Primary Versus Revision Arthroscopic Rotator Cuff Repair - An Analysis In 350 Consecutive Patients

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Introduction: Rotator cuff tears are common injury resulting in shoulder pain and functional disabilities. Arthroscopic rotator cuff repair has been a safe and effective procedure for patients with symptomatic rotator cuff tears. Arthroscopic techniques are now commonly employed to treat this condition with highly satisfactory outcomes. The clinical and functional outcomes of primary arthroscopic rotator cuff repairs are often equal if not better than open rotator cuff repair. Despite clinical success with arthroscopic rotator cuff repairs, anatomical failure has been documented in as many as 80% of repairs on follow up imaging studies. Rotator cuff repairs have also been reported to have a highly variable healing rate from 19% to 94%. With arthroscopic rotator cuff repairs being performed more frequently, rotator cuff re-tears are being encountered more commonly. However, there is paucity in reported functional and clinical outcomes of revision arthroscopic rotator cuff repairs.

Therefore the aim of this study was to evaluate the outcome of revision arthroscopic rotator cuff surgery when compared with primary arthroscopic rotator cuff surgery in a large cohort of patients.

Methods: A consecutive series of 360 (310 primary and 50 revision) arthroscopic rotator cuff repairs performed by a single surgeon with minimum of two years follow-up were retrospectively reviewed using prospectively collected data. With the 50 revision cases (revision group) as a reference, three primary repair cases (primary group) were chosen immediately before and three after each revision case. Standardized, patient-ranked outcomes, examiner determined assessments, and ultrasound determined rotator cuff integrity was assessed pre-operatively at six months and two years after surgery.

Results: The revision group were older (mean: 63 years, range 43 - 80) compared to the primary group (mean: 60 years, range 18 - 88) ( p < 0.05 ) and had larger tear size (4.1 cm2 ± 0.5 cm2)(mean ± SEM) compared to the primary group (3.0 cm2 ± 0.2 cm2)(p < 0.05). Two years after surgery the primary group reported less pain at rest (p < 0.02), during sleep (p < 0.05) and with overhead activity (p < 0.01) compared to the revision group. The primary group had better passive forward flexion (+13o, p<0.05), abduction (+18o, p < 0.01), internal rotation (+2 vertebral levels, p < 0.001) and also significantly greater abduction strength (+15 N, p < 0.001), lift-off strength (+9.3 N, p < 0.05) and adduction strength (+22 N, p < 0.01) compared to the revision group at two years. When compared to the primary group, the revision group was less satisfied with the overall shoulder function before surgery ( p < 0.001 ) but was equally satisfied with the primary group at 6 months post operatively. However the revision group’s satisfaction deteriorated and were less satisfied with their shoulder function than the primary group at two years ( p < 0.005 ). The re-tear rate for primary rotator cuff repair was 16% at 6 months and 21% at two years; while the re-tear rate for revision rotator cuff repair was 28% at six months and deteriorated
to 40% at two years (p < 0.05). The overall shoulder satisfaction corresponded with a decline in rotator cuff integrity at two years.

Discussion: The short-term improvements in functional and clinical outcomes of patients undergoing revision rotator cuff repair were similar to primary rotator cuff repair. However, these improvements did not persist and by two years patients who had revision rotator cuff repair were twice as likely to have re-torn compared to those undergoing primary repair. The increase re-tear rate in the revision group at two years was associated with increased pain, impaired overhead function, weaker strength, less passive motion excursion and less overall satisfaction with shoulder function.

Significance: This study highlights the disparity of clinical and functional outcomes between primary and revision arthroscopic rotator cuff repairs at two years and the fact that the revision repairs have approximately twice the re-tear at two years. This serves as a guide in management of revision cases where they do not do quite as well clinically and functionally as in the primary arthroscopic rotator cuff repair cases at two years.
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