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Case Report

Terrible triad of elbow: a case managed with radial head prosthesis

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ABSTRACT

The terrible triad of elbow consists of radial head fracture, coronoid process of ulna fracture, and posterior or posterolateral humero-ulnar joint dislocation. Favorable outcomes are expected in cases with early surgical intervention. Here we present a 48-year-old male patient with terrible triad of elbow injury following road traffic accident who underwent radial head replacement with temporary ulno-humeral transfixing K-wire. We came to a conclusion that planned and staged anatomical restoration of ligamentous and bony structures of the elbow with combative rehabilitation will give the best possible outcome.

Keywords: Terrible triad of elbow, Radial head replacement, Fracture of radial head

INTRODUCTION

Posterior elbow dislocation is the most common acute traumatic elbow instability and occurs secondary to trauma due to axial loading in the supinated forearm combined with valgus stress. Such trauma causes damage to the lateral collateral ligament complex which extends to the capsule, and to the medial compartment.[1,2]

As described by Hotchkiss, the terrible triad injury of the elbow consists of a combination of 3 lesions- radial head fracture; ulnar coronoid process fracture; and dislocation of humero-ulnar joint (generally posterior or posterolateral). Main principle of management in such injuries is to restore the anatomical relationship between bony structures of the elbow and stability of ligamentous complex to make the affected joint stable and anatomically reduced. Favourable outcomes are expected in cases with early intervention.[3]

CASE REPORT

A 48-year-old man presented to the emergency department of KLE Hospital, Belagavi with an alleged history of road traffic accident, skid and fall from 2 wheelers, complaining of swelling and severe pain around his right elbow joint. Clinically, local temperature was raised around the elbow. Tenderness and crepitus was present along with loss of 3-point bony relationship of the elbow and there was no associated neurovascular injury.

On roentgenography, radial head and coronoid process fracture with posterior humero-ulnar joint dislocation were seen (Figure 1).

Immediate closed reduction was performed and the elbow joint was immobilized in a POP slab (Figure 2). Pre-operative MRI of the right elbow joint suggested a comminuted fracture of head of the radius with displacement of multiple fracture fragments along with coronoid process avulsion attached to the anterior capsule (Figure 3).

Under brachial block, the patient underwent radial head replacement with radial head prosthesis along with K wire transfixing the ulno-humeral joint as it was found to be unstable intra-operatively (Figure 4). Post-operatively, joint was immobilised for a period of three weeks to allow soft tissue to heal. Anatomical reduction was achieved at 3 weeks post-operatively as confirmed by repeat

roentgenographic study and elbow rehabilitation was started with gentle active assisted flexion, extension, pronation, supination movements. Arm sling support was continued for another three weeks leading to a complete ROM by 12 weeks (Figure 5) and subsequent follow-ups were satisfactory.

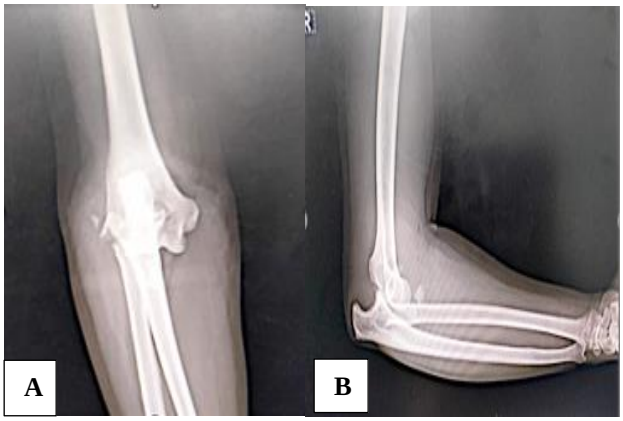

Figure 1 (A and B): Pre-operative radiographs (AP and lateral views) of right elbow showing radial head and coronoid process fracture with humero-ulnar joint dislocation posteriorly.

Figure 2: Post reduction (lateral view) radiograph.

