

Are We Doing Too Many Margin Convergence? A Prospective MRI Study on Re-Tear Rate after Arthroscopic Rotator Cuff Repair

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Summary:

The use of margin convergence, despite helpful to achieve a successful intra-operative complete repair for arthroscopic assisted rotator cuff repair, did not protect the repair from re-tear.

Abstract:

INTRODUCTION

Re-tear after successful arthroscopic rotator cuff repair is common. It is notorious that large and massive cuff tear is associated with a lower successful intra-operative complete repair and a higher postoperative re-tear rate. Margin convergence is commonly used to achieve intra-operative complete repair. Despite a very popular technique, the relationship between margin convergence and re-tear after rotator cuff repair is not known. It was hypothesized that there was no difference in the re-tear rate between the repair performed with margin convergence and those without.

METHODOLOGY

A prospective study on primary arthroscopic assisted complete repair of full thickness supraspinatus tendon tear using double-row suture-bridge technique was carried out in the author's institution from 2010 to 2013. 60 repairs were recruited after applying inclusion and exclusion criteria. The follow-up rate at one-year post-operation was 98% and that of two-year was 95%.

50 patients (83%) received reassessment MRI. The repair status was classified according to Sugaya classification. Full thickness re-tear was defined as Sugaya Type IV or V repair.

Association of use of margin convergence technique with retear after rotator cuff repair was examined using univariate analysis with Chi square test. The potential association of retear rate and other known patient-related and cuff-related risk factors (including age, DM, active smoking, heavy manual worker, tear size, tear retraction, tear topography in sagittal plane, tear morphology, number of full thickness tendon tear) were examined. Multivariate analysis was then conducted to determine the most significant factor predicting the rate of re-tear.

RESULT

50 arthroscopic complete repair of full thickness supraspinatus tendon tear using double-row suture-bridge technique with reassessment MRI was studied. The average age was 59 years. 19 were male and 31 were female. Right shoulder was involved in 36 patients. The average follow-up was 37 +/- 13 months.

There was 19 full thickness re-tear found on reassessment MRI (11 Sugaya IV and 8 Sugaya V). The incidence was 38%.

10 patients received margin convergence during the repair. The incidence of re-tear after repair with margin convergence was 80% and that without was 28% ($p=0.002$).

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The other risk factors identified by univariate analysis to be significantly associated with incidence of re-tear was (1) large and massive tear ($p=0.018$); (2) increased number of full thickness tendon tear ($p=0.03$); (3) medial retraction of tear ($p=0.001$) and (4) Geometric classification of tear morphology ($p=0.004$).

After running multivariate analysis, the most significant factor predicting re-tear after arthroscopic rotator cuff repair was medial retraction of tendon ($p=0.048$). The re-tear rate of Patte I, II and III were 24%, 50% and 100% respectively.

CONCLUSION

The incidence of rate of re-tear was significantly higher when margin convergence was used (80% vs 28%, $p=0.002$). The most important factor predicting rate of re-tear was degree of tear retraction ($p=0.048$). Despite helping to achieve a successful intraoperative complete repair, the use of margin convergence did not protect the repair in Patte II and III retraction from going into re-tear.