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Case Report

A Case of Bilateral and Simultaneous Triceps Tendon Rupture in a 42-Year-Old Male Bodybuilder

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Received: January 27, 2023; **Published:** February 16, 2023

Abstract

Background: Triceps tendon rupture (TTR) is an uncommon injury that classically occurs in middle-aged men associated with trauma and metabolic risk factors.

Case Description: In our case, we present a 42-year-old professional bodybuilder who sustained simultaneous and bilateral complete distal triceps tendon rupture with retraction during an incline dumbbell press. Aside from his profession as a bodybuilder, our patient possessed no additional risk factors for TTR. The bilateral tendons were repaired operatively using a double-row suture anchor technique. Following surgical intervention, the patient had a benign postoperative course and regained the full range of motion and strength of both elbows.

Keywords: *Triceps Tendon Rupture; Bodybuilding; Elbow*

Introduction

Triceps tendon ruptures (TTRs) are uncommon, accounting for only 0.8% of all tendon injuries and with a determined prevalence of only 3.8% [1,2]. Nonetheless, TTRs can cause significant functional impairment if misdiagnosed or not treated properly. Therefore, recognition and clinical suspicion leading to appropriate workup is essential. TTRs are typically seen in men between the ages of 30 - 50 years old with the most common mechanism of injury being a fall on an outstretched hand or weightlifting [1,3,4]. In particular, posterior force on the elbow or extension of the elbow against resistance are considered high risk scenarios [1,3,4]. Additional risk factors include anabolic steroid use, local steroid injection, metabolic bone disease, and type 1 diabetes [1,3]. Most often, patients have reported a sudden tearing sensation or a painful pop followed by pain, edema, and ecchymosis over the posterior aspect of the elbow and an inability to extend the elbow against resistance [1-4]. However, patients with partial tears may maintain active elbow extension, and occasionally, the anconeus muscle is able to compensate [1,5]. Therefore, TTRs should not be ruled out based on intact extension of the elbow against resistance. Initial imaging should include radiographs of the elbow, which most commonly shows an osseous flake suggesting avulsion of the tendon from the olecranon [1,3]. This particular finding has been present in over 60% of patients with TTR [1,3]. Radiographs should be followed-up with magnetic resonance imaging (MRI), as MRIs are considered the most accurate and efficient method of diagnosis for TTRs [1,3,4]. MRIs also contribute to preoperative planning.

Case Report

The patient is a 42-year-old bodybuilder who presented with bilateral elbow pain after performing an incline dumbbell press three days prior. He was nearly at full extension when he felt a pop in his right elbow followed by a pop in his left elbow and subsequent bilateral posterior elbow pain, edema, and ecchymosis.

On physical examination, the patient had tenderness to bilateral elbows approximately 5 centimeters proximal to the triceps tendon insertion. The patient also had a palpable tendon stump on the right. Strength examination revealed weakness in bilateral triceps with the right side being more severe. Bilateral range of motion was intact.

Radiographs obtained demonstrated avulsed enthesophyte fragments from the olecranon of bilateral elbows (Figure 1 and 2). Follow-up MRI showed a full-thickness tear of the distal triceps tendon with 2.5 cm retraction and surrounding post-traumatic hemorrhagic fluid on the right and a full-thickness tear of the distal triceps tendon with 3 cm retraction on the left (Figure 3 and 4).

