

patients and 71.0, 73.0, 54.5, 71.4, and 3.8, respectively for revision arthroscopy patients. All scores improved significantly compared to pre-operatively ( $p < 0.001$ ) and were higher for the primary subgroup compared to the revision subgroup ( $p < 0.05$ ). Satisfaction was 7.6 and 7.0 for primary and revision subgroups, respectively. Of primary and revision arthroscopy patients, 5.8% and 11.2% converted to THA/HR, respectively. The relative risk of a THA/HR was 1.93 after revision arthroscopy compared to primary arthroscopy. The overall complication rate was 5.3%.

**Conclusion:** Hip arthroscopy showed significant improvement in all PRO, VAS, and satisfaction scores at two years postoperatively. Primary arthroscopy patients showed significantly improved PRO scores and a trend towards improved VAS compared to the revision subgroup. Primary arthroscopy patients had a lower conversion rate to THA/HR of 5.8% compared to 11.2% of revision patients.

### Outcomes of Endoscopic GM Repair in 34 Patients with Minimum Two-year Follow-up

#### SS-32

April 15, 1:45 PM

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**Introduction:** The study purpose is to provide an update on a previously published study of patients with a gluteus medius (GM) tear, including a larger cohort and minimum two-year follow-up.

**Methods:** Thirty-four patients were identified from April 2009 to April 2012 who had undergone an endoscopic GM repair with minimum two-year follow-up. Patients were excluded if they had revision surgeries and previous hip conditions. Patient reported outcome (PRO) measures collected included the modified Harris Hip Score, Non-Arthritic Hip Score, Hip Outcome Score Activities of Daily Living and Hip Outcome Score Sports Specific Subscales. The visual analog scale (VAS) and patient satisfaction were also recorded.

**Results:** The cohort consisted of two men and 32 women with a mean age of 57 years (range 20 years to 79 years). Ten patients had a full thickness tear and 24 patients had a partial thickness tear. Seventeen patients were treated with completion of the tear and suture bridge technique and 17 patients with the trans-tendinous technique. There was a significant improvement of all four PRO at three specified timepoints. The mean pain VAS decreased from 6.6 to 2.4 at two-year follow-up ( $p < 0.05$ ). The mean satisfaction was 8.5 at two-years post-surgery. Twenty-six of 34 (76%) patients increased their abduction strength by at least one grade on manual muscle testing. Of 26 patients who had

a gait deviation pre-operatively, 15 (58%) regained a completely normal gait. There was no significant difference in PRO measures between patients when comparing surgical techniques.

**Conclusion:** Endoscopic surgical repair can be an effective treatment of GM tears at a minimum follow-up of two-years.

### Predictors of Clinical Outcomes After Hip Arthroscopy: A Prospective Analysis of 1038 Patients With Two-Year Follow-Up

#### SS-33

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**Introduction:** The purpose of this study was to evaluate clinical outcomes of hip arthroscopy in a prospective study and to analyze this cohort to identify predictive factors of improvement.

**Methods:** Data was collected prospectively on all patients undergoing hip arthroscopy between February 2008 and June 2012. We included all patients undergoing hip arthroscopy who agreed to participate and completed four PRO instruments at minimum two-year follow-up, including the modified Harris Hip Score, (mHHS), Non-arthritic Hip Score (NAHS), Hip Outcome Score – Activities of Daily Living and Sports Subscale (HOS-ADL, HOS-SSS). The NAHS was selected as our primary outcome instrument. All patients with any previous hip conditions were excluded. We analyzed 34 preoperative and intraoperative variables using bivariate and multivariate analyses compared to NAHS scores.

**Results:** The cohort consisted of 1038 patients with a mean follow-up of 30.1 months (range: 24.0 – 61.2 months). The mean age of the group was 36.4 years (range: 13.2 – 76.4 years). All postoperative PRO scores showed significant improvement ( $p < 0.001$ ) at two years compared to preoperative scores. Bivariate analysis identified fifteen variables (seven categorical and eight continuous), and multivariate analysis identified 10 variables that were predictive of two-year postoperative NAHS scores. Preoperative NAHS, HOS-ADL, mHHS, age, duration of symptoms, body mass index (BMI), and revision hip arthroscopy were identified as predictive factors in both bivariate and multivariate analyses. The predictive value of preoperative NAHS was accentuated for patients with higher BMI.

**Conclusion:** This study reports favorable clinical outcomes in the largest cohort of hip arthroscopies with minimum two-year follow-up in the literature to date. Factors identified as predictive in both bivariate and multivariate analyses included preoperative NAHS, Hip HOS-ADL, and mHHS, age, duration of symptoms, BMI, and revision hip arthroscopy. These predictive factors may

be useful to the clinician in determining prognosis and operative indications for hip arthroscopy.

