Abstracts from the 9th Domestic Meeting of the EUROPEAN HIP SOCIETY

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Guest Editor: George A. Macheras

I. ABSTRACTS - ORALS

O001 INCIDENCE OF SQUEAKING USING THIRD-GENERATION CERAMIC ON CERAMIC BEARING SURFACES
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Background: Squeaking is the most frequently related complication with ceramic on ceramic (CoC) in total hip arthroplasty (THA). Third generation Delta ceramics present improved mechanical properties and, so far, squeaking has not been reported with this bearing surface.

Aims: To analyze the incidence of squeaking through the use of third-generation CoC articulating surface.

Methods: This study included 109 hips in 97 patients, with an average of 49 years (range: 17-77 years), an average BMI of 22.3 (range: 19-48). 102 of these hips were primary THAs, whereas 7 were revision THAs. All acetabular components were Pinnacle (DePuy Orthopaedics, Warsaw, Indiana, USA); the femoral components were Corail uncemented stems (DePuy Orthopaedics, Warsaw, Indiana, USA) in 74 cases, cemented C-Stems (DePuy Orthopaedics, Warsaw, Indiana, USA) in 29 cases, and Srom uncemented stems with metaphyseal fixation (DePuy Orthopaedics, Warsaw, Indiana, USA) in 6 cases. The ceramic used was BIOLOX® Delta (Ceram Tec AG, Plochingen, Germany) in all the cases.

Results: The patients were followed up for an average of 25 months (range 12-36 months). Radiographic assessment of the anteverision was made with the Ackland method (range 1°-35°), inclination (range 22°-67°), acetabulum diameter (range 48-62), size of the femoral head (88 were 36 mm and 21 were 28mm) and pre- and post-op offset were also evaluated (offset in 36 hips was not reproduced). We observed 2 dislocations, 1 acute superficial infection, 1 periosthetic fracture and 1 fracture of the ceramic acetabular insert due to incomplete seating of the acetabular liner. None of the 97 patient referred noise or a squeaking hip.

Conclusions: In this series, squeaking was not observed although the range of anteverision and inclination of the cups was widely variable. Due to its composition and design Delta Ceramic components may have a lower rate of squeaking than second generation ceramics.

O002 CERAMIC ON METAL BEARINGS: FUNDAMENTALS AND EARLY RESULTS
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Background: Osteolytic particle disease undermines the long-term survival of hip arthroplasty. Furthermore, using ceramic on ceramic (CoC) or metal on metal (MoM) bearings may have some disadvantages: in CoC, occasional squeaking or breakage. In MoM, increased blood ion release, pseudotumours and ALVAL (Aseptic Lymphocytic Vasculitis Associated Lesions) may occur.

Aim: The introduction of a ceramic head on a metal insert (CoM) intends to solve the above problems.

Methods: 94 Ceramic on Metal bearings in 83 patients have been implanted since May 2007. A Ceramax Delta™ 36 mm head on a metallic Utlart™ has been used. A study was designed to compare the ion release pre-and postoperatively between MoM and CoM, as well as the effect on the oxidative stress of high levels of Cr and Co ions in blood.

Results: In vitro studies with hip simulator have shown that the release of ions, the corrosive wear and friction are less in CoM than in MoM and similar to those of CoC. The initial experiences and analysis in vivo confirm these data in the medium term. The operated patients, with a maximum of 34 months follow-up, have not shown adverse clinical effects. The determination of ions takes place preoperatively, after six months and then annually.

Discussion and conclusion: The lubrication of dissimilar elements is more favourable than with like-on-like elements. Friction, corrosive wear and ion release are less than those produced with MoM and similar to CoC. With regard to the ceramic couple, the ceramic on metal provides a greater flexibility and better lubrication of the different elements and the absence of rupture of the insert, with a similar wear rate. No adverse effects have been found in any of the patients of the series.

O003 TREATMENT OF DYSPLECTIC OSTEARTHROSIS WITH CERAMIC ON CERAMIC BEARING COUPLE IN AGE 60 OR YOUNGER PATIENTS. CLINICAL AND RADIOGRAPHIC RESULTS OF 5 TO 10 YEARS FOLLOW-UP
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Background: In Japan, the commonest diagnosis requiring hip arthroplasty is dysplastic osteoarthritis. Patients are relatively young and have high activity. For such patients, in the interests of better wear resistance and the longevity, we have been using a ceramic on ceramic bearing couple (CoC).

Material and method: We replaced 290 hips in 251 dysplastic patients (male 174, female 244) with an uncemented CoC. The average age was 53 (27-80). The average follow-up period was 6.5 (5-10) years. The metal shell was Spongiosa Metal II (SM) for all patients. The stem was SM for 181 hips and SL Plus (SL) for 109 hips. SL stems were selected for very narrow femoral canals. The bearing couple was 28 mm Biolox Forte. The patients were evaluated clinically and radiologically.

Result: The Harris hip score improved in all patients at the final follow-up. At the final follow-up, all but one cups and all stems were stable. In the acetabulum, a radiolucent line was observed in 4 hips with the SM Stem. In the femur, the line was observed around 8 SM Stems and 22 SL Stems. There were no cystic osteolytic lesions. The prevalence of cystic osteolytic lesions was lower with CoC than with ceramic on polyethylene bearing couples. The average cup inclination angle was 40 (23-58) degrees and that of cup anteverision was 29 (5-66) degrees. We had no dislocations. The revision due to bearing couple failure was less with CoC than that following the use of a metal on metal bearing couple in our hospital. Even in dysplastic osteoarthritis, the SM Cup provided rigid initial fixation in a safe zone and was suitable for the CoC bearing.
Conclusion: The clinical and radiological results of un cemented THA using CoC were satisfactory for young patients with hip dysplasia.

Q004 IMMUNOLOGIC ADVERSE REACTION ASSOCIATED WITH LOW-CARBIDE METAL-ON-METAL BEARINGS IN TOTAL HIP ARTHROPLASTY
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Background: An increased incidence of periprosthetic osteolysis, resulting in loss of biologic fixation, has been reported in contemporary THAs with low-carbide metal-on-metal compared with metal-on-polyethylene couple bearings. Although a hypersensitivity reaction attributable to Co and Cr debris is reportedly a potential cause for failure of THAs with high-carbide bearings, there are no evidence-based data for this reaction in low-carbide metal-on-metal bearings, although such hypersensitivity might be related to osteolysis.

Aims: We investigated whether there were differences in immunologic hypersensitivity reactions in retrievals from revised THAs with ceramic-on-polyethylene versus metal-on-metal bearing couples.

Methods: We compared newly formed capsule and periprosthetic interface membranes from revision surgery for aseptic failure from 20 patients with low-carbide bearings and 13 patients with ceramic-on-polyethylene bearings. For control tissue, we obtained samples from the hip capsule during the primary THA implantation in 13 patients with low-carbide bearings and seven with ceramic-on-polyethylene bearings. We examined the tissues with conventional histologic and immunohistochemical methods.

Results: Compared with tissue from the control subjects and patients with ceramic-on-polyethylene bearings, the tissues from patients with low-carbide metal-on-metal bearings were associated with (1) extensive necrosis and fibrin exudation in the newly formed hip capsule and (2) diffuse and perivascular lymphocytic infiltration of a higher degree than in the hips with ceramic-on-polyethylene bearings in conventional histologic examination, and (3) more T than B cells.

Conclusion: The conventional histologic and immunohistochemical findings in tissues retrieved from failed THAs with low-carbide metal-on-metal bearings are consistent with a link between hypersensitivity and osteolysis with low-carbide bearing couples.

Q005 THE EFFECT OF PATIENT ACTIVITY ON METAL ION LEVELS
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Introduction: Wear of conventional hip arthroplasty devices has been related to the patient activity. However there is a paucity of objective evidence relating to the step rates of patients in their day to day activity and its resultant effect on metal wear of the implant.

Aim: To monitor the activity levels of the patients pre and post-op and to look for correlations between patient activity and metal ion levels.

Methods: Twenty-five male patients (average 56 years) who underwent a unilateral 50 mm diameter hip resurfacing carried out by a single surgeon (DJWM) were recruited. Patients’ step activity were recorded at 1, 2 and 4 year follow-up stages using step activity monitoring devices. The device recorded maximum sustained activity over a ‘window’ of various designated times. Patients’ whole blood samples were also collected and analysed using HR-ICPMS. None of the patients had histories of renal impairment. Mean height of patients was 179 cm (range 167-196 cm) and mean weight was 85 kg (range 70-102 kg).

Results: All patients in this study had well functioning hips at the four year follow up stage. Patients’ overall step activity remained unchanged up to the 4-year follow-up period. At 1, 2 and 4 year follow-ups, the whole blood cobalt and chromium concentrations showed no correlation to mean number of steps taken per day by the patients.

Discussion and conclusions: The effect of patient activity on metal ion release showed little correlation. This may be due to the patients’ specific activities such as stop-start motion, walking speed, effect of varying kinetics and kinematics, all of which contribute to different levels of metal ion release. It may also be due to the varying rates of renal clearance and patient threshold, which would influence the blood ion concentrations.

Q006 RESULTS OF CONSERVE® ACETABULAR COMPONENT IN LARGE-DIAMETER METAL-ON-METAL ARTICULATION
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Background: Large-diameter metal-on-metal articulations reportedly provide improved stability and increased range of motion compared with smaller diameter bearings.

Methods: Between 2004 and 2008, 104 patients (41 male, 63 female), mean age 61.4 (range 27-78) years had at least one Conserve cup implanted by the senior surgeon. From the total 113 hips, 13% (15 hips) have undergone hip resurfacing and the rest 87% (98 hips) total hip replacement with large-diameter metal-on-metal bearings. Patients were followed up at regular intervals. Clinical evaluation was based on Harris Hip Score (HHS) and Merle d’Aubigné score (MDA). Digital radiograms of the hips were processed with ROMAN v1.7 software. Changes of the cup angle, vertical or horizontal migration of the cup were calculated. Gaps on immediate postoperative radiograms were measured. Radiolucent lines (RLL) around cups were recorded.

Results: Mean follow up was 54 (range 14-76) months. Mean preoperative Harris Hip Score and Merle d’Aubigné score were 48 and 10.3 respectively, whereas 92.2 (range 63-100) and 16.78 (range 14-18) at last evaluation. One cup was revised because of aseptic loosening. One demonstrated a circumferential RLL, but a HHS of 80. The patient is under consideration for a revision THA. No incidence of dislocation or deep infection occurred. Mean initial cup angle was 44.6°±7.549. Mean change of cup angle at last evaluation was 2.491°±1.5275. Two cups had a significant change in cup angle, but no RLL at last follow up. Mean vertical cup migration was 1.225mm±0.7463, whereas mean horizontal 1.1937mm±0.75. At last evaluation seven cups (6.6%) had a single-zone RLL and one in both Charnley zones II and III. There were four cups with non-progressive postoperative gaps. However, seven cases with initial gaps demonstrated complete radiographic bony ingrowth at last follow-up.

Conclusion: Clinical data and radiographic patterns confirm the adequacy of both biologic and mechanical fixation of Conserve cup.

Q007 TEN-YEAR SURVIVAL OF CEMENTLESS THA USING METASUL ARTICULATION IN ACTIVE PATIENTS LESS THAN 50 YEARS OLD
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Background: Main concern with longer life expectancy is longevity of the young and active patient total hip arthroplasty (THA).

Aim of this study was to report the results of a multicentre, retrospective series of 83 cementless total hip arthroplasties in 73 patients implanted with a metal-on-metal articulation.

Methods: All patients were less than 50 years old (average age: 41 years) at the time of the index procedure, and 80% of the patients had an activity level graded four or five when measured with the Devane system. A 28 mm Metasul articulation was used with three different non-cemented titanium alloy acetabular components: 59 press-fit cups (19 hydroxyapatite coated) and 24 grit-blasted threaded cups.

Results and discussion: At the most recent follow-up (mean, 10.1 years), the average pre-operative Merle d’Aubigné score improved from 11.1 points to 17 points and 70 patients (96%) had an excellent result. There was no radiographic evidence of acetabular component loosening at the last available radiographic control. However, 10 acetabular components showed radiographic evidence of lucency limited to 1 zone. Two THA required some type of revision, complete in one for late deep infection and partial in another for limited peri-acetabular os- tolysis due to polyethylene wear debris. The ten-year survivorship with the end-point of revision (i.e. exchange of at least one prosthetic or bearing component) for any reason and for aseptic loosening was 96.7% and 100%, respectively (95% CI, 90%-100%).

Conclusion: Metasul bearings with cementless acetabular components remain promising in this “high risk,” active and younger patient population. However, additional follow-up strategies are recommended to determine any possible long-term deleterious effects associated with the dissemination of metallic ions.
UHMWPE WEAR USING THE MALLORY HEAD CEMENTLESS TOTAL HIP PROSTHESIS: A LONG TERM CLINICAL FOLLOW UP STUDY

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Introduction: Cementless Total Hip Replacement surgery is a well established procedure for relative young patients with severe hip disease. Excellent long term clinical results have been published on the performance of the femoral component. With growing clinical experience, our concern focused on excessive wear of the Ultra High Molecular Weight Polyethylene (UHMWPE) ringloc liner of the Mallory Head (MH) cementless Total Hip Prosthesis. After its introduction in our clinic in 1997, this implant is still in use without any modification. We were concerned that due to premature liner wear, the performance of this implant would not be compliant with the international guideline on implant survival (NICE guidelines: at 10 year follow up, >90% of all implants should still be in situ). Our primary objective was to establish the amount of liner wear in our first 200 MH implants. Our secondary objective was to measure the implant failure rate, due to excessive liner wear, of our first 200 MH implants.

Methods: Our first 200 patients consecutively treated with Mallory Head prostheses (November 1997 - September 2002) were followed up to obtain a recent digital image. Follow up was complete for 181 (90.5%) of our 200 patients. Ten had died and nine were not able or willing to come for follow up. Mean age at surgery was 54.8 years (range: 29 – 69), mean BMI was 26.9 (range 17.5 – 45.9) and the mean duration of follow up was 8.3 years (range: 8 – 13). The 181 recent digital images were classified as either excessive wear or no excessive wear by two independent orthopaedic surgeons. Next, liner wear was measured in the 2D frontal plane using PolyWave Pro3D Digital Version Rev 5.1 software (Drafthare Developers, Conway, USA). Further analyses on subgroups of patients (i.e. age, BMI), component characteristics (i.e. shell size) and radiographic characteristics (i.e. acetabular inclination angle) were performed. A threshold for excessive liner wear was set at 0.2mm/year, according to previously published criteria.

Results: Using software for measuring PE wear, 46.7% of all patients had excessive UHMWPE wear (>0.2mm/yr). There was a positive relation between the amount of wear and the acetabular inclination angle (steeper cup = more wear). There was a positive relation between the cumulative wear of the liner and the acetabular inclination angle (steeper cup = more wear). There was a positive relation between the cumulative wear of the liner and the mean duration of follow up (r = 0.3). The 181 recent digital images were classified as either excessive wear or no excessive wear by two independent orthopaedic surgeons. Next, liner wear was measured in the 2D frontal plane using PolyWave Pro3D Digital Version Rev 5.1 software (Drafthare Developers, Conway, USA). Further analyses on subgroups of patients (i.e. age, BMI), component characteristics (i.e. shell size) and radiographic characteristics (i.e. acetabular inclination angle) were performed. A threshold for excessive liner wear was set at 0.2mm/year, according to previously published criteria.

Discussion and conclusion: The wear rate using 32mm oxidized zirconium heads is significantly lower than that for cobalt-chrome heads and this effect is dramatically enhanced when used in combination with highly cross linked polyethylene.

References

O009

RANDOMIZED CONTROLLED TRIAL OF OXIDIZED ZIRCONIUM VERSUS COBALT-CHROME AS BEARING SURFACES IN TOTAL HIP ARTHROPLASTY

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Background: The bearing surface of total hip arthroplasty (THA) is a key factor in implant survivorship. Ceramic bearings have enhanced wear properties though are prone to fracture and thus oxidized zirconium has been developed as an alternative. Aims: The aim of our study was to compare the wear properties of oxidized zirconium on polyethylene to cobalt-chrome on polyethylene which is currently the most widely used bearing coupling in THA.

Methods: We prospectively randomized 270 consecutive patients undergoing THA at one institution into three groups: Groups I, II and III. Group I received a cobalt-chrome femoral head and cross-linked polyethylene (XLPE) liner; Group II received an oxidized zirconium femoral head and ultra-high molecular weight polyethylene (UHMWPE) liner; Group III received an oxidized zirconium femoral head and cross-linked polyethylene liner. 32 mm heads were used in all the cases. We calculated the linear and volumetric wear rate for each group at six weeks, six months, one year and two years post surgery. The reviewers were blinded as to treatment group.

Results: The demographics and comorbid conditions were similar between the groups. The survivorship of all components was 100% in all groups at 2 years. No patients were lost to follow-up. After the first 6 months of creep, the rate of linear wear over 2 years was 0.16mm for Group I, 0.10mm for Group II, and 0.06mm for Group III. ANOVA testing demonstrates statistical significance between the groups (P<0.05).

Conclusion: The wear rate using 32mm oxidized zirconium heads is significantly lower than that for cobalt-chrome heads and this effect is dramatically enhanced when used in combination with highly cross linked polyethylene.

References
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Heterotopic ossification (HO) is a recognised complication of total hip arthroplasty (THA) and is known to cause significant morbidity but evidence on predisposing factors is limited. This study aimed to correlate demographics, the surgical approach and type of bearing surface to HO incidence.

Methods: A total of 1861 primary THAs were performed between 2005 and 2008. Radiographic data was available for 1159 THAs undertaken in our unit. 839 patients were included having a digitalised radiograph a minimum of one year following their index operation, using the Picture Archiving and Communications System (PACS) and HO was classified using the Brooker's classification. The dependant variable was taken as the presence of HO rather than the Brooker's classification allowing a clearer analysis with easily interpretable findings. Age, sex, type of arthroplasty, bearing surfaces and approach were considered. Type of arthroplasty was classified into four groups; total cemented

References
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Aims: The null model with 1159 hips clustered within 839 patients estimates the overall prevalence of HO to be 18.1% [95% CI (0.125, 0.264)]. The minimal adequate model (final model chosen through the principle of parsimony) yields the following coefficients where the reference class is females operated upon with a posterior approach and with a RH implant. Male sex [OR=3.57, 95% CI (1.79-7.10); p<0.001], lateral approach [OR=2.47 (95% CI 1.29-4.72); p=0.001] and Total cemented implant [OR=3.14 (95% CI 1.37-7.23); p=0.007] were significantly associated with HO. Both age and head type were considered as covariates but excluded as they did not reach significance. The intra-class correlation coefficient (ICC) for hips with patients was 0.52 [95% CI (0.21, 0.81); p<0.004]. This demonstrates that patients with previous HO to one hip replacement are very likely to suffer HO in the second hip replacement.

Discussion: The reported ORs demonstrate very large effects of sex, approach, and implant type on HO incidence. For females undergoing a posterior approach RH implant the prevalence was only 3%. The model predicts a prevalence rise of 85% for males undergoing TC replacement from posterior to a lateral approach. This raises the hypotheses that cement particles and injury to hip abductors may predispose to HO.

Q012 A COMPARISON OF LEG LENGTH DISCREPANCY WITH FUNCTION AND SATISFACTION SCORES AFTER CEMENTED TOTAL HIP REPLACEMENT

Introduction: Total Hip replacement (THR) is considered an effective surgical intervention for the relief of chronic pain and functional disability. However, a proportion of patients experience a poor outcome. Leg length discrepancy (LLD) can be introduced, or not corrected, at the time of operation. Previous research has shown that patients with LLD reported a lower functional outcome than those with equal leg lengths. We report on a cohort of 146 patients with a minimum of 3-year follow-up who underwent cemented total hip replacement. We have compared the data when looking at independent variables including age, sex, BMI, femoral head size, offset of stem, grade of surgeon, surgical approach and cup type. Materials and methods: 146 patients were followed up for a mean of 3.66 years (range 3.25-4.5 years). There were 96 females and 45 males. The mean age at surgery was 77 years (range 50-95 years). All patients were reviewed in clinic or contacted by postal survey for assessment of function and satisfaction. The pre-operative X-rays were compared with early post-operative X-rays. LLD was assessed radiologically according to the method of Woolson, as modified by Konyves and Bannister, on plain sequential AP pelvis radiographs by 2 independent observers.

Results: Mean LLD was 2 mm (range -10 mm to +14 mm). No significant association was found for the above independent variables. The overall stem alignment was satisfactory. A non-significant reduction in function (measured by Oxford hip score, SF-12 and satisfaction score) was noted in association with LLD of greater than 5 mm. There was no significant correlation between the timing of dislocation after surgery; the underlying cause of primary or revision THR; type of approach; whether it was the first episode of dislocation (number of previous dislocations); any predisposing factors; and the requirement for revision surgery.

Discussion: Cut of 3,000 THR, 74 (2.4%) females 344 patients met the inclusion criteria. The mean age was 73 (42 to 94) years. Surgical approach for the primary THR were anterolateral (15 cases), posterior (53) and transtrochanteric (6). Mechanism of dislocation included traumatic (25) and non-traumatic causes (49). 33 patients dislocated on one occasion, 21 (X2), 7 (X3) 4 (X 4) and 9 (X5 or more). After the first dislocation, the risk of a further dislocation was 28.4%. Dislocations after primary THR were 9 within the first month of surgery, 26 between 1-12 months, 24 after the first year. After revision THR there were 8 dislocations between 1-12 months and 6 cases after the first year. Revision procedures were performed on 31 (41.8%) patients. In total there were 15 posterior lip augmentation device procedures, 6 revisions of acetabular component, 10 revisions of both components Risk factors for dislocations included rheumatoid arthritis (8 cases), dementia (3), extensive hip muscle/tissue damage (2), trochanteric non-union (8). The mean acetabular inclination was 44 degrees (27-72) with 15 more than 50 degrees. 6 of the revised cases required hip washouts and in 2 cases a two stage revision was performed. The mean number of days of hospitalisation was 8.37 days (1 to 54). The cost of a hospital bed per day was 750 GBP. The cost of hospitalisation excluding cost of medical or surgical intervention was 900,000 GBP.

Abstracts from the 9th Domestic Meeting of the European Hip Society
TRANEXAMIC ACID IN TOTAL HIP REPLACEMENTS: A META-ANALYSIS

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Introduction: Total hip replacement (THR) is one of the commonest operations in orthopaedic practice and is associated with considerable blood loss. Although safer than ever, allogeneic transfusion is still associated with risks for the recipient including allergic reactions, infections and wound complications. The objectives of this study were to investigate the value of tranexamic acid (TXA) in reducing blood loss and blood transfusion after THR and other clinical outcomes such as deep venous thrombosis (DVT), pulmonary embolism (PE), ischaemic heart diseases and mortality.

Methods: A systematic review and meta-analysis of published randomised controlled trials which used TXA to reduce blood loss in hip arthroplasty was conducted. The data was evaluated using the generic evaluation tool designed by the Cochrane Bone, Joint and Muscle Trauma Group.

Results: 11 clinical trials were considered suitable for detailed data extraction. There were no trials which utilised TXA in revision THR.

Blood loss
Seven studies (350 patients) were eligible for this outcome. TXA reduced intraoperative blood loss by an average of 104ml (P-value 0.0006, 95% CI: 164, -44, Heterogeneity 0%); postoperative blood loss by an average of 167ml (P-value <0.00001, 95% CI: -214, -119, Heterogeneity 63%); and total blood loss by an average of 291ml (P-value <0.00001, 95% CI: -388, -195, Heterogeneity 54%).

Blood transfusion
Seven studies (346 patients) were eligible for this outcome. TXA led to a significant reduction in the proportion of patients requiring allogeneic blood transfusion (Risk Difference 0.20, P-value <0.00001, 95% CI: 0.29, 0.11 Heterogeneity 15%).

Other outcomes
There were no significant differences in the length of hospital stay, DVT, PE, mortality, wound haematoma or infections between the study groups.

Discussion and conclusion: TXA appears effective and safe in reducing blood loss and allogeneic blood transfusion in primary THR.

DOES PRE-OPERATIVE TRANEXAMIC ACID INCREASE THE INCIDENCE OF THROMBOEMBOLISM IN PRIMARY LOWER LIMB ARTHROPLASTY?

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Introduction: Tranexamic Acid (TA) has been shown to decrease peri-operative bleeding in primary lower limb arthroplasty surgery. There are still concerns with regards to the increased risk of thromboembolic events with the use of TA. The aim of this study was to assess whether the use of pre-operative TA increased the incidence of Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE) in Total Hip Replacement (THR) and Total Knee Replacement (TKR).

Methods: Patients who underwent primary THR or TKR between August 2007 and August 2009 were identified from the databases of three surgeons within the lower limb arthroplasty unit. A retrospective case notes analysis was performed. DVT was diagnosed on Duplex Ultrasound Scan and PE on CT Pulmonary Angiogram. A positive result was a diagnosis of DVT or PE within 3 months of surgery.

Results: 701 patients underwent primary THR and TKR over the 2 year period, 320 patients (189 THR, 131 TKR) received TA pre-operatively. 381 patients (190 THR, 191 TKR) did not receive TA prior to surgery. A total of 8 (2.5%) patients who received TA were diagnosed with either a DVT (4) or PE (4) post operatively. In those patients not receiving TA, 6 had a DVT and 4 had a PE, a total of 10 (2.6%).

Conclusion: Pre-operative use of Tranexamic Acid in primary THR and TKR does not increase the incidence of DVT and PE.

EDGE LOADING AND WEAR OF METAL-ON-METAL HIP RESURFACING DEVICES

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Introduction: Performance of a hip joint device depends not only on good design and material, but also on surgical technique and correct implant orientation. Poor orientation could result in edge loading and consequently significant increase in implant wear.
Aim: To examine the occurrence of edge loading in vivo and to compare the wear of edge loaded and non-edge loaded Birmingham hip resurfacings (BHR) retrieval devices.

Methods: Linear wear of 50 BHR retrievals were examined using a Taylor-Hobson Talymark 290 roundness machine. Multiple measurements were taken to locate the area of wear. The maximum deviation of the profile from an ideal circle was taken as the maximum linear wear. Edge loaded devices were classified as cups which showed the maximum area of wear crossing over the edge of the cup. Non-edge loaded devices were devices with wear area within the articulating sphere of the cup.

Results: Among 50 BHR retrievals examined, 28 (56%) were edge loaded and 22 (44%) were non-edge loaded. Edge loaded devices displayed greater linear wear than the non-edge loaded devices. A strong correlation was observed between the time in vivo and the amount of linear wear for the non-edge loaded devices, but such correlation was not observed for the edge loaded devices. Typically heads had greater linear wear than their corresponding cups for non-edge loaded devices, whilst on average the edge loaded cups had greater linear wear than the heads.

Discussion: Edge loading resulted in high and unpredictable amount of wear in the BHR devices examined in this study. The non-edge loaded devices generated low wear. The success of a hip resurfacing strongly depends upon correct orientation of the device resulting in the head articulating within the bearing surface of the cup.

Q020

REVISION OF FAILED TOTAL HIP ARTHROPLASTY ACETABULAR CUPS TO POROUS TANTALUM COMPONENTS. A 5-YEAR FOLLOW-UP STUDY

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Introduction: The primary purpose of this study was to analyze the minimum 5-year clinical and radiographic results obtained in total hip arthroplasties revised by means of the Trabecular Metal (TM) acetabular system. The secondary purpose was to consider these results in relation to the acetabular bone deficiency present at the time of revision.

Materials and methods: Between July 2000 and December 2002, 263 consecutive patients across 5 surgical centers underwent to a revision surgery of a total hip arthroplasty. The preoperative HHS rating improved from a mean of 43.6 ± 11.4 before revision to a mean of 82.1 ± 10.7.

Discussion: Among 50 BHR retrievals examined, 28 (56%) were edge loaded and 22 (44%) were non-edge loaded. Edge loaded devices displayed greater linear wear than the non-edge loaded devices. A strong correlation was observed between the time in vivo and the amount of linear wear for the non-edge loaded devices, but such correlation was not observed for the edge loaded devices. Typically heads had greater linear wear than their corresponding cups for non-edge loaded devices, whilst on average the edge loaded cups had greater linear wear than the heads.

Discussion: Edge loading resulted in high and unpredictable amount of wear in the BHR devices examined in this study. The non-edge loaded devices generated low wear. The success of a hip resurfacing strongly depends upon correct orientation of the device resulting in the head articulating within the bearing surface of the cup.
Five hips (5 patients) presented HO with an overall prevalence of 1.6 percent. All a patient with HO were within the control group who did not receive any NSAID prophylaxis or any other treatment against HO, with a prevalence of 33 percent. No HO has been observed within the treatment group.

Aims: The purpose of this study was to evaluate the clinical and radiographic outcome of this technique.

Materials and methods: From November 1996 to April 2007, 11 liners were cemented into well-fixed cementless acetabular shell in 11 patients. There were 4 males and 7 females with and average age 72.4 (range 46-8373) years at the time of the revision surgery. The indication for the revision procedure were osteolysis and wear in 7 cases, stem revision in 2 cases and periprosthetic fracture in 1 case. The pre-existing screws in the shell were removed, and screw holes were filled with allogenic bone graft or cement. All patients were evaluated with Merle d’Aubigné clinical score and were evaluated the radiographic evidence of progressive loosening and osteolysis. The average follow up period was 51.7 (range 14-156) months.

Results: There were no relevant clinical changes with the Merle d’Aubigné score. We support 4 early hip dislocations. One of these cases was revised with a constrained liner. No radiographic changes around the cup were observed after the last follow-up. There were no infections in this serie. The survival curve at 11 years was 90.9%.

Conclusion: A liner cemented into a stable, well-positioned cementless acetabular shell provides stability and durability at mid and long term follow up. This technique also has advantages of preventing bone loss associated with removal of a well fixed component, decreases surgical morbidity and gives more liner options. Careful attention to the preparation of the liner, the sizing of the component, and the cementing technique are likely to reduce the failure of this construct.
**Introduction:** The clinical and economic impact of perioperative surgical site infections (SSI) after orthopaedic surgery is the subject of great interest. However, existing studies on this topic are limited by small sample sizes and single institutional experiences. Population-based data are rare. Knowledge of risk factors for such an outcome can impact the ability of physicians to inform their patients and to focus measures to prevent this complication.

**Methods:** Data collected for each year between 1998 and 2007 for the National Inpatient Sample, the largest all-payer administrative database in the United States, were analyzed. Hospitalizations during which a primary total hip (THA) or knee arthroplasty (TKA) was performed were identified and included in the sample. Patients with a diagnosis of SSI were compared to the group without this diagnosis. The prevalence of patient demographics and comorbidities, and health-care system related variables were compared for each group. The incidence of morbidity and mortality, length of hospitalization and overall cost were assessed. Multivariate regression analysis was performed to determine independent risk factors for SSI.

**Results:** We identified 412,356 THA and 784,335 TKA patient entries, representing a national estimate of 2,013,352 and 3,823,167 patients operated on between 1998 and 2007, respectively. Of those, 0.36% and 0.31% developed perioperative SSI. Patients with SSI had a higher overall comorbidity burden (Deyo comorbidity index 0.62 vs. 0.47 for THA, 0.64 vs. 0.56 for TKA, P<0.0001) reflected in the increased prevalence of diseases such as alcoholism (3.1% vs. 1.2%, P<0.0001), chronic pulmonary disease (18.7% vs. 12.4% for THA, 17.6% vs. 12.2% for TKA (P<0.0001)), congestive heart failure (7.6% vs. 2.9% for TKA (P<0.0001)), cancer (6.1% vs. 2.2% for THA, 2.5% vs. 1.4% for TKA) and complicated diabetes (1.5% vs. 0.8% for THA (P=0.0035), 2.4% vs. 1.1% for TKA (P<0.0001)). No difference in the prevalence of uncomplicated diabetes (10.5% vs. 11.1% for THA (P=0.9918), 15.6% and 16.2% for TKA (P=0.7634)) or obesity (6.3% vs. 7.4% for THA (P=0.1073), 11.1% and 12% for TKA (P=0.1523)) was seen. Patients with SSI had a significantly higher perioperative mortality rate compared to those without this complication (2.5% vs. 0.3% for THA (P<0.0001), 1.2% vs. 0.1% for TKA (P<0.0001) and a longer average length of hospitalization (34.4 days vs. 4.2 days for THA (P<0.0001), 9.7 days vs. 4 days for TKA (P<0.0001)). Postoperative complications including DVT (4% vs. 0.5% for THA, 4.7% vs. 0.7% for TKA (P<0.0001)), ARDS (3% vs. 0.3% for THA, 2.8% vs. 0.3% for TKA (P<0.0001)), PE (1.9% vs. 0.2% for THA, 1.8% vs. 0.4% for TKA (P<0.0001)) were also more common among SSI patients. Surgical site infection occurred more frequently in SSI patients (10% vs. 1.3% for THA, 6.7% vs. 0.9% for TKA (P<0.0001)). Overall average cost of in-hospital care was approximately double for SSI patients ($31432 vs. $14,286 for THA, $24,558 vs. $13,334 for TKA (P<0.0001)). Independent risk factors for perioperative SSI included male gender and minority race. The comorbidities with the highest independent risk for SSI were metastatic cancer, liver disease, coagulopathies, fluid and electrolyte disorders, and congestive heart failure.

**Conclusion:** Perioperative SSI after THA is associated with increased morbidity, mortality, length of hospital stay and overall cost. Comorbidities subjecting patients to an immunocompromised state or predisposing them to hematoma formation were associated with the highest odds for SSI. Identifying patients at risk may aid in the implementation of strategies to decrease in incidence of this event.

**Method:** Patients with confirmed IP (n=31) were matched for sex, age, pre-operative diagnosis, component size and follow-up with an asymptomatic cohort (control n=58). For all patients radiographic anteverision (RCA) and cup inclination (RCI) were measured using EBRA. We calculated the distance in degree space of each component from the position of 40°/20° as recommended by the designers. The difference in incidence of IP around cups within and outside Lewinnek Zone (LZ) (inclination/anteverision, 30°-50°/5°-25°) was examined. The optimal component orientation was determined by calculating the chi-square statistic for difference in IP incidence within versus outside a ±10° zone over the RCA/RCI domain.

**Results:** A wide range in component orientations was seen in both groups; IP: 47.5°(10.1°-80.6°)/14.1°(4.1°-33.6°) Vs Control: 46.1°(28.8°-59.8°)/15.6°(4.3°-32.9°). IP-group acetabular components were significantly further away from the optimum position of 40°/20° in comparison to controls (P=0.023). There was no difference in IP incidence between components positioned within or out-of-LZ (P=0.9). The centre of ±10° zone with the lowest risk was around an RCA/RCI of 43°/22°. Within this optimum zone, there were 6 IP patients. The odds ratio of IP development around components positioned outside this zone was 3.7.

**Conclusion:** Acetabular component orientation has an important role in IP development but is not the sole culprit. The optimal position was found to be 43°/22°. Based on the assumption that a surgeon could at best implant an acetabular component within ±10°, we recommend the orientation of RCA/RCI: 45°/20° in order to reduce IP incidence.
Methods: The fixation surfaces of retrieved and un-used acetabular devices were examined using an FEI Quanta 200 scanning electron microscope (SEM) and an Inca energy dispersive X-ray (EDX) micro-analysis system.

Results: The BHR cup had a porous fixation surface (POROCAST) with cast-in Co-Cr beads and a hydroxyapatite (HA) coating. The ASR cup also had a porous fixation surface with Co-Cr beads and a HA coating; however, the diameter of the beads and the size of the open pores for the ASR cup were much smaller than those for the BHR cup. The Durom cup had a porous Ti coating on the fixation surface. The fixation surface for the BHR retrieval cups examined was covered with a large amount of bone tissue, showing good osseointegration of the device in vivo. In contrast, the fixation surfaces for all the ASR and Durom retrieval cups examined in this study were relatively “clean” without any significant amount of bone tissue. SEM examination and EDX analysis confirmed that there was a lack of bone growth onto/into the fixation surfaces of the ASR and Durom cups.

Discussion: Different designs and materials for the fixation surfaces contribute to various amounts of osseointegration, which in turn affect the implants’ clinical performances and survival rates. In this study the ASR and Durom had significantly less bony ongrowth/ingrowth than the BHR devices.

O031
TOTAL HIP RESURFACING IN FEMALES OVER 55 YEAR OF AGE, A 7 YEAR REVIEW OF A SINGLE SURGEON SERIES
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Background: Hip resurfacing in female over 55 has had controversial reports compared to the published literature with revision rates reported as high a 7.4%. Femoral neck fracture after this procedure has been reported as being as high as 6%. Given these higher complication rates it has been suggested that hip resurfacing should be performed only in younger female patients. Patient selection and outcome are excellent. The advantages are femoral bone stock conservation and preservation of movement. Short term functional results after hip resurfacing in young patients if a good selection of patients, a demanding technique with a learning curve is done.

Results: 173 patients were noted to be over 55 in this surgeon’s case series of Birmingham total hip resurfacing. The surgical approach was antero-lateral in all cases. The mean age at operation was 62.6 and the distrobution was 55 to 77. The mean BMI was 28.5 ranging from 19 to 38. The size of the acetabular and femoral components were recorded and the mean acetabular size was 52mm ranging from 56mm to 48mm and the mean femoral head size was 46 ranging from 50mm to 42mm.

One patient was noted to have osteoporosis from the pre-operative DEXA scan, nine were noted to be osteopenic. The rest were within normal limits. All patients had undergone a total hip resurfacing.

One patients underwent revision within the follow up period. The reason for this revision was for Trochanteric Bursitis. There were no other revisions noted. Thus, the revision rate for this study was 0.57%.

Conclusion: Our results to date show that hip resurfacing can be successfully performed in females over the age of 55. Compared to the published literature our revision rate is 0.57. However careful patient selection is necessary to achieve low rates of failure.

O032
EARLY RESULTS WITH DUROM HIP RESURFACING
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Background: Improving bearing surfaces (me-me) makes hip resurfacing a good option in young and active patients.

Aim: Clinico-radiological results with Durom hip resurfacing.


Results: Since Feb 2005-Dec 2008, 92 Hip resurfacings in 81 patients, 11 bilateral procedures. Medium age 54 years (17-68) 65 men and 16 women. MPD preop 3-3-4. 75% coxartrosis and 23% AVN, 25% narrowing neck first 6 months. MPD at 1 year 5-6-5. Improving quality of live. Complications: 2.1% fractures, 1.08 infection.

Conclusion: Satisfactory results can be obtained with hip resurfacing in young patients if a good selection of patients, a demanding technique with a learning curve is done.

O033
FUNCTION AND SURVIVAL AFTER REVISION OF ACETABULUM IN HIP RESURFACING
J. Lievensberg Hospital, Bergen Op Zoom, The Netherlands

Background: Failure of acetabular component in hip resurfacing has been linked to various amount of osseointegration, which in turn affect the implants’ clinical performances and survival rates. In this study the ASR and Durom had significantly less bony ongrowth/ingrowth than the BHR devices.


Results: Since Feb 2005-Dec 2008, 92 Hip resurfacings in 81 patients, 11 bilateral procedures. Medium age 54 years (17-68) 65 men and 16 women. MPD preop 3-3-4. 75% coxartrosis and 23% AVN, 25% narrowing neck first 6 months. MPD at 1 year 5-6-5. Improving quality of live. Complications: 2.1% fractures, 1.08 infection.

Conclusion: Satisfactory results can be obtained with hip resurfacing in young patients if a good selection of patients, a demanding technique with a learning curve is done.

O034
FUNCTION AND SURVIVAL AFTER REVISION OF ACETABULUM IN HIP RESURFACING
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Background: Hip resurfacing has resurfaced in the last decade due to a renewed interest in metal on metal bearing. One of the proposed advantages is ease of revision of the femoral component. Short term functional results after femoral revision are similar to those after conventional total hip replacement. Survival and function after revision of the acetabular component only or of both components have not been reported.

Questions/purposes: To assess hip function and implant survival after revision of the acetabular component for failed Birmingham hip resurfacing (BHR).

Patients and methods: The Oswestry Outcome Centre collected data prospectively on 3000 patients who underwent hip resurfacing between 1997 and 2002. Of these, 182 hips were revised: 42% had revision of the femoral component only; 8% revision of the acetabular component only; and 50% revision of both components. This study analyzed patients who had revision of the acetabular component, either in isolation or in combination with the femoral component.

Results: In the isolated acetabular revision group the median Harris Hip Score was 74 at a mean of 4.5 years post-revision. In the both components revision group the median Harris hip score was 85 at a mean of 4 years. There was no significant difference in function between the groups. Kaplan-Meier survivorship analysis after revision showed an average survival of 91% at 10 years. There was a significant difference between survival of isolated acetabular revision (75%) and both component revision (86%).

Conclusion: Revision total hip replacement subsequent to failure of hip resurfacing has good outcome and good midterm survival. Isolated acetabular revision and revision of both components had similar function but survival was significantly worse in the isolated acetabular revision group.
IMPLEMENTATION OF METAL-ON-METAL HIP RESURFACING: A SYSTEMATIC REVIEW

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Background: Hip resurfacing arthroplasty (HRA) has seen a recent revival with third generation Metal-on-Metal prostheses and is now widely in use. However, safety and effectiveness of hip resurfacing are still questioned. We systematically reviewed peer-reviewed literature on hip resurfacing arthroplasty to address these issues.

Objective: To evaluate implant survival and functional outcomes of hybrid Metal-on-Metal hip resurfacing arthroplasty (HRA).

Method: Electronic databases and reference lists were searched from 1988 to September 2009. Identified abstracts were checked for inclusion or exclusion by two independent reviewers. Data were extracted and summarized by one reviewer and verified by a second reviewer. Main study endpoint was implant survival, which we compared with the National Institute of Health and Clinical Excellence (NICE) benchmark. We also evaluated radiological and functional outcomes, failure modes and other adverse events. The quality of evidence was judged using the Grading of Recommendations Assessment, Development and Evaluation system (GRADE).

Results: We identified 433 articles, of which 24 met the inclusion criteria. Data were extracted from these 24 articles, totalling 8745 resurfaced hips, providing details on five out of 11 resurfacing devices on the market. Maximum follow-up was nine years, mean follow-up ranged from 0.6 to 8 years. Implant survival ranged from 88.7% to 100%. Of the 8745 hips, 276 were revised (3.2%), with fracture of the femoral neck as most frequent failure mode. With implant survival plotted against time, 10 studies showed satisfactory implant survival percentages compared to the three year NICE entry-benchmark. Nine of these ten studies used the BHR implant, the other study used the Cormet 2000 implant.
the nonunion site with reduction of fragments, followed by fixation and subtrochanteric osteotomy.

Materials and methods: Patients with established non-union of a femoral neck fracture entered in the study. Inclusion criteria were age under 60 years, a spherical head of femur without alterations in density, and femoral neck nonunion of at least 6 months' duration after fracture. The non-union site was freshened, fixation devices were removed, and the fracture was reduced as well as possible. Subtrochanteric valgas osteotomy to 150 degrees was performed and fixed with an angle blade plate. Bone graft was not used. Patients were reviewed for one year at monthly intervals for signs of union of the fracture site and evidence of aseptic necrosis of the femoral head.

Results: 29 patients were entered in the study. There were 21 males and 8 females with a mean age of 33 years (18 to 55). 19 had Garden type 4 and 7 garden type 3 fractures. The remaining 3 had garden type 2 fractures initially. Fracture of the initial fixation device was seen in 15 patients. After an average of 4 months (3 to 5.5) 27 showed union at the fracture site. In 7 cases, because of collapse at the fracture site, the tip of the blade plate entered the joint. In 2 cases avascular necrosis of the femoral head developed.