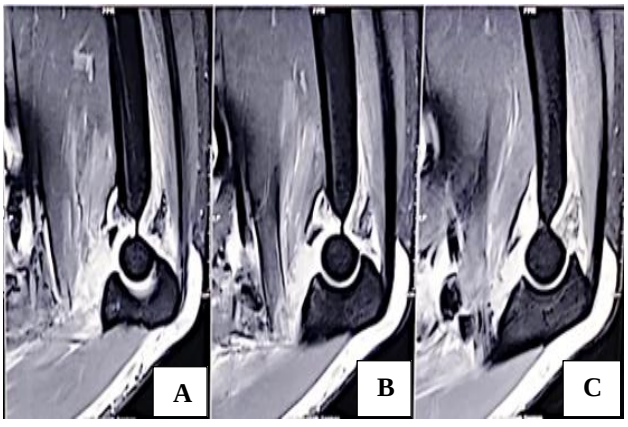

Figure 3 (A-C): Pre-operative MRI (sagittal view) of right elbow joint showing coronoid process avulsion attached to the anterior capsule.

Figure 4: Post-operative radiograph showing radial head prosthesis along with ulno-humeral transfixing K-wire.

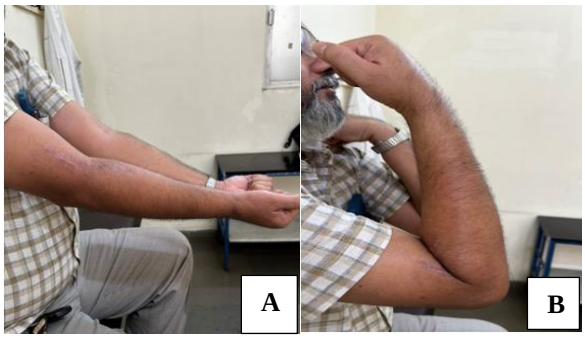

Figure 5 (A and B): Post-operative range of motion at 12 weeks.

Treatment of terrible triad of elbow is demanding and has poor outcomes as it is prone to re-dislocations. One of the commonest mechanism of injury is fall on the outstretched hand.[4-7] Structures around the joint gets injured in a sequential manner from lateral to medial direction post injury. In first phase, rotational instability of the elbow in varus stress is caused due to involvement of the lateral collateral complex. Afterwards, the radial head gets fractured, on persistent forces which leads to collision between radial head and lateral humeral condyle. Post radial head fracture, axial forces continue to act leading to posterior or postero-lateral dislocation of the elbow, and coronoid apophysis follows. Due to rupture of lateral ligament complex, it can affect the coronoid in the beginning as well, whilst the second and third phases occur almost simultaneously. Most of the patients will have associated medial ligamentous complex injury but it is not a requisite for the terrible triad to occur.[8]

A study done by Chemama et al concluded that the two main objectives in surgical management included lateral collateral ligament reconstruction and restoration of bony stabilizing structures (radial head and coronoid process). Surgically, medial approach is recommended in the case of persistent postero-lateral instability following lateral collateral ligament reconstruction or when fixation of a

large coronoid process fragment is indicated. An external fixator is indicated only in case of persistent instability following the reconstruction of bony and ligamentous structures.[9]

Said et al concluded that most patients reported a return to previous work and daily activity, and at least 70% of patients reported good functional ROM in their last follow-up with mean MEPS and Quick DASH scores of 76 and 37.09 points, respectively following radial head replacement in terrible triad injury of elbow. Current surgical protocols made it possible to achieve acceptable outcomes and regain joint function using economically affordable, cost-effective, non-modular prostheses. However, there is still a significant risk of long-term disability and a high rate of complications.[10]

Similar to this study, our patient also underwent radial head replacement along with temporary ulno-humeral transfixing K-wire and showed a good ROM at 3 months follow-up with acceptable recovery.

CONCLUSION

Hence, we came to a conclusion that planned and staged anatomical restoration of ligamentous and bony structures of the elbow with combative rehabilitation will give the best possible outcome.

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