

## Triceps Tendon Avulsion in an Army Recruit: A Case Report

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### Abstract

Army recruits are prone to injuries of the musculoskeletal system primarily due to the sudden increase in physical activities. While stress fractures of the metatarsals, tibia and other lower limb bones as well as injury of tendons is common, triceps tendon avulsion in an army recruit has not been reported in literature. As such, triceps tendon avulsion is an uncommon injury. We are reporting a case of a 24-year-old army recruit who had an avulsion of triceps tendon during training and which was missed initially. We managed him surgically by using non-absorbable Ethibond sutures. The patient recovered his full range of elbow motion and at the end of one year had no functional limitations. A physician needs to have high degree of suspicion to avoid delayed diagnosis and prolonged disability. Surgical repair of complete ruptures using transosseous sutures leads to excellent functional results and would probably be the best method of managing these injuries.

**Keywords:** Triceps tendon avulsion; Transosseous suture

### Introduction

Triceps tendon rupture/avulsion is a rare injury [1], it constitutes less than 1% of all tendon injuries in the upper extremity [2]. While the most common form of injury is an avulsion of the tendon from its insertion on the olecranon; the uncommon form of injuries are intramuscular or myotendinous junction ruptures [3].

A sudden eccentric load to contracted muscle, usually occurring after a fall on the outstretched hand, has been described as the most common mechanism leading to an avulsion of a small fragment from bony insertion or rupture of the muscle belly. However, ruptures may occur after direct trauma to the posterior aspect of the arm. Such closed avulsion injuries are often missed initially and requires high degree of clinical suspicion. Neglected cases and underestimated degree of injury can result in prolonged disability and poor functional outcome [4].

We report a rare case of closed triceps tendon avulsion injury in an army recruit due to fall on outstretched hand during running in training period, treated surgically after one month of injury by transosseous suture technique with a good functional result.

### Case Report

A 24-year-old right-hand-dominant army recruit came to our hospital with complaints of mild to moderate pain and an inability to fully extend his right elbow following a history of fall on outstretched hand while running 1 month back during his training period. There were no signs of inflammation because of delayed presentation. This was a closed injury as elicited from history so, was managed at camp hospital with analgesics, compression bandage and rest in line of soft tissue injury. Although his pain got improved but he noticed that he was unable to fully extend his elbow and his muscle power grade was < 3 (Figure 1) and he was disqualified from final recruitment and offered a second chance if he was declared physically and functionally fit by a medical board headed by an orthopedist. He was to our hospital for medical fitness and the board by headed by our department. On physical examination there was tenderness and a palpable depression just proximal to the olecranon. We obtained plain radiographs in antero-posterior (AP) and lateral planes. While the AP radiograph was unremarkable, the lateral radiographs showed a flake of avulsed osseous fragment from the olecranon (Figure 2). Based on above findings a diagnosis of triceps tendon avulsion was made and a primary surgical repair was planned.



**Figure 1:** Clinical photograph showing lack of full extension against gravity.

Regional interscalene brachial anesthesia was utilized and the patient was positioned in a lateral position. The surgery was done under tourniquet and a posterior approach was selected. A curvilinear incision was made over the posterior elbow, the rupture site was debrided and the haematoma was removed. Triceps tendon was found to be retracted 2 cm proximal to the tip of olecranon (Figure 3). The avulsed fragment had no comminution and was cleared of fibrous tissue. The tip of olecranon was cleaned and edges of the tendon were cleared and were released from the surrounding tissues. The triceps tendon was reattached using the Krakow method, constituting a 4-strand of No. 5 Ethibond suture [5]. The triceps tendon stump was positioned at the original insertion into the olecranon to restore the excursion length of the tendon by passing the sutures through bone tunnels made into the olecranon. The repair was put under tension and

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**Figure 2:** Lateral radiograph of elbow showing avulsed osseous fragment.

suture knots secured with elbow in full extension. Range of movement was tested intraoperatively. 0-90 degrees of flexion could be easily performed with no tension on sutures. The wound was closed in layers and the arm put on long arm cast in 50 degrees flexion. After 3 weeks, the cast was removed, and active flexion and passive extension of the elbow from 0° to 90° was started. After 2 weeks of physical therapy, ROM was advanced gradually. After 1 year of follow-up, patient had full elbow ROM, with flexion of 120°, without any extension lag and grade 5 power and was working in army without any problems.

An informed consent was obtained from the patients to publish this clinical case report.

## Discussion

Triceps tendon avulsion or rupture is a rare injury, with only handful cases in literature [1-8] and is the least common of all tendon injuries [1,4]. The application of a sudden eccentric load to contracted muscle, usually occurring after a fall on the outstretched hand, is the most common mechanism leading to avulsion of a small fragment from bony insertion or rupture of the muscle belly. However, ruptures have been reported after direct trauma to the posterior aspect of the arm [4-6] but in cases with spontaneous tendon rupture or rupture due to minimal or moderate force, predisposing factors, such as hyperparathyroidism secondary to chronic renal failure, hypocalcemic tetany, rheumatoid arthritis, osteogenesis imperfecta, anabolic steroid use, local steroid injection, and insulin-dependent diabetes should be ruled out [4].

The diagnosis of acute triceps tendon rupture may be missed in acute

setting because of pain and swelling which may prevent the clinician from conducting an accurate physical examination and also mask the palpable defect. So a second examination after a few days, when the swelling has reduced, should be the standard in doubtful cases or in any unclear joint injury. Although triceps tendon rupture is associated with small flakes of avulsed bone which may be visible on radiographs but if the radiographs are of poor quality they may be missed. MRI and ultrasound are useful modalities in unclear and doubtful cases [4,5].

Modality of treatment is based upon the degree of muscle injury (partial or complete) and muscle strength. Literature supports that, if a patient can perform active elbow extension against gravity (power of triceps >3/5), the injury is partial and can be treated non-operatively with splint protection for about 4 Weeks [5].

Surgical repair is usually successful with minimum morbidity. Commonly used surgical techniques of repair of acute and complete rupture include transosseous sutures through horizontal bone tunnels in the olecranon using non-absorbable suture [7], K-wires reinforced by encirclage wire and bone anchor sutures [6], Transosseous suture technique using the Krakow method with 4 suture strands instead of conventional 2 strands [5], and triceps tendon reconstruction with V-Y-plasty in the musculotendinous junction of the triceps are useful in neglected cases [4]. In our case we used the transosseous suture technique using the Krakow method with 4 suture strand instead of conventional 2 strands which provides more contact surface for tendon to bone healing and shortened period of immobilization. It is necessary to use non absorbable sutures which can hold the repair with adequate strength till the healing is complete. Also important is to ensure that the mobilization protocol should be one of gradual early mobilization so that there is no post operative stiffness and the repair is intact too.

## Conclusion

Avulsion of triceps tendon is a rare injury, usually occurs at osseotendinous junction. A high degree of suspicion, careful clinical and radiological is essential to prevent delayed diagnosis and prolonged disability. Surgical repair of complete ruptures using transosseous sutures leads to excellent functional results.

## Conflict of Interest

The authors declare that they have no conflict of interest related to the publication of this manuscript.

## Acknowledgement

None.

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**Figure 3:** Intra-operative picture showing avulsed osseous fragment.