

Predictors of Success of Nonoperative Treatment for Full-Thickness Rotator Cuff Tears: A Multicenter Cohort Study

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Summary:

The purpose of this study is to determine predictors of failure of nonoperative treatment using a multicenter prospective cohort study design.

Abstract:

Objectives:

Full thickness rotator cuff tears are extremely prevalent, yet fewer than 5% come to surgical repair. In those that undergo surgical repair and postoperative rehabilitation reported healing rates have ranged from 13% to 69%, yet patients who have failed repairs report good outcomes and satisfaction with treatment. These data suggest that physical therapy may be effective in treating the symptoms of some patients with full thickness rotator cuff tears. The purpose of this study is to determine predictors of failure of nonoperative treatment using a multicenter prospective cohort study design. Our hypothesis was that younger, more active patients would be more likely to fail nonoperative treatment and request surgery.

Methods:

A prospective multicenter cohort study design was used. Inclusion criteria included all patients with full thickness rotator cuff tears seen on MRI without other disease states. Baseline data from this cohort was used to examine risk factors for failing a standard rehabilitation protocol. Subjects that ultimately underwent rotator cuff surgery were defined as failing nonoperative treatment. A Cox proportional hazards model was fit to determine what baseline factors predicted surgery, or failure of rehab. The dependent variable was time to surgery; tear severity and baseline patient factors (age, activity level, BMI, sex, VAS pain level, education, handedness, comorbidities, duration of symptoms, strength, employment, smoking status, and patient expectations) were the independent variables.

Results:

Of the 433 subjects enrolled the median age was 62, and 49% were female. The dominant shoulder was involved in 69% of the cohort. The median baseline VAS was 4.4. The proportion of subjects with symptoms <1 month was 8%, 1-3 months was 22%, 4-6 months was 20%, 7-12 months was 14%, and over a year was 37%. Isolated supraspinatus tears were found in 73%, 21% had tears involving the supraspinatus and infraspinatus +/- teres minor, and 6% had subscapularis involvement. Tendon retraction was minimal in 48%, midhumeral level in 34%, glenohumeral in 13%, and 5% had retraction to the glenoid. Subjects that had surgery declared themselves early with a median f/u time of

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120 days (interquartile range [IQR]: 72, 176), while those that responded to rehab contributed a median of 731 days of f/u time (IQR: 366, 739). Multivariable modeling, adjusted for the independent variables listed above, identified patient expectations regarding physical therapy ($p < 0.0001$) as the strongest predictor of surgery. Figure 1 is a survival plot showing surgery-free probability stratified by patient expectation level. Younger age ($p = 0.042$), higher activity level ($p = 0.011$), and not smoking ($p = 0.023$) were also significant predictors of having surgery.

Conclusion:

Severity of cuff pathology (size of tear, retraction), pain level, and weakness were not associated with failure of rehab. The strongest predictor was low patient expectation about physical therapy. Other factors found to affect having surgery were higher activity level, younger age, and not smoking.

Level of Evidence: Level I, Prospective Cohort Study, Prognosis Study.