the LHB, and the angulation of the LHB relative to bicipital groove were measured after DAS.

Results: The mean length of the subscapular split after maximal external rotation was 20.4 ± 6.0 mm (range, 10 to 32 mm). The mean elongation of the LHB was 0.6 ± 1.4 mm (range, -1 to +3 mm). The final angle of the LHB relative to the bicipital groove was 45 ± 7 degrees (range, 41 to 67 degrees).

Conclusions: A subscapularis split can be created by passive external rotation of the arm after the LHB is shuttled into the joint during DAS. Therefore, there is no need to create a distinct split prior to DAS. Additionally, the DAS maintains the length-tension relationship of the LHB. The post-procedure medial angulation of the LHB relative to the bicipital groove may provide a lowering of the subscapularis, helping explain the anterior reinforcement of the technique.

#345 COULD SUBTLE OBSTETRICAL BRACHIAL PLEXUS PALSY EXPLAIN UNILATERAL B GLENOID?

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Aim: To analyse perinatal complications related to obstetrical brachial plexus palsy (OBPP) in patients suffering from static posterior instability

Background: Glenohumeral osteoarthritis (OA) with B glenoid is initiated by progressive posterior static humeral head subluxation. The exact cause of this phenomenon remains unknown but has been associated with excessive glenoid retroversion, lower humeral retrotorsion, specific proximal humerus morphology, and the position of the scapula on the thorax. Based on our experience, we believed that such morphologic changes are closely related to each other and that they may emerge from one common origin. Interestingly, we noted that these patients often report history of perinatal problems. Therefore, we hypothesized that B glenoid morphology would be induced by subtle neurological lesions whilst birth delivery, exhibited by OBPP.

Methods: The authors retrospectively studied a multicentric series of 154 patients (68% men, 187 shoulders) aged 63±17 years, suffering from static posterior subluxation of the humeral head (B0 to B2 glenoids) between May 2018 and August 2019. The authors asked the patients to complete a questionnaire comprising their age, gender, involved side, dominance, familial history, and history of perinatal complications either related to OBPP development (macrosomia >4kg, shoulder dystocia, fetal distress, maternal diabetes, breech delivery, clavicle fracture, multiple pregnancy, forceps and suction) or not (umbilical cord around neck, prematurity).

Results: For most patients, static posterior subluxation of the humeral head was unilateral (78.6%). Ten patients (6.5%) reported one perinatal complication unrelated to OBPP, including prematurity (n=8, 5.2%) and umbilical cord around neck (n=2, 1.3%). Thirty patients (19.5%) reported one or more perinatal complications related to OBPP, including shoulder dystocia (n=4, 2.6%), macrosomia>4kg (n=5, 3.2%), breech delivery (n=6, 3.9%), multiple pregnancy (n=3, 1.9%), fetal distress or pH>7.1 (n=8, 5.2%), maternal diabetes (n=2, 1.3%), clavicular fracture (n=2, 1.3%), and forceps (n=4, 2.6%). The comparison with the literature suggests that our rates of perinatal complications related to OBPP is much higher than in the general population, notably for shoulder dystocia (2.6% vs 0.2-0.8%), macrosomia>4kg (3.2% vs 0.1%), breech delivery (3.9% vs 0.1%), fetal distress or pH>7.1 (5.2% vs 1.1%), clavicular fracture (1.3% vs 0.2%), and forceps (2.6% vs 0.1%) (Table).

Conclusions: Neurological lesions might be an underreported cause of static posterior instability. This information may improve our understanding of glenohumeral pathoanatomy and posterior glenoid erosion patterns as well as assist with OA prevention.

Table: Perinatal complications related to OBPP

	Present study	Literature
Shoulder dystocia	2,6%	0.2-0.8%
Macrosomia > 4kg	3,2%	0,1%
Breech delivery	3,9%	0,1%
Multiple pregnancy	1,9%	1,3%
Fetal distress or pH > 7.1	5,2%	1,1%
Maternal diabetes	1,3%	1,0%
Clavicular fracture	1,3%	0,2%
Forceps	2,6%	0,1%

OBPP, obstetrical brachial plexus palsy

#359 MID- TO LONG-TERM FOLLOW-UP OF SHOULDER ARTHROPLASTY FOR PRIMARY GLENOHUMERAL OSTEOARTHRITIS IN PATIENTS AGED 60 OR UNDER

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Aim: Aim: The purpose of this multicenter study was to longitudinally evaluate young patients (<60 years old) undergoing primary shoulder arthroplasty for primary glenohumeral osteoarthritis.

