

Conjoint Tendon Release Improves Internal Rotation in Reverse Total Shoulder Arthroplasty: A Cadaveric Study

Feras Qawasmi¹, Logan Mitchell Andryk, Mei Wang², Seth Roge, Mustafa Yassin³, Steven I Grindel⁴

¹Orthopedic Department, Rabin Medical Center-Hasharon Hospital, ²Med College of Wisconsin, ³Orthopedic Department,

⁴Medical College of Wisconsin

INTRODUCTION:

Reverse total shoulder arthroplasty (rTSA) is a successful procedure for rotator cuff arthropathy. Internal rotation to the back (IR) is one of the most difficult motions to gain post rTSA. Hence patients struggle to do part of their daily activities, such as hygiene and dressing. rTSA medializes and distalizes the central rotation that over-tensions the conjoint tendon (CT), which may contribute to the limitation of internal rotation in the back and other motions. The primary aim of this study is to evaluate the effect of conjoint tendon release on the range of motion (ROM) after rTSA. The secondary aim is to assess the effect of coracoacromial ligament (CAL) release on ROM after rTSA.

METHODS:

Ten cadavers underwent rTSA by a fellowship-trained surgeon, followed by CT release (z-plasty) and then CAL release. Shoulder ROM was measured utilizing a goniometer after rTSA, CT, and CAL release. The IR was measured as the distance between the posterior-lateral acromion and the highest point of thumb elevation behind the back. Measurements were compared using a one-tailed, paired students' t-test to assess the difference in motion after each stage.

RESULTS:

Release of the CT after rTSA significantly increased ROM in all planes. The IR improved by an average of 10.3cm ($p < 0.001$). Significant improvements were also seen in internal rotation in abduction ($+15.0^\circ$, $p = .001$), external rotation in abduction ($+11.5^\circ$, $p = .002$), external rotation at the side ($+11.5^\circ$, $p < .001$), forward elevation ($+6.0^\circ$, $p = 0.009$), abduction ($+10.5^\circ$, $p = .009$), and extension ($+19.8^\circ$, $p < .001$). When the CAL was released following CT release, all ROM further improved significantly, except for shoulder abduction.

DISCUSSION AND CONCLUSION:

Release of the CT and CAL following rTSA significantly improved IR and ROM in all other planes in cadaveric shoulders. Clinical studies are needed to assess the clinical results of this technique after rTSA.