

a conservative post-operative regimen, sling immobilization for 6 weeks, on ROM following arthroscopic cuff repair.

Methods: 56 patients with full-thickness rotator cuff tears were prospectively followed for 1 year. Patients with preoperative stiffness were excluded. ROM was assessed preoperatively and at 2, 6, 12, 24, and 52 weeks postoperatively. Pre- and postoperative ASES and Constant scores were recorded. 43 patients (77%) had an MRI at one year postoperatively to assess repair integrity.

Results: During the first 6 weeks postoperatively 43 patients (77%) had "good" PROM (elevation $> 100^\circ$ and external rotation (ER) $> 30^\circ$), while 13 (23%) were "stiff" (elevation $< 100^\circ$ and/or ER $< 30^\circ$). No patients were stiff at one year. 44% of the repairs were intact at 1 year by MRI. There was a trend for better healing in the "stiff" group: 70% of repairs were intact on MRI, compared to 38% in the "good ROM" group ($p=0.13$). There was no difference in ASES, Constant scores, or ROM at 1 year between groups.

Conclusions: Six weeks of immobilization after arthroscopic rotator cuff repair does not appear to result in long-term stiffness. Additionally, patients with perioperative stiffness trended toward better tendon healing. Early PROM is not necessary to avoid stiffness after arthroscopic rotator cuff repair, and may have a detrimental effect on tendon healing.

The Effect of Rehabilitation on Cuff Integrity and Range of Motion Following Arthroscopic Rotator Cuff Repair: A Prospective, Randomized Study of a Standard vs. Decelerated Rehabilitation Protocol (SS-23). Allen Deutsch, MD, David Guelich, MD, George Mundanthanam, MD, Christopher Govea, MD, John Labis, MD

Summary: A prospective, randomized study of 70 patients determined the effect of 2 rehabilitation protocols on repair integrity and motion following arthroscopic cuff repair. The only difference between protocols was that passive forward elevation began on post-op day #7 in the Standard group and after 4 weeks in the Decelerated group. Patients underwent ultrasound at 1, 2, 3, and 6 months. For post-op ROM, no significant difference was found between groups. At 6 months, 81% of cuffs were intact for the Standard group vs. 91% for the Decelerated group. ($p>0.05$) The decelerated rehabilitation protocol resulted in fewer re-tears without postoperative stiffness.

Purpose: The effects of rehabilitation on repair integrity following arthroscopic cuff repair have been poorly

studied. A prospective, randomized study was carried out in order to determine the effect of 2 different rehabilitation protocols on structural integrity and range of motion (ROM) following arthroscopic cuff repair.

Methods: Seventy patients undergoing arthroscopic rotator cuff repair were randomized to either a Standard (37 patients) or Decelerated (33 patients) rehabilitation protocol. The average age (57 years; range: 29-78 years) and intraoperative tear size were similar for both groups. All repairs were performed by the senior author with a single row of metal anchors with simple sutures. All patients were immobilized in an ultrasling for 6 weeks. For both groups, pendulum exercises were initiated on post-op day #1, supine passive external rotation stretches on post-op day #7, and passive internal rotation stretches at 4 weeks. The only difference between groups was that supine passive forward elevation exercises were started on post-op day #7 in the Standard group and after 4 weeks in the Decelerated group. The strengthening phase was identical for both groups. All patients underwent post-op range of motion measurement and ultrasonography of the shoulder at 1 month, 2 months, 3 months, and 6 months. Dynamic images were reviewed by the senior author and 2 blinded musculoskeletal radiologists. Interobserver reliability was calculated. Chi-square and Student t test were used to determine whether a significant difference could be found between groups with respect to the number of re-tears and postoperative ROM.

Results: For postoperative ROM, no significant difference was found between groups at any of the time intervals. Interobserver reliability for the ultrasound readings was good to excellent with a Kappa value of 0.834. At 6 months, 81% (30/37) of cuffs were intact for the Standard group vs. 91% (30/33) for the Decelerated group. ($p>0.05$) For both groups, 35% (8/23) of large to massive tears were re-torn vs. 4% (2/47) of small to medium tears. ($p<0.05$) There was a trend for re-tears to occur in older patients: re-tear, 62y vs. intact, 56y. ($p=0.11$).

Conclusions: A statistically significant difference was not found between the re-tear rates in the Standard and Decelerated groups (19% vs. 9%); however this difference may be clinically relevant. This study supports the use of a decelerated rehabilitation protocol following arthroscopic cuff repair because it resulted in fewer re-tears and was not associated with postoperative stiffness.

The Operative Management of Rotator Cuff Disease Results in Superior Pain Relief and Functional Improvement Compared to Non-operative Treatment (SS-24). Theodore A. Blaine, MD, John-Erik Bell, MD, Jessica Lee, MD, Jonathan Packer, MD, Sara Edwards,

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