at the anterolateral view and 41% at the lateral view. Spot welds were observed in 98% at the anterolateral view and 79% at the lateral view. The femoral bone atrophy by stress shielding was judged as none in 9%, the 1st degree in 55%, 2nd in 28% and 3rd in 8%. Stem fixation patterns were ML in 47, FLR in 55 and DST in 68 hips. Spot welds on the porous surface more frequently appeared in cases with ML (96%) and FLR (98%) fixation than DST (81%). Severe stress shieling (the 2nd or 3rd degree) was more frequently recognized in DST (51%) than ML (13%) and FLR (36%).
Discussion: Midterm fixation of TW stem for DDH patients was stable with high frequent bone ingrowth. However, bone ingrowth on the porous surface and degree of stress shielding varied according to stem fixation patterns. Distal fixation of TW stem might lead to decreased bone ingrowth on the porous surface followed by early loosening and extensive stress shielding to the proximal femur.

P42

THE ANTERO-LATERAL APPROACH: A CORRECT DEFINITION OF TERMS

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Introduction: The "antero-lateral" minimal invasive approach (ALMI) as described by Rottinger is a modification of the standard antero-lateral Watson-Jones approach and utilizes the intermuscolar plane between TFL and the gluteus medius (GM), without incising or detaching muscles and tendons. It is similar and shares the advantages of direct anterior approach (DAA) of being muscle sparing by not violating the abductor muscle. However the term "antero-lateral" is sometimes utilized to describe other "lateral" approach in which the GM was detached, such as the gluteus splitting approach or similars.
Objectives: The aim of this study was to identify the correct definition of antero-lateral and lateral approach and which are the correct descriptions of both approaches.
Materials and methods: A thorough literature review focusing on the definition of antero-lateral and lateral approach was undertaken and for both approaches the description of the surgery was analyzed with special attention if the approach was anterior to the GM.
Results: The systematic search revealed 31 manuscripts in total. 21 papers correctly reported the term antero-lateral approach to describe the Watson-Jones interval, nonetheless in the remaining 10 papers the terms ALMI was used to describe approaches in which the gluteus medius were violated in some way (splitting, detaching, ect.) that should have been more correctly defined as "lateral" approaches.
Conclusions: Approaches to the hip joint were usually classified by muscle intervals or anatomic structures, thus terms ALMI should be deserved only to approaches "anterior" to the trochanter in the interval between TFL and GM. No approach which violates the gluteus medius should be called antero-lateral.

P43

CEMENTLESS TOTAL HIP ARTHROPLASTY: A BILAYER COATING TO ENSURE CUPS SURVIVAL RATE AS WELL THAN STEMS

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Introduction: For uncemented total hip arthroplasty (THA) addition of hydroxyapatite layer has been used in France for nearly 30 years. Survival rate of symmetrical straight stems with hydroxyapatite stabilized by corner effect is good (>95% at 10 years), however cup's survival rate is usually less than 85% leading to decreased THA survival.
Objectives: To support osseous fixation of the implant, the placement of an under-layer between the prosthetic substrate and the hydroxyapatite coating makes it possible to obtain a surface landscape that will serve as an "anchoring volume" for newly formed bone. We have previously validated bilayer manufacturing by *in vitro* tests, which proved that surface preparation (alumina blasting) does not change implant's mechanical properties and that vacuum spraying doesn't affect them either, as already described in literature.
Methods: An exploratory study with 127 consecutive THA from June 2001 to December 2005 was done. Radiological and clinical endpoints were evaluated at maximum follow up.
Results: With an average follow-up of 10 years, no fixation failure was demonstrated from a clinical standpoint. Only 5 revisions were observed, due to infection, dislocation, neck fracture and impingement. Improvement of average Postel Merle D'Aubigné score was very significant (from 9.5 to 17.8, $p<0.05$). For stems, the mean Engh score was 23.2. For cups, no migration and no loosening according to Engh criteria were observed. Radiological and clinical parameters collected in our study demonstrated an equivalent survivorship of stems comparing to literature and no difference between stems and cups (>96%).

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Conclusions: In medium-term, a bilayer coating is clinically effective at providing reliable and reproducible cementless tertiary fixation that begins when hydroxyapatite is resorbed as well for acetabula cups and stems and could ensure stability even when mechanical locking is not predominating. THA global survivorship could then be improved.

P44

THE USE OF INTERNAL LANDMARKS TO GUIDE CUP INCLINATION ANGLE IN TOTAL HIP ARTHROPLASTY

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Acetabular cup inclination and anteversion are important in the success of Total Hip Arthroplasty (THA). The use of the transverse acetabular ligament (TAL) has recently been popularised as an internal landmark to guide cup version. However, cup inclination is still most commonly guided by external references (45° cup holder) despite the evidence that patient position on the operating table is highly variable. The aim of this study was to assess the utility of a new technique to guide cup inclination that is independent of patient position, relying solely on internal landmarks identified by preoperative templating.
Group A consisted of 31 consecutive patients who underwent THA by a single surgeon. Pre-operative templating was performed with the socket at 40° inclination measuring the planned cup size, distance from the acetabular floor and the distance between the superolateral edge (SLE) of the acetabulum and the lateral rim of the cup. The cup was positioned intra-operatively according to these measurements paying close attention to the SLE distance and without reference to external guides or the cup handle position.
Group B was a historical cohort of 53 consecutive patients with THA performed by the same surgeon utilising traditional, external reference techniques (45° cup handle) attempting to correct for patient position to achieve a postoperative radiographic inclination of 40 degrees.
In both groups the TAL was used to guide cup version. Post-operative radiographic cup inclination was measured by and independent researcher using digital image analysis software.
Mean cup inclination in group A was 40.7° (Range 32°-52°). Group B mean cup inclination was 40.5° (Range 28.6°-50.6°). Statistical analysis showed no difference in inclination between the two groups.
The sole use of the SLE measurement as a guide to cup inclination is as effective as traditional methods and has the advantage that it is independent of intra-operative patient positioning.

P45

WEAR RATE AND MEDIUM-TERM SURVIVAL OF A CEMENTED, MODERATELY CROSS LINKED POLYETHYLENE ACETABULAR PROSTHESIS

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Introduction: The moderately cross-linked Depuy Marathon™ cemented acetabular component was introduced into the UK in 2007. Wear rates and follow up has been studied for the Marathon™ uncemented component but not as yet for the cemented version. We present the medium term results of the Marathon™ cemented prosthesis used in primary total hip arthroplasty.
Methods: All Marathon™ cemented acetabular components implanted between July 2008 and July 2009 were identified from our institutions electronic implant register. All patients' case notes were reviewed and follow up post-operative radiographs were examined by a single investigator. The uni-radiographic technique was applied using the CAD™ software to measure linear wear and wear rate.
Results: Two hundred and sixty five Marathon™ cemented acetabular component implants were identified. Mean age was 67 years (range 26-90). Of the two hundred and sixty five patients, data was unavailable for twenty two. Six patients had died during the study period, and sixteen were lost to follow up. Mean follow-up was 55 months (range 50-61). Mean radiological follow-up was 46 months (range 24-57). The mean overall wear was 0.37 mm (range 0.04 mm-0.78 mm). The wear rate was calculated as 0.03 mm/year (95% CI 0.02-0.06). Five patients were diagnosed with post-operative deep vein thrombosis (2.05%) and there were no cases of pulmonary embolus. There were 2 post-op dislocations (0.8%).
There were no revisions for failure of the Marathon™ cemented acetabular component.
Discussion: The wear rates for the Marathon™ uncemented acetabular component have been reported to be range from 0.06 to 0.01 mm/year. We report the mean wear rate of cemented Marathon cups to be 0.03 mm/yr. (95% CI 0.02-0.06). The Marathon™ cemented acetabular component is safe and reliable for use in primary hip arthroplasty. Post-operative surgical and medical complications are low. Medium term survivorship at a mean of 56 months is excellent.

P46

PRELIMINARY RESULTS OF A NEW TROCHANTER SPARING SHORT STEM

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Introduction: In the last decade short stems have appeared, but not all short stems are equal in terms of design, femoral cut level, biomechanical properties.
Material and methods: A case series of 62 hips in 59 patients were included with a mean follow up of 21,4 months (range: 18-37 months). A new cementless, trochanter sparing short stem with a modular neck was implanted in all patients using a mini posterior surgical approach. Selection criteria for implanting this stem was a femoral T-score value above -1, Dorr femur type A and B, age under 75 years and BMI <30. Pre-operative diagnosis were the following: 48 osteoarthris, 6 avascular necrosis, 4 posttraumatic osteoarthritis, and 2 dysplasia. Patients were followed up at 2, 4, 6, 12 and 24 months. WOMAC, Merle D'Aubigne, Harris Hip Scores were registered preoperative and postoperative on clinical records. Mean age was mean 58,7 years (range: 32 to 71 years). Biolox delta ceramic on ceramic bearing couple was used in all hips. To date neither neck fractures nor stem subsidence were reported.
Results: Mean WOMAC score improved from 42,2 points (range 29-51) to 96,7 (range: 66-100, p<0,001), Merle D'Aubigne from 11,8 (range 10-14) -17,1 (range: 16-18, p<0,01, Harris Hip Score from 37,4 points (range 26-66) to 93,8 (range: 61-100, p<0,001). Stem survivorship was 100%, considering as endpoint any cause of its revision.
Conclusions: Preliminary assessment of a new trochanter sparing short stem with modular neck system provides promising results in terms of clinical results and radiological observations at the latest follow up. Long-term results are necessary to assess if this trend continues.

P47

OUTCOMES OF DUAL-MOBILITY ACETABULAR CUP IN CASE OF FEMORAL NECK FRACTURES AND OSTEOARTHRITIS: AN UPDATE AND NEW PERSPECTIVES

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Introduction: The dislocations in case of total hip arthroplasty (THA) remains a troubling issue. A dislocation may be due to an infection, as the main early complication following THA. In case of primary THA, the dislocation rate is approximately 2-4%, rising to about 7-14% after revision procedures. The rate is doubles in case of the patients older than 70 years of age. The etiology is multifactorial.
Materials and methods: Patients with osteoarthritis and femoral neck fractures were subjected to cementless hip prosthesis. Both standard cups and dual mobility cups were used. The femoral stem was the same for each prosthetic implant. Surgery was performed by the same approach. Only patients with acetabular and/or femoral Parosky type I were included in the study. Patients were clinically and radiographically evaluated at month 1, 3, 6, 12 and 24. The linear polyethylene wear was measured by the method of Dorr and Wan. A TC evaluation was performed at month 12 and 24.
Results: Approximately one-third of the unstable hips require a revision. Therefore, different strategies able to reduce the incidence of dislocation are

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necessary. The dual-mobility acetabular components represent a new and interesting alternative. Our study showed that the polyethylene wear, debris desease and dislocation episodes were lower in patients in whom dual mobility cups were used, without damaging the range of motion.
Conclusions: The dual mobility cup has three essential goals: 1) to decrease wear; 2) to increase implant stability; 3) to restore a near-normal range of motion. It was showed that this target can be reached without reduce the range of motion. In our opinion the dual mobility cup is a new and interesting solution able to reduce the incidence of dislocation, both in case of femoral neck fractures and osteoarthritis.

P48
TOTAL HIP ARTHROPLASTY FIRST IMPLANT: CORRELATION AND VARIABILITY OF THE RESULTS IN THE SHORT TO MEDIUM TERM
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Introduction: Osteoarthritis of the hip is more than 80% of the changes in the hip joint and it is one of the most common degenerative diseases in the elderly population. The total hip (THA) revolutionized the treatment of this disease. There are several factors that contribute in achieving outcomes.
Objectives: To compare the data pre/postoperative looking for correlations between objective and subjective data.
Materials and methods: We recruited 114 patients (mean age 69 years) who was implanted a THA cup in the period 2008/11-2014/08. We observed Clinical data (Harris Hip Score and short -HHS- form -SF-36-) and the main measurements of X-ray pre/postoperative diagnosis of intervention, the main operating characteristics, complications and indices of surgical risk. The data were then analyzed for the presence of correlations.
Results: Clinical improvement postoperative (HHS preoperative mean 60.04, postoperative mean 92.15), good positioning of components and a number of complications same the literature. The data analysis found significance between the complications and the clinic, between conditions preoperative and postoperative outcomes, between diagnosis of the intervention outomes.
Conclusions: The THA has a big impact in improving the patient's quality of life (QoL). In this study confirms the data in the literature regarding outcomes and good positioning of the components. The correlation between the data allows to analyze the variables involved in determining the QoL and to understand the coexistence of several factors.

P49
ABDUCTOR WEAKNESS AFTER TOTAL HIP ARTHROPLASTY
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The hip abductor muscles have the capability to contribute to numerous actions, including the pelvic stabilization during the gait and the abduction and the rotation of the hip joint (Flack NA et al. Clinical Anatomy 2012). Kanimura et al. (2014) suggest that the strength of the hip abductor and the age may be good predictive factors for the ability of the ambulation at week 3 and at month 4 and after a total hip arthroplasty (THA); in fact the elderly patients (>70 years) have a higher grade of postoperative atrophy of the fatty gluteus medius muscle, raher than younger ones (Müller M et al. 2011). The weakness of the abductor is an important risk factor for the instability that can follow a primary (THA) and a minimally invasive approach (anterolateral mini-invasive approach) may minimizes the perioperative trauma of the soft tissues (Müller M et al. 2012). A direct trauma to the abductor muscle mass, a direct damage to the superior gluteal nerve (Kenny P et al. 1999) or an avulsion, are the major causes of the abductor weakness; the symptoms are especially the lateral hip pain (trochanteric pain syndrome), the limping and the positive Trendelenburg's sign. When the conservative therapy (physical therapy, NSAIDS, Injection) fails, a surgical approach is needed. The operative techniques are the vastus lateralis – transfer (Flip), the gluteus maximus muscle transfer (Whiteside Technique) and the tendon repair (avulsion). The weakness of the abductor is very difficult to diagnose and to treat; it is not very easy to perform a correct evaluation of the patient's problems and to indicate the right approach. Actually, the cellular therapy is considered a new chance for the treatment of the muscle deficits: von Roth et al. (2012, 2013) demonstrated that a transplantation (also systemic) of bone marrow derived cells for the improved regeneration of injured musculature appears to be feasible.

P50
FEMORAL MODULAR STEM SYSTEM. LONGITUDINAL WINGS STABILITY CONCEPT: OUR EXPERIENCE IN 2988 THP IMPLANTS
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Introduction: Femoral stem design evolution is related to the better comprehension of biomechanics and tribology of materials and implants, which brought to manufacture several new designs, since 60's available press fit models of stem include longitudinal wings in order to optimize immediate fixation and secondary osteointegration. Wings presents various shapes and directions; we believe that interaction between implants and bone obtained from longitudinal radial wings can provide a mechanical and biological cementless stability; so we use a system of modular conic stems provided by longitudinal wings suitable for primary and revision implants; in this study we conducted a retrospective analysis of our results.
Material and methods: We reviewed our arthroplasty activity over the last 10 years, from 2003 to 2014, in which 2988 THP were realized. Revision data was analyzed evaluating Harris score registered before operation and at 9 months after surgery.
Into statistics, periprosthetic fracture or rupture of implants was not included into statistics so as revision of acetabular component were not included.
Results: Harris score passed from 47.5 to 88.2; we revealed 1.0% of revision rate of femoral stem: 5 cases because of septic loosening, 10 cases due to fracture within 30 days of the surgery revision, 15 cases of debris loosening.
Discussion: The use of cementless implants makes more easier any future revision.
Modularity concerning the neck and the head allows to adjust length and offset of the hip.
The analysis of results in the use of this kind of wings provide a low % rate of revision if compared to the statistics in literature; we find that the design is crucial for the survival of THP: conic gradual adaptation into intramedullary space is further enhanced by the radial projection of stem wings, which provides a sectional transverse and rotational primary stability; this particular aspect is very useful to control the antiversion or retroversion of the stem. So we believe that this additional device offers more technical possibilities to overcome any difficulties due to the various anatomic forms and a better guarantee of longevity related to its intrinsic stability.

P51
BIG HEADS: DO DIMENSIONS MAKE THE DIFFERENCE?
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Introduction: The use of big heads in total hip arthroplasty demonstrated better stability and articular excursion. Troubles with metal on metal match give way to ceramic largest use. Till last few years ceramic heads were smaller than metal ones. In last years the use of big ceramic heads increased.
Objectives: Purpose of this study was to compare articulation of prosthetic hip with traditional assembled cup with ceramic insert with normal ceramic heads and a preassembled ceramic cup with big heads.
Methods: From January 2011 and May 2014 269 THA were positioned with trilock femoral body. We divided them in two groups: 162 were associated with pinnacle cup and heads of 36 mm (A GROUP), and 107 with Deltamotion and ceramic heads of 40, 46 or 48 mm (B GROUP). In both group we used ceramic heads and inserts. Minimum Follow up was of 12 months. Harris Hip score (HHS), misuration of passive and active articular excursion using a goniometer and a new smartphone app (Smartjoint®) and hip x ray were evaluated pre operative, and at 1, 3, 6, 12 months postoperative.
Results: No patient presented general complication intra or post operative. Two intraoperative cracks were treated immediately with cable wire cerclage. There weren't aseptic loosening or infection. The groups presented similar values in passive articulation and HHS. The values of active articulation were better in B group.

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Conclusions: Implants with heads from 36 mm are more stable and give better results in articular excursion. A preassembled cup is a better choice in young patients with higher functional request.

P52
RESTORATION OF THE FEMORAL OFFSET AND MODULARITY: REALITY OR FICTION
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The use of modular stems is still debated and controversial. Some authors have highlighted a number of disadvantages of modular prostheses including: the high costs, the tendency to fracture, the fretting and corrosion, the increased production of debris. Other authors have emphasized the possibility to adapt the prosthesis to the morphometric differences of patients, to allow better accuracy in restoring the anatomy and biomechanics of hip joint. The advantages of the modular devices appear to be more evident in patients with dysplasia of the hip. In our study we compared 60 patients, all with unilateral dysplasia of the hip operated with 30 modular prostheses (PROFEMUR®, Wright® Arlington, Tennesse, USA) and 30 with normal femoral stems (SYMAX®, Striker® Kalamazoo, Michigan, USA). The preoperative HHS (Harris Hip Score) was 44 (23-66), the postoperative 96 (76-100) in the 30 patients operated with modular prostheses and 87 (72-94) in the 30 patients with normal femoral stems The worst HHScores were seen in patients in whom the offset was not restored properly. On the contrary, the best scores have been reached in patients in which that value is closer to the "target" value (offset value of the contralateral hip). Restore the offset determining the correct tension of the abductor muscles of the hip implies a better functioning of the joint and have to be a primary objective of the THA surgery.

P53
RISK ANALYSIS OF FALLING IN PATIENTS WITH COXARTHROSIS IN PREOPERATIVE PERIOD: A PILOT STUDY
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Introduction: It has found that proprioception decreases in patients with coxarthrosis and total hip prosthesis (THP) compared with healthy individuals and as a result, there are problems in control of movement and balance. Falling induced by problems in balance can cause fractures, reduce the quality of life, and also cause periprosthetic fractures or loosening of prosthesis. Therefore, it is recommended that the risk of falling should be assessed in the preoperative period and fall prevention methods should be applied.
Objectives: The aim of our study was to investigate the risk of falling in the preoperative period in patients with coxarthrosis which were planned THP.
Methods: Nineteen patients (13 female, 6 male) with coxarthrosis were included in our study. Their mean age was 53.78 ± 17.3 years. Muscle strength, range of motion and pain of patients were evaluated. One leg stand test with eyes opened and closed, timed 50-foot walk test, 5 repeated sit-to-stand test, Harris Hip Scoring and Lower Extremity Function Scale were applied to the patients. The patients' risk of falling was assessed by Tetrax Balance Assessment System.
Results: The average of patients' falling risk was 0.25 ± 0.42. It was found that 7 patients had high falling risk and 12 patients had low falling risk. It was found no differences between patients with high falling risk and low falling risk in terms of other assessment parameters. When we compared male and female patients in terms of falling risk was not found any significant differences ($p>0.05$).
Conclusions: In this pilot study, it was found that high falling risk (37%) in patients with coxarthrosis which was planned for THP. It was seen that falling risk was significant in this patient group in spite of the limited sample size. Therefore, we think that it should be assessed risk of falling in patients with coxarthrosis and THP.

P54
MINIMALLY INVASIVE POSTERIOR APPROACH FOR TOTAL HIP ARTHROPLASTY
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Introduction: Implantation of the total hip prosthesis should always be as atraumatic as possible. Minimally invasive total hip arthroplasty (THA) has become popular over the past few years. Advantages of this technique include reduced soft tissue damage and faster recovery for patients. On the other hand, there are new risks related to reduced visualization.
Objectives: To show our results with this technique.
Methods: Patients were evaluated retrospectively at a minimum of 2 years postoperatively. Between January 2007 to January 2013, 473 hips from 436 consecutive patients were operated on using posterolateral minimally invasive THA in our center. We used the Wright prosthesis, from Wright Medical Implant (Wright Medical Technology, Inc, Arlington, TN, USA). The study group included 184 men and 252 women. Mean age of the patients at time of the index THA was 55.4 years (range, 25-89). The most common diagnosis was osteoarthritis in 303 cases (64%).
Results: Mean operative time was 42 minutes (range, 35-65). Mean incision length was 8.2 cm, with a range of 6 to 12 cm. Mean length of hospital stay was 3.2 days. Average postoperative Harris hip score was 92 at 3 months postoperatively (previous of 48). Complication rate was 2.1% (10 cases). 5 patients needed another surgery. There were 3 deep infections (all revised), 2 dislocations (1 reoperated), 2 deep vein thrombosis, 2 intraoperative femur fracture (1 reoperated), and 1 nerve injury (femoral).
Conclusions: Our study indicates a low complication rate and good functional recovery following minimally invasive THA using a posterolateral approach. With the mini-posterior approach, the prosthesis is placed through a less than 10 cm in length incision, but which still provides perfect visualisation of the surgical site while reducing trauma to the soft tissue. This technique provides short-term safety, low morbidity and fast postoperative recovery for the patient.

P55
INTRA-PELVIC MIGRATION OF FEMORAL HEAD TRIAL IN TOTAL HIP ARTHROPLASTY, A RARE INTRAOPERATIVE COMPLICATION. OUR EXPERIENCE AND SYSTEMATIC REVIEW OF LITERATURE
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Introduction: Trial reduction while performing total hip replacement is an essential step of the procedure. This is to check the stability of the hip joint with the selected implant sizes and to assess the leg length to avoid discrepancy.
Disengagement of the femoral head trial from the femoral rasp stem, with subsequent migration of the trial head into the pelvic cavity is a rare occurrence, but can be a very frustrating complication to both the surgeon and occasionally the patient.
We present our experience with this exceptional situation and different management options, together with systematic review of the literature.
Patients and methods: We conducted Medline database search via Pubmed interface. MeSH search was used. Systematic review of English literature case reports was performed.
15 reports were found discussing intra-pelvic migration of different arthroplsty related materials.
The total number of reported cases was 24 cases, out of those, 21 cases were related to migration of femoral trial head, 2 cases of migrated modular hemiarthroplasty bipolar heads and one case of migrated femoral head definitive implant.
Results and discussion: Migration of femoral head trial or prosthesis into the pelvic cavity is likely to be an under-reported incidence considering the number of cases found in literature.
In the reported cases, when dislocating or reducing the femoral head trial, it disengaged from the rasp trial stem or the definitive femoral stem. Usually the surgeon tries to retrieve the trial head by finger exploration, however it usually ends up being pushed further intra-pelvic. Similar pattern was described in the reports of migrated definitive prosthetic head and bipolar hemiarthroplasty modular heads.

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Conclusions: The dissociation of the femoral head during a THR is a rare complication. It is proved to be difficult to retrieve the head once disengaged. Co-ordination with assistant is important. Seeking senior surgeon assistance during the procedure is a reasonable approach. Closure and preparing for a second planned procedure to extract the head seems to be a safe option after proper imaging to localize the trial head. Keeping the patient informed about the unfortunate intra-operative event is a must.

P56

FEMUR FIRST SURGICAL TECHNIQUE: A SMART NON-COMPUTER-BASED PROCEDURE TO MATCH THE SAFE ZONE IN TOTAL HIP ARTHROPLASTY

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Introduction: Although the combined anteversion has been demonstrated to be more important than the absolute positioning based on the bony landmarks, few report investigated the role of non-computer-based surgery to address the reciprocal orientation of the components.
Objectives: To evaluate the clinical and radiological outcomes of a new non-computer-based procedure to match the safe zone in total hip arthroplasty (THA).
Methods: 92 consecutive patients (M:F = 53:39) (100 hips) undergoing primary THA were prospectively enrolled. At the time of surgery, the average age was 64.6 years (44-84). Pre-operative diagnosis was primary osteoarthritis (71%), osteoarthritis secondary to hip dysplasia (18%), post-traumatic arthritis (6%), avascular necrosis of the femoral head (3%) and other (2%). All patients were evaluated at one year of follow-up. In the femur first technique, the cup is positioned relative to the stem after the antetorsion of the trial stem has been fixed. Therefore, the cup is positioned in a compliant anteversion and coverage to the first component.
Results: The average HHS increased from 43.4 ± 5.2 preoperatively to 97.2 ± 6.4 at the last follow-up (P<0.0001). No patients reported dislocation of the prosthesis at one year of follow-up. The intraoperative average value of femoral stem antetorsion was 9.8° ± 3.2, whereas the average value of combined antiversion was of 36.4° ± 5.1. At the radiographic assessment, the average postoperative cup abduction angle was 41.2° ± 3.1.
Conclusions: The femur first technique is a non-computer-based procedure that allows the surgeon to match the safe zone during primary THA, optimizing the anteversion and coverage of the cup relative to the position of the stem.