Discussion: Exploration of the non-union in our cases had some advantages. In some cases, removal of broken fixation devices was necessary in any event. In addition, a better reduction of the fracture site probably improved fixation and biomechanics. Our method may also have allowed metaplasia of fibrous tissue in the fracture site.

O040 WITH CONSTRAINED LINERS OR DUAL MOBILITY OUTCOMES OF TOTAL HIP ARTHROPLASTY ARE SIMILAR FOR PATIENTS WITH DISPLACED FEMORAL NECK FRACTURES AND OSTEOARTHRITIS

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With constrained liners or dual mobility outcomes of total hip arthroplasty are similar for patients with displaced femoral neck fractures and osteoarthritis. This study attempted to evaluate whether total hip arthroplasty (THA) for displaced femoral neck fractures had significantly different outcomes when compared with THA for osteoarthritis. 1800 patients had THA between 1999 and 2005. Six hundred patients (mean age, 79.7 years) had THA for displaced femoral neck fractures; 1200 patients (mean age, 76.9 years) were treated with total hip arthroplasties for osteoarthritis.

75 per cent with fractures and 60 per cent with OA had a preoperative medical comorbidity including neurologic and vascular diseases. All THAs were done using posterior lateral approach and cemented implants. Standard liners were used for OA. Constrained liners or dual mobility were used to avoid dislocation in fractures. Patients had radiographic assessment, physical examination, and evaluation with the Harris hip score. The mean followup was 7 years. The mean Harris hip score for patients treated with a total hip arthroplasty for a femoral neck fracture was 85 points; the mean hip score for patients treated with a total hip arthroplasty for osteoarthritis was 87 points. Patients who were treated with a total hip arthroplasty for a femoral neck fracture did not have increased perioperative morbidity compared with patients who had a total hip arthroplasty for osteoarthritis. The rate of dislocation was 2 per cent and not significantly different between the two groups. This study suggests that with selected liners the outcomes for total hip arthroplasties in this consecutive series of patients treated for displaced femoral neck fractures and osteoarthritis are comparable.

O041 IS THERE A DIFFERENCE BETWEEN THE IMMEDIATE INTERVENTION AND THE SURGICAL DELAY IN ELDERLY PATIENTS WITH HIP FRACTURES IN TERMS OF MORTALITY?

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Background: Acute hip fracture is common in the elderly and it is also associated with high mortality. Early intervention is recommended but sometimes the need for urgent surgery exceeds the available resources or the patient is not fit for surgery for medical reasons. Either way that leads to a delay in the surgical treatment.

Aim of the study: To assess whether the delay of surgical treatment in hip fractures, regardless of the reason, has effect in mortality in elderly patients consisting hip fracture.

Method: We conducted a retrospective study of 308 patients who underwent a surgical treatment for hip fracture in our department in 2007. From these fractures, 209 were transtrochanteric and 99 were intracapsular NOF fractures. The patients were split into 2 groups looking at the day of surgery following admission. Group A included patients with immediate surgical treatment (in the first 24 hours) and group B, patients who had their surgery after the first 24 hours. Demographic data were documented as well as patients co-existing diseases and ASA score. We measured mortality rates at one, six months, one and two years and we compared the two groups with regard to their mortality.

Results: The two groups did not differ statistically considering demographic details and ASA score. The substance of these groups in regard to co-existing diseases was similar. The 30 days mortality rate of the group A was 8.2% and of the group B 9.1% and did not reach statistical significance (p=0.056). The six months mortality rate was 17.8 and 19.7 respectively (p<0.001), and there was a statistically significant difference in mortality rate at one and two years.

Discussion and conclusion: It appears that the immediate surgical intervention of patients with hip fracture has positive effect in mortality in elderly patients.

O042 POSSUM AND P-POSSUM SCORING IN FRACTURED NECK OF FEMUR MORTALITIES: WHAT SCORES ARE SIGNIFICANT?

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Background: POSSUM and P-POSSUM scoring are useful in predicting morbidity and mortality in fractured neck of femur patients. It is unclear what scores should alert clinicians of a significant risk of mortality and therefore prompt the use of either higher level perioperative care or conservative measures.

Aims: To examine the POSSUM and P-POSSUM scores of all fractured neck of femur mortalities and formulate guidance for the management of similar high risk patients.

Methods: Retrospective analysis of all consecutive mortalities in fractured neck of femur patients within 30 days of injury at Kingston Hospital between 2008 and 2009. Patient medical records were assessed for baseline demographics, causes of death and physiological and operative variables to calculate POSSUM and P-POSSUM scores at the time of injury.

Results: There were 30 patients with a median age of 87 years (range 63-99). 36.6% (11) were male and 63.4% (19) were female. Overall 73.3% (22) underwent surgical intervention. Causes of death were chest infection (32.6%), cardiac failure (26.1%), myocardial infarction (13%), respiratory failure (10.9%), renal failure (10.9%) and carcinoma (6.5%). The mean predicted POSSUM morbidity and mortality rates were 72.6% (28-99%) and 29.4% (6-83%) respectively. 56.7% (24) patients had a physiological score >30. 80% (24) of patients had a predicted morbidity of >50% and 63.3% (19) of patients had a predicted mortality rate of >20%. The mean predicted P-POSSUM mortality rate was 23.9% (1-91%) and 50% (15) of patients had a P-POSSUM predicted mortality of >20%.

Discussion and conclusion: Most fractured neck of mortalities had high preoperative morbidity and mortality scores, P-POSSUM scoring tended to underpredict the risk of mortality versus POSSUM scoring. We suggest patients with a physiological score >30, morbidity score >50% and mortality score >63% are at significant risk of mortality and warrant consideration for higher level care perioperatively or conservative treatment altogether.

O043 DIABETES MELLITUS AND HIP FRACTURE; A STUDY OF 5966 CASES

R. Norris, M. Parker
Peterborough and Stamford NHS Trust

We analysed the characteristics and outcome for 477 hip fracture patients who were known to be diabetic at the time of admission, against 5489 non-diabetic hip fracture patients. The aim was to see what role diabetes played in hip fracture because it is partially modifiable disease. At the time of admission the diabetic patients were more likely to be using walking aids [288/477(56%) versus 2455/5489(45%), p<0.0001], have a more restricted walking ability and a higher mean ASA grade (2.9 versus 2.6, p=0.0001). Diabetics patients were more likely to develop cardiac post-operative complications [26/477(5.5%) versus 146/5489(2.7%), p=0.0008] and to develop pressure ulcers [34/477(7.1%) versus 171/5489(3.1%), p<0.0001]. Hospital stay was increased for those with diabetes (25 days versus 21days, p=0.0061). No difference in surgical complications was seen between groups. At one year recovery of function was similar
G. Gie4, G. Bancroft 5, E. Tsiridis 2,3: Our antibiotic policy was changed twice to address the problems of MRSA and C. difficile. Up to 20% of the residential home population are colonized with methicillin-resistant S. aureus (MRSA), associated with complications such as microbial resistance and colitis was reduced by these changes.

Background: University Hospital North Staffs

ARTHROPLASTY AND DYNAMIC HIP SCREW MAY REDUCE INFECTION CHANGING PROPHYLACTIC ANTIBIOTIC USE FOR THOMPSON’S HEMI-FRACTURES

We reviewed retrospectively the outcome of treatment of 202 periprosthetic fractures around total hip arthroplasty from two specialised centres. Fractures were classified according to the Vancouver classification. The aim of the study was to evaluate the treatment methods with respect to stem revision and grafting and to record outcomes and complications, with an overall objective to identify the current preferred method of treatment in these complex cases. Type A fractures were treated conservatively with good results. Type C fractures were treated with conventional osteosynthesis techniques. 47% of B1 fractures were treated with stem revision as opposed to plate fixation, with better rates for union and furthermore shorter times to union. For B2 fractures the lowest rates of non-union were observed in the cohort treated by stem revision and grafting. Those treated with plating and no grafting had the highest rates of non-union. Periarticular fractures of the femur are highly complex and challenging cases. The surgeon must ensure meticulous pre-operative planning and surgery should be performed in centres equipped to deal with these cases. Stem revision for B1 fractures is now considered as a viable treatment modality in view of previous failures single plating. This study indicates that stem revision should be favoured in the treatment of B1 fractures when the fracture is transverse or short oblique. The latter fracture configurations are very difficult to be controlled with a single plate, therefore intramedullary fixation in the form of long revision stem bypassing the distal fracture line is necessary to achieve healing. Furthermore, bone grafting, whether used as an onlay graft or impaction grafting should be undertaken to augment mechanical fixation and promote osteogenesis.

O045

MANAGEMENT AND OUTCOME OF 202 PERIPROSTHETIC FEMORAL FRACTURES

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2Academic Department of Trauma and Orthopaedic Surgery, University of Leeds, Leeds, UK
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4Princess Elizabeth Orthopaedic Centre, Royal Devon and Exeter Hospital, Exeter, UK
5Faculty of Computing, Engineering and Technology, Staffordshire University, UK

We reviewed retrospectively the outcome of treatment of 202 periprosthetic fractures around total hip arthroplasty from two specialised centres. Fractures were classified according to the Vancouver classification. The aim of the study was to evaluate the treatment methods with respect to stem revision and grafting and to record outcomes and complications, with an overall objective to identify the current preferred method of treatment in these complex cases. Type A fractures were treated conservatively with good results. Type C fractures were treated with conventional osteosynthesis techniques. 47% of B1 fractures were treated with stem revision as opposed to plate fixation, with better rates for union and furthermore shorter times to union. For B2 fractures the lowest rates of non-union were observed in the cohort treated by stem revision and grafting. Those treated with plating and no grafting had the highest rates of non-union. Periarticular fractures of the femur are highly complex and challenging cases. The surgeon must ensure meticulous pre-operative planning and surgery should be performed in centres equipped to deal with these cases. Stem revision for B1 fractures is now considered as a viable treatment modality in view of previous failures single plating. This study indicates that stem revision should be favoured in the treatment of B1 fractures when the fracture is transverse or short oblique. The latter fracture configurations are very difficult to be controlled with a single plate, therefore intramedullary fixation in the form of long revision stem bypassing the distal fracture line is necessary to achieve healing. Furthermore, bone grafting, whether used as an onlay graft or impaction grafting should be undertaken to augment mechanical fixation and promote osteogenesis.

O046

A CEMENTLESS ELASTIC MONOBLOCK ACETABULAR COMPONENT FOR YOUNG PATIENTS. FOLLOW UP OF 158 ACETABULAR COMPONENTS FOR 10-18 YEARS

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Background and purpose: The uncemented elastic monoblock Robert Mathys socket mimics the elastic modulus of acetabular bone. Biological fixation combined with osteoconductive coating, physiological stress transfer and absence of back side wear could lead to long term survivorship of acetabular components. The purpose was to evaluate long-term clinical and radiological survival of a cementless elastic monoblock socket in patients under 50 years.

Methods: During the period of 1990 and 1997, 158 total hip arthroplasties were performed on 131 patients. The mean age was 42.4 (16 to 50) years; 67 were female and 64 were male. The mean follow-up period was 13.2 (10 to 18) years. Clinical and radiological analysis was performed using standard pelvic radiographs and questionnaires.

Results: 4 patients were deceased, 4 patients were lost to follow up. During follow up 22 patients underwent acetabular revision. The mean wear rate was 0.11 (0.0 to 0.68) mm/year, significantly higher in components with a metal on polyethylene articulation. Significant acetabular osteolysis was seen in 4 patients. Survival analysis at 10 and 14 years showed survival of 98% (95% CI: 95 to 100) and 80% (95% CI: 72 to 89) for revision for any cause and 98% (95% CI: 96 to 100) for aseptic loosening at 14 years.

Interpretation: This study shows good long term results of this uncemented elastic monoblock socket at 10-18 years follow up in patients less than 50 years. The main cause for revision of the acetabular component in this cohort has been PE wear.

O047

FULLY HYDROXYAPATITE-COATED TOTAL HIP REPLACEMENT: TEN YEARS RESULTS

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Purpose: To evaluate the clinical and radiological results of the JRI Furlong hydroxyapatite-coated total hip replacement (THR) with a minimum ten years follow-up.

Materials and methods: 295 consecutive primaries THR in 280 patients, using a Fully HA-coated stem and hemispherical cup are retrospectively revised. The woman/men ratio was 0.46 and the age average at the operation time was 58.2 years (range 17 to 77). The minimum follow-up was 10 years (range 10 to 14). Fourteen patients died for unrelated causes and 25 more were lost to follow-up. The remaining 254 hips underwent clinical and radiological controls at 3, 6 and twelve months and yearly thereafter. Special care was taken to evaluate the host biological response to the implant. Technical defects of implantation and perioperative complication were carefully revised in relation with clinical and radiological outcome.

Results: The average Harris Hip Score (HHS) raised from 49.8, preoperatively to 86.2, p. at the latest follow-up examination. Significant pain evaluation in HHS reached 42.9, p. of average, near to 44 p. (total absence of pain). Five acetabular cups (1.9%) were revised for aseptic loosening. The rest were considered radiologically stable at follow-up. All femoral stems reminded stable at the latest follow-up. Twenty-one (8.2%) of them showed non-progressive radiolucent lines, and a pedestal shaped medialular reaction at the tip of the femoral stem, revealing distal fixation, was detected in 103 hips. Primary varus placement of the femoral stem was present in 63 hips (24.8%); valgus placement of the femoral stem in 13 hips (5%). Primary high placement of the cup was present in 42 hips (16.5%). None of these technical defects showed radiological progression and there was no measurable correlation between them and the clinical score (p=0.8 and p=0.3 respectively). Intraoperative femoral fracture occurred in 25 cases (9.8%). All of them healed with no further influence in implant evolution.

Conclusions: These findings suggest that the long term results of the JRI Fur-
long THR are more than satisfactory because:
1. The JRI Furlong hydroxyapatite coated cup provides satisfactory bone fixation and excellent clinical and radiological results (1.9% of cup failure);
2. The JRI Furlong stem has shown, a outstanding radiological and clinical results with a 0% failure rate and total pain-relief;
3. Technical defects of implantation have no decremental effects in final results, which makes this implant suitable for any surgeon.

Background:
Published long-term survivals of Furlong-HAP total hip arthroplasty (THA) offer very good results (over 95% after 10 years), but differences among cups and stems are not established.
Besides, there are few papers about survival of uncemented THA in old patients, especially with hydroxyapatite (HAP) coated implants.
Aims: To compare survival of Furlong HAP-coated cups and stems between patients younger and older than 65 years.
Methods: Design: retrospective comparison of cohorts (evidence level III).
Patients: 115 patients (86 female) of 70.8 years (65-84) (127 THAs) were compared with 84 patients (40 female) of 58.0 years (26-64) (95 THAs), all of them operated from 1991 to 1995.
Exclusion criteria: revision surgery because of infection, dislocation and/or periprosthetic fracture.
Follow-up: minimum 1 year, maximum 17 years.
Results: Revision because of aseptic loosening: 11/125 > 65, 17/95 < 65. THA survival after 14 years: 90.5% older than 65, 83.3% younger (p=0.109). Cup survival after 14 years: 91.4% older than 65, 88.8% younger (p=0.443). Stem survival after 14 years: 95.5% older than 65, 87.4% younger (p=0.042). Other causes for revision in older vs younger: 65; dislocation (4.8% vs 2.1%), deep infection (5.6% vs 4.2%), periprosthetic fracture (7.2% vs 1.05%).
Discussion and conclusion: Survival of Furlong-HAC without aseptic loosening presents no significant differences between patients older and younger than 65. Survival of Furlong-HAP cups without aseptic loosening also presents no significant differences between patients older and younger than 65 years. Furlong-HAP stems offer significant better survival without aseptic loosening in patients older than 65 than in younger ones.
Surgical revision because of non-mechanical problems is more frequent in older patients than in younger patients.

The JRI Furlong hidroxyapatite coated cup provides satisfactory bone fixation and excellent clinical and radiological results (1.9% of cup failure);...
Material and methods: Between 1997 and 2009 we implanted 620 TMT cups in 533 patients. 183 cups were implanted in patients younger than 50 years old. 34.3% of those patients were operated because of DDH, 43.5% because of OA. All patients were prospectively evaluated radiographically and clinically at annual intervals. Functional outcome was assessed with Harris Hip Score and Oxford Score.

Result: Mean follow-up of these series was 5.5 years (13-1). Two cups were revised because of recurrent instability and one more patient was re-operated for open reduction. With the re-operation as end-point and 95% Confidence Interval survivorship was 98.5%. There were no progressive radiolucent lines, signs of liner wear or osteolysis. There was no deep infection in these series. Ten patients dislocated their hips and three of them needed re-operation. Radiographically we observed formation of thick trabeculae radiating from the cup. Results of these series of young patients does not present any statistically significant difference in comparison with the series of older patients or the general population.

Conclusions: THR with tantalum cups had excellent results in the young, comparable with the general population. We observed no mechanical failures, wear or osteolysis up to now in these demanding high activity patients.

O053 SURVIVAL OF 343 CEMENTED TOTAL HIP ARTHROPLASTIES IN PATIENTS UNDER 50 YEARS AND THE RESULTS OF THEIR REVISIONS
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Background: Because of the limited durability of prosthetic implants in young patients, surgeons must always take into account that the primary THA will be revised in the future.

Aim: Therefore we would like to report the outcome of a large series of consecutively performed cemented THA in patients under the age of 50 and the results of the revisions of these cemented prostheses within this population.

Methods: We have used cemented total hips in all cases. However, in case of bone stock loss at the primary surgery, we have used bone impaction grafting. All indications and all cases were included and radiographs were analyzed of patients operated on between 1988 and 2004. All failed hips were again revised with a cemented hip and bone impaction grafting. All revised patients were followed to evaluate the results of the revised hips within the same population. In all cases again a cemented implant was used.

Results: 343 primary total hip arthroplasties were implanted in 270 patients between 1988 and 2004. The average age at index surgery was 38 years. No case was lost during follow-up. Mean follow-up was 8.9 (range 2.0-19.3) years. The 10-years survival of the primary THA was 86% with endpoint revision for any reason and 93% with endpoint revision for aseptic loosening. 53 hips were revised. Average follow-up of the revised hips was 4.1 years and average age at revision was 46 (range 25-65) years. The 5-years survival of the 53 performed revisions, all again with a cemented implant and bone impaction grafting as needed, was 91% with endpoint revision for any reason and 100% for endpoint aseptic loosening.

Discussion and conclusion: Cemented implants in young patients show satisfying results at 10 years, provided that acetabular defects at the index surgery should be reconstructed with bone impaction grafting. Interestingly, in addition, the outcome of the failed cases at midterm follow-up using again cemented THA and bone impaction grafting for revision was also satisfactory with a promising survival rate at 5 years. To our knowledge, this is the first study that presents the outcome of a hip implant in young patients including the outcome of the failed cases showing the revisibility of cemented hips in young patients.

O054 FEASIBILITY OF FOUR PATIENT REPORTED OUTCOME MEASURES IN THE DANISH HIP ARTHROPLASTY REGISTRY. A CROSS-SECTIONAL STUDY OF 6000 PATIENTS
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Background: Patient reported outcome measures (PROMs) are warranted in the total hip arthroplasty (THA) registries.

Aim: To assess response rate, floor/ceiling effect, percentage missing items, and feasibility of PROMs relevant to THA patients in a register setting.

Methods: 5777 primary THA patients, operated 1-2, 5-6, and 10-11 years ago. SF-12 Health Survey (SF-12), EQ-5D, Oxford 12-item Hip Score (OHS), and Hip dysfunction and Osteoarthritis Outcome Score (HOOS) were included. Feasibility was assessed as license requirements, fees and need for manual validation of the scanned questionnaires.

Results: 5206/5733 (91%) patients (mean age 72 years, 59% females) responded. Non-responders did not differ from responders with regard to age and gender. Response rates for the PROMs were 62%-84%. The floor effect was <5% for all PROMs. Ceiling effects ranged from 4% (EQ-5D Index) to 6% (SF-12). Percentage of missing items ranged from 15% (HOOS Pain) to 3% (HOOS QoL and EQ-5D Index). When applying questionnaire specific rules for missing items, a score could not be calculated for 1-6% of the PROMs. The proportion of items needing manual validation ranged from 4% (EQ-5D) to 1% (SF-12, HOOS). OHS and HOOS do not acquire any license. For SF-12 administrative fee, survey reference kit, and scoring software cost altogether 1,569.90 USD. The EQ-5D can be used for free when applied to less than 5000 patients.

Discussion and conclusion: All questionnaires had very high response rates. The low floor effects and high ceiling effects can largely be explained by post-operative administration and the overall good outcome from THA. A score could be calculated for 94-99% of patients, indicating the items and format of the four questionnaires being appropriate for administration within a hip registry. We conclude that all four questionnaires are appropriate for administration in a hip registry.

O055 FUNCTIONAL OUTCOME AND QUALITY OF LIFE OF PATIENTS AFTER TOTAL HIP ARTHROPLASTY
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Background: Osteoarthritis is the most common joint disease in adults and identified by WHO as one of the civilisation threats. Total hip replacement is a reliable, well accepted operation by the patients for the improvement of their functional capabilities.

Aim: To examine the difference in quality of life and functional outcome in patients with severe hip osteoarthritis in the initial stages and in two years following total hip arthroplasty.

Methods and materials: This is a retrospective study in 158 patients, 94 women, with an average age of 69.6 years and 64 men with an average age 71.3 years, all diagnosed with hip osteoarthritis (clinically and radiographically). All patients underwent total hip arthroplasty between 2005 and 2007 in our clinic. The Short-Form-36 Health Survey (SF-36) and Harris Hip Score were evaluated preoperatively, at 3, 6 and 24 months postoperatively.

Results: The average hospitalization period was 7 days (5-17). The questionnaire were completed by 144 patients at time 3 months period, by 123 patients at 6 months and by 98 patients 2 years post-surgically. All the parameters from SF-36 improved in three months, except for mental health, and the improvement was greater and statistically significant 6 months and 2 years later. In general, female patients had a lower score pre-surgically but this difference did not exist post-surgically. Regardless of the improvement the results remained lower than those of the healthy population. The Harris Hip Score improved significantly after operation, reaching a plateau after 6 months. The presence of accompanying diseases or previous operations did not affect postoperative quality of life scores.

Conclusions: The results confirm that total hip arthroplasty improves patient’s quality of life. This positive influence is more visible in physical scales rather than the social and psychological ones.

O056 DEVELOPMENT AND VALIDATION OF A DISCRIMINATING FUNCTIONAL HIP SCORE
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Introduction: The aim of this study was to validate a user friendly discriminating functional hip scoring system developed in our unit for use in younger, ‘high demand’ patients undergoing hip arthroplasty surgery.

The commonly used hip outcome scores have a ceiling effect and discriminate poorly at the highest functional levels. The functional hip score uses a series of 5 tasks, which are graded on a hierarchical unweighted scale.
Methods: We studied a cohort of 38 subjects without any hip symptoms and 72 patients undergoing total hip arthroplasty (THA) for osteoarthritis of the hip. Pre-procedure and post-procedure scores were collected in the latter cohort of patients. Short form-36 (SF-36) and the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores were used to validate our functional scoring system.

Results: A statistically significant improvement following total hip arthroplasty was demonstrated by the functional hip score (p<0.001), WOMAC score (p<0.001) and the SF-36 scores (p<0.01). Our results confirmed that the functional hip score has a high test-retest reliability (Pearson correlation coefficient of 0.91), internal consistency (high Cronbach’s alpha for all tasks of the functional score) and criterion validity (excellent Pearson correlation with the respective components of WOMAC and SF-36 scores). A ceiling effect was noted with WOMAC and SF-36 with more than 15% patients showing highest or lowest possible scores in some subsets. No ceiling effect was noted with our functional hip score.

Conclusion: The functional hip score is a valid and reliable tool to detect change in the musculoskeletal function after total hip arthroplasty. It may provide a simple yet valuable tool to detect functional improvement in the young high demand patients following hip interventional procedures.

**O057**

**THE LEARNING CURVE IN HIP ARTHROSCOPY AND SEQUENTIAL ANALYSIS OF A SINGLE SURGEON'S SERIES OF CASES**

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Introduction: Hip arthroscopy has evolved dramatically, but remains a technically demanding procedure. The aim of this study was to objectively quantify a surgeon’s learning curve for hip arthroscopy.

Methods: We prospectively reviewed 150 consecutive hip arthroscopies performed over 3 years. Three groups of patients were sequentially analysed: Group 1 comprised the first 30 patients; group 2 consisted of patients 61 to 99 and group 3 comprised patients 121 to 150. The analysis included the diagnosis, the length of the central compartment procedure, patient satisfaction, conversion to arthroplasty and the non arthritic hip score.

Results: A marked decrease was noted in the operative time for central compartment arthroscopy between group 1 [70m (45-98)], group 2 [48m (26-59)] and group 3 [37m (18-61)]; and for peripheral compartment between group 2 [91m (60-126)] and group 3 [45m (36-62)]. There was an overall decrease in operative time over the 150 cases, representing a gradual learning process. No difference was noted in the number of cases requiring re-operations or conversion to arthroplasty. There was a significantly higher complication rate in the first 30 cases. An increase in non arthritic hip scores was noted post operatively in all three groups. An improvement in post-operative score was noted between group 1 [69 (39-84)], group 2 [79 (58-92)] and group 3 [86 (51-98)]. Patient satisfaction was highest in group 3.

Conclusion: Hip arthroscopy is associated with a very high patient satisfaction and good short-term outcomes but there is a learning curve that we estimate to approximately 30 cases. Training methods need to be developed to minimise the morbidity associated with the learning curve.

**O058**

**THE IMPORTANCE OF THE ARTHROSCOPIC HIP SURGERY IN THE ATHLETES WITH HIP INJURIES - OUR EXPERIENCE. A RETROSPECTIVE STUDY**

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Hip arthroscopy has gradually evolved over the past two decades. Recently, hip arthroscopy has an increased role in the diagnosis and treatment for specific intra-articular and extra-articular hip injuries and especially for soft tissue injuries.

**Material and methods:** February 2003 – March 2010, 35 athletes, football players, basketball players, weight lifters, gymnasts, 3 water polo players. Mean age; 32 years (19-39).

**Instrumentation and equipment:** 70°, 4.5mm arthroscope, High flow rate mechanical pump, 15 gauge 6”cardiac needle, Convex full radius chondroplasty blades, Special electrocautery. Distraction apparatus, DVD unit, Mechanical water pump unit, Image intensifier.

**Indications:** Undiagnosed hip pain, early Osteoarthritis, Labral pathology, Loose bodies, Osteochondral defects, Sepsis, Ligamentum teres, Trauma, Synovitis, Femoral acetabular impingment, “Frozen hip”.

**Symptoms:** Deep dull aching pain during hip flexion and external or internal rotation, Dislocation R.O.M., Hip flexion over 70-90°

**Clinical findings:** 30/35 Cam sign: positive, 12/35 Pincher sign: positive, Impingement syndrome in hip flexion and internal and rotation and occasionally in external rotation.

**Surgery:** Standard orthopaedic traction table, Supine position, Hip is extended and abducted 25°.

**Portals:** Anterolateral, Posteriorateral, Modified Anterolateral.

**Intraoperative findings:** Detachment of the labrum, 10/35 erosion of the articular cartilage of the acetabulum drilling of the bare area, 30/35 Cam sign excision, 12/35 pincher sign excision, 8/35 superior, and superior lateral labrum repair with anchors.

**Conclusion:** The athletes with symptoms of an internal hip pain and femoral acetabular impingement signs after a detailed clinical examination of their hip and after failure of their conservative treatment, will certainly get a benefit from an arthroscopic procedure (which is technically demanding).

**O059**

**EXTENDED TROCHANTERIC OSTEOTOMY IN FEMORAL COMPONENT REVISION**

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**Background:** Revision total hip arthroplasty (THA) often results in intraoperative fractures. Extended osteotomy of the greater trochanter (ETO) is considered as a safe and effective technique.

**Aim:** The goal of this retrospective study is to evaluate the efficacy and analyze the clinical and radiological outcome of the ETO in revision THA.

**Methods:** Between January 2002 and January 2006, 29 patients (17 male - 12 female), mean age of 79.5 years (68-87) underwent 32 revision THAs using an ETO (Endo-Klinik grade 3-4). Femoral reconstruction was performed using a modular cementless component with ischimic fixation. Mean osteotomy length was 11 cm (range 7-14 cm) and the fixation was supplemented with a minimum of 2 titanium cerclage wires. In 11 cases, a strut allograft was applied. Preoperative templating confirmed adequate fixation of at least 4 cm. Post-operative clinical evaluation was performed using the Harris and WOMAC scores; radiological evaluation assessed trochanteric fractures, stem subsidence and malpositioning. Osteotomy union was achieved using the Conr criteria. All patients were followed up at an average of 4.1 years (3-7).

**Results:** Harris hip and WOMAC scores improved from a mean of 36 and 39 preoperatively to 74 and 75 respectively, at the last follow-up. There was no subsidence or loosening observed in any case. All osteotomies united successfully at a mean time of 14 weeks (6-20 months). Mean migration of the osteotomised fragment was 8 mm (range 0-12 mm). One case suffered from recurrent dislocations and necessitated re-orientation of the femoral component.

**Conclusion:** ETO is recommended for the technically demanding revision THAs. It provides excellent acetabular exposure and simultaneously facilitates the expedient and safe removal of femoral implants whilst avoiding the pitfalls associated with more limited approaches. However, one needs to be meticulous in the preparation and subsequent fixation of the osteotomy in order to achieve excellent rates of healing.

**O060**

**TRANSPOSITION OF THE APOPHYSIS OF THE GREATER TROCHANTER FOR RECONSTRUCTION OF THE FEMORAL HEAD AFTER NEONATAL SEPTIC ARTHRITIS OF THE HIP**

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At the EHS meeting in 2004 the author reported medium term results after subtrochanteric osteotomy and transposition of the greater trochanter to the acetabulum in hips where the femoral head had been totally destructed after neonatal septic arthritis. The aim of this report is to present the long term results after this procedure.

**Patients and methods:** Two girls and two boys were operated. The age at operation ranged from 1 to 6 years. Anterior approach was used. After removal of fibrous tissue from the acetabulum, and resection of the insertion of the gluteal tendons, a subtrochanteric osteotomy was performed. The cartilage of the apophysis was trimmed. Following transposition of the apophysis into the acetabulum the osteotomy was fixeded with Steinmann pins or a plate. The gluteal tendons were sutured to the lateral subtrochanteric area. A spica cast was used for 3 months. The patients have now been followed for 24, 21, 16 and 14 years, respectively.
Results: Radiographic controls have shown development of a new femoral head in all hips. In two of them the head is nearly spherical, and covered by a well developed acetabulum. Both these hips are free of pain and only a slight limp is present, 24 and 16 years after operation respectively. In the other two where a good cover for the new head had not been achieved a dysplastic joint developed. Secondary osteoarthritits gave indication for total hip replacement, respectively 21 and 14 years after primary operation.

Conclusions: Provided that a good primary acetabular cover for the transposed apophysis is obtained, this method may give a well functioning spherical joint with a reasonable long term result. Ossification of the central part of the apophysis, and persistence of the peripheral layers of the cartilage, may contribute to development of a relatively normal femoral head.

O061
DIAgnOSTIC AND OPERATIVE TREATMENT OF PIRIFORMIS SYNDROME
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Introduction: Piriformis syndrome is a neuromuscular condition characterized by hip and buttock pain. This syndrome is often overlooked in clinical settings because its presentation may be similar to that of lumbar radiculopathy, primary sacral dysfunction, or innominuate dysfunction.

Methods: We present our experience of 12 cases with sciatic nerve compression neuropathy (Piriformis syndrome) which were diagnosed and operative treated in our clinic the last 3 years. Twelve patients 7 males and 5 females mean age of 55 years old were operated between 2005 and 2008 Most of them were referred to us by the Spinal Disorders Clinic. Symptoms began before an average of 16 months (range 8 to 30).

Results: Seven patients (58%) stated an immediate relief from the pain. The rest stated relief of pain after 2-4 months. The average time from operation to return to work was 2 months. Functional outcome were evaluation using the SF-36 score and the Benson and Schutzer scale.10 patient had excellent results and 2 had good results.

Conclusion: Piriformis syndrome is very difficult to diagnose. Following the right indications and excluding any other causes of the same clinical appearance, operative treatment is the best treatment giving pain relief to the patient.

O062
CONSTRAINED LINERS IN NEUROLOGIC AND COGNITIVELY IMPAIRED PATIENTS UNDERGOING PRIMARY TOTAL HIP ARTHROPLASTY
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Total hip arthroplasty (THA) performed in patients with cognitive deficits or neuromotor diseases has been associated with a high post-operative complication rate, especially dislocation rate. Previous reports have included post-operative bracing, hemi-arthroplasty and observation. We propose the selective use of constrained acetabular liners for primary THA in neurologic or cognitively impaired patients. Between 1999 and 2004, fifty-two consecutive cognitively impaired patients (Alzheimer's, other forms of dementia), thirty patients with decreased muscle tone (e.g. Down's syndrome, Poliomyelitis, Myelomenigocele), forty-two patients with increased muscle tone (Parkinson disease with stage IV or stage V according to the system of Hoehn and Yahr, cerebral palsy), and twenty patients with stroke associated with hip fracture on the hemiplegic side underwent primary THA using a constrained acetabular liner. The results of these 144 constrained acetabular liners were compared with 120 arthroplasties (hemiarthroplasty or standard total hip arthroplasty) performed for the same diseases between 1988 and 1999 in the same hospital.

The cemented retentive cup (Cemented retentive cup, Groupe lépine, Genay, France) is a UHMWPE cup. The principle of retentiveness requires a more enveloping cup than the hemispherical model. The flange in the equatorial plane permits insertion of a split polyethylene ring reinforced by a stainless steel hoop. This ring plays the role of a veritable retentive clip. The head plane permits insertion of a split polyethylene ring reinforced by a stainless steel hoop. This ring plays the role of a veritable retentive clip. The head

O063
COMPLICATIONS AFTER HIP SPACER IMPLANTATION
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Background: The implantation of antibiotic-impregnated spacers is an established method in the treatment of late hip joint infections. Several complications might occur after hip spacer implantation including recurrent or persistent infections, mechanical complications or systemic side effects. However, despite the wide use of hip spacers the exact incidence of some these complications still remains unknown.

Aim: The aim of this retrospective study was to identify and evaluate complications after hip spacer implantation other than reinfection and/or infection persistence.

Methods: Between 1999 and 2008, 88 hip spacer implantations in 82 patients have been performed. There were 43 male and 39 female patients at a mean age of 70 (43-89) years. The mean spacer implantation time was 90 [14-1460] days. The mean follow-up was 54 [7-96] months. The most common identified organisms were S. aureus and S. epidermidis. In most cases, the spacers were impregnated with 1 g gentamycin and 4 g vancomycin / 80 g bone cement.

Results: The overall complication rate was 58.5 % (48/82 cases). A spacer failure occurred in 15 cases (17%). Spacer fractures could be noticed in 9 cases (10.2%). Femoral fractures occurred in 12 cases (13.6%). After prosthesis reimplantation, 16 patients suffered from a prosthesis dislocation (23%). 2 patients (2.4%) showed allergic reactions against the intravenous antibiotic therapy. An acute renal failure occurred in 5 cases (6%). No cases of hepatic failure or ototoxicity could be observed. Complications including mostly of draining sinus, pneumonia, cardiopulmonary decompensation, lower urinary tract infections) occurred in 38 patients (46.3%).

Discussion and conclusion: Despite the retrospective study design and the limited possibility of interpreting these findings and their causes, this rate indicates that patients suffering from late hip joint infections and being treated with a two-stage protocol are prone to having complications. Orthopaedic surgeons should be aware of these complications and their treatment options and focus on the early diagnosis for prevention of further complications. Between stages, an interdisciplinary cooperation with other facilities (internal medicine, microbiologists) should be aimed for patients with several comorbidities for optimizing their general medical condition.

O064
INTRINSIC PASSIVE STIFFNESS OF TWO CONSTRUCTS OF VARUS PROXIMAL FEMORAL OSTEOLOGY: EXTERNAL FIXATOR OR BLADE PLATE
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Background: Despite the published clinical evidence of the implementation of external fixation of proximal femoral osteotomies there is lack of specific laboratory justification.

Aims: The authors hypothesized that external fixation may not be a biomechanically sound alternative to internal fixation of varus intertrochanteric osteotomies.

Methods: Two groups of five adult composite femur constructs of varus proximal femoral osteotomy were tested under incremental and cyclical loading of up to 600N along the mechanical axis. Five were fixed with a blade plate and five with a
monolateral external fixator. Load versus displacement curves were produced and passive stiffness of all constructs was calculated. The described loading regime aimed to simulate the initial postoperative state and provide data for the assessment of vertical intrinsic passive stiffness in partial weight-bearing conditions.

Results: Although the blade plate constructs showed higher average stiffness this was not statistically significant (F(1.8) = 1.712, p=0.23). No construct failed. No failure or plastic deformation was observed under the described loading regime.

Discussion and conclusion: Vertical intrinsic passive stiffness in partial weight-bearing conditions during the initial postoperative period can be considered satisfactory, following unilateral external fixation of a varus intertrochanteric osteotomy.

Methods: We conducted this study to evaluate the role of pluripotent stem cells in the repair of cartilage defects in the knee joint. Five motivated and less than 40 years of age patients with aligned and balanced knee were included. MRI and arthroscopic examination was used to prove the presence of the cartilage defects. Stem cells of bone marrow aspirate from iliac crest were cultured and replaced in the defects covered by periosteal patch. After 6 months, the joints were examined arthroscopically and the rate of cartilage repair was assessed clinically and histologically.

Results: After 6 months, by probing the repaired cartilage and by direct visualization of it by arthroscope, the gross appearance of it was the same of hyaline cartilage of the rest of knee and in histopathologic biopsy, there was a hyaline-like cartilage (70-80%).

Discussion: Reaching to hyaline cartilage is the final goal of all studies and in this way, 70-80% resemblance with hyaline cartilage is satisfactory. It is desired that in future, instead of periosteal patch, collagen patch will be used and it is tried to shift to one stage surgery.

Background: Osteopetrosis is a common skeletal disease characterized by a combination of low bone mass and increased fragility. The CER1 gene, that inhibits bone morphogenic proteins’ activity, is a novel candidate gene for osteopetrosis.

Aim: Association between novel single-nucleotide polymorphisms (SNPs) of CER1 gene with BMD and fracture risk in osteoporotic women.

Methods: DNA was extracted from peripheral blood of 125 postmenopausal women. CER1 genotyping was carried out by PCR and sequencing. Bone mineral density (BMD) was measured by dual-energy X-ray absorptiometry (DXA) and fractures confirmed by radiographs. Statistical analysis was adjusted for age/BMI using Pearson χ² or Fisher’s exact test.

Results: All patients were osteoporotic (DXA). Genetic analysis of the CER1 gene revealed five SNPs at the same sites/frequencies: 239C>G 61.3%, 1058G>T 62.4%, 2160A>G 61.7%, 2355A>G 51%, 2749T>C 31.5%. Patients with vertebral fractures carried the polymorphic sites 239C>G and 1058G>T, 2160A>G 61.7%, 2355A>G 51%, 2749T>C 31.5%.

Methods: Total Hip Arthroplasty (THA) was performed on 40 patients (25 women and 15 men). All patients had a minimum age of 40 years. The type of surgery was determined using the Harris Hip Score. Method of postoperative analgesia was Ropivacaine based given to patients in the treatment group. In group A, a solution of 100 ml Ropivacaine 2mg/ml (Naropeine 0.2%) was infiltrated in the deep tissues (capsule, gluteus medius, gluteus maximus and rotators) (50 ml) while the fascia, subcutaneous tissues and skin were infiltrated with the remaining 50ml. Group B was the control group. All patients received standardized general anesthesia or PCA machine using a self-administered pain pump was applied in the recovery room for 48 hours. All patients took 1gr x 3 Apotel i.v., 40mg x2 Dynastat i.v., and 4mg x2 Zofron i.v. for 48 hours postoperatively. Pain scores with Visual Analogue Scale (0-10) at 1, 2, 4, 8, 12, 24 and 48 hours postoperatively, time to the first analgesic requirement and side effects were recorded.

Results: There were no significant differences in demographic characteristics of the patients and duration of the surgery between two groups. Morphine consumption was statistically significantly lower in group A for the first 48 hours, resulting in a lower frequency of nausea, itching and sedation. Postoperative pain levels at rest and during mobilization were statistically significantly lower in group A while median hospital stay was similar in both groups.

Conclusion: Operative wound infiltration with ropivacaine reduces pain and the requirement for analgesics after hip replacement, leading to faster postoperative mobilization.
Aim: To assess whether ACI could be used in the treatment of osteochondral lesions in the hip.

Material and methods: We describe a consecutive series of sixteen patients with chondral or osteochondral lesions of the femoral head that underwent ACI. Pre-operatively hip function was assessed by the patient using the Harris Hip Score (HHS) and Magnetic Resonance Imaging (MRI). Post-operatively MRI was performed at 1 year and HHS collected annually. Failure was defined as a second ACI to the operated lesion or a conversion to a hip arthroplasty.

Results: Harris Hip score improved from a median of 58 pre-operatively to 72 points at two years and 96 at five years following surgery. Four patients had good integration of the new cartilage on arthroscopic examination at one year. One patient developed AVN as a post-operative complication following a posterior approach. Seven patients have progressed to hip replacement or resurfacing in due course but it is of note that all these patients had cyst formation pre-operatively.

Conclusion: Despite a small sample size our study shows that ACI could be a viable option for osteochondral lesions of the hip in young patients. Presence of cyst in femoral head pre-operatively may indicate a poor outcome.

O069

MUTIPLE SMALL TANTALUM PEGS FOR JOINT SALVAGE IN FEMORAL HEAD NECROSIS

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Background: Tantalum rod implantation has been proposed for treating early stages of femoral head osteonecrosis. However it serves as a single-point support of the necrotic lesion. We have applied a novel technique with two or three trabecular tantalum pegs of 4.7 mm for the prevention of collapse of the necrotic lesions.

Aim: To report the early results of this joint salvaging approach.

Methods: In 21 patients (26 hips) with non-traumatic femoral head osteonecrosis at a precollapse stage we have prospectively studied both the radiological and functional outcome using the ARCO system and the Classification of the Japanese Investigation Committee of Health and Welfare, and the Harris Hip Score (HHS), the Merle D'Aubigné-Postel Score (MAP), the SF-36, and the Visual Analog Score (VAS) systems. Mean follow-up time was 33.3 (12–55) months.

Results: Radiological assessment employing the ARCO classification showed that only 7 hips deteriorated. According to the JICHW system the necrotic lesion deteriorated in 6 hips. All the rest remained at the same stage without collapse. The functional development for efficient patient-specific surgery planning and/or implant design. The use of image processing software (Mirumics, Materialise NV, Belgium), preoperative planning software (SurgiCase Orthopaedics, Materialise, Belgium), computer aided design software (3-matic, Materialise NV, Belgium) and finite element software (Abaqus Inc, USA) is integrated into an efficient preoperative workflow by means of data exchange and dedicated software development for efficient patient-specific surgery planning and/or implant design.

Results: The potential of 3D imaging and pre-operative planning is illustrated by several clinical cases in the field of orthopaedics and traumatology such as intracortical radius fracture, clavicu la malunion, acellular revision surgery and acetalubar fractures. Where appropriate, patient-specific guides and implants were designed for these cases.

Discussion and conclusion: The use of 3D image processing and pre-operat ive planning in orthopaedics provides all tools and possibilities to facilitate medical diagnosis, simulate virtual surgeries, optimize surgical procedures, improve surgical outcome, reduce surgery time and elongate implant life time. Nevertheless, equilibrium between preoperative effort and postoperative outcome should be sought for on a case-specific basis. A skilled biomedical engineer can assist the surgeon for such purpose.