Background: Shoulder arthroplasty in young patients with primary glenohumeral osteoarthritis is an area of continued controversy.

Methods: A retrospective multicenter study was performed for all patients aged 60 years or less undergoing either hemiarthroplasty (HA) or total shoulder arthroplasty (TSA) for primary glenohumeral osteoarthritis with a minimum of 24-month follow-up. Clinical and functional outcomes, complications, and need for revision surgery were analyzed. Survivorship analysis using revision arthroplasty as an endpoint was determined.

Results: A total of 202 patients with a mean age of 55.3 years (range, 36-60 years) underwent TSA with a mean follow-up of 9 years (range, 2-24.7 years). Revision arthroplasty was performed in 33 (16.3%) shoulders, with glenoid failure associated with the revision in 29 shoulders (88%). TSA survivorship analysis demonstrated 95% free of revision at 5 years, 83% at 10 years, and 60% at 20-year follow-up. A total of 31 patients with a mean age of 52.5 years (range, 38-60 years) underwent HA with a mean follow-up of 8.7 years (range, 2-21.4 years). Revision arthroplasty was performed in 5 (16.1%) shoulders, with glenoid erosion as the cause for revision in 4 shoulders (80%). HA survivorship analysis demonstrated 84% free

from revision at 5 years and 79% at the final follow-up. TSA resulted in a significantly better range of motion, pain, subjective shoulder value, and Constant score compared with HA.

Conclusions: In young patients with primary glenohumeral osteoarthritis, TSA resulted in significantly better functional and subjective outcomes with no significant difference in longitudinal survivorship compared with patients treated with HA.

#370 ARTHROSCOPIC REDUCTION AND TRANSOSSEOUS SUTURE FIXATION OF AVULSED DISPLACED GREATER TUBEROSITY FRACTURE

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Aim: Aim: This study evaluates the functional and radiographic results of a new arthroscopic reduction and transosseous suture fixation technique in a series of mostly old patients,selected displaced two parts greater tuberosity fractures of the proximal humerus

Background: Background: the results of conservative treatment of the proximal humerus fractures are not satisfactory. Open reconstruction and rigid internal fixation as well as arthroscopic–assisted reduction and internal fixation are only possible in selected cases, mostly young patients. Old patients with osteoporotic, comminuted bone accounts for 70% of the cases.

Methods: Methods: The technique was to reduce the upwards and medially displaced greater tuberosity to its anatomical position and make a longitudinal, horizontal and mattress suture fixation. 23 patients (12 males and 12 females) with a specifically defined displaced fracture of the greater tuberosity underwent arthroscopic reduction and transosseous sutures fixation. The average age was 56 years (between 21 and 79). 66% were above 50 years of age.They were examined with an average follow up of two and a half years (between 12 and 83 months). Follow-up radiographs were assessed for fracture consolidation, malunion, nonunion, heterotopic ossification, and signs of impingement. All displaced fractures were reduced fixed with number 2 non-absorbable sutures. Rehabilitation exercises were started after a postoperative immobilization period of 3 to 4 weeks.

Results: Results: according to Neer classification excellent results were present in all cases of the two parts fracture. All fractures united within four weeks, no nonunion, no heterotopic ossifications and no osteoarthritis or avascular osteonecrosis was detected. Three men and one women active athletes were able to go back to their previous performance.

Conclusions: Conclusion The clinical and radiographic result strongly encourage using the arthroscopic transosseous suture fixation techniques to treat displaced greater tuberosity fractures especially in old age patients or patients with osteoporosis. It is the only method with very good results in this group of patients.

#371 ARTHROSCOPIC STABILISATION OF ATRAUMATIC SHOULDER INSTABILITY: MINIMUM TWO YEAR OUTCOMES

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Aim: To assess the safety and efficacy of arthroscopic inferior capsular shift in the context of atraumatic shoulder instability at minimum two-year follow up.