P57

SHORT STEM HIP IMPLANTS: LIGHT AND DARKS AT MEDIUM FOLLOW-UP

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Introduction/purpose: The traditional hip stems have been proven to be reliable and effective. More recently short stems have been proposed, in the prospective of preserving bone and soft tissues, as well as ensuring minimal invasiveness, but without any evidence of equal effectiveness to date. The reliability in the medium and long term is scarcely described in the Literature. The aim of this study is to evaluate the clinical and radiographic results of a group of short-stemmed hip prosthesis in the medium-term.
Material and methods: We have collected 141 patients short-stemmed prosthesis from our hip replacement database.
Of these, 75 were males and 66 females with a mean age of 62.4 years (min: 25; Max: 84 years), affected by primary osteoarthritis (OA), post-traumatic OA, avascular necrosis and dysplasia OA.
All patients were operated by the same surgeon using the same technique (lateral and posterior, minimally invasive access when possible) and periodically evaluated by radiographic examination and clinically by HHS, WOMAC, SF-12 and VAS pain preoperatively, 1, 3, 6, 12 months and then every year after surgery. The mean follow-up was 35.2 months, with a minimum F-UP of 1 month and a maximum of 112 months.
Results: All the implants were osseointegrated radiographically, with a failure rate of 0%. Five complications were observed (1 dislocation at 1 month, 2 sciatic palsy, 1 EO, 1 intraoperative fracture). A rapid improvement of clinical indices, recover from pain and joint function, were observed (HHS: 92.9; VAS pain: 7, 5) with a significant increase in the quality of life (SF-12P: 52.1; SF-12M: 56.4; WOMAC: 88.2).
Discussion: Short stems have shown good clinical and radiographic results in the medium term. A law rate of complications confirmed the effectiveness of these implants. Quickly recover in terms of pain and function, made these results good as or better than traditional stems. The advantages are bone saving and minimally bone invasivity, excellent load distribution that allows to avoid stress shielding and tight pain, and easier surgery in case of future revisions.
Conclusions: This study highlight that the use of short prosthetic hip stem represent a good therapeutic choice in the treatment of primary and secondary hip osteoarthritis, especially in younger and active patients, but also in those not so young with a good bone quality.

P58

OPTIONS FOR HIP ARTHROPLASTY IN PATIENTS YOUNGER THAN 50 YEARS: OUTCOME OF METAL-METAL HIP RESURFACING AT MORE THAN 10 YEARS FOLLOW-UP

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Background: Arthroplasty registries and consecutive series indicate significantly worse results of conventional metal-on-polyethylene total hip arthroplasty (THA) in patients younger than 50 years compared to older patients. Metal-on-metal hip resurfacing (MoMHRA) was proposed as a more anatomic reconstruction with preservation of the natural proprioception and kinematics of the hip. In order to evaluate the outcome of MoMHRA at minimum 10 years, we conducted a retrospective review of all MoMHRA with more than 10 years follow-up implanted at an independent hip specialist centre in patients under 50.
Methods: From a single surgeon patients' prospective database, we identified all consecutive MoMHRA performed before May 2005 in patients under 50. All patients are contacted by phone and asked to present for a clinical exam and patient reported outcome questionnaires, standard radiographs and metal ion measurements. Complications and reasons for revision are noted. Kaplan-Meier survivorship is analysed for the whole cohort and sub-analysis is performed by gender, diagnosis and component size.
Results: We identified 626 MoMHRA, all Birmingham Hip Resurfacings (BHR) in 561 patients (65 bilateral BHR) under 50 years performed by a single surgeon between 1997 and May 2005. There are 392 males (70%) (42 bilateral) and 169 females (30%) (23 bilateral). Mean age at surgery was 40.8 years (median 42 years; range 16-50 years). In 33 cases, a BHR dysplasia cup was used (23 in females). Mean follow-up is 11.5 years (median 11 years; range 10-17 years).
Discussion: Patients under 50 needing a hip arthroplasty often present with more complex anatomic abnormalities or bone damage as in congenital dysplasia, avascular necrosis, traumatic osteoarthritis or rheumatic diseases. Besides, the worse results with conventional THA in young patients may be related to a higher activity level. We present the outcome and survivorship of MoMHRA in patients under 50 at more than 10 years postop.

P59

OPTIONS FOR HIP ARTHROPLASTY IN PATIENTS YOUNGER THAN 50 YEARS. CERAMIC-CERAMIC TOTAL HIP ARTHROPLASTY OUTCOMES AT MORE THAN 10 YEARS FOLLOW-UP

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Background: Arthroplasty registries indicate significantly worse results of conventional metal-on-polyethylene total hip arthroplasty (THA) in patients younger than 50, with 10-year survivorship ranging between 70 and 90%. At our institution, patients under 50 needing a THA receive either a metal-on-metal hip resurfacing (MoMHRA) or a ceramic-on-ceramic (CoC) THA. We conducted a retrospective review of all CoCTHA with more than 10 years follow-up implanted in patients under 50.
Methods: From a single surgeon patients' prospective database, we identified all consecutive CoCTHA performed before May 2005 in patients under 50. All patients are contacted by phone and asked to present for a clinical exam, questionnaires and standard radiographs. Complications and revisions are noted. Kaplan-Meier survivorship is analysed for the whole cohort and sub-analysis performed by gender, diagnosis and head size.

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Results: We identified 135 CoCTHA in 111 patients under 50 (24 bilateral CoC). There are 71 males (64%) (17 bilateral) and 40 females (36%) (7 bilateral). Mean age at surgery was 38.2 years (median 39 years; range 16-50 years). In 21 cases, the CoCTHA was a revision of a former hip replacement: 15 THA revisions and 6 hip resurfacing revisions. Three types non-cemented acetabular components were used and 7 types femoral stems (5 non-cemented; 2 cemented). Ceramic heads and inlays were Biolox forte in 128 cases and Biolox delta in 7. Head size was 28 mm in 125, 32 mm in 7 and 36 mm in 3. Mean follow-up is 14.9 years (median 15 years; range 10-18 years).
Discussion: Patients under 50 needing a hip arthroplasty often present with more complex anatomic abnormalities or bone damage as in congenital dysplasia, avascular necrosis, traumatic osteoarthritis or rheumatic diseases. Besides, the worse results with conventional THA in young patients may be related to a higher activity level. We present the outcome and survivorship of CoCTHA in patients under 50 at more than 10 years postop.

P60

SHORT TERM RESULTS OF TANTALUM ACETABULAR CUPS IN TOTAL HIP ARTHROPLASTY FOLLOWING PELVIC IRRADIATION

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Introduction: Radiotherapy in pelvic area is commonly used to treat gastrointestinal and genitourinary carcinomas, bone metastasis, hematopoietic diseases and primary sarcomas.
Due to post-radiation bone damages a conventional hip prosthesis replacement is needed (osteonecrosis, degenerative arthritis, pathologic stress fractures). However, high rate of failures (between 44 and 52%) of the acetabular component should be expected. Recently, the use of tantalum implant on irradiated bone has been reported with good results.
Objectives: The aim of this study is to report our experience about the use of trabecular metal acetabular cups on these patients.
Methods: From 2005 to 2013, we performed 12 THA replacements on irradiated bone with TM acetabular cups. The previous conditions leading to the replacement included, 2 Ewing's sarcomas, 2 non-Hodgkin lymphomas, 2 metastatic breast cancers, 1 plasmocitoma, 1 multiple myeloma, 1 aneurysmal bone cyst, 1 myxoid liposarcoma, 1 synovial sarcoma, 1 giant-cell tumor. The mean radiation dose delivered was 43000 cGy (range 800 cGy – 67000 cGy) and the mean time from radiation to the hip replacement was 88 months (range 13-364 months).
They were 4 male and 8 female with age ranging from 25 to 77 years old (mean 47 years old).
For the clinical evaluation we used the Harris Hip Score.
Results: After a mean FU of 45 months none of the patients were considered failed for aseptic loosening. However, there were two deep infections: the first acute healed with debridment and antibiotic therapy, while the second chronic leading to septic loosening treated by explantation. Moreover, we had two cases of hip dislocation, treated by conservative procedure.
Harris hip score improved from an average of 46 to 80 points at follow-up.
At last follow-up no one case presented with radiographic signs of progressive lucent line.
Conclusions: Even though we reported few cases distributed in a wide range of time with a relatively short follow up, we considered our results encouraging to keep on with this type of implant. In clinical setting, Tantalum seems to provide a better initial stability followed by secondary stability due to the integration of the trabecular metal to the underline spongy bone. The good performance of the material can provide a better functional result during time.

P61

COMPLICATIONS AND MID-TERM OUTCOMES OF TOTAL HIP ARTHROPLASTY FOLLOWING FAILED INTERNAL FIXATION OF THE PROXIMAL FEMORAL FRACTURES

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Introduction: Despite good outcomes of internal fixation (IF) following hip fractures, some patients experience failure of IF due to several causes. These problems lead to severe pain and disability and necessitate revision surgery. Salvage treatment with total hip arthroplasty (THA) can be considered.
Purpose: In current study, we aimed to investigate the mid-term clinical and functional outcomes and incidence of complications of THA for patients with failed ORIF of proximal femoral fractures.
Methods: Between 2004 and 2010, there were 44 patients (31 males, 13 females) with failed IF of previous femoral neck fractures (FNF). The age of the patients averaged 36.3 ± 16.1 years. The etiology of the failure included avascular necrosis with collapse in 29 patients, nonunion in 9 patients and nail cut-out or screw breakage with acetabular abutment in 6 patients. Patients were followed for 5.9 ± 3.5 years.
Results: Two patients had died and 5 were lost due to the changing of the contact information. Intraoperative femoral fracture occurred in one patient. There was no patient with dislocation, deep venous thrombosis and pulmonary embolism. Heterotopic ossification was found in 2 patients. Three patients had developed superficial infection of the surgical wound and were treated with oral antibiotic therapy. Thirty seven patients returned for last visit. Five patients complaint from mild to severe pain and required analgesics. Three patients could not ambulate without crutches. Harris hip score averaged 86.7 ± 15.2.
Conclusions: Our findings confirm that THA is an effective and safe salvage procedure for patients with failed IF of FNF and results in satisfactory functional and clinical outcomes.

P62

USING TRANEXAMIC ACID TO DECREASE POSTOPERATIVE HEMORRHAGE: LOCAL VERSUS INTRAVENOUS ADMINISTRATION

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Introduction: Postoperative bleeding is one of the most important problems after major orthopedic surgeries including Total hip arthroplasty (THA). It has been demonstrated that Tranexamic acid is a useful agent to control the volume of blood loss. However, the more effective route of TXA administration remained controversial.
Purpose: In current study, we compared the effects of local and intravenous (IV) administration of TXA on need to blood transfusion and hemoglobin drop.
Methods: There were 80 patients underwent THA assigned to 2 groups, randomly: local (L) group and IV group. In group IV, 500 mg TXA was administered systematically and in group IV the joint was irrigated with 4 of TXA in 100 cc of normal saline. The level of Hb was measured before and 12 hours after the operation and the rate of Hb drop was compared. Also, the number of packed cell transfused were compared in two group.
Results: The mean of Hb drop was 1.7 ± 1.1 mg/dL and 2.5 ± 1.2 mg/dL in group IV and L, respectively. In group IV, 0.32 ± 0.6 units and in group L, 0.46 ± 0.41 units of packed-cell were transfused. The difference in non of the variables was statistically significant.
Conclusions: Although, there was no statistically difference between two groups, however, it seems that IV administration of TXA is associated with lower Hb drop and decreased blood transfusion. More studies are required.

P63

A ROSE BY ANY OTHER NAME; THE VALIDITY AND SAFETY OF THE NEW PATENT-FREE EQUIVALENT/GENERIC HIP IMPLANTS

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The price of established hip implants with good clinical data is high and subject to wide variation, in particular in a state-funded healthcare system. As the patents for some of the more established hip implants expire, companies are exploiting this by introducing generic implants into the market. This follows a well-trodden yet well regulated path set by the pharmaceutical industry.
We set out to understand the processes involved in the development and manufacture of these new implants and to assess their merits and limitations.

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We asked how the introduction of such implants should be regulated and if the BHS, SIDA, the EHS and others should consider setting up a governing body to oversee this process.
We sought information directly from implant manufacturers, the National Joint Registry and Internet searches.
The new implants use the same materials to produce the same design prostheses; often even in the same factories to the same industry specifications. While production costs are similar to the branded implants, the overall costs of these newer implants are minimised by reducing or eliminating the cost of support staff, marketing, royalties and research and development. By using exactly the same design and materials, the newer companies are marketing these implants as having the same survivorship and reliability as their templates. While the pharmaceutical industry has a strict regulatory framework for generic drugs, no such framework exists for implants. However, Beyond Compliance does exist to safely support the introduction of these prostheses. We consider whether these implants are justified in using the relevant survivorship in their marketing and debate whether a separate ODEP rating is valid in their marketing.

P64

PRELIMINARY RESULTS ON FUNCTIONAL OUTCOME AMONG LATERAL TRANSGLUETAL APPROACH VS TISSUE SPARING APPROACHES

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Introduction: Hip arthroplasty is one of the most common orthopaedic surgery. Surgical approaches are many, but the most common are the posterolateral and the direct lateral transgluteal. Swedish hip arthroplasty register noticed that in 2013 the 98% of hip arthroplasties were performed using posterior and lateral approaches, both on supine and lateral position. Mini invasive approaches (posterior, lateral, and sec Watson Jones) were used only in the 2% of the cases. Recent literature enlightens that tissue sparing approaches lead to a better functional recovery, especially in the short postoperative period, but have an higher risk of component malpositioning due to the longer learning curve.
Objectives: Our objective is to demonstrate that tissue sparing approaches does not increase component malpositioning risk, allows a quicker and better functional recovery with less complications.
Materials and methods: From July 2014 to April 2015 we performed 28 hip arthroplasties using three surgical approaches: 13 lateral transgluteal (LTG), 15 with tissue sparing approaches (8 anterolateral sec watson jones with tissue sparing (WJA), 7 direct anterior (DAA)). In all cases we performed preoperative x ray planning, it was used the same prosthesis (anatomical) and all the patients followed the same postoperative rehabilitation protocol. The minimum follow up was 6 months. We recorded hospital length days and blood transfusion rates.
Functional results were examined with Harris (HHS) and Oxford Hip Score (OHS) at 3-6 months.
Preliminary results:

HHS:	78.8 in LTG at 3 months, 87.3 at 6 months; 80.6 in tissue sparing approaches at 3 months, 94.80 a 6 months.
OHS:	38 in LTG at 3 months, 45 at 6 months; 42 in tissue sparing approaches at 3 months, 47a 6 months.
Transfusion rate:	6 units/13patients blood transufusions in LTG approach; 2units/15 patients blood transfusions in tissue sparing approaches
Hospital days:	11.4 days mean hospital stay in LTG; 9 day in tissue sparing approaches

Discussion: In our experience we found that both tissue sparing approaches allows a better outcome. Functional results at 3 months are better in tissue sparing approaches compared to standard LTG approach, while they are more similar at 6 months.
Tissue sparing approaches reduces blood transfusion need, hospital length stay with quicker functional recovery but cannot be performed on all patients, particularly on those with subcutaneous fat or on those with good muscular tone.
On the other side LTG approach allows a better acetabular view and has a quicker learning curve, but is associated with higher risk of blood transfusions and has a slower functional recovery.

P65

MEDIUM TERM OUTCOMES OF THE DELTA TRABECULAR TITANIUM CUP IN PRIMARY HIP ARTHROPLASTY

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Introduction: The Delta Trabecular Titanium™ cup (Delta TT cup) is a 3D printed cup with hexagonal cells of 640µm allowing effective osseoinduction and integration. It has an elastic modulus very similar to that of trabecular bone.
Objectives: To assess medium term clinical outcomes, stability and bony ingrowth of the Delta TT cup in primary total hip replacement (THR).
Methods: We present 200, prospectively evaluated, consecutive cases of primary THR with the Delta TT cup.
Radiographs were assessed by two assessors for osseointegration, cup migration and failure. Pre and post-operative Oxford Hip Scores were used to measure clinical outcome.
Results: There were 200 cases, followed up from 3 to 4 years. The mean age was 66 years (range 37-94 years). The mean pre-operative Oxford Hip Score was 21 (IQR 14-29) and the mean post-operative score was 42 (IQR 24-46)
There were no cases of aseptic loosening. One cup underwent early revision owing to acetabular fracture and cup migration. 4 patients underwent revision for infection.
Conclusions: This study is the first to demonstrate the medium term outcomes of the Delta TT cup in primary THR. This implant was successfully used in a broad range of patients and demonstrated sound osseointegration with no cases of aseptic loosening and good clinical outcomes. We will continue to report on this cohort.

P66

PAIN MODULATION AND CORTEX REORGANIZATION AFTER HIP RECONSTRUCTION

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Introduction: Hip osteoarthritis, is a chronic degenerative disease, that develops gradually and leads to increasing disability. Pain may occur only during intense and prolonged effort. Secondly pain and functional limitation resulting in patients with osteoarthritis often develop mood disorders that occur with depression, anxiety, sleep disturbances and decision-making difficulties.
Objectives: The objective of the MRI enrollment will be to assess cortical thickness, the connectivity of the areas involved in the different aspects of pain and functional reorganization during the performance of working memory tasks and to evaluate the data of MRI before surgery, at 5 weeks and at 1 year after surgery and check for any differences before and after surgery.
Materials and methods: We enrolled 36 subjects, including 18 patients with osteoarthritis under the age 65 years who will undergo surgery for total and resurfacing hip arthroplasty, and 20 age and sex-matched healthy control subjects. We excluded the presence of other systemic diseases and the presence of any medical condition potentially associated with cognitive impairment and mood. All subjects will then be subjected to brain Magnetic Resonance Imaging (MRI) with high-field magnet (3T) (Siemens Verio).
Results: Preliminary analysis of data functional MRI showed patients before surgery increased connectivity with PAG frontal cortical areas (precentral gyrus and middle frontal gyrus), the insula, the paracingolo and temporal cortical areas. The analysis of the results of functional MRI to 8 weeks after surgery showed a reduction of connectivity with these areas while there was evidence of increased connectivity PAG with different nuclei of the thalamus and the posterior cingulate gyrus.
Conclusions: MRI findings could potentially influence the evolving debate regarding the optimal timing of hip arthroplasty in younger patients.

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DUAL MOBILITY CUP IN TOTAL HIP ARTHROPLASTY. SHORT TERM RESULTS

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Introduction: Nowadays the experience with conventional hip arthroplasty is well known. Stems and cups are coated with materials that allow osseointegration and prevent hip dislocation. Dual mobility cup reduce the risk of total hip arthroplasty dislocation in patients undergoing primary total hip replacement.
Objectives: The aim of the study was to demonstrate how dual mobility cup prevents dislocation and improves hip mobility with good functional outcomes after hip replacement surgery.
Materials and methods: 36 consecutive patients (aged between 55 and 85), 22 with femoral neck fracture and 14 with hip osteoarthritis (1 bilateral) were treated in the period between January 2012 to April 2015. Lateral approach was performed in 25 patients, posterior approach was performed in 11 patients. To evaluate clinical outcomes we used Harris Hip Score. The mean follow-up period was 24 months.
Results: The Harris Hip Score was good in all patients. After hip replacement surgery patients started early physical rehabilitation program. Functional outcomes were very good and we reported no hip dislocations or infections.
Conclusions: According to international scientific publications dual mobility cup presents considerable advantages comparing to conventional hip arthroplasty. The bias of our study is the short term follow-up and low number of patients. The use of dual mobility cups in younger patients (under 50 years old) could be considered. Dual mobility cup can provide a viable alternative in preventing and treating hip instability with good functional outcomes.

P68

PREOPERATIVE ULTRASONOGRAPHIC EVALUATION IN ASSESSING GLUTEAL TENDINOPATHY DEGENERATION IN PATIENTS WITH HIP ARTHRITIS

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Introduction: Gluteal tendon degeneration is an important predicting factor to be assessed prior to a hip replacement because of its capability of significantly affecting post-operative clinical outcome. In this prospective study we aimed to assess the reliability of ultrasonographic evaluation as preoperative instrumental exam.
Methods: We prospectively assessed 26 male patients (mean age: 68; range: 52-74) admitted for a hip prosthesis with ultrasonographic evaluation. All these patients were also evaluated pre- and post-operatively through the following examination scales: Oxford, WOMAC, HHS and HOOS. Twelve months after surgery all patients were radiologically and functionally evaluated.
Objectives: We aimed to verify whether there was a correlation between the preoperative ultrasonographic evaluation of the gluteal musculotendineous unit and post-operative clinical outcome.
Results: Ultrasonographic comparison between the affected and the healthy side showed significantly worse results on the affected side (0.5 vs. 0.31, *p: 0.04*); on the contrary the width of tendons on the affected side appeared to be significantly thinner with a mean width of 5.5 mm vs. 5.9 mm (*p: 0.04*). Overall muscle degeneration showed worse results on the affected side with a mean value of 0.93 vs. 0.56 of the contralateral side (*p: 0.03*). Pearson's coefficient evaluation showed a positive correspondence between ultrasonographic tendon degeneration and clinical results according to all the evaluation scales used (*p: 0.5*), while no high correlation was found in regard to either tendon width (*p: 0.1*) or muscle fat degeneration (*p: 0.2*). Similarly, a positive correlation (*p: 0.4*) was found between tendon degeneration and the incidence of post-operative limping.
Conclusions: Results seem to support the use of ultrasonographic evaluation in assessing the amount of tendon degeneration prior to surgery in patients affected by hip arthrosis and in assessing candidates for joint replacement.

P69

RESULTS OF PRIMARY TOTAL HIP REPLACEMENT WITH C-STEM (ASIAN) IN FEMORA WITH ABNORMAL ANATOMY

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Introduction: Primary total hip replacement (THR) in patients with abnormal/altered proximal femoral anatomy/narrow canals presents a technical challenge. There are only limited standard prosthetic stems available to deal with narrow canals or abnormal morphology. Custom implants are expensive; have a lag time to manufacture, and very little long term data.
Objectives: We present results of the cemented C-stem (Asian) (a standard small implant available on the shelf) used in patients predominantly of Caucasian origin with abnormal proximal femoral anatomy.
Methods: Retrospective review of clinic and radiological results of 117 patients (130 stems) who underwent cemented primary THR using Asian C stem at our hospital between 2006-2012. All data was collected till their latest follow up. Revision for any reason was considered as primary end point. The trochanteric osteotomy or posterior approach was used in all. All patients had metal or ceramic on polyethylene bearings. The size of the stem was selected using pre-operative planning and intra-operative trailing.
Results: Mean age at surgery was 51.9 years (16-80). Commonest indications were primary osteoarthritis (66) and hip dysplasia (54). Mean follow up was 43.5 months (36 -97). 6 patients died due to unrelated reasons during the follow up period. Early complication included dislocation (2) and PE (1). One dislocation needed revision surgery. There were no intra-operative perforations or fractures. One patient underwent acetabular revision for loosening after 2 years. There was no stem failure, symptomatic loosening or loss of stem fixation in any patient.
Conclusions: We believe this is the largest series using the C-stem (Asian) cemented THR in predominantly Caucasian patients to address abnormal proximal femoral anatomy and narrow canals. This economical and straightforward on-the-shelf solution provides reliable short to medium term results in a difficult scenario. Long term follow up is essential.

P70

THE HIP PROSTHESIS RELATED OSTEOTOMY AND SUBTROCANTHERIC SHORTENING IN THE TREATMENT OF CONGENITAL HIP DISLOCATION

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Introduction: The congenital hip dislocation is the main important cause of hip arthrosis in the young people, currently the prosthesis is the only solution in the most serious cases, but it present several technical difficulties for the anatomical changes with high risk of complications and failures.
Materials and methods: In the period March 2000 through March 2013 16 adult patients ((10 femal and 6 male) with average age 38,6 years (28-68) with D.E.A. high grade (Crowe III-IV) and proximal dislocation of the femur, were subjected to intervention of hip prosthesis. Clinical and radiographic data was collected with average classification follow up of 88 months (63-133). 11 patients with dislocation Crowe grade III and 5 patient Crowe grade IV were subjected to intervention of hip prosthesis associated subtrochanteric osteotomy of shortening. The average dysmetria between the limbs decreased from preoperative of 4,5 cm (3,8-6 cm) to postoperative 1,2 cm (0,9-2,0 cm). The HHS was increased from42 pt (range 37-61) to 85 (59-90). Temporary suffering of the sciatic territory was reported in only 3 patients and was resolved in 6 months from the surgery.
Discussion: More useful classification was the Crowe classification. Primary is the recovery of the "Paleo Cup". Most widespread techniques are two: the first one with external fixation in distraction and than subsequent prosthesis (two steps); the second onethe technique of our preference, the solution in one step with subtrochanteric osteotomy of shortening. It is critical a careful preoperative planning with CT bi-tridimensional reconstruction to evaluate the poorness of the cup, that may require bone grafts, and the anatomical changes of the femur with size of thr bony canal that may shape the stem choice.
Conclusions: The prosthesis of an hip with congenital hip dislocation with Crowe grade III-IV is a difficult procedure with high risk of complications and failures. The restoration of the correct length of the limbs is important but is

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essential to avoid neurological damage from excessive traction. Currently are used 2 techniques in 2 steps (external fixation than prosthesis) or one step (sutrocanteric osteotomy and prosthesis). Both these procedures are valid none prevails over to over. In our experience femoral stem with distal quadrangular or conical grip associated with subtrocanteric trasverse osteotomy of shortening seem to be successful clinical and radiographic.