Preoperative image-based 3D planning software is helpful to orthopedic surgeons in planning a complex operation more accurately, improving clinical outcome and reducing associated health care costs.

O072

PROPAGATION OF FATIGUE CRACKS IN ACRYLIC BONE CEMENTS CONTAINING DIFFERENT RADIOAQUE AGENTS

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Introduction: Acrylic bone cements are widely used in orthopaedic surgery to fix the joint prostheses. In previous studies the addition of inorganic radiopaque agents to

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the polymethyl methacrylate (PMMA) cement have show an increase of the differ-
entiation and proliferation of the osteoclast and macrophages who contribute to the
bone resorption and the loosening of the prostheses in the joint replacement.

On this study we propose a new radiopaque agent: the 3, 5-diolidine salicylic
methacrylate (DISMA).

Material: A comparative study of the propagation of fatigue cracks in three dif-
ferent bone acrylic cements (radiolucent cement, cement with barium sulphate
and cement with DISMA) has been realised.

Methods: On each sample the curves shape of crack propagation velocity have
been analysed. Finally a statistical study has been done employing the analysis of
the variance and the Fisher test for multiples comparisons.

Results: The addition of the iodine agent improves the mechanic properties like
traction resistance, fracture tenacity and ductility compared to the cement with
barium sulphate as radiopaque agent.

Discussion: Those results confirm that the addition of barium sulphate de-
creases the fatigue crack propagation.

The radiopaque agent eliminates the porosity associated with the inorganic par-
ticles which presents a bad adhesion with the polymeric matrix.

Conclusion: The addition of some organic radiopacifiers (DISMA) increases the
fatigue crack propagation resistance as compared to the radiolucent cement,
being similar to the barium sulphate containing cement.

The radiolucent cement showed a low crack propagation resistance due to the
absence of inorganic particles.

Q073
CUSTOM DRILL GUIDES: NEW APPLICATIONS IN ORTHOPEDICS
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Background: Pin placement can be an intermediate step to position an implant
component into a pre-determined position, or to determine the screw pre-drill
trajectory. Planning of pin placement has become more frequent nowadays, the
reasons being two-fold.

Firstly, the past couple of years, both clinical and biomechanical studies come
forward indicating the need for accurate positioning of implants and screws, due
to its major influence on the long-term survival [Beaulé 2004, JOA].

Secondly, technology for planning and transfer has now come to a level that is
viably accurate, economically practical, and practically feasible.

Methods: The custom disposable CT-based guide was developed, for two
applications, being (i) placement of the femoral component in SRA; and (ii)
pre-drilling screw holes with massive acetalubet defect reconstruction using a
patient-specific implant.

In case of SRA, the position of the guide wire is planned pre-operatively. The
SRA guide is designed as a slightly more-than-hemispherical cage to fit the
anterior part of the femoral head.

In case of THA revision, the guide is positioned onto the patient-specific ac-
etabular implant, by specifically fitting onto the implant surface.

Results: The potential of patient-specific guide technology is illustrated by
different retrospective and clinical SRA cases. Custom guides were tested on
10 cadaver femurs and deviations between planned and actually obtained pin
placement assessed from optical scans. The average three dimensional angle
variation and the average entry position variation equal respectively 1.14 ± 0.57
degrees and 1.01 ± 0.47mm.

In case of custom implant application in THA, the surgeon was able to place a
planned combination of screws without any intersections, and thus according to
plan if postoperative X-rays were compared to preoperative planning in five
clinical cases.

Discussion and conclusion: Patient-specific guide technology in orthopedics
shows high potential for accuracy improvement and surgery time reduction.

Q074
PREVENTION OF HIP DISLOCATION IN CEREBRAL PALSY: EARLY MULTI-
LEVEL MINIMALLY-INVASIVE APPROACH (E.M.M.A.)
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Background: Hip problems in Cerebral Palsy are frequent (25-75%). Sublux-
ation and dislocation of the hip is proportional to the neuromuscular involve-
ment and is often due to the altered spastic muscular forces acting on the
femoral head in the acetabular cavity.

Aim: E.M.M.A approach (Early Multilevel Minimally-invasive Approach) has
been designed in 3 different steps and applied to decrease unbalanced forces due
to spasticity acting on the femoral head and therefore to decrease hip migration
progression, bone deformities and future pain with the minimal biological cost
for the patients.

We consider age and R.I. as crucial discriminants for treatment steps.

All muscles around the hip joint are addressed simultaneously (adductor longus,
iliacos, medial hamstrings and rectus femoris).

Methods: E.M.M.A. 1: age 2 - 4 years, R.I. ≤ 20%: multilevel injection of botul-
num toxin in case of muscular hyperactivity without morphological alterations of
the couple muscle-tendon (contractures)

E.M.M.A. 2: age 4-6, R.I. ≥ 20%: multilevel aponeurectomies in case of muscular hy-
peractivity with morphological alterations of the couple muscle-tendon (retraction).

E.M.M.A. 3: AGE 6-8 EMMA 2 associated to early bone surgery (proximal femo-
al temporary epiphysiodesis with canulated screw to achieve a progressive correction of valgus deformity).

We adopted this approach to prevent bone deformities with early mobilisation
and early control of the pain in the same time.

Results: We treated 35 children with hip subluxation and a mean follow-up of 28
months. None of our patients have had a progression to hip dislocation.

Discussion and conclusion: E.M.M.A. seems to be a practical and minimally inva-
sive approach to achieve hip containment, decrease spasticity and it appears to
be satisfactory to prevent progressive acetabular displasia and hip dislocation.

Q075
MIS AND POSTOPERATIVE FULLWEIGHT BEARING. WHICH IMPLANT DO
WE NEED?
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Background: As MIS-THR is the standard procedure for total hip arthroplasty
at many orthopaedic clinics, as well as increased demands of patients concern-
ing fast postoperative mobilization and sportive activities, higher requirements
must be fulfilled by the latest generation of implants i.e. reduction of bone loss,
preservation of muscle insertions and faster osseointegration.

Aim: Since 2004 we performed more than 2800 MIS-THRs. At the beginning
we implanted the well established Zweymüller SL-PLUS stem. In order to
minimize soft tissue trauma and bone loss we modified the stem to the effect
that the trochanteric wing was removed. Thereby the risk of trochanteric frac-
tures and muscle insufficiencies nearly disappeared but according to the now
possible immediate postoperative fullweight bearing which means increased
shearforces at the bone-implant interface in some cases radiolucent lines oc-
curred, especially in young and active patients. To reduce this appearance
of RLLs we now implant the THA bioactive coated SL-PLUS MIA stem. To
evaluate the advantage of the stem, we performed a clinical and radiological
comparison of the three stems.

Methods: All patients we operated in supine position via anterolateral MIS-
approach followed by early and fullweight mobilization starting on the first post-
operative day. Follow-up included the clinical (HHS) and radiological evaluation
(migration, RLLs) in terms of 6 weeks, 3 and 6 month and than yearly.

Results: HHS was equal in all groups. The best outcome concerning migration
showed the coated SL- MIA versus the SL-MIA standard and the SL-PLUS.
Regarding appearance of radiolucent lines in the proximal part we observed in
0.9% (SL-MIA THA coated/n=227) in comparison to 24% (SL-MIA standard/
n=598) and 38% (SL-PLUS/n=62).

Conclusion: For MIS-THR combined with immediate fullweight mobilization
the bioactive coated SL-MIA stem meets the expectations best as it preserves
bone and soft tissue and due to the THA coating it guarantees an earlier
secondary stability.

Q076
IMPLANT POSITION AND EARLY FUNCTIONAL OUTCOME AFTER DIRECT
ANTERIOR MINIMALLY INVASIVE TOTAL HIP ARTHROPLASTY IN OBESE
AND NON-OBESE PATIENTS
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Introduction: Total hip arthroplasty continues to be one of the most success-
ful orthopaedic procedures. A great deal of attention in recent years has been
focused on alternate and improved approaches to minimize soft tissue dissection and surgical trauma. Obesity has been cited by some authors as a contraindication to minimally invasive joint surgery.

**Purpose:** The aim of the present study is to determine whether there are any differences in the implant position and early functional outcome of total hip arthroplasty between obese and non-obese patients.

**Methods:** A series of 122 consecutive patients who had 136 primary total hip arthroplasties done through an anterior approach by a single surgeon from November 2005 to July 2008 was reviewed. The patients were categorized into three groups: non-obese (body mass index (BMI) <25 kg/m²), overweight (BMI 25-30 kg/m²) and obese (BMI >30 kg/m²). The outcome measure included radiological analysis assessing cup position and leg length discrepancy, modified Harris Hip Score, operative time and estimated blood loss. Radiological analysis and modified Harris Hip Score were routinely performed at 6 weeks after surgery. Presurgically, there was no significant difference of age as well as Harris Hip Score (HHS) between the groups.

**Results:**
- 37 patients were assigned to the non-obese group (group 1), 42 patients to the overweight group (group 2) and 43 to the obese group (group 3).
- Mean abduction angle was 49.43°+/−5.1° in group 1, 48.3°+/−5.6° in group 3 and 47.2°+/−5.6° in group 1. The average anteverision was 16.5°+/−5.5° in group 2, 18.6°+/−5.8° in group 1 and 17.5°+/−4.7° in group 3. In group 1 leg length discrepancy was on average 3.6+/−3.1 mm. Mean operative time was 110.5+/−30.6 min in group 2, 115.5+/−23.2 min in group 3 and 101.4+/−17.4 min in group 1. The average estimated blood loss was 522.9+/−332.9 ml in group 2, 501.7+/−288.8 ml in group 3 and 461.7+/−317.7 ml in group 1. The mean hospital stay was 2.9+/−0.8 days in group 1, 2.8+/−0.6 days in group 2 and 3.2+/−2.0 days in group 3. 6 weeks postsurgically mean modified HHS was 83.7+/−11.0 in group 1, 83.4+/−14.0 in group 2 and 85.2+/−11.3. Student’s t-test revealed no statistical difference significance between any of those groups (p<0.05).

**Discussion:** The results of the present study show that a single anterior approach allows accurate and reproducible component positioning and leg length restoration in non-obese as well as obese patients. Our findings suggest that there is no evidence to support withholding total hip replacement from obese patients on the ground that their implant position and early functional outcome will be less satisfactory than those who are not obese.

**O077 AMIS VERSUS POSTERIOR MIS IN THA**


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In our practice we compared our results in THA with Anterior Minimally Invasive Surgery through Hueter approach and Minimal Incision Surgery through Mores approach in period March 2006 to March 2009.

In group one we performed 53 THA with AMIS. 28 patients were female and 25 male with average age of 56.6. 49 patients had arthrodesis of hip joint grade III and IV. 2 patients had displastic hips and 2 patients had unhealed femoral neck fractures.

We implanted 40 cementless, 10 cemented and 3 hybrid hips. In group B we performed 49 THA with MIS surgery through Mores approach 24 patients were female and 15 were male with average age of 58.4. 48 patients had arthrodesis of hip joint grade III and IV and 1 patient had displastic hips.

In group 2 we implanted 42 cementless and 7 cemented hips. Results: Average time of operations was 78 minutes in group 1 and 70 in group 2. Average blood transfusion was 486 ml in group 1 and 736 ml in group 2. Average HHS preoperatively was 56 in group 2 (52 - 55), and 3 months postoperatively was 93 compared with 94 in group 2. We had complications in four cases in group 1 (2 dislocations, 1 fissura of smaller trochanter and 1 deep infection) and in five cases in group 2 (3 luxations and 2 TE).

AMIS in THA showed better results in postoperative rehabilitation with smaller surgical trauma, shorter hospital treatment, faster return to daily life activities without signs of thromboembolism.

**O078 10 YEARS EXPERIENCE WITH MINIMAL INvasive HIP REPLACEMENT WITH A NECK PRESERVING HIP STEM**

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**Objectives:** More and more younger patients need primary hip replacement. Especially for these patients the calcar prostheses have been developed; short stems with fixation, bone incrow and loading only in the proximal parts of the femur. Using these prostheses in primary operation, later on the first revision can be done with the so called standard prostheses.

**Methods:** We have experience with more than 1.500 calcar prostheses type MAYO in the last 9 years. The indication for operation in these group of patients is different to the older patients group; younger patients need hip replacement because of rheumatic diseases, dysplasia or femoral head necrosis. Mean age of these patients is below 50 years. Implantations have been done by a modified Watson Jones approach. We developed a minimal invasive operation technique to provide any trauma to the gluteal muscles. All the cases we have done are under clinical and radiological follow up.

**Results:** Reporting all our cases according to the Harris-Hip-Score, we saw good and excellent results; the good functional results were reached in a short period of time after the operation. We have seen less complications in comparison to the group of patients with our standard hip stems. 95% of the operations have been done without any incision to the gluteal muscles; the mean length of skin incision has been less than 8 cm. The x-ray follow up shows in none of our cases any osteolysis in the region of the calcar femoris.

**Conclusions:** With the MAYO Hip System good and excellent results can be reached, especially in cases of younger patients this stem should be used. The primary hip replacement therefore can be done with a minimum of bone lost at the calcar and with a maximum of atraumatic operation technique to the soft tissue around the hip joint.

**O079 AVOIDING COMPLICATIONS IN TOTAL HIP ARTHROPLASTY PERFORMED FROM AN ANTERIOR MINIMALLY INVASIVE APPROACH**

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**Background:** Minimally invasive total hip arthroplasty (THA) has become a big trend in orthopedic surgery with results that depend on the type of approach used, the experience of the surgeon and the correct selection of patients.

**Aim:** We would like to present the complications we noticed with the first forty cases of THA performed by an anterior approach. The goal of this study is to present how these complications could have been avoided with correct surgical technique and appropriate patient selection.

**Methods:** From April 2008 to December 2008, three staff surgeons performed forty THA through an anterior approach according to Hueter. All patients were operated in a dorsal decubitus position with the assistance of a traction table. Postoperative follow-up included clinical and x-ray controls at day 0, day 3 and 6 weeks.

**Results:** The following complications were observed: two fractures of the greater trochanter, two lesions of the lateral femoral cutaneous nerve, one stem subsidence, and one early stem loosening. The latter was revised. Three patients had a leg length discrepancy of one cm or more. One patient developed an unacceptable scar that also had to be revised.

**Discussion:** Anterior minimally invasive THA is a quite promising method that provides early mobilization of patients and shorter hospital stay. However, the initial consequent rate of complications implicates performing this surgery with caution and according to well set protocols. As a reference center for this type of surgery, we would like to present the errors we made in the past and the methods we developed to avoid them.

**O080 MID TERM RESULTS OF COMPRESS FIXATION IN DISTAL FEMORAL RECONSTRUCTION**

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**Aim:** To retrospectively analyze the mid term results of distal femoral resection with the uncemented Compress® Pre-Strain Implant (Biomet, Warsaw, IN, USA).

**Methods:** 41 patients operated from 1999 to 2006 received Compress® uncemented fixations. Reconstruction was performed for osteosarcoma in 22 pa-
tients, prosthetic revision in 12, giant cell tumor in 3, chondrosarcoma in 2, and malignant fibrohistiocytoma in 2. Twenty patients were women and 21 men aged between 7–62 years old (average 27).

**Results:** The average follow up was 45 months (range, 3–85) (minimum follow up of 2 years unless failure occurred earlier). The overall survival was 88% at 5-years (Kaplan Meier). Complications were encountered during the first post-operative year in 5 patients. Four of these sustained a femoral fracture, 1 had a distal bone resorption with a secondary failure of the compress mechanism. Four patients needed a second surgery at an average of 2 months (range, 1–4). No significant relationship was found between the prosthetic outcome and age, gender, extent of femoral resection, surgical approach, plug diameter, chemotheraphy or amount of compression (Cox regression analysis).

**Discussion:** The Musculoskeletal Tumor Society (MSTS) functional score at last follow up was 26.8 of 30. Function was rated as excellent in 30 reconstructions, good in 4, and fair in 2 patients.

**Conclusion:** Compress prosthesis showed satisfactory 5 years survival comparing with bibliographic data. No failures were observed after one year follow-up; thereby Compress fixation may improve prosthetic long term survival that will need to be established via longer follow-up.

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**O061 RECONSTRUCTION OF PRIMARY AND METASTATIC PERIACETABULAR TUMORS**

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**Introduction:** Periacetabular tumors, primary and metastatic, can be painful and disabling. Operative treatment is indicated for patients who fail to respond adequately to adjuvant chemotherapy and/or radiation therapy.

**Aim:** The objective of this study was to evaluate the functional and oncological outcome of acetabular reconstruction for primary or metastatic tumors.

**Material and methods:** Twelve patients with tumours around acetabulum were treated surgically between 2006 and July 2008 in our department. There were 5 males and 8 females with a mean age 54.3 years (range 42 to 75 years). Three patients were diagnosed with chondrosarcoma, 2 with osteosarcoma, 2 with multiple myeloma, 3 with aneurysmal bone cyst and 2 with metastatic breast cancer. Three cases were reconstructed with bulk allograft, 6 with currettage and cement and 3 with cement and anti-protrusion cages and 3 with total hip replacement after currettage of the lesion and filling with morselized grafts.

**Results:** The mean follow-up was 24 months (range 14 to 48 months). Two patients died at mean 12 months post reconstruction (range 8 to 16 months). Two patients had local recurrence. Eight patients were free of disease. Seven patients had relief of pain as determined by decreased use of pain-killers. Nine of the twelve patients who could not walk preoperatively regained the ability to walk. Six of them ambulated without walking assistance whereas 3 of them had to use a cane. One case had hip dislocation and one more was revised due to early failure of implant fixation. The mean MSTS score was 59.8% (range 40% to 90%) in survivors, which was 74.5% (range 60% to 90%) for primary tumors, and 46.8% (range 30% to 75%) for metastatic tumors (p<0.001). The overall patient survival was 69.9% at one year and 58.8% at three years. Patients with primary bone tumors had significantly better survival compared to those with metastatic tumors (85.2% vs. 58.3%, respectively at one year (p=0.032).

**Conclusions:** Reconstruction with cemented modular endoprostheses is an appropriate surgical alternative in the treatment of large segmental defects after resection of proximal femoral neoplasms. They are associated with intraoperative versatility, low incidence of implant-related complications and acceptable function particularly in primary tumors.

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**O062 BIPOLAR HIP AND PROXIMAL FEMUR REPLACEMENT USING A MODULAR PROSTHESIS FOR NEOPLASMS**

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**Introduction:** Limb salvage has become an important alternative to amputation in the treatment of bone neoplasms. Modular endoprostheses offer off the shelf availability and can be adapted to most reconstructive situations.

**Aim:** The objective of this study was to evaluate the functional results of patients who were treated with cemented modular prosthetic replacement for bone tumors of the proximal femur.

**Material and methods:** Twenty patients (11 males, 9 females; mean age 51 years; range 18 to 76 years) who underwent wide resection and cemented bipolar hip and proximal femur replacement between 2003 and 2009 were retrospectively reviewed. The METS (Stanmore Implants Worldwide) modular tumour prosthesis were used in 16 cases and the Howmedica/Stryker implants in 4 cases. 7 patients (35%; mean age 59.8 years) had metastatic, and 13 patients (65%; mean age 42.4 years) had primary tumors. Functional assessments were made with the Musculoskeletal Tumor Society (MSTS) scoring system.

**Results:** The mean follow-up was 36 months (range 8 to 86 months). Postoperative complications were seen in 5 patients (25%), including delayed wound healing (2), drainage (2), dislocation (1). No patient needed revision surgery. No amputation was needed. Local recurrences were developed in three patients at mean 7.3 months (range 3 to 12 months) post surgery. Four patients died, three patients developed distant metastases, and thirteen patients were tumor-free. Survival was significantly better in patients with primary tumors (p=0.001). All the patients were able to ambulate without walking assistance 3 months postoperatively. The mean MSTS score was 62.9% (range 50% to 90%) in survivors, which was 74.5% (range 60% to 90%) for primary tumors, and 46.8% (range 30% to 75%) for metastatic tumors (p<0.001). The overall patient survival was 69.9% at one year and 58.8% at three years. Patients with primary bone tumors had significantly better survival compared to those with metastatic tumors (85.2% vs 58.3%, respectively at one year (p=0.032).

**Conclusions:** Reconstruction with cemented modular endoprostheses is an appropriate surgical alternative in the treatment of large segmental defects after resection of proximal femoral neoplasms. They are associated with intraoperative versatility, low incidence of implant-related complications and acceptable function particularly in primary tumors.

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**O063 AGGRESSIVE EARLY DEBRIDEMENT CAN BE SUCCESSFUL FOR INFECTED HIP ARTHROPLASTY**

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**Introduction:** Up to 2% of total hip arthroplasties (THA) are still complicated by infection. This leads to dissatisfied patients with poor function, and has far-reaching social and economic consequences. The challenge in these cases is the eradication of infection, the restoration of full function and the prevention of recurrence. We report the outcome of early aggressive debridement in the acutely infected THA.

**Methods:** We studied 28 consecutive patients referred with acutely infected THA (21 primaries, 7 revisions) which occurred within 6 weeks of the index operation or of haematogenous spread between 1999 and 2006. Microbiology confirmed bacterial colonisation in all cases with 20 early post-operative infections and 8 cases of acute haemagogenous spread. Patients with a cemented THA underwent aggressive open debridement, a thorough synovectomy and exchange of all mobile parts. Uncemented THA were treated as a single stage revision with removal of all implants, aggressive debridement and re-implantation of new prosthesis. Antibiotics were continued in all cases until inflammatory markers and the plasma albumin concentration returned to within normal limits.

**Results:** Ten patients required multiple washouts. 7 patients needed a two stage revision. 21 patients returned to their expected functional level without removal of the implants and with no radiographic evidence of prosthetic failure. At a minimum 2 years follow-up, we had a 75% infection control rate. The outcome was significantly better in patients treated in the first 120 hours after presentation.**

**Discussion and conclusion:** Our data suggests that there is a role for early aggressive open debridement in acute infections after THA with an excellent chance of eradicating infection.
Methods: We conducted a retrospective study. Group 1 (12 patients) received antibiotics intravenously after administration of anaesthesia in the anaesthetic room but prior to obtaining samples. Group 2 (20 patients) received antibiotics intravenously after samples were obtained.

Results: Our study results demonstrated that in Group 1 50% (6/12) samples were culture positive and in Group 2 85% (17/20) were culture positive. This was statistically significant p-value <0.05.

Conclusion: We recommend withholding antibiotics until infected tissue/fluid samples are obtained to improve culture positivity on microbiological testing.

0085 TWO-STAGE TREATMENT PROTOCOL FOR ISOLATED SEPTIC ACETABULAR CUP LOOSENING
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Background: Antibiotic-impregnated spacers are an established method in the treatment of late infections after total hip replacement. Not every infection after total hip arthroplasty involves both prosthesis components. In some cases with a septic acetabular cup loosening but no involvement of the stem, the orthopaedic surgeon is confronted with the dilemma to explant one or both prosthetic components. This decision might be even harder in the presence of osteoporotic bone or bone weakened by previous surgical revisions. In this condition it is unknown which one provides optimum fixation and, hence, the lowest dislocation rate.

Aim: The aim of this study was to evaluate the treatment of isolated septic acetabular cup loosening at no involvement of the prosthesis stem by insertion of an antibiotic-loaded spacer head and at stem retention.

Patients and methods: Between 1999 and 2008, 13 patients (5 men, 8 women, mean age 59 years) with this entity could be treated according to this regimen. S. epidermidis and S. aureus were the two most common identified organisms. In 12 cases the spacers have been impregnated with 0.5 g gentamicin +2 g vancomycin / 40 g bone cement, except for one patient with a vancomycin allergy, where 0.5 g gentamicin +0.4 g teicoplanin have been used. All spacers acted as a hemicranioplasty. The mean spacer head implantation time was 88 [35-270] days.

Results: At a mean follow-up of 55 [12-83] months, an infection eradication could be achieved in 11 out of 12 cases (91.6%). Complications included draining sinus, space involvement and infection dislocation, respectively. One patient passed away after prosthesis reimplantation due to cardio-pulmonary decompensation.

Discussion and conclusion: This method is an elegant option in the treatment of isolated septic acetabular cup loosening at well-fixed stem, especially in cases with osteoporotic bone or bone weakened by previous surgical revisions.

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0086 IN VITRO ELUTION CHARACTERISTICS OF VANCOMYCIN IN A COMPOSITIONAL AND ANTI-BACTERIAL PROPHYLAXIS
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Introduction: Periprosthetic joint infection is a particularly difficult orthopaedic problem, complicating a growing number of revision arthroplasty. Joint debridement and the use of localized antibiotics is the mainstay of treatment, yet difficulty remains in maintaining a minimum inhibitory concentration of antibiotic at the site of infection. Calcium phosphates have been used extensively as a bone substitute and antibiotic vehicle, yet, investigated elution rates have been variable. Of recent, calcium sulfate has been studied as an alternative delivery method, well tolerated and non-immunogenic, studies suggest antibiotic elution from the cement occurs predominantly in the first 72 hours, and then tapers exponentially. This study analyzes the elution characteristics of a 40% bwt calcium phosphate-60% bwt calcium sulfate composite, at varying concentrations of antibiotics.

Methods: Four groups of varying concentrations of vancomycin (2.63% bwt, 5.13%, 9.76% and 17.78%) were mixed with one pack of the composite cement. In this entity could be treated according to this regimen. S. epidermidis and S. aureus were the two most common identified organisms. In 12 cases the spacers have been impregnated with 0.5 g gentamicin +2 g vancomycin / 40 g bone cement, except for one patient with a vancomycin allergy, where 0.5 g gentamicin +0.4 g teicoplanin have been used. All spacers acted as a hemicranioplasty. The mean spacer head implantation time was 88 [35-270] days.

Results: At a mean follow-up of 55 [12-83] months, an infection eradication could be achieved in 11 out of 12 cases (91.6%). Complications included draining sinus, space involvement and infection dislocation, respectively. One patient passed away after prosthesis reimplantation due to cardio-pulmonary decompensation.

Discussion and conclusion: This method is an elegant option in the treatment of isolated septic acetabular cup loosening at well-fixed stem, especially in cases with osteoporotic bone or bone weakened by previous surgical revisions.

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O090 STUDY OF ANTIBIOTIC IMPREGNATED CEMENT SPACERS TO DETERMINE GENTAMICIN ELUTION RATES IN A SIMULATED WEAR MODEL
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Background: Infection is a major complication of arthroplasty surgery with a reported incidence after primary operation of between 0.2 and 1%. We feel that two stage exchange arthroplasty surgery utilising antibiotic impregnated bone cement offers the best way of eradicating infection along with restoration of function.

Aim: To assess the effect of wear on the rate of elution of gentamicin from polymethyl methacrylate bone cement as employed as spacers in two stage revision arthroplasty.

Methods: We set up a lubricated sealed mechanical jig to constantly wear a known volume of standard polymethyl methacrylate bone cement containing gentamicin against an abrasive surface of hydroxyapatite. Samples of fluid were taken at known intervals and the gentamicin concentration determined using High Precision Liquid Chromatography. These were carried out along side controls with no wear. The samples were also inspected using electron and infinite focus microscopy.

Results: Gentamicin elution rates were initially higher in the worn samples but then dropped below the elution rates for the non-worn samples. Electron microscopy revealed the worn samples had sealed over accounting for this phenomenon.

Discussion and conclusion: Wear does not increase the rate of antibiotic elution from bone cement if it in fact decreases it. This brings into question the need for expensive spacers and moulds in two stage surgery.

O091 USE OF PLASMA VISCOSITY IN DIAGNOSING INFECTION IN LOWER LIMB JOINT ARTHROPLASTY
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The diagnosis of infection following joint replacement can be difficult. Diagnosis is often made on haematological, radiographic and microbiological investigations. The use of plasma viscosity (PV) in the diagnosis of prosthetic joint infection is often made on haematological, radiographic and microbiological investigations. We investigated the role of PV, C-reactive protein (CRP) and Frozen Section (FS) in diagnosing prosthetic joint infection. We compared these results with microbiological diagnosis of infection of the tissue samples taken at the time of revision surgery. The presence of infection was confirmed, if three or more samples grew the same organisms in the culture.

47 patients, average age 67 years (37-89) underwent 53 joint revision surgeries. 31 patients had hip and 16 patients had knee joint revision arthroplasty, this includes single and multiple stage revision surgeries and excision arthroplasty. Six patients underwent multiple surgeries. Nine (17%) patients had microbiologically proven joint infection. PV had sensitivity of 100%, specificity of 83% and negative predictive value of 100%. CRP had sensitivity of 89%, specificity of 75% and negative predictive value of 97%. FS (presence of infection being recognized using sonication of explanted prosthetic material. The procedure is simple, sensitive and relatively cheap.

Discussion: In cases where we were uncertain if the infection was present we removed prosthetic parts and obtained tissue samples in all patients during the operation. Metallic or ceramic parts were sonicated and cultured and obtained samples were made. We also took tissue samples and soft tissue biopsies in all patients during the operation. In cases of infection, additional therapy was given if infectious disease was diagnosed.

Results: We studied 50 cases (46 patients) operated for revision (2 cases of spine surgery, 2 cases of revision foot surgery, 2 cases of revision tumor prosthetics and 44 cases of revision arthroplasty of hip or knee) during the period from February 2008 to March 2010 treated in our clinical department for orthopaedic surgery. In 2 (4%) cases infection was proven only by soft tissue biopsies (negative sonication), 7 cases (14%) were diagnosed by soft tissue biopsies and sonication, additional 10 cases (20%) were diagnosed only by sonication of explanted prosthetic material. In 31 cases (62%) all results were negative and no specific therapy was given.

Conclusions: We believe that sending retrieved prostheses to sonication aside from making microbiologic cultures of soft tissue biopsies and swaps can improve detection of present microorganisms. Sonication should be considered in dubious cases and after preoperative administration of antimicrobial agents, but still only as surrogate method.

O092 AUGMENTING DIAGNOSIS OF INFECTION USING SONICATION OF REMOVED PROSTHESSES
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University Medical Centre Ljubljana, Clinical Department for Orthopedic Surgery, Ljubljana, Slovenia

University Medical Centre Maribor, Institute for Public Health – Center for Microbiology, Maribor, Slovenia

Background: Infection of prosthetic orthopaedic material can be hard to prove and difficult to treat. Diagnosing infection is especially hard in the absence of obvious clinical signs of infection. Golden standard in dubious cases is obtaining soft tissue biopsies and tissue and synovial fluid analysis. Sonication is an advanced diagnostic tool for diagnosis of infection. Adherent bacteria from biofilm are more readily recognized using sonication of explanted prosthetic material. The procedure is simple, sensitive and relatively cheap.

Methods: In cases where we were uncertain if the infection was present we removed prosthetic parts and just a part of it during the operation. Metallic or ceramic parts were sonicated and cultured and obtained samples were made. We also obtained tissue samples and soft tissue biopsies in all patients during the operation. In cases of infection, additional therapy was given if infectious disease was diagnosed.

Results: We studied 50 cases (46 patients) operated for revision (2 cases of spine surgery, 2 cases of revision foot surgery, 2 cases of revision tumor prosthetics and 44 cases of revision arthroplasty of hip or knee) during the period from February 2008 to March 2010 treated in our Clinical Department for Orthopaedic Surgery. In 2 (4%) cases infection was proven only by soft tissue biopsies (negative sonication), 7 cases (14%) were diagnosed by soft tissue biopsies and sonication, additional 10 cases (20%) were diagnosed only by sonication of explanted prosthetic material. In 31 cases (62%) all results were negative and no specific therapy was given.

Conclusions: We believe that sending retrieved prostheses to sonication aside from making microbiologic cultures of soft tissue biopsies and swaps can improve detection of present microorganisms. Sonication should be considered in dubious cases and after preoperative administration of antimicrobial agents, but still only as surrogate method.

O093 STUDY OF HIP IMPLANT FIXATION BY DUAL-ENERGY X-RAY ABSORPTIOMETRY: LONG-TERM EVALUATION
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1 Department of Orthopaedics, University of Salamanca, Salamanca, Spain
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The hip prostheses of biological anchorage can be affected by zones of peri-prosthetic lysis, diffuse slimming of the femoral cortical, focal cystic injury, distal migration of the stem and bony atrophy in the proximal zone of the femur. The bone integration of an anatomical model of hip prosthesis, quantifying the peri-prosthetic bone changes by Dual-Energy X-Ray Absorptiometry (DEXA) is valued. The Bone Mineral Density (BMD) is studied in g/cm², with qualified personnel (interexploratory mistake of variability of 1.6-2%), suitable position (projection A-P in both hips), 6 min by session and 3 mRem/session of radiation. The total hip prostheses analyzed are ABG-II (Stryker©) (n=93). The period of
follow-up was 1997 to 2003, divided in two groups (9-5 years and 5-10 years). In the area 7 of the femur was estimated a loss of BMD from 5 to 18 % (p<0.001), followed by the trochanteric zone with a loss of 7% (p<0.05). In the internal metaphyseal zone there was targeted an increase of the BMD of 5%. In the tip of the stem, a decrease of the BMD is targeted, if the first and second group of follow-up are compared. This will give as consequence a decrease or absence of the “tip effect” with the passage of time in a stem of anatomical characteristics. In the area 1 of DeLee appeared an increase of the BMD, which translates a zone of major compression. In the area 3 it appreciates a decrease of the BMD for being a zone of minor transfer of loads.

Conclusions: We reported a comparatively high percentage of coincidence in assessment of displaced fractures of femoral neck using the most common three methods (46.7%). The highest degree of identity was found when the observers were evaluating CT - images 21 (70%). The role of conventional X-rays and 3D-reconstruction is approximately equal. These results gave us grounds to recommend the CT scan as an important and requisite imaging method for establishing the type of displaced femoral neck fracture. It is easier to estimate Garden’s type IV fractures using imaging methods than other type of Garden’s fractures.

0096

MORPHOMETRIC EVALUATION OF PROXIMAL FEMUR IN PATIENTS WITH UNILATERAL TOTAL HIP PROSTHESIS

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Background and aim: Knowledge of the morphometric features of the proximal femur is essential and significant in order to reduce vascular and metabolic complications, complications related to surgery performed due to trauma, and to achieve prosthesis adjustment. In this study, we aimed to set up a database for making and performing total hip prosthesis by evaluating the morphometric features of the proximal femur.

Material and method: In our study, antero-posterior pelvis X-Rays of a total of 162 subjects (69.75% females and 30.25% males) with the mean age of 65.8 years (range 24-93) who had undergone unilateral total hip arthroplasty at the Department of Orthopedics and Traumatology in the Dokuz Eylul University Hospital between 2003 and 2008 were used. Landmarks were determined and defined for all parameters. The caput femoris diameter (CFD), collum femoris width (CWF), collum femoris length (CFL), collum femoris axis length (CFAL), intertrochanteric length (LIL), and the inclination angle (IA) of digital radiographies obtained in the setparcas media of the computer were measured digitally using setparcas’ own measurement program.

Results: CFD was measured as 48.1±3.7 mm (females 46.4±2.6 mm, males 52.0±3.2 mm), CWF was measured as 35.4±4.2 mm (females 33.7±3.2 mm, males 37.2±3.6 mm), CFL was measured as 30.8±6.1 mm (females 29.5±5.2 mm, males 34.2±6.6 mm), CFAL was measured as 98.6±9.4 mm (females 95.2±6.6 mm, males 106.7±9.8 mm), LIL was measured as 81.1±7.9 mm (females 78.5±6.8 mm, males 87.1±7.4 mm), and IA was measured as 130.4±5.1º (females 130.1±4.9º, males 130.9±5.4º). A statistically significant difference was found between the CFD (p=0.006), CFL (p=0.031) and CFAL (p=0.008) values of males and females when the mean values were compared. A poor relationship was found in the age- parameter values in the correlation test (r=0.20, p>0.05).

Discussion: Assessment of the caput femoris diameter, collum femoris axis length, collum femoris width and inclination angle along with age, gender, bone mineral density and racial factors is important in terms of the risk of fracture in subjects with proximal femur pathologies (collum femoris fracture, subcapital fracture, subtrochanteric fracture, intertrochanteric fracture). We also suggest that morphometric assessments for femoral component design in the surgical interventions of the proximal femur, especially in arthroplasty practices, will contribute to this matter.

Conclusion: Taking the regional and sexual differences into consideration in the morphometric assessments of the proximal femur is important in terms of prosthesis design and surgical achievement.

0097

METAL-ON-METAL RESURFACING OF THE HIP WITH KINEMATIC NAVIGATION: FOLLOW-UP 4 YEARS

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Purpose: We evaluated the initial results of 82 Articular Surface Replacements (ASR) of the hip joint inserted with kinematic navigation. The main purpose of the study was to analyze the functional, clinical and radiographic outcomes.

Method: Between March 2006 and March 2007 we performed 82 resurfacings of the hip using the Articular Surface Replacement (ASR-DePuy) with the kinematic navigation (CI system). There were no bilateral cases. The ASR is a hybrid

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The aim of this study is to analyze the results obtained in 60 patients with a THR.

Introduction:

Clinical and radiological findings (pre and post surgery) were studied prospectively. No infection has been noted. 90% of the patients were satisfied with the result. Postsurgical complications were noted: during the first three months (2 dislocations, 1 hip resurfacing, 1 infection, 1 heterotopic bone formation).

Discussion and conclusions: This technique allows a better positioning of the implant and improves the reproducibility of the technique, but when the surgeon is skilled and experienced the difference between those techniques is not significant. CAOS allows a better joint reconstruction and facilitates the implantation of the prostheses in patients with very deformed hips.

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Conclusion: Articular Surface Replacement of the hip joint with modern design, reproducible instrumentation and kinematic navigation can eliminate the previous cause of osteolysis, failures and loosening. Postoperatively, there was no femoral component had evidence of loosening. No osteolysis was identified in the proximal femur.

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O101 ANALYSIS OF CHANGE IN PROXIMAL FEMORAL NECK MORPHOLOGY OF PATIENTS UNDERGOING BIRMINGHAM TOTAL HIP RESURFACING USING AN ANTEROLATERAL APPROACH
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Background: Many failures of total hip resurfacing in patients with idiopathic osteoarthritis have been related to specific anatomical characteristics of the proximal femur.

Aim: To analyse specific proximal femoral anatomical characteristics, groin pain and limitation in flexion in a series of 250 Birmingham total hip resurfacing performed by a single surgeon, using an anterolateral approach.

Methods: Prospectively collected preoperative and postoperative clinical and radiological records were evaluated in 250 hips with osteoarthritis, with a mean age 56 years (35 to 64 years) and male: female ratio of 1:0.58, with a minimum follow-up of 2 years. Changes in head: neck diameter, neck shaft angle, neck length, offset, cup inclination angle, incidence of neck thinning was evaluated and patients were questioned directly about groin pain and limitation of hip function. Clinical outcome was calculated using SF-36 and womac scores.

Results: Femoral head component size under 50mm and those with increased head:neck ratio were more likely to have neck thinning, however those with calcar buttress and decreased head: neck ratio were found to get groin pain.

Conclusions: Proximal femoral morphology is an important factor in determining success of total hip resurfacing.

O102 PERCUTANEOUS COMPRESSION PLATE VERSUS GAMMA-NAIIL IN THE TREATMENT OF INTERTROCHANTERIC HIP FRACTURES
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The aim of this study is to compare the Percutaneous Compression Plate (PCCP) (Gottfried®) with the standard Gamma Nail (GN) (Stryker®) in the intertrochanteric fractures of the hip. The work consists on the comparison with a historical cohort of intertrochanteric fractures of hip: 82 treated with PCCP versus 81 managed with GN, between 2006 and 2008 (AO type 31A1, 31A2). The variables of evaluation were: Time of surgery, blood loss (Hto, Hb, Hem and transfusions), complications, hospital stay and costs with a follow-up of one year. The postoperative decrease in the levels of haemoglobin was of 1.7 and 2.3 g/dl, respectively for every group (p<0.05). The group PCCP had 50% less of units transfused (0.8 units vs. 1.7 units, p<0.0001). 38% of the patients treated with PCCP needed transfusion in comparison with 68% from those of GN (p<0.0001).

The minimally invasive technique PCCP resulted in a minor loss of blood and consistently needed a minor transfusion of blood and had fewer complications related to the implant. The surgical time was minor in the series of GN and the surgical costs were minor in case of the PCCP in terms of healing, reoperations, stays and analytical and transfusions.

O103 A SIGNIFICANT HIGH NUMBER OF COMPLICATIONS WITH THE USE OF AN INTRAMEDULLARY NAIL IN TREATING INTERTROCHANTERIC FRACTURES. THE IMPORTANCE OF CHOOSING THE PROPER INTRAMEDULLARY DEVICE
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Background: The incidence of the intertrochanteric fractures is high in older people due to osteoporosis and will probably continue to increase because of population aging. The goal of treatment is a stable osteosynthesis to allow immediate mobilization. At the present time, the use of intramedullary nails gains a mediate mobilization. At the present time, the use of intramedullary nails gains a great popularity and different devices have been used with satisfactory results.

Aim: To record the outcomes and effectiveness of an intramedullary nail in the treatment of intertrochanteric fractures.

Methods: During the period July 2005 to June 2007, 105 patients with an intertrochanteric fracture were operated using the ENDOVIS (Citieffe) nail. All patients sustained a low energy injury and fracture stability was assessed according to the Evan’s classification. Data recorded were the type of the fracture, blood loss, mobility status pre- and postoperatively, duration of hospital stay, postoperative complications and mortality rate at 12 months.

Results: Blood loss, transfusion requirements, hospitalization and mortality rates were similar to previous studies concerning the treatment outcomes in intertrochanteric fractures. However, there were a significant higher rate of mechanical complications regarding the failure of distal locking, femoral shaft medialization, cut out, Z-phenomenon, proximal screws back out, screw joint penetration, with the use of ENDOVIS nail. The high percentage of complications adversely affected the overall functional and walking competence of the patients.

Conclusions: The results show a considerable number of complications with the use of the ENDOVIS nail. Its design characteristics and instrumentation possibly influence negatively the operative outcome, rendering this nail unreliable in the treatment of intertrochanteric fractures, especially the unstable ones. The choice of the proper implant seems to be of great importance in the final outcome in treating these fractures.

O104 DOES THE INTRAMEDULLARY NAILING SUBSTITUTE THE SHS?
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Purpose: To present our clinical experience considering the complications and the need for revision after surgical treatment of peritrochanteric fractures of the hip with sliding hip screw (SHS) and intramedullary nailing (IMN).

Material and methods: We reviewed 59 fractures of the hip treated with SHS (stable) and 111 with IMN (stable and unstable) from 2005 until 2008. All patients were studied clinically (HHS) and radiologically (TAD), with a mean postoperative follow up of 8 months. We also studied the mean time of surgery, complications and time of consolidation.

Results: The mean time of surgery was 55 minutes for SHS and 32 minutes for IMN. The mean hospitalization period was 18 and 15 days and the mean HTO was 85 and 89. We have observed screw cut out in 5 patients treated with SHS (unstable fracture, eccentric position of the screw) and they have been revised. In the group of IMN 4 patients had superficial soft tissue infection and 4 patients had failure of the implant (gap>10 mm, subtrochanteric unstable fractures). In total 8 patients were revised in total hip arthroplasty because of screw cut out and implant failure.

Conclusion: The treatment of the stable intertrochanteric fractures is still safe and has a low complication rate with either the SHS or the IMN technique. Increased use of the IMN is advocated because of the advantages of minimally invasive techniques. The complication rate is correlated with the correct implantation technique. Absolute reduction without gap (<5mm) and positioning of the screw in the centre of the femoral head (TAD>25) are essential.

