A Slower Recovery Of Range Of Motion after Arthroscopic Supraspinatus Repair Is Associated With a Higher Healing Rate

Abstract ID# 22821
All Authors:
Tiago Martinho MD SWITZERLAND
Marko Nabergoj MD SLOVENIA
Alexandre Lidérmann MD SWITZERLAND
Philippe Guy Collin MD FRANCE

Summary:
Our study shows that the speed of recovery of passive ROM influences tendon healing after isolated arthroscopic SSN repair. Indeed, repairs that resulted in healing had lower AE and ER up to 3 months after surgery compared to those that did not heal. However, this difference did not affect the level of pain and/or shoulder function, which were similar.

Data:
INTRODUCTION: The purpose of this study was therefore to analyze the impact of the speed of recovery of ROM on tendon healing and functional outcome in patients undergoing an isolated arthroscopic supraspinatus (SSN) repair and the same postoperative rehabilitation protocol. We hypothesized that a faster ROM recovery would lead to a better functional outcome without compromising SSN repair healing. MATERIAL AND METHODS: This was a prospective monocentric study. All primary isolated arthroscopic SSN repairs for small to medium tears, without retraction (Patte 1), significant fatty infiltration (Goutallier <2) and associated glenohumeral osteoarthritis were eligible. Patients who did not complete all postoperative follow-ups were excluded. An experienced orthopedic surgeon performed all procedures using a standard double-row technique. All patients followed the same rehabilitation protocol postoperatively. It included the use of a sling and progressive passive overhead stretches and external rotation (ER) with the elbow at side during the first 6 weeks. An independent observer assessed all patients before and at 6 weeks, 3, and 6 months after surgery. Collected data at each follow-up included passive and active anterior elevation (EA) and ER as well as the visual analog scale (VAS) for pain. In addition, the Constant score was obtained before and at 6 months after surgery. A single and experienced radiologist examined the healing of the repair by ultrasound at 6 months postoperatively. The integrity of the repair was classified into 5 categories according to Sugaya. Types 1 to 3 were considered as healed. RESULTS: 1323 consecutive patients between 2010 and 2020 were eligible. 169 were excluded according to the aforementioned criteria. Finally, 1154 arthroscopic SSN repairs were included. The healing rate was 87.3%. Table 1 presents the following results in detail. Preoperative characteristics of healed and non-healed repairs were similar in terms of passive and active ROM, VAS pain, and Constant score. Compared to the non-healed repairs, the healed ones were slightly younger (57.8±8.0 vs. 61.5±8.5 years; p<0.001) and had a lower passive AE and ER at 6 weeks and 3 months postoperatively. However, this difference faded by 6 months after surgery. There was no difference in Constant score and VAS pain between healed and non-healed repairs. In both cases, the SSN repair resulted in an improvement of the Constant score at 6 months postoperatively and a decrease in the VAS pain already from the 6th postoperative week. DISCUSSION: Our study shows that the speed of recovery of passive ROM influences tendon healing after isolated arthroscopic SSN repair. Indeed, repairs that resulted in healing had lower AE and ER up to 3 months after surgery compared to those that did not heal. However, this difference did not affect the level of pain and/or shoulder function, which were similar. These results illustrate the importance of the immediate postoperative rehabilitation phase on tendon healing and support the hypothesis that an initial period of rest without active mobilization or at least with protected mobilization increases the chances of tendon healing.

Category: Shoulder - Rotator Cuff

All Arthroscopic Muscle Advancement Procedure for Massive Retracted Rotator Cuff Tears: Clinical and Radiological Outcome