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DIFFICULT PRIMARY TOTAL HIP ARTHROPLASTY VIA DIRECT ANTERIOR APPROACH

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Introduction: We considered total hip arthroplasties (THAs) in degenerative joint diseases (DJDs) secondary to protrusio acetabuli, perthes disease, and other hip involvements with short neck and large head and overgrowth of the greater trochanter, like developmental dysplasia of hip (DDH) as difficult primary THAs. These DJDs need technical challenges for the surgeon. In these cases, femoral head dislocation and femoral neck cut are Difficult. In some DDH cases reduction without femoral shortening is impossible. The purpose of this manuscript is to explain total hip replacement in these challenging cases via direct anterior approach (DAA).
Materials and methods: From Jan 2011 to Dec 2013, 25 hips in 23 patients (15 women and 10 men) were subjected to total hip arthroplasty at our department. These defficult cases were 11 protrusio acetabuli secondary to JRA and R.A (2 of them were bilateral), 7 DDH (5 crowe type III, 2 crowe type2), and 5 cases with short neck and overgrowth of the greater trochanter. The mean age was 34/5 years (ranged from 22 to 43). All patients underwent THA via direct anterior approach in supine position. Complete capsulectomy and in situ double neck osteotomies were done. The patients were allowed to weight bearing as tolerated with crutches the day after surgery. Operation time, intraoperative and postoperative complication rates, functional outcomes were evaluated.
Results: Average operating time was 78 minutes and no longer than straightforward cases. Dislocation, infection, deep venous thrombosis did not occurred postoperatively. Medial wall reconstruction was done with chips allograft in 5 protrusio acetabuli. 2 greater trochanteric fractures and 1 calcar crack occurred intraoperatively which were fixed with wire. No femoral shortening was needed. Postoperatively, the function of hip joint improved with the Harris hip score rising from preoperative 42.5 ± 6/3 to 88.3 ± 7.4
Conclusions: Primary THA in difficult cases is challenging. DAA is associated with less pain and rapid recovery. Complete capsulectomy, soft tissue release, double neck osteotomy in DAA will help surgeon to resolve hip flexion contracture and defficult dislocation. We believe that THA in difficult cases via DAA is possible, easier with shorter operating time and less complication rate.

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THE OUTCOME OF CEMENTLESS TOTAL HIP ARTHROPLASTY IN FEMORAL HEAD OSTEONECROSIS

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Introduction: The outcome of cementless total hip arthroplasty (THA) in patients with late-stage osteonecrosis of femoral head (ONFH) is encouraging. However, the rate of reoperation and complications were reported higher in some papers. We conceive this study to compare early and short-term results of cementless THA in patients with ONFH with THA in osteoarthritic patients.
Methods: This was a rertrospective study with prospective data gathering. 61 hips (in 43 patients) with end stage ONFH (group A) and 61 osteoarthritic hips (group B) underwent cementless THA through direct anterior approach between January 2010 and January 2012. The male to female ratio was 3.3 in group A. The mean age of the patients at the time of surgery was 34.5 years. All patients were evaluated for 18.5 months using Harris hip score (HSS) and radiograghy.
Results: The average HHS improved significantly from 42 preoperatively to 91 postoperatively at the latest follow up in group A ($p<0.001$). All patients were satisfied with the result of surgery. No early postoperative complication or later reoperation was observed. There were 2.5% early complication or reoperations in group B patients.
Conclusions: Our results showed that uncemented THA in patients with late-stage ONFH, at least in short term follow-up, is a successful operation and is not associated with higher rate of complications or reoperation. Further study is needed to determine the long-term outcome.

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TOPICAL VS INTRAVENOUS ADMINISTRATION OF TRANEXAMIC ACID IN DIRECT ANTERIOR HIP ARTHROPLASTY - A PROSPECTIVE RANDOMIZED TRIAL

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Introduction: Tranexamic acid (TXA), an inhibitor of fibrinolysis, can be administered intravenously or intra-articular to reduce blood loss in patients undergoing total hip arthroplasty. The ideal method of providing TXA remains topic of debate.
Objectives: In this study we compare the efficacy of intra-articular to intravenous administration in terms of postoperative blood loss in direct anterior total hip arthroplasty.
Methods: In a prospective, randomized, clinical trial, we investigate the effect of TXA in 120 patients undergoing unilateral total hip arthroplasty for the treatment of osteoarthritis or avascular necrosis of the hip using the direct anterior approach. Uncemented implants were used in all patients. A dose of 3 g TXA in 100 ml 0.9% saline solution was applied intra-articular (IA) in 60 patients just after wound closure through a drain. The sixty patients in the control group received a solution of 1.5 g TXA in 100 ml 0.9% saline solution, administered intravenously (IV) before closure. A surgical drain was used in all patients and opened 2 hours after wound closure. Postoperative blood loss was calculated using 2 postoperative hemoglobin measurements. Secondary outcomes included length of hospital stay and the number of bood units transfused.
Results: No significant difference was detected in peroperative blood loss [IA TXA group = 373.9 ± 327 ml vs IV TXA group = 322.8 ± 139 ml ($p = 0.638$)] and in postoperative blood loss [IA TXA group = 577.6 ± 572 ml vs IV TXA group = 670.0 ± 335 ml ($p = 0.216$)]. Also no statistically significant differences were found in length of stay ($p = 0.818$) and transfusion rate ($p = 0.163$).
Conclusions: In patient undergoing total hip arthroplasty through the direct anterior approach the intra-articular use of 3 g TXA was equally effective in reducing postoperative bloodloss compared with a 1.5 g dose of TXA administered intravenously.

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EARLY RESULTS OF AN UNCEMENTED TOTAL HIP REPLACEMENT WITH A MODULAR NECK-STEM JUNCTION

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Introduction: Important parameters to be considered for a successful treatment after a THA are leg length, offset, anteversion and avoidance of impingement. Advancements in prostheses design have increased the intraoperative flexibility providing the surgeon with variable options in order to optimize the surgical outcome.
Objectives: To identify the safety, efficiency, characteristics, as well as the possible drawbacks of an uncemented THA with a modular neck-stem junction.
Methods: One-hundred and twenty one patients were operated from 2010 to 2012. Uncemented cups were hemispherical in shape with an exterior of Trabecular Metal material, while the uncemented stems were proximally coated having a modular neck-stem to permit preoperative adjustments of the vertical offset, lateral offset, anteversion and retroversion. The patients' demographics and complications were prospectively recorded. Blood Titanium levels were measured post-surgery. The Harris Hip score, Oxford-12 questionnaire and WOMAC score were used to assess the functional status, while the SF-12 questionnaire was completed to evaluate the quality of life.

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Results: The mean follow-up was 36 months. Mean values of walking, hip functional and quality of life scores were significantly improved after surgery. The overall Kaplan–Meier survival rate at 3 years for any revision or dislocation as the end-point was 99.2%. No statistically significant differences were found among bearing couples and femoral head sizes in relation with the serum titanium levels.
Conclusions: The presented stem design provides an effective method for the treatment of the primary osteoarthritis of the hip. The versatility and modularity of the neck-stem junction offers a wide variety of options to the surgeon assisting him to restore the hip biomechanics and provide the best functional outcome to the patient. The technique can be used with different bearing combinations and it is easily reproducible in routine clinical practice.

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TOTAL HIP ARTHROPLASTY AFTER ACETABULAR FRACTURE: INCIDENCE OF COMPLICATIONS, REOPERATION RATES AND FUNCTIONAL OUTCOMES: EVIDENCE TODAY
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Introduction: The role of acute (early) or delayed (late) total hip arthroplasty (THA) in combination with surgical reconstruction of the acetabular fracture has lately attracted an increased interest with clearly defined indications and promising results.
Objectives: A systematic review of the literature was undertaken in order to (a) determine the existing evidence concerning the classification, indications and surgical management of acetabular fractures that were treated with THA; (b) to analyse the clinical outcomes and the incidence of complications; and (c) to evaluate the impact of the timing of intervention (early versus delayed hip arthroplasty) as well as the type of prosthesis used (uncemented versus cemented) on the long-term treatment outcome.
Methods: We searched the Medline databases using PubMed, Scopus, and Cochrane library search engines, from January 1990 to January 2014, in order to retrieve all relevant articles reporting on the management of post-traumatic arthritis of the hip following acetabular fractures.
Results: An uncemented acetabular and femoral component was used in 80.1% and 59.8% of the cases respectively. The median Harris hip score was 88 points. In the early THA group, Kaplan-Meier survivorship analysis with any loosening, osteolysis or revision as the end point revealed that the 10-year cup survival was 81% whereas in the late THA group was 76% (P = 0.287). The 10-year survival was 95% for the early stems and 85% for the late ones (P = 0.001).
Conclusions: Revision rates after THA following acetabular fractures are substantially higher than those following a conventional primary THA, thus justifying a multispecialty treatment approach of these complex injuries. Based on the currently available evidence, an algorithm of management has been compiled. Further studies are desirable to through more light into the factors influencing functional outcomes and longevity of THA after acetabular fracture reconstruction.

WITHDRAWN

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DIRECT ANTERIOR MINI INVASIVE SURGERY FOR THR: IS IT WORTH? FORGOTTEN HIP SCORE EVALUATION AT 6-18 MONTHS FROM SURGERY
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Introduction: Direct anterior miniinvasive surgery is one of the most attractive techniques to perform total hip prosthesis in the last years.
Concerning the evaluation of the results of joint replacement, subjective evaluation forms based on the opinion of the patient on daily activities after the implant are more and more widespread in literature.
Objectives: The purpose of this study is to evaluate the results of 125 THR performed by a direct anterior mininvasive approach at 6-12-18 months after surgery by the "Forgotten Hip Score", one of the latest subjective functional scores validated in literature.
Methods: The study is based on the answers given by the patients on the phone to a physiotherapist and not to the surgeon.
Results: The results have been globally evaluated but also subdivided in terms of age, sex, elective or traumatic surgery.
The same parameters have been also evaluated in 3 groups of patients: those at 6, 12 and 18 months from the surgery.
Conclusions: The limits of a little sample do not unable us to give definite statistical conclusions. Nethertheless we believe the results must be taken into consideration in order to evaluate the satisfaction of the patients operated of THR by direct anterior mininvasive approach.

P78
A "BIOFILM PREVENTION PROTOCOL" LEADS TO LOW READMISSION RATES IN HIP SURGERY
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Infection is a devastating complication in both trauma and elective orthopaedic surgery. The bacterial contamination of instruments and implants often occurs during the actual surgical procedure. Over the last decades surgeons have lost the tradition and discipline of the preantibiotic Era where implants and surgical wounds were never touched by the surgical team.
Objectives: To investigate the effectiviness of a "Biofilm Prevention Protocol" in both hip fracture surgery and elective hip arthroplasty. This Biofilm Prevention protocol involves 6 intraoperative surgical steps
- Change of gloves by the whole surgical team before implantion of any implant
- Not touching implants (nails, screws, cups, stems, …) by hand
- Rifampicine covering of nails and screws
- Extensive 2-4 litres Pulsatile lavage for all procedures
- Gentamycine swab (Duracoll) covering of cementless femoral stems and protruding implants before closure when antibiotic containing cement is not used
- Meticulous watertight wound closure

Material and methods: 1278 patients operatated by one single surgeon for hip surgery included in Study over 7 year period. Riziv database (rijksinstituut

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voor ziekte en invaliditeit) covers the whole country and can be used for evaluation of all post discharge readmissions. All readmissions one year after index procedure were included
Results: Analysis and data mining on 1260 patients (11 Patients died). There were 165 readmissions in 156 patients (12.4%). 38 readmissions were related to index orthopaedic procedure (3.0%). There were 3 readmissions for deep infection and two for superficial infection. One deep infection was treated abroad. The readmission rate for postoperative infection was only 0.32%.
Conclusions: A simple 6 step "biofilm Prevention Protocol" shows a low readmission rate for infection in both hip fracture and elective hip surgery.
The Riziv national database is a usefull tool to check for readmissions and postoperative infections as it covers the whole country.
Further investigation on a larger scale is mandatory to evaluate if this improvement in intraoperative surgical discipline lowers the postoperative infection rate.

P79
THE TRUE VALUE OF PRE-OPERATIVE TEMPLATING IN TOTAL HIP ARTHROPLASTY
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Introduction: There is debate in the literature about the accuracy of preoperative templating in total hip arthroplasty (THA).
Objectives: To clarify the accuracy of digital templates in THA, judged by its success in predicting the prosthesis size and offset implanted, and if these restore the patients anatomy.
Methods: A retrospective review of imaging, Traumacad templates and medical notes for 75 consecutive THA patients. The appropriateness of the prostheses implanted was determined by assessing the restoration of anatomy and the correct size of implanted stem on postoperative imaging.
Results: A calibration ball placed at groin level was present in 46 of the 75 patients, these inferring a calibration factor of 109% to 133% (mean 117.2%). 64 patients had femoral stem templates, total implanted femoral stems measured as planned (±1 size) in 60 (93.8%) of cases, when subtracting those cases without a marker ball saw this accuracy at 92.3%. Implanted femoral components ranged from 1 to -2 sizes from templates, mean total size difference 0.70; 15 undersized and 21 oversized. Subgroup analysis found 11 of 13 (84.6%) uncemented stems size as templated (range +1 to -2, mean difference 0.85). Cemented stems were correct size (±1 size) in 49 of 51 templated (96.1%, range +1 to -2). Offset was accurate to 5 mm in 92.3% (12 of 13) uncemented stems and 84% (43 of 52) cemented stems.
52 patients had acetabular templates, Implanted acetabular components measured as planned (±2 mm) in 38 (73.1%) of cases, when a subtracting those cases without a marker ball saw this accuracy rise to 75.8% (25 of 33 cases). Implanted acetabular components ranged from ± three sizes from that templated, mean total difference 2.4 mm; 18 undersized and 13 oversized.
Conclusions: Pre-operative computer templating provides the correct prosthesis choice in the majority of patients.

P80
TOTAL HIP ARTHROPLASTY IN YOUNG PATIENTS: EARLY RESULTS ARE BETTER
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Background: Managing young patients with end-stage hip disease is a challenging problem. Although Total Hip Arthroplasty (THA) is successful in the elderly patients, the results in the young seem unsatisfactory.
Material and methods: We prospectively compared the outcome of uncemented THAs in 91 patients younger than 40 years old with 169 patients older than 40 years old. The mean time of follow up was 16.32 ± 8.8 months. 1 patient in the young group and six patients in the elderly group passed away.
Results: Regarding Harris Hip Score, Womac score, and SF-36 score, both groups improved after the surgery (P value = 0). However, the mean postoperative HHS and Womac score was significantly higher in the young group. (P value = 0,0.003 respectively) The mean post-operative SF-36 scores were not significantly different between two groups. (P value = 0.12, 0.34) One patient from the young group and 2 patients in the elderly group underwent revision surgery due to acetabular loosening. Six dislocations were observed and only one occurred in the young group. Radiographic findings were similar between two groups.
Conclusions: Uncemented THA using metal on poly ethylene prosthesis can provide satisfactory early results in both young and elderly patients, however in terms of complications, failure rate and post-operation scores, our results were superior in younger patients.

P81
POSTEROLATERAL VERSUS LATERAL APPROACH IN TOTAL HIP ARTHROPLASTY, A PROSPECTIVE STUDY
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Introduction: Given the increasing demand for tissue sparing surgery, the surgical approach is the subject of lively debate in total hip replacement (THR).
Objectives: We compare the short term results of posterolateral (PL) and lateral (L) approaches in THR in a prospective cohort study.
Methods: 134 hips in 120 patients who underwent primary THR with posterolateral (PL) or lateral (L) approach entered in the prospective cohort study. Demographic and perioperative information reordered in questionnaires and clinical and radiographic results reordered at 2, 6, 12, 24, 36 and 48 weeks after surgery.
Results: 77 hips underwent (PL) and 56 one underwent (L) THR. mean follow up was 18 months (9- 36) Demographic data and preoperative diagnosis was the same between two groups. At six months after surgery and later on there was no statistical difference between two groups regarding Harris hip score, pain visual analog scale perioperative complications (fractures, bleeding, infection, DVT, death) and radiographic evaluation. The only difference was at second and sixth weeks after surgery regarding pain (p value 0.04) and limp in favor of PL approach.
Conclusions: In short term follow up there is no difference in clinical and radiographic results of PL and lateral approach THR. During first 6 weeks after THR there is less pain and limp in PL approach.

P82
TRANEXAMIC ACID USE IN ELECTIVE PRIMARY HIP AND KNEE ARTHROPLASTY; A PROSPECTIVE STUDY
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Introduction: Tranexamic acid stabilises fibrin clot thus reducing bleeding in trauma and elective settings. There have been multiple studies demonstrating its benefit in reducing blood loss in elective orthopaedic procedures and has become part of our unit's Enhanced Recovery Protocol.
Objectives: (1) Audit the consistency of Tranexamic acid use and its dosage. (2) Compare group of patients receiving tranexamic acid versus those who didn't regarding haemoglobin fall post-operative, cell saver transfusion volume, blood transfusion rates within a week of index operation, dressing change incidence secondary to wound ooze and incidence of venous thromboembolism.
Methods: Prospective cohort study. Inclusion – Primary hip and knee arthroplasty. Exclusion – patients high risk for of venous thromboembolism, patients with multiple comorbidities. Wound dressing applied in theatre not routinely disturbed till removal of sutures. Dressing change necessitated by copious wound ooze recorded by ward doctors. Transfusion criteria was either haemoglobin <70 g/l or if symptomatic with haemoglobin <100 g/l. Routine post-operative venous thromboembolism chemical prophylaxis was dalteparin subcutaneous injection whilst in-patient then oral rivaroxaban.
Results: Total of 161 patients. 84 patients did not receive Tranexamic acid whilst 77 did at induction prior to arthroplasty. Both groups matched in age, gender and type of surgery. Dose varied between 1 gm to 2 gm despite unit protocol advising 1.5 gm. There was a statistically significant increase in dressing changes due to wound ooze in first group (p-value = 0.014). No statistically significant difference in haemoglobin drop, cell saver volume, transfusion or venous thromboembolism incidence between the two groups.
Conclusions: There exists a high degree of noncompliance with Tranexamic acid administration. Significantly reduced dressing changes could have favourable impact on early wound and deep infections rates.

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DISPLACEMENT OF POLISHED CEMENTED STEM DURING ATTEMPTED CLOSED REDUCTION OF DISLOCATED TOTAL HIP REPLACEMENT

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Dislocation is a common complication of total hip arthroplasty. The reported incidence in the litrature is 1-4%. This commonly requires closed reduction. We present a case report of displacement of the smooth polished tapered femoral stem, which occurred while attempting closed reduction of dislocated cemented total hip arthroplasty. This required open reduction and replacing the stem within the cement mantle.

Case report: A 79 year old gentleman presented to our hospital with a history of pain in the left hip after he was bending down to pick something off the floor. He was unable to weight bear on the affected leg and on presentation the leg was shortened and internally rotated. He was neurovascularly intact. He had a history of Parkinson's disease which was well controlled with medications. He had a total hip replacment performed 6 weeks ago.

Radiographs showed a cemented polished tapered stem with a cemented cup and dislocated of the femoral head. The position of the cup was slightly retroverted. The stem was in varus and there was no cement at the shoulder of the prosthesis.

The patient was taken to theatre for reduction under General anaesthesia. During attempted reduction it was noted that femoral stem had started to displace proximally. The reduction was abandoned. The patient required a revision surgery subsequently with replacement of femoral stem within the cement mantle and cement in cement revision of the cup.

Discussion and conclusions: Displacement of smooth polished tapered cemented stems during closed reduction of dislocation is rare. This can be avoided if care is taken at the time of index procedure by inserting cement at the shoulder of the prosthesis and also ensuring the prosthesis sits 1-2 cm below the tip of the greater trochanter.

P84

OUTPATIENT TOTAL HIP ARTHROPLASTY CENTER FOR ELECTIVE SURGERY, CES, SILKEBORG RH, DENMARK

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Background: On behalf of several patient requests for same day discharge after a THA operation, the CES initiated a pilot project in 2014. The project's aim was to study the possibility of carrying out a THA operation on an outpatient basis.

Purpose: Is it possible that a THA operation can be completed in one day without compromising: a) The patient's safety. b) Quality, including the patient's experience of the quality of the treatment, nursing and training. c) The patient's experience of involvement, safety and satisfaction. d) Supporting person's experience of involvement, safety and satisfaction.

Approach/methods: This pilot project is a quantitative study of 20 patients. The project quantifies the experienced anxiety (VAS) pre- and post-hospitalization. The patient's anxiety and depression (HADS), self-confidence and health status (EQ5D) are also measured. Each trial takes 3 months to complete, from when the patient is signed up for surgery until 3 months after the surgery. Moreover, selected data is measured throughout the hospitalization as well as the Stopping Guide Line (hip dislocation, DVT, infection, etc.), which is obtained 6 weeks after the surgery.

Results: The results of this study indicate that the patient participants have experienced the course of treatment as professional with a high degree of satisfaction, involvement and safety by being discharged 0 POD. 85% of the patient participants could be discharged the same day as surgery (0 POD). 10% (N = 2) of patients could be discharged 1 POD and 5% (N = 1) could be discharged 2 POD. No patients had any complications that could compromise the patient's safety during their hospital stay or after the discharge.

Conclusions: The majority of the patient sample displayed confidence in being able to handle the putative stressing life event of getting a new hip and being discharged the same day. Furthermore, it is advised to perform qualitative studies concerning the patient's and the supporting person's experience of a same-day THA procedure because there appears to be a correlation between collaboration in rehabilitation and positive patient outcomes.

P85

REINFUSION DRAINS IN PRIMARY TOTAL HIP ARTHROPLASTY

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Introduction: Primary total hip replacement can result in a considerable amount of blood loss. Higher pre-operative and post-operative hemoglobin (Hb) levels are related to earlier functional recovery, higher patient satisfaction and shorter hospital length of stay. A number of strategies to reduce the need for blood transfusion have been employed such as retransfusion drains.

Objectives: The goal of the study was to evaluate the effects of reinfusion drains on hematological parameters of patients undergoing total hip arthroplasty (THA).

Methods: We retrospectively reviewed 103 patients (reinfusion group) who underwent THA with the use of a postoperative reinfusion drain and 100 patients (no reinfusion group) who underwent THA with no postoperative reinfusion drain used. Preoperative variables evaluated were: age, sex and body mass index (BMI); comorbidities; and type of anesthesia. Postoperative variables evaluated were: Hb, hematocrit (Hct) and platelets (Plt) levels at the first, second, third, and fourth postoperative days and at discharge. We also assessed the total blood loss during the postoperative in-hospital stay and the number of units of blood eventually transfused.

Results: Eighty-four (84%) patients in the reinfusion group and 42 patients (40.8%) in the no reinfusion group were transfused with at least one unit of blood postoperatively (1.3 ± 0.9 and 0.5 ± 0.7; $p<0.001$, respectively). The need for transfusion was found to be 7 times higher in the no reinfusion group compared to the reinfusion group. In the first and second postoperative day, Hb levels were higher in the reinfusion group ($p = 0.002$ and $p<0.001$, respectively). Hct levels were significantly higher in the reinfusion group at first, second, third and fourth postoperative days and at discharge. No other statistically significant differences were detected.

Conclusions: Proper management of patients undergoing THA using reinfusion drains can reduce or eliminate the need for transfusions.

P86

INTRA-ARTICULAR AND INTRAVENOUS TRANEXAMIC ACID TO REDUCE BLOOD LOSS IN TOTAL HIP REPLACEMENT

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Introduction: Abundant literature regarding intravenous administration of tranexamic acid (TXA) in total hip replacement (THR) is available. Randomized controlled trials have also demonstrated the efficacy of topical use of TXA.

Objectives: The present study was designed to verify the efficacy of a protocol of intra-articular and intravenous administration of TXA in THR.

Methods: An experimental group of 50 patients undergoing THR received a TXA protocol consisting of topical administration of 3 g of TXA in 100 ml of physiological saline solution and two intravenous doses of 15 mg/kg of TXA in 100 ml of physiological saline solution, one dose before skin incision and a second one three hours after surgery. Fifty patients undergoing THR without receiving a TXA protocol constituted the control group. In all cases we adopted a press-fit implant through a modified direct lateral approach to the hip. Primary outcomes were blood transfusion rate and postoperative bacterial infection rate; secondary outcomes included visible blood loss (as misured in the drain 24 hours postoperatively) and haemoglobin values eight days after surgery. No significant differences were there in demographic and laboratory values between the two groups.

Results: No blood transfusions were carried out in TXA group, while 12% of transfusion rate was observed in the control group. Mean drain blood loss 24 hours postoperatively was 250 ml in TXA group and 450 ml in control group. No postoperative bacterial infection occurred in both groups.

Conclusions: This study supports the use of intra-articular and intravenous TXA in THR in order to reduce blood loss and trafusion rate. This allows to minimize the infection and mortality risk and to reduce hospital stay and costs.

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THE CEMENTED AND CEMENTLESS STEM-ENDOSTEAL INTERFACE OF TOTAL HIP REPLACEMENT AT LONG TERM FOLLOW-UP

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The cemented and cementless stem endosteal interface of total hip replacement at long term follow-up. The study was carried out on five autoptic cases with THR (two uncemented and three cemented stems) removed with the proximal femur segment for histological study. The period of implant permanence "in situ" was between 4 and 7.5 years. Clinical and radiographic data were incomplete, therefore considerations about loosening could be exclusively based on histology. Infection was excluded by histological evaluation of periprosthetic tissues. Fixation of the stem was found to be fastened by endosteal bone either in cemented and cementless stems with direct, discrete contact zones forming bone-cement or bone-metal interfaces. However focal zones of granulation tissue related to foreign body reaction could be observed also in mechanically not-loosened stems.

