

Complex Elbow Dislocation with Ipsilateral Humeral Shaft Fracture Management

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Abstract: A 35-year-old man, with no previous medical records, came into our casualty after being fall from height while painting, complaining of pain and swelling in his left elbow and arm. He had marked swelling over his left elbow and arm, Neurovascular status was physiological, and there were no associated wounds. The patient was advised X-ray and CT scan of elbow, shoulder with arm were obtained. Plain radiographs showed humeral shaft fracture with complex elbow dislocation, CT scan showed a very rare fracture pattern of humeral shaft fracture with complex elbow dislocation with coronoid, capitellum, lateral trochlear ridge and radial head fracture. Open reduction and internal fixation with plate and screws of the humerus was initially performed, lateral Trochlear fragment was fixed with minifragment screw, capitellum is fixed with Herbert screw and cancellous screw, for unstable elbow trans Olecranon humeral k wire applied, coronoid fixation done with pull out suture, medial collateral ligament repaired with suture anchor, distal radioulnar joint was fixed with k wire. This is a very rare injury pattern and a guidance for sequence of fixation is hard to find in literature. A combination of bony and soft tissue procedures addressing individual injuries and stabilising operatively must be attempted. Complete stabilisation and early mobilisation will give optimal results in these fractures.

Keywords: complex elbow dislocation, humerus fracture, collateral ligament, coronoid, trochlea, radial head, capitellum, Herbert screw

1. Introduction

The elbow is the second most commonly dislocated joint in adults, Less than 20% are associated with a fracture [1, 2]

The presence of any concomitant fracture to the radius, ulna or humerus around the ipsilateral elbow joint is termed a complex dislocation [1].

2. Case Report

2.1 History

A 35-year-old man, with no previous medical records, came into our casualty after being fall from height while painting complaining of pain and swelling in his left elbow and arm. He had marked swelling over his left elbow and arm, Neurovascular status was physiological, and there were no associated wounds.

2.2 Laboratory findings

CBP, LFT, RFT: Normal, Viral markers- Negative.

2.3 Radiological Investigations

Plain radiographs of the elbow, shoulder with arm were obtained (Fig.1, 2, 3),

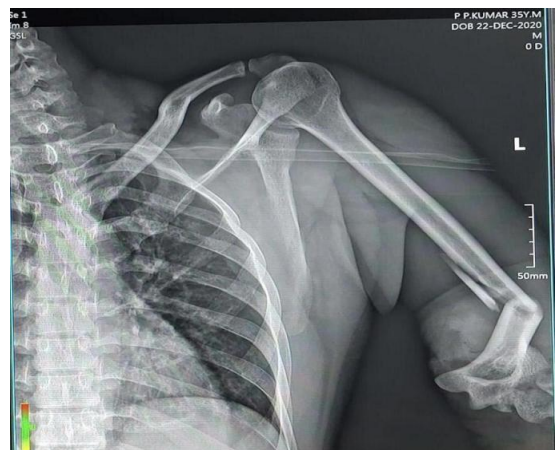


Figure 1: Humerus shaft AO 12B3 fragmentary wedge fracture

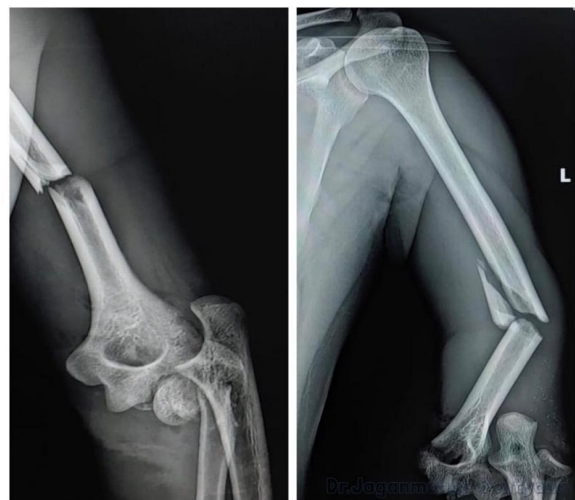


Figure 2 & Figure 3: Complex elbow dislocation with humeral shaft fracture

CT scan of elbow with arm:

CT scan showed a very rare fracture pattern: humeral shaft fracture with complex elbow dislocation with coronoid, capitellum, lateral trochlear ridge and radial head fracture (Fig.4, 5, 6).



