

stems, with metadiaphyseal anchoring, follow the anatomical collum-caput- diaphyseal angle (CCD-angle) on the medial side of the calcar of the femur. This allows better offset restoration, as more variety is possible in placement of the hip stem. The purpose of this study was to assess whether restoration of the preoperative FAO differs between short and conventional stem by use of digital templating. Additionally, the association of the preoperative FAO and CCD-angle with the FAO restoration of both stems were investigated and reliability of the measurements was assessed.

**Methods:** A total of 100 standardised hip measurement X-rays were used for digital templating, from two ongoing cohorts with a short and conventional stem. Restoration of FAO was dichotomized into “restored” when equal or smaller than 5 mm from baseline value or “not restored” when > 5 mm from baseline value. Differences between the two stems concerning the proportions of correct restoration of the FAO were analyzed by use of McNemar tests. To assess the association between CCD-angle and preoperative FAO with absolute offset restoration, multi-level analysis was performed by use of a linear mixed model to account for paired measurements. Through determination of the optimal point under the curve in ROC- analysis, bootstrapping of a thousand sets was performed to determine the optimal cutoff point of the preoperative FAO for restoration within the limits of 5 mm. Three observers participated for inter-observer reliability, with two observers measuring the X-rays twice for intra-observer reliability.

**Results:** The mean preoperative FAO was 79.7 mm (range 62.5–113 mm), with a mean CCD-angle of 128.6° (range 114.5–145°). The conventional stem could only restore the offset in 72 of the cases, whereas the short stem restored the offset in all of the cases. CCD-angle was not a predictor, but the pre-operative FAO was. A cut-off point of 81.25 mm (95% CI of 80.75–84.75 mm) in pre-operative FAO was found where the conventional stem was unable to restore offset. The reliability of baseline measurements was excellent, with an intra-observer reliability of 0.99 for the preoperative FAO and 0.94 for the CCD-angle. Inter-observer reliability between the three observers in preoperative FAO was higher than 0.9, and for CCD-angle this was higher than 0.8.

**Conclusions:** Short stems with a curve following the medial calcar are superior to conventional stems in restoration in hips with a FAO of greater than 80.0 mm.

#### FP02-1315

##### Migration pattern of the short stem in total hip arthroplasty: RSA analysis

de Waard, Sheryl<sup>1</sup>; Sierevelt, Inger<sup>2</sup>; van der Vis, H.<sup>3</sup>; Hoornenborg, D.<sup>4</sup>; Kerkhoffs, G. M.<sup>5</sup>; Haverkamp, D.<sup>6</sup>

<sup>1</sup>MC Slotervaart, AMC, Amsterdam, Netherlands; <sup>2</sup>Slotervaart Hospital, Spaarne Hospital, Amsterdam, Netherlands; <sup>3</sup>Slotervaart Center of Orthopedic Research and Education, MC Slotervaart, Amsterdam, Netherlands; <sup>4</sup>Slotervaart ziekenhuis, Amsterdam, Netherlands; <sup>5</sup>AMC, Amsterdam, Netherlands; <sup>6</sup>Slotervaart Hospital and AVE Orthopedische Klinieken, Amsterdam, Netherlands

**Objectives:** Consensus that bone stock preservation and optimal restoration of offset and leg length is important in total hip arthroplasty (THA) is now wide spread, especially since more young and active individuals undergo THA. Short stems are promising in this aspect, since they claim to have the advantage of proximal bone stock preservation, tissue and bone preserving surgery and accurate anatomical restoration. However, due to different designs and anchoring sites, the migration pattern and stability of short stems is hard to compare. This prospective cohort study investigated the migration pattern of a metadiaphyseal anchoring short stem through radiostereometric analysis (RSA), which illustrates a reliable 3-dimensional migration pattern of hip stems.

**Methods:** A total of 36 patients were included in this RSA-study. RSA images were made postoperative (within 5 days), at 6 weeks and at 3, 6, 12 and 24 months. For precision measurement, double examinations were made at 6 month follow-up. Two patients did not complete the study (n = 1 lost to follow up, n = 1 deep infection with two-stage revision). One patient was excluded for analysis with a CN number > 110. Due to non-normality of the distributions, nonparametric tests were used for the analysis of the RSA data. The median values were given with interquartile ranges. Friedman tests were performed to assess migration during 2 year follow-up. The pairwise comparisons between follow up moments were performed by use of Wilcoxon Signed Ranks tests. Holms' correction was applied to adjust for multiple testing.

**Results:** Of the 36 patients, 24 were female. The mean age was 60 years with a mean BMI of 27 kg/m<sup>2</sup>. RSA analysis of 33 patients showed a significant median initial proximodistal migration (subsidence) of 0.21 mm and anteversion- retroversion rotation of 0.59° up to 6 weeks, after which the stem stabilized and showed no further significant movement. The median translation and rotation in all directions was small, with a maximum total point migration of 0.71 mm at 6 weeks and of 0.83 mm at 2 years. An initial subsidence of > 2 mm was observed in four patients, with a maximum migration of 6 mm. However, all hip stems showed secondary stabilization in all directions after 6 weeks and no clinical and radiological signs of loosening were observed during the 2 years follow-up.

**Conclusions:** After initial migration the metadiaphyseal anchoring short stem achieves secondary stabilization, predicting a satisfactory long term survival of the hip stem.

#### FP02-1445

##### Extra-articular pathologies as a source of recalcitrant anterior hip pain

Kaya, M.<sup>\*1</sup>

<sup>1</sup>Hitsujigaoka Hospital, Sapporo, Japan

**Objectives:** Intra-articular pathologies like acetabular labrum tear are believed to be major problems for hip pain. Nowadays, FAI correction and labral repair are common therapeutic targets. In contrast, extra-articular pathologies like tendinosis of direct head of rectus femoris or bursitis around hip joint give relatively little attention. For the patients who have anterior hip pain by Patrick's test and tenderness at Scarpa's triangle, we are performing periarticular debridement on the hypothesis that periarticular pathologies are responsible for the hip pain. In the current manuscript, we introduce the endoscopic extra-articular findings to evaluate the clinical significance of peri-articular pathologies.

**Methods:** Diagnosis of anterior periartthritis had made by anterior hip pain by Patrick's test and tenderness at Scarpa's triangle and had been confirmed by the ultrasound guided lidocaine injection to AHS. 77 patients who were performed operation were included to this study. As we hypothesized that intra-articular pathologies are not responsible for hip pain in this cohort, we had never repaired the injured labrum. We assessed the extra-articular lesion, direct head and reflective head of rectus femoris muscle, AHS fat pad. Surgical procedure was consisted of debridement of torn fiber of rectus femoris tendon and AHS fat pad. Tendinosis of the direct head or reflective head of rectus femoris were evaluated. The macroscopic appearance of the AHS fat pad was categorized as follows: normal fat tissue, blood vessel rich-adipose tissue, adipose tissue with fibrosis and scar formation. Outcomes were evaluated for all hips using MHHS and VAS.

**Results:** The patient population consisted of 27 male and 50 female patients with a mean age of 38.1 ± 19.7 years (range 13–78 years). The radiological diagnoses were FAI in 28(Cam; 2, Pincer; 23, Mixed; 3), acetabular dysplasia in 8, borderline dysplasia in 17, OA in