Tribology/Materials

P88

USE OF POROUS TANTALUM CUP IN TOTAL HIP ARTHROPLASTY WITH DIFFERENT ADVANCED BEARING TECHNOLOGIES

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Introduction: According to patients demand, age and bone quality Continuum acetabular system offers flexible solutions in most patients. The system combines the over eleven 12 years of clinical history proven biologic fixation of trabecular metal technology with three advanced bearing options: Biolox Delta ceramic, Longevity Highly crosslinked Poly and Vivacit -E poly.
Objectives: Our study point out the indications and the clinical experience with these different liner material component coupled to continuum primary cup.
Methods: One hundred and ten patients with a mean age of 51 years (range, 20 to 74 years) had undergone 128 hip resurfacing arthroplasties between June 2013 and June 2015: in 49 hip we used delta ceramic (mean age 47, range 24-74), in 45 Longevity Poly (mean age 63, Range 49-74), and 35 Vivacit-E poly coupling (mean age 4, range 19-55). Outcomes evaluated included implant survivorship, Harris hip scores, activity levels, and complication rates.
Results: Advantages for using the continuum cup include initial stability, histologically observed bone and tissue ingrowth with long term biologic fixation: we found any marked absence of radiolucent lines around all implants. The mean post-op Harris hip scores had improved to 98 (Vivacit-E) and 94 (Delta ceramic) 92 (Longevity) points, respectively and were statistically similar. There were no differences in the complication rates between the three cohorts. Activity level respected completely patients expectations. The choice between three liner types meet individual patient needs and features with high satisfaction ratio at short-medium term follow up.
Conclusions: The author concludes that porous tantalum hip implants with the possibility to choose the bearing technology that best meets the needs of each patient provides satisfactory results with no significant implant-related problems. The author suggests that long-term follow-up is necessary to validate the resistant to wear and aging of Vivacit-E poly liner that seem to be a strong answer to implant survivorship for youngest and high demand patients.

P89

CLINICAL AND RADIOGRAPHIC OUTCOMES OF A TRABECULAR TITANIUM ACETABULAR COMPONENT IN HIP ARTHROPLASTY: RESULTS AT MINIMUM 5 YEARS FOLLOW-UP

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Background: Aim of this prospective study was to evaluate mid-term clinical and radiographic outcomes in total hip arthroplasty using an acetabular cup made of an innovative biomaterial, Trabecular Titanium™, whose highly porous structure and mechanical properties have been designed to mimic those of the natural bone, thus promoting a more physiological load transfer and a more durable fixation.
Methods: Between September 2007 and November 2009, 134 total hip replacements and 8 revisions were carried out using DELTA-TT primary cups in 133 patients. Mean age was 57.5 ± 14.7 SD (18-92) years. Diagnosis was primarily hip osteoarthritis in 85 (63%) cases, developmental dysplasia of the hip (DDH) in 24 (18%) and hip avascular necrosis (AVN) in 10 (7%). All the revision procedures were due to aseptic loosening of the original implant.
Results: Mean follow-up was 72.7 ± 7.9 SD (60-86) months. Average Harris Hip Score (HHS) significantly increased from 44.2 ± 5.4 SD (35-52) preoperatively to 95.3 ± 3.5 SD (88-100) at the last follow-up. No major post-operative complications were observed. 99.3% of the acetabular components were radiographically stable at the last follow-up, without any radiolucent lines, sclerotic areas or periprosthetic osteolysis. Kaplan-Meier survival rate was 99.3% at 5 years (95% confidence interval).
Conclusions: This first account on the mid-term clinical performance of the DELTA-TT cup shows great mechanical stability and bone ingrowth, thus representing an optimal solution for patients with high demands or affected by severe hip conditions.

P90

SQUEAKING OF HARD-ON-HARD BEARINGS - A MAJOR CLINICAL ISSUE?

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Introduction: Modern ceramic-on-ceramic (CoC) bearings show very good survival rates. Nevertheless, there are still reports in the literature reporting on the event of squeaking. However, it is unclear how relevant the squeaking is with respect to revision rates of CoC bearings.
Objectives: The objective was to assess the clinical relevance of the squeaking issue of hard-on-hard bearings with respect to revision.
Methods: The database of the world's largest manufacturer of ceramic hip components has been evaluated to determine the rate of retrievals due to squeaking that have been reported. A literature review was performed to further investigate the main influencing parameters on the incidence of squeaking.
Results: The investigation of the database exhibited a revision rate of 0,003% for the period from 2000 to 2014 for squeaking as a reason. Further analysis demonstrated that from this rare occasion 26% of these cases have experienced previously a ceramic component fracture with squeaking as a consequence. From the remaining, 13% felt pain or discomfort, and 2% had a limited movability of the hip joint.
According to the literature, the revision rate due to squeaking of 21'700 patients is 0.1%. The main factors for squeaking are malpositioning of the metal cup, microseparation and subluxation, interruption of fluid film lubrication, wear particles due to metal impingement, and the design and material of the prostheses components.
Discussion: Compared to the main reasons for revision of artificial hip joints, the incidence of squeaking as a reason for revision is extremely low. The investigation on the main influencing factors exhibited that some implant systems are more prone to squeaking than others but its etiology is multifactorial and still under discussion. Altogether, the reports found in the literature, accompanied by the evaluation of the database indicate that the squeaking is in general intermittent, pain free and not an indication for revision surgery.

P91

MODULAR NECKS IN HIP REPLACEMENT IN THE MID-LONGTERM: A MULTICENTRIC STUDY

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Introduction: Modular necks provide individualized prothesis in terms of hip rotation center, lever-arm, offset, leg length, cervico-diaphyseal and version

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angles. Some controversies have raised in some countries specially outside from European Union.
Objectives: Survivorship and clinical-functional results in 2314 consecutive performed in two different centers by two senior surgeons are evaluated.
Materials and methods: From 2002 to 2009, 2314 primary non cemented hip stems with modular necks were implanted. Mean follow-up was 9,7 years (range: 5-12) and age at index surgery was 72 years (range 39-86). Harris hip score (HHS), WOMAC score (pre-operative and at the last follow-up) and eventual complications were registered. Non parametric Wilcoxon test was used for statistical analysis (SPSS 13, Chicago-IL) and Kaplan-Maier survivorship curve was established considering any eventual revision as endpoint. Stems used were Profemur E, Profemur R and Anca-Fit® (WMT, Arlington-TN, USA).
Results: Most frequently used necks (57,8%) were short varus-anteverted (AR/VV 1 - AR/VV2). There was a clear clinical functional improvement in HHS, -from 39,1 (R:18-57) to 87,2 (R:72-100, p<0,001), WOMAC,-from 41,3 (R: 22-61) to 91,1 (R: 86-100; p<0,001). 32 infections (1,4%) 28 cup-loosenings (1,2%), 10 stem-subsidence (0,4%), 43 dislocations (1,8%) and 2 ceramic liner failure (0,08), 3 neck fractures (0,12%, all >32 BMI + long-varus neck) were registered. Overall complication rate including primary and revision surgery was 4,6%. Overall implant survivorship rate was 98,36% at 9,7 years mean follow-up.
Conclusions: In this mid-longterm serie satisfactory clinico-functional results with high survivorship, low dislocation and neck fracture rate have been observed. The usefulness of this device as alternative to traditional monoblock stem implants, refuting the observations concerning any possible rupture of neck modules, has been stated. Obesity-longvarus neck is a risk fracture.

P92
EFFECT OF HEAD MATERIAL AND SIZE ON FRICTIONAL TORQUE OF CROSS-LINKED ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE
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Introduction: In total hip arthroplasty, larger femoral heads may produce higher wear of ultra high molecular weight polyethylene (UHMWPE) and higher frictional torque. It was also hypothesised that higher frictional torque increases fretting induced taper corrosion.
Objectives: The aim of this study was to evaluate the effect of head size and material on the frictional torque against cross-linked UHMWPE (XPE).
Methods: Two bearing combinations (CoCrMo/XPE and ceramicised metal oxidized Zr-2.5Nb (CM)/XPE) with three head sizes (28, 36 and 40 mm, n = 3 each) were evaluated on a friction simulator (SimSol, UK). The load cycle was set to a maximum/minimum of 2 and 0.1 kN, and flexion/extension of 30° and 15°, respectively, at 1 Hz frequency. Load was applied through the articulating femoral head on to a static XPE liner at 0°. The test lubricant was new born calf serum (protein concentration ~20 g/L). The average of maximum frictional torque from the collected data for each sample was used for analysis.
Results: Frictional torque increased with the head size for all bearings. The average (± std. dev.) maximum frictional torques of 28, 36 and 40 mm CoCrMo were 3.5 ± 0.2 Nm, 4.1 ± 0.2Nm and 5.5 ± 0.2 Nm, respectively, and those of 28, 36 and 40 mm CM were 2.9 ± 0.3Nm, 2.8 ± 0.1 Nm and 4.7 ± 0.0.1 Nm respectively. For all sizes tested, the average maximum frictional torque produced by CM heads was significantly less than that produced by CoCrMo heads (p<0.05). Head size, material, and the interaction between size and material were statistically significant (p<0.05, two-factor ANOVA with replication).
Conclusions: For both CM and CoCrMo femoral heads, frictional torque increased with head size. Depending on the size, the average maximum frictional torque produced by CM/XPE couples was approximately 15 to 31% less than that produced by CoCrMo/XPE couples. This is consistent with the observation that ceramic surfaces reduce XPE wear and have lower corrosion susceptibility than metal heads.

P93
TAPER CORROSION OF THE MODULAR TOTAL HIP ARTHROPLASTY: A SYSTEMATIC REVIEW AND META-ANALYSIS OF SURVIVORSHIP BETWEEN METAL AND CERAMIC HEADS
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Corrosion at the head-neck taper in Total Hip Arthroplasty (THA) is a topical subject with reported adverse effects.
Our objective was to review the published evidence and the English National Joint Registry data to assess the evidence for, and significance of, corrosion at the metal-metal head-neck junction. We present a systematic review of the data comparing metal-on-polyethylene (MoP) and ceramic-on-polyethylene (CoP) bearing surfaces to assess whether wear at the metal-metal interface could be the cause of early aseptic failure.
We reviewed all English literature on MEDLINE, EMBASE, CINAHL, the Cochrane Database for Systematic Reviews, and the Compendex of Engineering from inception to July 2014 for comparative or randomised studies in this topic. Seven Randomised Controlled Trials met the criteria for this study with a total of 720 patients (894 hips).
There was no difference in linear or volumetric polyethylene wear between the CoP or MoP groups. One randomised trial assessed metal ions using various implant designs. It was found that MoP had significantly higher serum Chromium levels in comparison to CoP (p = 0.015); however, there were no significant differences between the two groups in regards to Titanium levels (p = 0.67).
Joint Registry data shows a significantly lower revision rate for CoP versus MoP. The reason for this is unknown, but this meta-analysis suggests that polyethylene particulate wear and associated osteolysis is not the cause. An alternative hypothesis for the higher failure rates therefore needs to be found; a leading contender is trunnion corrosion and subsequent metal ion release. Our presentation of the literature including retrieval studies and *in vitro* analysis show that rates of trunnion corrosion are high and therefore may cause aseptic loosening in more cases than previously thought. More RCTs with patient matched cohorts with longer follow-ups are required to confirm this along with a more in depth analysis of the NJR data.

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EVALUATION OF PERIPROSTHETIC BONE RESORPTION SECONDARY TO FIRST TOTAL HIP REPLACEMENT WITH METHA® SHORT HIP STEM: FOLLOW-UP EXAMINATION RESULTS AT 48 MONTHS
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Purpose: The aim of this study is to evaluate the effects of the BBraun Metha short hip stem with femoral neck metaphyseal anchoring at the level of the 7 Gruen zones and to define the evolution of periprosthetic bone resorption associated to this type of stem.
Methods: 20 patients with average age of 59, were selected in this study in accordance with specific inclusion and exclusion criteria. Clinical examination (Harris Hip Score and Womac Score), radiological evaluation (AP and LL X-ray views) and DXA scan (7 Gruen zones) were performed on each patient following a specific protocol: T0 (within six months from surgery), T12, T24, T36 and T48.
Results: Harris Hip Score (HHS) and Womac Score significantly improved. All radiological follow-up examinations did not show evidence of radiolucency. 2 cases of calcifications were found on x-ray examinations, but were not clinically relevant. No stem was surgically revised. No episodes of joint dislocation or infections occurred. The densitometry evaluation after 48 months confirm that the periprosthetic BMD evolution had a positive outcome in every Gruen zones, with the exception of the calcar region (R7), avoiding the proximal metaphyseal region that over the time could damage the stability and the longevity of the stem itself. There is also evidence of periprosthetic bone density changes, mainly starting from 24 months after surgery. Statistically significant results (Wilcoxon signed-ranks test, P<0.05) were documented at the level of R5 and R6 regions at 24, 36 and 48 months.
Conclusions: The Metha® stem is able to reduce the proximal periprosthetic bone resorption, thanks to its femoral neck metaphyseal anchoring, and to provide a greater longevity of the stem itself. From the comparison between our data and the literature data bone remodelling around the Metha stem appears to be also related to level of the osteotomy and to the stem angu-

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lation (varus and valgus), showing a variability of the operator dependent results. According to our study, we can conclude that the follow-up evaluation of the Metha® BBraun hip stem at 48 months, had a positive outcome on the periprosthetic bone resorption especially at the level of the proximal regions, although the DXA scan results could be influenced by the different angulation of the operator dependent stem.

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DIFFERENCES BETWEEN IMPLANTATION OF 36 MM OR 40 MM FEMORAL HEAD IN THA: PRELIMINARY RESULTS

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Introduction: Dislocation is a devastating complication after total hip arthroplasty (THA) and occurs in 2-5% of primary THA cases and 5-10% of revision THA cases. Assuming correct implantation, dislocation risk can be reduced primarily by capsular repair and use of larger prosthetic heads. However, larger heads are also associated with risks like accelerated wear or implant loosening. The aim of this study is to quantify the difference of THA dislocation risk in patients undergoing implantation of prosthetic heads of 40 mm or 36 mm diameter.
Materials and methods: In this retrospective study were evaluated all patients undergoing THA from January 2014 to june 2014 treated with heads of diameter 40 m or 36 mm, both with 20° of elevated liner, with at least 1 year of follow-up. The only complication considered was dislocation.
Results: During the observation period, 46 THA interventions with implantation of 40 mm femoral head were performed and 58 with 36 mm of femoral head. The operation was done by a single skilled surgeon. The minimum follow up was 12 month and the maximum follow-up was 18 month. No THA dislocations were reported in both group.
Conclusions: In the literature we find that larger femoral heads correspond to greater stability, and better range of motion. Our results do not show differences in the results in the installation of heads of 36 mm or 40 mm in diameter in the hands of an experienced surgeon. Further studies are needed to decide which is the best diameter for hip replacement.

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SYSTEMIC TOXICITY OF METAL IONS IN A METAL-ON-METAL HIP ARTHROPLASTY POPULATION

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Introduction: Potential systemic toxicity of metal ions from metal-on-metal hip arthroplasties (MoMHA) is concerning. High blood cobalt (Co) levels have been associated with neurological, cardiac and thyroid dysfunctions.
Objectives: The aim of this research was to investigate the prevalence of systemic Co toxicity in a MoMHA population, identify confounding factors and indicate a Co level above which there is a high risk for systemic toxicity.
Methods: We conducted a cross-sectional study of patients with a MoMHA, using questionnaires validated to detect mainly symptoms of cobaltism in cobalt industry workers. We retrospectively identified 161 patients with Co levels >4 µg/L and matched them for age and gender with 237 <4 µg/L and collected 385 completed questionnaires. There were 207 men and 178 women with a mean age of 60 years (24-86). mean follow-up was 5.7 years postoperatively (1 to 13 years). Co levels were subdivided into <4 µg/L, 4-10 µg/L, 10-20 µg/L, and >20 µg/L groups.
Results: There were significant correlations (p = 0.003) between increasing CO levels and prevalence of sensorimotor disorders, equilibrium disturbances, neuropathic pain, physical complaints, sleeping disorders, fatigue, cognitive problems and behavioral changes. More frequent and severe symptoms were encountered with Co >20µg/L (p = 0.0017). Several years post revision, some patients still complained of chronic symptoms possibly associated with longer exposure. Female gender and age = 50 years were confounding factors.
Conclusions: We demonstrated a significant correlation between increasing CO levels and systemic toxicity symptoms (p = 0.003). aS in the published case reports of MoMHA related cobaltism, the highest incidence of symptoms was found with Co levels >20µg/L. Patients with repeated CO measurements >20µg/L are at risk for systemic toxicity.

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LARGE-DIAMETER METAL-ON-METAL TOTAL HIP ARTHROPLASTY: 5 YEARS OF FOLLOW-UP

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Introduction: It is weel known that patients with Articular Surface Replacement XL (ASR XL) DePuy implants (large-diameter and metal-on-metal (MoM) total hip arthroplasty) are monitored over time.
Objectives: We have carried out a continuing prospective investigation into the failure of MoM hip devices from a single manufacturer to evaluate general and local conditions of patients.
Methods: From 2010 we have monitored 106 patients (51 males, 55 females, mean age 63.6) with ASR XL implants.
The controls were performed annually. The following scales were used for patients evaluation:
- Clinical Score: Harris Hip Score (pain and functional limitation)
- Rx score, evaluating the prosthetic-bone integration and the inclination of acetabular component
- Ultrasound score, considering the amount of periprosthetic fluid
- Blood metal levels of Chromium-Cobalt (Cr-Co) (µg/l = ppb): normal <3 ppb, alert between 3 and 7 ppb, pathologic >7 ppb

Patients who presented positive clinical-instrumental conditions and values of Cr and Co >7 mg/l were checked every 6 months.
Results: The follow-up included 110 implants (4 are bilateral case). 41 patients (37.2%) required revision. In 10 patients (4 women, 6 men) (24.4%) the revision surgery was caused by the mobilization of the cup; in 1 case (2.5%) by a severe functional limitation and pain; in the remaining 30 patients (19 women, 11 men) (73.1%) by high levels of Cr/Co and positive ultrasound. We are following the additional 69 patients (62.8%), not revised.
Conclusions: The ASR XL implant was afflicted by an excessive revision rate, associated with levels of metal ions significantly higher than other hip bearing surfaces. Analysis of variance for repeated measures proved a statistically significant reduction of blood concentrations of Cr and Co after revision, supporting evidence that the wear of MoM implants was the main cause. In our results the return values of ionemia and the fluid collection disappearance improved clinical patients conditions.

Revision

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BIG BALLS – THE CERAMIC EXPERIENCE IN REVISION TOTAL HIP REPLACEMENTS

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Aim: To discuss the rationale, selection criteria, indications, and results of using large diameter ceramic heads in revision hip arthroplasty.
Patients and methods: We routinely use Biolox family of ceramic heads and acetabular liners in patients undergoing revision total hip replacements. We present our experience in using ceramic articular bearings over the last 20 years and the switch to larger diameter ceramic heads. We also present our rationale for using a large diameter ceramic head instead of a large metal head and in revision of metal on metal hip replacements.
Results: We reviewed a total of 689 revision arthroplasties over this time period and we report the outcome of large bearing couples with case examples in primary and revision scenarios. Furthermore we compared a subset of patients (110) with large diameter ceramic heads – Biolox Delta 36 mm to patients who had metal on metal (large head 42 mm and above) bearing couples. The performance of the ceramic bearing couples has been exceptional and the functional outcome of these patients was excellent in 84%. We found no difference in the functional, clinical sports activities (UCLA and

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Tegner scores) between patients who had large metal bearing couples and large ceramic couples. Complication rate was less with the ceramic bearing revision arthroplasties, as was patient satisfaction.
Conclusions: Ceramic bearing couples have stood the test of time and have demonstrated an excellent long term wear properties. The recent introduction of the large diameter couples proves to be an excellent alternative if not the first choice in young, complex primary and revision case scenarios.

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TOTAL HIP ARTHROPLASTY AFTER ACETABULAR FRACTURE
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Background: Aim of this study is to evaluate the clinical results of total hip arthroplasty after conservative treatment or internal fixation for an acetabular fracture.
Materials and methods: 27 patients were enrolled: gender, age, time from trauma to arthroplasty and follow–up were recorded. Analysing the x-rays after trauma, the acetabular fractures were classified according to Letournel classification. Pre-implant x-rays were evaluated according to AAOS and Paprosky classifications. Used stem and cup were classified as primary, revision and reconstruction implants. All patients were clinically evaluated with modified Harris Hip Score (mHHS) and Western Ontario and McMaster Universities Arthritis Index (WOMAC) before arthroplasty and at the last follow-up.
Results: Average age was 50 years old, average time from trauma to arthroplasty was 59 months. Fractures were classified as elementary in 13 cases and as complex in 14 cases. Internal fixation has been performed in 16 patients and 11 cases received conservative treatment. As regards to implant, primary, revision and reconstructive implants were used respectively in 15, seven and five cases. Average surgical time was 104 minutes.
Average mHHS was 26 point preoperatively and 83 points at an average follow-up of 30 months. Average WOMAC was 73 points preoperatively and 15 points at the last follow-up.
Patients who received a reconstruction arthroplasty showed significant worst results than patients who received a primary arthroplasty. Mean time was significantly correlated with the type of implant (primary vs reconstruction p = 0.003).
Patients who underwent a conservative treatment showed a correlation with higher value of superior migration (p = 0,014) and teardrop osteolysis (p = 0,045) when compared to patients who underwent an internal fixation. Superior migration and teardrop osteolysis were also significantly correlated with worse outcomes.
Conclusions: This study suggests that arthroplasty after acetabular fracture has a good efficacy. Type of fracture has no influence neither in clinical outcome neither in Paprosky's classification on pre-implant X-rays. Furthermore outcome seems to be influenced by either preoperative superior migration and teardrop osteolysis either implant type.

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THE USE OF BIOTECHNOLOGIES IN REVISION OF PROSTHETIC HIP REPLACEMENT
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Introduction: The hip arthroplasty implant is currently growing up both in orthopedic and trauma practice. This increases the frequency of prosthesis revision due to implant loosening often associated with periprosthetic osteolysis that determine the failure and lead to a loss of bone substance. Nowadays there are numerous biotechnologies seeking to join or substitute the autologous or omologous bone use. These biotechnologies (mesenchymal stromal cells, growth factors and bone substitutes) may be used in such situations, however, the literature doesn't offer class 1 clinical evidences in this field of application.
Objectives: Aim of the study is to give an overview of the existing literature about biotechnologies application in arthroplasty revision surgery at the hip.
Methods: We performed a literature review using the universally validated search engines in the biomedical field: PubMed/Medline, Google Scholar, Scopus, EMBASE. The keywords used were: "Growth Factors", "Platelet Rich Plasma", "OP-1", "BMP", "BMP-2", "BMP-7", "Demineralized Bone Matrix", "Stem Cell", "Bone Marrow", "Scaffold", "Bone Substitutes" were crossed with "hip", "revision", "replacement"/"arthroplasty", "bone loss"/"osteolysis."
Results: The search led to 321 items, of these were considered relevant: as regards the growth factors 21 articles related to *in vivo* animal studies and 2 articles of human clinical use of BMPs and 1 single article on the use of PRP; as regards the mesenchymal stromal cells 2 items of application in animals; as regards the use of bone substitutes we have analyzed a review of this application.
Discussion: The use of biotechnologies in hip prosthetic revisions has produced conflicting results: autologous growth factors (PRP) have definitely been proven effective in maxillofacial surgery, in animal studies the results of BMPs are inconsistent with articles that validate their use and others that don't recommend it. Clinical application has demonstrated, today, the limited use of BMP-7 in revisions with even an increased risk of early re-mobilization, PRP appears to be rather effective only in the early stages of peri-prosthetic osteolysis. The mesenchymal cells can increase the chances of recovery and integration of the grafts but an important variable is the number of cells that are still alive after the impaction of the graft which affects their vitality. The bone substitutes appear to be safe and very useful, particularly if applied in order to implement the omologous bone, which is still the most scaffolds used in this surgery.
Conclusions: The systematic review of the literature has shown an important lack of clinical studies regarding the use of biotechnologies for prosthetic revisions. It is therefore difficult to draw guidelines that regulate the application, prospective randomized clinical studies are therefore needed to validate its effectiveness.

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PROSTHETIC SEPTIC LARGE REVISION
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Introduction: Throughout the world the number of large joint arthroprosthetic implants continues to increase and consequently the number of septic complications with prosthesis mobilizations, periprostehtic bone loss or non-unions.
The implant of large resection prosthesis (megaprosthesis) in selected patients could be a good solution both in hip and knee infected prosthesis with bone defects.
The two stage techniques with a first operation to debride, prosthesis components removal and antibiotic spacer implantation followed by a subsequent final prosthetic implant offer great results even in highly complex patients.
Objectives: The purpose of this study is to evaluate retrospectively the outcome after the implantation of megaprosthesis of the lower limbs in prosthetic infected revision.
Methods: We have retrospectively evaluated all the patients we have treated with implantation of megaprosthesis in septic prosthesis revision. Between January 2008 and January 2014 we have treated 25 patients: 18 cases of hip revision and 7 cases of knee revision. All patients were treated with a two steps procedure.
Results: We obtained good results from a clinical, laboratory and radiological point of view with restoration of the function of the affected limb in 22/25 cases. In 3/25 cases the infection recurred and an additional surgery was necessary.
Conclusions: Megaprosthesis in large septic revision can be considered, in extreme cases appropriately selected, an available solution for the orthopedic surgeon able to restore function to the patient. The two steps procedure gives the best results with safety and lower infection recurrence creating a membrane (Chamber Induction Technique) that can protect the prosthesis in a safe environment. This type of complex surgery must be performed in specialized centers where knowledge and technologies are present.

P102
ACETABULAR REVISION WITH DELTA REVISION SYSTEM
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Introduction: Revision surgery, that most of time concerns the acetabular side, is often afflicted by a high percentage of failures: the effort that the

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orthopedic equipe has to face is technically demanding and requires a slow and gradual learning curve, involving mainly specialized sectors. Great acetabular defects can be treated according to some different methods that principally depend on the quantity of bone stock, on the kind of defect that has to be treated, on the availability of fixation instruments and biomechanical helps, on the possibility to recreate a physiological center of rotation and eventually on the use of osteoinductive and/or osteoconductive bone graft materials. It is in this context that cups and augmentation with osteoconductive material coating (tantalium and trabecular titanium) are developed to ensure primary stability, they are also able to provide biologic support to new osseous formation. In our recent surveys both anti protrusion cages (Lima, Burch-Schneider, Muller-Rings) application, both in cemented cups, is generally limited to patients over 75 with great osseous defects (Paproski III and higher) with low functional requirements, because of poor clinical outcomes obtained in young patients.