O105 G3-TROCHANTERIC NAIL FOR TREATMENT OF SUB-TROCHANTERIC FRACTURES OF THE HIP
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Purpose: Presentation/evaluation of the results of G3-trochanteric nail for treatment of sub-trochanteric fractures of the hip.

Material and methods: Forty-eight (48) patients aged 54-87 years old (average: 74.6 yrs) with sub-trochanteric fractures of the hip were treated in our department with G3-trochanteric nail. Twenty-eight (28) patients were women and twenty (20) were men. Twenty-six (26) fractures were located in the left hip and twenty-two (22) in the right one. All patients were operated by the same surgical team within 3 days of injury in 85% of the cases. The duration of the procedure was between 45-70 minutes. Post-op, the patients were mobilized early with at least partial weight bearing and were followed-up clinically and radiologically for 7-27 months.

Results: 90% of the fractures were united within 14 weeks uneventfully. Open reduction was needed in 12.5%. In five cases, bone grafts were used. Four (4) cases of superficial wound inflammation and two cases of haematoma were noticed. All above cases were treated successfully. 79% of patients achieved the pre-op status of rehabilitation.

Conclusions: The results of this study show that G3-trochanteric nail seems to be a reliable method for the treatment of sub-trochanteric fractures of the hip; and it could be considered as treatment of choice for them.
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O106
INTRAMEDULLARY FIXATION OF PERTROCHANTERIC HIP FRACTURES WITH GAMMA LOCKING NAIL SYSTEM
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Aim: Surgical fixation, early weight bearing and bony union remain a challenge in the treatment of pertrochanteric hip fractures. The Gamma Locking Nail is a device designed for the treatment of unstable trochanteric femoral fractures. This study reports the outcome in such fractures treated using this device in our hospital.

Methods: Between 2007 and 2008 we studied prospectively 120 hip fractures treated with Gamma Locking Nail. Their mean age was 78.5 (62-88) years, and 85 were female. The fractures were classified on the basis of the preoperative x-rays as 12 A1 (stable pertrochanteric), 73 A2 (unstable pertrochanteric), and 35 A3 (unstable intertrochanteric) fractures. The mean follow-up time was 8 months (4-12).

Within this period, there were 8 deaths and 4 patients were lost to follow up.

Results: The operations were reduced by closed means, with an average duration of operation of 48 minutes and little blood loss. Intraoperative technical complications occurred in 2 patients with the distal locking. The mean healing time was 8.5 weeks in 96.3% of the cases. There were 4 cases of delayed consolidation but no pseudarthroses. Postoperative complications occurred in 12 cases (11.1%). One case of migration of the proximal screw was the most serious complication. The most frequent complications (7) were seromas and hematomas of the surgical wound, which resolved satisfactorily in all cases. Superficial infections (4) responded well to the appropriate antibiotic treatment. The patient’s recovery after suffering the fracture and the operation were evaluated and 80% (86 patients) recovered their previous walking ability.

Conclusions: The Gamma Locking Nail is a promising method for the treatment of pertrochanteric hip fractures. This implant enables the surgeon to treat intertrochanteric and high subtrochanteric fractures with a less invasive technique, and permits early mobilization and unprotected weight bearing with excellent clinical results.

O107
CHONDROSARCOMA OF THE Iliac (ZONE II)/III – CASE REPORT
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Chondrosarcoma is the second most frequent primary malignant tumour of bone, representing approximately 25% of all primary bone neoplasms. Chondrosarcomas are a group of tumours with highly diverse features and behaviour patterns, ranging from slow-growing non-metastasizing lesions to highly aggressive metastasizing sarcomas. As radio and quimio-resistant tumours, surgery provides the only chance of cure. Nowadays, besides the curative intention, reconstructive surgery is also a priority in order to save the limb and optimize function.

This case report is about a young woman, 24 years old, with hip-related pain and a large mass in the left pelvis. The imagologic study showed a large mass of about 8 cm diameter, starting at the anterior wall of the acetabulum, involving the pubic arcs and with matrix calcification. The core needle biopsy confirmed the presence of a chondrosarcoma, staged as a IIIb of Enneking. Because of its size and location the limb salvage surgery was a challenge. The surgery included a broad approach of the left hemipelvis, with wide excision of the tumour, reconstruction of the abdominal wall with a propylene prostesis and reconstruction of the hemipelvis with a “custom-made” prostesis with preservation of the femoral neurovascular bundle. The patient started to walk with total bearing after three months and had a normal gait and a nearly normal life after eleven months. Fifteen months after the surgery lung metastasis and local recurrence were diagnosed and she died six months later.

Conclusion: The surgery is our unique weapon in the “combat” against the chondrosarcoma. The reconstructive surgery must be considered to give our patients the best functional result and quality of life.

O108
ANATOMO-PATHOLOGICAL CLASSIFICATION OF DYSPLASTIC ARTHRITIS AND ALGORITHM OF THE SURGICAL TREATMENT
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In adults, Dysplastic Arthritis (DA) often requires a Total Hip Arthroplasty that can be technically difficult. The most commonly used classifications of DA are those of CROWE and HARTOFILAKIDIS. The former calculates the degree of “Subluxation” of femoral head (4 Groups) while the latter divides DA into 3 Groups. In Grade 1 (“Dysplasia”), the head is still contained inside the Acetabulum that shows an hypoplastic antero-lateral wall. In Grade 2 (“Low Dislocation”), the head is articulated with a large, flat and antiverse surface formed by PALEO- and NEO-acetabulum overimposed. All wall are severely hypoplastic. Finally, in Grade 3 (“High Dislocation”), the head is migrated proximally and posteriorly and there is no contact with the PALEO-acetabulum that normally is highly atrophic and even convex.

In the last 20 years, in DA we have used the following protocol: 1) in Grade 1 we perform a single-stage THR in a routine manner; the cup has to be medialised reaming the posterior acetabular wall 2) in Grade 2 we perform a single-stage operation, sometimes with intra-operative monitoring of Sciatic Nerve function; 3) in Grade 3 we use an original two-stage procedure with progressive lowering of femoral epiphysis followed by THR. The first stage consists in a fascio-mio-arthrolysis (Adductor’s tenotomy, gluteal fasciectomy, Psoas’ Z-lengthening, capsulotomy, femoral head resection) and application of an External Fixator. Then we start a progressive lowering of the femoral epiphysis until the femoral neck is in the position to allow a THR with the cup in the paleo-acetabulum. We have used this technique in 15 cases. The average limp lengthening was 5.1 cm. In all cases we have used a straight, cementless, conical stem with met-met articulation. Lateral grating was required in 3 cases (20%). Satisfactory results were obtained in 11 cases (73%). No nerve palsies and no pin site infection were seen. One dislocation occurred and was treated conservatively. One cup needed revision for loosening. No femoral component was revised. THA in CDH arthritis is more difficult and requires particular experience of the Surgeon in order to get good results.

O109
CLASSIFICATION OF DDH IN ADULTS USING CT IMAGING
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Background: All the traditional methods of analysis and classification for hip dysplasia and dislocation concentrate on frontal-plane analysis of the hip. Transverse-plane anatomy of the acetabulum is very important for the reconstruction of the acetabulum and is available only after a CT scan.

Aim: To develop a classification system of DDH in the Adult using the CT-imaging to supplement the existing classification systems and to be used in the planning of total hip arthroplasty.

Patients and methods: 16 patients (29 hips) with DDH were admitted for THA in our institution. All the patients underwent plain AP x-rays and CT/3DCT of the pelvis.

The acetabular deficiency was classified according to Hartofilakidis et al classification in the frontal plane. Further we classified the acetabulum deviation as Retroverted (≤ s30’), Neutral (0-30’) or Anteverted (≥ s30’) in the transverse plane based on the CT scan of the pelvis.

Results: According to Hartofilakidis et al classification, there were 11 hips type-1 (dysplasia), 8 hips type-2 (low dislocation) and 10 hips type-3 (high dislocation). Using the proposed classification in the transverse plane 17 hips were classified as Neutral type, 9 hips as Anteverted and 3 hips as Retroverted type.

Conclusion: The CT scan offers a new dimension to the pre-operative evaluation of the adult dislocated hip. It gives three-dimensional data on the quality of bone, it helps determine the choice of placement of the socket, the size of the socket and most important the technique and the need for supplemental bone graft according to the direction of the acetabulum. Acetabular anteverision was not found to be consistently increased. Retroversion of the acetabulum was found after pelvic osteotomy in a younger age or conservative treatment with plaster or traction in our cases and as well as in most of the cases found in the literature.

O110
TOTAL HIP REPLACEMENT WITH AN UNCEMENTED WAGNER CONE STEM FOR DYSPLASTIC HIPS
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A dysplastic hip is a challenge for an orthopaedic surgeon. Different alterations of the hip: overanteverted neck, displaced centre or hip rotation or dysplastic acetabulum are some of them. The use of a Wagner Stem is a resource for these hips with a Crowe I or II dysplasia. These stems allow the surgeon to correct the different alterations in the proximal femur. A small socket allows good bone coverage without great difficulties related to a too shallow acetabulum.
Material and methods: A retrospective clinical radiological review of 30 hips diagnosed of Hip Dysplasia Crowe I or II treated in our centre between 2002 and 2008.

All of them were treated with a Wagner Cone Stem and with a small Trilogy acetabulum (Zimmer®).

Results: 30 hips, 18 men and 12 women, 3 left and 17 right femurs. Mean follow-up 48 months (11-84). 13 patients were classified as Crowe I type and 17 as Crowe II type. Merle d’Aubigné and Postel score previous surgery was 12.23 and in the last follow-up was 15.54. Mean previous dismetry was 1.79 and after surgery was 0.69 cm. We had 3 cases of infection and 5 cases of dislocations (2 of them in the same patient) and 1 stem loosening. None acetabulum loosening was registered. 5 patients required reintervention (1 dislocation, 3 infection and stem loosening).

Discussion: The use of a Wagner Stem is a good option to correct the different alterations in the proximal femur in these cases. A small socket allows us a correct collocation of acetabulum in a dysplastic one with good bone coverage. The problem with this acetabulum is the use of a small head that increases the risk of dislocation.

O111 CEMENTLESS CONE STEM FOR THE TREATMENT OF ARTHRITIS FOLLOWING CONGENITAL HIP DISEASE
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Little experience exists in the Literature about the use of cementless cone stems in primary arthroplasties. The first Conical Stem was designed in the 80’s by Prof. Wagner. The stem is made of a rough blasted Titanium Alloy with a cone angle of 5° and 8 sharp longitudinal “ribs” that cut into the inner cortex, providing excellent rotational stability: The ribs depth of penetration ranges between 0.1 and 0.5 mm and is also very important to achieve osteo-integration. The CCD angle is 135°. The stem is straight and can be implanted indifferently in any degree of ante- or retroversion thus being indicated in dysplastic arthritis where we need to correct femoral neck anteversion.

Between 1993 and 1998 the Senior Author (RB) has implanted 92 consecutive cone stems in 88 patients with dysplastic arthritis. The acetabular component was cementless and in Titanium with tridimensional porosity. As articulating surface we chose second generation Metal-on-Metal in order to reduce peri-prosthetic osteoarticular loosening.

We always used a femoral head of 28 mm. The average follow-up was 11.2 years. According to the Hartofilakidis classification we had 63 patients of type A, 18 of type B and 11 of type C. Clinically we had 82 (89%) Satisfactory results, with excellent correction of preoperative diagnosis. The undesirable proximal reattachment was not possible in 9 hips (10%). The rate of union was statistically significant related to the position of reattachment of the trochanter which was greatly depended on the preoperative diagnosis. The undesirable proximal reattachment was not avoided in 21 hips (33%) with high dislocation, in 35 hips (38%) with low dislocation and in 6 hips (17%) with dysplasia. The preoperative Trendelburg gait significantly improved in all three types of the disease and in all four categories of reattachment of the trochanter.

In conclusion, this study indicates that the complications of trochanteric osteotomy in THA in patients with CHD are limited in comparison with the benefits offering, especially in cases with low and high dislocation, by a better exposure of the hip joint and easier reconstruction of the distorted anatomy of the acetabulum and the proximal femur.

O112 TOTAL HIP REPLACEMENT IN PATIENTS WITH FEMORAL DYSPLASIA USING STRAITGH CONICAL WAGNER-TYPE STEMS
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Aim: The evaluation of the middle term behaviour of the Wagner-type stems in dysplastic femurs and the presentation of the technical and surgical differences with the implantation of a Wagner stem.

Materials and methods: Between 1997 and 2009 we implanted 64 Wagner stems in 58 patients. Average age at the time of implantation was 64 years. 52 patients were operated because of DDH, 12 patients had had previous osteotomy. All patients were prospectively evaluated radiographically and clinically at annual intervals. Functional outcome was assessed with Harris Hip Score and Oxford Score.

Results: Mean follow-up of these series was 5 years (12-1). One stem was revised because of fracture of the lesser trochanter and two more patients were re-operated for open reduction. With the re-operation as end-point and 95% Confidence Interval the survivorship rate was 98, 5%. There were no progressive radiolucent lines. Stem migration was at an average 2mm (-1-8) during the first two years and remained stable thereafter. There was no deep infection in these series. After the second year a dense zone is evident in all Gruen zones at the implant–bone interface with a width of 2-3 mm.

Discussion: Dysplasia of the proximal femur may pose significant technical problems during THA due to the distortion of the geometry and the narrowing of the femoral canal. The sort, conical Wagner type stems can offer a very good alternative is such patients. They allow control of the anteversion and they are able to get a good press-fit despite the metaphysial/diaphysal mismatch and the femoral bowing.

Conclusions: Wagner type stems are a reliable alternative when performing THA in patients with dysplastic femurs.

O113 TROCHANTERIC OSTEOTOMY IN TOTAL HIP ARTHROPLASTY FOR CONGENITAL HIP DISEASE
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The purpose of this retrospective study was to evaluate the effect of trochanteric osteotomy (TO) in total hip arthroplasty (THA) in a special group of patients with congenital hip disease (CHD).

The study included 192 THA performed in 140 patients with different types of CHD during the period 1976 – 1996. Parameters that were evaluated included: the position of reattachment (original bed, distal, lateral femoral cortex, proximal) and the union rate of the trochanter, breakage of the wires, presence of heterotopic ossification, dislocation, nerve palsy, bursitis, Trendelenburg gait and aseptic loosening of the components.

Bony union was noticed in 158 hips (82%), fibrous union in 19 hips (15%) and nonunion in 5 hips (3%). The rate of union was statistically significant related to the position of reattachment of the trochanter which was greatly depended on the preoperative diagnosis. The undesirable proximal reattachment was not avoided in 21 hips (33%) with high dislocation, in 35 hips (38%) with low dislocation and in 6 hips (17%) with dysplasia. The preoperative Trendelburg gait significantly improved in all three types of the disease and in all four categories of reattachment of the trochanter. A persistent Trendelburg gait postoperatively was noticed mostly in patients with defective union (fibrous union and non-union). Acetabular and femoral loosening after 14 years minimum follow-up (14 – 34 years) was statistically significant related with defective union and with the position of reattachment of the trochanter. Other complications (dislocation, nerve palsy, heterotopic ossification and bursitis) were rare.

In conclusion, this study indicates that the complications of trochanteric osteotomy in THA in patients with CHD are limited in comparison with the benefits offering, especially in cases with low and high dislocation, by a better exposure of the hip joint and easier reconstruction of the distorted anatomy of the acetabulum and the proximal femur.

O114 CEMENTLESS TOTAL HIP REPLACEMENT IN PATIENTS WITH SEVERE DEVELOPMENTAL DYSPLASIA OF THE HIP
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Background: Total hip arthroplasty in patients with high congenital dislocation of the hip is a technically demanding procedure. According to the literature, the acetabular component should be placed at the site of the original acetabulum. To avoid excessive limb lengthening, appropriate shortening of the femur should be performed.

Aim: The presentation of our experience with cementless total hip replacement in patients with severe developmental dysplasia of the hip.

Material and method: The study included twenty-three total hip replacements, 15 women and 8 men with mean age 58 years (46 to 70), performed between 1999 and 2009 in twenty-two consecutive patients with high congenital hip dislocation, grade III by Hartofilakidis. In all cases we used a cementless acetabular component fixed with screws, which was placed at the place of the original acetabulum. In cases where the coverage of the acetabular component was less than 70%, we advocate the use of cotyloplasty technique (controlled...
fracture of the acetabular floor and medialization of the component). Extreme lengthening of the limb was controlled by osteotomy of the proximal part of the femur. The mean follow-up is 4.8 years.

Results: The mean Harris Hip Score improved from 57 preoperatively to 82 at the time of last follow-up. Until today no revision arthroplasty has been performed in any patient and there is no radiographic or clinical suspicion of any asptic loosening in anyone of the arthroplasties.

Conclusions: The combination of total hip replacement with placement of the cementless acetabular component at the site of true acetabulum and proximal femoral shortening, in patients with severe developmental dysplasia of the hip can be considered as a technically demanding but relatively safe procedure. It allows appropriate lengthening of the affected limb, stability of the prosthesis and it has a low complication rate. Short and mid-term results are excellent but longer follow up is needed.

O115

COTYLOPLASTY TECHNIQUE – OUR EXPERIENCE

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Background: Developmental dysplasia of the hips is a challenge, which needs to be overcome to give patients the best possible outcome of total hip replacement.

Aim: To achieve anatomical and biomechanical orientation of the acetabular cup by controlled surgical deeping of the shallow acetabulum during total hip replacement.

Method: Acetabulum is exposed and assessed for its orientation and depth. After reaming of the acetabulum a curved gouge is used to create controlled osteotomy / fracture of the medial wall / floor of the acetabulum. This is then deepened using the trial prosthesis and true roof of the acetabulum is created. It is filled by autologous bone graft on which the acetabular cup is positioned. Thus allowing stability to the prosthesis during weight bearing and maintains the true biomechanics of the hip joint with correct lever arm.

Results: 12 patients over period of two years, 3 patients had bilateral procedures. Mean preoperative Harris hip score was 40.3. Mean post operative Harris hip score was 93.1. No complications were encountered. No patient required revision of the acetabulum. In 4 patients uncemented cotyloplasty was performed. Results are promising in all patient up to date will all returning to working life post surgery.

Discussion: Cotyloplasty helps surgeon to achieve correct anatomical alignment of the acetabular cup during total hip replacement. Although the described cotyloplasty technique uses cement, more work is required to ascertain if uncemented cotyloplasty can prove as successful as cemented version.

O116

MEDIAL WALL IATROGENIC DEPRESSIVE FRACTURE IN ACETABULAR DYSPLASIA

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The aim of the present study is to evaluate the results of an intentional fracture of the medial wall vascular fracture in treating shallow and wide acetabulum for primary Total Hip Replacements.

Methods: From June 2002 to December 2005, twenty patients (seven men and thirteen women) from 48 to 75 years of age suffering from acetabular dysplasia have had the medial wall depressive fracture. After marking the bottom of the acetabulum using a trampeoideal shape small reamer, a metal ball point pusher put onto that and hammered until a satisfactory depression was achieved. Reaming was then carried out, up to the diameter of the preparoceptive planning and intraoperative findings. Piece meals autografts from the femoral head were poured into the medial wall for better cup bonding. Then a non cemented metal backed acetabulum was screwed into place.

All patients postoperatively were allowed to PWB for six weeks and then according to clinical and x-rays evaluation, progressively from partial to PWB as tolerated for the next six to eight weeks.

Results: There was no infection, dislocation or neurovascular damage. Harris hip score was improved from 47.5 to 86.5 (median). All patients were satisfied and stated that they would recommended the operation to another patient.

Conclusion: The iatrogenic medial wall depressive fracture preserves a quite good bone block medially, helps to avoid excessive medial wall thinning and provides a better acetabulum back ground for any revision procedure. It also allows working within the true acetabulum and allows cup medialization.

O117

CEMENTLESS HIP ARTHROPLASTY IN CONGENITAL DYSPLASIA OF THE HIP: A RETROSPECTIVE STUDY COMPARING BULK FEMORAL AUTO-GRAFTS AND OVAL CUPS FOR ACETABULAR RECONSTRUCTION

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Background and aims: Spherical cup systems do not allow anatomical reconstruction of all acetabular defects in congenital hip dysplasia. With cranial bone deficiency, augmentation with bulk autografts becomes necessary. However, autograft reconstruction is associated with the need of protected weight bearing and the risk of graft resorption or fracture. Alternatively, oval cups with asymmetrical caudal placement of the liner allow press-fit filling of cranial acetabular defects with anatomic reconstruction of the hip center. The present study was performed to compare mid-term results of the two described methods after cementless hip arthroplasty.

Methods: A total of 92 patients received a cementless total hip arthroplasty for major acetabular deficiency due to congenital dysplasia of the hip between 1999 and 2006. 68 patients were available for clinical and radiographic analysis in this monocentric retrospective study at a mean follow-up of 6.5 years (12–13 months). 32 patients had been treated with a cementless asymmetric oval cup (Cranial cup, ESKA implants, Germany), and 34 patients had been treated with a hemispherical press-fit cup (ESKA implants) and acetabular augmentation with a femoral bulk autograft. Mean patient age at the time of operation was 54.6 years (31–89), with 49 female and 17 male patients. Primary outcome measure was implant survival. Secondary outcome measures included Harris-Hip-Score, pain as measured by a 10-point visual analogue scale as well as radiographic evaluation according to the criteria of the Consensus Study Group for cementless implants. Radiographic evaluation was performed and involves insertion of some cement into the femur. Each of these factors could potentially increase the risk of DVT. To answer the question: “Does HRA lead and involves insertion of some cement into the femur. Each of these factors could potentially increase the risk of DVT. To answer the question: “Does HRA lead to greater risk of thromboembolism compared to non-cemented total hip replacement (THR)?” – markers of thrombin generation during surgery were assessed in a blinded, prospective fashion, to measure the degree of thrombogenesis.

Method: Twenty patients receiving HRA and 20 receiving THR, less than 65 years of age, by two surgeons and a single anesthesiologist were studied. Radial artery blood samples were taken at the following events: (1) prior to incision, (2) after femoral head osteotomy (THR) or after femoral head exposure (HRA), (3) following insertion of the cup, (4) after femoral reaming (THR) or after resurfacing (HRA), (5) following hip relocation, and (6) wound closure. Samples were subsequently assayed for prothrombin fragment F1+2 (F1+2) and thrombin-antithrombin III complex (TAT) using ELISA assays.

Results: Patients were similar in height, weight, ASA status and gender mix. HRA patients were significantly younger (50 ± 8 years vs. 59 ± 6 years, p<0.0005), their surgery was significantly longer (87 ± 14 min vs. 65 ±13 min, p<0.0001)
and required more crystalloid during surgery (2193 ± 489 mL vs. 1862 ± 356 mL, p=0.005). F1+2 and TAT increased significantly during surgery and there were no differences at respective surgical events between patients having HRA and THR.

**Conclusion:** There is no difference in thrombin generation during surgery between HRA and THR suggesting that HRA should be considered at similar risk of thromboembolism to THR.

**O119**

**GORHAM’S DISEASE OF THE HIP**

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**Background:** Gorham’s disease is a very rare disorder characterized by progressive spontaneous resorption of one bone or contiguous bones. The diagnosis is difficult and is based on clinical, radiological, and histopathological findings.

**Aim:** Because of the rarity of the lesion we present a case report of a patient with Gorham-Stout syndrome of the hip. We aimed to discuss the clinical features of this rare entity with respect to our case.

**Methods:** 55 year old male patient was admitted with persistent right hip pain, decreased range of motion, 3 cm shortening. He was on medical treatment for chronic psychic disorder. Laboratory investigations were within normal limits. His radiography revealed vanishing of the hip joint. T1 coronal MRI images revealed joint effusion and SPAIR T2 MRI scans revealed isointens signal intensity with respect to muscles suggesting fibrosis.

**Results:** Open biopsy was performed for definitive diagnosis. The biopsy specimen revealed dilated vascular channels lined by endothelial cells, osteoclastic activity and areas of fibrosis which is well correlated with Gorham’s disease. The microscopic analysis of the biopsy specimen was negative. Girdlestone operation was preferred because of the co-morbid factors of the patient and unpredictable prognosis of the disease.

**Conclusion:** This case report draws attention to the massive osteolysis of the hip. A high index of clinical suspicion is needed for the diagnosis of Gorham’s disease. The approach to Gorham osteolysis is based on exclusion principle with well established team work.

**Fig. 1:** Resorption of the right femoral head and neck. Widening of the acetabulum is also remarkable.

**Fig. 2:** Axial CT scan reveals tapering of the proximal femoral neck and typical scalloping (white arrows).

**Fig. 3 (A, B):** T1 coronal images reveals joint effusion (black arrows). SPAIR T2 MRI scan reveals isointens signal with respect to muscles suggesting fibrosis (white arrows).

**Fig. 4 (A):** Sclerosis in spongious bone and dilated vascular channels in intertrabecular area (H&E, X20). **B:** Absence of muscular zone in the dilated vascular structures Mason Trichrom, x100.

**O120**

**THE GENETIC INFLUENCE ON SEVERE SYMPTOMATIC PRIMARY OSTEOARTHRITIS OF THE HIP. A REGISTERBASED TWIN STUDY**

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**Background:** In the past decades an additive genetic influence on osteoarthritis has been established. However, data on the additive genetic influence on severe symptomatic primary osteoarthritis of the hip are indeed few.

**Aim:** To assess the additive genetic contribution to symptomatic primary osteoarthritis of the hip requiring hip replacement surgery in men and women.

**Methods:** The Danish Twin Registry comprises more than 75,000 twin pairs. In 1995 The Danish Hip Arthroplasty Registry was established and comprises more than 70,000 patients of which approximately 2% will be twins. Data on all twins from The Danish Hip Arthroplasty Registry with the diagnosis of primary osteoarthrits of the hip are sampled by merging the two registries. Twins with unknown zygosity (UZ) and opposite-sex dizygotic (OS-DZ) twins are excluded. Analysing the observed twin data Structural Equation Modelling is implemented using the statistical software R and OpenMx. Structural Equation Modelling is a standard approach often used in the analyses of twin data and assigns variation among traits in a twin population to additive genetic factors (A) and factors in the environment that may be common to members of a twin pair (C) or unique to individual twins (E).

**Results:** Analyses are in progress.

**Conclusion:** To be drawn.

**O121**

**HELIXOR® VERSUS ILOMEDINE IN THE TREATMENT OF OSTEONECROSIS OF FEMORAL HEAD. EXPERIMENTAL STUDY IN RABBITS**

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We compared therapeutic effects of two pharmacological options in the treatment of experimentally induced osteonecrosis of femoral head (ONFH); ilomedine, a vasodilator the most commonly used agent and Helixor®, an extract of viscum album, mainly anticarcinogen and used empirically by local people for the treatment of various hip disorders.

We experimentally used surgical vascular deprivation method to induce ANFH in 27 rabbits. First group (n=9) used as controls, second group (n=9) treated by ilomedine in dosage of 2 ng/kg/min, and third group (n=9) treated by Helixor® in increasing dosage from 0.1 mg to 1 mg. Both agents administrated intravenously starting from 5th postoperative day and lasted 5 days. All rabbits were sacrificed by the 30th day following surgery. Femoral head specimens were examined histopathologically for the presence and extent of necrosis and repair tissue; and morphometric trabecular volume. Quantitative data were analyzed statistically for possible differences.

Presence of ONFH was confirmed in all femoral heads. Both treatment groups were superior to control group in the extent of necrosis and formation of repair tissue. Both osteoblastic and osteoclastic activity and new bone formation were significantly superior in ilomedine group. However, Helixor® group demonstrated significantly less cartilage degeneration and increased trabecular volume. There was no difference between two treatment groups in femoral head deformation.

Helixor® can have a potential role alone or combined with ilomedine in the pharmacological treatment of ONFH.

**O122**

**HYDROGELS ENRICHED BY HUMAN BONE MARROW Stromal CELLS AS A FUTURE TOOL TO IMPROVE OSTEO-INTEGRATION OF TITANIUM IMPLANTS**

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**Background:** Titanium is widely used for several medical implants and many surface treatments have been developed to enhance osteo-integration of implants, however, the interface between graft and bone remains the weakest point during the initial healing period.
AIM: Hydrogels are easily colonized by cells and may represent an alternative approach to titanium implants coating. In this study we tested the properties of an amidated carboxymethylcellulose hydrogel (CMCA) obtained by converting about 50% of carboxylic group of carboxymethylcellulose into amicid groups (provided by Lima-Lto) and enriched with human bone marrow stromal cells (BMSCs), that have already been used for bone regeneration applications, thanks to their great osteogenic potential.

METHODS: In our study we isolated BMSCs from patients undergoing total hip replacement and we tested different seeding methods to obtain a viable bioconstruct with a homogeneous cell distribution. We analyzed the cytotoxicity of CMCA at different time points and evaluated the adhesion and viability of cells cultured on this biomaterial in the presence of osteo-inductive medium.

In order to set up a reproducible seeding procedure we aliquoted fixed volumes of CMCA in 24-multiplates; hydrogels were then air-dried, rehydrated with a cellular suspension (1x10^6 BMSC) and maintained in osteo-inductive medium.

RESULTS: CMCA did not show any significant cytotoxic effect on BMSCs as demonstrated by Alamar Blue® assay. Cells were able to colonize CMCA, with a full-thickness distribution, and to maintain their viability as shown by Live/Dead assay; these observations at fluorescence microscopy were also confirmed by Alamar Blue® viability test.

DISCUSSION AND CONCLUSIONS: These preliminary results demonstrate that CMCA is a good support for BMSC growth and therefore may be considered a promising candidate for future clinical applications in the field of bone tissue engineering.

O125 TOTAL HIP ARTHROPLASTY AFTER PREVIOUS ACETABULUM FRACTURE FIXATION
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BACKGROUND: Acetabulum fracture is a high energy fracture of hip joint which, even with secure fixation after good reduction of fragments, may result in a damaged hip joint. The main cause of this late damage may be avascular necrosis of the head of femur or arthritis of the hip joint. In the past, hip arthrodesis or resection arthroplasty (Girdle stone) were the only procedures to overcome this problem but nowadays, total hip arthroplasty is the procedure of choice. But it has some special problems in these patients which make it different from THA in other patients. This study is designed for evaluation of problems of THA after previous acetabulum fracture fixation.

MATERIALS AND METHODS: Patients with history of acetabulum fracture and fixation of it who experienced destruction of joint with arthrosis or damage of head due to avascular necrosis are candidates for arthroplasty of hip joint if they have functional abductors and there are no signs of infection. They were studied at 3 months for post operative infection, dislocation, sciatic nerve palsy, approach, peri-prosthetic fracture, blood loss, operation time, need for device removal for insertion of components.

RESULTS: 35 cases were entered in study. 24 cases had only posterior approach for fixation of acetabulum fracture, 8 had both anterior and posterior approaches and 3 had only anterior approach. 6 periprosthetic fractures were seen in 3. Pre-existing neurological compromise included cerebral palsy or old spinal injury and Charcot-Marie-Tooth syndrome (1 each). All cases experienced excellent relief of symptoms and there were no dislocations or other complications. One patient died about 8 months after surgery from unrelated causes. Total hip arthroplasty represents a safe and reliable option in these patients.

O126 TREATMENT OPTIONS IN PAEDIATRIC HIP FRACTURES
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INTRODUCTION: Hip fractures in children are rare and account for <1% of all paediatric fractures. Their prevalence in children is <1% of the prevalence of hip fractures in adults. Most are caused by high-energy mechanisms. But in case of a pathologic bone, fractures can occur usually from low-energy trauma.

METHODS: Our study consists of 12 patients (9 boys, 3 girls) with average age 10.9 years (ranging from 4 to 14 years). According to Delbet classification four fractures were type I, one fracture was type II, four fractures were type III and three fractures were type IV. Ten of the patients suffered a fracture from high-energy mechanism and two were pathological (one fibrous dysplasia, one fibrous cortical defect). A close reduction on a fracture table was performed to all cases apart from one, followed by stable fixation of the fracture. In one case fixation was done with Steinman pins. In ten cases transphyseal screw fixation was used. Finally, one of the pathological fractures was stabilized by external fixation.

RESULTS: Seven fractures healed without any complication, in approximately 3 months. Two of the patients with type I fractures, suffered from avascular necrosis of the femoral head and one patient from premature physeal closure. The patient with the pathological fracture, that was treated with external fixation system, had a recurrent fracture 6 months later.

One of the patients with type III fracture had a nonunion.
O127
EFFECTS OF MODULAR HIP REVISION STEMS ON FEMORAL BONE STOCK
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Background: One of the most challenging problems to be expected confronting hip revision surgery are the proximal bone defects. Devices like the diaphyseal anchored cementless stems have been used to settle this.

Aims: The objective of this study was to assess the evolution of the bone stock, the incidence of stress shielding and the previous bone defect and its clinical relevance.

Methods: A descriptive retrospective study of 54 revision surgeries using the Revitan modular prosthesis was performed with a mean follow-up of 39.7 months. Le Beguec and Sieber classification and Paprosky classification were used to assess the cortical regeneration and previous bone defects. Postel-Merle-d’Aubigné was used for the clinical assessment. Measurements were taken of the medial and lateral cortical thickness on plain radiographies Turin the follow-up.

Results: 64% of the revised hips showed a good clinical outcome and only 5% a bad outcome with no differences if the presence of stress-shielding was taken into account. The more previous Paprosky defect the more insufficient the regeneration and also the diameter of the stems had an effect on the presence of stress-shielding.

Lateral cortical was noted to reduce its thickness in contrast with the medial one. This phenomena was intensified with the concurrence of stress-shielding.

Discussion: The less the diameter of the stem is the more regeneration it promotes but it also confers less instability. Thus the appropriate election of the stem is the key point.

O128
OSTEointegration of PORous TANTALUM STEMS implanted in IDIO-PATHIC AVASCULAR NECROSIS of the FEMORAL HEAD
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Introduction: In the search for improvement in performance of osteointegration, tantalum has been employed as a constitutive material within the porous system given its high degree of porosity, its modulus of elasticity which is shown to be similar to that of cancellous bone, plus its excellent primary stability in resisting shear between the porous mesh and surrounding host bone. Wishing to enlarge the knowledge about the osteointegration of tantalum implants in humans, we report analyzing retrieved tantalum implants following the collapse of the necrotic area of the head resulting in failure of the attempted procedure. In order to resolve the problem, total hip arthroplasty (THA) was performed on all patients.

Following en bloc resection of the implant and surrounding bone of femoral head and neck, the specimens were radiographed in coronal, sagittal and transversal views. The procedure used in the preparation of the specimens was that of conventional methods used in biological samples. Observation of the samples was carried out using an electronic microscope JEOL JSM 6400 (JEOL Corporation, Tokyo, Japan), equipped with a spectrometer of dispersive energy of X-rays. Computerized image analysis based on gray level discrimination was used in order to obtain quantitative information relating to the percentage of the porosity filled with new bone.

Results: The time of implantation ranged between six weeks and twenty months. Observation during this study has confirmed the effectiveness of osteointegra-

Conclusion: Six weeks following implantation, invasion of the porous system is shown to be moderate in our study. This leads us to believe, that osteogenic response within the human body in the conditions mentioned above is slower than in a transcortical animal model. Our findings are similar to that reported by Ronga, et al, with agreement of the evolution of the osteointegrative process noted in retrieved implants with the radiological clinical estimation from implants in service also located in cervical and hip regions. Although some authors report that the magnitude of the bone formation is not different according to anatomical location involved with implantation, it could appear differences at sight of the results in most cases of the studies carried out. Both extension and distribution of bone ingrowths appeared to reflect the physical contact of bone to tantalum together with the magnitude of transmitted loads across this interface.

Conclusions: Following the observations made by Bobyn et al, we must agree that porous tantalum reveals itself as being an effective scaffold for bone in-growths with little change developing after a period of one year from the time of implantation. The osteoconductive properties of the material are unquestionable. The same must be said of its osteogenic capacity filling up of new bone any surrounding gap. It remains to be proven however, that this material, in porous form, is osteoinductive.

O129
HIP REPLACEMENT WITH MEGAPROSTHESIS FOR NON-NEOPLASTIC DISORDERS
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Background: There are many non neoplastic disorders that can generate a significant deficit of the femoral bone stock, for example, septic or aseptic total hip prostheses loosening, periprosthetic hip fracture, operated hip fracture nonunion, some bone diseases, etc... In some cases, the deficit is so significant, that the standard reconstruction procedures and prosthesis are not useful and we need to use a proximal femoral allograft or a megaprosthesi- sis to save the limb itself and its function.

Aims: This study evaluates the indication, surgical technique and outcome of our patients treated with hip megaprosthesis for non neoplastic disorders.

Methods: We evaluate 26 patients (76.3 years old in average), operated in our insti-
tution between 1994 and 2006; all of them with the same Argentine prosthesis. Results: 2 patients died for reasons related to the surgery (heart attack and sepsis). The remainder had a radical improvement in their quality of life and are satisfied with their functional outcome.

Conclusion: The hip megaprosthesis replacement is an excellent option in older patients with a significant deficit of the femoral bone stock, low functional demand and comorbidities.

O130
MORPHOMETRIC EVALUATION OF PROXIMAL FEMUR IN DRY BONE FOR HIP PROSTHESIS
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Background and aim: Knowledge on the morphometric features of the proximal femur is essential in order to decrease vascular and metabolic complica-

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O131
GAIT ANALYSIS IN PATIENTS TREATED WITH RESURFACING AND BIG FEMORAL HEAD TOTAL HIP ARTHROPLASTY. A PRELIMINARY STUDY
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Introduction: Standard total hip arthroplasty (THA) is the established surgical treatment for patients older than 65 years with progressive osteoarthritis. Resurfacing hip arthroplasty (RS) is an alternative for younger, active patients reportedly providing superior range of motion. Better functional outcome is believed to occur after RS than conventional 28 or 32 mm THA. The superior outcome may simply be the result of a bias in patient selection or the use of a larger femoral head. A more sensitive, and complementary evaluation of the clinical and functional outcomes can be obtained in a gait and posture laboratory analysis.

Aim: To evaluate the superior clinical outcome of resurfacing compared with large-diameter head THA in terms of gait analysis, and performance on several functional tests.

Material and methods: In a preliminary study, we invited 12 patients younger than 65 years who were candidates for either resurfacing or large-diameter head. Gait speed and postural balance evaluations, functional tests, clinical radiological data were analyzed 12 and 18 months after surgery.

Results: Our data did not demonstrate a clear difference in gait speed between resurfacing and large-femoral head total hip arthroplasty up to 1 year after surgery. The gait speed and postural balance evaluations, the performance at most functional tests and clinical scores (Harris Hip, WOMAC, SF-36, Charnley pain and VAS scores) were similar.

Conclusion: Bone conserving resurfacing hip arthroplasty represents a safe, effective alternative to conventional THA, especially for younger, active patients. Bone conserving resection can be considered a true advantage. As with resurfacing, large-diameter head THA with a femoral stem also possesses the advantages of using a larger diameter femoral head. In our study the superior clinical outcomes of resurfacing compared with large-diameter head THA did not confirm.

O132
TREATMENT OF LABRAL TEARS ASSOCIATED WITH FEMORO ACETABULAR IMPINGEMENT; LABRAL REPAIRS VERSUS LABRAL RESECTION
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Aim: Labral tears are commonly associated with femoroacetabular impingement (FAI) and should be addressed simultaneously with cam decompression or acetabular rim trimming. The aim of the comparative study is to demonstrate the difference in outcomes between labral repairs and labral resection in patients treated for FAI.

Methods: Retrospective study of 53 consecutive patients with FAI, with an associated labral tear, treated with hip arthroscopy. Inclusion criteria were: positive impingement test; radiographic features of FAI; Tonnis grade 2 or less; and a lateral sourcil height ≥2 mm. The type of impingement, CE angle, Tonnis grade and lateral sourcil height and the intra-operative findings were recorded. The impingement lesion was treated with either cam decompression and/or acetabular rim trimming. In group 1 (37 patients) labral repair was performed, in group 2 (16 patients) labral resection was performed. Patients were assessed using a 100 point Modified Harris Hip Score (MHHS) pre-operatively and at minimum of 1 year post-op.

Results: 53 patients (mean age 38 years, range 15-58) were assessed pre-operatively and at 1 year. 40% of the patients had a pincer deformity, 15% a CAM deformity and 45% a mixed deformity. There was no statistically significant difference between the two groups, with regards to: age or sex distribution, lateral sourcil height, centre-edge angle or FAI-type. Regarding Tonnis grade: in group 1 the distribution was 41% grade 0, 53% grade 1 and 6% grade 2; and in group 2 12.5% grade 0, 50% grade 1, 50% grade 2. There was no statistically-significant difference between the two groups with regards to preoperative pathologies mean MHHS: 59.7 in group 1 and 62.3 in group 2.

However, there was a statistically-significant difference in the postoperative mean MHHS between the two groups; 97.2 in group 1 versus 88.8 in group 2 (p<0.0001).

Conclusions: Labral repair, in association with arthroscopic impingement surgery, results in better outcome scores than labral resection.

O133
ARTHROSCOPIC TREATMENT OF FEMOROACETABULAR IMPINGEMENT IN ATHLETES
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Aim: Treatment of athletes with femoroacetabular impingement (FAI) is challenging. With our study we demonstrate that arthroscopic treatment of athletes with FAI can be successful with the correct patient selection.

Methods: Retrospective study of 45 consecutive athletes with FAI treated with hip arthroscopy. Inclusion criteria were a positive impingement test, radiographic features of FAI, Tonnis grade ≤2, and a lateral sourcil distance ≥2 mm. The FABER distance was recorded. The type of impingement and operative findings were recorded. Patients were assessed using a 100 point Modified Harris Hip Score (MHHS) pre-op and at 2, 6 and 12 months and 2 years post-op.

Results: 45 patients (mean age 30 years, range 15-54) were followed between 1 and 2 years. Clinically 34 patients had an increased FABER distance. 34% of patients had a Tonnis Grade 0, 52% Grade 1 and 14% Grade 2. The average lateral sourcil distance was 3.6mm (range 2-5mm, mode 4mm). 44% patients were treated by a combination of acetabular rim trimming and cam decompression; 24% with isolated acetabular rim trimming; and 27% with isolated cam decompression. 84% had associated labral tears (73% underwent repair, 13% labral resection). Micro-fracture was also performed in 18% of patients. Overall the average pre-op MHHS was 62.1 (90% CI 57.9-66.4) and the average post-op MHHS, between 6 months and 5 years, had statistically significantly increased to 94.8 (95% CI 92.8-96.9) (p<0.001). Average return to sport was 2.4 months. There was no statistical difference in outcome score when correlated with age. However, outcome was statistically worse if Grade 4 acetabular chondral lesions were noted compared to patients with normal cartilage (p<0.001).

Conclusions: Our short term results of therapeutic hip arthroscopy can provide good or excellent improvement of symptomatic FAI in selected athletes. Chondral lesions appear to be a predictor for a less favourable outcome.

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O134
ARTHROSCOPIC TREATMENT OF FEMOROACETABULAR IMPINGEMENT. CLINICAL RESULTS AND RADIOLOGICAL ANALYSIS OF CAM RESECTION
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Background: Hip arthroscopy has been described as a safe method in the treatment of Femoroacetabular impingement (FAI). However, one of the most important limits is the potential lack of accuracy in the amount of bone resection.

Aim: Purpose of present study is to analyze the initial clinical and radiological results of a series of patients with CAM type femoroacetabular impingement (FAI) who were arthroscopically treated.

Material and methods: Between May and October 2009, 38 consecutive patients with diagnoses of CAM type FAI were arthroscopically treated in a single institution. There were four women and thirty four men with a mean age of 37 years-old (range 18 to 57). Preoperative alpha angle was 59 grades (range 56 to 63). There were 12 patients Tonnis 0, 19 patients I and 7 patients grade II. Preoperative WOMAC functional score averaged 83.6 (range 60-98).