Abstract ID# 23450
All Authors:
Ashish Gupta MBBS, MSc, FRACS AUSTRALIA
Mohammad Jomaa MD AUSTRALIA
Andrew Ker MBChB, BSc (Hons), FRCSed (T+O) UNITED KINGDOM
Jashint Maharaj MBBS, FRSPH AUSTRALIA
Preek Hollman MD NETHERLANDS
Roberto Pareyon MEXICO
Kenneth Cutbush MBBS, FRACS, FAOrthA AUSTRALIA
repair to the anatomical footprint. 59 shoulders (89%) were reviewed at a mean follow-up of 52.4 weeks (SD: 27.6 weeks, range: 20.3-175.1 weeks). Patients were radiologically assessed with a magnetic resonance imaging (MRI) at 6 months after the procedure. Pre-operative and Post-operative range of motion, cuff strength, VAS, Constant, ASES, and UCLA scores were assessed. Pre-operative radiologic assessment with an MRI included Patte (modified by Boileau) classification of tendon retraction, and Goutallier classification of fatty degeneration. Cuff healing and integrity of repair was assessed using the Sugaya classification, wherein, Sugaya 4 and 5 were considered as re-tears. Results & Discussion Advanced fatty degeneration (Goutallier 3 and 4) was present in 44% of supraspinatus and 20% of infraspinatus muscle bellies, respectively; while moderate degeneration (Goutallier 2) was present in 42% of supraspinatus and 22% of the infraspinatus muscle bellies, respectively. Tendon retraction was to the level of the glenoid (Patte-Boileau III-2) or medial to the glenoid (Patte-Boileau IV) in 22%, and just lateral to the glenoid (Patte-Boileau III-1) in 66%. About half of the tears (51%) extended into the teres minor. The subscapularis was partially torn (Lafosse 1-3) in 46% of cases and completely torn (Lafosse 4-5) in 20%. At follow up, there was a statistically significant increase in the mean range of motion (Table 1). Relative cuff strength improved from 57% to 90%, when compared to contralateral side (Table 2). VAS improved statistically from 4.25 to 1±1.7 (p<0.001). There was a statistically significant improvement in all scores from preoperative to postoperative evaluations; Constant from 50 ± 17.8 to 74 ± 13.0 (p<0.001), ASES from 52 ± 17.5 to 87 ± 14.9 (p<0.001), and UCLA from 16 ± 4.9 to 30 ± 4.9 (p<0.001). There were 6 re-tears (10%) with Sugaya 4 and 5 grades noted, one failure was due to P. acnes infection. 65% of patients were Sugaya 2. Stiffness occurred in 6 cases (10%) with 4 requiring arthrolysis. 93% returned to pre-injury work, and 89% of cases returned to pre-injury sport. The satisfaction rate was 96%. Primary repair of massive posterosuperior cuff tears using the muscle advancement technique coupled with double-layer lasso loop repair leads to restoration of range of motion, symmetrical strength, and excellent functional outcomes.

Category: Shoulder - Rotator Cuff

Simulator VR Rotator Double Row Cuff Repair Training Improves the Overall Ease of the Procedure: A Randomized, Controlled and Multicentric Transfer Validity Study

Abstract ID# 21536
All Authors:
Nicolas Valleé MD FRANCE
Alexandre Tronchet MD PhD FRANCE
Tiphaine Casy PhD FRANCE
Hervé Thomazeau FR FRANCE
Pierre Jannin PhD FRANCE
Julien Maximen MD FRANCE
Arnaud Huaulme PhD FRANCE

Summary:
This prospective, controlled and multi centric study about the transfer validity between VR simulator and real condition demonstrate that the simulator is not sufficient to learn a complex and sequential procedure like double row repair. Data: Purpose To investigate the transfer validity of an arthroscopic cuff repair from virtual reality simulation to real conditions. Methods Thirty orthopedic residents and first year orthopedic fellows were enrolled in our study from six French university hospitals. At baseline, they were asked to answer a survey about the number of arthroscopic procedures they performed as an operating assistant or main surgeon. The attendees were also asked about their confidence in performing an arthroscopic cuff repair. Following this survey, they were randomized in two different groups: virtual reality training (VR+) or no virtual reality training (VR-). At the beginning of our study, both groups received one session of training on the simulator Arthro® (VirtaMed AG, Zurich, Switzerland) and a theoretical course on cuff repair. Thereafter the VR+ group underwent a monthly based training program with increasingly difficult procedures. The training sessions were standardized, lasted 1 hour, and were performed under the supervision of the same assessor. After 6 months, all the attendees were asked to perform an arthroscopic double row supraspinatus repair on a 3D printed shoulder model using real anchors. Two independent and blinded shoulder specialists scored the attendees using the Arthroscopic Surgical Skill Evaluation Tool (ASSET) score. Statistical analysis was performed with a non-parametric t-test Mann-Whitney was used. The results are expressed with median and standard deviation. Results Both groups were initially comparable. There is no significative difference between the two group with the total ASSET score (63 +/- 4.7 versus 58 +/- 8.3, p=0.11). The VR+ group presented a better ASSET Global rating scale than the VR- group (35 +/- 3.1 versus 32 +/- 5.7, p=0.046). The task specific checklist for the procedure did not differ between VR+ and VR- (26.8 +/- 2 versus 25.6 +/- 2.8, p=0.24). The VR+ group was faster than the VR- group (1705 +/- 212 seconds versus 1890 +/- 247 p=0.0063). Conclusion A monthly based VR program of 6 months improves the arthroscopic performance of orthopedic surgeons in formation but is not sufficient to master a procedure.