Background: Atraumatic shoulder instability is difficult to treat especially when recalcitrant to physiotherapy rehabilitation. In the absence of instability lesions capsular plication is a treatment option. Surgeons have varying degrees of success with this treatment modality and in our experience, there is a high risk of recurrence though this is not often in keeping with the literature.

Methods: From April 2013 to January 2017, 72 patients with atraumatic instability underwent arthroscopic inferior capsular shift. Patient-reported outcome scores were prospectively collected during routine outpatient follow up, as determined by the local research and innovation committee. These included Oxford Shoulder (OSS), Oxford Shoulder Instability (OSI), pain using a numerical rating system (NRS) and Stanmore Percentage of Normal Shoulder Assessment (SPONSA).

Results: Mean age was 27.4 years with a large female preponderance (46F:26M). Median Beighton score was 5, with 14 diagnosed pre-operatively with a connective tissue disorder. Mean follow up was 2.7 years (range 2 to 5.8 years). As of January 2019, 59 patients have attended two year follow up. Significant improvements in pain and functional outcomes were seen. Mean pain score improved from 7.3(SE $\pm$0.34) to 2.7(SE$\pm$0.35) and mean SPONSA increased from 43.8% (SE$\pm$3.31) to 71.6% (SE$\pm$2.92). Mean OSS increased from 29.6(SE$\pm$1.81) to 39.1(SE $\pm$1.34), while mean post-operative OSI was good at 34.6(SE $\pm$1.47). At two years, 23 patients (39%) reported instability symptoms, with 5 requiring further stabilisation surgery (8.5%). Using the FEDS (Frequency, Aetiology, Direction, Severity) classification the majority of recurrences were atraumatic anterior subluxations with more than 5 episodes. Subgroup analysis of our recurrent instability group demonstrated age less than 30 ($<$30 vs $>$30, p=0.007) and female gender (male vs female, p=0.007) as significant predictors of recurrence. Beighton score ($<$5 vs $\geq$5, p=0.297) or direction of instability (anterior vs inferior vs posterior vs multidirectional, p=0.307) were not predictive of recurrent instability. Nor was pre-existing Hill-Sachs or glenoid bone loss. There was one complication of adhesive capsulitis requiring capsular release.

Conclusions: Arthroscopic inferior capsular shift surgery is an appropriate treatment option for those with atraumatic shoulder instability recalcitrant to conservative measures. Although improvements in stability and functional outcomes can be anticipated it is our obligation to inform patients of the high rates of recurrent instability. Female patients under the age of 30 should be made especially aware.

#374 DOES RADIOGRAPHIC MARKERS AFFECT POSTOPERATIVE MUSCLE STRENGTH IN REVERSE SHOULDER ARTHROPLASTY?

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Aim: The purpose of this study was to investigate the influence of radiographic markers on muscle strength after reverse shoulder arthroplasty(RSA).

Background: RSA is a useful shoulder treatment option for patients with irreparable massive rotator cuff tears and cuff tear arthropathy. Many kinds of implant design have been introduced, however, considerable debate persists in the ideal placement of RSA component to optimally restore function. Although there are many reports of the influence of implant position on range of motion, complication, and etc., there are a few reports of correlation of implant position and muscle strength after RSA.

Methods: We evaluated 44 shoulders in 44 consecutive patients. All patients who underwent RSA for massive rotator cuff tear or cuff tear arthropathy between July 2016 and July 2018 were included in this study. Postoperative radiographic markers included acromiohumeral interval(AHI), critical shoulder angle(CSA), deltoid length(DL), deltoid lever arm measured to center of rotation(COR), Humeral offset(HO). Moreover, the cross-sectional area of the deltoid was measured using MRI at 3 months postoperatively. The muscle strength was measured using a hand-held digital dynamometer in flexion, abduction and external rotation at preoperatively and 6 months postoperatively, respectively.

Results: Significantly positive correlations between DL and muscle strength in 0 degrees, 90 degrees external rotation at 6 months postoperatively were recognized, respectively(r=0.42 p=0.01,