Results: Postoperative alpha angle averaged 52 grades (range 42-57). 20 patients normalized alpha angle under 50 grades. 18 patients remained with an angle greater than 50 grades but bone resection was considered insufficient in 6 of them. Anterosuperior labral tears were found and arthroscopically treated in all the cases. Postoperative WOMAC score was 90.6 (range 50-98) improving significantly (p<0.001) at 17.8 months of follow-up (12 to 18 months). A trend toward significance was found related functional score and advanced grade of degenerative disease (p=0.008) as a factor of poor prognosis.

Discussion and conclusions: Arthroscopic management of patients with CAM FAI results in significant improvement in outcomes measures, with favorable results observed in well selected patients at a minimum 1-year follow-up. Modification of natural progression to osteoarthritis and sustained pain relief as a result of arthroscopic management of FAI remain to be seen.

O136
FUNCTIONAL OUTCOME OF ARTHROSCOPIC MANAGEMENT OF CAM TYPE FAI
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Introduction: Our aim was to evaluate the functional outcome following arthroscopic management of CAM type femoroacetabular impingement (FAI).

Methods: 150 consecutive patients who underwent hip arthroscopy for CAM type FAI with minimum 1 year follow up were prospectively studied. Patient satisfaction, non arthritic hip score, re-operations and conversion to arthroplasty were analysed.

Results: There were a total of 90 males and 60 females. The average age group was 32 years (27 to 46 years). All patients underwent/arthroplasty of the CAM lesion and stabilisation/repair of the labral tears. A comparison of pre procedure non arthritic hip scores with the scores at latest follow up (minimum 1 year, maximum 3 years) showed a significant improvement (56 vs 86; p<0.01). There were 2 re operations for unresolved symptoms and 1 conversion to arthroplasty for continued pain associated with significant loss of articular cartilage. Perineal numbness was noted in 9 patients all of which resolved. No other major complications were noted in this series. Hip impingement symptoms resolved in all cases and a good (20%) to excellent (75%) outcome was reported.

Conclusion: Arthroscopic management of CAM type FAI is associated with subjective and objective improvement in hip function at early follow up. Longer follow up is necessary to analyse the ability of this procedure to arrest progression of degenerative hip disease.
O139 THE PREVALENCE OF DYSPLASIA IN FEMOROACETABULAR IMPINGEMENT
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Background: A common characteristic of femoroacetabular impingement (FAI) and hip dysplasia is the abnormal loading of the acetabulum. It is unknown how often FAI and hip dysplasia co-exist and which is more important in the development of intra-articular lesions such as labral tears.

Aim(s): The authors hypothesized that FAI provides a possible cause for the acetabular rim syndrome in dysplastic hips. This study calculated the prevalence of dysplasia in a group of 76 consecutive patients with symptomatic FAI.

Methods: Complete radiographic data on 63 hips (63 patients) were obtained. Radiographic assessment utilised the centre-edge (CE) angle of Wiberg, the acetabular angle (AA) of Sharp, FAI type, offset ratio and posterior wall sign.

Results: Patients were predominantly young adult males (mean age: 34.6 years; 10:4 male-to-female ratio). Most females (13:18) showed signs of dysplasia based on the AA. No association of dysplasia with FAI group, offset ratio or posterior wall sign was found. 47% of our patients with FAI also had radiographic evidence of dysplasia (3-15% definite and 9-30% borderline, depending on the angle utilised).

Discussion and conclusion: Dysplastic patients can present with femoroacetabular impingement. Dysplasia in FAI varies greatly depending on which and how many standard, anteroposterior-radiographic dysplasia measurements are taken into account. Surgery for FAI should thus take into account the presence of co-existing dysplasia while, conversely, surgery for dysplasia should take into consideration the co-existence of FAI.

O140 OPEN OFFSET CORRECTION WITHOUT OSTEOTOMY OF THE GREATER TROCHANTER. TECHNIQUE AND RESULTS
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Introduction: The osteotomy of the greater trochanter is the standard procedure to treat a cam or pincer impingement of the hip. Especially in the latter an open approach is superior to an arthroscopic treatment. But the trochanteric osteotomy has the disadvantage of a longer rehabilitation and possible complications.

Method: For 3 years we used a technique without a trochanteric osteotomy. The hip joint is approached through the interval between m. gluteus medius and m. vastus lateralis. After opening of the joint capsule the necessary corrections on the femoral and acetabular side can relatively easily be achieved. In the case of a pincer impingement the joint is additionally opened posteriorly and the acetabular wall is reduced.

Results: We have operated 59 patients using this approach, 49 with a cam impingement, 10 with a pincer impingement, with circumferential rim reduction in 7 patients. At a one year follow up 7 patients were painfree, 27 rarely had symptoms. At a one year follow up (FU) 7 patients were painfree, 27 rarely had symptoms. In the case of a pincer impingement the joint is additionally opened posteriorly and the acetabular wall is reduced.

Discussion: Open offset restoration in both cam and pincer impingement is possible through a limited open approach without osteotomy of the greater trochanter. The results are comparable to an arthroscopic treatment, which is technically more demanding and less suited to correct a pincer impingement.

O141 SURGICAL ARTHROSCOPIC ASSISTED ANTERIOR MINI-OPEN TECHNIQUE FOR THE TREATMENT OF FEMOROACETABULAR IMPINGEMENT: RESULTS IN THE MIDTERM
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Background: Surgical treatment of femoroacetabular impingement (FAI) is becoming accepted worldwide, mainly because of improvement in clinical results and quality of life in preliminary studies. In addition, arthroscopy assisted direct anterior mini-open approach has provided an excellent way to treat this condition in different FAI presentations.

Aim: We analyse midterm results to ascertain if they differ from the preoperative degenerative stage.

Material and methods: A cohort of 296 patients operated between 2003 and 2008 (mean follow up 5.2 years, range 2-8 years) have been included in the study. Data of Merle d’Aubigné and WOMAC scores and UCLA activity level preoperative and at the latest follow up (FU) have been obtained from their clinical records. A Kaplan-Meier survivorship curve has been established considering endpoint those patients, who either were lost from FU or those who underwent hip replacement. Chi-Squared and Wilcoxon test have been used for comparisons between groups according to Tönnis radiological preoperative stage.

Results: Overall results show mean improvement in MDA, WOMAC and UCLA activity level from preoperative values of 15.7, 59.7 and 7.3 to 17.4, 93.3 and 8.7, respectively at the latest FU (p<0.001). Global survivorship was at 8 years 88.8% (CI 95%). However when survivorship was divided according to radiological degenerative stages: 98.77% was obtained for Tönnis 0, 92.8% for Tönnis 1 and 62.3% in Tönnis 2 (p<0.001, CI 95%).

Conclusions: Overall there is still improvement in the midterm in FAI symptomatic patients with encouraging survivorship in patients with preoperative stages Tönnis 0 and Tönnis 1. According to our experience we recommend this population undergo a surgical procedure at the onset of their clinical symptoms.

O142 PAINFUL METAL REACTIVITY AFTER HIP RESURFACING ARTHROPLASTY
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We describe 5 cases of edge-loading due to component malposition in hip resurfacing arthroplasty, leading to the accumulation of high amounts of metal ions within the joint, producing a painful local response. These 5 patients were treated with revision surgery, cleaning out the joint of these metal particles and eliminating the wear production. We subsequently found the blood metal levels to decrease dramatically following revision surgery.

Materials and methods: 5 patients were evaluated at an average of 16 months (range 10-24) after hip resurfacing arthroplasty for a painful joint. Radiographic evaluation revealed excessive anteversion (mean 45 degrees) in two, excessive abduction (mean 80 degrees) in two, and a combination of excessive anteversion (40 degrees) and abduction (77 degrees) in the fifth. 4 patients were converted to ceramic on ceramic THR; one had an isolated acetabular revision, retaining the femoral resurfacing implant.

Results: The mean serum cobalt level was 125.7 ng/ml preoperatively; the chromium level was 71.7 mcg/ml. At the time of revision surgery, metallic stained fluid was noted in all 5 joints. In addition, synovitis was present. No signs of visible surface damage was noted on either the femoral head or acetabular components. The patients all reported complete resolution of their symptoms within 1 month postoperative. Furthermore, blood metal ion levels decreased significantly, normalizing by 1 year postop.

Discussion: Proper component positioning is critically important for the function of a metal on metal hip arthroplasty. Poor component position may lead to edge loading and the generation of excessive amounts of metallic debris; this may even give the appearance of a so-called “pseudotumour”. We found that the excessive generation of metal ions led to local reactivity and pain, which subsequently resolved after revision surgery.

O143 THE EFFECT OF VARIOUS CoCr MICROSTRUCTURES ON WEAR OF METAL-ON-METAL HIP RESURFACING
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Introduction: There have been considerable discussions about the adverse effects of heat treatments on the wear of CoCrMo metal-on-metal (MoM) hip devices. Clinical results have shown higher metal ion levels, higher wear and osteolysis for the Double Heat Treated (DHT) devices compared to the As Cast (AC) MoM devices. However, researchers have not been able to show any significant difference in terms of wear between these two microstructures under traditional hip simulator test protocols.

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Aim: To investigate the influence of various microstructures on the wear of CoCr MoM implants under a more physiologically relevant hip simulator test protocol.

Methods: Three AC and four DHT devices have been tested in a ProSim hip simulator. All the components tested are of the same design, size (50 mm) and specifications. The only difference between the two sets of components is the microstructure (AC vs DHT). These components have been tested under a more physiologically relevant test protocol developed for MoM devices [1].

Results: The average gravimetric wear rates during the running in phase of the DHT and AC devices were 1.15 and 8.4 mg/Mc respectively (p<0.05). During the steady state phase, the average gravimetric wear rate of 2.8 mg/Mc generated by the DHT devices was significantly higher than that generated by the AC devices. The average metal ion level for the DHT devices was 71% higher (p<0.05) than that generated by the AC devices.

Discussion: Increase in wear and metal ion levels was observed during the test for the DHT devices compared to that of the AC devices. The results from this study support in vivo wear and metal ion results for the two microstructures.

Conclusion: Heat treatments can adversely affect the wear performance of CoCr MoM devices.

O144
PROGRESSIVE RESOLUTION OF SOFT TISSUE REACTION FOLLOWING METAL-ON-METAL HIP RESURFACING AFTER REVISION TO CERAMIC-ON-CERAMIC TOTAL HIP ARTHROPLASTY
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Background: Soft tissue reactions following metal-on-metal (MoM) arthroplasty of the hip have been under discussion in recent times. The phenomenon has been observed since the advent of arthroplasty, but the particular nature of MoM hip resurfacing or total hip arthroplasty (THA), and the associated shedding of metal particles in high wear states, appears to excite a more aggressive response. Recent reports suggest involvement of muscle groups on a wide scale, and some cases of neurovascular involvement. It is not known which reactions require widespread muscle excision, and which cases may be adequately addressed by bearing exchange alone.

Aim: In this study we aimed to assess whether this soft tissue reaction (widely known as pseudotumour) can be managed adequately in the early stages by revision of the prosthesis to ceramic-bearing THA without widespread surgical debridement.

Methods: We report three cases of pseudotumour formation following MoM hip resurfacing all managed with revision to ceramic-on-ceramic (CoC) THA with minimal soft tissue excision. All patients were female with ages at original operation of 49, 52 and 58 years. Time to revision surgery was 85, 28 and 66 months respectively. Patients received pre- and post-operative MRI scans to assess the extent of the pseudotumour.

Results: All patients had clinical resolution of their pseudotumour following revision of the prosthesis without extensive soft tissue excision. Post-operative MRI confirmed a significant reduction in the size of the tumours.

Discussion and conclusion: Revision of MoM hip resurfacing to ceramic-bearing THA, in cases of pseudotumour formation, results in progressive and satisfactory resolution of the tumour. We propose that in the early stages, pseudotumour following MoM hip resurfacing can be adequately managed with revision to ceramic-bearing THA alone rather than revision with extensive soft tissue debridement that has recently been described.

O145
PREVALENCE OF ADVERSE LOCAL TISSUE REACTION IN METAL ON METAL HIP ARTHROPLASTY
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Background: Metal-on-metal articulations have rapidly entered clinical practice due to soft tissue necrosis. Comparisons of ALTR in symptomatic and non-symptomatic patients have not been reported.

Questions and purposes: To assess ALTR in a surgical practice of different types of metal-on-metal articulations and analyse effect of risk factors.

Patients and methods: We evaluated a consecutive series of 105 MOM hip arthroplasties in 82 patients. A self-assessed Harris Hip score (HHS) was used to divide patients into Group 1 HHS<70 and Group 2 HHS>70. Patients had an ultrasound scan (USS) or MRI scan assess soft tissues.

Results: Our study observed a 16% prevalence of ALTR around the MOM bearing hip arthroplasty. Prevalence in the Group 1 was 9.5% and in Group 2 was 32%. A total of 5 (18%) hips were revised in group 2 and one (1.3%) in Group 1. Patients with ALTR had significantly lower hip scores. 9.5% patients in Group 1 showed evidence of ALTR. No predictive factors were identified.

Conclusions: A significant proportion (9.5%) of ALTR was observed in asymptomatic patients. USS is a cost effective modality to monitor MOM patients and positive findings can be confirmed by MRI scan. Large studies are needed to assess the true prevalence and risk factors associated with ALTR. We advise follow up of all MOM patients with ultrasound scans.

O146
TOTAL HIP ARTHROPLASTY WITH CERAMIC-ON-CERAMIC AND VARIABLE NECK PROSTHESSES
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Introduction: Although ceramics first appeared in total hip arthroplasty 3 decades ago, its use has been limited because of the high failure rate and loosening of the materials. The insufficient design of prostheses was associated with their decline. However, improved biomechanics of the new prostheses has rekindled interest in recent years. The authors present early results from the use of ceramic-on-ceramic total hip arthroplasty and variable neck, with special emphasis on monitoring the incidence of postoperative dislocation of the hip.

Method: 51 patients (average age 61.5 (42-79)) were included in a prospective study of 5 years. All patients underwent a primary total hip arthroplasty (osteoarthritis 33, ddd 9, rheumatoid arthritis 3, traumatic arthritis 3, ankylosing spondylitis 3). Average preoperative Harris Hip score was 41.3 (10-60). Main ceramic on ceramic prosthesis with variable neck. Postoperative monitoring of patients is on average 18.5 months (9-36). Average term postoperative Harris Hip score at the last evaluation of the patient was 97.5 (87-99).

Results: There were no major postoperative complications, bone integration of prostheses was good and short-term clinical and radiographic follow-up of patients revealed no evidence of material loosening and dislocation of the hip.

Conclusions: The short term results from the application of total hip arthroplasty with ceramic head and variable necks shows no problems of loosening of materials or osteolysis, crushing equipment, and postoperative dislocation of the hip. However, additional studies with long-term results make it safe to use.

O147
REVISION HIP ARTHROPLASTY WITH CEMENTLESS REVISION ACETABULAR CUPS
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Background: The revision acetabular shell associated with iliac winglets and acetalular notch hook provide several advantages for acetalular revision, but limited information is available on the results of their use. The purpose of this study was to evaluate, at a minimum of five years the results associated with use of this porous coated revision acetabular shell.

Methods: Twenty-five revision acetabular components were used for revision after aseptic loosening of twenty-one total hip replacements and four septic loosening cases. The revision implant is revision cementless acetalular cup with iliac winglets and acetabular hook notch. Eight patients have segmental defects, three patients have cavitory defects, and fourteen patients have combined defects.

Results: At the time of last follow up no components had been removed or revised. There was no radiographic evidence of loosening in all components. The mean Harris Hip Score increased from twenty-four preoperative to eighty-two postoperative. There was one case of infection and one case of dislocation.

Conclusion: The study demonstrated that cementless revision acetabular component used for revision in the presence of bone loss perform well, but long term data is required for better evaluation of the acetalular shells.
O148
IN VIVO EVIDENCE FOR ELEVATED OXIDATIVE STRESS IN ASEPTIC LOOSENING OF HIP ARTHROPLASTY
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The role of wear debris in the process of loosening is well established. However, debate continues about the pathogenesis of the process. Some researchers implicated that free radicals may be involved in the induction and maintenance of chronic inflammation with resulting periprosthetic bone resorption. We have therefore investigated the levels of oxidative stress in pseudosynovial fluid from loose hip arthroplasties.

Material and methods: We studied 18 consecutive revision hip arthroplasties performed for aseptic loosening. Pseudosynovial fluid was collected at surgery and immediately deep frozen until analysis. Malondialdehyde (MDA) was assayed as a marker of lipid peroxidation in the 18 loose hips and in 18 controls. Linear wear was measured and periprosthetic osteolysis was graded.

Results: Pseudosynovial fluid from the 18 loose hips showed significantly higher level of MDA. (27.46 nmol/L, range, 13.47 to 82.9, SD ±17.55) compared to controls (14.86 nmol/L, range, 10.66 to 28.9, SD ±4.45). MDA level correlated nonsignificantly with linear wear and grade of femoral osteolysis.

Discussion: We demonstrated that elevated oxidative stress is associated with aseptic loosening of hip arthroplasty. Our results suggest that oxidative stress might induce periprosthetic osteolysis and subsequent loosening.

O149
DISLOCATION IN LARGE DIAMETER METAL ON METAL TOTAL HIP REPLACEMENTS: A SIGN OF SIGNIFICANT METALLOSISSS
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Introduction: The risk of dislocation in large diameter metal on metal hip replacement is said to be lower than in standard THR. This is due to the increased primary arc, increased jump distance and possibly a suction effect. Our unit has performed over 1500 of these cases with an overall revision rate of <1%. We report a case series of dislocations in 5 large diameter metal on metal hips undertaken at our institution.

Method: All cases underwent closed reduction on the day of admission. They were subsequently investigated for cause of dislocation. Radiological investigation included plain film radiographs and CT to exclude component mal-position and MRI to document soft tissue deficiency. Metal ion levels were measured from serum samples and microbiological investigation was undertaken.

Results: In all cases component positioning was acceptable. Metal ion levels were significantly elevated with levels comparable to published work on pseudotumours. MRI showed significant soft tissue defects in all patients. At revision all were found to have necrotic areas associated with a large turbid effusion. Histology confirmed metal related inflammatory change, in all cases microbiology specimens confirmed the absence of infection.

Discussion: The local detrimental effects of metal debris are well documented. We believe this is the first series with a proven link between these soft tissue problems and dislocation. Every case of large diameter metal on metal hip in our institution that has dislocated has been proven to be associated with metallosis and has required revision. Further work is necessary to confirm any associated risk factors for dislocation risk in this group of patients.

O150
BURDEN OF LINER REVISION OF MODULAR CUP IN HARRIS GALANTE
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Wear of polyethylene liner is the main cause of revision in Harris Galante acetabular components. However, the burden of an early liner revision is not certain. This study is a report of liner revision only in Harris Galante Acetabular components. Parameters of investigation were: acetabular cup size, head size, neck length, blood, loss, hospital stay, surgical time.

We examined 12 [age 70 years +/- 12] patients who underwent a liner only revision due to wear at an average of 13 years (+/- 6.0) after primary hip arthroplasty. Parameters of investigation were: acetabular cup size, head size, neck length, blood loss, hospital stay, surgical time.

The acetabular size cup differed from 52 mm to 60 mm. 7 patients femoral head size was 28; 5 patients had a 32 mm head. Neck length of femoral head differed from short in 6 patients, 4 in medium and 2 long necks. The average of blood loss was 491 ml (+/- 192); the operating time 87 minutes (+/- 40) and the hospital stay averaged out 12 days (+/- 4.0). No patient had postoperative complications.

Introduction: We believe this is the first series with a proven link between these soft tissue problems and dislocation. Every case of large diameter metal on metal hip in our institution that has dislocated has been proven to be associated with metallosis and has required revision. Further work is necessary to confirm any associated risk factors for dislocation risk in this group of patients.

Materials: Four different treatments on the UHMWPE material were investigated.

Methods: The test methods proposed were a horizontal and multidirectional pin-on-disc to evaluate the wear of polymers in biotribology. The samples worn were observed by optical microscopy and by Scanning electron microscopy.

Results: Higher wear for the irradiated and crosslinked UHMWPEs (XLPs) than for the unirradiated UHMWPE material. The difference between crosslinked materials is statistically significant and that both crosslinking treatments seem to have a similar effect on the wear resistance of the UHMWPE.

Higher number of scars for irradiated and XLPs than for the unirradiated UHMWPE, and they are shallower.

The grade of fibril formation is higher for the unirradiated than for the irradiated material and then less for the XLPs. The particle formation of the XLPs corroborates their lower deformation capacity in comparison with irradiated and unirradiated UHMWPEs.
The wear results show a higher wear for the irradiated and unirradiated UHMWPE material compared to the XLPEs on the multidirectional wear test.

Discussion: UHMWPEs with higher capacity to deform locally present a higher wear resistance and lower weight loss under unidirectional conditions. Unirradiated UHMWPE wears less than irradiated.

Multidirectional sliding conditions cause higher UHMWPE wear than unidirectional and multidirectional sliding motions.

Conclusions: The multidirectional wear results performed on the POD machine also show that the XLPEs are an optimal material for acetabular bearing components in Total Hip Replacements. Under unidirectional sliding conditions the XLPEs are subjected to more wear compared to the unirradiated UHMWPE. Therefore, in situations where the unidirectional sliding motion is the main type of motion between the articulating components XLPEs should not be used.

O153
INFLUENCE OF DIFFERENT COCROMO COUNTERFACES ON UHMWPE WEAR FOR ARTIFICIAL JOINTS
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Introduction: The objective in these wear tests was to study the effect of different material counterparts on the UHMWPE wear behaviour.

Materials: The materials used as counterparts were based on CoCrMo: forged with hand polished and mass finished, CoCrMo cast and mass finished and additionally two coatings were proposed.

Methods: The reciprocating pin-on-flat (RPOF) device pin-on-disk wear was used for this study. The worn surfaces were observed by optical, atomic force and scanning electron microscopy.

Results: The implication of this measurement variation is that with little weight loss of the UHMWPE the gravimetric wear determination is highly affected by the method of determination. Because of the uncertainty of the measurement, however, it is more interesting to compare the wear rates of the sliding couples rather than to compare the volumetric wear after the one million cycles of the wear test. The results show that the CoCrMo coating causes the highest UHMWPE wear of all counterparts tested. The CoCrMo coating wear rates in an order of magnitude higher than that produced by the mass finished (forged) alloy, which in this study causes the least UHMWPE wear. It is interesting to note that different surface treatments (mass finishing and hand polishing) on the forged CoCrMo alloys lead to a significant difference in UHMWPE wear.

Discussion: The mass finished (forged) alloy causes less UHMWPE wear than the mass finished (cast) alloy and the latter causes less UHMWPE wear than the hand polished (forged) alloy. In the same order, mass finished (forged) CoCrMo alloy is harder than the mass finished (cast) alloy and the latter is harder than the hand polished (forged) alloy.

Conclusion: Regarding the CoCrMo coating, it has the highest hardness value. This should give the coating a very good scratch resistance, at least much more than for the bulk materials investigated. Furthermore, coating fragments may favour third body wear mechanisms, roughening the coating surface.

O154
A STUDY CAUSES AND CLINICAL OUTCOME OF REVISION OF THA SINCE DECEMBER 2008, DECEMBER 2010 AT SINA HOSPITAL
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Background: Because of increasing total hip arthroplasty (THA) surgery performed at a lower age, revision surgery has increased. This operation is followed by more complications and worse results. Recently, most surgeons choose to use cementless prosthesis in revision surgery. Cemented prosthesis is used in some situations such as: very old patients; severe osteoporosis; very wide or deformed medullary cavity. The biggest cause of THA revision is considered to be aseptic loosening in most literature. Functional disorders corrections such as LLD or ROM deficit that are without pain are THA revision contraindications.

Discussion: The purpose of this study is to determine causes of THA revision that are able to recommend methods for revision surgery delay and to improve surgery results.

Materials and methods: All patients who needed revision surgery were included in our two year study. Patient’s history was taken. Cause of primary THA, cause of necessary revision, sex, age, preoperative Harris hip score and kind of primary prosthesis were recorded. Presence or absence of bone deficiency and type, kind of revision prosthesis were recorded at time of surgery. Post operative complication and Harris hip score in third, sixth, twelfth month post operatively was recorded. Any patient who did not attend post operative visits was excluded.

Results: 28 patients were entered in our study, 4 patients were excluded. One patient underwent operation twice. There were 12 men and 10 women. The most common referral symptom was pain. The most common cause of primary THA was severe DJD. The most common cause of need to revision was device failure and the most common cause of it was acetabular component failure. The most used prosthesis in primary and revision was cementless (respectively 7 and 17 patients). Bone graft was used in 16 patients and in 3 patients cage was used. The mean preoperative Harris hip score was 49±3 and post-operative were 75±3, 80±7 and 84±7 respectively. The most common periprosthetic complication was excessive bleeding and post operative complications were irreducible dislocation and transient sciatic neuropraxia. The observed differences between the rate of periprosthetic complications with respect to preoperative Harris hip score (HHS) was significant statistically (P=0.043).

Conclusion: In this study it the most common cause of revision was device failure. It may be due to uncompromising patients not paying enough attention to the recommended post operative limitations. We believe that less preoperative HHS leads to increased periprosthetic complications which should be considered by the surgeons and patients.

O155
LONG TERM FOLLOW-UP AND SURVIVAL OF THE UNCEMENTED OMNIFIT FEMORAL STEM AFTER ACETABULAR COMPONENT REVISION
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Introduction and purpose: Previously, several authors have reported unsatisfactory results from the acetabular component of the un cemented hydroxyapatite coated Omnifit (Osteonics Corporation, New Jersey, USA) total hip arthroplasty (THA) due to polyethylene wear and secondary loosening. Only few authors have reported about the fate of the femoral stem and the functional outcome in patients who had an acetabular revision operation.

Methods: From the original cohort 1989-2000 (n=564 THA in 462 patients), 224 cases with a revision operation for loosening of the acetabular component of the Omnifit THA were selected for this follow-up study. After acetabular component revision there was an average follow-up of 8 years (range: 2-17.8 years).

Study parameters were:
- Femoral osteolysis using Gruen zonal system functional outcome using Oxford Hip score, HOOS and VAS for pain, satisfaction and subjective outcome.

Results: Despite loosening of the acetabular component, the femoral stem was still well fixed in the majority of all cases. Femoral osteolysis was observed proximally in Gruen zone 1 and 7. In conjunction with acetabular component revision 36 of 564 original femoral stems were revised. In 76 of 224 cases with proximal femoral osteolysis only allograft cancellous bone chips were used to treat this osteolysis. The average Oxford Hip score was 37.5 (range: 12-48), HOOS was 72 (range: 8.75-100), VAS for pain, satisfaction and subjective outcome were 2.2, 1.9 and 2.1 respectively.

Conclusion: Despite the observed proximal femoral osteolysis in acetabular revision, the un cemented hydroxyapatite coated Omnifit femoral stem was well fixed in the majority of cases and could be left in place. Bony defects were treated with allograft cancellous bone chips, if necessary. Most patients were performing well in daily life with only little pain, whereas 80% of the patients were satisfied with the outcome after the acetabular component revision.

O156
TITANIUM, FULLY HYDROXYAPATITE COATED STEMS IN REVISION HIP ARTHROPLASTY: AN INDEPENDENT REVIEW OF 161 STEMS AT MAXIMUM 17 YEARS FOLLOW-UP
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Introduction: The Corail primary stem (DePuy) has shown excellent results in many studies in primary hip arthroplasty. The Corail Revision Stem is a long, fully hydroxyapatite coated, titanium stem which is slotted distally to allow for implant flex during insertion. The aim of this study was to independently assess the results of the Corail Revision stem in revision hip arthroplasty performed by the designing surgeons.
Methods: An independent audit was carried out of the case notes and radiographs of the first 61 stems implanted by the designing surgeons. All notes were reviewed to confirm implant details, dates of surgery and follow up, indication for revision and complications. Radiographs were assessed to corroborate case note details and analysed for implant stability, bony ingrowth and remodeling. The Kaplan-Meier method was used to calculate survival.

Results: Of the 161 stems implanted 5 have been revised, 2 for infection and 3 for aseptic loosening. The overall survival at maximum 17 years (mean 7 years) for all causes of failure was 94.7% (CI 34-100%). The survival with revision for aseptic loosening as the end point was 97.3% (CI 53-100%). Two of these revisions occurred due lack of ingrowth of associated bone graft and one due to initial undersizing of the stem. Radiographic analysis showed that no stems were at risk of failure and a significant proportion showed proximal bone regeneration with no cases of distal hypertrophy.

Conclusion: The Corali Revision stem demonstrates excellent results at medium term follow up with no signs of progressive loosening or proximal stress shielding that may lead to late failure. The stem is simple to use and is suitable for revision in a very broad range of indications making it a useful standard revision stem.

Q158
THE TUMOR-/MEGAENDOPROSTHESSES IN HIP- REVISION ARTHROPLASTY
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Background: Despite significant improvements in surgical techniques as well as implant materials, revision total hip arthroplasty in cases of large femoral bone defects remains a challenging problem. We describe one alternative to handle impaired proximal femoral bone stock by using a modular hip revision stem with flexible stem extension that is characterized by transmitting the main force in the proximal part and a minor part to the distal part of the femur.

Methods: From 1997 to 2006 sixty consecutive patients treated with the GHE revision hip stem were enrolled in this retrospective study. Implant survival and revision rates were analyzed after a follow-up of 4.6 years (range 0.6-9.2 years). Further patients included modified Harris hip score, SF-36, and pain measured with a 10-point numeric analog scale (NASC). Pre-op radiographs were evaluated regarding femoral bone structure according to the classifications of Paprosky, AAOS and Enne; post-op radiographs were assessed for signs of implant loosening.

Results: At the time of follow-up implant survival with revision as end-point was 100%. In 46 cases the stem was still in situ, 7 patients had died with the stem in situ and 7 patients had moved unknown. Harris hip score improved significantly from a median of 35 points preoperatively to a median of 79 points postoperatively, as well as pain on NAS. The SF-36 results at follow-up were significantly lower compared to the norm population. In approximately one third of the preoperative radiographs we found advanced situations of bone destruction in all three classifications. Radiological signs of implant loosening were detected in two cases, both without clinical symptoms.

Conclusion: Given the fact that implant survival at the time of follow-up was 100% and results regarding pain and function improved significantly, we reason that the use of this revision implant can offer at least mid-term clinical and radiographic stability in patients with major femoral bone deficiency. Long-term data will be required to identify the longevity of these implants.
Results: Our result was successful in 54 of the 56 hips at a mean of 5.3 y. The Harris hip score improved from a mean of 35 points to 76 points. All implants were radiographically stable at the latest follow-up with no stem subsidence no stress shielding indicating good secondary implant osteointegration. There were 4 postoperative complications: 2 cases of deep infection, only one case with cross locking screw fracture and one patient with hip dislocation.

Conclusion: The use of modular cementless HA-coated femoral stems with distal cross-locking screws provides clinical and radiographic stability in patients with Paprosky grade-III or IV femoral deficiencies. They show low rate of complications. This study assures that we are now in the era of cementless biological revision as the best choice for treatment of complex revision cases.

O161 TOTAL HIP REPLACEMENT. ADVANTAGES OF THE USE OF FEMURAL STEM WITH MODULAR NECK

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Background: Nowadays, total hip replacement is the most frequent orthopaedic operation worldwide. A great variety of implants, with attention to design, material, coating, modularity, are being used for the treatment of hip arthropathies.

Object: The purpose of this study is to demonstrate the benefits and effectiveness of the use of the femoral stem with modular neck for treatment of hip osteoarthritis.

Method: 85 patients suffering hip osteoarthrits treated with total hip replacement. We used the Lineage® (WRIGHT Medical Technology, Arlington, TN) acetabular cup system and the Profemur® E (WRIGHT Medical Technology, Arlington, TN) porous coated femoral stem with modular neck. All operations performed by the same surgical team, technique and approach.

Results: All patients followed the same rehabilitation programme. Mean follow up 22 months. Mean Harris hip score 92. 3 patients (3.5%) suffered recurrent dislocations of the total hip replacement due to excessive femoral anteversion. Treatment of choice was minimal revision with replacement only of the modular neck with an 8º of retroversion in two cases and one in 15º of retroversion in one case.

Conclusion: The use of femoral stem with modular neck proved very effective providing the advantage of the intraoperative flexibility adjusting the proper femoral anteversion. Additionally, in case of recurrent dislocation of total hip replacement, gives the beneficial opportunity of minimal revision with a modular neck in anteversion/retroversion accordingly, that provides stability.

O162 TAPERED TITANIUM STEMS WITH MODULAR NECKS. EXCELLENT PERFORMANCE IN 175 CONSECUTIVE CASES

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Background: Many cementless stem designs have been developed in the past 20 years targeting a stable and durable fixation without the problems related to bone cement. Recent evolutions in bioengineering proposed a 3 dimensional (3D) tapered stem which is supposed to offer perfect primary fixation and reduced shear forces due to geometry titanium elasticity.

Aim: Our purpose is to determine the minimum 2-year preliminary results of one type titanium cementless 3D tapered stem in 175 consecutive cases.

Material and methods: During November 2007 and December 2009, 169 consecutive patients 175 hips with a mean age 58.4 years (range 16-78 years) underwent primary cementless total hip arthroplasty by a single surgeon, using the same surgical technique (posterior approach with re-sutting of the small external rotators) and a single titanium stem. All cases were evaluated clinically using the Harris Hip Score and radiographically (canal fill, alignment, osseous integration and subsidence).

Results: After a mean follow-up of 18 months (range 4-27 months) no patient was lost to follow-up. Radiographically, bone ingrowth was evident in all stems. There were no cases with more than 5 mm of subsidence, leg-length discrepancies more than 5 mm, or early aseptic loosening. Clinically, the average Harris Hip score was 96 points (range, 78-100 points) at the latest follow-up showing an improvement of at least 20 points comparing to the preoperative assessment. There were no severe complications such as deep infection, periprosthetic fractures, permanent nerve palsies, or persistent thigh pain. 2 cases with hip dislocation were reduced non-operatively and had no recurrence up to their latest follow up.

Conclusions: Although the duration of follow-up is small, we conclude that the specific tapered titanium stem is characterized by excellent preliminary clinical and radiographic results. Long-term follow-up studies are necessary for safer and more definitive conclusions.

O163 WHY A MODULAR STEM? EXPERIENCE WITH THE M/L TAPER KINECTIV

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Background: The success of total hip arthroplasty depends on achieving a correct biomechanical reconstruction. Among the most important factors for this success are length of the extremity, offset, and avoidance of impingement. This prosthesis M/L Kinectiv is composed of a modular stem and proximal neck components that allow greater flexibility during surgery.

Aim: To review our experience with the M/L Kinectiv hip prosthesis.

Methods: Prospective study of all patients who received a modular M/L prosthesis at our institution from October 2008 to December 2009. Surgical planification included clinical and radiological studies to evaluate for the presence of length discrepancy of the lower extremities (LD).

Results: During the study period (14 months), 44 modular M/L prostheses were placed in 40 patients. Mean age was 68, 1 years (range, 31 to 78 years); 50% were males. Mean follow-up time was 37 months (range, 6 to 96 months). Infections for prosthesis were arthritis (37 cases), and avascular necrosis (7 cases). Pre-existing LD was present in 10 cases; 2 patients were wearing raised insoles. Three months after surgery, 5 patients had LD. None of the patients with pre-existing LD required wearing raised insoles following surgery.

Discussion and conclusion: The modular M/L hip prosthesis allows independent control of the length of the extremity, the offset, the version, and the proximal adjustment of the stem. This prosthesis provides greater degree of flexibility during minimal invasive surgery.

O164 TAPERED CONICAL STEMS WITH DISTAL FIXATION FOR CEMENTLESS FEMORAL REVISION: RESULTS AT 10 YEARS

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Mid-long term results obtained with the conical tapered stem designed by Wagener for cementless hip revision were on the whole very encouraging. Nevertheless we have identified some defects of the stem such as an excessive valgus neck, an insufficient offset for larger stems and a lack of modularity, making soft tissues tension sometimes difficult. The T3 stem was designed with the purpose of correcting these defects. The T3 stem is made of Titanium alloy with a textured surface finish and is modular. The lateral offset has been increased to 42 mm (34 mm for Wagner's stem) and the cervico-diaphyseal angle has been reduced from 145° to 138° degrees. Recently, the T3 stem has been replaced by the Restoration having a more varus neck (132° instead of 138°) and 3 sizes of distal stem (instead of 2). In this retrospective study we have analyzed the preliminary results obtained with the T3 stem.

We reviewed the first 30 consecutive cases having an average FU of 8 years (range 6-10 years).

We have always used a trans-femoral approach with "prophyllactic" distal cable circlage. In NO case an homologous bone graft was used. On the second postoperative day patients start walking with 2 crutches and FULL weight-bearing and the only the stem has been revised, PARTIAL weight-bearing if both components have been revised.

Eighty-seven% of the cases were rated as Satisfactory. No re-revision was necessary. 26 (87%) of the femurs showed good bone reconstruction and 7 (23%) some subsidence (only two cases > 1 cm) without clinical symptoms except for the necessity of a compensatory heel pad.

Conclusions:
- cementless revision with conical stems and trans-femoral approach is a relatively simple procedure with shorter surgical time and less blood loss.
- distal fixation stems like T3 are the implants of choice for severe bone stock loss (Paprosky 2C-3) for their immediate mechanical stability allowing early weight bearing.
- transfemoral approach allows complete removal of debris and scar tissue, enhancing bone reconstruction.
- in our experience, Subsidence occurs in the first 6-8 months then stops and if it is not progressive does NOT mean LOOSENING (even if more than 1 cm).
- stem's modularity allows an excellent control of soft tissue tension.

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O165
CORRELATION BETWEEN UNCEMENTED TAPERLOC STEM AND THIGH PAIN IN A COHORT OF OSTEOPOROTIC PATIENTS
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Background: Literature would suggest that approximately 1-4% of all patients who under go an un cemented femoral stem insertion as part of total hip replacement would experience thigh pain. This is thought to be due to mismatch in elastic modularity between femur and stem.

Aim: To investigate the incidence of thigh pain in osteoporotic patients who underwent primary total hip arthroplasty using the Taperloc (Biomet, Warsaw, Ind) un cemented femoral component.

Methods: We evaluated 52 hips in 48 patients at a mean follow-up of 5 years (1-7 years). This was a single surgeon series. The average age of patients at time of surgery was 72 years (51-84 years) and female to male ratio was 1.0:6. Clinical scores using Womac and SF36 scores were used and patients were specifically asked about thigh pain. Those patients who required revision was also noted.

Results: Excellent postoperative clinical scores were achieved. The incidence of thigh pain was 6.25%, but did not warrant revision. Two patients underwent revision rate for pseudotumour and asptic loosening of acetabular component.

Conclusion: Primary total hip arthroplasty with the taperloc un cemented femoral component in patients with osteoporotic bone is associated with increased incidence of thigh pain.

O166
LONG-TERM (20-25 YEAR) RESULTS OF AN UNCEMENTED TAPERED FEMORAL STEM IN PRIMARY TOTAL HIP ARTHROPLASTY
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Introduction: High survival rates have been reported for the un cemented CLS Spotorno stem up to 20 years. To confirm survival at longer follow-up we report the minimum 20-year (mean, 22 years; range, 20-25 years) results using this device.

Aim: To evaluate the long-term outcome of an un cemented femoral component after a mean follow-up of 22 years.

Methods: We retrospectively evaluated the clinical and radiographic results of a consecutive series of 354 total hip arthroplasties using an un cemented grit-blasted, tapered femoral stem (CLS Spotorno) in 326 patients. Mean time of follow-up evaluation was 22 years (range, 20-25 years), mean age at surgery was 57 years (range, 13-81 years). Clinical results were evaluated using the Harris Hip Score. Kaplan-Meier survivorship analysis was used to determine long term outcomes for different end points.

Results: At final follow-up, 126 patients (136 hips) had died, and 7 patients (8 hips) were lost to follow-up. Forty-one hips (12%) in 38 patients underwent femoral revision - 10 (3%) for infection, 12 (3%) for late periprosthetic fracture, and 19 (5%) for aseptic loosening of the stem. Kaplan-Meier analysis, with revision of the femoral component for any reason as the end point, revealed that the survival rate at 22 years was 86% (95%-confidence limits, 82%-90%). The survival rate with femoral revision for aseptic loosening as the end point was 93% at 22 years (95%-confidence limits, 90% - 96%).

Conclusion: The long-term results with this type of un cemented femoral component are encouraging and compare to the best reported series in primary cemented total hip arthroplasty. Besides aseptic loosening, periprosthetic femoral fracture is an important mode of failure in the long term following un cemented THA.

O167
CONstrained ACetabular Liners in ReVIsion Hip Surgery
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Introduction: Dislocation continues to be one of the most common and difficult complications after total hip arthroplasty (THA) and more important after revision THA. Dislocation rates after revision increase to between 10% and 25%. Successful management of recurrent dislocations and intraoperative stability can be a challenge with reports of only 60% success rate using different techniques.

Material and methods: Between January 2006 and December 2007, 98 revision THA were performed at our institution. Only in 9 cases in nine patients a constrained liner was used. The tripolar constrained implant (Styker) is the constrained system used at our institution. The average age of this group of patients was 72.4 years and the mean follow up was 30 months. In three cases the constrained liner was used in the first revision while the rest was used after more than two revisions. In the first revision cases the acetabular cup was also revised. In three cases the constrained liner was cemented in a stable device and in six was inserted in a compatible acetabular cup.

Results: There is one case of failure of the constrained implant without dislocation that was revised. The rest of patients remain stable.

Discussion: Failure rates of constrained devices depend on the design of the implant and the length of follow up. Our results are acceptable due to other aspects of the reconstruction are optimized during revision and longer follow up may be required.

O168
HEMIARTHROPLASTY WITH A STRAIGHT TAPERED UNCEMENTED STEM IN FEMORAL NECK FRACTURES
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Straight tapered un cemented stems have been provided excellent results in primary total hip arthroplasty, even in elderly patients and osteoporotic bone. We ask whether a hemiarthroplasty using one of these stems achieves similar clinical and radiological results in elderly patients with a femoral neck fracture.

We evaluated 85 patients with a hemiarthroplasty and a straight tapered stem older than 70 years old (72 to 90) for a displaced femoral neck fracture with a minimum follow-up of 12 months (range 12 to 36). Radiological evaluation analyzed femoral type according to Dorr, femoral canal filling, and the appearance of subsidence and type of fixation according to Engh.

There were two femoral revisions. One due to early subsidence in a small stem and one due to a periprosthetic fracture. 43 femora were type B and 42 were type C. Mean femoral canal filling was 90.8% (range 78 to 97). There were two cases with early subsidence of 5 mm with a femoral canal filling less than 85%. All the stems were radiologically osseointegrated.

Although the present follow-up in this series is too short to allow definite conclusions, a straight tapered un cemented stem provides satisfactory femoral fixation in elderly patients who underwent hemiarthroplasty for a displaced femoral neck fracture.

O169
THE USE OF A CEMENTLESS STRAIGHT TAPERED STEM IN PRIMARY THA. 15 VS. 10 YEAR RESULTS
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365 patients underwent THR between January 1993 and May 1994 using 376 straight tapered stems made of Ti6Al7Nb-alloy. At 10 years, 84 patients (86 hips) died, 14 patients were lost to follow-up and 39 patients (41 hips) were evaluated by telephone because of advanced age or disability. None of them had undergone revision. An evaluation of 229 hips was made clinically and radiographically after 10 years. The follow-up time was 10.0-12.6 years, mean 10.2 years at operation was 62.8 (19.8-83.3) years. At 15 years 128 hips in 127 patients were reviewed again. By then another 54 patients (60 hips) died. In addition 19 patients could be followed by telephone only, 18 Patients were lost to FU. Mean follow-up time was 15.6 (10.0-16.9) years. Mean age at operation was 59.9 (26.8-78.4) years.

