

Complete Rupture of the Triceps Tendon and Ulnar Collateral Ligament of the Elbow in a 13-Year-Old Football Player: A Case Report

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Learning Point of the Article:

This case suggests that prompt surgical repair of a functionally deficient triceps tendon tear and conservative management of associated UCL injury in a young athlete may result in good prognosis and return-to-play within six months.

Abstract

Introduction: With the increasing number of children and adolescents participating in sports, pathologies once reserved for high-level athletes are now emerging in this younger population. Distal triceps tendon tears represent an injury infrequently seen even among older, skeletally mature athletes. We report a case of distal triceps tendon tear with concomitant ulnar collateral ligament (UCL) injury in a skeletally-immature football player.

Case Report: This is a rare case of traumatic triceps tendon tear with UCL injury in a 13-year-old male football player during a fall and hyperextension of his elbow. Management included surgical treatment of the triceps tear with suture anchors in double row technique. The concomitant UCL injury was treated conservatively.

Conclusion: This case suggests that this type of injury can occur in young athletes, but good prognosis can be expected with prompt management. Surgical repair of a functionally deficient triceps tendon tear and conservative management of associated UCL injury can result in return to play within 6 months.

Keywords: Triceps tendon, tendon repair, ulnar collateral ligament.

Introduction

The number of children and adolescents participating in sports is increasing yearly, with estimations of approximately 35 million children and adolescents involved in sports, 2 million of which are participating in organized little league activities [1]. As a result, there has been an emergence of pathologies once reserved for athletes participating in high-level competition. Overuse is the likely culprit for many elbow injuries in young athletes, including damage to ligamentous structures and stress- or overuse-related fractures [2]. As athletes continue to engage in higher levels of competitive sports and younger ages, injuries that were previously only seen in older, skeletally mature athletes, are becoming more frequently encountered in this

younger population. One such injury - the distal triceps tendon tear - is infrequently encountered in the adolescent population. Only 21 such tears were found between 1991 and 1996 in the National Football League, of which 15 required surgical interventions at that time [3]. In this report, we present a rare case of distal triceps tendon tear with concomitant ulnar collateral ligament (UCL) injury in a young athlete following a tackling injury during a football game. This report overviews the diagnosis, management, and successful follow-up of this injury. To the best of our knowledge, there are currently no existing reports in the literature that describes a distal triceps tendon tear accompanied by UCL tear in the pediatric population. The authors have obtained the patient's and

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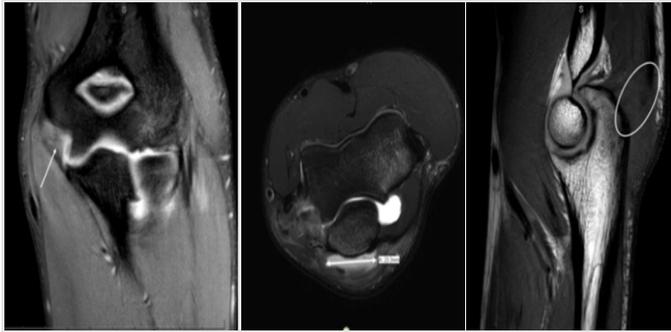


Figure 1: (a) Magnetic resonance (MR) arthrogram coronal cut of the elbow showing complete tear of the ulnar collateral ligament (arrow); (b) MR arthrogram axial cut showing fluid collection in the absence the triceps tendon (arrow); (c) MR arthrogram sagittal cut of the elbow showing triceps tendon detachment from olecranon (circled region).

parent’s informed consent for print and electronic publication of the case report. None of the contributing authors have any conflicts of interest to disclose relevant to this case.

