

Does Stiffness Impair or Enhance Healing Post Rotator Cuff Repair? A Study in 1500 Consecutive Arthroscopic Rotator Cuff Repairs.

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Summary:

Patients with preoperative stiffness and those who developed stiffness at 6 and 12 weeks postoperatively were more likely to heal their rotator cuff repairs than those who did not present with stiffness and/or develop stiffness post surgery.

Abstract:

INTRODUCTION

Failure to heal, or re-tear, is a common postoperative complication of rotator cuff repair. Similarly, stiffness is a frustrating complaint pre- and postoperatively. Some surgeons defer rotator cuff repair until any stiffness has resolved. The purpose of this study was to determine if shoulder stiffness might play a beneficial or detrimental role in healing of the rotator cuff.

METHODS

The study cohort consisted of 1500 consecutive patients who presented with a rotator cuff tear and had an arthroscopic rotator cuff repair by a single surgeon. Excluded were those who had an isolated subscapularis tear, rotator cuff repair with an interpositional ePTFE patch, revision rotator cuff repair, partial rotator cuff repair, or irreparable rotator cuff tear, arthritis of the shoulder (grade II or greater), concurrent capsular release, fracture of the humerus, scapula or clavicle, arthroplasty, or concurrent stabilisation. Patients ranked their stiffness using a Likert scale and examiners ranked passive range of motion (forward flexion, abduction, external rotation and internal rotation) preoperatively, 1 week, 6 weeks, 12 weeks and 6 months postoperatively. Ultrasound was used to determine repair integrity at 6 months. Bivariate Pearson's and Spearman's Tests were conducted to evaluate 98 different variables taken from the pre- and postoperative data. Subgroup analysis was performed on 863 patients with examiner ranked passive external rotation at 6 weeks post surgery. Patients were divided into stiff (<20 degrees external rotation) and non-stiff (>20 degrees external rotation) groups. Paired and unpaired Student t-tests were conducted to determine significance.

RESULTS

After rotator cuff repair there was an overall 24% loss of shoulder motion at 6 weeks, a partial recovery at 12 weeks and a full recovery at 24 weeks. We found an excellent agreement between patient ranked stiffness and examiner ranked shoulder loss of passive motion (forward flexion, abduction, external rotation and internal rotation) at all time points ($r = 0.16 - 0.42$; $p < 0.0001$). Those shoulders which were stiff before surgery were more likely to be stiff at 6, 12, and, to a lesser extent, 24 weeks after surgery ($r = 0.10 - 0.32$; $p < 0.002$). At 6 weeks and 12 weeks post surgery patient ranked stiffness, and examiner rated restrictions in forward flexion, abduction, external rotation, and internal rotation correlated with an intact repair at 6 months ($r = 0.11 - 0.17$; $p < 0.0001$). Thus, a stiffer shoulder pre-operatively and at 6 and 12 weeks (but not 24 weeks) post surgery correlated with better rotator cuff integrity at 6 months post surgery. Subgroup analysis showed the re-tear rate of patients with less than 20 degrees external rotation 6 weeks post surgery was 7%; approximately half the re-tear rate of those patients with more than 20 degrees external rotation at 6 weeks (15%; $p < 0.001$).

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DISCUSSION

To our knowledge, this is the first study to show that pre- and/or postoperative stiffness is beneficial for rotator cuff tendon to bone healing.