At 10 years the Kaplan-Meier-Survivorship Curve showed a rate of 98.3% (95% CI:96.0%-99.3%) with revision of the stem for any reason. We documented 5 stem revisions (one low-grade infection, one aseptic loosening, one traumatic subsidence, two periprosthetic fractures). Two stems were found to be loose radiologically.

At 15 years the Kaplan-Meier-Survivorship Curve showed a rate of 96.6% (95% CI:93.1%-98.4%) with revision of the stem for any reason. Between 10 and 16.9 years we documented 6 more revisions (three aseptic loosenings, three periprosthetic fractures). Radiolucency lines were found in 38.3%, mostly in position 1.7 and 8.14. In 13 cases osteolyses were observed, mainly in the positions 1.7 and 8.14. In one of those a revision is planned. Radiologically one stem was found to be loose (revision after 15.7 years).
We hypothesized that the Summit™ stem (Johnson & Johnson) would allow us to obtain excellent clinical results and radiographic ingrowth with a better seal of the femoral canal and thus reduce the incidence of avoid radiolucent lines, subsidence and endosteal osteolysis. We assess early clinical and radiographic results of a multicentric and prospective study of 485 Summit stems implanted in 5 hospitals. 171 had hydroxyapatite (HA) coating and 314 had non-HA porous-coated stems. The mean follow-up was 4.2 years (range, 2.5-6 years). A standard femoral offset stem was used in 366 (75.5%) hips and a high femoral offset in 119 (24.5%) hips. Dislocation was the most frequent postoperative complication (16 hips). Clinical results according to the Harris scale were 30.17 points (range, 10-52) before surgery and 95 points (range, 90-100) at the last follow-up evaluation. All hips had radiographic follow-up in the study. These were no stem revisions in the follow-up study in this series. All stems were radiographically osseointegrated. Femoral stem position was neutral in 395 (81.4%) hips, and femoral canal filling was related with implant position. No stem subsidence greater than 5 mm has been found in any hip. No osteolysis was found around the femoral stem. Proximal femoral osteopenia grades 1-2 was observed in 33 hips. In 28 cases cortical widening was recorded in Gruen et al zone 5. No differences have been found between HA coating and non-HA porous-coated stems. Although the present follow-up in this series is too short to allow definite conclusions, the Summit™ stem with and without HA coating has provided excellent short-term results. Continued follow-up is required to determine if the use of Summit™ cementless stem with or without HA coating results in less osteolysis and loosening.

O170
A MULTICENTRIC AND PROSPECTIVE STUDY OF THE SUMMIT TM CEMENTLESS TAPERED STEM
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O171
TOTAL HIP ARTHROPLASTY WITH MORE THAN 4000 CPT AND EXETER STEMS: ARE LOOKALIKE STEMS AS GOOD AS THE ORIGINAL?
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O172
COMPARATIVE STUDY OF TWO PURE METAPHYSEAL LOADING FEMORAL IMPLANTS: WITH AND WITHOUT A STEM
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O173
HIGH HIP CENTER TECHNIQUE USING A BICONICAL THREADED ZWEYMULLER CUP IN OSTEOARTHROSIS SECONDARY TO CONGENITAL HIP DISEASE
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The high hip centre technique used for a deficient acetabulum is reconstruction of the hip at a high center of rotation. In the literature, there is no consensus regarding the value of this technique. We investigated whether the new generation biconical threaded Zweymuller cup fixed in a nonanatomic position in patients with arthritis secondary to congenital hip disease experienced different rates of polyethylene wear and long-term survivorship when compared with anatomically positioned cups.

Methods: The high hip centre technique includes stable Zweymuller cup fixation in a healthy osseous region without femoral shortening osteotomies, bone grafts, or soft tissue injuries, in combination with suitable head/neck length, suitable stem position, and adequate gluteus medius tensioning. We studied the polyethylene wear rate and Kaplan-Meier survivorship of 104 titanium threaded Zweymuller cups in 88 patients (81 females), placed in 70 hips at near-normal hip center and in 34 hips at a high hip center position. Minimum follow up was 2 years (2-15 years).

Results: The mean linear polyethylene wear rates in the near-normal and high hip center groups were not different (0.110 ± 0.050 mm and 0.113 ± 0.057 mm, respectively). The Kaplan-Meier 15-year cup survivorship rates with revision for any reason as an event of interest in the near-normal and high hip centre groups also were not different.

Conclusions: The high hip center technique using a biconical threaded Zweymuller cup in patients with arthritis secondary to congenital hip disease results in a polyethylene wear rate and long-term cup survivorship comparable to those observed in anatomically positioned cups.
Introduction: Total hip arthroplasty has become a famous and successful procedure in orthopaedic surgery. A variety of modifications have been made to traditional approaches to improve outcomes. One of these modifications is to apply short stem implants instead of standard long implants. The aims of this modification are: soft tissue and trochanteric/bone sparing for further revision operation, achievement of optimized anatomy, minimally invasive surgery, better range of motion etc. In this study we compared short-term outcomes between patients undergoing THA with either of these kinds of implants.

Material and method: Between 2006 and 2008, we had approximately 52 cases of osteoarthritis (OA) which were candidates for THA. Standard long-stem implants were applied in 30 cases while short stem implants were used in the remaining 22 cases. All implants were Cementless and posterior approach was applied in all cases by the same surgeon. Cases were between 48 and 76 years of age. In post-op care, all received LMWH for about 2 weeks. On the second day post-operatively, patients were able to walk with the aid of a walking frame and physiotherapy. Once the sutures were removed, the patients could walk using two elbow crutches with about 20 percent partial weight bearing.

Results: Mean preoperative Harris hip score was 42.5 (±0.5) in the long stem group and 44.7 (±0.3) in short stem group. Mean postoperative score was 86.3 (±0.4) in short stem group while it was 95 (±0.2) in long stem group. The comparison between two groups showed that improvement in Harris score was significantly greater in short stem group (P value <0.05).

Conclusion: In our study, short stem implants have shown acceptable and encouraging outcomes when compared with traditional long stems in THA for: 1) proximal fixation can be achieved in short stem and... 2) short stem does not interfere with the trochanteric region but long stem does; 3) short stem has a trapezoidal or rectangular cross section following the calcar bony anatomy but long stem does; 4) proximal fixation can be achieved in short stem and... Previous studies show that careful patient selection is needed when using this type of implants. More studies are needed in this field for supporting their use and specifying their exact indications.

Abstracts from the 9th Domestic Meeting of the European Hip Society

O175 DEVELOPMENT OF A MORE PHYSIOLOGICAL TEST PROTOCOL IN VITRO
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Introduction: Hip wear simulations have been conducted for decades to determine the wear of implants under conditions that are considered to be relatively close to the normal walking cycle. The use of the international wear testing standards (ISO) has been justified in testing metal-on-polyethylene devices. However, studies have shown differences between the in vitro simulator wear rates and in vivo wear rates in metal-on-metal devices. Under the standard test conditions the metal-on-metal devices would generate an exaggerated lubrication regime due to the faster speed (1Hz) between their articulating surfaces and consequently generate extremely low wear. Hence there is a need for the development of a more physiologically relevant simulator test protocol for testing hip MoM devices.

Method and development rationale: Test frequency: In order to find a more relevant test frequency, a Step Activity Monitor study was carried out to measure the step counts of patients during their daily activities (25 patients at 1,2 and 4 year follow-up). The frequency was approximately 0.5Hz.

Stop/start motion: Continuous cycles along with higher test frequencies, contributing to exaggerated lubrication regime, were restricted with stop/start motions every 100 cycles.

Kinetics and kinematics: The identical kinetics and kinematics per cycle, resulting in a much shorter running in phase have been replaced by two different profiles with alternating kinematics and kinematics to improve the physiological relevance of the test protocol.

Condition one:
- Flexion/extension range: 30°/15°
- Internal/external rotation: ±10°
- Maximum stance phase loading: Paul type 3kN; ISO swing phase load: 0.3kN

Condition two:
- Flexion/extension: ±22°
- Internal/external rotation: ±24°
- Maximum stance phase load: 2.2kN; Swing phase load: 0.24kN

Conclusion: A more physiologically relevant simulator test protocol with 0.5Hz walking frequency, alternating kinetics and kinematics and stop/start motion has successfully been developed. Hip simulator results under the new test protocol have shown good correlation with the in vivo results.
CABLE SYSTEM IN THE TREATMENT OF PROXIMAL FEMORAL PERIPROSTHETIC FRACTURE

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Background: Metallic wires and cables are commonly used in primary and revision THA for fixation of periprosthetic fractures. Cable system as a unique fixation can provide secure fixation in B1 type fractures Vancouver classification under certain conditions.

 Aim: We tried to determine the conditions for using cable system for fixation of periprosthetic fractures at the site of THA as a unique fixation.

 Methods: In cooperation with Technical University we arranged the computer model of Vancouver B1 fracture and compared stability of osteosynthesis with plate system and cable system depending on localization and length of fracture. We retrospectively reviewed 14 patients who had primary and revision THAs using cable system for periprosthetic fracture treatment and analyzed the radiological conditions for successful treatment of periprosthetic fracture with cable system.

 Results: In computer modeling analysis we determine that the cable system can provide similar stability as plate fixation in Vancouver B1 fractures where the line of fracture is minimally five time longer than wideness of femoral diaphysis and where the fracture is minimally 2/3 located in well fixed stem part of femur. Two of the 14 patients developed instability of used cable system with necessity of revision surgery.

 Conclusions: Cable system as a unique system of fixation of proximal femoral periprosthetic fracture can be used under the conditions mentioned above, however, there are many other factors affecting the success of treatment; especially osteoporosis.

Periprosthetic fractures of the femur are a complex surgical problem and require especially osteoporosis.

Primary stability of the Burch-Schneider ring (BSR) in case of acetabular revision is discussed controversial. In a retrospective two centre cohort study we analyzed the influence of the mode of screw fixation and the restoration of the centre of rotation on migration, loosening and other radiographic parameters.

Material and methods: Patients with a minimal radiographical follow-up of 2 years and suitable for EBRA analysis were included. In group 1 (46 patients) screws were placed through the cranial spherical part of the ring and covered by cement and cup, in group 2 (40 patients) screws were placed through the cranial flange. Preoperative bone defects were classified, the postoperative centre of rotation was determined. Changes of screws were recorded, migration exceeding >1mm was seen as significant.

Results: Demographic data and size of bone defect were comparable in both groups. No cups in group 1 and in group 2 were re-revised. In group 1 the centre of rotation was medialized mean 5.5 (SD 8.2) mm, in group 2 it was laterallised mean 11.0 (SD 10.3) mm (p<0.001). Screw changes were observed in 5 (10.9%) patients in group 1 and 14 (35%) patients in group 2 (p=0.009). Migration at 2 years was observed for 17 (37%) patients in group 1, mean migration was 1.0 (SD 1.0) mm. In group 2 21 (52.5%) patients showed migration at 2 years (p=0.193), mean migration was 1.6 (SD 1.7) mm (p=0.031).

Conclusion: Medialization of the implant and screw fixation with compression of the ring against the acetabular roof reduces migration and screw changes. The improved stability might be due to better osteointegration of the BSR and angular stability of the screws which are additionally fixed with cement.
Aim: Our purpose is to refer the high complication rate observed with cementless oblong acetabular implants with modular side plates and screws in revision hip arthroplasty cases.

Material and methods: During May 2003 and November 2007, 62 patients (62 hips, 17 males, 45 females) with a mean age 62.4 years (range 37-81), had revision of the acetabular component due to aseptic loosening. All cases had a Paprosky type-IIa acetabular defect. Revision surgery of the acetabular component was performed using cementless oblong implants with modular side plates and a hooks. All patients were reviewed clinically and radiographically at 1, 3, 6, 12 months and annually thereafter.

Results: After a mean follow-up of 40.5 months (range 12-72) no patient was lost to follow-up and 1 patient died due to unrelated illness. The complication rate was 32.3%. Complications included aseptic loosening (15 cases, 23%), deep infection (3 cases), broken hook and side plate (1 case), and femoral nerve palsy (1 case). Re-revision of the acetabular component was done in 14 cases and 4 more cases are definitively loose waiting for revision.

Conclusions: Reconstruction of Paprosky type-IIa acetabular defects using oblong implants showed an early and unacceptably high complication rate. Predisposing factors may include insufficient grid blast porous coating of the specific implant, bulk and heavy implant dimensions (high rotational moment of inertia), and allograft intervention to host bone contact.

O182 GAP REINFORCEMENT RING AND IMPACTED MORSELLIZED ALLOGRAFT BONE IN TYPE III AND TYPE IV ACETABULAR DEFECTS
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Background: Acetabular bone loss is a major challenge in revision of total hip arthroplasty. Reconstruction with bone grafts have been used for the management of these defects.

Aim: The goal of this study was to evaluate the clinical and radiographic outcomes of the Gap reinforcement ring and allograft bone in severe acetabular defects.

Methods: During January 2003 and 2007, 24 patients with acetabular failure (21 aseptic and 3 septic) underwent acetabular revision surgery using the Gap reinforcement ring and morselized impacted bone graft. Acetabular defects were radiographically assessed and intraoperatively confirmed according to the American Academy of Orthopaedic Surgeons classification. Ten hips presented acetabular defects type III and 14 hips had type IV defect. The preoperative and postoperative clinical evaluation was performed with use of the Merle d’Aubigné-Postel Score. Successful reconstruction was defined in cases showing radiographic presence of a stable reconstruction with less than a 5 mm migration of the ring and with evidence of full incorporation of the acetabular bone graft.

Results: At an average follow-up of 34 months (range: 24 to 72), successful reconstructions were observed in 15 cases. Asymptomatic, more than 5 mm migration without pression was observed in 3 reconstructions with less than 30% graft resorption. Reconstruction failure was observed in 6 cases requiring reoperation. Fatigue fracture of the ring was observed in 5 cases. Aseptic loosening was observed in 3 cases and deep infection in 3 cases, all these cases presented a migration greater than 5 mm. Three patients sustained dislocation.

Discussion and conclusion: Excluding infection, a 87% success rate was observed in complex acetabular reconstructions using the Gap reinforcement ring with impacted morselized bone allografts.

O183 ISOLATED ACETABULAR REVISION. MID TERM RESULTS OF 89 CONSECUTIVE REVISIONS
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Background: Controversy exists over whether to remove well-fixed components at the time of revision of a failed total hip arthroplasty (THA). The purpose of this study was to evaluate the results of selective acetabular revision after acetabular failure in which only the failed component was replaced. Eighty nine isolated acetabular component revisions were performed and prospectively followed for a mean of 8.6 y (range: 5-14 y), the components had been in place for a mean of 12.5 y. All femoral components well fixed at the time of revision and left in place. Cemented acetabular cup was always used associated to bulk allograft reconstruction in 73 cases

Results: The mean Harris hip score at the last follow up was 91.8 [SD 6.89]. Two thirds of femoral component occurred 4 and 10 years after revision. Radiologically one femoral cemented component is loosened. Survivorship at 8.6 years is 89.26% +/- 0.112 considering all causes of revision and of 97.4% +/-0.046 if revision is related to femoral failure.

Conclusions: Revision of only the failed acetabular component is recommended in cases of isolated acetabular failure, providing good results over the medium term, and allowing preservation of bone stock with lower surgical morbidity.

O184 CALCIT METAL MESHES, IMPACTION ALLOGRAFTING AND CEMENTED STEMS Y REVISION HIP ARTHROPLASTY
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Background: One of the essential requisites for the impaction grafting method is containment of the impacted cancellous bone within the medullary cavity. In patients with segmental bone loss, this procedure can be performed with metal mesh on the outside of the femur. Although the combination between metal meshes and impacted bone allografts is commonly used clinically, data in literature is lacking.

Aims: To analyze the results in cases with proximal femoral bone defects reconstructed with a calcar metal mesh, impacted bone allografts, and a cemented stem in revision hip surgery.

Methods: We prospectively followed 91 cases with proximal femoral bone defects reconstructed between 2002 and 2006 with a calcar metal mesh, impacted bone allografts, and a cemented stem. Patients’ average age was 66 years (32-88); 64 females and 27 males. Femoral deficiencies were classified according to the Endoklinik: 50 cases presented a grade 3 defect, 38 cases presented a grade 4 defect and 2 cases a grade 1. We implanted 44 short conventional stems and 47 long stems.

Results: Reconstruction survival was 98% after a minimum follow-up of 31 months and a maximum of 87 months. We observed one fracture of the metal mesh and a femoral long stem that was reoperated and a traumatic asymptomatic fracture of the metal mesh that did not require surgery 1.5 years after this episode.

Average stem subsidence was 3.6 mm. We observed 8 dislocations (9%) and 7 infections (8%).

Discussion and conclusion: Although the incidence of complications in these patients was high, this could be related to the complexity of the cases. Mesh failures were not observed except in the two cases presenting massive femoral bone loss and trauma.

Patients with calcar femoral defects may be candidates for biological femoral reconstructions using metal mesh, impacted bone allografts and a cemented stem.

O185 INTRAOPERATIVE BONE DEFECTS DETERMINE CLINICAL OUTCOME IN FEMORAL IMPLICATION BONE GRAFTING
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Impaction bone grafting with cemented tapered stems in revision hip surgery shows good clinical results but is sometimes time-consuming and technically demanding. We hypothesized that the intraoperative bone defect determines clinical outcome and complication frequency.

We have used femoral impaction bone grafting revisions in 70 hips between 1993 and 2005. The mean age was 61.0 years (31-79 years). According to the Endoklinik classification of intraoperative bone defects, 14 hips were type 2, 38 type 3, and 18 type 4. The mean follow-up was 10.4 years (5-17 years). All hips with bone defect type 2 showed excellent clinical results without complications. There were 8 reoperations: 3 intraoperative fractures requiring postoperative revision, 4 postoperative fractures requiring osteosynthesis and one revision for aseptic loosening. All reoperations affected types 3 (6 hips) and 4 (2 hips). Kaplan-Meier survivorship for all causes of failure was 100% for type 2, 85.4% (95% confidence interval [CI] 73.6 to 97.2) for type 3, and 82.6% (95% CI 64.8 to 96.7) for type 4 at 10 years. The most improvement in the clinical score (Merle d’Aubigné-Postel scale) was in type 2 regarding pain (p=0.008), function (p=0.018) and mobility (p=0.008). Limp was most frequent in the type 4 group (p=0.004). Radiolucent lines around some femoral zones were found in 9 hips and were more frequent in types 3 and 4. The mean average subsidence was 4.9 mm for type 2, 5.2 for type 3 and 9.8 for type 4 (p=0.123).
The impaction bone grafting technique has good clinical results in femoral revision. However, major bone defects determine clinical outcome and also result in more operative complications.

O186
TELESCOPE ALLOGRAFT TECHNIQUE IN REVISION SURGERY
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Aim: We propose a surgical technique for structural allograft reconstitution of the diaphysis of long bones, maximizing the surface contact between host and allograft bone. This method, analogous to a telescope, overlaps the graft and host bone, theoretically increasing bone surface contact substantially.

Methods: We report the outcome of 22 telescoped allograft junction sites in 19 patients who lacked sufficient host bone to accommodate a regular-length stemmed implant, between September 1999 and June 2006. The mean patient age at the time of revision was 28 years (range, 4-56). Nineteen junction sites were in the femur (11 proximal, 5 distal, 3 mid-diaphysis), and 3 were in the humerus. At 16 sites, we used an allograft-prosthetic composite (APC); in 6 an intercalary allograft was performed.

Results: Mean followup was 4 years (range, 0.5-7.8; minimum of two years or until allograft failed or patient died). 15 of 16 adjacent joints at risk for replacement were preserved and total femur or humerus replacement was avoided in 18 of 19 patients. Five patients needed further surgery, but none for nonunion. In all patients, the bone apposition surface area was dramatically larger than what could have been obtained from conventional end-to-end techniques.

Conclusion: This biologic reconstruction method is best suited for patients with quantitatively or qualitatively deficient residual bone stock after tumor resection or prosthetic revision. It is an excellent technique for revising megaprostheses when there is a short remnant of proximal femur/ distal humerus and has particular value as an alternative to total femur/humerus replacement.

O157
CEMENT-IN CEMENT FEMORAL REVISIONS USING A SPECIALLY-DESIGNED SHORT POLISHED STEM
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Background: Cement-in-cement femoral revision is attractive if the old femoral cement mantle has remained intact. Examples are loosening of the stem at the prosthesis-cement interface, revision for recurrent dislocation to change offset or version, stem fracture with intact distal cement and the replacement a monobloc stem with head. However, often for a proper insertion of the stem distal drilling and reaming of the cement and plug is needed. For these cases a tapered polished short revision stem (Exeter SRS stem) of 125 mm length and with a 44° offset was designed and introduced on the market.

Aim: Study our experience with this new stem in cement-in-cement revisions.

Methods: A historical prospective study on all 24 consecutive SRS stems that were inserted between 2005 and 2008; 13 women and 10 men with average age of 66 years (54-62) were included. No patient lost to FU, all clinical and radiological data available.

Results: At minimal 2 years and average 3.5 years (2-4.5) 3 stems were removed, all for infection. One infection was related to the surgery. There were no aseptic loosening. At review the average HHS in the 21 surviving stems was 89 and the Oxford score 20. There were no additional radiological loosening. After implantation 2 stems subsided more than 2 mm, one became stable and is one gradually migrating. Both cases have no clinical symptoms. There were no signs of loosening at the cement-cement interface.

Discussion and conclusion: To our knowledge this is the first clinical report on this new stem designed for cement-in-cement revisions. This stem indeed facilitates cement-in-cement revisions. Except for infection, there were no failures. In one asymptomatic case there is a slowly progressive subsidence, however the significance is unclear at the moment. The short-term results of this new implant for hip revisions are promising.

O188
THE PROXIMA SHORT STEMLESS METAPHYSEAL LOADING IMPLANT – IS THERE A LEARNING CURVE? EARLY RESULTS AND EXPERIENCES
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Background: Recent advances in bonesparing total hip arthroplasty (THA) have lead to the development of smaller proximally fixed stems. However, surgical technique differs from a standard THA and hence there is concern that a learning curve may be involved to the subsequent detriment of the patient.

Aim: In this prospective study we assess the functional and radiological outcome of the Proxima prosthesis and examine the presence and implications of a potential learning curve.

Methods: 201 primary THA’s using the Proxima stem were undertaken by two surgeons. There were 112 females and 89 males with a mean age of 63 (range 29-91). Mean follow up was 12 months (range 6-24).

Results: At one year follow up mean pre-operative Oxford score improved from 44 (range 21-59) to 15 (range 12-26). Mean Harris score improved from 42 (range 67-11) to 90 (range 77-100). Average improvement in scores was 31 for Oxford and 44 for Harris.

At six week follow up, nine stems had increased varus tilt. At three months these showed no further movement. In none of these cases was any difference noted in the patient’s post operative recovery. There were two cases of single incident dislocation and no other significant complication.

Discussion: The Proxima is a short stemless metaphyseal loading prosthesis with pronounced lateral flare. It differs from conventional uncemented stem insertion by utilising a “round the corner technique”. Our series demonstrates that complications involving minor breaches of the cortex occurred within the first 30 cases done by either surgeon. Similarly, post-operative varus tilting occurred within the first 50 cases done by either surgeon and our stem-size data suggests this may be due to an initial tendency to undersize the stem. Despite the presence of a learning curve the problems encountered have not affected patient outcome and early results appear promising.

O189
SILENT HIP™, A NEW, NECK PRESERVING FEMORAL PROSTHESIS IN A PROSPECTIVE DOUBLE-CENTER-STUDY INCLUDING RADIOSTEROMETRY - 5- YEAR RESULTS
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Preservation of bone and soft tissue at the time of a primary Total Hip Arthroplasty is highly advantageous. The Silent Hip is positioned within a milled cavity in the neck region of the proximal femur exclusively, thus avoiding unnessary bone removal and providing loads transfer to the cancellous bone of the femoral neck. Following extensive validation of the design concept in computer simulation and laboratory, a prospective, pilot study was performed in two independent centers (DE; AU).

Inclusion criteria were patients between the ages of 25 and 65 years with a diagnosis of non-inflammatory arthritis. 23 males and 18 females were included and the mean age at implantation was 50 years (range 26-65), mean BMI 26.6 (range 19-37). In order to assess the in-vivo-stability Radiosterometry (RSA) has been used.

Patients were followed up using the Harris-, the Oxford Hip Score and by both standard- and RSA-X-rays at 3, 6, 12, 18, 24 and 60 months with Oxford Hip Scores additionally completed at 36 and 48 months.

The Harris score increased from a pre-operative mean of 54 to 95 at two years follow-up. The mean Oxford score improved from 39 to a near maximum of 13.2 at the later follow-up time point of 5 years. Assessment of the radiographs indicates increased bone density in the region of the calcar. RSA data over the critical post-operative period, show a maximum level of femoral stem migration of <1 mm in any of the 3 axes. In the five year assessments the Silent Hip is remaining stable.

The results of this initial clinical experience demonstrate that the Silent hip, with its smaller fixation surface area, achieves excellent clinical results and keeps stable out to five years follow-up, Silent Hip has been CE marked and is a viable alternative for patients who would benefit from conservative hip arthroplasty.
fixed at the lateral femoral cortex with a bolt, plate and screw. This has a metal-on-metal articulation with a 28mm Metasul head and Allcoff press fit acetabular cup. Our study aimed to assess the functional outcome of this prosthesis.

**Patients and methods:** In our institution 234 TTP’s were implanted between 1995 and 2005. All patients completed a self-assessed questionnaire of Harris Hip Score at 2 months, 1 year, and then yearly. Only those who had a follow-up was within the last two years were included in the analysis. 76 patients who had failed to satisfy the criteria were excluded. Of the 158 hips in the study 75 hips were in male patients and 83 were in female patients. The median age of patients was 52 years (range 15 to 82), 75 hips were on the right side and 83 on the left. All patients were operated by the senior author or a senior trainee under his supervision (seven hips). Revision of the implant or decision to revise was taken as the end point of our study.

**Results:** The median time to follow up was 7 years (range 1 to 15). The median pre-operative hip score was 43 (range 3 to 77) which rose to 83 points (range 11 to 100) at the latest follow up. Median hip score in females improved from 39 to 82 points and in males from 52 to 85 points. Twelve patients underwent revision surgery either for infection or aseptic loosening.

**Conclusion:** The Thrustr Plate Prosthesis had a good outcome with an increase in hip score of 40 points and a median survival of 7 years.

**Methods:** Prospective study of 53 patients (younger than 55 years) that underwent total primary hip arthroplasty with Proxima® stem between September 2006 and December 2009. Clinical (Harris hip score, patient satisfaction, complications, dysmetria) and radiographic evaluation (standart AP, lateral and long axis) has been made at 0, 3, 9, 12, 24 and 36 months after surgery.

**Results:** Average age at the time of surgery was 45 and the average follow-up was 21 months. Arthritis secondary to osteonecrosis of the femoral head has been the main cause. The mean Harris Hip Score improved from 39.6 pre-operative to 94.1 post-operative. All patients were very satisfied and would repeat the experience if needed. There were no revisions, no dislocations or neurovascular lesions. There were no cases of thigh pain. Radiographic analysis showed that all hips were stable. Three of the stems were implanted in slight varus but with no consequent migration.

**Discussion and conclusions:** Short stem implants have several advantages compared to resurfacing, with a larger range of indications, lower complications, easier surgical technique and allows alternative bearing surfaces that can be used in women of childbearing age and patients with renal pathology. Moreover, they allow bone preservation and avoid stress shielding and thigh pain that occurs in the traditional length stems. This makes short stem implants a valid alternative in the treatment of young hip arthritis with excellent results at short-medium term.
We present a clinical test, which has proved to be very reliable with a very high sensitivity.

**Method:** In this internal rotation test the patient’s hip and knee are flexed to 90 degrees. The patient is told to push his lower leg to the outside (thus doing an internal rotation of the hip). The examiner resists this motion and pushes abruptly against the leg. In a loose or unstable stem the patient experiences a sharp pain in the thigh.

We evaluated the internal rotation test in 40 patients which were scheduled for hip revision. In 16 patients there were clear signs of loosening, in 4 patients stem stability was doubtful and in another 20 patients the revision operation was done for cup loosening with a stable stem. In every patient stem stability was tested during surgery by trying to extract the stem.

**Results:** In all 16 patients, where the internal rotation test was positive, the stem was evidently loose. In the 4 patients with doubtful stability on plain x-ray and a positive test the stem was fixed but could easily be extracted. In all patients, where the preoperative internal rotation test was negative the stem was well fixed and could not be extracted. Thus the sensitivity of the internal rotation test regarding stem instability or stem loosening was 100%.

**Conclusion:** The internal rotation test is a very valuable tool for the diagnosis of stem instability and stem loosening. We found it to be superior to plain x-ray or bone scans. We now rely on this test for the indication of stem revision.

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**O195**

**A NOVEL TECHNIQUE (ROOF STEP CUT) OF BONY RECONSTRUCTION IN ACETABULAR ROOF DEFICIENCY**

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**Background:** During arthroplasty the dysplastic acetabulum requires either a special implant or bone substitution. The long term result is better when we perform the latter one with the patient’s own femoral head as a structural graft. There are several methods as first described by Harris and Müller, who often used cemented cups in these cases.

**Aims:** Our aim was to elaborate a surgical technique, which allows the surgeon to use a press fit cementless cup in case of acetabular roof deficiency.

**Methods:** The technique is based on the step cut of the dysplastic roof and the fixation of an accordingly cut femoral head graft, and their fixation with two screws. The cut of the roof and of the head assures spongy contact surfaces and if the technique is carried out suitably, the press fit fixation of the cup is assured this way.

**Results:** Between 2008 January and April 2009 we used this method in 10 cases of Hartofilakidis type I and Crowe type I and II acetabulum. The good primary and follow up results are due to the fact that the step cut produces contact spongy surfaces perpendicular to the force exerted by the cup in press fit position.

**Discussion and conclusion:** Using our step cut technique neither cementing nor special implant is required during hip arthroplasty.

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**O196**

**ACETABULAR REVISION IN TOTAL HIP ARTHROPLASTY WITH THE BURCH-SCHNEIDER ANTIPROTRUSIO CAGE. LONG TERM RESULTS**

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From 1985 to 2001, the Burch-Schneider antiprotrusio cage (B-S APC) was implanted in 57 hips (55 patients) with massive acetabular deficiency. Five to twenty-one years post-operatively the B-S APC survived in 89.5% of the cases while patients presented with substantial pain relief, increased range of hip motion and walking capacity. The 10.5% failure rate was due to aseptic loosening in two cases and mechanical failure in four. It appears that application of the B-S APC in extensive acetabular deficiency presents a durable solution provided that proper indications and surgical technique are used.

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**O197**

**EXPERIENCE WITH GAP REINFORCEMENT RING**

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**Introduction:** GAP reinforcement ring (Stryker) had been a widely used tool to treat acetabular defects Paprosky type III. Some complications had been described such as migration, failure for fatigue or dislocation of the prostheses.

**Objective:** The purpose of this study is evaluate our series of results from 2003 to 2009 and analyze the complications.

**Material and methods:** Clinical-radiologic retrospective revision of 17 GAP rings operated during years 2003 to 2009.

**Results:** 9 patients were male and 8 female. Average age was 70 years (range from 38 to 87). Most of them had an acetabular defect according to Paprosky type I(3), IIa(4) or IIb (4). Average follow-up is 4 years. Infection has been the most common complication (3 patients) despite all three patients were infected previously. We found 2 cases of implant migration, 2 dislocations and 1 partial sciatic palsy.

**Discussion and conclusions:** According to the literature and our experience, we can see that the most common complication is failure for fatigue. For this reason, we have abandoned this technique.
surrounding bone based upon fully individualized muscle modeling and finite element simulation. Certified rapid manufacturing in Ti6Al4V allows for efficient and limited throughput time.

**Results:** Seven clinical cases have benefited from patient-specifically designed and evaluated implants. Personalized case documentation was incorporated, and screw drilling intra-operatively guided. Short term follow-up (4 to 36 months) indicates good outcome for the patients treated.

**Discussion and conclusion:** A completely personalized process of acetabular implant design features unique restoration in terms of anatomy, stability and mobility.

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**O203**

**THE "GLOVE"-TECHNIQUE: A NEW METHOD FOR FEMORAL FIXATION OF ANTIBIOTIC-LOADED HIP SPACERS**

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**Background:** The implantation of antibiotic-loaded spacers is accepted to be an efficient method in the treatment of late hip joint infections. Postoperatively, an insufficient femoral fixation might lead to a spacer dislocation and, hence, endanger the outcome.

**Aim:** Here, a new method is described for femoral fixation of articulating, anti-biotic-loaded hip spacers.

**Method:** The "glove" technique can be used for commercially available as well as custom-made hip spacers. Usually, 80 g bone cement are required for spacer production. The antibiotic impregnation of the cement should be made in accordance with the antibiotic sensitivity profile of the particular causative organism.

**Results:** "Glove"-technique: A sterile glove is placed into the proximal femur whereby the fingers are bound together with a vicryl suture. After preparing the same mixture used for the spacer (40 g cement), the doughy bone cement is now introduced into the glove. Afterwards, the intraoperatively prepared or commercially available spacer is inserted into the cement-filled glove. The entire construction is removed after a minimum of 2 minutes yielding a spacer with a near exactly anatomical copy of the proximal femoral part. There is no risk that the spacer-glove complex gets stuck in the femur as long as it is removed after 2 minutes before the polymerization heat has started. The glove is removed from the cement mantle around the spacer’s stem. Following the reinsertion of the stem the remaining doughy cement is used for partial fixation onto the femoral resection surface. After cement hardening the spacer is reduced.

**Discussion and conclusion:** The "glove" technique allows a stable femoral fixation between stages as well as a safe and easy spacer explantation in one piece without cement debris, reducing mechanical complications and operating time at the second stage.

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**O204**

**SURGICAL DEBRIDEMENT AND PARENTERAL ANTIBIOTICS IN ACUTE OR HEMATOGENOUS INFECTED TOTAL HIP ARTHROPLASTY**

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**Background:** Fractures around implants pose unique fixation challenges. The original placement of the implant may predispose to later fracture, the long-term presence of the device may change the structure of the bone and increase susceptibility to fracture.

**Aim:** Periprosthetic femoral fracture treatment is based on the site of fracture, implant stability and bone stock. We report our experience for the treatment of these fractures.

**Methods:** We reviewed the results of 15 patients with periprosthetic fracture of the femur after total hip replacement treated with open reduction and internal fixation, or revision arthroplasty in the time period of 2005-2007. According to Vancouver’s classification, fractures were 7 of type B1, 2 were type B2, 4 type B3 and 2 type C fracture. Seven patients had severe osteopenia and 8 patients had bone defect. Nine patients had internal fixation using reconstruction plate (CCQ) with cerclage wires and 6 had revision arthroplasty using a long-stemmed femoral prosthesis. The mean time of follow-up was 26 months.

**Results:** All the patients had a satisfactory functional result except one who had long length discrepancy. There were no malunion, non-union or infections. All the patients presented with bone healing in an average time of union 16.5 weeks (12 to 24 weeks).

**Conclusions:** Open reduction and internal fixation seems to be a valid method for the treatment of these fractures. Intraduillary stability and intraoperative evaluation of stem stability are important for fracture healing. Precise reduction and functional rehabilitation lead to a high percentage of bone union.
Background: Management of acute or hematogenous periprosthetic joint infections remains a therapeutic challenge. Whether surgical debridement and parenteral antibiotics with prosthesis retention for infected THA eradicate infection is not well established.

Objective: We sought to determine the prevalence of reinfection in a series of 54 patients with acute (Tsukayama Type I, 46 patients) or hematogenous (Tsukayama Type III, 8 patients) infections after a THA presenting a stable prosthesis.

Materials and methods: The patients were treated with surgical debridement and retention of components at an average of 13 days (range: 8 to 17) from the onset of symptoms.

Between January 2006 and January 2010 twelve early periprosthetic infections were treated with a vacuum-instillation system while leaving the implant components in situ.

Results: Successful implant salvage was achieved in 36 patients (66%) with a mean follow-up 20 months (range: 16-120).

Conclusions: Early debridement with retention of the prosthesis after an acute or hematogenous infected total hip arthroplasty is a valid treatment in those patients with fixed implants.

O205 DISTALLY LOCKED LONG STEM PROSTHESIS FOR THE MANAGEMENT OF INFECTED PERI PROSTHETIC FRACTURES OF THE FEMUR
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Introduction: We describe our novel approach to managing infected periprosthetic fractures using a revision implant for temporary fracture stabilisation.

Methods: A series of 17 consecutive patients aged between 74 and 83 years (average age 81.51, SD 6.32) who presented with periprosthetic fracture and microbiologically proven infection, were managed by radical debridement and antibiotic therapy along with temporary manipulation of a long stem cannulated, non-hydroxyapatite coated and distally locked femoral prosthesis (Canulock, Orthodesign, Chirchuch, UK in 12 cases and Kent Hip prostheses in 5 cases). Post operatively patients were allowed to mobilise as allowed and antibiotics were continued until biochemical markers returned to normal.

Results: A good clinical outcome and excellent functional outcome was noted in all 17 cases. There was one case of pulmonary embolism, which was treated. There were no instances of infections associated with prolonged immobilisation and hospital stay. Ten patients underwent a definitive revision hip replacement procedure within an average of 4.3 weeks (range 3.9 to 5.7, SD 2.15). Two patients required a second debridement and delayed definitive treatment due to persistently high inflammatory markers. In the rest of the cases, the implant has been accepted as permanent prosthesis.

Conclusion: We believe that this novel approach significantly improves functional outcome in the management of infected periprosthetic fractures.

O206 MANAGEMENT OF EARLY PERIPROSTHETIC INFECTION IN THE HIP USING THE VACUUM-INSTILLATION THERAPY
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Background: An implant associated infection represents a severe complication following hip arthroplasty. Several treatment options have been implemented. However, the duration of the infection is the single most important factor for the decision, if the implant can be left in place.

Aims: To find out if the use of vacuum-instillation therapy is useful and feasible in early periprosthetic infections and is enhancing therapeutic safety and success as well as reducing the number of surgical revisions, while leaving the implant components in situ.

Methods: Between January 2006 and January 2010 twelve early periprosthetic infections were treated with a vacuum-instillation system while leaving the implant in place. The series included postoperative and acute hematogenic infections, in which the duration of infection did not exceed to 8 weeks. In all cases after meticulous debridement polyvinyl foam was applied amply into the wound while instillation and suction drains were inserted. An intermittent vacuum-instillation therapy was then performed using polyhexanide solution. All patients received systemic antibiotics for six weeks.

Results: Between 2 and 5 surgical interventions (average 3.2) per patient were performed for the reason of the infection. Besides one patient suffering from an infection caused by an MRSA no local or systemic re-infections occurred. At the last follow up examination, C-reactive protein levels were normal in all patients but one. No method-associated or general complications were observed.

Discussion and conclusion: The success rate of the new therapeutic option was high in relation to other modalities. The implant preserving treatment of an early periprosthetic infection with surgical debridement, joint lavage, systemic antibiotic treatment and use of the vacuum-instillation therapy in the hip joint represents an alternative approach. The results achieved so far, justify the future use of the method and its inclusion into the therapeutic algorithm.
Scanning Electron Microscope (SEM) and an Energy Dispersive X-ray Spectrometer (EDS) were used for analysis of the differences among the surfaces of materials coated using different processing pressures of the working gas, and the Japanese Industrial Standard (JIS) method (JIS Z2801: 2000) was used for analysis of the antimicrobial activity, against Staphylococcus aureus, Pseudomonas aeruginosa and Klebsiella pneumoniae. Antimicrobial activity was analyzed only for the sample coated at 3.0 MPa.

**Results:** From the SEM and EDS results, when the pressure of the working gas was increased, the antimicrobial coated the titanium adequately. This material showed good effect against S. aureus, and P. aeruginosa, and some effect for K. pneumoniae.

**Discussion and conclusion:** Antimicrobial implants represent one preventive method against infection, and there is some possibility of using them not only for primary operations, but also for secondary operations after infection.

**O209 TREATMENT OF FEMOROACETABULAR IMPINGEMENT SYNDROME**

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**Aims:** In this paper the authors present the results of initial experience with the surgical treatment of FAI – femoroacetabular impingement.

**Methods:** Ganz technique for safe surgical dislocation of the hip with greater trochanter flip osteotomy.

**Results:** Our group composed 25 patients (15 men, 10 women) average age 36.5 years. With a 3 year follow up. For evaluation we used HSS system.

**Conclusions:** Our experience with Ganz technique for safe surgical dislocation of the hip with greater trochanter flip osteotomy as treatment of FAI was good. The clinical results - postoperative X-ray, motion, pain are positive, however, these are only the first results.

**O210 CONSTRAINED ACETABULAR CUPS IN REVISION SURGERY OF TOTAL HIP ARTHROPLASTY**

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**Introduction:** The recurrent hip instability is a major cause of prosthetic revision. In this study, we have reviewed cases where constrained acetabular components were used to avoid this instability and restore joint function.

**Methods:** We retrospectively reviewed 18 patients who underwent replacement of total hip arthroplasty between 2005 and 2009. They had a mean age of 73 years (56-85 years). Mean follow-up was 15 months (2-42 months). Causes of revision surgery were recurrent dislocations, ten hips (55.5%); septic arthritis, four hips (22.2%); and prosthetic loosening and soft-tissue defect, four hips (22.2%). We performed Hardinge’s reconstruction cup, plus a cemented liner. The mean follow-up was 62 months (48-75). Failure was defined as migration of the component of >5 mm.

**Results:** In 53 cases (89%) there were no clinical or radiological signs of loosening at the last follow-up. Bone graft showed total or partial radiological integration in 49 cases (83%). The Merle D’Aubigné score improved from 9.4 to 15.6 at five years. The complications included two dislocations. No re-operations were required.

**Discussion:** Our findings indicate that this treatment of severe acetabular defects is a reliable option.

**O211 METASTATIC CARCINOMA AS AN UNUSUAL CAUSE OF OSTEOLYSIS AFTER TOTAL HIP ARTHROPLASTY (THA)**

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In general, osteolysis may be the harbinger of infectious, neoplastic or metabolic bone disease. However, when associated with total joint prostheses, progressive endosteolysis is considered to be an inflammatory tissue response to particulate wear debris. Periprosthetic osteolysis has become so well recognized, and its presentation so stereotyped, that the clinician may fail to consider that the differential diagnosis of an osteolytic lesion remains broad.

We present the clinical, radiographic and pathological features of a 64-year-old woman in whom loosening and failure of total hip arthroplasty occurred secondary to a periacetabular metastasis from a previously undiagnosed lung carcinoma. At the time of our initial evaluation, the severity and pattern of the pain did not fit any diagnosis particularly well. The review of the history and the imaging studies as well as a high level of suspicion allowed us to reach a highly unlikely diagnosis. This naturally completely changed the prognosis and therapeutic direction and avoided revision surgery with associated aggressiveness and possibly highly painful consequences.

Our aim is to highlight the potential for malignancy to mimic septic and aseptic loosening and to encourage inclusion of periprosthetic malignancy as a differential diagnosis in the mechanically failing THA.

**O212 ACETABULAR RECONSTRUCTION WITH IMPACTION GRAFTING AND G.A.P. CUP SYSTEM**

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**Introduction:** Large defects in pelvic bone caused by osteolysis represent a complex challenge in acetabular revision surgery. Reconstruction using anti-protrusio cages combined with morseilled bone is a reliable technique associated with high rates of long term success.

