

Familial Triceps Tendon Ruptures

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Triceps tendon injuries are one of the least common of all tendon injuries. While certain activities, medications, and systemic conditions have been associated with avulsion of the triceps tendon, there have been no reported familial associations. This article presents a case of a father and son who both sustained this rare injury during their teenage years. The diagnosis and treatment of this injury is discussed, along with a review of the salient literature

CASE REPORT

A previously healthy 19-year-old collegiate football player sustained an injury to his dominant arm during practice. He was in a push-up position with the arm and elbow flexed when another player fell on top of him. He felt his arm “give out” under him creating an eccentric load on the triceps tendon. He described feeling a “pop” followed by immediate pain, and he was unable to continue playing.

He presented the following day with elbow and distal arm pain and ecchymosis. On examination, swelling and a palpable defect were noted in the olecranon fossa and he was unable to extend the elbow against gravity.

The patient had no known conditions that might predispose a young male to triceps tendon avulsion. He had no prior



Figure 1: Radiograph showing “flake” sign (indicated by arrows).

medical history and was not taking any medications. He had no renal or endocrine abnormalities. He reported that he did not take anabolic steroids or had never received any corticosteroid injections into the area.

Family history revealed that the patient’s father sustained bilateral injuries to triceps tendons approximately 30 years earlier. The first occurred at age 15 years while wrestling. The second occurred on the contralateral side while he attempted to lift a heavy box overhead. Each required surgical repair. Because of the apparent familial association, the patient and his father underwent

endocrine and rheumatologic consults as well as testing for osteogenesis imperfecta, all of which were negative.

A lateral radiograph revealed a “flake”

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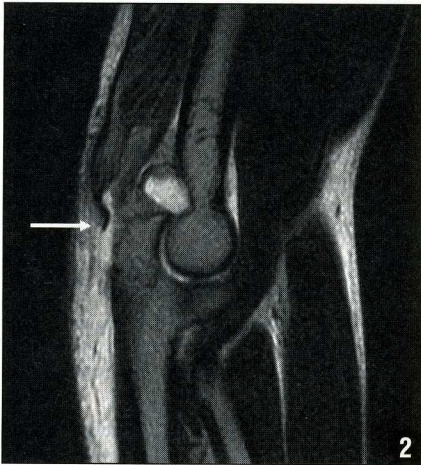


Figure 2: T2-sagittal MRI showing complete avulsion of the triceps tendon at its insertion into the olecranon. The retracted tendon is marked with an arrow (Courtesy of Dr Derek Armfield).

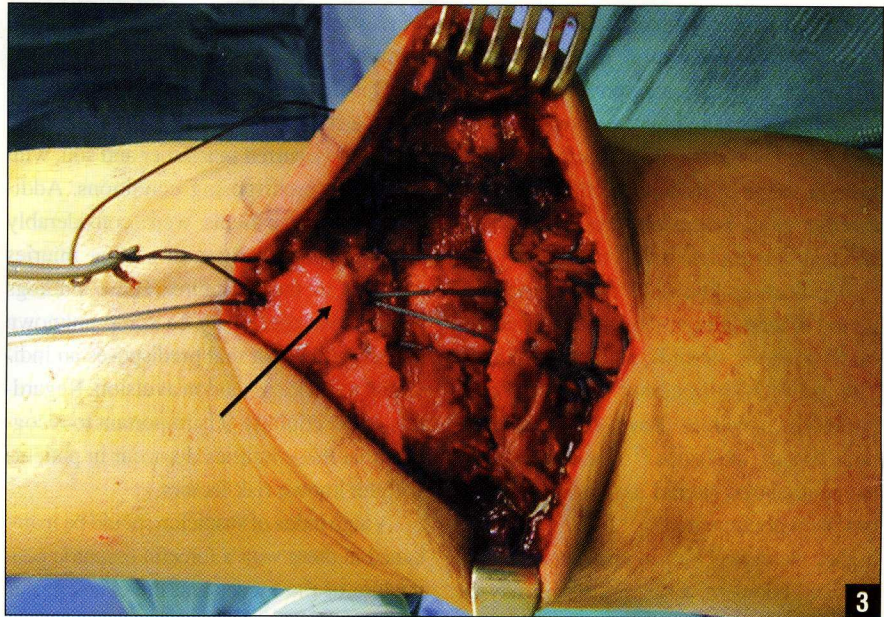


Figure 3: Intraoperative photograph demonstrating repair with locking stitches in the tendon (right) passed through drill holes in the olecranon (left, marked with an arrow).

sign off the olecranon process, indicating a triceps avulsion (Figure 1). No other injuries were seen. Magnetic resonance imaging (MRI) confirmed a complete rupture at the tendon-osseous junction (Figure 2). The decision was made to undergo immediate surgical repair to improve strength and facilitate early motion.

Intraoperatively, the tendon had retracted 2 cm proximal to its insertion and had an approximately 2-mm wafer of bone attached to the end of the tendon. The site of the avulsion on the olecranon was visible and used to ensure an anatomic repair under normal tension. The tendon was repaired with a No. 5 nonabsorbable locking suture passed through 3 bone tunnels in the olecranon, as described previously by van Riet et al¹ (Figure 3). The patient was splinted in 30° of flexion for 10 days, and then started on a motion rehabilitation protocol with active flexion and passive extension. Full active motion was started at 8 weeks and strengthening started at 12 weeks postoperatively. At 6 months, he had regained normal symmetric strength and motion, and has returned to athletics.

DISCUSSION

Triceps tendon injuries are among the rarest of all tendon injuries.²⁻⁴ Several case reports and small series are reported in

the literature. The injury most commonly occurs in men between the third and fifth decades, with an average age at rupture reported to be between 29 and 50 years.^{1,5-7}

The most commonly reported mechanism is an excessive eccentric load most often sustained in a fall onto an outstretched arm.^{3,8} This injury occasionally results in an associated fracture of the radial head.⁹ Activities known to be associated with this injury include professional football and competitive weightlifting.^{6,10-12}

A recent series of 21 patients from the National Football League may indicate that this injury is more common than previously recognized.⁶ Most of the injuries occurred in football linemen, who are forcefully driven back while attempting to keep their arms extended. These patients often present with posterior arm or elbow pain.

Because this is not a commonly seen entity, the diagnosis is often delayed. Delays of several months have been reported.¹ Tears most commonly occur at the tendon-osseous junction and often involve a bony avulsion that is variable in size.⁷ In these cases, a lateral radiograph will often reveal a “flake sign” where the tendon

has avulsed a small fleck of bone from the olecranon³ (Figure 1).

Inability to extend the elbow against gravity is suggestive of a complete rupture and is an indication for surgery, similar to extensor mechanism testing in the knee. A modified Thompson test has been described, wherein a positive test results from squeezing the triceps muscle belly and observing no resultant extension of the forearm.¹³ Partial tears are more difficult to diagnose clinically, and additional imaging modalities such as MRI or ultrasound have been useful¹⁴⁻¹⁶ (Figure 2).

Partial tears often may be treated nonoperatively, however, complete tears are best treated surgically.^{3,6,7,12} While many techniques have been described, acute ruptures are usually repaired primarily using a locking stitch passed through drill holes in the olecranon^{1,4,5,7,8} (Figure 3).

Chronic tears may require reconstruction or augmentation and have not fared as well, prompting some authors to recommend repair within 3 weeks of injury whenever possible.¹ A brief period of immobilization followed by gradual mobilization to prevent elbow stiffness has been advo-