Figure 4: Distal humerus AO 13C3 multifragmentary articular fracture



Figure 6: Regan & Morrey type III Fracture of more than 50% of height of coronoid



Figure 5: Radial head fracture AO 2R1C3 or mason type III Multi fragmentary/Displaced Total Articular

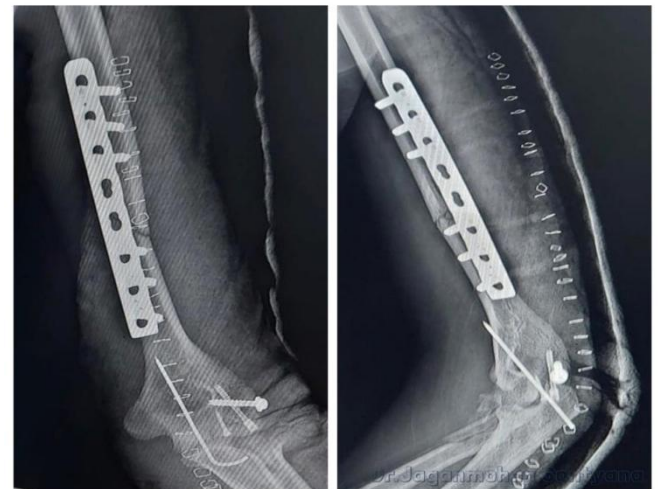


Figure 7 & Figure 8

After the humerus fracture was fixed, lateral Trochlear fragment was fixed with minifragment screw, capitellum is fixed with Herbert screw and cancellous screw (fig 9,10), elbow is then reduced and remained in position. Radial head fragments were retrieved in pieces from both medial and lateral sides and found to be beyond reconstruction. A cement made radial head is made to match the size of radial head and to the diameter of the radial shaft. During the last two blows on radial head radial shaft has fractured and was held intact by annular ligament, hence left alone without any intervention. Coronoid fracture is noticed, Elbow is found to be unstable, trans Olecranon humeral k wire applied to stabilise elbow and medial side procedure is postponed for second sitting.

Second surgery was performed in supine position and coronoid fixation done with pull out suture, medial collateral ligament repaired with suture anchor, ulnar nerve anterior transposition done, distal radioulnar joint was fixed with k wire (fig 11) to avoid proximal migration of radius and trans olecranon-humerus k wire was removed, elbow is found to be stable.



Figure 9



Figure 12 & Figure 13



Figure 10 & Figure 11

Follow Up

Physiotherapy to his elbow right started after suture removal. The Bone consolidation was assessed by physical examination, X-rays and no pain at fracture sites.

Currently, after 2 months our patient is pain free, Patient has gained range of motion of 30 degrees to 150 degrees of flexion (fig 12,13) evaluated by Mayo Elbow Performance score (MEPS) this score is 85 and outcome is rated as good. He is back to his previous daily activities with no associated limitations.

3. Discussion

Elbow joint stability relies on primary stabilizers (ulno-humeral articulation, lateral collateral ligament complex and medial collateral ligament complex) and secondary stabilizers (radiohumeral articulation, capsule and muscles that cross the joint). All these structures work together providing stability to the joint [4,5].

Three main patterns of complex elbow instability have been described: posterolateral fracture dislocation, also known as the terrible triad, varus posteromedial in which anteromedial coronoid fracture, trans-olecranon fracture dislocations.

The present case shows a fracture dislocation pattern unrelated to any previously described elbow dislocation,

- Humerus shaft AO 12B3 fragmentary wedge fracture,
- Distal humerus AO 13C3 multifragmentary garticular,
- Radial head fracture AO 2R1C3 or mason type III Multifragmentary/Displaced Total Articular,
- Regan & Morrey type III Fracture of more than 50% of height of coronoid.

It is also combination of the terrible triad and Different fracture patterns associated with ligament damages.

As it is a very rare fracture dislocation pattern, there is no standardized protocol available in terms of surgical treatment. However, it is well known that main objective is to provide sufficient stability to begin elbow therapy. The main issue with fracture fixation was whether to treat radial head fracture or not. Egol et al. [9] showed that resection and radial head fixation have similar elbow function. Nevertheless, Laun et al.[9] recommended reconstruction or prosthetic replacement. We have attempted filling up radial

head space with cement prosthesis, but as radius shattered, we had to leave that alone.

Elbow instability could be related to coronoid fractures, In cases with large fragments, the literature recommended open reduction and internal fixation [9, 10] If small coronoid process fragment bone fixation would be not possible.

- In our case coronoid fracture fixation done with pull out suture.
- Anterior capsule should be repaired to prevent elbow dislocation.
- After the bone fixation, the medial collateral ligament was repaired using an anchor to the medial epicondyle.
- Therapy started, with passive ROM, the day after suture removal.
- Non-weightlifting continued till 3 months post op till humerus was united post-surgery.

4. Conclusion

This is a very rare injury pattern and a guidance for sequence of fixation is hard to find in literature, A combination of bony and soft tissue procedures addressing individual injuries and stabilising operatively must be attempted. Complete stabilisation and early mobilisation will give optimal results in these fractures.

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