MD, Christopher Ahmad, MD, William Levine, MD, Louis Bigliani, MD

Summary: Using validated outcome instruments, this study indicates that operative treatment of rotator cuff disease results in greater pain relief and functional improvement than non-operative treatment.

Purpose: To compare the outcomes of operative and non-operative treatment in patients with rotator cuff disease using validated, patient-derived outcome instruments.

Methods: All patients with a diagnosis of rotator cuff disease over a 5-year period (2000-2005) were surveyed using a questionnaire which included the validated patient-derived outcome assessment instruments: SF-36, Euroqol (EQ), VAS, ASES (American Shoulder and Elbow Surgeons) score, and SST (Simple Shoulder Test). Non-operative treatment consisted of NSAIDs, corticosteroid injections, and physical therapy. Operative treatment included arthroscopic acromioplasty and rotator cuff repair when indicated. Of the patients with completed questionnaires and minimum one-year follow-up data, 90 patients (92 shoulders) who underwent operative treatment of rotator cuff disease were demographically matched by age and gender with 90 patients who underwent non-operative treatment. Statistical analysis was performed using a paired student's t-test.

Results: At minimum one year follow-up (average 2.9 ± 1.3 years), improvement in pain relief (percent reduction) was significantly better in the operative group than non-operative group (VAS 42.8% v. 23.9%, $p<0.05$). Functional improvement (percent increase) was also significantly better in the operative group relative to the non-operative group (SST 40.7% v. 20.5%, ASES function 40.3% v. 23.6%, $p<0.05$). No statistically significant differences were observed post-treatment in quality of life scores (Euroqol, SF-36, Health Scale), although patients who elected surgical treatment had a greater percent improvement at follow-up (22.6% v. 9.8%, $p<0.05$).

Conclusions: The present study supports the success of both operative and non-operative treatment of rotator cuff disease using validated outcome instruments and quality of life scores. Results from operative treatment were superior to non-operative treatment in both pain relief and functional improvement. These findings may have significant impact on the decision between operative and non-operative treatment in rotator cuff disease.

Functional Outcomes of Arthroscopic Rotator Cuff Repair: Correlation of Fatty Degeneration in the Cuff Muscles with Shoulder Function (SS-25). *Hiroshi Takeda, MD*

Summary: Preoperative degree of fatty degeneration in cuff muscles was negatively correlated with postoperative overall shoulder functioning after the arthroscopic rotator cuff repair.

Purpose: There have been several reports on the correlation of fatty degeneration of rotator cuff muscles with functional outcomes after open rotator cuff repair. The purpose of this study was to determine whether the fatty degeneration in cuff muscles predicts functional outcomes after arthroscopic rotator cuff repairs.

Methods: From February 2003 to March 2004, fifty-one shoulders were treated by arthroscopic rotator cuff repair. Of these, forty-nine shoulders were followed up. Mean age at surgery was 59 years. Mean follow-up time period was 26 months (24 – 39 months). There were 4 partial thickness tears, 15 small tears, 19 medium tears, 7 large tears, and 6 massive tears. Preoperative degree of fatty degeneration was determined by the Global Fatty Degeneration Index (GFDI), developed by Goutallier. The isometric strength of shoulder flexion was quantified utilizing a hand-held dynamometer. Outcome assessment was evaluated using the Japanese Orthopaedic Association Shoulder Scoring system (JOA score: 100 total points).

Results: The mean JOA score was significantly improved from 63 preoperatively to 94 postoperatively ($p<0.001$). GFDI was positively correlated with the size of the tear ($p<0.01$). Postoperative JOA score and isometric flexion strength were negatively correlated with GFDI ($p<0.01$). If the fatty degeneration index in supraspinatus muscle was smaller than or equal to one, then the mean isometric flexion strength at follow-up was ninety percent of the unaffected side.

Conclusions: Preoperative degree of fatty degeneration in cuff muscles was negatively correlated with postoperative overall shoulder functioning after the arthroscopic rotator cuff repair. GFDI was found to be a very useful index to predict functional results after the arthroscopic rotator cuff repairs.

Arthroscopic Debridement of Massive Irreparable Rotator Cuff Tears (SS-26). *Dennis Liem, MD, Nina Lengers, MD, Wolfgang Poetzl, MD, Joern Steinbeck, MD, Bjoern Marquardt, MD*

Purpose: The purpose of this study was to evaluate clinical and radiological results of arthroscopic debridement of massive rotator cuff tears. 31 patients (av. Age 70.6 years) were retrospectively reviewed an average of 47 months (24 – 69) after arthroscopic debridement of an irreparable rotator cuff tear. The ASES Score was improved from 24.0 to 69.8 points. Scores for pain were

reduced from 7.8 to 2.9 points. There was progression of osteoarthritis in 10 cases (32.3%), without influence on the ASES score. For elderly patients arthroscopic debridement in combination with biceps tenotomy leads to significant functional improvement.