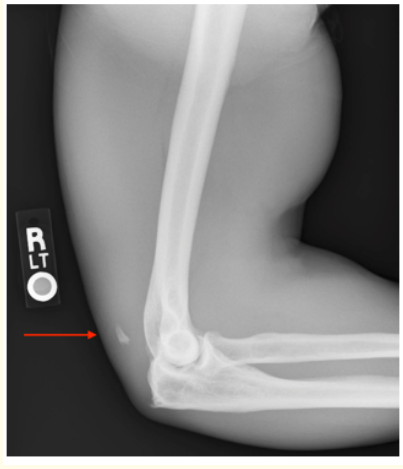

Figure 1: *X-ray of right elbow demonstrating a "flake sign".*

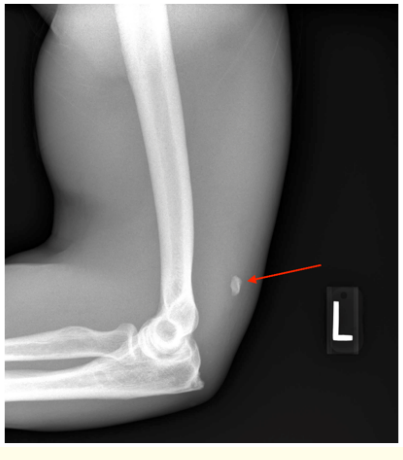

Figure 2: *X-ray of left elbow demonstrating a "flake sign".*

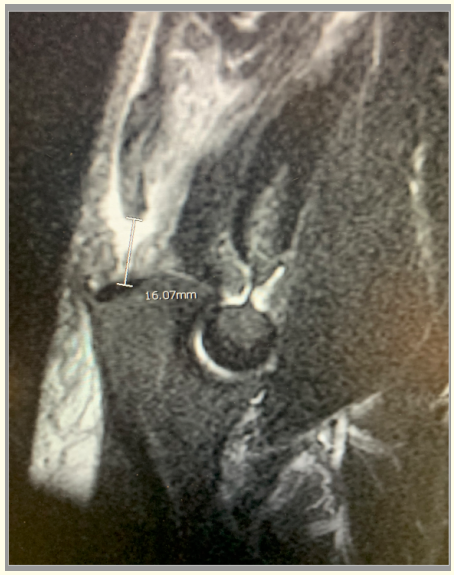

Figure 3

Figure 4

The patient presented within the most common age range and mechanism of injury for presentation of TTR. He also admitted to current tobacco use as a possible, though not previously documented, risk factor. He otherwise denied any other associated risk factors. He

was previously healthy with no notable past medical history. He denied any anabolic steroid use or recent antibiotic use. Given his occupation as a professional bodybuilder, the patient ultimately elected to proceed with open repair of bilateral triceps tendon 9 days after injury.

Intraoperatively, the patient was initially positioned supine then switched to a prone position after general anesthesia. An upper arm tourniquet was inflated on the right upper extremity, and an incision was made over the posterior elbow curving laterally around the olecranon. The long head of the triceps was identified and found to be completely avulsed off the olecranon with the enthesophyte attached to the distal stump. The enthesophyte was removed, and the edges of the distal stump were debrided to a bony bleeding bed on the posterior olecranon. A LabralTape was placed with a Krackow maneuver on the tendon for additional traction and fixation. Two 4.75 mm Arthrex anchors were placed to establish the medial row with one on the medial and one on the lateral aspect. The tendon was released and easily mobilized to 90 degrees of flexion back down to the footprint. FiberTape and FiberWire sutures were then passed. The medial row was tied with the arm in extension. The FiberTape sutures including the LabralTape were crisscrossed and placed in two distal row anchors. There was good reapproximation of the footprint of the tendon and compression of the tendon site. The right upper extremity was ranged to approximately 80 to 90 degrees until the patient had tension at the long head of the triceps tendon. The site was irrigated copiously with normal saline, and the wound was closed. Attention was then turned to the left upper extremity. The left side appeared to be worse than the right with significant fraying of the distal tendon stump and a tear of the long head separating the long head from the lateral head of the tendon. However, the procedure was repeated without complications and with great repair.

Postoperatively, the patient was kept non-weight bearing with a right hinged arm brace and left splint until his first postoperative visit 2 weeks later. He was allowed gentle range of motion of his right upper extremity only as needed for activities of daily living from 0 degrees in extension to 80 degrees of flexion, as this was his dominant extremity. Two weeks postoperatively, the left splint was removed, and the left upper extremity was placed into a hinged elbow brace. His passive range of flexion was 0 to 90 degrees in the right elbow and 0 to 75 degrees in the left elbow. Six weeks postoperatively, his range of flexion improved to 125 degrees in the right elbow and 120 degrees in the left elbow. He had a full range of motion for supination and pronation. Four months postoperatively, his range of flexion improved to 130 degrees in the right elbow and 130 degrees in the left elbow. He also demonstrated bilateral strengths of 5/5 and was able to resist triceps activation without pain.

Discussion

TTRs may be the rarest of all tendon ruptures, and simultaneous complete bilateral TTRs are even rarer [6]. Of the few cases noted in the literature, the TTRs were more commonly associated with metabolic abnormalities including pseudohypoparathyroidism and kidney failure [7-9]. However, our patient had no known underlying medical risk factors. One case report published in 2015 discussed a non-traumatic unilateral TTR in a patient similar to ours and proposed chronic tendinopathy secondary to repetitive microtrauma commonly experienced by bodybuilders and weightlifters as a possible etiology in otherwise healthy patients without the typical metabolic or immunological risk factors [10]. This case is similar to the one we present, however, our case is unique in that the rupture was both bilateral and simultaneous.