**Materials and methods:** We reviewed a consecutive series of 59 cases of Type III-A and III-B Acetabular defects treated with impaction grafting and a G.A.P reconstruction cup, plus a cemented liner. The mean follow-up was 62 months (48-75). Failure was defined as migration of the component of >5 mm.

**Results:** In 53 cases (89%) there were no clinical or radiological signs of loosening at the last follow-up. Bone graft showed total or partial radiological integration in 49 cases (83%). The Merle D’Aubigné score improved from 9.4 to 15.6 at five years. The complications included two dislocations. No re-operations were required.

**Discussion:** Our findings indicate that this treatment of severe acetabular defects is a reliable option.
O214
HEAD-NECK-RATIO CHANGES IN RESURFACED HIPS AND THEIR SIGNIFICANCE
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Introduction: The association of Metal-on-Metal-Hip-Resurfacing-Arthroplasty (MoMHRA) with the development of Pseudotumour (PT) is a concern, especially in women. PT has been linked to increased metal-on-metal wear, which can be related to metal ion concentrations. Increased wear may result from impingement and edge-loading. Head-neck ratio (HNR) is a predetermining factor for range of movement and impingement. Neck thinning, with resulting increase in HNR, is a recognised phenomenon post-MoMHRA. Our aims were to identify HNR changes a hip undergoes when resurfaced and at follow up; and whether those changes are associated with elevated metal ions.

Methods: 90 patients (58M:32F) with unilateral MoMHRRAs were included. Blood tests were obtained at a mean follow up of 3.9 years and serum (Co:Cr) ion levels were measured using ICPMS. High metal ion concentrations were defined as Co>4.4 μg/l and Cr>5.2 μg/l. HNR and Head-Junction Ratios (HJR) were measured on plain antero-posterior pelvic radiographs pre-operatively (HNRpre), post-operatively (HNRpost/ HJRpost) and at follow-up (HJRfollow). Articular HNR (HNRart) was calculated allowing for a 2 mm cartilaginous layer.

Results: The mean amount of junction neck narrowing was 3.7%. Females had significantly larger (p=0.001) HNRpre compared to males (1.34, SD 0.1 vs 1.27, SD/0.1). There was no difference in HNRpost between genders (p=0.11). At follow-up, females had greater neck narrowing (5.6% vs. 2.6%) (p=0.01). Patients with high ions had higher HNRpre (1.37 vs. 1.27), their head were downsized more with resurfacing (p=0.001) and subsequently had greater neck narrowing (7.7% vs. 2.8% p=0.001).

Conclusion: Females have greater HNR pre-operatively and appear to be biomechanically disadvantaged when resurfaced. A decrease in HNR, secondary to neck thinning was also associated with higher ion levels. Increased neck thinning in symptomatic MoMHRA hips could indicate increased wear and should be investigated.

O215
BONE MINERAL DENSITY CHANGES IN THE PROXIMAL FEMUR AFTER RESURFACING VERSUS REGULAR TOTAL HIP ARTHROPLASTY: A PROSPECTIVE RANDOMIZED CONTROLLED STUDY
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Introduction: Resurfacing hip arthroplasty (RHA) claims to be bone preserving. However, periprosthetic stress shielding could lead to a gradual loss of bone stock in the femoral neck and may play a role in the evolution of future ‘neck narrowing’ and neck fractures.

Aim: A prospective follow-up of periprosthetic bone mineral density (BMD) changes after a RHA versus a regular THA may further elucidate this cliniac discrepancy.

Methods: Fifty-nine patients (65 years) were randomized to a RHA (n=29) or a regular uncemented THA (n=30). The BMD was prospectively determined at 4 separate regions of interest (ROI) of the femoral neck and in the calcar region for the RHA group, as compared to only the calcar region for the THA group. Standardized measurements were performed preoperatively and after 3, 6 and 12 months.

Results: The BMD in the calcar region (Gruen zone 7) increased after 1 year to 105.2% of baseline levels in the RHA group, compared to a significant decrease to 82.1% (p<0.001) in the THA group. The difference between the two groups in this area was highly significant (p<0.001). For the RHA group, in all 4 regions of the femoral neck, a non-significant decrease in bone density at 3 months was followed by recovery to baseline levels after 12 months.

Conclusion: In this study, RHA did indeed preserve bone mass in the femoral neck. As compared to a decrease in BMD in Gruen zone 7 after a THA, a significant increase in this region was observed after RHA. Longer term follow-up studies will have to elucidate whether this benefit of bone stock preservation will appear to be of clinical significance in future revision surgery.

O216
THE OSTEO NECROTIC PROCESS OF THE FEMORAL HEAD FOLLOWING RESURFACING THA. A CLINICAL PET STUDY
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Background: Since the historical reintroduction of resurfacing arthroplasty, the concept has spread widely. A number of questions like metal ions, pseudotumour, long term results and viability of bone in femoral head remain to be answered.

Aim: In our original prospective PET study of resurfacing THA1, four of 14 patients had developed an asymptomatic osteo necrosis of the remaining part of the femoral head one year after surgery.

Methods: In the present study those 4 cases were further analyzed again by F-PET-scans and radiography two years after surgery. The area of low fluoride uptake seen in prosthetic components, cement and non viable bone was analyzed.

Results: In one case the area had diminished in three it had enlarged. No signs of osteo necrosis were seen on radiography and no patient had pain or discomfort from the hip. Discussion: Fluoride-PET is a sensitive tool to study dynamic processes of bone metabolism in vivo and non-invasively. Metabolism of the demaged bone areas 1-2 years after resurfacing THA may diminish or enlarge. Clinical consequences of the present results are unclear. We recommend the resurfacing THA method to be used with restrictiveness until further research is presented.

References:
Introduction: Modern metal-on-metal hip resurfacing was introduced as a bone-preserving method of joint reconstruction for young and active patients; however, the large diameter of the bearing surfaces is of concern for potential increased metal ion release.

Aim: We investigated the metal ion blood concentrations and functional outcomes between patients who had metal-on-metal hip resurfacing (Group A) and patients who had 28-mm metal-on-metal total hip arthroplasty (Group B).

Methods: Consecutively, 59 patients (<65 yrs) were prospectively randomly assigned to receive either a hip resurfacing (n=30) or a cementless THA (n=29). Patients in both groups were matched for age, gender, BMI and preoperative metal ion release. Cobalt and chromium were analyzed preoperatively, at 3, 6 and 12 months. Functional outcomes were assessed with the Oxford Hip Score (OHS), Harris Hip Score (HHS) and Short Form-12 (SF-12) preoperatively, at 6 and 12 months.

Results: Both groups showed significant increased cobalt release at 3 months with stable concentrations thereafter, at 12 months there is a significant difference in cobalt concentration 1.40 μg/L (Group A) vs 1.00 μg/L (Group B) (p=0.011). The chromium release of Group A showed a significant increase in the first postoperative year up to 1.10 μg/L, while Group B remained low at 0.40 μg/L, this difference was also significant (p=0.003). Functional outcomes showed no differences between the two groups and after one year all patients did significantly improve.

Conclusion: Our data suggest an increased metal ion release for metal-on-metal hip resurfacing in the first year compared to metal-on-metal THA, median metal ion concentrations did not reach toxic levels. Patients experienced a significantly better function and quality of life 12 months postoperatively regardless of their implanted prosthesis.

Discussion and conclusion: Metal-on-metal hip resurfacing is an accepted hip resurfacing arthroplasty with a prevalence of 1% to 3% quoted in the literature.

Aims: To determine the prevalence of femoral neck fractures and time to fracture in patients undergoing Birmingham hip resurfacing (BHR) arthroplasty at a tertiary referral centre, and to assess the complication rate following revision surgery.

Methods: All patients with a BHR implanted at our centre who subsequently underwent hip revision surgery for a femoral neck fracture were identified from our database. Case notes were analysed and demographic data, details of primary and revision surgery, and any complications following revision surgery were extracted.

Results: Between October 1997 and December 2009, 3435 BHR procedures were performed at our centre. Femoral neck fractures occurred in 30 patients giving a prevalence of 0.87%. Mean age was 63.0 yr, and 50% (n=15) were female. Median time to fracture was 64 days (range 3 days to 11.2 years). All fractures were treated by single stage revision. Postoperative complications were classified as local (superficial wound infection; n=1, 3.3%), mechanical (aspecific loosening; n=3, 10%), and systemic (pulmonary embolism; n=1, 3.3%). Two patients underwent further surgery during follow-up for aspecific loosening; one had revision of the acetabular component and one had revision of the femoral component. Two patients died during follow-up for reasons unrelated to surgery. Mean follow-up was 3.0 yr (range 4 days to 8.6 years).

Discussion and conclusion: The largest published single centre series of femoral neck fractures following BHR arthroplasty known to the authors are presented. The low prevalence of fractures reported in our series highlights the good results that can be achieved by experienced surgeons routinely performing resurfacing procedures. However, complication rates following revision surgery are not negligible and surgeons should guide patients with this in mind.

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We have assessed 206 hips in which a Cerafit cementless cup was implanted. According to Dorr et al, acetabulae were classified as type A, in which the radiolucent triangle had an isosceles shape (86 hips), type B, in which the triangle extended into the teardrop (90 hips), and type C which had a right-angle triangle (29 hips). The use of screws was decided at the time of surgery and according to cup stability, not acetabular anatomy. Avascular necrosis and inflammatory arthritis were the most frequent diagnoses in type A hips, osteoarthritis in type B, and dysplasia in type C. Women were more frequent in types A and C (p<0.001). The use of screws was more frequent in women (p<0.001) and in type A (34.9%) and type C hips (62.1%) than in type B hips (20.6%) (p<0.001). The multivariate logistic regression model showed the acetabular type (p=0.11) and gender (p=0.003) as independent factors. Acetabular types A (OR=1.98, 95% CI: 0.92-4.208, p=0.075) and C (OR=5.09, 95% CI: 1.74-14.9, p<0.003) increase the risk for screw use. Men have a lower risk for screw use (OR=0.39, 95% CI: 0.16-0.68, p=0.003).

Acetabular anatomy and gender determine the use of screws in cementless cups. Continued follow-up is necessary to determine if screws results in less loosening and osteolysis.

O223 EARLY STABILITY OF A CEMENTLESS ACETABULAR CUP WITH A FLATTENED POLE: A RANDOMIZED RADIOSTEREOMETRIC STUDY COMPARING HA-COATED AND NONHA-COATED FLEXIBLE SOCKET
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Background: Press-fit acetabular cups are widely used in primary total hip arthroplasty. Press-fit cups have a hemispherical geometry. However, cups with a flattened pole might offer advantages in physiological load transfer and primary stability. Furthermore, a hydroxyapatite (HA) coating is frequently used to stimulate bone growth. Radiostereometric analysis (RSA) studies have shown that HA-coated cups have less migration and rotation. While good early stability of hemispherical cups has been documented in several RSA studies such data are unavailable for flattened pole designs.

Aims: To investigate both the early migration pattern of a flattened pole cup and the influence of HA coating on migration.

Methods: For this prospective, 2-centre RSA study, 39 postmenopausal female patients (40 hips) undergoing THA for primary osteoarthritus were randomized to receive a flattened pole titanium press-fit cup with either a titanium-plasma-sprayed surface (Ti-group) or with an additional hydroxyapatite coating (HA-group). Cup translations and rotations along 3 cardinal axes were measured immediately postoperatively, at 6 weeks and at 3, 6, 12 and 24 months.

Results: As 1 hip was lost to follow-up and in 1 hip the 2-year RSA images were not acquired, migration data of 38 cups were available for analysis at 2 years. Minimal translation along the y-axis (mean 0.10 mm) and rotation around the x-axis (mean – 0.34 degrees) occurred. Our hypothesis that translation and rotation would be different in the two groups was rejected. All cups showed complete osseointegration. Patients had an excellent clinical outcome with mean Harris Hip Scores of 96.7 for the HA-group and 97.1 for the Ti-group.

Discussion and conclusions: Excellent early stability was seen with both versions of this flattened pole cup. HA coating did not enhance the osseointegration. Compared to RSA studies with hemispherical press-fit cups at 2 years, stability of this flattened pole cup was somewhat better.

O224 ACETABULAR STRESS SHIELDING. A FINITE ELEMENT ANALYSIS OF A CEMENTED, A CEMENTLESS RIGID AND A CEMENTLESS ELASTIC SOCKET
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Background: Acetabular stress shielding behind cemented, cementless rigid and cementless elastic sockets has yet to be investigated.

Methods: We used two-dimensional finite element analysis to evaluate the hypothesis that flexible sockets protect acetabular bone from stress shielding. We compared the strain energy density and the interfacial micromotions of a cemented, cementless rigid and cementless elastic socket during a walking cycle.

Results: During the walking cycle, the elastic cementless socket showed load transfer comparable to the anatomical model. The rigid cementless model showed the highest levels of acetabular stress shielding. The elastic cementless socket showed the highest peak levels of micro-motion during the walking cycle (400 μm). The rigid cementless socket showed smaller areas of micro-motions and lower levels of micromotions.

Interpretation: Our study supports the theory that elastic sockets lower acetabular stress shielding. Sockets with higher elastic modulus seem to induce higher levels of micro motions that theoretically could interfere with the biological fixation of the socket.

O225 SINKING IN COLLARLESS CORAIL HIP REPLACEMENT
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Introduction: The purpose of this study was to assess whether sinking occurs in collarless corail hip replacement (CCHR) and to ascertain the extent and timing of sinking if present. We also evaluated its clinical relevance.

Methods: Retrospective case notes analysis was performed. 68 patients who had CCHR were identified from our database. Male to female ratio was 32:36. Their mean age was 74.2 years (range 37-95 years). Indications for surgery were osteoarthritus in 64 (94%) patients, rheumatoid arthritis in two (3%) patients and avascular necrosis in two (3%) patients. Sinking was measured at 6 weeks, 6 months and 1 year post-op compared to initial post-op x-rays. Measurement was from the highest point of the greater trochanter to the highest lateral aspect of the femoral stem.

Results: At 6 weeks x-ray 21 patients did not have any sinking, 18 patients had 1 millimetre (mm) sinking, 10 patients had 2mm sinking, 4 patients had 3mm sinking, 5 patients had 4mm sinking, 1 patient had 5mm sinking, 4 patients had 6mm sinking and 1 patient each had sinking of 7mm, 9mm, 11mm, 13mm and 26 mm respectively. When compared with x-rays at 6 months only 2 patients had a further sinking of 2mm while another patient had 3mm sinking. No further sinking was shown at 1 year follow up x-rays. One patient had revision surgery due to symptomatic sinking (29mm) at 6 months follow up.

Conclusion: Sinking does occur in the first 6 weeks in collarless corail hip replacement. Sinking of up to 13mm was asymptomatic. Hence we recommend: 1) the patient be informed about it when consent is taken; 2) six week check radiographs must be considered mandatory; 3) further prospective study with larger numbers and better measurement technique is needed.

O226 THE HISTOLOGY OF THE "FRENCH PARADOX". A POST-MORTEM ANALYSIS OF EIGHT WELL-FIXED CEMENTED MÜLLER STRAIGHT STEMS WITH A MEAN FOLLOW-UP OF 12.5 YEARS
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Introduction: Long-term success of a cemented hip stem depends on the longevity of the cement-bone and the cement-prosthesis interface. Various anchoring concepts for cemented hip stems have been presented, which, in brief can be categorised as either being force-closed or shape-closed, depending on the shape, thickness and completeness of the cement mantle. The Müller straight stem (CoNiCr) implanted with a shape-closed fixation has shown excellent long-term results. Aim of this study was to analyse histological changes related to this fixation concept also established as the "French paradox".

Patients and methods: Out of a recently published series of 165 primary total hip replacements a total of 8 stems were harvested with adjunct bone during autopsy. Specimens were cut at four defined levels, contact radiographs obtained and slices prepared for histology. Clinical data and radiographs, contact radiographs and histological samples were scrutinized for signs of loosening and micromodelling.

Results: After a median follow-up of 10.2 years all stems were clinically and radiologically well-fixed. Contact radiographs revealed an incomplete cement mantle but a complete filling of the medullary canal. PE-particles were detected histologically in the cement-bone interface of 7 stems in various extents without an accompanying inflammatory reaction, while massive PE accumulations were only seen with osteolysis. Cortical atrophy and the formation of an “inner-cortex” was confirmed in 6 of 8 stems by contact radiographs and histology but was only visible on 2 clinical radiographs.
Conclusion: At mid-term follow-up there were no specific histological and radiological findings related to the shape-closed fixation concept. We found no evidence that the histological appearance of the well fixed stems differs from stems fixed according to the force-closed concept.

O227 MODULAR GRT-BLASTED PROFEMUR-E STEM COMBINED WITH LARGE-DIAMETER METAL-ON-METAL BEARINGS: CORRELATION OF BONE QUALITY, CANAL FILL, STEM POSITIONING AND NECK GEOMETRY WITH STEM SUBSIDENCE

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Background: Modular femoral prostheses are designed to optimise femoral version at the time of THA. Large diameter femoral heads were introduced to increase range of motion and decrease rate of impingement and dislocation.

Aim: To investigate the factors affecting subsidence of a prosthesis combining these features with a grit-blasted femoral surface.

Methods: Between 2004-2008, 84 patients (56 female-28 male), mean age 62 years (27-78) have undergone primary THA by the senior surgeon, comprising a group of 92 hips. A combination of the grit-blasted Profemur- E stem, which utilizes six interchangeable neck geometries, and Metal-on-Metal articulation, with large-diameter heads, was selected in all cases. With the use of ROMAN v1.7 software, Cortical Index and CC Ratio were calculated and the patients were divided into 3 groups, according to Dorr’s bone quality. Canal fill in four different levels (calcar, lesser trochanter, midstem and stem tip) and varus or valgus stem positioning were assessed on immediate postoperative radiograms. Clinical and radiological evaluation was performed thereafter in regular intervals. Digital radiograms were graded according to Engh criteria and processed via ROMAN software. Stem subsidence was assessed.

Results: Mean follow up was 52 months (17-76). Mean preoperative Harris Hip Score and Merle d’Aubigné score were 45 and 10.3 respectively, whereas 92 (62-100) and 16.74 (14-18) at last evaluation. Radiological assessment showed good bony stability in 98% of implants. No incidence of thigh pain, dislocation, infection and cup or stem adverse effect occurred. One stem was revised because of aseptic loosening. Mean subsidence was 1.464±1.74mm in group A, 1.2306±0.694mm in group B and 2.03±1.457mm in group C. Non significant (NS) statistical difference was found. NS statistical difference in canal fill in each level was found between the 3 groups. However, statistical analysis revealed a negative correlation between subsidence and canal fill in tip and midstem area. Neck geometry or initial positioning had no effect on subsidence.

Conclusion: These mid-term results reveal the importance of correct stem sizing, at least for radiographical performance of this type of prosthesis.

O228 RADIO STEREOEMETRIC MIGRATION ANALYSIS OF AN ELASTIC SOCKET: A RANDOMIZED CONTROLLED TRIAL: WITH OR WITHOUT ADJUVANT SCREW FIXATION

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Background: An cementless elastic socket could be the answer for acetabular stress shielding and retainment of acetabular bone stock. Finite element analysis (FEA) however showed higher micro-motion levels compared to cemented and cementless rigid acetabular sockets.

Aim: Our goal was to perform a migration analysis and determine the effect of additional screw fixation on migration of an elastic press-fit socket.

Method: A randomized controlled trial was developed in which 37 patients were enrolled with a mean age of 63 years and a mean BMI of 26. Migration analysis was conducted using radio stereometric analysis (RSA) performed on two, six, twelve months after implantation of a cementless RM press-fit cup (Mathys, Betlach) with a cementless OLS spotorno stem (Zimmer, Warsaw). Clinical scores were obtained using the Harris hip score and the Oxford hip questionnaire.

Results: Randomization led to demographic equally divided study cohorts. We report our results twelve months after implantation in which there are no significant or clinical relevant migrations (migration >0.2 mm or rotation >2 degrees) in and between both study cohorts (P>0.05).

Conclusion: This study shows no clinical relevance of the micro-motion levels on component stability and could detect no beneficiary effect of additional screw fixation on migration in a cementless press-fit elastic socket. Both study cohorts showed stable sockets twelve months after implantation. FEA showed promising results for elastic sockets to resist acetabular stress shielding. Bone density studies are necessary to evaluate the effect of socket elasticity on bone quality.

O229 USAGE OF THE HARMONIC SYSTEM IN TOTAL HIP ARTHROPLASTY

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Aim: To compare operative factors, postoperative outcomes, and surgical complications of total hip arthroplasty when using the harmonic scalpel (HS) vs. conventional techniques (CT).

Method: In our prospective, comparative, observational study we compared two groups of patients underwent total hip arthroplasty in which either the HS or CT was used. We measured a compared operative time, blood loss to drainage, postoperative pain, soft tissues injury, and complications.

Results: Mean operative time was longer in the HS group compared with the CT of total hip arthroplasty (61 minutes vs. 54 minutes; P<0.05). We found no significance in postoperative pain regarding to visual analog scale score and use of paracetamol. Use of tramadol was significantly reduced in HS group compared to CT group at the 7th day measurement. Drainage volume was significantly lower in the HS group at 24 hours (332 ml vs. 429 ml; P<0.05) and at 48 hours (429 vs. 537 ml; P<0.05). C-reactive protein blood levels were significantly lower in the HS group 75mg/l vs. 96mg/l at the third day (P<0.05) and 26mg/l vs. 54mg/l at the seventh day (P<0.01). Creatine kinase blood levels were significantly lower in the HS group at the 3rd and the 7th day measurement: 2.4 ukat/l compare to 5.3 ukat/l at the 3rd day (P<0.01), respectively 1.1 ukat/l compare to 1.8 ukat/l at the 7th day (P<0.01). We found no significant differences between the HS and CT in blood myoglobin levels.

Conclusions: Use of the HS may reduce postoperative pain, drainage volume, and soft tissue injury in patients undergoing total hip arthroplasty. We presume even better results in cases of revision hip arthroplasty with large access through muscles and other soft tissues and particularly in orthopedic oncurosurgery.

O230 THE USE OF PREOPERATIVE DEXA SCANS TO EVALUATE BONE QUALITY IN HIP RESURFACING: A PILOT STUDY

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Introduction: There is renewed interest in hip resurfacing arthroplasty (HRA) because of the theoretical advantages of femoral bone stock conservation, proposed suitability for younger and more active patients, as well as improvements in the technology and surgical technique. A fracture of the femoral neck is the most common complication and depends on patient and surgical factors. The goal of this study was to determine whether a preoperative DEXA scan is useful to assess preoperative proximal femoral bone stock and to help in patient selection for HRA.

Method: We reviewed 40 patients with primary osteoarthritits who were good candidates for a HRA and had a preoperative DEXA scan of the hip region. The operating surgeon determined intraoperatively whether the patient had a HRA or a large head metal-on-metal total hip arthroplasty (MOM) according to the bone quality.

Results: Eventually, 12 patients (10 women and 2 men) had a MOM and 28 patients (19 women and 9 men) a HRA. The t-score and z-score were significantly lower in the MOM group compared to the HRA group (p=0.021 and p=0.014 respectively). The mean age of the MOM group (56.13 SEM 2.30) and the HRA group (61±2) were significantly different (p<0.01). Eventually, 12 patients (10 women and 2 men) had a MOM and 28 patients (19 women and 9 men) a HRA. The t-score and z-score were significantly lower in the MOM group compared to the HRA group (p>0.021 and p>0.014 respectively). The mean age of the MOM group (56.13 SEM 2.30) and the HRA group (67.49 SEM 1.24) was similar (p>0.73). There were no neck fractures in the HRA group at a minimum follow-up of 2 years.

Discussion: Our study demonstrates that a preoperative DEXA scan can account for proximal femoral bone material quality. We believe that in relatively elderly candidates for a HRA, a preoperative DEXA scan should be performed. According to our data, HRA can be safely done in patients with a t-score <-1.5 a conventional total hip arthroplasty should be considered.

O231 COMPLIANCE OF LOW-MOLECULAR WEIGHT HEPARIN PROPHYLAXIS AT HOME FOLLOWING JOINT REPLACEMENT SURGERY

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Patients who had undergone joint replacement surgery and received subcutaneous injections of Low-Molecular Weight Heparin (LMWH) in the commu-
Discussion and conclusion: Most undertake moderately or highly demanding jobs. These work full time, have an average commute of 10 miles, and travel to work by car. Keeping patients at work and enabling them to return to work. Patients are just as likely to return to physically demanding jobs as they are desk jobs. This may have an impact on implant survival. Furthermore, few patients took the opportunity to use the benefits of potential increase in quality adjusted life years to take early retirement.

Q234 CEMENTED TOTAL HIP ARTHROPLASTY IN “HIGH-RISK OF DISLOCATION PATIENTS”

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Background: One of the most feared complications in total hip arthroplasty is undoubtedly hip dislocation. Patients with neuromuscular disorders, neck femoral pseudarthrosis, dementia or any other condition associated with muscle weakness or low compliance can have a risk of dislocation as high as 40%. Aim: To evaluate the clinical and radiographic results of a cemented stem (Lubinus®) with a snap-fit cup at the short-medium term in “high-risk of dislocation patients”.

Methods: Retrospective study of 30 patients (4 male and 26 female) that underwent total hip arthroplasty (posterior approach) with Lubinus® stem and snap-fit cup between June 2007 and January 2010. Clinical (functional status, patient satisfaction, complications) and radiographic evaluation (standart AP, lateral and long axis) has been made at 0, 3, 9, 15 and 24 months after surgery.

Results: Average age at the time of surgery was 77 (68-90) and the average follow-up was 16 months. Pseudarthrosis (6) or failure of the osteosynthesys (13) of the neck of the femur and unstable total hip arthroplasty (5) were the main causes. Primary coxarthrosis in patients with hemiplegia or dementia was responsible for four cases. The other two were from conversions from hemiarthroplasty and Girdlestone. Two of the patients died from medical problems complications. One of the patients was re-operated after an acetabular periprosthetic fracture. One case of pulmonary thromboembolism was reported. All patients were satisfied with the result and returned to their previous functional status. There were no dislocations or neurovascular lesions. Radiographic analysis showed that all hips were stable and there were no signs of cup or stem loosening.

Discussion and conclusions: There are several implant and technique options to counteract dislocation in “high-risk” patients. The use of cemented snap-fit cups is an excellent alternative in low-demand patients because of its easier technique with low morbidity and scarce of complications.

Q232 FINANCIAL IMPLICATIONS OF INACCURATE CODING IN TOTAL HIP ARTHROPLASTY

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Background: The Payment by results (PbR) system was introduced in the United Kingdom to encourage and reward good performance, support sustainable reductions in waiting times and make best use of available capacity. Payment by results was implemented in the National Health Service (NHS) in 2003/4 for outpatient activity and for elective activity in 2005/6. NHS Hospital Trusts receive payment for their activity depending on the Healthcare Resource Group (HRG) codes allocated by the clinical coding department. If HRG codes are incorrect or incomplete then hospital trusts will lose revenue.

Aims: Identify the financial implications of inaccurate coding in total hip arthroplasty and implement strategies to address these inaccuracies.

Methods: The operative notes, clinic letters and radiographs of 200 consecutive total hip replacements were reviewed. The actual procedure performed was referenced against the HRG allocated by the clinical coding department. Details of incorrect codes were recorded. Lost revenue was calculated using the NHS costing manual.

Results: 45% of cases reviewed were inaccurately coded (89 of 200). The loss of revenue due to inaccuracy (including the 79% top-up applied to specialist services) was £120,609.

Discussion: This study revealed significant coding errors. NHS Trusts are losing revenue. The reason is non-medical staff (clinical coders) translate medical terminology to HRG codes (based on ICD-10 and OPCS-4 codes) to derive coding. Incomplete, inaccurate or inaccessible then codes may be inaccurate. To address these inaccuracies a pro-forma was introduced detailing the exact operation type and relevant patient co-morbidities. This was completed by the clinician/surgeon during admission and attached to the front of the patient notes. This provides easily accessible information for Coders. Coding inaccuracy was reduced from 45% to 19% in 3 months following introduction of our pro-forma.

Q233 EMPLOYMENT STATUS FOLLOWING PRIMARY HIP ARTHROPLASTY IN PATIENTS UNDER THE AGE OF 65

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Background: The number of patients of working age undergoing hip replacement is increasing. Whilst the benefits of total hip arthroplasty on pain and function are well documented, few large series have been published regarding the effect of hospital status in the United Kingdom.

Aim: To study the impact of primary hip replacement upon employment status in patients under the age of 65.

Methods: A cohort of 160 consecutive patients under the age of 65 who had undergone primary hip arthroplasty within the last 6-12 months was contacted by post. They were asked to complete a detailed questionnaire concerning their employment status both pre- and post-operatively.

Results: There were 113 respondents (71% response rate). 95 patients were available for final analysis (18 patients were either retired or had never worked). 78% were working up until the time of surgery; 92% returned to work. Of these, 87% returned to their normal job without any changes. 52% of those patients who had stopped work prior to surgery were able to return to work. In total, 83% returned to work following surgery. All but one returned to work within 6 months with more than half returning in under 3 months. The majority of these work full time, have an average commute of 10 miles, and travel to work by car. Most undertake moderately or highly demanding jobs.

Discussion and conclusion: Total hip arthroplasty is an effective means of both keeping patients at work and enabling them to return to work. Patients are just as likely to return to physically demanding jobs as they are desk jobs. This may have an impact on implant survival. Furthermore, few patients took the opportunity to use the benefits of potential increase in quality adjusted life years to take early retirement.

Q235 TOTAL HIP ARTHROPLASTY FOLLOWING ACETABULAR FRACTURE: A REVIEW OF POST-ARTHROPLASTY OUTCOME

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Background: Development of post-traumatic osteoarthritis after acetabulum fractures can occur even after anatomical reconstruction of the hip joint. The post-arthroplasty outcome of these injuries has not been well reported in the literature.

Aim: To measure the outcome of patients requiring total hip replacement (THR) following acetabular fracture.

Methods: Between August 1995 and November 2008, all patients who had THR, having sustained acetabular fractures previously were included. Demographic details, mechanism of original injury, fracture classification (Letournel & Judet), post-fracture/THR complications, type of THR, and pre/post-operative Charnley’s modified D’Aubigné & Postel hip score were recorded. Mean follow-up time was 4.5 years (1-12).

Results: Out of 520 patients treated in our institution, 31 (5.9%) (11 female) patients met the inclusion criteria. Average age at injury was 43.5 years (18-80 years), Average age at THR was 53 years (28-80). 7 patients sustained both column fractures; 8 posterior columns posterior wall; 8 posterior wall, 7 transverse posterior wall and 1 anterior column. 15 patients sustained dislocation of their native hip. All fractures (except 3 patients) underwent surgical reconstruction. Post-fracture fixation complications included proximal deep venous thrombosis (3), pulmonary embolism (1), residual lower limb neurapraxia from injury (4), severe heterotopic ossification (3) and AVN (6).

All patients received cemented THR apart from 1 case of hip resurfacing. The mean time between acetabular injury and THR was 9.85 years (1 to 40 years). There were 3 early dislocations (within 1 year of THR) and 1 late dislocation. 2 patients developed deep infections. In total 5 patients have undergone revision surgery. The patient’s Charnley’s modified hip score showed 63% Charnley Activity Grade A, 85% “Very Good Satisfaction”, 67% “No Pain” and 44% “Normal” Function.

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Conclusion: THR after acetabulum fracture remains a challenging procedure. Vigilance is required for the avoidance of complications, good functional outcome and to optimize the longevity of the hip joint.

O236 REVISION HIP REPLACEMENT IN 55 YEARS OF AGE AND YOUNGER S. Konan, F.S. Haddad
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Introduction: The purpose of this study was to assess the efficacy and complications associated with revision hip arthroplasty undertaken in patients under the age group of 55 years. Methods: A review of our institutions revision hip database showed that 430 revision hip arthroplasties undertaken over the past 9 years had a minimum follow up of 2 years. 84 (56 female, 38 male) patients were under 55 years of age (range 2 to 8 years). The index procedures were preformed at an average age of 46 years (range 15 years to 54 years). The single major etiology of failure was aseptic loosening (74%), followed by infection (8%) and recurrent dislocation (7%). In majority of cases uncemented implants were used at revision surgery (91% femoral stem, 100% acetabular cups). Bone grafts were necessary in 39% of cases.

Results: There was 1% incidence of DVT requiring treatment and 1% incidence of deep infection requiring a further revision hip surgery. There were no cases of dislocation in this series. At final follow up satisfactory progress was noted in all cases with a significant improvement in Harris hip score (p<0.05).

Conclusion: Revision of hip arthroplasty in patients below 55 years is associated with improvement in function and patient satisfaction.

O237 POSTOPERATIVE ACUTE CEREBRAL VASCULAR ACCIDENTS AFTER PRIMARY TOTAL HIP ARTHROPLASTY F. Comba, D. Muñoz De La Rosa, M. Buttur, F. Piccaluga
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Introduction: Postoperative cerebral vascular accidents after primary total hip arthroplasty are rare, potentially disabling and even a life-threatening complication. Aim: The purpose of the present study is to report the incidence, initial diagnosis and treatment of the mentioned complications. Material and methods: Between January 2000 and July 2009, 3150 primary total hip arthroplasties were performed in a single institution. We analyzed those patients with cerebral vascular accidents that occurred in the first week after surgery. The neurological event was suspected based on clinical findings and a definitive diagnosis was achieved through MRI images.

Results: The incidence of cerebral vascular accident was 0.12 % (4 cases of 3150 THA, IC 95% = 0.05 - 0.32). All were diagnosed during the first postoperative day. MRI was an important tool for early diagnosis and to confirm the ischemic etiology in all the cases. In three patients MRI findings were bilateral compromise of the territory between anterior medial cerebral arterial territory after surgery. The neurological event was suspected based on clinical findings and a definitive diagnosis was achieved through MRI images.

Results: The mean score ± SD was 83 ± 22 for the Harris Hip Score, 22 ± 25 for the WOMAC Score, 42 ± 14 and 59 ± 6 for the physical and mental SF-12, and 40 ± 15 for the UCLA Score. Radiologically 4/6 showed an excellent and 2/6 a fair result, AVN with collapse of the femoral head was not observed.

Conclusion: This case series looked at data from an infrequent trauma and focused on a variety of concomitant injuries due to dislocation. The case-related management of presented injuries yielded satisfactory clinical and radiological outcomes.

O239 MODIFIED BLOODLESS “THOMINE ET AL” LIMITED LATERAL APPROACH (TA) VERSUS TRADITIONAL LATERAL HARDINGE APPROACH (HA) IN TOTAL HIP ARTHROPLASTY N.A. Christodoulou, G.K. Gouzias, K.P. Diatekis, Th.Ch. Georgas, Ch.V. Sdrenias Orthopaedic Department, Karpenissi Hospital, Karpenissi, Greece

Background: In traditional lateral transfemoral Hardinge approach (HA), if it is extended, injury of superior gluteal nerve branches or lateral circumflex artery at the anterior part of vastus lateralis region may be occurred, but in modified Thomine et al (TA) limited lateral hip approach these injuries may be avoided.

Aim: To evaluate clinical and radiological parameters and complications intra-and postoperatively between two groups of patients operated by (TA) and (HA) approaches for THA.

Methods: 64 Thomine et al approach (TA) cases in 55 patients (47 women and 8 men) and skin incision of 14cm (range, 10 to 16cm) according to subgroin diameter of each patient in comparison with 97 Hardinge approach (HA) cases in 88 patients (79 women and 9 men) with skin incision of 18cm (range, 16 to 24cm). All patients suffered from primary osteoarthritis and were operated between April 2003 and March 2007.

Results: Time of surgery, peri-operative complications and Harris hip score were similar in both groups regarding short-term clinical outcomes at one month, 3 months and one postoperative year, but peri-operative blood loss was eliminated in TA group accompanied by earlier independent walking ability and higher hip score, fewer need for blood transfusion, shorter hospital stay.

Conclusions: “Thomine at all” modified approach with limited skin and soft tissue incision has the advantages of minimal blood loss, post-operative hip abduction and walking ability related to intact strong posterior part of gluteus medius muscle but further analysis of this modified approach is needed before it can be recommended for widespread adaption.

O240 ANTERIOR LATERAL DECUBITUS INTERMUSCULAR (ALD) APPROACH IN HIP TISSUE SPARING SURGERY: A MODERN INTERPRETATION OF THE SMITH-PETERSEN APPROACH S. Carta, M. Fortina, D. Scipio, A. Riva, S. Di Giacinto, P. Fenata Orthopaedics and Traumatology Clinic, University Hospital of Siena, Siena, Italy

Background: The increasing desire to protect the periacetabular structures has led to the need for Tissue Sparing Surgery. The accesses most widely used are the direct-lateral approach and the poster-lateral one, both with patient in reverse decomit. Aim: However, these accesses require an incision of tendons and muscles even in their minimally invasive technique, so we looked for an approach that would wholly protect the periacetabular structures and allow us not to revise our experience in patient positioning, preparation of the operating field and surgeon's position during surgery. Our intent was to leave the acquired knowledge unchanged and to preserve unaltered the anatomical landmarks that we had previously identified and consolidated for the correct positioning of the components.
Methods: We have used this approach in more than 180 cases of primary hip arthroplasty. Clinical control includes: Oxford Hip Score, VAS and X-Ray.

Results: OHS mean: 44, range 37–48. On X-Ray no signs of components migration, radiolucent lines or osteolysis. We did not have dislocations or other complications.

Discussion: The only approach that really safeguards the periarticular structures is the anterior one (Smith-Petersen), which actually is performed placing the patient in supine decubitus, with obvious difficulties in preparing the operating field and a complete change of the anatomical landmarks. We have combined the advantages of the anterior access with the ones linked to the lateral decubitus. The rewards of this new approach are: easiest preparation of the operating field; no special bed or supports are required; the inferior limb can be easily moved; It is a real tissue sparing approach; good acutabular exposition; surgeon placed traditionally on the posterior side of the patient during the acutabular time.

Conclusion: We have encoded all the steps of this approach that we have called the Anterior Lateral Decubitus Intermuscular (ALDI) approach.

O243 TOTAL HIP ARTHROPLASTY WITH MINIMAL INVASIVE ANTERIOR APPROACH

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Aim: To evaluate the minimal invasive anterior approach in total hip arthroplasty.

Material and method: 18 patients; 10 men and 8 women underwent a Total Hip Arthroplasty (THA) with minimal invasive anterior approach. The mean age was 55 years. The minimal invasive anterior approach was performed with the patient in the true lateral position using the modified Smith-Petersen approach. The incision was 1 cm long on average. Tantalum uncemented acutabular cup and Spornato type femoral stem was used in 16 patients while in 2 patients a cemented femoral stem was fitted by means of specially designed instruments. The mean surgical time was 100 minutes.

Results: The average follow-up was 4 years (1-5y). There was no need to modify the incision in any patient. Skin contusions were made to 3 patients while fitting the femoral stem and dysesthesia at the lateral aspect of the thigh was recorded in one patient. Adequate exposure of the acetabulum was achieved in all patients and the cup was placed easily. On the contrary, placement of the femoral stem was a vigorous effort and gaining access to the medullary canal was difficult. Intraoperative undisplaced femoral fractures were recorded in 3 patients. Postoperatively, all patients were mobilized with the use of assistive devices. No significant differences in postoperative ambulation were reported compared to the patients who underwent THA with a posterior approach.

Conclusion: Even though the minimal invasive posterior approach is an anatomical approach, no advantages were reported regarding postoperative ambulation and pain. Fitting the femoral stem was technically difficult and predisposes to complications.

O244 RESURFACING ARTHROPLASTY OF THE HIP: MIDDLE TERM RESULTS

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Introduction: Resurfacing arthroplasty has gained importance as an alternative treatment of young patients with hip arthritis. The advantages of these type of prostheses have been documented as the preservation of bone stock and the low wear rate of the Me-on-Me bearing. The objective of this paper is to evaluate our experience in this type of arthroplasty.

Material and methods: Between July 2005 and July 2010, 118 RSF arthroplasties were performed at our hospital. We evaluated our patients before and after the surgical procedure, using clinical and radiographic protocols. The functional evaluation was performed using the Harris Hip Score, the Oxford test and the SF-36 questionnaire. The survival rate was calculated with the statistical analysis of Kaplan-Meyer.

Results: 88.89% of our patients were men, with a mean age of 52.27 years for the whole series. The mean follow-up period was 2.98 years, and the survival rate, at three years, 96.6%. The mean value obtained with the Harris Hip Score was 94.5 points.

Discussion: The clinical and radiographical results obtained in the first series of patients operated in the Hip Unit of our Hospital are different depending of the prosthetic model used. The best results, obtained with the Conserve Plus prosthesis, are excellent after a mean follow-up of three years, clinically as well as radiographically. Although the clinical and radiographic results obtained using the Icon prosthesis are also good, the survival rate of the arthroplasties using this device is lower. A careful selection of the patients is of the utmost importance to avoid complications. In our opinion, the preservation of bone

O242 HIP INSTABILITY TREATED WITH ARTHROSCOPIC CAPSULORAPHY

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Aim: Symptomatic capsular laxity of the hip is a difficult diagnosis and its treatment very challenging.

Capsuloraphy can be effective in treatment of symptomatic capsular laxity of hip in patients with associated labral or ligamentum teres tears.

Methods: Retrospective case series study reviewing 16 patients with hip instability treated with arthroscopic capsuloraphy. Inclusion criteria for the procedure were: giving way, a positive log roll test, demonstration of hip laxity with the image intensifier under general anesthesia. Patients were also assessed for ligamentous hyperlaxity. We made 4 groups based on associated pathology: I. dysplasia (CE<20°) II. FAI III. Labral tear/ ligamentum Teres Tear IV. Ligamentous Hyperlaxity. Postoperatively patients were assessed for instability, log roll test and 100 point Modified Harris Hip Score.

Results: At 2-3 years follow-up, 15/16 had a negative log roll test and no instability. The average preoperative MMHS was 52 points (range 11–74), the average postoperative score at 2-3 years follow-up was 79.1 points (range 20–100). The MMHS scores per group are: Group 1 (n=4) preoperatively 48 points and post-operatively 65; group 2 (n=2) 51 points preoperatively and 93 postoperatively; group 3 (n=7) 63 points preoperatively and 95 postoperatively; group 4 (n=3) 52 points preoperatively and 53 postoperatively.

Conclusion: Although arthroscopic capsuloraphy seems to be effective in treating symptomatic capsular laxity, significant differences in outcomes between the groups are observed. Associated labral tears seem to result in better outcomes except in patients with dysplasia. Capsuloraphy may not suffice as a sole procedure to treat instability patients with dysplasia and ligamentous hyperlaxity without other intrarticular pathology.

O241 THE ANTERIOR SUPINE INTERMUSCULAR APPROACH FOR TOTAL HIP ARTHROPLASTY WITHOUT THE USE OF AN EXTENSION-TABLE: A PROSPECTIVE COHORT STUDY ON EARLY RESULTS, COMPLICATIONS AND LEARNING CURVE

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Discussion and conclusion: The only approach that really safeguards the periarticular structures is the anterior one (Smith-Petersen), which actually is performed placing the patient in supine decubitus, with obvious difficulties in preparing the operating field and a complete change of the anatomical landmarks. We have combined the advantages of the anterior access with the ones linked to the lateral decubitus. The rewards of this new approach are: easiest preparation of the operating field; no special bed or supports are required; the inferior limb can be easily moved; It is a real tissue sparing approach; good acutabular exposition; surgeon placed traditionally on the posterior side of the patient during the acutabular time.