Objectives: Delta Revision System, other than giving optimal guarantees regarding osteointegration and primary stability, also enables, thanks to the modularity of the inserts, to recreate the status quo ante center of rotation of the hip implanted. The association of osteoconductive bone grafts with tridimensional characteristics similar to the bone stock is really helpful especially in great cavital defects.

Material and methods: From July 2010 to October 2014 we performed 20 acetabular revisions in our centre using Delta Revision System, all patients were female (age min 58 years old, average 70 years old, max 81 years old). The pre op. diagnosis was aseptic mobilization in 14 patients, 3 patients with post-traumatic mobilization, 1 case of Gilderstone, 1 case periprosthetic sepsis. Acetabular defects are classified in Paprosky 1-2 in 2 patients, Paprosky 3A in 13 patients, Paprosky 3B in 2 patients, Paprosky 4 in 2 patients. In all patients a pre-operative study has been carried out through tc and tridimensional reconstruction. In 9 patients bone grafts made from highly purified bovine bone mineral (Orthoss - Geistlisch) have been used. In 8 cases the stem was revisioned as well. Average pre-op HHS was 25. Average leg length dicrepancy was 1 cm in 75% of cases and beyond 1 cm in the others. For 13 patients augmentation implant (included in the system) has been necessary to fill osseous defects detected on the high acetabular wall.

Loading has been given to the 30% with 2 crutches 20 days after surgery in 12 patients, to the 50% with 2 crutches on the 2nd day post-op in 3 patients and with 2 crutches one month after surgery to the 50%. Clinical and radiographical follow-up has been performed after 45 days-3 mm-6 mm -1 year after surgery, (Fup min 6 mm - Fup max 4 years old). 3 months after surgery 80% of patients showed free and painless loading. All patients (excluded 2 cases) reported a leg length discrepancy lower than 1 cm. Clinical outcome was good in 90% of patients (average HHS 85 3 months after surgery). In 65% of cases we noticed a good integration of the system and of the bone grafts 4 years after surgery. In one case the removal of the system for Proteus periprosthetic sepsis was necessary in a patient with clinical history of colon diverticulitis and severe pelvic protrusion (Paprosky 3B+).

Conclusions: The results with this system, the good osteointegration and modularity, drive us in using it above all in patients where we have to face complex acetabular revisions with severe bone stock defect. The early loading in our series of patients mixed with the possibility of recreating the center of rotation and the biomechanical safety of the system make it as an ideal solution for these kind of surgeries mainly on high demanding patients.

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TRABECULAR TITANIUM TECHNOLOGY IN ACETABULAR REVISION SURGERY

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Introduction: Trabecular Titanium is an open-cell regular structure composed by hexagonal cells of controlled pore, manufactured by Electron Beam Melting (EBM) technology, that allows moulding of cellular solid structures. The Lima Delta TT revision cups are One and Revision, which is characterized by a caudal hook and fins. Both allow internal modularity and cranial TT augments.

Objectives: The aim of this prospective study is to evaluate the short to medium-term clinical and radiographic outcomes of acetabular revision cups in TT.

Methods: Between December 2008 and March 2013 we performed 60 cup revisions, 33 with the Revision cup and 27 with the One cup. In 20 cases (3.3%) stem revision was associated. The mean age of patients was 69.6 years (range 29-90). Causes of revision were: aseptic loosening in 48 cases, periprosthetic acetabular fractures in 5 cases, recurrent dislocation in 5 cases, infection in 2 cases. In 52 cases bone grafts were used to fill cavitary defects (AIR 1-4). Hemispheric TT augments were used in 13 cases with the same aim. Internal modules were used in 39 cases to restore correct offset. The average follow-up was 39 months (range 19-70).

Results: Mean Harris Hip Score (HHS) was 39.9 preoperatively and 82.7 at last follow-up. We had no intraoperative complications.

We had 2 cases of superficial infection, one of which required revision of the surgical wound. 4 patients suffered dislocation episodes (1 recurrent); none of them required revision. We had 1 case of asymptomatic aseptic loosening, which did not require intervention. In the remaining cases no radiographic evidence of radiolucent lines was noticed at follow up, neither any evidence of aseptic loosening. The graft was considered to be integrated in all cases.

Conclusions: Trabecular Titanium revision cups showed high capacity of osseointegration, providing good results in short to medium-term follow-up.

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MEDIUM TO LONG-TERM FOLLOW-UP WITH REVISION STEM IN HIP REVISION SURGERY

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Introduction: The Lima Revision stem is a cementless, modular, tapered stem designed in accordance with the philosophy of Wagner. The 2 body of the stem lengths and the neck modularity gives the opportunity to restore biomechanical joint parameters.

Objectives: The aim of this retrospective study was to evaluate the long-term clinical and radiographic outcomes of revision hip surgery with the Revision stem.

Methods: Between May 2001 and July 2011, 105 patients underwent revision hip surgery with the Revision stem (Lima Corporate, Italy) due to aseptic loosening in 79 (75.2%) cases, infections in 5 (4.8%) and periprosthetic fractures in 21 (20.0%). 62 (59%) cases required also an acetabular revision with implant designs according to the bone defects.

Clinical evaluation with the Harris Hip Score (HHS) and radiographic analysis to assess the implant stability were performed. The average follow-up is 81 months (range 40-161).

Results: Four patients died, 7 patients were not contactable for last follow-up. Postoperative complications included 3 hip dislocations, treated conservatively; 3 periprosthetic fractures, addressed with wiring and plates; 2 subsidence, self limited. Radiographic assessment demonstrated that all stems had a good stability at the last follow-up. The average Harris Hip Score significantly improved from 42 (range 30-65) preoperatively to 86 (range 67-99). No length leg discrepancy of two limbs greater than 1 cm. No taper breakage and no new revisions occurred.

Conclusions: The Revision stem ensured an effective restoration of biomechanical joint parameters in all the revision cases thanks to the neck modularity. Immediate primary stability of the implants favored an early adequate osseointegration of the grafts and the remaining bone stock. This stem allow an early mobilization and weight bearing, to provide for satisfactory clinical outcomes.

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METAL-ON-METAL IMPLANTS: THE TIMING OF REVISION

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There is no international consensus around Metal-on-Metal (MoM) implants particularly for best timing of revision. Indications need to be balanced with the risk of surgery. Current available literature is not able to produce strong evidence and consensus on indications or technical procedures for revision surgery neither it does in relation to strategy for appropriate timing of revision surgery in Adverse Reaction to Metal Debris (ARMD) cases. Great interest about MoM implant revisions concerns late failures whose causes are to be ascribed to wear factors. The timing of revision is related to patient's symptoms, expected outcomes and complexity of revision surgery and finally to comorbidities presented by the single patient.

Literature provides some algorithms and guidelines for the diagnosis and management of MoM, based on symptoms, imaging and blood ion levels. All

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of these algorithms basically distinguish patients' population in symptomatic and asymptomatic. Whereas the revision timing is rather well-defined in the symptomatic patient it is definitively not in the asymptomatic one.
What are patient's expectations? What about surgeon's position? What are the medico-legal implications if the revision outcomes are poor? And finally what are the medico-legal implications if the surgery is not made and further damages happen to the patient? Own experience and common sense appear the solely surgeon's tools. Aim is to substitute evidence and surgeon's experience with evidence and risk stratification, introducing a risk management based approach possibly through a risk evaluation tool that offers acceptable sensitivity and specificity level. Ideally a semi-quantitative matrix for risk evaluation defining both severity ranking and probability of occurrence of a given clinical risk could help in properly staging the clinical condition and guide through decision making. This aim will demand a multi-disciplinary approach, due to the multitude of involved variables.

P106
ACETABULAR REVISION WITH DELTA REVISION TT CUP AND BONE GRAFT: MID TERM FOLLOW-UP
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Introduction: Aseptic loosening of acetabular cup is one of the main cause of revision surgery. Frequently is associated to major bone loss that often require bone graft or augmentation to restore bone stock and to provide adequate implant stability.
Objectives: To evaluate the clinical and radiographic results of the Delta Revision TT cup associated with bone graft in patients with acetabular cup mobilization.
Methods: We retrospectively reviewed 28 patients (30 hips). The bone loss were classified according to the Paprosky classification of acetabular defect. In 20 cases a morcellized allogenic bone graft was used and in the remaining 10 cases a synthetic bone substitute was used. The patients were reviewed at a mean follow up of 40 months with the Harris Hip Score (HHS) and with a pelvis and hip x-rays to evaluate the grade of bone grafts incorporation and the position of the cups respectively to the immediate postoperative x rays.
Results: The mean HHS was 86 (range 66-98). The 76% of the patients were pain free, the remaining 24% complained only slight pain (NRS 1-3). The bone graft integration was of grade 3 (trabecular remodelling) in 67% of cases and of grade 2 (trabecular integration) in 33% of cases. No mobilization of the cups was founded: the mean immediate postop cup inclination was 42.8° (range 30-52) and the mean follow-up cup inclination was 42.3° (range 30-52). No periprosthetic osteolysis was found. As complication we have found 2 deep infection treated with a Gilderstone, one superficial infection treated with debridment and VAC-therapy. In 2 cases there was a dislocation treated using a 20° internal spacer to restore adequate inclination and anteversion of the cup.
Conclusions: The Delta Revision TT cup is a valid option in these cases with good clinical and radiographic results at a mid-term follow up. The modularity of the system is also useful to manage severe bone loss or complicantion as postop dislocation.

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THE ROLE OF TMT AND THE BONE DEFECT MANAGEMENT IN THE ACETABULAR REPLACEMENT
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Introduction: Acetabular component loosening is the main cause of total hip arthroplasty revision in long-term studies. Acetabular loosening usually occurs as a result of the implant fixation failure, due to the micromovements that occur between the prosthesis and the bone. It could be very hard to obtain an effective primary stability, but especially to achieve a good secondary osseointegration.
Materials and methods: From March 2011 to July 2014, 86 patients with prosthetic acetabular component loosening, underwent to a revision surgery using Trabecular Metal (TM) acetabular component. In 29 patients was also associated a femoral revision. All patients were preoperatively classified according to Paprosky score. A clinical (Harris Hip score and Merle Daubigné-score) and radiographic follw-up (Benson and Gill classification) was performed at month 1, 3, 6, 12 and 24. At month 36 a CT scan with 3D reconstruction and analysis of chrome-densitometry was obtained. The mean follow-up was 52 months.
Results: One of the most important factors which can limits the integration is the low porosity of the implants. TM is a highly porous material (80%) made of porous tantalum. The TM appears to be an ideal material for its integration properties. The average diameter of the pores is 550 microns. This is the optimal size in order to allow the osseointegration and it is affine to the size of the bone trabeculae. The TM modulus of elasticity is very similar to that of cancellous bone. No patients was subjected to a further revision and there were no cases of infection. No radiographic signs of loosening were detected. The patients returned to walk independently and only 6 daily use aids for walking.
Conclusions: In our experience, the use of the cup in tantalum reduced the use of bone grafts. The cup should seek the support on the wall acetabular and partly act as "bone grafting" which will be integrated.

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ACETABULAR REVISION USING STRUCTURAL FEMORAL HEAD ALLOGRAFT AND A CEMENTED SOCKET FOR ASEPTIC LOOSENING WITH UNCONTAINED DEFECTS. CLINICAL AND RADIOLOGICAL FOLLOW-UP TO 16 YEARS
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Revision for aseptic cup loosening in cases with large, uncontained acetabular bone defects are becoming more common as indications for primary surgery widen and follow-up progressively increases. Various implants and operative techniques have been developed to allow cup revision where bone stock in the acetabulum is poor, but most techniques do not allow restoration of bone stock and successful component fixation is still a major concern. The aim of the study was to review the medium to long-term clinical and radiological results of cup revision using structural fresh frozen allograft and cemented components.
Between 1998 and 2014, 134 aseptic cup revisions using fresh frozen structural allograft and cemented components have been carried out at our hospital at a first revision setting.
The acetabular defect was assessed on pre-revision radiographs and graft dimensions and socket coverage by the graft were measured on the post operative radiographs. Follow-up radiographs were analysed for socket loosening, quality of graft union, graft resorption and screw position.
At a mean follow-up of 5 years 10 months (range 0-16) four hips had been re-revised by the fourth post-operative year and 82 hips had a follow-up past 4 years with a mean follow-up of 8 years 6 months (4-16). In addition to the 4 early failures, 11 other hips were re-revised, the reasons for re-revision were 1 for infection, 1 for recurrent dislocation, 1 aseptic stem loosening and 12 for aseptic cup loosening.
Survivorship analysis for aseptic cup loosening was 88.35% (78.4-98.2) at 9 years when 40 hips were still attending follow-up.
The results using structural fresh frozen allograft to reconstruct the acetabulum are encouraging with a follow-up to 16 years. Use of this technique facilitates re-establishment of joint centre and allows restoration of acetabular bone stock, which is particularly important in younger patients.

P109
CUSTOM MADE CONSTRAINED POLYETHYLENE IN RECURRENT TOTAL THP INSTABILITY
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Introduction: Some special clinical conditions could contribute to Hip prosthesis recurrent dislocation; particular difficulties arise in cases were muscular balance is compromised: hyperactivity in spastic patients, flaccidity in palsy, neurological diseases, mental impairment. When mechanical stability cannot be achieved by traditional standard prosthetic components or instability is still

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even after using revision components, we studied the possibility to revise maintaining THP components, especially if well osteointegrated, without a need to remove the implant. For this purpose we used a modified additional polyethylene piece, it can be applied over the original insert in polyethylene in order to achieve prosthesis intrinsic stability and prevent dislocation of the head.
Materials and methods: Seven patients were treated for hip prosthesis instability: 4 Females and 3 Males; mean age was 65 years. The group was heterogeneous for pathogenesis: 4 patients had at least 2 episodes of trauma; one patient had rupture of the prosthesis modular neck: after neck substitution intra-operative findings of stem and cup appeared to be fixed to bone, but THP still easily dislocates; 2 patients had psychiatric syndrome; one of them had poliomyelitic limb. Posterolateral approach was used; an additional semilunar shape of polyethylene was fixed with several screws over polyethylene insert border in order to construct a peripheral stop preventing dislocation of the head out of the cup. Excellent stability was immediately obtained.
Results: Clinical follow up and X-Rays were obtained at 3, 6 and 12 months. Permanent stability and no other events of dislocation were documented. X-rays also showed no mobilization or bone loosening around any of the components.
Discussion and conclusions: Some cases could present failure of the first revision surgery for recurrent instability of THP; occasionally, during intra operative evaluation of a revision procedure it is possible to predict that final stability of prosthesis can't be obtained; then exceptionally a decision could be made to treat the case by applying new components in addition to the previous stable implant, instead to remove and exchange the cup with a constrained one: a custom semilunar of polyethylene insert fixed with screws over the previous one hold prosthesis head. This offers a fast solution, less invasive and with low costs; the stability is immediate and midshort term follow up still presents stable results.

P110
ACETABULAR REVISION FOR FAILED SOCKETS AFTER PRIMARY HIP ARTHROPLASTY WITH STRUCTURAL BULK AUTOGRAFTS: THE ROLE FOR FURTHER BONE-GRAFTING
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Background: Structural bulk autografts restore the severe bone loss at primary hip arthroplasty in dysplastic hips and have shown to have good long term outcomes. There are only a few reports of revision arthroplasty for these sockets that fail eventually. We report on a series of such primary hips which underwent cemented revision of the socket for aseptic loosening and their outcomes.
Methods: A retrospective review was performed from our database to identify fifteen acetabular revisions after previous bulk autograft. The mean age at revision was 53.9 years (range 31-72.1). The mean duration between the primary and revision arthroplasty was 12.4 years (range 6.6-20.3). All procedures were done using trochanteric osteotomy and three hips also needed the femoral component revision. All fifteen hips needed re-bone grafting at the revision surgery to restore the new socket to the level of the true acetabulum. Of these ten hips had morselised impaction allograft, and the remaining five also needing a structural bulk allograft.
Results: Two sockets underwent re-revision at mean 7.5 years for aseptic loosening. One patient had a dislocation that was reduced closed. At a mean follow up of 5.7 years, one socket showed superior migration, but was stable and did not need further intervention. Two other sockets also showed radiological evidence of loosening, and are being closely monitored.
Conclusions: The medium term results of cemented acetabular revision in this younger age group are satisfactory, with repeat bone grafting being required to restore the true acetabular position. Though the primary arthroplasty with bulk bone graft recreates the acetabular bone stock, significant bone loss due to the mechanical loosening of the socket needs to be anticipated in revision surgery.

P112
DUAL MOBILITY CUP SYSTEM: OUR INDICATIONS
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Introduction: Dual mobility cup systems reduces the risk of dislocation, that is the most common complication of the total hip artrhoplasty.
Objectives: The factors that influence prosthetic joint stability can be classified into three main groups:
Patient factors: gender, age
Surgical factor: surgical approach, previous surgical treatment
Prosthetic factors: size, off set
Double mobility cup or tripolar cup is a system which consists of a combination of two joints, one large unconstrained joint between the metal cup and the liner, and a smaller constrained joint between the liner and a standard metallic head that is attached to the femoral component.
Methods: Our indications to use this system consist:
Medial neck femoral factures in neurologic disease
Cut out of endomidollar nail system in lateral neck femoral factures
Acetabular revision
Emiarthroplasty revision
Conclusions: We want to show this clinical use in our daily clinical practice.

P113
ACETABULAR REVISION WITH LARGE BONY DEFECTS USING JUMBO CUPS
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Introduction: There are several methods introduced for treatment of large bony defects in revision acetabular components. Some authors suggested that Jumbo cups are useful for these patients.
Purposes: In current prospective study, we investigated the midterm the clinical, radiographic and functional outcomes of acetabular revision using Jumbo cups.
Methods: Between 2004 and 2008, 51 consecutive patients underwent uncemented revision total hip arthroplasty (THA) in current prospective study. Nine patients lost during follow up. The remaining patients were followed for 8.6 ± 4.9 years.
Results: Unfortunately, aseptic implant loosening occurred in two patients who required re-revision surgery. One patient experienced dislocation. Radiolucency around the bone-implant interface was found in other 4 patients, however, none of these patients suffered from instability. No patient developed infection or thromboembolic events. The Harris hip score (HHS) averaged 81.4 ± 14.6. Based on the HHS, the functional outcomes were excellent in 5 patients, good in 17 patients, fair in 13 patients and poor in 7 patients.
Conclusions: The findings of our study confirms that using Jumbo cups for acetabular revision with large bony defects leads to almost satisfactory functional, clinical and radiographic outcomes without complications.

P114
DUAL MOBILITY CUPS FOR RECURRENT DISLOCATION OF TOTAL HIP ARTHROPLASTY
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Introduction: Instability following total hip arthroplasty (THA) is a serious disabling complication. Even revision THA due to the recurrent dislocation can be associated with persistent instability. Dual mobility implants (tripolar prosthesis) are used to reduce the risk of recurrent hip dislocation. However, there is little knowledge about the mid-term and long-term outcomes of using these implants.
Purpose: To evaluate the midterm results of treating recurrent THA dislocation using tripolar prostheses.
Methods: Between 2005 and 2011, 24 consecutive patients were revised due to recurrent hip dislocation. The patients aged 62.4 ± 10.6 years at the time of surgery. All of the patients had at least 2 episodes of dislocation. Preoperative Harris hip score (HHS) was 46.1 ± 11.5. Patients were followed for 6.2 ± 4.1 years.
Results: At the last visit, HHS improved significantly (83.5 ± 12.6, $p<0.001$). Redislocation occurred in one patient who required a more revision surgery (4.1%). No patient developed infection and or symptomatic deep venous thrombosis. Also, we found no patient with implant loosening or periprosthetic fracture.
Conclusions: Tripolar hip prostheses are useful and effective for treatment of patients with recurrent hip instability after THA. However, more large long-lasting prospective studies are required.

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P115

TANTALUM ALLOY FOR ACETABULAR BONE DEFECTS IN HIP REVISION

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Introduction: Reconstructing acetabular defects in revision hip arthroplasty can be challenging. The large bone defects are treated with bone graft and tantalum acetabular cup fixed by screws. Compared with conventional porous materials such as titanium alloy, the tantalum alloy is caracterized by high porosity that offers rapid attachment.
Materials and methods: We retrospectively reviewed 20 revised for aseptic loosening of uncemented cup with a large defect between 2006 and 2009. The average of Follow-up is 3 years. Acetabular bone status was classified according to the criteria of Paprosky. The allograft was used for acetabular augmentation. The surgycal technique consists in using tantalum multi-holes or revision shell non cemented cup. Furthermore we used to fix the acetabular component with cancellous bone screws in ischial and sovra-acetabular part. Before to implant the cup, we used to prepare acetabular wall with allograft bone chips. We were able to fix the insert with a cement or pressfit according the different cases. We allowed the full weight bearing after 3 days. We assessed clinical status before and after arthroplasty with Harris Hip Scores and measurement of leg length differences after 1 year. Furthermore we evaluated the postoperatively radiographs in order to detect radiolucent lines and mobilization signs.
Results: The majority of patients demonstrated considerable improvement in quality-of-life and hip function scores from baseline preoperatively. The mean Harris hip scores improved from 32 preoperatively (range 25-45) to 84 postoperatively (range 76-89).
We did not observe any postoperative dislocations, infections or intraoperative periprosthetic fractures. The average leg length difference improved from 25 mm preoperatively (range 15-40 mm) to 15 mm postoperatively (range 10-19 mm).
Conclusions: Our study shows that cementless total hip arthroplasty with allograft is a good way for massive defect in acetabular bone stock. Our study shows no graft reabsorption and early failure. The reason for our results is supposed to be related with the stability of cup. In fact the tantalum alloy allows us to research the biological and mechanical support.

P116

DUAL MOBILITY CUP IN COMPLEX REVISION CASES

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Introduction: The dual mobility cup was introduced in the 1970s to allow extensive range of motion associated with great stability thanks to double articulation; the first between the head and polyethylene, the second between the polyethylene and the cup.
Objectives: Cemented dual-mobility cups are available, these are the topic of this study. One of the most frequent complications in the major revisions of hip replacement is dislocation.
This study summarises our experience gathered in the use of dual-mobility cups during revisions of complex cases (GIR III-IV femoral or acetabular).
Materials and methods: Between July 2014 and March 2015, we have implanted 13 cemented cups with dual-mobility (Avantage® Biomet) each in different patients, who have undergone revision with severe ostheolysis (GIR III-IV femoral or acetabular).
Indications for revisions has been: aseptic loosening in 7 patients (two at third surgery), recurrent dislocation in 3 patients, 1 septic loosening, 1 revision after spacer removal e 1 post-traumatic.
We used dual-mobility cup in revision surgery when implant stability could have been compromised due to difficult positioning of acetabular component in cases of walls defects or muscolar laxity of the patient.
Results: In most difficult cases with a severe lack of acetabular walls (9 patients), and thus difficulties in correct cup positioning, we have chosen to implant a cemented cup inside a Burch-schneider® (Zimmer) ring.
No dislocations occured during the folllow-up, neither infections, neurological events or DVT.
Conclusions: The dual-mobility cup in acetabular revisions, is one of the possible choice to keep in mind in more complex cases, where obtaining stability is difficult or impossible using other revision implants.
In the literature, the available follow up are not yet long enough to be sure of implant longevity and so it's important to pay attention to use this cup in those patients with long life expectancy.

P117

ACETABULAR REVISION WITH TRABECULAR TITANIUM - 120 CASES WITH A 2 YEAR MINIMUM FOLLOW-UP

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Introduction: Trabecular titanium implants are 3D printed with a high-friction ingrowth surface that is continuous with the rest of the acetabular shell. The ability to "face-change" following optimum seating of the component allows unprecedented levels of versatility in acetabular orientation. Bolt-on augments enable rapid trialling and definitive insertion of a monobloc construct. The use of these implants has rapidly increased in the National Joint Registry over the last three years with little published outcome data. We present one of the largest studies using this material.
Objectives: This study assesses the early stability, ingrowth and clinical outcome of revision acetabular reconstruction with trabecular titanium.
Methods: 120 consecutive acetabular revisions were prospectively evaluated radiographically and clinically with a 2 to 5 year follow-up.
Results: The indications for revision were aseptic loosening (84) infection (20), dislocation/instability (9), metallosis (6) and impingement (1) The defects were classified as type I in 2 cases, IIA in 26, IIB in 47, IIC in 15, IIIA in 25 and IIIB in 5. External augments were used in 16 cases and face changing liners in 40 cases. Mean preoperative Oxford Hip Score was 24 (range 13-33) with a postoperative mean score of 36 (range 13-46).
No patients were lost to follow-up which was from 2 to 4 years (mean 3 years) Two cases were subsequently revised for infection and two for instability. One case was revised for material failure as a result of a cross-threaded screw.
There were no cases of aseptic loosening and all remaining implants appear well-integrated radiographically.
Conclusions: These early results are very encouraging with excellent initial stability clinically and radiographically. The versatility of face-changing liners, multiple bearing options and bolt-on augments allows rapid and accurate reconstruction. The data support the use of this material and we will continue to report the outcome of this series.