Additionally, we found one other case report that documented a bilateral and simultaneous rupture of the triceps tendons in a patient without predisposing factors. However, the patient was not a bodybuilder and sustained the injury through a fall [11]. The patient recovered without complications, but the details of the surgical procedure were not mentioned [11]. In both of the above cases, the patient denied taking steroids, and our patient also denied taking steroids. It should be noted that no objective evidence was gathered in this regard.

The two most commonly reported methods of triceps tendon repair following a complete rupture include transosseous and suture anchor repairs. Transosseous repairs utilize cruciate and transverse bone tunnels whereas suture anchor repair involves either a single row or double-row of anchors for fixation. Biomechanical studies suggest that the double-row technique most accurately restores the triceps tendon footprint and may provide a more durable repair [12]. Existing literature currently demonstrates no consensus regard-

ing optimal repair strategy, and several studies have found favorable outcomes regardless of technique [13]. A systematic review of TTR repair outcomes reported that 89% of patients returned to their level of activity prior to injury with a low re-rupture rate of 6% following surgery [3]. Postoperative outcomes can be measured in various ways, one of which includes the Mayo Elbow Performance Score (MEPS). MEPS is commonly used to evaluate elbow-specific outcomes and assesses pain, range of motion, stability, and function on a scale of 5 to 100 [14]. A study comparing functional outcomes of 101 patients undergoing either transosseous or suture anchor repair measured an average MEPS of 94 with no difference in outcomes between the two groups [13].

Conclusion

Our case demonstrates that simultaneous repair in bilateral TTRs using the double-row suture anchor technique is both feasible and associated with successful postoperative outcomes.

Acknowledgments

We received no support or funding for this case report.

Disclosure of Interest

The authors declare that they have no competing interests.

Statement of Consent

We obtained written informed consent from the patient to publish the details of this case in a privacy-protected manner.

Bibliography

1. Gaviria M., *et al*. "Triceps Tendon Ruptures: Risk Factors, Treatment, and Rehabilitation". *JBJS Reviews* 8.4 (2020): e0172.
2. Koplas MC., *et al*. "Prevalence of triceps tendon tears on MRI of the elbow and clinical correlation". *Skeletal Radiology* 40.5 (2011): 587-594.
3. Dunn JC., *et al*. "Triceps Tendon Ruptures: A Systematic Review". *Hand* 12.5 (2017): 431-438.
4. Chan AP., *et al*. "Unusual traumatic triceps tendon avulsion rupture: a word of caution". *Hong Kong Medical Journal* 15.4 (2009): 294-296.
5. Yeh PC., *et al*. "Distal triceps rupture". *Journal of the American Academy of Orthopaedic Surgeons* 18.1 (2010): 31-40.
6. Harris PC., *et al*. "Bilateral partial rupture of triceps tendon: case report and quantitative assessment of recovery". *American Journal of Sports Medicine* 32.3 (2004): 787-792.
7. Najefi AA and Domos P. "A unique case of bilateral triceps avulsion fracture in a patient with pseudohypoparathyroidism". *Journal of Shoulder and Elbow Surgery* 13.3 (2021): 334-338.
8. Zaidenberg EE., *et al*. "Simultaneous Bilateral Rupture of the Triceps Tendon in a Renal Transplant Patient". *Journal of Orthopaedic Case Reports* (2015): 903690.
9. Taşoğlu Ö., *et al*. "Bilateral quadriceps and triceps tendon rupture in a hemodialysis patient". *Hemodialysis International* 20.1 (2016): E19-E21.

10. Mangano T., *et al*. "Chronic Tendonopathy as a Unique Cause of Non Traumatic Triceps Tendon Rupture in a (Risk Factors Free) Bodybuilder: A Case Report". *Journal of Orthopaedic Case Reports* 5.1 (2015): 58-61.

11. Desai B., *et al*. "Bilateral and Simultaneous Rupture of the Triceps Tendon in a Patient without Predisposing Factors". *Case Reports in Emergency Medicine* (2012): 920685.

12. Yeh PC., *et al*. "The distal triceps tendon footprint and a biomechanical analysis of 3 repair techniques". *American Journal of Sports Medicine* 38.5 (2010): 1025-1033.

13. Horneff JG., *et al*. "Functional outcomes of distal triceps tendon repair comparing transosseous bone tunnels with suture anchor constructs". *Journal of Shoulder and Elbow Surgery* 26.12 (2017): 2213-2219.

14. Stanley D., *et al*. "Outcome Measures in Surgery of the Elbow". In: Operative elbow surgery. Edinburgh: Churchill Livingstone Elsevier (2012): 705-716.

Volume 6 Issue 3 March 2023