Title: Patient, Imaging, and Surgical Factors Associated with Re-Tear Pattern After Cuff Repair

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Background: This study aimed to characterize patient, imaging, and surgical factors associated with re-tear patterns after rotator cuff repair, as well as to identify predictors of type 2 failure in a large patient cohort.

Methods: A retrospective case-control study was performed at a single urban academic institution. All patients that underwent an arthroscopic rotator cuff repair by two fellowship trained shoulder and elbow surgeons between 2005 and 2022 and were subsequently found to have a symptomatic re-tear on MRI were included. Patients were characterized as either a type 1 (failure at bone-tendon interface) or type 2 (failure medial to the bone-tendon junction) re-tear based on the Cho classification. Chart review was performed to collect demographic, imaging, and intraoperative surgical factors. Multivariable analysis was performed to determine patient and imaging factors associated with type 2 failure.

Results: Fifty-seven patients were included in the study. Overall, 33 (57.9%) patients were classified as a Cho 1 re-tear and 24 (42.1%) were classified as Cho 2 re-tear. No differences in preoperative tear characteristics (tear width, tear retraction, tendon length) or fatty infiltration were found between Cho 1 and Cho 2 re-tears. Bivariate analysis comparing Cho 1 vs Cho 2 found male sex was associated with a higher incidence of a Cho 2 re-tear (79.2% vs. 20.8%; p=0.033). No significant differences in repair construct (single row vs. double row) (p=0.816), biceps treatment (p=0.552), concomitant subscapularis repair (p=0.306), number of medial anchors (p=0.533), or number of lateral anchors (p=0.776) were noted between re-tear types. After controlling for potential confounding factors, multivariable regression analysis demonstrated that male sex was predictive of developing a Cho 2 re-tear (OR 3.8; 95% CI 1.1-13.3; p=0.039). Repair construct was not found to be predictive of re-tear pattern (p=0.580).

Conclusions: Repair construct utilized during rotator cuff repair does not appear to influence re-tear pattern. Male sex was associated with a higher rate of type 2 failure.