P118

CLINICAL AND RADIOLOGICAL RESULTS OF A HETEROGENEOUS GROUP OF PATIENTS TREATED WITH A MODULAR FEMORAL REVISION SYSTEM

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Introduction: Goals of stem revision could be summarized: primary stability, offset restoration, leg length discrepancy correction, early load and avoidance of dislocation. Femoral geometry can be altered due to loosening, previous fractures, previous two staged exchange for infection or after internal fixation device removal. The surgeon could be helped by modularity facing complex femoral reconstruction both in primary and revision hip surgery specially for version control and for proximal and distal sizing.
Objectives: Aim of this study was to evaluate survival and functional outcomes of a heterogeneous group of patients with a modular femoral revision system.
Materials and methods: Between May 2010 and march 2015, 38 patients were operated using the same modular femoral revision system. 17 were male with an average age of 76,3 years old (40-87) and 21 female with an average age of 75,2 years old (57-88). 17 procedures were performed due to aseptic loosening, 6 infection cases were treated with two staged exchange, 7 femoral fractures, 7 cases after femoral internal fixation device removal, just in one case for femoral complex primary surgery. All patients were clinically and radiologically evaluated.
Results: Average follow up was 2.5 years (1 month to 5 years). Average Hhs improved from 40 preoperatively to 81.14 at most recent evaluation. 3 intraoperative periprosthetic fractures were recorded and 10 extended trochanteric osteotomy were dome. 36 hips (95%) were completely satisfied. 1 dislocation was observed due to cup malposition, 1 cup aseptic loosening and 1 reiinfection. In 14 cases a radiolucency was observed and in 6 patients osteolysis.
Conclusions: Modularity is a valid choice during revision hip surgery. The possibility to have many different combinations allows the surgeon to restore

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the correct leg length, offset, varus valgus and anti-retro version. It is also possible to achieve a good proximal fill and distal fit.

WITHDRAWN

P120
THE RADIOLOGIC OUTCOMES OF OPEN REDUCTION AND LATERAL PLATING WITH WIRING IN TREATING FOR VANCOUVER B2 PERIPROSTHETIC FRACTURES OF THE FEMUR

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Introduction: Treating Vancouver B2 periprosthetic fractures, stem revision surgeries were recommended generally, because of high failure rate of open reduction and internal fixation (ORIF). However, stem revision surgery is difficult and have a high risk for combining perioperative complications, rather than ORIF.
Objectives: We retrospectively reviewed the clinical outcomes for open reduction and lateral plating with wiring in treating for Vancouver B2 periprosthetic femoral fractures.
Methods: From 2009 to 2013, we retrospectively recruited 27 patients with a mean age of 70 years who treated with ORIF with lateral plating and wiring for Vancouver B2 fractures. During the fracture repair, direct lateral approach was done for femoral shaft to exposure fracture area and we applied lateral plate with wiring. Average distance of sinking down for retained stem were investigated between immediate postoperative radiographs and final radiographs achieving union.
Results: Within 1 year after operation, 6 patients was expired before fracture union. 4 patients could not evaluated, because of follow up loss. The remaining 17 patients were achieved complete bony union without notable complications. Average union period was 18.3 5.7 weeks (range 15~24 weeks) and distance of stem sinking was averaged 2.4 4.5 mm (range 0~7 mm), which had no significance between immediate postoperative radiographs and final radiographs achieving union. There was no case of reduction loss or fixation loss, requiring revision surgery. There was no case of infection and nonunion.
Conclusions: In our study, open reduction and lateral plating with wiring in treating for Vancouver B2 periprosthetic femoral fractures shows good radiologic outcomes with successful bony union. ORIF could be a primary option for Vancouver B2 fractures, rather than stem revision surgery.

P121
WHICH IMAGING MODALITY IS MOST EFFECTIVE FOR IDENTIFYING PSEUDOTUMOURS IN REVISED METAL-ON-METAL HIP RESURFACINGS: ULTRASOUND OR MAGNETIC RESONANCE IMAGING OR BOTH?

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Introduction: No preference is given by regulatory authorities between the use of ultrasound (US) or magnetic resonance imaging (MRI) for assessing metal-on-metal hip resurfacings (MoMHRs).
Objectives: We assessed diagnostic test characteristics for US, MRI, and US combined with MRI for identifying intra-operative pseudotumours in revised MoMHRs.
Methods: A diagnostic accuracy study was performed, including 40 MoMHR patients revised for any indication with both US and MRI performed before revision. Time between imaging modalities was a mean of 14.6 days, with imaging performed within one-year of revision (mean 5.3 months). The radiologist assessing US and MRI images was blinded to all clinical information. Diagnostic test characteristics and kappa agreement were calculated for each imaging combination (gold standard = presence or absence of a pseudotumour at revision).
Results: The prevalence of intra-operative pseudotumours was 82.5% (n = 33). Agreement with intra-operative findings was: 82.5% (n = 33) US, 87.5% (n = 35) MRI, 92.5% (n = 37) US with MRI. Diagnostic test characteristics for US alone and MRI alone reached similar sensitivities (90.9%-93.9%) and positive predictive values (PPVs; 88.2%-91.2%), but higher specificities (57.1% v. 42.9%) and negative predictive values (NPVs; 66.7% v. 50.0%) were achieved with MRI. US and MRI together produced 100% sensitivity and 100% NPV, whilst maintaining specificity (57.1%) and PPV (91.7%). For identifying intra-operative pseudotumours, agreement was substantial for US and MRI combined (kappa = 0.69), moderate for MRI (kappa = 0.54), and fair for US (kappa = 0.36).
Conclusions: US and/or MRI have a role when assessing MoMHR patients, though the choice depends on institutional finance and US expertise. However in MoMHR patients requiring revision, combined imaging was most effective. Combined imaging always identified intra-operative pseudotumours if present, and if neither modality showed a pseudotumour one was not found intra-operatively.

P122
ASSESSMENT OF THE CLINICAL AND RADIOLOGICAL RESULTS OF GRAFT AUGMENTATION PROSTHESIS (GAP 2 CAGE) IN ACETABULAR COMPONENT REVISION

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Introduction: The need for revision total hip arthroplasty (THA) continues to grow yearly. The reconstruction of acetabular bone defects remains a challenge to arthroplasty surgeons. Several methods have been tried to manage this including allograft reconstruction with hemispherical cup, oblong acetabular components, custom triflanged implants, trabecular metal cup with augments, or a reconstructive cage. The use of the acetabular impaction grafting in addition to a reconstructive cage has been an attractive option in treating these severe acetabular bony deficiencies. The cage is to bridge the bony defect and to protect the underlying bone graft as it incorporates restoring the pelvic bone stock which allows future revisions if necessary.
Objectives: The purpose of this study was to analyse the survival and the midterm clinical and radiological outcome using the Graft Augmentation prosthesis (GAP II cage) (Stryker Orthopaedics, Mahwah, NJ, USA) in addition to acetabular impaction grafting for severe acetabular defects in revision hip surgery, and to compare it to the published results in the literature.

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Patients and methods: This was a retrospective review of all patients who underwent acetabular revision hip replacement using GAP II cage and impaction bone grafting between 2009 and December 2012 at our institution. 26 patients were included with a mean age of 71 years at the time of surgery (49-91). According to the American Academy of Orthopaedic Surgeons classification; three patients had type II defect, 20 had Type III while three suffered from Type IV defect. We have evaluated the clinical outcome of the patients using the Oxford hip score and assessment of the associated complications. Radiological assessment was done by measuring the implant migration and the incorporation of the bone graft to the host bone.
Results: The average Oxford hip score improved from of 11.3 (2-22) preoperatively to 32.1 (8-48) postoperatively. With the revision of the Gap II cage and/or the acetabular component for any cause was the end point, the survivorship of this construct was 100% at mean follow up of 36 months (24-68 months). There was no breakage of the implant noted at the end of follow up. 2 patients had radiological failure of the implant (7 mm and 12 mm migration) with no clinical consequences. The rate of the associated complications was 11.5% (7.6% was related to the revision of femoral component).
Conclusions: GAP II cage with impaction bone grafting has encouraging midterm results with low failure rate. It could reconstruct severe acetabular bone defects allowing further revision surgeries if needed.

P123

CLINICAL EXPERIENCE OF REVISION SURGERY FOR FAILED METAL-ON-METAL TOTAL HIP ARTHROPLASTY

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Introduction: Clinical evidence suggests some metal-on-metal total hip arthroplasties (m-o-m THAs) have higher failure rates and subsequently early revision. However, there are few studies demonstrating the clinical outcome of these patients following revision surgery.
Objectives: To ascertain the functional outcome, causes and complications of revision surgery in patients with failed m-o-m THAs.
Methods: We have identified 32 patients (12 women, 20 men); mean age: 68.9 years (range 55 to 83); 34 hips have been revised for failure of primary stemmed m-o-m THAs. Reasons for revision included pain with loose components (n = 9; 26.5%), adverse reaction to metal debris (n = 10; 29.4%), dislocation (n = 2; 5.9%), pain of unknown origin (n = 6; 17.6%) and infection (n = 7; 20.6%). Minimum follow-up was 9 months (mean = 38 months; range = 9 to 108 months) following revision. Clinical review, Oxford Hip Score, whole blood Cobalt (Co) and Chromium (Cr) levels and radiographic evaluation were documented.
Results: Whole-blood levels of Cobalt (Co) decreased below the 7 ppb cut-off value in all patients with revision of unilateral m-o-m THA. However, blood Chromium (Cr) levels remained elevated in 7 of 32 (20.5%) revision patients in the unilateral THA group. The median Oxford hip score improved from pre-operative to 1-year post-operative in the unilateral THA group [38 (31 to 45) to 27 (18 to 36); $p<0.05$].
Conclusions: Revision surgery seems to be effective for removal of the systemic metal ion burden. However, some patients still had a poor functional outcome at 38 months after revision surgery. Complication rates following revision surgery appeared to be high (41.2%; 14 out of 34) in this cohort of patients and closed monitoring post-revision outcomes is recommended. Further research or consensus is needed to formulate surgical strategies to mitigate complications in this group of patients.

P124

PRIMARY HIP STEMS IN TWO STAGE REVISION AFTER EXTENSIVE LATERAL WINDOW APPROACH: RESULTS AND ADVANTAGES

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Introduction: Femoral stem revision is one of the most challenging procedure in orthopedic surgery. This has traditionally required a trochanteric osteotomy or a trans-femoral approach for successful stem/cement removal. Removal of the implant could heavily affect the original bone stock especially in periprosthetic joint infection. Several sparing procedures have been carried out in last few years in order to address this clinical problem and to restore normal hip biomechanics. No consensus about which is the most valuable approach is present. The use of a "cortical lateral window" allows to reach the distal portion of the femoral stem and the cement/plug with minimal invasivity. We suggest that lateral window technique could preserve bone stock, simplify re-implantation with primary stems and restore optimal hip biomechanics.
Objectives: The aim of our retrospective non-controlled trial is to evaluate the radiological results obtained from a cohort of patients treated with two stage revision hip surgery using "lateral window technique".
Methods: We retrospectively evaluated 63 patients who underwent a two stage revision for a periprosthetic hip infection using the lateral window technique, from 2007 to 2014. Radiological evaluation was performed observing the following parameters: leg length discrepancy, offset of the affected and unaffected hip, length of femoral window, healing time, subsidence using the Fowler and Gie method. Periprosthetic hip fractures were also recorded. Time of surgery in both stages and type of spacer and definitive stem were collected.
Results: Of 63 patients evaluated, 28 were female and 35 were male; mean age at time of revision was 60. Mean window length was 6.4 cm (range 3,1-8,2), radiological healing time was 7,2 weeks (range 5-18); mean radiological leg length discrepancy at the end of the procedures was 1,9 mm (range 0,3-15,1); mean offset of the unaffected side is 55,3 mm (range 45,3- 66,5); the mean offset of the operated hip is 59,3 (range 42,1-79,7). In our cohort of patient we used 2 short femoral spacer. We performed a double cortical lateral window in 4 patients. Mean time of surgery in the first stage was 147,2 min ± 53,2. Mean operation time at the second stage was 114,8 ± 42,2. 43 definitive stem were primary uncemented hip stem (68%). 6 patients sustained a femoral spacer dislocation, 1 spacer rupture was recorded. 3 periprosthetic fractures have been observed, 2 during spacer implantation and 1 after the second stage procedure.
Conclusions: Our data support the suggestion that the use of lateral cortical window in revision surgery can help in preserving bone femoral bone stock and simplify definitive stem implantation. We underline that cortical lateral window approach permit the use of primary stems in definitive implantation with satisfactory outcomes. This allows for further surgical chances in case of re-revision. Our results showed how hip biomechanics have been restored in terms of leg length discrepancy and lateral offset. We advocate the use of lateral cortical window technique for two stage revision in periprosthetic hip joint infection.

P125

FRACTURE OF ACOBALT CHROMIUM HIP PROSTHESES OF REVISION AFTER A FRACTURE OF CERAMIC HIP PROSTHESES

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Introduction: The advantages of biocompatibility and resistance to corrosion of ceramic hip prostheses contrast with its lower plasticity and elasticity. After a fracture of a ceramic hip prostheses, a lot of ceramic debris are released in the articulation. This fact increase the friction between the components of a new revision prostheses increasing the risk of wear and fracture. The direct or indirect trauma, physical activity and obesity are some risk factors. However, production errors (porous prostheses, micro fractures and abrasions) or technical surgical errors (head prostheses impaction or loose bodies in the articulation) are risk factors too. The release of metal debris from hip prostheses has proven to cause local inflammatory reactions and systemic reactions like neuropathy, cardiomyopathy and hypothyroidism.
Objectives: To present a clinical case of recurrent fractures on hip prostheses of revision and diffuse metallosis.
Methods: A 46 years-old patient, with excess weight and severe hip osteoarthritis, was submitted to a total hip arthroplasty on the left, in 2006. After a fall, the patient suffered a femoral head fracture of the ceramic hip prostheses. He was submitted to a revision surgery. It was applied a cobalt-chromium hip prostheses and substituted the polyethylene acetabular component. After one year, without any history of trauma, the patient develops a head fracture of cobalt-chromium hip prostheses. It was done a new revision surgery with the substitution of one femoral head and polyethylene acetabular component by equal ones.

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Results: In the present moment, the patient is asymptomatic without physical impairment. A local inflammatory reaction with a large metal debris deposits are detectable in soft tissues of the thigh on x-ray image. He suffer of hypothyroidism and has a progressive diminished visual and auditory acuity in investigation. Without others systemic effects. X-ray of hip shows some femoral head wear.
Conclusions: The procedure in this clinical cases is challenging but, the substitution of femoral head and polyethylene acetabular component, associated with total synovectomy, surgical debridement and the verification of the femoral stem are absolute conditions. Diffuse metallosis is frequently seen in cases of second revision surgeries with substitution of ceramic femoral head by metallic femoral head or when the femoral stem articulates directly with the acetabular insert.
The femoral head type to apply is very challenging. Nowadays, the revision rate is inferior on cobalt-chromium hip prostheses (11%) relatively to a ceramic (17%) and metallic hip prostheses (47%). It is consensus that, after a first fracture hip prostheses episode, ceramic heads should not again be applied, by the risk of lesion of femoral stem or a new fracture. Until the present moment, there is not any agreement to treat patients with cobalt-chromium hip prostheses fractures. Because cobalt and chromium intoxication has local and systemic effects, these patient should have a strict follow-up.

P126
THE "NEW NORMALITY" AFTER HIP REPLACEMENT
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Post operative "New Normality" is a concept we introduced at the SIOT Congress in Genova, in 1998.
Since then, it has encountered moderate scholarship consensus, though the reassessment of the principal guide lines that have led to its definition in the years following has – in our view – confirmed the validity of the concept.
New Post Operative Normality identifies the **outcome** of the operation, whether it be successful or not, which in all cases is different from physiological normality.
In the evaluation of the **results**, this must be considered not only from the anatomical–clinical and functional perspective, but also in terms of Legal Medicine.
In the case of an implant of a **hip prosthesis**, both primary as well as a revision, the operation will never bring the articulation back to normal, even with results that can be defined as excellent, i.e. achieving the objective of full clinical recovery and/or the optimal functional improvement.
The rationale informing the indications, the choice of the prosthesis, the implant techniques, and above all the evaluation of the results, must take into consideration the new normality, in aiming to integrate the prosthesis into the articulation and not to substitute it; in fact, the most important objective to reach with the procedure does not consist in returning to the "biological" hip, but rather in a new condition, that comes as close as possible to this, guaranteeing its function and endurance lasts in time.
We wish to remark the difference in results, complications and iatrogenic failures that is extremely significant and that must be clearly outlined in Medical-Legal evaluations for requests filed for compensation, nowadays too improper and frequent.

Others

P127
PROXIMAL FEMORAL RESECTION-ARTHROPLASTY IN SEVERE CEREBRAL PALSY AND PAINFUL HIP
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Introduction: The deformity of the hip associated with spasticity may prevent the patient from assuming a sitting position, cause pain and make it difficult to clean the perineum, with significant deterioration in the quality of life of the patient.
In the literature it is not clear which technique is preferable, and considering the low level of evidence of the articles, most of us follow the directions of experts, who very often do not converge.
Proximal Femoral Resection-Interposition Arthroplasty is generally used when the hip can not be reconstructed, and the patient is particularly fragile. It is associated with a high percentage of good results.
Objectives: Our purpose is to present our experience as a single center about the treatment of painful hip in severe cerebral palsy.
Materials and methods: We reviewed 7 patients (3 male, 4 female) with cerabral palsy and painful hip surgically treated in our hospital. The patients were operated on between 2003-2014, mean age was 35,5 years.
In all cases a resection interposition arthroplasty, as previously described by Castle, was performed.
Preoperative and postoperative evaluation, consisted in the analisis of data obtained from the evaluation of hip pain, perineal hygiene, hip range of motion. Postoperatively in all but one patient a skin traction was performed. Patients were followed up through a clinical and radiographic evaluation. During the follow-up we searched for the presence of pain (described as the use and the frequency of analgesic pills per day and subjective assessments by the patients' families) and the presence of heterotopic ossification.
Results: All patients/caregivers noted an improvement in subjective assessment of pain. Hip range of motion and perineal hygiene consistently improved.
Conclusions: We believe that surgical decision is a critical factor. Resection should be as wide as possible, considering that a shorter one may lead to additional surgical procedure that could be dangerous and in any case ineffective.

P128
REHABILITATION AFTER HIP ARTHROPLASTY WITH ANTERIOR APPROACH
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Hip arthroplasty is one of the most successfully practiced surgery in the orthopaedic world, consequently rehabilitation has always played a key role.
In the last years we have seen an evolution of prosthetic implants in materials and design, while the approaches for the surgery are still the ones in use from the past.
Recently new solutions have been developed, to spare soft tissues for diminishing complications and shortening recovery time (1,2).
The direct anterior approach is the most diffused of the minimally invasive techniques: the access is in the muscular gap between sartorius and tensor fasciae latae (3).
Advantages of the anterior approach are a shorter scar, less blood lost and less post-op pain; spare of any muscular tissue, especially the gluteus with a faster functional recovery; less risk of dislocation with the elimination of any domestic tool (4).
Reduction of pain and functionality in the very first phases of rehabilitation are evident: patients walks with crutches from the first day post op, mobilization is free and hospital time is reduced.
Without the risk of dislocation, there are no limitations in passive and active mobilization in flexion; this factor aloud the elimination of any domestic tool for sitting, a faster drainage of soft tissue with faster control of movements and earlier autonomy in the activity of daily living, personal hygiene, dressing and car driving.
Sparing the gluteus, correct walking is easier and bodyweight exercises are emphasized.
Matching with the type of patient (age, weight, pre-op pain, associates pathologies) we can organize our rehabilitative program with the integration of manual treatment of massage and passive mobilization, with active exercises in the gym, in the pool and at home.

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DIAGNOSIS OF DELIRIUM IN PATIENTS WITH FRACTURED NECK OF FEMUR

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Introduction: Delirium is a common condition amongst hospital inpatients, with the highest prevalence reported amongst patients with a fractured neck of femur (up to 62%). Delirium has negative outcomes for patients, including increased length of stay, increased mortality, increased rate of hospital acquired complications, increased risk of requiring institutional placement, and the patient is three times more likely to develop dementia.
Objectives: To look at the prevalence of delirium in patients with a fractured neck of femur in a busy district general hospital.
To look at the length of stay in these patients with delirium.
To see whether a validated tool was used to diagnose delirium.
Methods: Aimed for a sample size of 50 patients, however due to difficulty with note acquisition, the total sample size was 38. Retrospective review of case notes of patients admitted with a fractured neck of femur between July-August 2014. A standardised proforma was used.
Results: Delirium prevalence was 13% (n = 5). Only one of these patients was diagnosed using a validated tool; the Confusion Assessment Method (CAM). Average length of stay in patients with with delirium was 22 days, compared to 13 days in patients without delirium.
Conclusions: The prevalence of delirium was found to be much lower than reported in the literature, suggesting that we are under diagnosing the condition. The CAM tool is also under used. Average length of stay was 9 days longer in people with delirium.
This study was limited by a small sample size, therefore we are unable to tell whether the results are statistically significant. However, they clearly show that we need to improve our recognition and diagnosis of delirium. We have introduced routine usage of the CAM tool in all patients admitted with a fractured neck of femur. We aim to re-audit our usage of the CAM tool in 6-12 months time.

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SIMULATION-BASED EDUCATION FOR SURGICAL TRAINING IN HIP ARTHROPLASTY

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Introduction: Total hip arthroplasty (THA) is one of the most performed surgical orthopedic procedure. The art of correctly performing THA has developed to a large extent, anyway it is an intervention that need a long a learning curve. Today in most of the UE countries the surgeon and resident training is based on an operating room based approach (surgeon to surgeon course) and on a cadaver based approach (cadaver lab). In Italy the use of cadaver for surgical training is not allowed in all the accademic istitutions thus reducing the possibility to use this important resource for the routinary education of medical students, residents and surgeons. Phantom based training raised in the last year. We propose the use of a simulation-based education for surgical training in hip arthroplasty.
Materials and methods: The training course is based on a physical simulator: a pelvic phantom containing a patient specific hip anatomy. The phantom is fabricated by e-Spres3D a spin-off company of the University of Pisa. The position of the bone replica is carefully evaluated to ensure an accurate orientation of the hip joint. The bone model is printed in Acrylonitrile Butadiene Styrene and it has two different density to simulate the cortical bone and the trabecular bone. In January 2015 we started sponsorised educational courses on hip artroplasty based on the use of this surgical simulator. As for now 15 orthopedic surgeons were involved. At the end of each course a questionnaire was administered to surgeons to have a precise feedback on the use of this kind of surgical simulator for training.
Discussion: A training course based on such kind of physical phantom allows the tailoring of the surgical simulation complexity to the level of the participants' skills: different grade of hip joint pathology can be simulated (ranging from a normal hip arthrosis to a severe dysplasic hip) including also rare surgical cases. Moreover the training course can be enriched with a virtual preoperative planning phase, based on the analysis of the radiological images (x-ray and CT) images and the 3D virtual model of the selected hip joint (replicated in the physical phantom). This allows a critical analysis of the specific case and a discussion on the treatment options.
Conclusions: Surgical training through simulation is gaining attention in a lot of different surgical specialties. In the field of orthopedic surgery, physical simulatation allows a direct interaction with the bone replica and a realistic training experience. Our experience encourages creation and structuring of training curricula based on phantom lab courses and live surgery.

P131

DISCUSSION AND AUDIT OF INCIDENCE OF CONTRAST INDUCED NEPHROPATHY (CIN) POST CT PULMONARY ANGIOGRAPHY (CTPA) IN CHELTENHAM AND GLOUCESTER HOSPITALS (CGH AND GRH)

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Introduction: Orthopaedic patients often have a number of co-morbidities. These will become more prominent in an aging population. Many patients who suffer a neck of femur fracture may also develop a deep vein thrombosis (DVT) or pulmonary embolism (PE). There is an increased public awareness of DVT and PE, however, we must also be aware of the risks that investigations such as a CTPA carries.
Objectives: CIN is defined as a rapid fall in renal function following the infusion of iodinated contrast agents. The aims were to highlight those patients who have suffered a significant renal injury likely attributable to the CTPA and to advise suitable methods of highlighting these patients.
The incidence of CIN post CTPA was defined as those patients who sustained a fall in eGFR of greater than 25% post scan.
Methods: Patients were selected from random periods at CGH and GRH. The renal function for all patients was reviewed for the pre CTPA scan period and in the next 72 hours.
There were 391 patients with complete data sets. The age range was from 21-95 (median 68).
Results: Results overall were that 4.3% of patients showed a greater than 50% rise in their creatinine values post CTPA. However, there is an absolute risk of developing CIN post CTPA (by eGFR definition) of 13% in this population as studied.
If the eGFR is <59 before CTPA, then the risk of CIN is 18%. If the eGFR >90 before CTPA, the risk is 6%.
Conclusions: This audit demonstrates that the risk of CIN post CTPA is significant and doctors should be aware of this when ordering a CTPA. Further support may be required for a patient to be medically optimised prior to undergoing a CTPA. Disseminating awareness of the risk factors may go some way to reducing the impact of the dye load on the renal system. Dehydrated diabetic patients are most at risk.

P132

A NEW SYSTEM FOR ACETABULAR REAMING

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Introduction: Total hip arthroplasty (THA) is one of the most common orthopedic surgeries. The procedure is sophisticated and in addition to several factors affecting the outcomes such as patient's status, surgeon's expertise and implant type, using appropriate surgical tools is necessary. Acetabular component implantation necessitates the surgeon to ream the acetabular fossa which is time consuming and devastating. Utilizing currently-used reamers, the size of the tool must be changed repeatedly for 5-20 times

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within a surgery. In every stage, the size of the reamer is increased up to 1-2 mm. This tiring process takes 15-30 minutes and is associated with some injuries to the soft tissue. Furthermore, the risk of mistakes is considerable.
Objectives: Designing a new system which overcomes the limitations and defects with previous systems.
Methods: Regarding the defects of currently used reaming tools, we designed a tool mounted on the drill. This tool has 3 pairs of reaming blades placed with 120° angle relative to each other.
Results: The new tool is applicable for all the diameters between 38-58 mm with 0.2 mm accuracy. We evaluated the efficacy of the tool *in vitro* and found that maxiaml error in acetabular radius is 0.1 mm.
Conclusions: The new reaming system is an appropriate and efficient system for exact reaming of the acetabulum.