Case Report

A 13-year-old right-handed male, with no pertinent medical history or prior history of an elbow injury, presented to primary care physician three days after the patient was tackled while playing football and heard a “pop” following hyperextension of his left elbow. He immediately suffered from elbow pain, swelling, and was unable to continue playing. Orthogonal X-ray views of the elbow were obtained, and no evidence for a fracture was appreciated. An elbow sling was recommended with referral to non-operative sports medicine physician for assessment of ligamentous injury of the elbow. Five days after injury, the non-operative sports physician noted moderate swelling at the elbow accompanied by tenderness on palpation at the medial and posterior aspect. Passive range of motion was within normal limits, but painful with the elbow in full flexion. Active range of motion was also within normal limits in flexion but limited to 170° in extension. The patient had 4 of 5 strength on active extension of the elbow and a positive moving valgus stress test. The neurovascular exam was unremarkable. Ultrasound and magnetic resonance imaging (MRI)



Figure 2: Patient in the lateral decubitus position and the skin mark showing the curved incision.



Figure 3: Arrow tendon edge (retracted from footprint) held with allis clamp (arrow). Note debridement of triceps footprint and surrounding soft tissue.

arthrogram were ordered. One week after injury, ultrasound showed a near complete, partial-thickness, obliquely-oriented tear of the triceps tendon with a bony avulsion-type fracture, approximately 3.0 cm retracted. A portion of the medial aspect of the tendon was still intact. Suspicions of UCL tear from physical exam were confirmed by the MR arthrogram (Fig. 1a, b, c), which showed a complete tear of the anterior band of the UCL from its humeral attachment. Finally, the MR arthrogram provided further evidence of a high-grade, near complete tear of the triceps tendon with complete avulsion of the lateral and long head portions of the tendon from the olecranon. The patient was referred to be seen by the senior author, an operative sports surgeon, 3 weeks after sustaining the injury. Physical examination was notable for palpable tendon gap at the distal triceps insertion, weakness in active extension of the elbow, and extension lag of approximately 15°. There was approximately 15° of valgus laxity with stress testing in slight flexion. Recommendation was made to surgically repair the triceps tendon. Risks and benefits of non-operative and operative treatment were presented to the patient and family. The decision was made to proceed with refixation of the triceps tendon. Since the patient was not a throwing athlete, the UCL was to be treated non-operatively with immobilization.



Figure 4: Drill guide position for suture anchor, for the proximal row. Note nitinol wire as a sounding device.



Figure 5: Suture pairs tied and tensioned sequentially starting medial to lateral, using tension slide technique.



Figure 6: Double-row fixation triceps tendon, 3 of 6 suture limbs were passed back through the tendon and into “lateral” row single knotless suture anchor; (b) final fixation construct with the triceps tendon fixed to the footprint.



Figure 7: Lateral X-rays at the first post-operative visit showing the trajectory of the anchors (dashed boxes-arrows) avoiding the intra-articular space.

Operative details

On the day of surgery, the patient's left elbow was marked by the senior author. Details of the procedure, post-operative recovery, and risks and benefits were again discussed and agreed on by patient and family. Regional anesthesia, as well as pre-operative antibiotics, was administered. The patient was positioned in a lateral decubitus position using a bean bag, and a non-sterile tourniquet was applied (Fig. 2). A standard posterior approach to the elbow was made using a curved incision to the lateral aspect of the elbow, approximately 10–15 cm in length. Sharp dissection was carried down to the triceps avulsion. The distal end of the triceps was readily identified and seen to be detached nearly completely from the footprint at the olecranon, with only a few remaining fibers intact medially. The necrotic and fibrotic tendon edges were sharply debrided. The footprint on the olecranon was identified and lightly decorticated for tendon preparation (Fig. 3). One medial and one lateral 3.0 double-loaded suture tac (Arthrex, Naples, Florida, USA) was inserted into the footprint (Fig. 4). After drilling through the drill guide, a free nitinol wire was used as a sounder inside the drill hole to ensure that the joint surface had not been penetrated. A Krakow stitch was then placed through the distal end of the tendon with each limb of the pairs. The other suture pairs were placed into a horizontal mattress stitch through the distal tendon. With the elbow in approximately 20° of flexion, the suture pairs were sequentially tied and tensioned, starting medially and going laterally, using a tension slide technique (Fig. 5). Three suture strands were then re-passed through the tendon just proximal to the site of a fixation in incorporated into a single 3.5 mm Swive Lock anchor (Arthrex, Naples, Florida, USA) that was placed 2 cm distal to the suture tac. After fixing the Swive Lock, the elbow was ranged from extension to flexion to confirm that the construct was stable (Fig. 6a, b). After closing the incision, the elbow was placed in a posterior mold splint with the elbow in 30° of flexion. Post-operative follow-up visits were planned for 2 weeks, 6 weeks, 3 months, and 6 months.

