

CASE REPORT

TRICEPS TENDON AVULSION: A RARE INJURY

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ABSTRACT

BACKGROUND: Triceps tendon avulsion is one of the rare tendinous injuries. Such injuries can easily be missed, and should be kept as a differential diagnosis in all patients who present with pain and swelling at the back of the elbow after a traumatic event.

CASE DETAILS: We present a case of triceps tendon avulsion which was missed in the initial workup by a local practitioner. Careful physical examination and evaluation of the X-rays clinched the diagnosis. The patient was treated surgically by transosseous suture technique using the Krakow method. The end result was a good range of movement and a power equal to the uninjured side. A high index of suspicion, physical examination seeking a palpable gap, and search for a 'flake' fracture on lateral radiographs will help make the diagnosis of triceps avulsion. Early recognition of these injuries and prompt intervention are the cornerstones of a successful outcome. A second examination after a few days, when the swelling has reduced, should be the standard in doubtful cases or during any unclear joint injury. We recommend a primary repair through a transosseous suture technique using Krakow method for optimal results.

KEYWORDS: Triceps avulsion, Krakow, Ethibond

DOI: <http://dx.doi.org/10.4314/ejhs.v24i1.14>

INTRODUCTION

Triceps tendon rupture/avulsion is a rare injury (1); it constitutes less than 1% of all tendon injuries in the upper extremity (2). Rupture most commonly occurs from the osseous tendon insertion in the olecranon or rarely through the muscle or its myotendinous junction (3-4). Very few cases have been reported in literature (5); hence, there is no well-established treatment protocol for this condition.

We report a rare case of triceps tendon avulsion due to direct trauma treated surgically by transosseous suture technique with a good functional result.

CASE DETAILS

In April 2012, a 34 year old laborer came to our hospital with complaints of pain and swelling around the right elbow following a history of assault by hard and blunt object on the posterior aspect of the right elbow that had happened seven days back. He had consulted a local practitioner earlier, who treated him on the lines of soft tissue injury of the elbow. Having gained only little benefit from the treatment, he was referred to our tertiary center. A physical examination revealed severe tenderness and swelling on the posterior aspect of his right elbow. The

patient was admitted for workup, and a re-examination revealed that it was not possible to actively extend the elbow (power of triceps was 1/5). There was also a palpable depression just proximal to the olecranon. Lateral X-rays of the affected elbow showed a small piece of avulsed osseous fragment from the olecranon (the 'flake' sign) (Fig 1).



Fig 1: Avulsed osseous fragment from the olecranon (the 'flake' sign)

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The combination of a palpable depression proximal to the olecranon, loss of active elbow extension and the 'flake sign' helped us clinch the diagnosis of triceps tendon avulsion. Since the avulsion was complete, suggested by loss of active elbow extension, a primary surgical repair was undertaken.

A primary surgical repair of the triceps tendon avulsion was performed. The patient was given regional brachial anesthesia and was positioned in lateral decubitus position. The surgery was done under a tourniquet. 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 2cm proximal to the tip of olecranon. The avulsed fragment was severely comminuted and was removed. The edges of the tendon were cleared and were released from the surrounding tissues. The triceps tendon was repaired using the Krakow method, constituting a 4-strand suture. The suture we used was No.2 Ethibond. 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 (Fig 2).

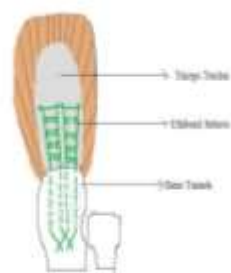


Fig. 2: Triceps tendon repaired using Krakow method



Fig 3: Postoperative X-ray

The repair was put under tension and suture knots secured with elbow in full extension. Range of

movement was tested intraoperatively and was found stable from 0-90° flexion with no tension on sutures. The wound was closed in layers and the arm put on long arm slab of 30° flexion.

Postoperatively, progressive elbow flexion was started in the following order: 0-30° flexion in the first two weeks; 0-60° in the next two weeks with the active flexion reaching 90° at the end of six weeks. The range of movement after 4 months was excellent, and the power in triceps muscle was equal to the uninjured side.

DISCUSSION

Triceps tendon avulsion or rupture is a rare injury, the "least common of all tendon injuries" (6). The diagnosis of acute triceps tendon rupture is difficult and can be easily missed because of the low degree of suspicion of triceps rupture. In addition, pain in acute injury prevents appropriate physical examination such as active elbow extension. The common differential diagnoses of elbow injuries include a sprain, radial head fracture, olecranon bursitis and fractures around the elbow joint (7). Likewise, swelling masks the palpation of the gap. Furthermore, tiny avulsed flecks of bone are easily missed in an overcrowded emergency room where speedy evacuation and disposal of patients is a tendency. 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. In doubtful cases, diagnosis using MRI or ultrasound is also of great use.

Mechanism of injury in such cases is usually; a fall on an outstretched hand when a sudden deceleration stress is put on a contracted triceps muscle or rarely after direct trauma due to assault (8). Such injury can be seen in football players and weight-lifters (9-11) where substantial force is required to rupture a tendon in healthy adult, but some local and systemic factors alter integrity of tendon and can lead to rupture even after a small trauma. Systemic causes such as chronic renal failure, steroid use, diabetes mellitus, hyperparathyroidism, rheumatoid arthritis, osteogenesis imperfecta and local causes like local steroid injection, olecranon bursitis and attritional changes due to degenerative arthritis are associated with tendon weakening.

Another key point concerning the need for operative treatment is whether the injury is complete or partial. If a patient can perform active elbow extension against gravity (power of triceps $\geq 3/5$), the injury is partial and can be treated non-operatively with splint protection for about 4 weeks at 30° flexion (12). MRI is a useful investigation for determining the percentage of tears and hence is of great help in preoperative management. If a tear of more than 50% is shown on MRI together with significant loss of triceps power (power less than 3/5), then operative repair of the torn tendon is recommended (13). Surgical repair is usually successful with minimum morbidity.

Other possible surgical techniques of repair of acute and complete rupture that have been described in the literature include transosseous sutures through horizontal bone tunnels in the olecranon using non-absorbable suture (14), K-wires reinforced by encirclage wire and bone anchor (15) sutures. Patients undergoing repair with the above method usually have good functional recovery after a period of active strengthening exercise. We used the transosseous suture technique using the Krakow method with 4 suture strand instead of conventional 2 strand which provides better strength and more contact surface for tendon to bone healing. The period of immobilization is decreased and the recovery period is fastened.

Early repair of complete triceps tendon rupture is recommended for a good functional outcome, and the prognosis of these lesions is effective.

To conclude, avulsion of the triceps tendon is a rare injury. It can occur after direct or indirect trauma, and usually occurs at the osseotendinous junction. A high index of suspicion, physical examination seeking a palpable gap, and search for a 'flake' fracture on lateral radiographs will help make the diagnosis. 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. Early identification of these injuries and prompt intervention are the cornerstones of a successful outcome. Surgical repair of complete ruptures generally produces good functional results. We recommend a primary repair through a

transosseous suture technique using Krakow method for optimal results.

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