

# The Effect of Overtensioning of Rotator Cuff Tear Repair on Integrity

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## INTRODUCTION:

This study is to suggest a cutoff value of tension related to retear of a repaired chronically contracted rotator cuff and to analyze the correlation between predictive factors and integrity of repair in large to massive contracted rotator cuff tears (RCTs).

## METHODS:

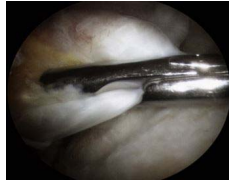
We analyzed arthroscopic rotator cuff repairs for large to massive (>3 cm) contracted RCTs, not amenable to complete repair by standard means with meticulous release, with a minimum of 1 year follow up. An intraoperative procedure was designed for the estimation of repair tension using a tensiometer. Clinical and radiological findings were compared between the healed group and the retear group, and magnetic resonance imaging was performed ~ 1 year postoperatively for the evaluation of integrity of the repair site. The receiver operating characteristic curve was used to identify the cutoff value of the independent factors. Factors affecting postoperative retear were examined with multivariate analysis.

## RESULTS:

One-hundred patients were enrolled in this study and divided into the healed group (62 patients) and the retear group (38 patients) according to the follow-up magnetic resonance imaging findings. Significant results showed that tension (5.13 < 95% confidence interval [CI] < 58.15, P < .001) and acromiohumeral interval (AHI) (1.13 < 95% CI < 33.10, P < .013) were important factors for the integrity of rotator cuff repair. The cutoff value of tension was 35 N, and an AHI <6.6 mm may also be considered a predictor of retear. An occupation ratio of the tendon >35 N was the strongest predictor of retear, with an area under the curve of 0.799, sensitivity of 84.2%, and specificity of 67.7% (accuracy = 76.0%).

## DISCUSSION AND CONCLUSION:

The integrity of a large to massive rotator cuff repair is strongly related to the tension to reach the articular margin of the footprint and AHI. We found that the possibility of retear increases when tension 35 N is required. AHI <6.6 mm may also be considered a predictor of retear.



Results of Multiple Logistic Regression Analysis of Rotator as a Function of Significant Factors Using a Stepwise Forward Conditional Method

Factor	Odds Ratio	95% Confidence Interval	p-value
Tension	11.565	1.13 to 38.21	< 0.001
Acromiohumeral distance	0.184	1.15 to 31.38	0.013
Infraspinatus bony dehiscence	0.059	1.07 to 17.41	0.045
Extent of atrophy, intraoperative	1.011	8.39 to 15.62	0.005
Occupation ratio of supraspinatus tendon	4.858	0.72 to 32.41	0.006
Tear size, intraoperative	1.175	0.41 to 3.53	0.328

Cutoff Value and AUC of the Receiver Operating Characteristic Analysis

Factor	Cutoff Value	AUC
Tension (N)	35	0.799
Acromiohumeral distance (mm)	6.6	0.688
Occupation ratio of supraspinatus tendon (%)	42	0.542
Tear size, intraoperative (cm)	30.5	0.628
Extent of atrophy, intraoperative (mm)	39.5	0.687
Tear size, MRI (cm)	36.5	0.578
Infraspinatus bony dehiscence (grade)	1.5	0.539
Extent of atrophy, MRI (mm)	33.0	0.533