Post-operative course

At the first post-operative visit, the patient's wound was inspected and showed complete healing. The patient had full passive range of motion. We positioned the patient in a hinged elbow brace locked at 60° of flexion (0-60). X-rays were taken and showed good positioning of the anchor tracks at the olecranon without joint penetration (Fig. 7). At 6 weeks postoperatively, the patient had full active range of motion with no instability or opening to valgus stress test. The recommendation was to continue bracing for a total of 10 weeks postoperatively, followed by gradual strengthening program, without brace, and with physiotherapy referral after 10 weeks.

At 3 months postoperatively, the patient had completed his physiotherapy course, and elbow strength had returned to pre-injury level relative to the healthy contralateral side. Overall function, as reported by the patient, was "100%" at this time-point. He was not complaining of any weakness or pain. At 6 months postoperatively, he had returned to sport and competition at full, pre-injury level without complications. At 12 months postoperatively, the patient reports that he has not suffered any setbacks or complications and has remained in full contact sport. The patient perceives his strength and function to be 100% relative to the contralateral side and has not complained of any weakness or pain.

Discussion

Triceps tears are quite rare considering its low incidence in the general population, and they are even more rare in the pediatric population. Our literature review produced only three cases that reported triceps tendon tears in skeletally immature patients [4, 5, 6], of which two involved the distal triceps and one involved the proximal long head of the triceps. The primary mechanism of injury for triceps tears is a fall on an outstretched arm, but they have also been reported to be caused by a direct blow to the elbow [7]. Diagnosis of this injury at the acute phase is challenging due to excessive swelling. The examiner should evaluate the elbow for weakness in resisted extension, and a palpable gap just proximal to the olecranon [8]. Diagnostic imaging should start with orthogonal X-ray views of the elbow to assess any bony injuries. If the physical exam is suggesting triceps tear, ultrasound, or MRI should be obtained to confirm the diagnosis [8, 9]. Partial triceps tears that exhibit minimal loss of function have been treated non-surgically with good results [10]; therefore, these patients should be managed accordingly. However, complete triceps tear in young, healthy athletes is considered an indication for repair [8]. Good outcomes have been reported for complete triceps tear repairs in professional football players with all players returning to play [3]. Published favorable outcomes, coupled with imaging evidence of a high-grade tear and associated weakness, indicated that operative management of the triceps tear would be beneficial in the case presented here. The concomitant UCL injury in this unique case required further consideration. UCL injuries of the elbow are usually found in sports that require overhead motion such as baseball, volleyball, or racquetball [11, 12]. Initial management of this injury is conservative treatment consisting of NSAIDs, rest, and physical therapy. Many studies have reported on the outcomes of conservative treatment for UCL injury, with about 42%–50% of athletes returning to their sports activities [11]. Our approach to this case included conservative treatment for the injured UCL and surgical intervention of the

acute rupture of the distal triceps. This management allowed our patient to return to pre-injury function after 3 months and return to sport after 6 months.

Conclusion

This case describes the successful outcome of a young athlete managed for triceps tear and associated UCL injury of the elbow. A triceps tendon tear with functional deficiency and weakness can be repaired surgically with suture anchors in double row technique, while the associated UCL injury can be

treated conservatively during recovery with good functional outcomes and successful return to pre-injury level of athletic participation.

Clinical Message

Triceps tendon repair with conservative management of concomitant UCL injury allows a successful return to pre-injury level of athletic participation in teenage athletes.

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