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Case Report

Terrible triad elbow with tricep avulsion: diagnostic challenge and treatment dilemma: case report

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ABSTRACT

Triceps Avulsion with terrible triad of elbow is a rare presentation and often missed at the time of presentation. The aim of this case report is to identify triceps avulsion in patients with terrible triad elbow and help in its management and post-operative mobilization protocol. We report a case of 40-year male, a case of road traffic accident with right elbow terrible triad injury with triceps avulsion. The radial head was fixed with 2.5 mm locking plate and screws and suture anchor was used for triceps avulsion. Elbow mobilization was started at 2 weeks post-operatively. In patients with terrible triad injuries, diagnosis of triceps avulsion is very challenging because of swelling, pain and difficult to examine triceps for extension power. It is important to know this type of presentation of triceps avulsion with terrible triad to address the diagnostic pathway in the right direction and to treat them promptly. Missing triceps avulsion in complex injuries may hamper post-operative elbow range of movements in form of extension lag or triceps weakness.

Keywords: Terrible triad, Triceps avulsion, Elbow, Flake sign

INTRODUCTION

Traumatic elbow injuries can present with different combination patterns. Terrible triad of elbow, which is classically described by Hotchkins as combination of elbow dislocation with radial head fracture and coronoid fracture.[1] But to our knowledge, triceps avulsion is rarely reported in combination with elbow dislocation and radial head fracture. Triceps examination may be challenging in such combinations.[2]

We report a case with elbow dislocation, radial head fracture, coronoid fracture and triceps avulsion.

CASE REPORT

A 40-year-old right hand dominant male fell from bike onto his outstretched hand.

On examination he had gross swelling and deformity around right elbow with painful restriction of movements. Distal neurovascular status was normal.

Radiographs showed radial head fracture with posterior subluxation of the ulno-humeral joint and small bone fragment posteriorly about the elbow joint. (Figure 1, 2).

Three-dimensional computed tomography reconstruction (Figure 3) showed radial head fracture, cortical flecks of bone anteriorly (possible coronoid tip) and posteriorly (triceps tendon avulsion) and laterally (lateral collateral ligament avulsion).

With proper informed consent, surgery was performed on post injury day 1.

In supine position and under regional anesthesia, elbow was approached laterally. Partial avulsion of extensor

origin along with lateral collateral ligament avulsion was noted. Radial head was exposed, out of two radial head fragments, one was lying lateral to radius and other was medial to ulna as seen on CT scan. Both the fragments were reduced and fixed with a plate (Figure 4-6).

Figure 1: Right elbow lateral x-ray.

Figure 2: Right elbow anteroposterior x-ray bone flakes posteriorly and anteriorly.

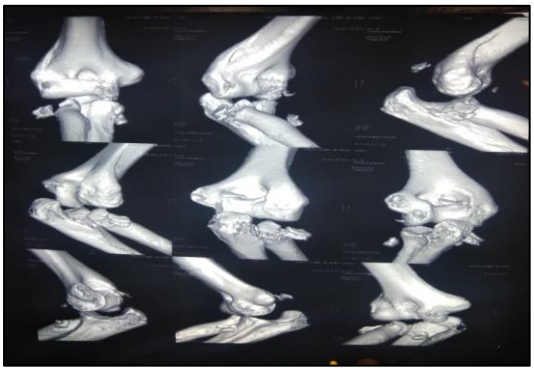

Figure 3: 3d CT of right elbow.

The lateral collateral ligament and extensor origin mass was repaired using a suture anchor. On image intensifier, the elbow joint still looked subluxated.

Palpable gap felt over olecranon in region of triceps insertion. Incision taken over olecranon and triceps avulsion confirmed and repaired with a suture anchor in olecranon. (Figure 7). Elbow was stable in all directions and range of motion. Post-operatively elbow was splinted in 90-degree flexion for 2 weeks.

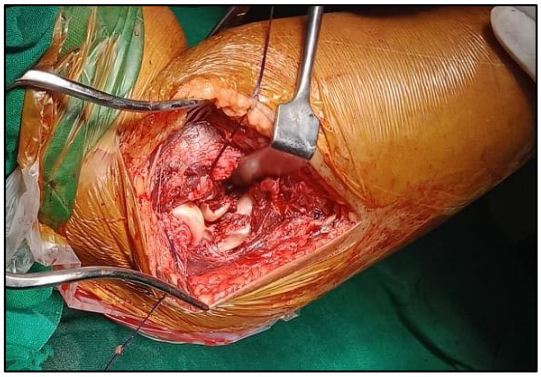

Figure 4: Intra-operative picture showing radial head fragments.

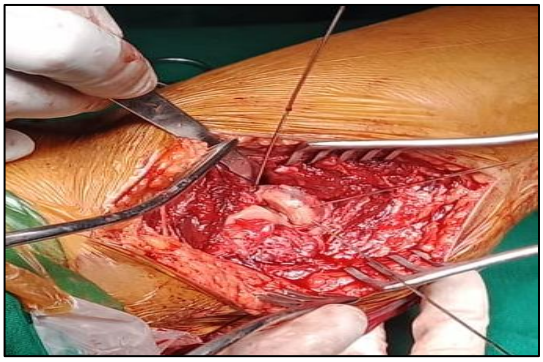

Figure 5: Intra-operative picture showing head fixed temporarily with K wires.

Figure 6: Radial head fixed with plate and screws.

At 2 weeks follow up, suture removal was done and passive range of motion started.

At 6 weeks, elbow ROM was 20 degree to 100 degree and active assisted ROM was started.

At 3 months, ROM was 5 degree to 120 degree and full active ROM was initiated.

Strengthening started from 3 months.

Radiograph at 3-month post-operative: showing good stable alignment with fracture union.

Figure 7: Post-operative x-ray showing radial head fracture fixed with plate and suture anchor in olecranon for triceps avulsion.

Figure 8: Three month post-operative x-rays anteroposterior and lateral view.

DISCUSSION

It's difficult to assess elbow extension strength in acute setting of elbow dislocation. Therefore, radiological finding of osseous avulsion from olecranon 'flake sign' may be helpful if looked for.[3]

If triceps avulsion is not looked for or missed, it may affect elbow stability and also have extension lag and may lead to need for reconstruction and reduced functional results compared with primary repair.[4]

Ring and Jupiter mentioned triceps along with olecranon as a part of posterior column in their ring theory of elbow stabilizers.[5]

Rood and Hevesy reported development of acute compartment syndrome in patient with radial head fracture and triceps avulsion hence requires early surgical intervention.[6]

Early treatment of terrible triad injuries leads to better final range of motion, and inadequate early treatment because of a missed triceps injury can compromise outcomes.[7]

CONCLUSION

Triceps avulsion should not be missed in a case of terrible triad or other elbow fracture dislocations. Early surgery indicated to avoid complication like compartment syndrome. This case also presented with dilemma of postoperative protocol. After surgery to avoid stiffness, elbow should have been mobilized but it could have hampered triceps repair. So, we immobilized elbow in 90-degree flexion for 2 weeks. After 2 weeks, passive ROM mobilization was started with restricted terminal 15 degrees flexion and extension. At 6 weeks, full ROM exercises was initiated. At 3 months, patient was painless with ROM of 5 degree to 120 degree with strengthening initiated. So, we suggest mobilization can be stared at 2 weeks after surgical stabilization of such injury.

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