Conclusion: We have encoded all the steps of this approach that we have called the Anterior Lateral Decubitus Intermuscular (ALDI) approach.
Abstracts from the 9th Domestic Meeting of the European Hip Society

Q246

GOO D OUTCOME OF LUBINUS SPII PROSTHESIS FOR THE TREATMENT OF CHRONIC HIP DISEASES. OUR EXPERIENCE
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Background: Patients who experienced hip disease in the past were forced to live with pain and discomfort. Total hip arthroplasty is able to restore function and mobility to hip joints, enhancing the quality of life for patients. In the last 40 years many types and designs have been used but the results still remain controversial.

Aim of the study: To evaluate the survivorship rate of the Lubinus SPII II snap fit cemented total hip arthroplasty.

Method: From 1997 to 2002 we performed 237 total hip replacements using the Lubinus SPII hip stem and the eccentric snap fit acetabular cup with cement. Thirty-one of these were revisions due to aseptic loosening of other types of THR. We documented demographic and clinical data related to the surgery as well as complications, early and late, and survivorship of the prosthesis up to 8 years. The functional assessment was made using the Harris Hip Score and the Oxford hip score.

Results: There were 167 women and 70 men with a mean age of 76.2 years. We used the Altman classification modified by Chartoffildakis to categorize the hips. The functional outcome was improved statistically significant in HHS as well as in OHS. There were two cases with periprosthetic fracture and one case with traumatic dislocation (after the fall of the patient from bed). In the fracture cases we revised the femoral stems using long stems for dysplasia and in the last case we performed revision of the acetabular component. The results in all three cases were excellent. The 8 year survivorship rate for aseptic loosening and infection was 91%, with the overall rate 98.6%.

Discussion and conclusion: The results using this prosthesis are encouraging and having considered the literature we believe that this is a reliable method for the treatment of chronic hip diseases.

Q247

TREATMENT OF FEMORAL NECK NONUNION WITH INTERTROCHANTERIC OSTEOOTMY WITH DYNAMIC HIP SCREW OF VARIABLE ANGLE
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Introduction: The number of hip fractures is large and a small percentage of patients experience nonunion or fixation failure. The primary modified Fauvel's intertrochanteric osteotomy is a reliable alternative to achieve fracture healing in neglected femoral neck fractures and simultaneously correct associated coxa vara and shortening.

Material and methods: We present four cases of failed treatment of femoral neck fractures treated with intertrochanteric osteotomy fixed with dynamic hip screw with a variable angle blade plate (D.M.S. Martin). Average age was 33 years (18-45), average time between primary stabilization and osteotomy was 5 months and minumum follow up after osteotomy was 30 months.

Results: All femoral neck non-unions healed. There were no problems with intertrochanteric osteotomy union.

Discussion: In young patients an attempt to salvage the femoral head is preferred. The most predictable results in young patients can be obtained with the use of realignment osteotomies. The D.M.S. Martin device makes the surgery easier, shorter, and allows good adaptation of the plate to the femur.

Q248

CLINICALLY FUNCTIONAL, RADIOLOGICAL AND SURVIVORSHIP FOLLOW-UP OF 200 CONSECUTIVE TRIPLE TAPER POLISHED CEMENTED STEMS IN AN INDEPENDENT CENTRE
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Introduction: Long-term results are required to expose long-term problems. Medial calcar bone loss is observed with contemporary designs of cemented and uncemented total hip replacement. In order to address this issue, a triple taper design was introduced (the C stem). The originating centre reports excellent results with no revisions at 13 years. The stem was unpopular with some surgeons due to the lack of traditional shoulder geometry and a 8/10 taper. An evolution of this stem (the C stem AMTs) was therefore introduced with a traditional shoulder geometry and 12/14 taper. The intramedullary geometry is identical to that of the previous design. We report the short-term results from an independent centre.

Materials and methods: 200 consecutive patients with C stem AMTs were followed up for a mean of 3.75 years (range 3.25-4.9 years). There were 131 females and 62 males. The mean age at surgery was 77 years (range 48-95 years). Patients were assessed by use of Oxford hip scores, SF-12 questionnaire, patient satisfaction surveys, radiological analysis and survivorship analysis.

Results: In this cohort of our first 200 cases, the survivorship of all stems and constructs was 100% at 3 years. Outcome scores indicated good or excellent results in all cases and patients were “very satisfied” with their operation. Barrack grades of A or B were achieved in over 75% of cases and no cases of excessive subsidence were observed. Stem alignment was satisfactory.

Conclusion: Improved cementation has improved survivorship of contemporary cemented stems. It is hoped that the triple taper will preserve medial bone stock in the long-term. The survivorship and results of use of the stem in an independent centre are excellent and it would appear the C stem AMT behaves in the same way as its predecessor. Long-term follow up is continuing to confirm these initial findings.

Q249

RETROSPECTIVE RESULTS OF 200 THA WITH A DOUBLE MOBILITY ACETABULAR IMPLANT
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Introduction: Double mobility acetabular implant has a semicircular shape, it is covered with hydroxyapatite, the entire surface has a thickness of 3 mm and its...
centres of rotation are shifted. The polyethylene employed is a high density one and it has some chanbers to avoid the cam effect.

Methods and materials: We present the results of an homogeneous series of 200 patients, operated between 2003 and 2007. Clinical and radiographic parameters were analyzed prospectively. The mean follow-up was done during 15 months. Clinical results were evaluated by the HHS at the out patients clinical previous and post surgery. Results: From the 200 patients operated (130 women - 70 men / mean age: 81 years): 57.63% had a primary hip osteoarthritis; 5.77% femoral necrosis; 1.13% rheumatoid arthritis; 16.85% revision surgeries; 13.45% femoral neck fractures; 3.2% acetabular fractures and 1.5 % hip tumours.

HHS before surgery was 45.83 points on average (from 12 to 79) and post surgery HHS was 80.03 points (from 37 to 100), increasing the total score after the arthroplasty in a mean of 34.17 points. Post surgery complications were as follow: 3 dislocations (1 after an enormous fall and 2 in patients with Alzheimer. In our series there are 50 patients diagnosed of dementia-Alzheimer); 1 per prosthetic fracture (revision surgery); 4 deep infections (2 acute: lavage+antibiotherapy; 2 late ones: spacer + antibiotic therapy + second time surgery); 2 Deep vein thromboses (Eco Doppler +): 10 urinary infections; 2 urinary retentions and 17 deaths.

Discussion: Double Mobility acetabular implant has shown good results in all the following indications: revision surgery, hip osteoarthrits, femoral necrosis, rheumatoid arthritis, femoral neck and acetabular fractures, hip tumours and as an implant for Computer Assisted Hip Surgery.

Conclusions: The complications found while this acetabular implant is used appeared with the same percentage than others. The dislocation rate is lower than standard acetabular implants, especially in patients with neuromuscular or cognitive illnesses.

Those clinical results are encouraging and they could increase the number of actual indications (hip osteoarthrits in people over 70 years old, multiple illneseases associated, iterative dislocations…) for the double mobility implant on the future.

O250 CERAMIC-ON-CERAMIC CEMENTLESS TOTAL HIP ARTHROPLASTY. RESULTS AFTER A MINIMUM OF TWENTY YEARS FOLLOW-UP G. Petsatosidis, F. Aeataghelidis, P. Papadopoulus, I. Hatzokos, A. Christodoulou 1st Orthopaedic Department, “G. Papankolou” General Hospital, Thessaaloniki, Greece

We retrospectively evaluated the clinical and radiographic results of 100 patients who had undergone a total of 109 primary total hip arthroplasties with a cementless alumina ceramic-on-ceramic prosthesis between January 1985 and December 1989. Clinical evaluation was performed with use of the Charnley prosthesis. The appearance of radiolucent lines in any of the 7 zones described by Gruen included type of fixation (according to Engh criteria), subsidence, orientation of the stem, calcar remodelling, osteolysis and the presence of radiolucent lines.

Failure was recorded with the Kaplan-Meier survival curve analysis. The survivorship of both stems with aseptic loosening as end-point. The purpose of our study was to compare osteointegration of a single stem design with two different alloys (cobalt-chromium or titanium). We also analysed the survivorship of both stems with aseptic loosening as an end-point.

Methods: We analysed 100 Meridian stems (Howmedica, Rutherford, New Jersey) 50 were cobalt-chromium stems and 50 were titanium stems) randomly selected from the 2001 database of uncemented implants. Radiological analysis included type of fixation (according to Engh criteria), subsidence, orientation of the stem, calcar remodelling, osteolysis and the presence of radiolucent lines. The appearance of radiolucent lines in any of the 7 zones described by Gruen was recorded. Clinical results were assessed with the Harris Hip Score. Time to failure was recorded with the Kaplan-Meier survival curve analysis.

Results: Harris Hip Score improved from 45 points preoperatively to 89 points postoperatively. Two cobalt-chromium stems are radiographically loose. One of them has subsided 4 millimetres. There was one distal osteolysis in one cobalt-chromium stem. Titanium stems showed a statistically significant better osteointegration and also presented less radiolucent lines than cobalt-chromium stems.

Conclusion: The Meridian stem shows a good clinical result at nine years follow-up. Titanium stems obtained better osteointegration than cobalt-chromium stems.

O253 THE CPS-PLUS STEM: MEDIUM-TERM RESULTS OF A PROSPECTIVE MULTICENTRE STUDY B.J.A. Lankester1, R.F. Spencer2, C. Curwen3, L.D. Leamonth4

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4Avon Orthopaedic Centre, Southmead Hospital, Bristol, UK

The object of this multicentre international study was to evaluate the performance of the CPS-Plus polished stem in various clinical settings, to document adverse events, and to determine survivorship. At 5 centres in the United Kingdom and Norway, 227 implants were inserted in 219 patients who subsequently underwent regular clinical and radiographic follow-up. Follow-up data at 5 years were available for 182 patients (80.2%). At 5 years, Kaplan-Meier survival was 0.986 (0.970–1) for all-cause revision and 0.994 (0.982–1) for stem revision. There have been no stem revisions for aseptic loosening, resulting in a 100% rate of survivorship. The CPS-Plus stem may have beneficial design characteristics compared to similar established devices, having a stem geometry that ensures linear subsidence and a proximal centraliser that assists centralisation.
LONG-TERM RESULTS OF UNCEMENTED THA USING MODULAR NECKS WITH DUAL STEM TECHNOLOGY
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Background: Improved biomechanics and stem fit facilitated by gender adapted stem design and modularity have the potential to make total hip arthroplasty (THA) easier. Increased fretting at the connecting interfaces may be a drawback.

Aim: The aim of this study was to determine the mid-term outcome using a straight, uncemented femoral stem with dual stem technology and modular necks in combination with an uncemented acetabular component.

Methods: We retrospectively followed the first 190 consecutive implantations in 173 patients between 1993 and 1997. Radiographic evaluation was performed and clinical results were determined using the HHS (Harris Hip Score). Serum ion levels were measured to detect fretting at the metal connection between modular neck and stem. Kaplan-Meier survivorship analysis was used to evaluate outcomes for different end points at 10 years.

Results: At a mean follow-up of 9 (8-13) years, 21 patients (22 hips, 11.6%) had died, and 13 (14 hips, 7.4%) were lost to follow-up. 10 acetabular components were revised, 2 for infection and 6 for aseptic loosening. One hip underwent femoral revision for a periprosthetic fracture 12 years postoperatively. There was one neck revision due to a high offset neck fracture at the laser labeling without trauma. Survival rates at 10 years were 93.5% for all revisions, 98.8% for neck revisions and 100% for stem revisions. Mean HHS was 94 points. On serial radiographs no stem subsidence was seen. Femoral osteolysis was observed in 4 hips (2%) and limited to Gruen zones 1 and 7. Metal ion analysis revealed no elevated titanium serum ion levels compared to a control group.

Conclusion: Modular necks and dual gender stems are a reliable and durable option in primary total hip arthroplasty. It allows adaptation of the implant to individual patient’s needs irrespective of gender, anatomical variations or grade of osteoporosis.
Avascular necrosis (AVN) of the femoral head is thought to be caused by a compromised blood supply. Most occurrences are secondary to trauma, glucocorticoid therapy, radiation therapy, alcoholism, connective tissue disease etc. AVN of the femoral head is a rare and usually asymptomatic complication during myeloma therapy. Cumulative dexamethasone dose, male sex, younger age, autologous stem-cell transplantation, but not thalidomide increase the risk of AVN. Lytic lesions of the skeleton in multiple myeloma patients are not rare when the disease is progressed.

We describe the case of a 70 year old female multiple myeloma patient with severe AVN of the left femoral head and lytic lesions of the isspilateral proximal and distal femur. Multiple myeloma had diagnosed before 8 years and lytic lesion of the skeleton before 2 years. Last three months, the patient was practically recumbent because of severe AVN-related pain with limited range of motion of the affected left hip and moderate pain to the left femur. The patient was receiving monthly zoledronic acid 2 years ago. In the past received for a long period glucocorticoids, chemotheraphy and thalidomide. We treated the patient operatively with total hip replacement. The acetabular component was cementless (Exachelon Novation press fit No 52 with screw 6.5x30 mm). The femoral component was cemented anatomical and long (Exchelon Smith & Nephew anatomical long stem 300 mm, No 12) in order to stabilize the femur with the lytic lesion. The head was 32 mm. We used three packages of Gentafix cement in order to fill the femoral cavity and the lesions. The patient to 1st year follow up is ambulant, without pain of the left hip and femur. In our patient, the severe AVN of the femoral head, possibly because of glucocorticoids or-and chemotheraphy, in association with the lytic lesions of the femur, was a difficult surgical problem. The revision arthroplasty that we used, is an effective solution because the long anatomical stem works like an intramedullary nail for the stabilization of the femur. Monthly zoledronic acid protects bone resorption. However, and in contrast to this protective effect, bisphosphonates recently have been associated with an increasing risk of osteonecrosis of the jaw.

**P02 CHRONIC IATROGENIC HYPERTROPHIC SYNOVITIS OF THE HIP JOINT IN YOUNG ADULT WITH FEMORO-ACETABULAR IMPINGEMENT - CASE PRESENTATION**

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**Background:** Femoro-acetabular impingement (FAI) is characterized by decreased clearance and abnormal contact between femoral head-neck junction and acetabular rim, where the morphology of the acetabulum and/or proximal femur were changed.

**Purpose:** The purpose of this presentation is to introduce male young adult patient with mixed und unrecognized form of FAI, previously treated with skin traction and intraarticular steroid application which caused worsening of symptoms and, as a consequence, nonspecific hypertrophied sinovitis of the hip joint.

**Material and method:** 18 year old male patient first seen at our institution two years after the beginning of the symptoms, with groin pain, advanced limping, positive FAI test, and radiological clearly visible form of mixed of FAI. We did open surgery of the left hip with partial synovectomy, biopsy, labrum an lig capitis femoris resection, which were destroyed by inflammatory reaction, and debridement of the bone abnormalities of the hip.

**Results:** Two years after surgery, patient is asymptomatic, painless and free of motion and with stable x-ray.

**P03 TOTAL HIP REPLACEMENT IN BILATERAL AVASCULAR FEMORAL HEAD NECROSIS ASSOCIATED WITH SICKLE-CELL TRAIT**

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Sickle cell trait occurs in approximately 300 million people worldwide, with the highest concentration in Africa and the Mediterranean region. Traditionally, sickle-cell trait (heterozygosis) has been viewed as a non-disease, partially protective against falciparum malaria without any of the painful episodes characteristic of the homozygous drepanocytosis. Although sickle cell trait is a benign condition in a majority of affected individuals, occasionally, it can be associated with significant morbidity and mortality. We present two cases of sub-saharan middle-aged males with pain in both groin regions and hip mobility limitation. Radiological results confirmed diagnosis of bilateral avascular femoral head necrosis. We concluded that were two cases of osteonecrosis secondary to sickle cell trait and we treated them with bilateral total hip replacement. Despite a definite association of osteonecrosis with homogygous sickle cell disease there is an unproven association with the inheritance of a single sickle haemoglobin gene (heterozygosis); we observed and we present a two cases report of this association.
Primary retroperitoneal abscess complicated with septic arthritis of the hip is an unusual disease. The insidious and occult nature of abscess coexistent with arthritis causes diagnostic delays, prolonged sepsis, and considerably higher morbidity and mortality. We present a case of a hip degenerative arthritis in a 67-year-old woman who complained of fever, right flank pain, body weight loss and several weeks of hip pain with several visits to the emergency department. The computed tomographic scan showed a huge psoas abscess, and widespread drainage was consequently performed together with broad spectrum antibiotics. On the third day, because of persistent purulent discharge, local heat and swelling over the right thigh region and a new abscess in front of the hip on the CT scan, an anterior approach (Smith Petersen) to the hip was performed and showed invasion of the articular from the infection. In the post-op there has been a great improvement in the clinical status of the patient with discharge from intensive care after 3 days. The patient is now discharged from hospital and waiting for normalization of the inflammatory markers in order to have a total hip arthroplasty.

**P06 PRIMARY RETROPERITONEAL ABSCESS COMPROMISED WITH SEPTIC ARTHRITIS OF THE HIP**

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Primary retroperitoneal abscess complicated with septic arthritis of the hip is an unusual disease. The insidious and occult nature of abscess coexistent with arthritis causes diagnostic delays, prolonged sepsis, and considerably higher morbidity and mortality. We present a case of a hip degenerative arthritis in a 67-year-old woman who complained of fever, right flank pain, body weight loss and several weeks of hip pain with several visits to the emergency department. The computed tomographic scan showed a huge psoas abscess, and widespread drainage was consequently performed together with broad spectrum antibiotics. On the third day, because of persistent purulent discharge, local heat and swelling over the right thigh region and a new abscess in front of the hip on the CT scan, an anterior approach (Smith Petersen) to the hip was performed and showed invasion of the articular from the infection. In the post-op there has been a great improvement in the clinical status of the patient with discharge from intensive care after 3 days. The patient is now discharged from hospital and waiting for normalization of the inflammatory markers in order to have a total hip arthroplasty.

**P07 SURGICAL HIP DISLOCATION FOR A LOCKED TRAUMATIC POSTERIOR DISLOCATION**

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Traumatic posterior hip dislocation associated with a posterior acetabular wall fracture and a fracture of the femoral neck is a very rare injury. A 29-year-old man presented at a level one trauma with a locked posterior hip dislocation of the right hip with fractures of the medial femoral neck and the posterior acetabular wall after a bicycle accident and a failed attempt on closed reduction. This case report describes in detail the surgical management and the clinical and radiological outcome. The hip joint was exposed within 5 hours of trauma by surgical hip dislocation with trochanteric osteotomy for open fracture reduction with preservation of the intact retinaculum. Three years later, he progressively developed thigh pain and X-rays revealed intrapelvic migration of the cup with excessive osteolysis of the acetabulum anteriorly, cranially and medially. The acetabular component revised again using a press-fit PRO CotyLe (WRIGHT Medical Technology, Arlington, TN) cup, stabilized additionally with a T-plate cranially and a hook caudally, and allografts (fresh frozen femoral head).

**P08 RETROSPECTIVE STUDY OF THE GANZ REINFORCEMENT RING IN COMPLEX SURGERY OF THE HIP**

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Introduction: In revisions of total hip prosthesis, loss of bone stock may hinder the establishment of the new acetabular component. Ganz reinforcement rings are used in such cases.

Objective: The purpose of this study will evaluate clinical and radiologically results Ganz reinforcement ring in reconstruction of acetabular stress fractures.


Results: Have involved 22 women and 3 men of mean age 78 years (69 to 88). We used the classification of Paprosky to classify the acetabular defects in our patients: IIC (6), III A (9) or IIIB (10).

Mean follow-up was 4 years (range from 9 months to 12 years). The average of Postel Merle d’Aubigne score has improved over the preoperative evaluation, however, 5 complications were detected: 2 cases of infection, 2 cases of dislocation and 1 case of acetabular loosening. We have also found 2 cases of periprosthetic fracture (unrelated to the procedure).

Conclusions: The patient treated with Ganz reinforcement ring, in case of loss of bone stock, has good results both clinically and radiologically. However, this procedure is not without complications that should be borne in mind.

**P09 THE IMPORTANCE OF PREOPERATIVE DIAGNOSIS IN RISK ASSESSMENT METHOD TO DETERMINE REHABILITATION PROCESS IN HIP ARTHROPLASTY PATIENTS**

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Background: The major goals of inpatient rehabilitation for hip arthroplasty (HA) patients are independence mobility, self care and early discharge.

Aim: The objective of our study was to determine the rehabilitation process of HA patients and factors which influence the discharge from hospital or hospitalization period.

Materials and methods: 79 patients with HA were included in the study. Patients were divided into two groups according to their preoperative diagnosis as coxarthrosis (mean age; 53.7±18.1, n=38) and hip fracture (mean age; 75.3±12.9, n=41).

Results: Patients were evaluated with preoperative risk assessment and intervention scale (high risk score=6), intermediate risk (score=5), low risk (score<5) and compared to each other. Lengths of hospital stays of the patients were also compared.

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Results: Mean risk score of coxarthrosis group was 8.9±3.0 while 61% (n=23) of patients were in intermediate risk, 34% (n=13) were in low risk and 5% (n=2) were in high risk group. Mean risk score of fracture group was 8.3±2.3 while 64% (n=27) of patients were in intermediate risk, 24% (n=10) were in low risk and 12% (n=5) were in high risk group. There was no difference between mean risk scores of the groups (p=0.05). Both of the groups were in intermediate risk level. Length of hospital stay in coxarthrosis group was 7.8±3.0 days and 6.5±1.8 days in fracture group. Length of hospital stay was longer in coxarthrosis patients (p<0.05).

Discussion: It was found that preoperative diagnosis had similar effects when deciding discharge when it is assessed with risk definition method. In addition, length of hospital stay was longer in coxarthrosis patients than fracture patients. Most of the patients in Turkish society who had undergone HA were in low and intermediate risk groups. We consider that preoperative risk assessment is a helpful tool in decision making of determination of rehabilitation process at discharge.

**P10 MOLYBDENUM METAL ION LEVELS IN A PATIENT WITH A METAL-ON-METAL BEARING (XL-HEAD) AFTER REVISION OF A HIP RESURFACING NECK FRACTURE**

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Background: To present a case of a patient operated on by a hip resurfacing in 2007. Due to the age and activity level of the patient we decided to do a hip resurfacing with ASR implant (DePuy). There were no complications during surgery or hospitalization period.
During the follow up period there was no full recovery with some discomfort for a long time. The cause was found on the X-ray for this mild pain and discomfort. The patient needed a crutch for walking. Finally a femoral neck fracture occurred while he was walking.

We decided to revise the head by a big metal XL-Head and Corail Stem (DePuy) high offset stem maintaining the cup. There were no complications during the surgery and hospitalization period. But 9 months after revision surgery the patient complained of mild groin pain and some discomfort in the trochanteric region. No evidence of loosening was found.

One year later the patient complained of the same symptoms with no pain, but moderate pain in his left hip. The X-Ray was completely normal, but we found high metal ion levels in blood and urine. No signs of pseudotumour or loosening were found in CT-Scan, but a polylobulated mass was found in the MRI. Blood ion levels were constantly increased up to ten times standard values.

Results: Revision surgery was done maintaining the stem and removing the ASR cup and big XL-head, inserting a Pinnacle (DePuy) with ceramic on ceramic 36 mm head Biolox Delta (DePuy).

Discussion: Discussion about the causes of failure, metal ion concern and metal toxicity or hypersensitivity and the risk of deliver an avascular lymphocyte disease or pseudotumour is done.

P11 TWO-STAGE REVISION OF HIP PROSTHESES INFECTIONS USING A HIP SPACER WITH STABILIZING PROXIMAL CEMENTATION
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Introduction: The revision in two stages using antibiotic-impregnated cement spacer as a treatment for infections in hip prostheses is effective and widely accepted. However, the mechanical instability of the spacer may occasionally be difficult to achieve. Proximal cementation of the spacer might be a factor in preventing its dislocations.

Methods: A retrospective revision that consisted of 35 patients was carried out in which a two-stage prosthetic replacement with the temporary implantation of a cement spacer impregnated with gentamicin (G-sapcer) was done. The average follow up period was 32 months. Special emphasis was placed on the resolution of the infection and the mechanical stability of the spacer. The spacer was cemented proximally in 16 patients.

Results: Eight patients exhibited spacer dislocations (22.9%); 5 without proximal cementation and 2 with it (p=0.005). There was no reported case of a fracture. There was a re-infection of the infection in 5 patients (13.80%); 3 by the same microorganism and two by a different one.

Conclusion: We conclude that there is a slight, non-significant, statistical tendency suggesting that proximal cementation of the spacer prevents its dislocation. The infection resolution rate in this revision was seen in 86% of the patients.

P12 PRIMARY TOTAL HIP ARTHROPLASTY IN DISTORTED PROXIMAL FEMORAL ANATOMY – THE ADVANTAGES OF A SHORT STEMMED IMPLANT
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Background: Total hip arthroplasty is well established as a successful treatment modality for reducing morbidity and improving function in patients with hip arthritis. There are a wide variety of implants with proven track records available. However, utilising traditional stemmed implants in patients with distorted proximal femoral anatomy can be technically challenging with increased risk of complications.

Aims: We present three cases where a potentially difficult operation was significantly simplified by use of a short, stemless, metaphyseal loading implant with a pronounced lateral flare.

Methods: Three patients with distorted proximal femoral anatomy underwent primary total hip arthroplasty using a Proxima stem.

Case 1: A 64 year old male with ipsilateral below knee amputation and previous proximal femoral fracture.

Case 2: A 52 year old female previously treated with femoral osteotomy for a Slipped upper femoral epiphysis (SUFE). Plate removal was complicated by retained screws in the proximal femur.

Case 3: A 38 year old male who had been treated for SUFE with pins.

Results: Mean operating time was 54 minutes and there were no peri-operative transfusion requirements. Average discharge was on day three post-operatively and subsequent recovery was uneventful. At 12 months follow up there have been no complications with average improvement in Oxford and Harris scores of 40 and 49 respectively. Radiological analysis shows all stems to be stable and well fixed.

Conclusions: Although a relatively recent addition to the pantheon of implants available to choose from, early results of the Proxima prosthesis have so far been reported as encouraging. Designed primarily as a bone conserving option we would suggest that it also be considered in cases where a conventional stemmed implant may not be suitable. Our results show excellent functional outcome and in effect convert a potentially complex primary into a routine hip replacement.

P13 NO EVIDENCE FOR SUPERIOR FIXATION OF CEMENTED SOCKETS. A REVIEW OF RANDOMIZED CONTROLLED TRIALS
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Introduction: Although THA is a very successful orthopaedic procedure, we still face the challenge of defining optimal fixation for acetabular components. Acetabular components are most crucial for a good long term outcome of THA.

Purpose: The primary goal of this article is to perform a systematic literature review for randomized controlled trials in which cemented and cementless acetabular components are compared and to find evidence for the best acetabular fixation interface.

Methods: In order to assemble all relevant literature we searched the most common data bases of published medical literature: Medline and the Cochrane database of randomized controlled trials. Search strategy: acetabulum and cement and cementless or uncemented or non cemented. Two authors reviewed all selected articles for relevance en used the van Tulder and Jadad checklist to assess methodological quality.

Results: The search revealed 3491 articles from which we isolated 16 randomized controlled trials in which cemented and cementless acetabular components were compared. A best evidence analysis for wear, osteolysis, migration and clinical scores showed no superiority for either cemented or cementless sockets.

Conclusion: Although our search could not provide evidence for the superiority of either cemented or cementless acetabular fixation, the long term follow-up studies reported in literature are providing us with data that cementless acetabular fixation is a good alternative to cemented fixation of the socket.

P14 FLUOROSCOPY GUIDED RESURFACING ARTHROPLASTY IN PATIENTS WITH A PREVIOUS PROXIMAL FEMORAL OSTEOSYNTHESIS PLATE.
Surgical Technique and Preliminary Results
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Background: Secondary hip osteoarthritis in patients with a previous osteosynthesis of the proximal femur is a frequent situation. Reccommended steps in the case a THA needs to be performed are: first, plate removal and then, if the bone quality is adequate, total hip arthroplasty, sometimes with a long stem that bypasses the most distal screw. However, bone quality after hardware removal can be compromized, and THA may need to be deferred for a second stage.

Furthermore, osteosynthesis plates that were implanted many years ago may be covered by bone or may have screws that are difficult to be extracted.

Aims: We present 3 patients with a previous proximal femoral osteosynthesis plate performed between 25 and 45 years before that developed hip osteoarthritis and were treated with a Durom (Zimmer) fluoroscopy guided resurfacing arthroplasty (FGRA).

Methods: The patients were operated under epidural hypotensive anaesthesia. A 139° template was developed to help locate the best entrance and position for the pin guide. The first step consisted in the percutaneous location of the pin guide in the extensor aponeurosis and lateral plane using fluoroscopy and a traction device with the patient in the dorsal decubitus position. The pin guide was left 3 mm inside the hip joint space, and cut at the level of the lateral femoral cortex. The patient was then located in the lateral decubitus position, and was operated through a posterolateral approach, finding the pin guide after dislocation. The next step was to use the routine cannulated instruments as described for the original surgical technique.

Results: At an average of 6 months postoperative, no femoral neck fractures were observed, and no other complications were related to this procedures.
Discussion and conclusions: FGRA is a valid option to treat patients presenting with a previous proximal femoral osteosynthesis plate, thus avoiding the need for plate removal and a long stem.

P15

MASSIVE PELVIC AND FEMORAL PSEUDOTUMORAL OSTEOBLYS-secondary to POLYETHYLENE WEAR in AN UNCEMENTED TOTAL HIP ARTHROPLASTY

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Periprosthetic osteolysis is the most common cause of implant failure after total hip arthroplasty. However, the effects of osteolysis can sometimes result in uncommon, catastrophic presentations.

We report an unusual presentation of polyethylene failure consisting in a massive pelvic and femoral pseudotumoral osteolysis secondary to polyethylene wear in an un cemented total hip arthroplasty. A 67-year-old man underwent a left Thompson cemented arthroplasty in 1965 after a fracture of the femoral neck caused by a motorcycle accident. He was revised to an un cemented long stemmed Harris Galante prosthesis in 1989.

The patient revealed groin pain for the last 10 years although he did not visit any doctor.

One year before he visited us, a general surgeon drained a pelvic mass through a suprapubic approach. When he presented to our hospital, this scar was fistulized and small fragments of polyethylene were delivered through the fistulae. Radiographs showed a massive osteolysis compromising the whole hemipelvis and an expansive granulomatous osteolytic lesion located at the tip of the stem.

On revision surgery, clear yellowish fluid was noted in the left hip joint during which surgery was sent to be cultured. Massive osteolysis was noted over the acetabulum, with loosening of the cup and stem and severe compromise of the anterior and posterior column.

Resection arthroplasty with curettage of the pelvic mass was performed because of extensive bone loss of the pelvis. Histopathological findings revealed no tumoral process, fibrous necrotic tissues, histiocytes, and polyethylene wear particles, which were birefringent in polarized light. As this patient had no symptoms for a long time, we should keep in mind that foreign-body reaction to wear debris may produce pelvic masses and lead to this catastrophic situations.

P16

TWO STAGE REVISION OF INFECTED TOTAL HIP REPLACEMENT

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Introduction: Sepsis continues to be one the most dreaded complications in total hip arthroplasties. Infected patient treatment may require a long hospitalization, many time of antibiotic therapy and multiple surgical procedures. The economic implications to both the patient and society are immense. So, we considered the infected total hip arthroplasties one the most challengers of the actual orthopaedic surgery.

Material and methods: Between 1999 to 2008 we carried out 34 revision total hip arthroplasties in two stages, after septic loosening of a primary total hip arthroplasty. 16 un cemented implants, 15 un cemented prosthesis and 3 hybrid total hip arthroplasties. The patients were 26 male and 8 female with a mean age of 61.2 years (range 49 to 76 years). All patients was submitted a radical debridement (Girdlestone resection) followed by reimplantation in two stages. Supplemental antibiotic program was used.

The average of reinserion of a total hip prosthesis was 8 months (range 4 weeks to 42 months). In acetabular reconstruction we applied a cemented cup in 8 cases and Muller acetabular reinforcement ring in 26 cases. In all patients we used gentamicin impregnated cement and Corenolok® uncemented femoral stem as femoral implant.

Results: In 27 patients (79%) we obtained an excellent result with no evidence of recurrence of infection. However, 4 clinical cases (12%) needed a surgical cleanliness with implants preservation, 2 cases (6%), we removed both components (Girdlestone resection) and finally 1 case (3%) we removed the acetabular component and a proximal tip in a osteointegrated uncemented femoral stem.

Discussion and conclusions: The results depend on the right strategy used for the treatment of the infection around the total hip joint. Identify as soon as possible and the precocious surgical treatment is the best way to obtain a good results. If the causal microorganism is considered to be virulent, a two-stage procedure with an interval between the Girdlestone resection arthroplasty and the second-stage reconstructive procedure can be a good therapeutic option.

P17

FAILED BILATERAL AVASCULAR NECROSIS HEAD CORE DECOMPRES-SION: CASE REPORT OF FAILURE AND COMPLICATIONS

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Background: The Avascular Femoral Head Necrosis (AFHN) is a recognized disease, which may lead to a permanent incapacity if it is not treated properly. Multiple authors recommend Core Decompression (CD) as early treatment in the beginning of the pathology. Additional actions are done as part of the CD, like the implantation of Tantalum Rods (TR) or vascular pedicle grafting, but not always gives the awaited body’s response.

Aim: We report a case of a 42-year-old male patient with bilateral AFHN, the attempt of a CD with TR, its failure and the complication at time of Total Hip Replacement

Methods: We present a case report of 42-year-old male patient who initiates with pain in both hips; Image Studies offer diagnosis of bilateral AFHN. Bilateral CD with TB were performed at two different surgical events with temporal clinical improvement, but reappearance of symptoms within a few months (Pain and lameness). New studies show failure of CD translated for the reappearance of pain and progression of necrosis, proposing replacement of both TB for total hip prostheses: Right hip was operated on twice (extractions and prosthesis placement). Left hip was done at the same time with complication in the extraction. At time to rod removal using a trephine, it was cut and introduced towards diaphysis. After several attempts the rod fragment extraction was not possible so the surgeon decided to introduce it deeper to allow stem introduction.

Results: Patient refers asymptomatic and there are no evidence of loosening or impairment of the fragment or the stem.

Discussion and conclusion: The question of future revision surgery seems to be the osseointegration of the tantalum fragment in the femoral canal. Furthermore if it will interfere the placement of future stem or will led to early loosening of the actual stem.

P18

CORRELATION BETWEEN ACCOLADE TMZF AND CORAIL STEMS FOR PREOPERATIVE TEMPLATING

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Background: The National Hip registries have shown a trend towards the use of uncemented components in primary hip arthroplasty. A number of different types of femoral stems are available. Two of the most popular uncemented femoral components are the Corail (Depuy) and the Accolade TMZF (Stryker). As an Orthopaedic surgeon one may be more familiar templating with one femoral component over the other.

Aim: To see if there is a relationship between the sizes of the Corail (Depuy) and the Accolade TMZF (Stryker) stems to allow easy cross referencing between these two systems.

Methods: The Symgo® Imaging XS (Siemens) digital templating system was used. Corail (Depuy) and Accolade TMZF (Stryker) stems of varying sizes were overlayed in order to identify matching sizes. A formula providing the relationship between the two stems was calculated.

Results: The following relationship was identified: Corail stem Size = (Accolade TMZF stem size x2) + 6

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Discussion and conclusion: The use of a simple equation: Corail stem Size = (Accolade TMZF stem size x2) + 6 enables easy cross-referencing for surgeons more familiar with one of the 2 uncemented femoral components. This may be particularly useful for Orthopaedic trainees who rotate through different institutions.

P19
BIOMECHANIC COMPARATIVE STUDY OF TWO FIXATION SYSTEMS IN HIP FRACTURES
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For the treatment of the proximal end fractures of the femur two predominant systems exist: the endomedullary nail and the sliding screw plate. The dependent variables at the moment are the weight, age and type of fracture. The principal aims are: To develop models of finite elements of both types of implants and of two types of fracture (stable and unstable), to integrate the models of finite elements of the implants in the model of fractured femur, to obtain the mechanical behavior of both types of implants and them to fit to the model of finite elements. The analyzed models have been the nail gamma-3 (Stryker®) and the plate PCCP (Gottfried®). The real geometry has been created in the program SolidWorks 11.0 to be treated later in the program of calculation by means of finite elements Ansys. The assembly with nail is more rigid (11.51 mm) that with plate (1.95 mm) on having had a few minor displacements. The tensions that appear in the nail (446 MPa) are major that those of the plate (132.93 MPa), in the unstable fractures; the nail intramedullar is more rigid than the system of plate. The tensions to which the nail meets submitted are superior to those of break for what the nail would not be capable of supporting the first cycles of load. It is for it, that the system to using in these cases would be the sliding screw plate.

P20
TROCHANTERIC NONUNION AFTER TREATMENT OF FEMORACETABULAR IMPINGEMENT: A CASE REPORT
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A 40-year-old woman was referred to our clinic with complaint of proximal right groin pain, which had been present for the past 3 months after a walking period. Despite the non-steroidal anti-inflammatory drug treatment she had worsening symptoms. Radiographic evaluation, including frog leg lateral and anterior-posterior (AP) pelvic views, demonstrated decreased femoral head-neck offset, with prominence of the femoral head-neck junction and acetabular cyst. The patient underwent a proximal femoral osteoplasty, and acetabuloplasty using trochanter major osteotomy which was described by Ganz. Trochanteric osteotomy fixed by two 4.5 mm spongiou (cancellous) screws then. A week after surgery patient expressed a high degree of satisfaction and clinical improvement. However after a noncompliant period her gluteal limping was not resolved. The AP pelvic view we realised a trochanteric nonunion at the osteotomy line with a broken 4.5 mm cancellous screw. Eventually at the third month patient underwent surgical treatment of nonunion. Screws were removed, and trochanteric osteosynthesis were applied with a trochanteric plate. Both clinical and radiological healing of the nonunion occurred at the fifth month. The reason of nonunion was related to close relation osteotomy to priform fossa that might have impaired of bleeding.

P21
DEGENERATIVE LABRAL TEARS OF THE HIP JOINT TREATED WITH A COMBINATION OF INTRA-ARTICULAR LONG LASTING STEROID AND HYALURONIC ACID INFUSION
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Background: Tears of the hip labrum is being increasingly recognized as causative factor of hip pain in younger populations due to better understanding of the local anatomy and the evolution of hip arthroscopy techniques.

Aim(s): To evaluate the functional outcome of degenerative tears of the hip labrum treated by a series of intra-articular hip joint infusions.

Methods: A consecutive series of 4 patients with hip pain of no acute precipitating aetiology and reproducible clicks on clinical examination were included in the study. Radiological work-up included plain radiographs and magnetic resonance arthrography for confirmation of the diagnosis. A protocol of three consecutive fluoroscopic guided hip infusions at 0, 2 and 4 weeks was instigated. Each infusion contained a combination of Triamcinolone Hexacetonide (Kenacort®) and Hyaluronic Acid (Hyalal®,). All patients were advised to rest for one day and to weight bear as tolerated following each infusion. Hip movement at the extremes of motion, squatting, kicking etc. was discouraged for the duration of treatment.

Results: There were 3 male and 1 female patients with an average age of 38 years. The average follow up was 9 months. All plain radiographs were normal. Magnetic resonance arthrography demonstrated degenerative tears in different portions of the labrum (2 anterosuperior, 1 anterior, 1 posterior). All patients complied with the treatment protocol. All patients had a good to excellent result with symptomatic relief and return to previous level of activity at the final follow-up visit.

Discussion and conclusion: Serial intra-articular hip infusions using a combination of long lasting steroid and hyaluronic acid can provide early symptomatic relief in active patients with degenerative labral tears. The long lasting efficacy of this protocol remains to be seen.

P22
TROCHANTERIC NONUNION AFTER TREATMENT OF FEMORACETABULAR IMPINGEMENT: A CASE REPORT
I. Tuncay, O.F. Erkoçak, H. Senaran
Orthopaedic Surgery Department, Selçuk University, Selçuklu Faculty of Medicine, Selçuk, Turkey

A 40-year-old woman was referred to our clinic with complaint of proximal right groin pain, which had been present for the past 3 months after a walking period. Despite the non-steroidal anti-inflammatory drug treatment she had worsening symptoms. Radiographic evaluation, including frog leg lateral and anterior-posterior (AP) pelvic views, demonstrated decreased femoral head-neck offset, with prominence of the femoral head-neck junction and acetabular cyst. The patient underwent a proximal femoral osteoplasty, and acetabuloplasty using trochanter major osteotomy which was described by Ganz. Trochanteric osteotomy fixed by two 4.5 mm spongiou (cancellous) screws then. A week after surgery patient expressed a high degree of satisfaction and clinical improvement. However after a noncompliant period her gluteal limping was not resolved. On the AP pelvic view we realised a trochanteric nonunion at the osteotomy line with a broken 4.5 mm cancellous screw. Eventually at the third month patient underwent surgical treatment of nownion. Screws were removed, and trochanteric osteosynthesis were applied with a trochanteric plate. Both clinical and radiological healing of the nonunion occurred at the fifth month. The reason of nonunion was related to close relation osteotomy to priform fossa that might have impaired of bleeding.

P23
DISSOCIATION OF MODULAR HIP ARTHROPLASTY AFTER THE FEMORAL-NECK- HEAD INTERFACE AFTER PERIPROSTHETIC FRACTURE: A CASE REPORT
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Background: The use of modular femoral and acetabular components greatly increases the flexibility during primary or revision total hip arthroplasty. However complication concerning modularity itself have been reported.

Aim: The aim of this case report is to present the rare event of the separation of modular THR at the femoral-neck interface and its treatment.

Material and method: A 74 year-old woman presented to our outpatients department on a wheelchair, 6 months after a re-revision THR due to mechanical loosening of the arthroplasty components. In the admission the patient complained of walking disability and pain. From her medical record she underwent THR 25 years ago, with the first revision arthroplasty after eight years. Two years ago she was admitted in our Department with loosening of the components and a second revision arthroplasty took place. During the rehabilitation regime a periprosthetic fracture, Vancoover B3 was demonstrated. The fracture was immediately reduced and an internal fixation performed. The post-operative regime was uneventful. Six months after the operation the patient presented to our outpatients department and the X-ray showed dissociation of the THR at the femoral head-neck interface. The patient reported a sudden pain and inability to walk during climbing stairs. During the operation, migra-
HIP REVISION USING IMPACTION BONE GRAFTING AND A CEMENT: RADIOSTEREOMETRIC ANALYSIS OF 25 CONSECUTIVE PATIENTS FOLLOWED UP TO 9 YEARS
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Introduction: Migration of the Exeter stem after hip revision with impaction bone grafting and cement (IBGC) has been measured with radiostereometric analysis (RSA) up to 5 years after revision. Longer-term migration has not been evaluated.

Patients and methods: 25 consecutive aseptically loose hip stems primarily operated on because of osteoarthritis and revised for the first time with IBGC using the Exeter stem were followed with repeated RSA measurements. After revision, 2 patients died and 1 sustained a femoral fracture within 5 years. Another 4 patients declined further participation before the 9-year examination. The remaining 17 patients (9 men and 8 women; mean age at revision 73 years) were followed 9 years. Subsidence and migration in the posterior-anterior and medial-lateral directions were analyzed. The radiographs were assessed before and after surgery.

Results: No hip had been rerevised. At the 9-year follow-up all 17 femoral stems had subsided (mean 3.9 mm) and all stems had also migrated in the medial or lateral direction (mean 0.7 mm) and posterior direction (mean 3.8 mm). In 1 patient examined up to 6 years after revision major migrations (>20 mm) were observed but with no radiographic signs of loosening.

Conclusion: After hip revision using IBGC, migration of the Exeter stem seems to continue up to 9 years after surgery though at a very slow rate after the first year and without evident radiographic or clinical deterioration.
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