Arthroscopic debridement is a common treatment option for older patients with low physical demands suffering from irreparable rotator cuff tears. The purpose of this study was to evaluate clinical and radiological results of this procedure at mid- to long-term follow up.

Methods: 31 consecutive patients (av. Age 70.6 years) were retrospectively reviewed an average of 47 months (24 – 69) after arthroscopic debridement of an irreparable rotator cuff tear. Operative treatment included biceps tenotomy in 24 cases (77.4%) while in 4 cases (12.9%) the biceps tendon was already ruptured. No acromioplasty was performed to maintain the coracoacromial arch.

Clinical outcome was assessed by an independent observer with ASES-Scores as well as measurement of abduction strength and elbow flexion strength in comparison to the contralateral side at final follow up. Preoperative and follow up X-Rays were evaluated for acromiohumeral distance and grade of osteoarthritis.

Results: The average ASES Score was significantly improved from 24.0 to 69.8 points at follow up. Scores for pain were reduced from 7.8 to 2.9 points on a 0-10 VAS scale. The age and gender adjusted Constant Score was 72.2%. On a VAS scale from 0-10 satisfaction with the procedure was rated at 7.7. Radiological analysis showed progression of osteoarthritis in 10 cases (32.3%) however this had no influence on the ASES score. Acromiohumeral distance decreased from 8.3 mm to 7.0 mm. Biceps strength was measured at 6.1 kg on the operated and 6.3 kg on the contralateral side. Abduction strength was significantly lower on the operated side at 2.6 kg versus 3.7 kg on the contralateral side. No complication related to the procedure was reported.

Conclusions: For elderly patients with low functional demands arthroscopic debridement in combination with biceps tenotomy is a safe procedure and leads to significant functional improvement without loss of biceps strength. Progression of osteoarthritic changes can not be achieved however no influence on the clinical result could be demonstrated.

Arthroscopic Biceps Tenotomy And Tenodesis For Massive Irreparable Rotator Cuff Tears (SS-27). *Ryan T. Bicknell, MD, MSc, FRCSC, Christopher Chuinard, MD, Pascal Boileau, MD*

Purpose: The purpose of this study was to evaluate outcome following arthroscopic biceps tenotomy or tenodesis for massive irreparable rotator cuff tears associated with biceps lesions.

Methods: This is a retrospective study of 68 consecutive patients (mean age 68 $\pm$ 6 years) with 72 irreparable rotator cuff tears treated with arthroscopic biceps tenotomy (39 cases) or tenodesis (33 cases). All patients were evaluated clinically and radiographically at a mean follow-up of 35 months (range, 24-52).

Results: Fifty-three patients (78%) were satisfied. The Constant score improved from 46 to 67 points ($p<0.001$). Presence of a healthy, intact teres minor on preoperative imaging correlated with increased postoperative external rotation (40 vs. 18°, $p< 0.05$) and higher Constant score ($p<0.05$). Three patients with a pseudoparalyzed shoulder did not benefit from the procedure and did not regain active elevation above the horizontal level. By contrast, 15 patients with painful loss of active elevation recovered active elevation. The acromiohumeral distance decreased 1 mm on average, and only one patient developed glenohumeral osteoarthritis. There was no difference between tenotomy and tenodesis (Constant Score 61 vs. 73). A "Popeye" sign was clinically apparent in 24 tenotomy patients (61%), but none were bothered by it. Two patients required reoperation with a reverse prosthesis.

Conclusions: Arthroscopic biceps tenotomy and tenodesis effectively treats severe pain or dysfunction caused by an irreparable rotator cuff tear associated with biceps pathology. Shoulder function is significantly lower if the teres minor is atrophic or fatty infiltrated. Pseudoparalysis or severe cuff arthropathy are contraindications.

Outcome of 'All Inside' Arthroscopic Meniscal Repair—Isolated vs. Combined with Anterior Cruciate Ligament Reconstruction (SS-28). *Christopher Cao Ninh, MD, Henry Goitz, MD, Christopher Wybo, MD, Peter Leaman, MD*

Summary: Age, Gender, Side of surgery, were not significant factors for meniscal repair failure. The overall rate of successful healing of meniscal repairs was 92%. Lateral meniscal repairs fared better than medial meniscal repairs. Concomitant anterior cruciate ligament reconstruction did not have an impact on meniscal repair failure rates.

Purpose: To determine the outcome of all inside arthroscopic meniscal repairs versus arthroscopic meniscal repairs with concomitant arthroscopic assisted anterior cruciate ligament reconstruction.