P133
THEATRE COST IS £16/MINUTE SO WHAT ARE YOU DOING JUST STANDING THERE?
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Introduction: Operating theatre inefficiency and turnover delays are a significant cause of wasted hospital resources. Delays can increase anxiety and frustration for both patients and members of theatre staff. There are certain identifiable factors which may cause delay and which can be successfully addressed to improve efficiency in all institutions.
Objectives: The purpose of this study was to measure the time to perform activities in the operating room which take place before and after the surgery; and to calculate the cost per minute to perform each activity. This would allow us to understand where delays are occurring and help us make recommendations on how we can improve overall efficiency.
Methods: We performed a single-centre prospective pilot study analysing operating room utilization. In 20 consecutive patients, we timed how long it takes to perform 15 individual activities carried out by orthopaedic trainees in the operating theatre during elective total hip and knee replacement surgery. These activities included: setting image display, transferring patients off the trolley, tourniquet placement, setting the patient up, setting up the catheter trolley, catheterisation, and nine other activities which are essential in allowing the patient's surgery to proceed safely. In these 20 patients, we also recorded the total time taken for the perioperative preparation of a patient undergoing total hip and total knee replacement surgery. We then prepared an algorithm to allow better coordination of the operating surgeons by simultaneously performing certain duties. In the second phase of our study we measured the time taken for the perioperative preparation of 20 consecutive patients using our algorithm.
Results: A total of 40 patients undergoing elective hip and knee replacement surgery were included. We found that the most time consuming activities were "preparation and drape" "getting scrubbed", "performing the WHO check list" and "writing operation notes, including the NJR form.
Overall, the total mean time taken to complete all the perioperative activities serially was 23.44 min (95% CIs 21.7-25.18) and 23.2 min (95% CIs 21.18-24.99), the mean costs were 375.04 pounds (95% CIs 347.2-402.88 pounds) and 371.2 (95% CIs 338.88-399.84) for total hip replacement surgery and total knee replacement surgery groups respectively. Using our algorithm, overall operation time was safely reduced by 25.32% (p<.0001) in THR and by 27.60% (p<.0001) in TKR and at least 84.32 pounds per total hip replacement and 93.44 pounds per total knee replacement.
Conclusions: Tight coordination between surgeons and theatre staff is essential to reduce the time spent performing theatre activities and this will help improve theatre efficiency.

P134
ORAL ANALGESICS FOR POSTOPERATIVE PAIN IN TOTAL HIP ARTHROPLASTY. OUR EXPERIENCE
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Introduction: The control of postoperative pain in total hip arthroplasty is today one of our most important goals, in order to reduce hospital stay, complications and maximize patient's comfort. Even if this surgery is associated with moderate-to-severe postoperative pain, we managed to abandon in most cases epidural or intravenous therapies and obtain effective analgesia with oxycodon or tapentadol.
Objective and methods: The objective of this study was to characterize the impact of opioid-based analgesia in 327 patients undergoing primary total hip arthroplasties, retrospectively reviewed. We identified 3 groups: 112 patients were administered oxycodon 10 mg twice per day, starting from the day of intervention; 105 patients were administered tapentadol 50 mg twice per day, starting from the day before intervention; 110 patients received tapentadol 100 mg twice per day starting from the day before intervention.
We recorded pain assessment based on Visual Analogue Scale (VAS) or Numerical Rating Scale (NRS) immediately after surgery and then after 6-12-24-36-48-60-72 hours.
Conclusions: Our postoperative analgesia management provides in all gruops excellent pain control, could reduce common opioid side effects such as constipation, confusion, pruritus, nausea, vomiting, and urinary retention. We managed to reduce significantly IV or epidural therapies, granting the patient a fast recovery after hip arthroplasty.

P135
DOES CHANGES IN HEALTH-RELATED QUALITY OF LIFE DETERMINE PATIENT SATISFACTION AFTER TOTAL HIP REPLACEMENT?
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Introduction: An important minority of patients receiving total hip replacement (THR) have inadequate pain relief, limited function or dissatisfaction with the outcome of surgery. For example, in Sweden 10% of all THR patients report dissatisfaction one year after THR. The Swedish Hip Arthroplasty Register (SHAR) introduced a patient-reported outcomes measure (PROM) program in 2002 and it was gradually adopted to cover all clinics performing THR by 2008. The PROMs questionnaire comprises the health-related quality of life instrument EQ-5D and a satisfaction item on the outcome of surgery. The first aim of this study was to explore the relationship between changes in the five dimensions of EQ-5D and satisfaction one year after THR. The second aim was to examine the relative importance of the different EQ-5D dimensions on satisfaction outcomes one year after THR.
Patients and methods: We used data from SHAR on patients with THR between 2008 and 2012 (n = 78 068). Cases with incomplete data (BMI, ASA class, Charnley class, EQ-5D, n = 36 426) were excluded. The remaining cases (n = 41 642) were included in this analysis. A univariate regression model was performed to examine the relation between differences in pre- and one-year postoperative EQ-5D with satisfaction measured on a visual analogue scale ranging from 0 (very satisfied) to 100 (very unsatisfied). Based on findings from the aforementioned regressions a multivariate linear regression analysis was performed. In this model patient response for different dimensions of EQ-5D at one year was classified in to two groups, either "no problem" or "moderate/severe problems". The association between different EQ-5D dimensions and one year satisfaction, adjusted for gender, age, BMI, ASA class, Charnley class and preoperative EQ-5D index was analyzed. Δ R-squared statistics was calculated for different EQ-5D dimensions.
Results: The univariate regression analyses identified associations between the different patterns of change within each dimension and satisfaction one year after surgery. Generally, any improvement to the "no problem" level was associated with greater satisfaction using unchanged "moderate problems" as the reference. Similarly, any deterioration to "extreme problems" was associated with less satisfaction except for the self-care dimension.
Adjusting for the aforementioned confounders, reporting "no problems" in any dimension at the one year follow-up was associated with greater satisfaction compared to "some/extreme problems". The highest impact on satisfaction with the outcome at 1 year was found for patients reporting "no problems" with pain/discomfort (B = -9.66, Δ R2 = 0.03) followed by anxiety/depression (B = -7.64, Δ R2 = 0.02).
Discussion and conclusions: We demonstrated a relationship between changes in the different dimensions of EQ-5D and satisfaction with the outcome of surgery one year after THR. Our results indicate that satisfaction is a valid patient-reported measure reflecting the changes in the different EQ-5D

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dimensions. Absence of pain and discomfort, followed by "no problems" in the anxiety/depression dimension had the strongest influence on the one year satisfaction. In accordance with previous reports (1), these findings highlight the importance of mental health in determining satisfaction with THR.

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P136

THE SURGICAL TREATMENT OF RECURRENT TROCHANTERIC BURSITIS AND COXA SALTANS EXTERNA WITH Z-PLASTY LENGTHENING OF THE ILIOTIBIAL BAND

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Introduction: Lateral hip pain may occur secondary to trochanteric bursitis or coxa saltans externa (iliotibial band snapping over the greater trochanter). Iliotibial band lengthening is indicated for refractory cases that fail to respond to non-operative treatment.
Objectives: The aim of this study is to report the clinical and functional outcomes of patients undergoing Z-plasty lengthening of the iliotibial band for radiologically proven trochanteric bursitis and coxa saltans externa.
Methods: A retrospective review of 14 consecutive cases between 2011 and 2015 was performed. Patient reported outcome measures were the Oxford Hip Score (OHS), the Hip Disability and Osteoarthritis Outcome Score (HOOS) including an assessment of pain, stiffness, function and recreational activity and overall satisfaction with the procedure rated on a scale of 0-5.
Results: Data for all patients was available at a mean follow-up of 32 months (range, 6-52 months). The mean age of patients in this series was 54 years (range, 51-92) and all patients were female. Eleven lengthenings were performed for recurrent trochanteric bursitis and three were performed for coxa saltans externa.
The mean pre-operative OHS was 20.7 (out of 48, range, 10-30) which post-operatively improved to 41.1 (range, 35-46). The mean pre-operative HOOS was 44.25% (range, 21.1-57.8%) which post-operatively improved to 80.75% (range, 21.1-94.5%). Both scores showed a statistically significant improvement between pre-operative and post-operative values (paired t-test; OHS $p<0.0001$, 95% CI 23.15-17.56; HOOS $p<0.0001$, 95% CI 28.04-44.97). The mean patient satisfaction score was 3.9. One patient was unsatisfied due to prolonged stiffness. There were no complications.
Conclusions: This study shows that Z-plasty lengthening of the iliotibial band can provide improved functional outcomes with a successful return to recreational activity. It is a relatively simple procedure which provides safe and predictable clinical results.

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ATHLETIC PUBALGIA: DOES IT REALLY EXIST?

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Introduction: Injuries of the hip in athletes have a lower incidence than other lesions that involve lower limb, even if these pathologies should not be underestimated. These types of lesions are frequently characterized by high morbility with a prolonged absence from sport's participation, which can lead sometimes into dramatic conclusions such as the end of the career. Furthermore, if athletes are unable to return to their sport, this may result in a significant economic impact on professional sporting clubs and organizations. Groin pain, as described in the literature, may result from an acute or chronic repetitive trauma and also from systemic diseases. The differential diagnosis of hip pain is broad and includes bone injuries, intra- and extra-articular pathologies, neuropathies and also visceral diseases. Anterior groin pain is often simply classified as athletic pubalgia or rectum-adductor syndrome, even if the real aetiology is unknown. Objectives. Aim of the study was to verify the real prevalence of athletic pubalgia in a group of professional Italian soccer players affected by generic groin pain and also to verify the accuracy of the initial diagnosis.
Methods: In this study, 44 professional soccer players were selected and divided into 2 groups. Group A was composed of 22 athletes with anterior groin pain and generic diagnosis of athletic pubalgia and group B of 22 healthy patients. The components of the 2 groups had similar characteristic of age, height, BMI and player position. Each athlete underwent a clinical and instrumental evaluation with pelvis' x-rays (antero-posterior and oblique views) and teleradiography of the lower limbs in order to detect specific sign of athletic pubalgia (i.e. synphisitis, disruption of the adductor muscle insertion), femoro-acetabular impingement, early osteoarthritis and different legs length. Symptomatic patients were also submitted to a pelvis' MRI with the aim to find typical pathological signs such as bone marrow oedema and enthesopathies. Finally, all patients were evaluated with a stabilometric platform. In some cases other specialists were consulted, especially when diagnosis showed that visceral pathologies should be the cause of groin pain (i.e. urologist).
Results: The results showed that only 50% of the soccer players were affected by a real athletic pubalgia and midfielders were more affected by this kind of pathology (81%). Postural examination revealed a difference in feet pressure between dominant foot and contralateral one.
Conclusions: In conclusion, the results of this study showed that athletic pubalgia may be the real cause of anterior groin pain in a suitable number of cases, but is always necessary to consider other pathologies or morpho-structural alterations, which could be associated, or be the cause of these symptoms.

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OSTEOPOROSIS FRACTURES OF THE TROCHANTERIC REGION IN ELDERLY: ANALYSIS OF RADIOGRAPHIC INDICES AND RISK PREDICTOR OF SUBSEQUENT FRACTURES

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Introduction: Fractures in elderly people are often a dramatic event and characterized by an incomplete physical and psychological healing. In a context of bone fragility, repeated fractures are a growing problem in the industrialized world, especially in Italy, where the aging population is increasing (Scaglione M 2013). In 2010 it was estimated that approximately 465.000 new fragility fractures were sustained in Italy, 91.000 of which are hip fractures, thus increasing the costs of their management (A. Svedbom 2013). There are several factors that have a negative impact on the new fractures risk, and among these the most important one is a framework of bone fragility, a condition which can be prevented with the help of specific medical treatment and rehabilitation (J. A. Kanis 2013). Dual x-ray absorptiometry is currently the gold-standard technique to measure bone mineral density and to diagnose osteoporosis according to the WHO guidelines; however, there are several radiographic index related to bone quality, which show a relationship with T-scores measured by DEXA (Thomas M 2012; Alexander P. Sah 2007).
Objectives: The aim of this study was to evaluate the possibility of a secondary prevention in a population at risk of a new fracture, by identifying those who are likely to have a higher risk of subsequent fractures.
Methods: The authors analyzed 331 patients in the period between 2011 and 2012 that underwent reduction and osteosynthesis for lateral fractures of the proximal femur. 48 patients (group 1) out of 331 had at least another fracture between those typically related to osteoporosis and were examined for a possible condition of bone fragility through the analysis of three radiographic index related to a radiogram in anteroposterior view of the contralateral proximal femur (Singh index, Dorr's classification and Cortical Thickness Index). Patients of the group 1 were compared with a control group of 48 patients (group 2), selected between the remaining and characterized by similar age and risk factors, who did not undergo to further fractures. In addition, patients, when that was possible, were interviewed by telephone interview in order to assess how their condition of osteopenia had been managed by a diagnostic and therapeutic point of view and how their quality of life had changed as a result of fractures.
Results: The results showed that patients, who had subsequent fractures, had radiographic index, which were indicative of bone quality on average worse than those in the control group. The distribution of the values obtained differed in the two groups, with statistical significance ($p<0.0001$). It was not possible to make an objective comparison among the three radiographic index, but seemingly the most reliable one, in agreement with the literature (Alexander P. Sah 2007), was the Cortical Thickness Index. Telephone interviews revealed that in most cases the diagnostic-therapeutic work up for osteoporosis has not been performed and had a poor therapeutic adherence.

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Conclusions: The results obtained in this study suggest that we can do more in terms of prevention for fragility fractures and the use of radiographic index in a systematic manner can be a valuable screening tool for secondary prevention that could improve the quality of life of these patients and reduce the economic burden of this disease.

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H-MAX STEM IN RESTORING FEMORAL OFFSET IN HIP ARTHROPLASTY: OUR EXPERIENCE

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Introduction: Several total hip arthroplasty models had been developed in last years. Common aim is to suit prosthesis stem to every type of femur, restoring correct biomechanical anatomy. Restoring femoral offset in THA is important to give an optimal muscles lever arm, joint stability, range of motion, and to reduce the incidence of implants impingement.
Objectives: The aim of the study is to evaluate the restoring of correct femoral offset in primary THA using H-Max cemented and uncemented stem.
Methods: 51 Primary Hip Arthroplasties, 6 cemented, were performed by using a H-Max LimaCorporate S.p.A stem withmetaphyseal fit (Corail type). All patient underwent postero-lateral access and preoperative planning was respected. The procedure was bilateral in 4 cases. Mean Flare index was 3.23 (range 1.63-4.5). Mean age was 65,89 (range 41-83). Stems sizes were from size 8 to 17. Lat-stem was employed in 14 cases. Uncemented hemispherical cups were implanted in all cases. Head sizes were 28 in 6 cases, 32 in 24 cases and 36 in 20 cases. Short heads were used in 17 procedures, medium in 26 cases, long in 8 ones. Radiographic evaluation was obtained by PACS Caresteam software system. Preoperative and postoperative offset was calculated on x-rays in weight-bearing position. Range of motion was evaluated at first follow up.
Results: Femoral offset shown a mean variation of 5,06 mm (range + 18.94/-18.23) between preoperative and postoperative. Postoperative range of motion was high (110-100° of flexion, abduction 20°-15°, adduction 15-10°, ER 15-10°) in 33,3%, low (<90° of flexion, <10° abduction, <5° adduction, <5 ER) in 2%, average in 64,7%. Conclusions. H-Max stem showed a good adaptability to different femur shapes and capability in restoring satisfying articular biomechanics parameters. The large use of medium size heads did not require further adjustment of the offset. Other studies are needed to evaluate differences between H-Max and new metaphyseal fit stems in restoring femoral offset.

Trauma

P140

MANAGEMENT OF INTERTROCHANTERIC FRACTURES OF THE FEMUR USING PRIMARY HEMIARTHROPLASTY IN SENILE PATIENTS

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Introduction: Treating senile patients with unstable intertrochanteric fracture is still controversial. The use of dynamic hip screw for internal fixation, was usually the option of choice. Recently, the use of primary hemiarthroplasty had been advocated by some authors as it results in better functional outcome.
Objectives: The aim of this study is to assess the clinical and functional outcome of the patients with intertrochanteric fractures managed using primary hemiarthroplasty.
Methods: Between 2007 and 2014, 64 patients with unstable intetrochanteric fracture were admitted to the trauma unit in Assiut university hospital and managed using primary hemiarthroplasty.
Results: Postoperative functional and clinical outcomes and rehabilitation were satisfactory with a mean HHS of 83.
Conclusions: According to our results, hemiarthroplasty is a good modality for the management of intertrochanteric fractures, as it allows early mobilization postoperative and avoids recumbency complications.

P141

DELAYED SURGERY FOR PATIENTS WITH HIP FRACTURE - INCIDENCE AND RISK FACTORS FOR PREOPERATIVE VENOUS THROMBOEMBOLISM: USING PREOPERATIVE CT THROMBOEMBOLISM PROTOCOL

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Introduction: Patients with hip fracture have a high risk of venous thromboembolism (VTE). However, there is little information on incidence and risk factors for VTE in a group of patients with hip fracture who experienced a delay of over 24 hours from trauma until surgery.
Objectives: This study aims to identify the incidence and risk factors for preoperative VTE in patients with hip fracture who had delayed surgery using computed tomography (CT) thromboembolism protocol and we also evaluated the effectiveness of preoperative CT thromboembolism protocol.
Methods: Between December 2010 and August 2014, 208 consecutive patients with hip fracture who were treated in our hospital and could be followed up at least 3 months were enrolled for this study. The mean time to surgery from trauma was 5.9 days. CT thromboembolism protocol was performed in all patients before surgery. The interval between trauma and CT scan, age, sex, type of fracture, underlying medical illnesses, cerebrovascular disease, Alzheimer's disease, cancer, body mass index (BMI), preoperative transfusion within 48 hours, and mobility score before trauma were considered as potential risk factors for VTE.
Results: There were 23 confirmed cases of preoperative VTE (11.1%), including 12 cases with deep vein thrombosis (DVT), 7 cases with pulmonary thromboembolism (PTE) and 4 cases with combined DVT and PTE. The mean time to CT thromboembolism protocol from injury was 4.8 days. According to the univariate logistic regression, more than 10 days interval between trauma and CT scan (OR = 3.08; 95% CI = 1.14-8.29), an age greater than 75 years (OR = 5.42; 95% CI = 1.23-23.87), type of fracture (OR = 8.97; 95% CI = 2.70-29.75), cardiac disease (OR = 3.41; 95% CI = 1.26-9.26), pulmonary disease (OR = 9.33; 95% CI = 3.20-27.17), cancer (OR = 4.4; 95% CI = 1.65-11.67), and mobility score less than 4 points (OR = 2.28; 95% CI = 1.05-4.96) were significant risk factors for preoperative VTE. Type of fracture (OR = 15.76; 95% CI = 3.89-63.89), pulmonary disease (OR = 17.1; 95% CI = 4.73-61.8), cancer (OR = 4.97; 95% CI = 1.42-17.48), and mobility score less than 4 points (OR = 2.48; 95% CI = 1.09-5.67) were independent risk factors according to multivariate regression analysis. Mechanical and chemical prophylaxis were started as soon as possible in all patients. There were no complications related to preoperative VTE.
Conclusions: High incidence of preoperative VTE in patients with delayed surgery suggests the necessity of preoperative CT thromboembolism protocol in order to prevent various perioperative complications including fatal PTE. Since the occurrence of preoperative VTE can be identified anytime, we suggest that preoperative CT thromboembolism protocol should be performed in all patients with delayed surgery.

P142

PREOPERATIVE PREVALENCE OF DEEP VENOUS THROMBOSIS OF LOWER EXTREMITIES IN PATIENTS WITH FEMORAL NECK FRACTURES

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Introduction: The frequency of venous thrombosis (VT) of lower extremities after hip replacement is 45-57%.
Purpose: The aim of the study was to investigate the relationship between the term of injury and the prevalence of preoperative VT of the lower extremities and to determine the optimal timing of the ultrasonography (US).
Materials of and methods: During 2013-2014 90 patients (mean age 75 ± 10 years, 78% women) with femoral neck fractures were studied. US of lower limbs was performed in all patients. 17% patients reported previous VT complications. In 92% of patients the operation was delayed more than 48 hours from the onset of the injury. Mean time form injury till admission to the hospital was 10 ± 4 days.
Results: On the day of injury and admission, US was performed in 8 patients (8.8%), 2% had varicose disease of both lower extremities without an evidence of thrombi and chronic thrombophlebitis. From second to 5th day post-injury 27 patients (30%) were examined and femoral vein thrombophlebitis

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without flotation was found in 4%. From 5th to 7th day post-injury 13 patients (14.4%) were examined, one case of VT in one leg was found while 7% of patients had sub-acute deep VT of both lower extremities. From 7th to 14th day post-injury 42 patients (46.6%) were examined, one case of large saphenous VT of one leg with flotation signs was found, 10% of patients had sub-acute DVT of both lower extremities. Out of all examined patients 15 (17%) underwent a course of conservative therapy for VT complications. The venographic evidence of VT complications were found in 15 patients (17%). The highest incidence of VT was during 7-14 days post-injury.
Conclusions: Delayed admission is a major risk factor for VT of lower extremities. US is an early screening method for diagnosing VT events, which should be implemented as soon as possible after onset of injury in all patients with femoral neck fractures.

P143
IMAGING IN OCCULT NECK OF FEMUR FRACTURES: WHAT MODALITY IS BEING CHOSEN?
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Introduction: The National Institute of Clinical Excellence recommend Magnetic Resonance Imaging (MRI) as the 2nd line imaging modality of choice when hip fracture is suspected but plain radiographs are normal. If MRI is contraindicated or not available within 24 hours, then Computer Tomography (CT) should be considered.
Objectives: To assess our current practice at our hospital with regard to imaging occult hip fractures. Compliance with NICE guidelines assessed.
Methods: We reviewed the imaging modality used to diagnose neck of femur fracture in all hip fracture patients from June 2014 to October 2014 (4 month period). 177/192 were diagnosed with plain radiograph. Of the 15 occult neck of femur fractures, 13 were diagnosed with CT (only two were out of hours or had contraindications to MRI), and 2 were diagnosed with MRI. Intervention consisted of multidisciplinary team education (orthopaedic and radiology), which was implemented via the morning trauma meetings to enable urgent MRI within 24 hours of presentation. Re-audit was undertaken in January 2015.
Results: Re-audit revealed 100% compliance with trust guidelines (29/32 diagnosed with plain radiograph. Of the 3 occult fractures 2 were diagnosed with MRI, and 1 with CT (contraindication to MRI).
Conclusions: Awareness of guidelines is poor. However, simple interventions and education can prevent unnecessary investigations.

P144
SURGICAL TREATMENT OF ACETABULUM FRACTURES
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Acetabulum fractures make up 3% of all injuries. Fractures of acetabulum in 79% of cases occur in conjunction with other injuries which aggravate the general condition of the patients.
Objectives: Evaluation of the results of operative treatment of acetabulum fractures.
Methods: We have studied the results of examination and treatment of 44 patients with fractures of acetabulum from 2007 to 2014. There were 19 (43,2%) women, and 25 (56,8%) men. The patient's age was from 19 to 63. The mechanisms of injury were motor vehicle accidents, falls from heights. Acetabulum fractures classified according to AO - Letournel [3].
Fractures of acetabulum of type A encountered in 15 cases (34%), type B - 23 cases (52.3%), and type C in 6 cases (13.7%). Open reduction with internal fixation of acetabulum with Kocher-Langenbeck approach made in 24 cases, ilioinguinal approach - 16 cases, there were 2 cases from two approaches (Kocher-Langenbeck and ilioinguinal). The evaluation of results of treatment was conducted by Harris scale.
Conclusions: Comparison X-ray and examinations were made on the next day, after 1, 3, 6, 12 months after surgery. On a scale of Harris poor results obtained in 12 patients (27.3%), the rest received satisfactory, good and excellent results. Through the surgical treatment the number of bad results managed to reduce.

P145
THE USE OF DHS VERSUS CANNULATED SCREWS IN TREATMENT OF FRACTURE OF FEMORAL NECK: OUR EXPERIENCE
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Introduction: The aim of our study is to evaluate the failure rate after surgical osteosynthesis in fractures of the femoral neck by comparing two surgical techniques: internal fixation with cannulated screws and DHS plate and anti-rotation screw. The failure was defined as non-consolidation, osteosynthesis failure, avascular necrosis or revision surgery. Mortality at three months, the rate of perioperative infection, the time interval between admission and surgery and the need for blood transfusion have also been evaluated.
Materials and methods: We enrolled 60 consecutive patients with a fracture of the neck of the femur, any level within the classification Garden, treated at the Clinic of Orthopedics and Traumatology of Perugia from 2013 to 2014. The average age of the study population is 71.8 years. The patients were referred for treatment with cannulated screws or to treatment with DHS plate and screw anti-rotational. All patients were followed up with a minimum follow-up of 1 year, with radiographic and clinical intermediate at 1, 3 and 6 months. The Singh Index score was used as score for assessing bone quality. The Harris Hip Score at 12 months was used to evaluate the functional outcome.
Results: In the two study groups the difference in time of consolidation and functional results was not statistically significant. The increased risk of avascular necrosis is more associated with the degree of displacement of the fracture rather than the type of surgical treatment. During our study, we observed a significantly lower mean duration of the procedure with cannulated screws to the implant of DHS.
Conclusions: The preliminary results of our study were a not superiority of one surgical technique over the other, by assessing the time to bone healing and the functional results. The incidence of avascular necrosis was found to be related to the classification of Garden and not to the type of synthesis.