Category: Shoulder - Rotator Cuff

Risk Factors for Early Failure of Non-operative Management of Degenerative Rotator Cuff Tears

Abstract ID# 21676
All Authors:
Logan Finger BS UNITED STATES
Bryson P. Lesniak MD UNITED STATES
Jonathan D. Hughes MD UNITED STATES
Albert Lin MD UNITED STATES

Summary:
A retrospective cohort study designed to identify risk factors that increase likelihood of surgery within 3 months of initial presentation after failure of non-operative management for degenerative rotator cuff tears. Data: Background: A number of risk factors for the general failure of non-operative management in the treatment of atraumatic, degenerative rotator cuff tears (RCT) have been identified. However, to date, there is a paucity of research investigating how these risk factors are related to the timing of the failure of non-operative management. A study incorporating this temporal factor would assist physicians and patients to determine when an individual patient is likely to need surgical intervention. The aim of this study was to determine risk factors, including duration of symptoms from initial date of onset to presentation, for early surgical intervention. Methods: A retrospective cohort study was performed of patients with degenerative, atraumatic RCT who underwent surgery by two fellowship-trained shoulder surgeons and had at least 12 months of postoperative follow-up. These patients were divided into two cohorts based on duration of time between index presentation to the surgeon and intervention: early (fewer than 3 months) and delayed (greater than 3 months). Patient characteristics such as demographics, comorbidities, individually and combined via the Functional Comorbidity Index and Charlson Comorbidity Index, clinical findings and shoulder/rotator cuff tear characteristics were collected and data analysis was performed. Results: 144 patients met inclusion criteria, which was failure of at least 6 weeks of physical therapy +/- a glucocorticoid injection. One hundred seven patients (74%) underwent surgery within 3 months of presentation, and 37 (26%) underwent surgery after at least 3 months. Analysis revealed duration of symptoms prior to presentation is a prognostic factor for early versus late surgery (--3 months: 5 (14%) early group, 39 (36%) late group, 4-10 months: 11 (30%) early, 27 (25%) late, 11-25 months: 16 (43%) early, 28 (26%) late, >25 months: 5 (14%) early, 12 (11%) late; p-value 0.05). Additionally, no current tobacco use increased likelihood of undergoing surgery early (early: 96/106 (90%), delayed: 28/37 (76%); p-value 0.04). Age was also a predictive factor with older patients, on average, being more likely to require surgery earlier (mean age: early: 56 +/- 9, delayed: 61 +/- 11; p-value 0.02). Patients who experienced night pain were more likely to fail non-operative treatment earlier (early: 89/94 (95%), delayed: 27/34 (79%); p-value 0.02). Patients with an external rotation strength less than 5/5 were more likely to undergo surgery within 3 months of presentation (early: 58/107 (54%), delayed: 12/36 (33%); p-value 0.03). Conclusions: This study found that the major risk factors for failure of non-operative management within 3 months of index presentation are shorter length of time from symptom onset to presentation, older age, presence of night pain, and an external strength less than full strength. This information may help guide informed decision making.

Category: Shoulder - Rotator Cuff

Assessment of the Tendon Retraction Classification Systems for Predicting Reparability and Rotator Cuff Integrity in Arthroscopic Rotator Cuff Repair

Abstract ID# 21771
All Authors:
Yoshitsugu Takeda MD, PhD JAPAN