### **A Comparison of Staged vs Simultaneous Hip Arthroscopy for Selected Patients With Symptomatic, Bilateral Femoroacetabular Impingement**

#### **SS-34**

April 15, 1:55 PM

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**Introduction:** Symptomatic, bilateral femoroacetabular impingement (FAI) has been increasingly recognized in recent years. Treatment options include staged or simultaneous (single anesthetic) bilateral hip arthroscopy, however the outcomes of the latter are largely unknown. The purpose of this study was to compare clinical outcomes and complication rates of staged versus simultaneous bilateral hip arthroscopy.

**Methods:** Between March 2010 and June 2013, 1800 hip arthroscopy cases were reviewed, identifying 81 patients (162 hips) who underwent bilateral hip arthroscopy for symptomatic FAI. Twelve patients (24 hips) had undergone a simultaneous procedure with a minimum of 1-year follow-up. This group was matched 1:2 for age, sex, and alpha angle, to a control group of 24 patients (48 hips) that had undergone a staged procedure. Patient-reported outcome scores, including the Modified Harris Hip Score (mHHS), the Hip Outcome Score-Activity of Daily Living (HOS-ADL), and the Hip Outcome Score-Sport-specific Subscale (HOS-SSS) were obtained preoperatively at 6 months, 1, and 2 years postoperatively.

**Results:** Patient demographics (age and sex) were comparable between groups ( $p > 0.95$ ). Mean preoperative alpha angle was  $65.3 \pm 9.6^\circ$  in the simultaneous group and  $65.9 \pm 11.2^\circ$  in the staged group ( $p = 0.6$ ). At a mean of 17.8 months (range, 12-33 months), there was significant improvement ( $p < 0.001$ ) in all patient reported outcome scores (mHHS, HOS-ADL, HOS-SSS). The mean single anesthetic traction time was  $90.8 \pm 21.9$  minutes (sum of both hips) in the simultaneous group, compared with a combined two-anesthetic traction time of  $85.7 \pm 27.2$  minutes in the staged group ( $p = 0.579$ ). There were no traction-related complications in either group. No patients in the simultaneous group required revision surgery, while one patient in the staged group required lysis of adhesions at 24 months postoperatively.

**Conclusion:** Simultaneous bilateral hip arthroscopy is safe and effective, resulting in improved patient-reported outcomes at 1-year follow-up comparable with the results of staged treatment.

### **The Effects of Arthroscopic Lateral Acromioplasty on the Critical Shoulder Angle and the Anterolateral Deltoid Origin: An Anatomical Study**

#### **SS-35**

April 15, 2:10 PM

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**Introduction:** A critical shoulder angle (CSA) greater than  $35^\circ$  is associated with rotator cuff tears (RCTs). Reduction of a CSA greater than  $35^\circ$  to the "favorable" range of  $30-35^\circ$  may potentially lower the risk of primary RCTs or decrease re-tears after rotator cuff repair. The aims of this study were to investigate if (1) a standard acromioplasty and (2) a lateral acromion resection alters the CSA without affecting the deltoid origin.

**Methods:** First, the native CSAs of 10 human cadaveric shoulders (6 male, 4 female, average age 54.2 years) was determined with the use of fluoroscopy. The test setup allowed for consistent repetitive measurements. Next, a standard arthroscopic anterolateral acromioplasty was performed and the CSA was then re-assessed fluoroscopically. Then, a lateral acromioplasty was performed with a 5mm lateral acromion resection using a 5mm burr, and the CSA was measured again. The native CSA was compared to: (1) the CSA after acromioplasty and (2) the CSA after lateral acromion resection using a paired t-test. Finally, the acromial deltoid attachment was evaluated anatomically for damage to the anterolateral origin.

**Results:** The average native CSA ( $34.3 \pm 2.1^\circ$ ) was reduced significantly ( $p < 0.001$ ) by standard acromioplasty (mean CSA =  $33.1 \pm 2.0^\circ$ ) and was further reduced by lateral acromion resection (mean CSA =  $31.5 \pm 1.7^\circ$ ;  $p < 0.0001$ ). In three specimens with a pre-surgery CSA greater than  $35^\circ$ , the CSA was reduced to the desired range of  $30-35^\circ$  by the combination of a standard anterolateral acromioplasty and a 5mm lateral acromion resection. The acromial deltoid attachment was found to be well-preserved in all specimens.

**Conclusion:** Standard arthroscopic acromioplasty as well as a 5mm lateral acromion resection each reduced the CSA significantly and did not damage the deltoid origin. Future investigations will determine whether the combination of both techniques can be used in clinical practice to reduce a CSA  $> 35^\circ$  to the desired range of  $30-35^\circ$ .

### **Outcomes and Survivorship After Arthroscopic Management of Glenohumeral Osteoarthritis With a Minimum 5 Year Follow-up**

#### **SS-36**

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