P146
MINIMALLY ANTERIOR APPROACH FOR HIP PROSTHESIS IN THE TREATMENT OF FRACTURES OF THE FEMUR NECK
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Introduction: Minimally invasive anterior approach is a real step forward in the mini-invasive story of the hip prosthesis. The preservation of muscle-tendon insertions guarantees a better and faster recovery with a lower rate of complications. We applied this new technique for prosthetic treatment of fractures of the femur neck.
Materials and methods: From March 2010 to March 2014 we have applied minimally invasive anterior approach to 310 fractures of the femoral neck (201 bipolar prostheses, 109 hip arthroplasty).
Results: From the analysis of the results we observed less post-operative pain and blood loss, reduced need for transfusions, reduced hospitalization, reduced use of crutches, compared to the traditional approaches used in our Division (posterolateral and direct lateral approach). As complications we observed a higher rate of fractures of the greater trochanter, especially at the beginning of the experience.
Discussion: The anterior approach to the hip is, in our opinion, the most 'innovative mini-invasive approach. The access does not sacrifice any muscolar insertion, based on the principle of muscle-splitting. In fact, it crosses the gap between the group of sartorius/rectus femoris and tensor fascia lata. The exposure is adequate, although one should practice some technical tips (capsulotomy rear, change of position of the lower limbs) to expose the femoral canal in the right direction and to prevent complications. In our experience we don't use bed traction, the operative field is single, we use only uncemented anatomical stems. The complications observed at the beginning of the experience is reduced considerably after time.
Conclusions: The results of this work show that the benefits of minimally invasive anterior approach may also useful in the treatment of femoral neck fractures, as well as in degenerative disease. We believe that the faster functional recovery and reduced risk of complications is useful not only in the adult patient, but also in elderly where these features facilitate the recovery and survival in trauma.

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TOTAL HIP ARTHROPLASTY IN END STAGE RENAL DISEASE WITH FEMORAL NECK FRACTURE

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Introduction: End-stage renal disease (ESRD) patients have metabolic bone disorder, which make them prone to femoral neck fracture with higher risk of complications after internal fixation (IF) like avascular necrosis (AVN) and non-union. In this series we analyzed the outcomes of treatment in a consecutive series of displaced femoral neck fractures.
Methods: We included 9 ESRD patients with Garden type Ш or IV femoral neck fracture over a 2-year period. All of them underwent total hip arthroplasty (THA) with cemented component in eight patients. Only one patient underwent non-cemented THA who had revision arthroplasty one year later. Six patients have been operated with direct anterior approach and three patients with direct lateral approach.
Results: The mean age of our patients were 73 (range 56-82) and male to female ratio was 2/1. Only five cases remembered a history of simple falling before fracture. The mean time for dialysis was 120 months (range 26-248). We found no case of infection or dislocation postoperatively in mean follow up of 18 months (range 15-27 months). Only one 77 year-old male died 18 months after surgery due to ischemic heart disease. The mean Harris Hip score improved significantly from 37 at the beginning to 78 at last follow up ($P<0.05$).
Conclusions: We believe ESRD patients with displaced femoral neck fracture should be underwent THA instead of IF because of low complication rates after arthroplasty. On the other hand, we had no IF-related complications like nonunion, AVN, pseudoarthrosis, or a failed osteosynthesis.

P148

TOTAL HIP ARTHROPLASTY IN PATIENT WITH OLD POSTERIOR WALL FRACTURES

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Introduction: Total hip artrhroplasty (THA) in patients with acetabular fracture is a challenge for joint surgeons. There are many reports on THA following acetabular fractures treated by internal fixation, but not following missed posterior wall (PW) fracture. The aim of this case report was to present two cases of missed PWF.
Materials: 2 patients (mean age: 45) with untreated PW fracture of the acetabulum, presented to our institution with severe osteoarthritis 6 months after primary trauma. Both patients had severe PW deficincey due to fracture. We decided to put the cup in a little higher center of rotation rather than reconstructing the PW.
Results: In both patients we got press fit cup fixation. The hip centers were put about 1.8 mm higher. We needed additional screw fixation in one patient to secure the cup. Both patients were ambulated on the same day of surgery with weight bearing as tolerated program. We did not apply hip precautions to these patients like our other primary THAs. At the latest follow up (mean: 14 months), radiographic assessment showed satisfactory cup position with bone ingrowth and no signs of loosening.
Conclusions: Putting acetabular cup in a higher but more supportive bone offers a reliable and easier technique for reconstruction of acetabular posterior wall deficiencies. Further studies are needed to prove the long-term outcome of this method.

P149

LATERAL X-RAY FOR PROXIMAL FEMORAL FRACTURES – IS IT REALLY NECESSARY?

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Introduction: Historically routine work up of a patient with a proximal femoral fracture always included anterior-posterior (AP) and a lateral film of the hip. The aim of the study was to define the role of the lateral x-ray in the assessment and surgical planning of proximal femur fractures.
Methods: Radiographs of 320 consecutive patients with proximal femoral fractures who were admitted over a 12 months period were divided into lateral and AP views. Two blinded reviewers independently assessed the AP view alone and then the AP plus the lateral view. Fracture classification was noted for each x-ray and then compared with intraoperative diagnosis which was our study's gold standard. A 2 × 2 contingency square table and Pearson's x^2 test were used for statistical analysis.
Results: The rate of correct classification by the reviewers enhanced by the assessment of the lateral x-ray in addition to the AP view for intracapsular fractures ($p = 0.018$) but not for extracapsular fracutes ($p = 0.29$). Operative management did not change for intracapsular fractures which appeared displaced on initial AP view. The only advantage of obtaining a lateral view in intracapsular fracture was the detection of displacement were the fracture appeared to be undisplaced on initial AP view.
Conclusions: This study provides statistical evidence that one view is adequate and safe for majority of proximal femoral fractures. The lateral radiograph should not be performed on a routine basis thus making considerable saving in time and money, and avoiding unnecessary radiation exposure and discomfort to the patient.

P150

EXPANDABLE PROXIMAL FEMORAL NAIL VERSUS GAMMA PROXIMAL FEMORAL NAIL FOR THE TREATMENT OF AO/OTA 31A1-3 FRACTURES

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Introduction: The gamma-proximal femoral nail (GPFN) and the expendable proximal femoral nail (EPFN) are two commonly used intramedullary devices for the treatment of AO 31A1-3 proximal femur fractures. The aim of this study was to compare outcomes and complication rates in patients treated by both devices.
Patients and methods: A total of 299 patients (149 in the GPFN group and 150 in the EPFN group, average age 83.6 years) were treated for AO 31A1-3 proximal femur fractures in our institution between July 2008 and February 2013. Time from presentation to surgery, level of experience of the surgeon, operative time, amount of blood loss, and number of blood transfusions were recorded. Postoperative radiological variables, including peg/screw location, tip to apex distance, and orthopedic complications, as, malunion, nonunion, surgical wound infection rates, cutouts, periprostatic fractures and the incidence of non-orthopedic complications. Functional results were estimated using the modified Harris Hip Score, and quality of life was queried by the SF-36 questionnaire.
Results: The GPFN and the EPFN fixation methods were similar in terms of functional outcomes, complication rates and quality of life assessments. More patients (107 vs. 73) from the GPFN group were operated within 48 hours from presentation (44.81 hours verses 49.88 hours for the EPFN group, $p = 0.351$), and their surgery duration and hospitalization were significantly longer (18.5 days versus 26 days, respectively, $p<0.001$). The GPFN patients were frequently operated by junior surgeons (nr/nr). Other intraoperative measures were similar between groups. Cutout was the most common complication affecting 6.71% of the GPFN group and 3.33% of the EPFN group ($p = 0.182$).
Conclusions: Good clinical outcomes and low complication rates in the GPFN and the EPFN groups indicate essentially equivalent safety and reliability on the part of both devices for the treatment of proximal femoral fractures.

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WARFARIN REVERSAL IN NECK OF FEMUR FRACTURES - CURRENT FAILINGS AND FUTURE STRATEGIES

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Introduction: At the time of publication, the 2007 BOA blue book on fragility fracture care highlighted the need to "develop an evidence base for decisions about patients on warfarin". Eight years later there remain no formal guidelines on the use of warfarin reversal agents in hip fracture patients.
Objectives: This study aimed to analyse warfarin reversal in our centre, and examine its impact on patient outcome as measured by National Hip Fracture Database parameters including time to theatre, length of hospital stay and survival to one year.

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Methods: A retrospective analysis of data for all patients presenting with fractured neck of femur at Addenbrooke's Hospital, Cambridge, UK from July 2009 to July 2014 was performed using the National Hip Fracture Database. All patients taking warfarin at the time of admission were considered for the study and case notes for these patients were obtained for analysis of the use of reversal agents.
Results: 1,978 patients presented to our centre during the time period, of which 9% were being treated with warfarin. The warfarinised group were significantly less likely to receive operative treatment before 36 hours ($p<0.05$) and had significantly longer stays in hospital ($p<0.05$). Survival analysis to June 2015 showed a significantly higher mortality for patients receiving warfarin therapy at the time of admission ($P<0.05$). There was a consistent delay from presentation to the administration of warfarin reversal agents.
Conclusions: Patients who sustain a fractured neck of femur whilst on warfarin therapy have significantly poorer outcomes than those not on warfarin. Administration of reversal agents was delayed in almost all cases.
Reversal of warfarin represents a significant yet avoidable delay in patient care. The poor outcomes of patients receiving warfarin therapy supports a policy of reversal at the point of diagnosis. Our newly implemented neck of femur anticoagulation pathway is presented.

WITHDRAWN

P153
BILATERAL PERIPROSTHETIC HIP FRACTURE: HOW WE DO IT
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Total hip arthroplasty (THA) is well established to be a safe and effective therapy in relieving pain and dysfunction for patients with advanced degenerative joint disease. The continuous increase in the number of primary and revision THAs being performed annually, the growing number of patients with bilateral THA or THA for more than 20 years, the aging population of THA patients (with increasing life expectancy, poorer bone quality, and high fall risk), and broader indications for this kind of surgery to younger and active, and consequently high-energy trauma prone patients, led to an increasing in the incidence of periprosthetic fractures. Several controlled and non-controlled trials regarding this topic have been published in literature. The Vancouver classification system is the most widely used and accepted method for classification of periprosthetic fractures after total hip replacement. Undoubtedly, the Vancouver classification helps surgeons in decision-making process addressing the most important factors in the revision surgical procedure. This classification refers only to unilateral periprosthetic fractures. Very few evidence regarding bilateral periprosthetic hip fracture is available in literature. The aim of this paper is to report a sample case of bilateral periprosthetic fracture after THA in a patient focusing on the management of this rare clinical situation and to brief review the available literature on this specific and interesting topic.

P154
SPONTANEOUS POLYARTICULAR SEPTIC ARTHRITIS WITH BILATERAL ADDUCTOR COMPARTMENT COLLECTIONS
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There have been reports in the literature of osteomyelitis and septic arthritis of the pubic symphysis. The condition is a recognised complication following pelvic surgery, trauma, intravenous drug abuse and there have been reported cases following renal transplantation, amongst athletes and in childhood. We present the case of a fit and well 42 year old gentleman, with no history of intravenous drug use, presenting with lower abdominal and bilateral groin pain, shoulder pain and fever. On examination there was tenderness over the pubic symphysis, both groins and right acromioclavicular joint (ACJ). Blood tests showed a raised C-reactive protein (CRP) 185.0 mg/L, white cell count (WCC) of 15.7 x 10 x 9/L and negative HIV serology. Initial magnetic resonance imaging (MRI) demonstrated bilateral adductor compartment myositis with sepsis centred on the symphysis pubis and right ACJ. The response to initial treatment with intravenous (IV) antibiotics was poor and the patient became systemically unwell, with enlarging collections on repeat MRI and a CRP increasing to 350.6 mg/L. A bilateral adductor compartment release was carried out via a medial approach to the hip with concurrent aspiration of pubic symphysis and ACJ. Over 50 ml of pus was vented from the adductor muscle groups, which on culture had heavy growth of *Staphylococcus aureus*.
Post operatively the CRP improved to 100.9 mg/L with a WCC of 11.7 × 10 ” 9/L. The patient was treated with a six week course of antimicrobials with inflammatory markers returning to normal over this period.
We present this unusual case of spontaneous septic arthritis of both the pubic symphysis and ACJ; with adductor compartment collections. Pubic symphysis septic arthritis alone is uncommon and its presence with seeding to concomitant sites, in a non- immunosuppressed patient is not noted within the literature.

P155
AUDIT OF FRACTURE NECK OF FEMUR
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Introduction: To improve the national standard of care and outcomes for patients presented with fractured neck of femur in all centres, the Best Practice Tariff was launched in April 2010. Compliance is monitored via the National Hip Fracture Database (NHFD). The aims of NHFD are to improve acute hip fracture pathway of care, bone health management and eventual reductions in fracture incidence. Endorsed by the British Orthopaedic Association and the British Geriatrics Society, one indicator is the use of an agreed assessment protocol. Royal Albert Edward infirmary has an established Fracture Neck of Femur (NOF) integrated pathway which follows the admission from A&E presentation until orthopaedic discharge. 30 days mortality after NOF is reported to be 15.29%.
Objectives: The aim of the audit was to compare presentation, management and outcomes of patient presented with fracture neck of femur in 2 different centres, and reasons for delayed discharge, using one proforma.
Methods: As part of multi-centre audit we retrospectively reviewd 299 patients admitted with fracture neck of femur between the 1st August 2013 and 31st August 2014, in Royal Albert Edward Infirmary (RAEI) hospital.
Results: 299 patients, mean age of 80.96 years (range 33-100). 284 (95%) had NOF due to mechanical falls. 240 (80.3%) had their surgery in less than

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36 hours from admission, 23 (7.7%) died in hospital. The biggest contributor to delay in discharge was medical and social issues.
Conclusions: 80.3% of the patient had surgery within 36 hours of admission. In hospital mortality is 7.7%. Medical optimization is recommended to decrease the lengths of stay after NOF. A further re-audit is scheduled after receiving the results from another centre to ensure high standards are maintained and to see if further improvements may be made to the pathway.

P156
ANTIBIOTIC PROPHYLAXIS FOR HIP FRACTURE SURGERY
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Introduction: The aim of antibiotic surgical prophylaxis is to reduce rates of surgical site and healthcare-associated infections and thereby reduce surgical morbidity and mortality. In order to comply with the Scottish Intercollegiate Guidelines Network (SIGN) guidance, April 2014 they should be administered in theatre, given as a bolus <30 mins prior to tourniquet inflation and skin incision, and should be documented in the 'once only' section of the drug chart. Guidelines are often confusing and lead to uncertainty regarding appropriate prophylaxis, particularly for hip fracture surgery i.e. is it surgery with an implant or open surgery for closed fracture?
Objectives: We investigate the rationale behind trust departmental antibiotic prophylaxis guidelines and retrospectively review departmental prophylaxis given for hip fracture surgery during September and October 2014.
Methods: The medical notes of 53 patients were obtained from the audit department by clinical coding and cross-checked with hip fracture patient admission data from the trauma co-ordinators.
Results: Only 85% of patients were prescribed the correct antibiotic prophylaxis pre-operatively and only 7% of these were prescribed post-operative antibiotics (if indicated) in the 'once only' section of drug chart.
Conclusions: There was poor compliance with existing guidance. Terminology was deemed to be confusing. New guidelines have been highlighted through posters in anaesthetic rooms and a re-audit performed to assess adherence to new guidelines.

P157
ACETABULUM FRACTURES – WORTH OPERATE? CASE-BY-CASE REVIEW OF CASES OPERATED IN THE LAST 5 YEARS
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Introduction: Acetabulum articular fractures are lesions resulting from high-energy trauma. According to Letournell, the results depend on the joint congruity, hip stability and reduction achieved. Deviations of less than 1 mm would lead to lower incidence of osteoarthritis and a long-term functional articulation. However, despite this and taking into account the requirement of surgical treatment and almost certain developments for hip osteoarthritis, will it be worth to operate these fractures?
Objectives: Describe the results of acetabulum fractures submitted to surgery with rigid osteosynthesis and evaluate the rate of progression to hip osteoarthritis of such lesions.
Methods: We will be introducing the service experience in the treatment of such fractures during the last 5 years. All patients underwent rigid osteosynthesis with plate and screws. The exclusion criteria were: sick without conditions and/or criteria for surgery, loss to follow-up and/or transfer to another institution, other surgical techniques of provisional or definitive stabilization of these lesions. All patients were assessed clinically and radiologically.
Results: During this period, 10 patients were operated: 7 male and 3 female. The average of ages was 45.1 years (22-69). The average of follow-ups was 21 months (6-60 months). The mechanism of injury was registered: 6 cases (60 percent) resulted of traffic accident, 3 cases (30%) of fall of a considered height and 1 case (10%) of hit-and-run. The average time of hospitalization was 23 days (11-47 days). One pacient (10 percent) developed during the internment a major vascular complication (thrombus-pulmonary embolism). The fractures were classified according to Judet-Letournell being 40% fractures of the two columns. Surgical procedures used were: isolated or combined Kocher-Langenbeck and Stoppa approaches.
From all the patients operated, 90% are asymptomatic, with preserved amplitudes of movement without the use of auxiliary gear and without progression to hip osteoarthritis. One patient (10%) showed progression to arthritis (Tonnis 3) being proposed for a total hip arthroplasty. Surgical complications were: 2 cases of injury of the external popliteal sciatic nerve and 1 case of heterotopic calcification. There were no cases of infection, non consolidation/pseudarthrosis or failure of the osteosynthesis material.
Conclusions: Although the period of time elapsing between the surgery and the clinical and radiological evaluation was brief, concerning natural history of the disease, the authors show in this study the advantages of a demanding joint reduction and a perfect congruence line. In case of clinic evolution a growth of independence for daily life activities and range of motion of the hip. The authors think that the approach of the acetabulum fractures must pass through the surgical open reduction and internal fixation. Although this is a small series with a short follow-up time (2 years), some results as the average internment time (just 23 days), the fact that 90% of patients are asymptomatic and independent with a painless and maintained hip mobility, and only 1 case has progressed to hip osteoarthritis have prove the authors that it is whenever indicated to operate these fractures.

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FUNCTIONAL RESULTS OF FEMORAL NECK FRACTURES IN ELDERLY PATIENTS TREATED WITH OSTEOSYNTHESIS
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Introduction: Partial arthroplasty is the treatment of choice for displaced intracapsular fractures of elderly patients. Results of non-displaced fractures have been little studied in the literature. It should analyze what is the risk of reoperation, which is the clinical and functional outcome of these patients when treated by osteosynthesis.
Materials and methods: We analysed 56 patients, all over the age of 65, treated with osteosynthesis at Our Center between 2000 and 2013 (48 patients by cannulated screws and 8 patients by DHS) Fractures were classified according to the classification of Garden and Pauwels. Patients were followed after 1, 3, and 6 months and after 1 and 2 years, considering different factors such as the time from the fracture to the surgery, timing until weight bearing, pain and movility. Furthermore RX controls were studied by analyzing the quality of the reduction and synthesis and time to union. We studied medical complications, reoperation rate, nonunion and avascular necrosis. We specifically analyzed if time to weight bearing was associated with early onset of these complications.
Results: Mean age was 75 years. All fractures were Garden type 1 or type 2 and Pauwels type 1. The reduction and synthesis was in most cases successful. The mean time to surgery was 3 days (range 0-7) and for weight bearing was 4 days. Survival of the implants after the synthesis was 94.6%. Patients with later weight bearing (>4 days after surgery) consolidated without collapse or varus. Fractures consolidated in collapse and varus position were more frecuent in patients with early weight bearing (<4 days after surgery): 4 in varus position, 7 with collapse and 6 with collapse and varus associations Two patients treated with cannulated presented nonunion at 4 months, requiring a total hip arthroplasty after 8/9 months (both patients had early weigth bearing). 1 patient treated by cannulated screws had avascular necrosis after 1 year requiring a total hip arthroplasty.
Conclusions: Non-displaced subcapital fractures in elderly people treated with osteosynthesis have good evolution In elderly patients is important to achieve early weight bearing. This may compromise the results of the synthesis in certain cases.

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THE VARIABLE ANGLE MARTIN PLATE – DOES A VARIABLE ANGLE GIVE VARIABLE OUTCOMES OVER THE DHS? A CASE MATCHED STUDY
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Introduction: The Variable angle Martin Plate (MP) is designed to offer patient-specific adaption in the treatment of intertrochanteric hip fractures. Its proposed benefits include optimization of lag screw placement with plate shaft congruence decreasing the risk of failure.

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Objectives: The purpose of this study was to compare the outcome of using a MP to that of a fixed angle Dynamic Hip Screw (DHS).
Methods: A retrospective review of a prospective fracture database system was undertaken. All patients with a MP were identified from 2004 to 2013. MP patients were matched to a cohort of DHS patients identified from the prospective database. 1-year mortality rates, reoperation rates, and radiographic findings were determined. Minimum follow up was 12 months.
Results: 85 Martin plate patients were identified and case matched. The mean pre op and post op NSA in the MPs was significantly different ($p<0.001$). Conversely, the mean pre op DHS NSA and the mean post op NSA was not ($p = 0.397$). Mean TAD was significantly different between groups MP mean 26.51 ± 9.09 mm vs DHS mean 23.50 ± 8.14 mm ($p = 0.023$). A Quality of Reduction Score (QRS), consisting of 4 variables – 3 radiological and one surgical (TAD) was devised. A highly significant inverse relationship between QRS and occurrence of complication, with no difference between MP and DHS groups was found. Logistic regression analysis demonstrated that TAD>25 mm, and a change in AP NSA of >5° conveyed the greatest risk of complication. No difference occurred in the 12 month mortality.
Conclusions: No difference in complications or mortality was demonstrable between implants. The QRS demonstrated a significant inverse correlation with implant-related complications.
A rationale exists regarding the use of MPs, particularly in patients with varus NSA. However, planning, adequate reduction, and a TAD<25 mm are essential regardless of implant choice.

Tumours

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SCHWANNOMA OF LATERAL FEMORAL CUTANEOUS NERVE THAT THIGH PAIN MIMICKING: A REVIEW OF THE LITERATURE AND CASE REPORT

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Introduction: Schwannomas are benign neurogenic tumors that develop from Schwann cells, and were first described by Theodor Schwann. Schwannomas are rare, slow-growing, benign tumors. Schwannomas usually present as a mass and paresthesia. Lateral femoral cutaneous nerve Schwannoma that mimicking thigh pain case was not reported yet.
Methods: A 65-year-old woman was visited to our orthopaedic outpatient department with pain on her left anterior thigh. The pain has been present for more than 6 months. We first diagnosis as muscle origin thigh pain however Tinnel's sign was positive on the anterior aspect of the left thigh. On deliberate physical examination, isolated soft-tissue mass was detected in the anterior aspect of the left thigh. No motor deficit was detected on neurological examination. Magnetic resonance imaging showed a well-defined expansive mass associated with the lateral femoral cutaneous nerve in the anterior compartment of the thigh.
Results: Surgical resection of the soft-tissue mass was performed under general anesthesia. The mass was found to inside lateral femoral cutaneous nerve. A tissue specimen was sent to the pathology laboratory, and a schwannoma was confirmed histologically.
Conclusions: Schwannomas are benign multinodular tumors composed of and arising from Schwann cells along peripheral nerves. They are typically asymptomatic solitary tumors that occur in adults, and are most frequently distributed in the skin and subcutaneous soft tissues of the head and neck. We have described the case lateral femoral cutaneous nerve schwannoma that mimicking thigh pain.

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OSTEOCHONDROMAS OR LOW-GRADE CHONDROSARCOMAS? A TWO CASES WITH DIFFERENT CLINICAL FOLLOW-UPS STUDY

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Introduction: The osteochondromas are the most frequent benign bone tumors. Historically there is a debate whether this kind of neoplasms represents an aberrant development of the bone or if it corresponds to a benign tumor. More recently the discovery of chromosomal abnormalities showed that it is indeed a neoplasm. The size of these injuries varies a lot. The size of the lesion may be small and rarely shows symptoms, being this the reason that its true incidence is unknown. Symptoms are set by its size, impingement in neurovascular structures or fracture of the base of pedicle, the latter with pain.
Objectives: Present the results of two clinical cases submitted to open surgery with different follow-ups.
Methods: A photographic report of two clinical cases of a giant osteochondroma of the hip in two patients, one female, caucasian,24 years old and another male, black race, 35 years old. The first patient with a follow-up of 16 years and the second case with 6 months of follow-up. Regarding the first case, history with 3 years of evolution of appearance of a hard consistency tumor at the level of the right iliac crest. The injury was initially growing slowly, until the patient got pregnant again when the patient noticed a faster growth, accompanied by local pain, feeling of warmth and appearance of paresthesias in the upper thigh area. As for the second case, history with 6 years of evolution painless tumor growing in the right supra-acetabulum. Aggravation of complaints 1 year ago, the patient relates this aggravation of complaints with postural positions of hyper-pressure of the right hip. The patient had no other complaints associated to neurovascular compression.
Results: he radiological examination of the first case revealed the existence of an injury with the mushroomlike aspect, pedunculated based on 1/3 of the anterior iliac crest at the top of the outer board. Magnetic Resonance Imaging (MRI) revealed changes of the strength of the sign of the right iliac bone elements. An excision of the lesion 3 inches of the greater axis including its insertion on the external board was made in the O.R. on the 4/7/1997. The anatomo-pathological examination revealed a low-grade chondrosarcoma (grade 1) secondary in osteochondroma. The patient is currently asymptomatic without local recurrence of the tumor. The radiological examination of the second case revealed the existence of an injury with the mushroomlike aspect, pedunculate with a fixed base in the space between the anterior superior iliac spine and antero-inferior. The MRI revealed a voluptuous iliac mass, in isosinal with the muscle, with areas in hiposinal T1 inside with about 3.9 inches larger shaft and is in apparent continuity with osteochondroma flap of right wing of ilium, with which it has no cleavage plane, cannot however delete given its size and growth referenced degeneracy for chondrosarcoma. An excision of the lesion including its insertion of the pedicle was made in the O.R. on the 27/4/2013. The anatomo-pathological examination revealed a low-grade chondrosarcoma (grade 1) secondary in osteochondroma. The patient is currently asymptomatic.
Conclusions: he treatment of these tumors depends on its size, radiological findings and suspicion of malignancy. The resection in the O.R. is indicated as definitive treatment of this type of injury.

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