Distal Triceps Tendon Tears: MRI Classification based on Insertional Anatomy

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INTRODUCTION:
Improved knowledge of the distal triceps insertion can aid in distal triceps tendon repair. A recent cadaveric study has shown there are separate insertions of the deep muscular portion (corresponding to the medial head) and the superficial portion (corresponding to the long and lateral heads). The purpose of this study was to evaluate tear patterns and layer involvement on MRI in patients who had undergone distal triceps repair.

METHODS:
A retrospective review was conducted of all patients with an MRI diagnosis of triceps tear between 2002 and 2022 at a single institution. Patients were excluded if they did not require surgical repair or had a history of previous triceps surgery. 56 elbows were included and the MRI for each was reviewed by a musculoskeletal fellowship trained radiologist. Tear patterns were classified by layer (deep and/or superficial) and involvement (intact, partial, or full-thickness tear). Data on preoperative and postoperative patient strength and range of motion were collected retrospectively. Analysis of variance (ANOVA) was utilized to determine differences in clinical outcomes by triceps tear classification.

RESULTS: The deep insertion was intact or only partially torn in 35 elbows (63%) (Figure 1). There were 47 (84%) full thickness tears of the superficial layer. These were accompanied by full thickness tears of the deep layer in 20, partial thickness tears of the deep layer in 19, and an intact deep layer in 8 patients. There were 9 (16%) partial thickness tears of the superficial layer. These were accompanied by partial thickness tears of the deep layer in 2 and an intact deep layer in 7 patients. There were no isolated deep layer tears. Mean triceps retraction was 2.6 ± 1.1 cm without significant difference by tear classification ($p=0.13$). Mean strength preoperatively was 3.3 ± 0.6 which increased significantly postoperatively to 4.6 ± 0.5 ($p<0.01$). Strength did not differ by tear classification pre- or postoperatively ($p=0.46$ and $p=0.64$, respectively). Patients had a mean flexion-extension arc of 136 ± 10º prior to surgery and 137 ± 10º after without significant change between the two time points ($p=0.66$). Range of motion did not differ by tear classification pre- or postoperatively ($p=0.49$ and $p=0.81$, respectively).

DISCUSSION AND CONCLUSION: The majority of distal triceps tendon tears requiring surgery have the deep muscular insertion, corresponding to the medial head, intact or partially intact. Surgeons can recognize this preoperatively on MRI and can incorporate this intact portion into their repair, instead of taking down this layer of the insertion in preparation of repair.

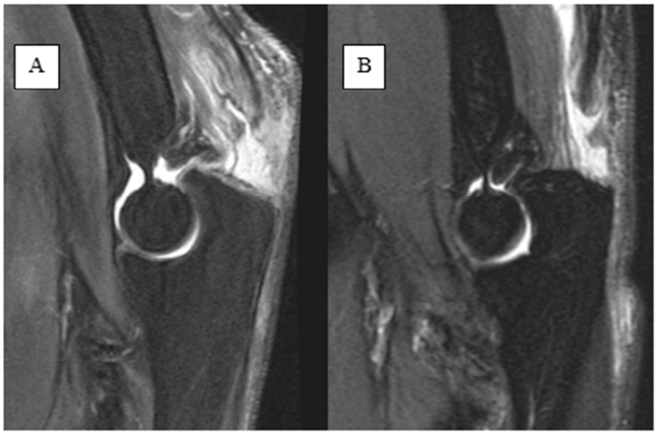

Figure 1: A) Sagittal T2-weighted MRI demonstrating a full tear of the superficial and deep layers. B) Sagittal T2-weighted MRI demonstrating an intact deep layer and a full tear of the superficial layer.