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Posteromedial elbow dislocation with irreducible medial condyle fracture in adult, a case report

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ABSTRACT

Elbow dislocation is a common elbow injury classified into simple or complex depending on the associated bony injuries. Posterolateral dislocation is the most common, while posteromedial elbow dislocation is rare. Elbow fracture-dislocation in adults usually has a typical pattern of associated fractures. However, medial condyle fracture is an uncommon pattern in the context of elbow dislocation in adults. The following report describes a thirty-two-year-old male who developed posteromedial elbow dislocation with an irreducible medial condyle fracture.

Introduction

Elbow dislocation is just after the shoulder in frequency [1]. In the absence of dislocation-associated osseous injury, it is called simple dislocation and most commonly occurs in a posterolateral and posterior direction [2,3]. A complex dislocation occurred when a fracture accompanied the dislocation. Complex elbow dislocation with associated humeral condyle is commoner in the pediatric age group, but this injury is rare in adults [4,5].

This study reports an exceptional complex elbow dislocation in an adult male who developed posteromedial elbow dislocation with an irreducible medial condyle fracture.

Case presentation

A thirty-two-year-old male slipped from ground level and fell on his right elbow while carrying a teapot. The patient can not disclose the exact mechanism of the injury, and he mentioned different scenarios like landing on the lateral right side of his body while he was carrying a teapot; another mentioned scenario is landing directly on his flexed elbow. However, the patient developed immediate pain and gross deformity of the elbow with no wounds nor bruises in his limb. Initial radiographs revealed a posteromedial elbow dislocation with an undefined fracture pattern, Fig. 1.

Closed reduction was performed in the emergency room, and a slab was applied. Postreduction radiographs confirmed a concentric reduction with a displaced rotated medial condyle fragment. The fragment was tethered to the skin medially, and the neurovascular exam, including the ulnar nerve, was intact pre and postreduction. CT scan of the elbow showed no comminution of the fragment with displacement and rotation of the medial condyle, Fig. 2.

Upon planning for fixation of the fracture, there was a debate whether to go directly to the subcutaneous fragment through the

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Fig. 1. (a, b) Initial elbow radiographs obtained at the emergency room, poor quality images but the only available preproduction images. (c–f) Post elbow reduction radiographs in different views demonstrated a reduced elbow with an irreducible medial condyle fragment.

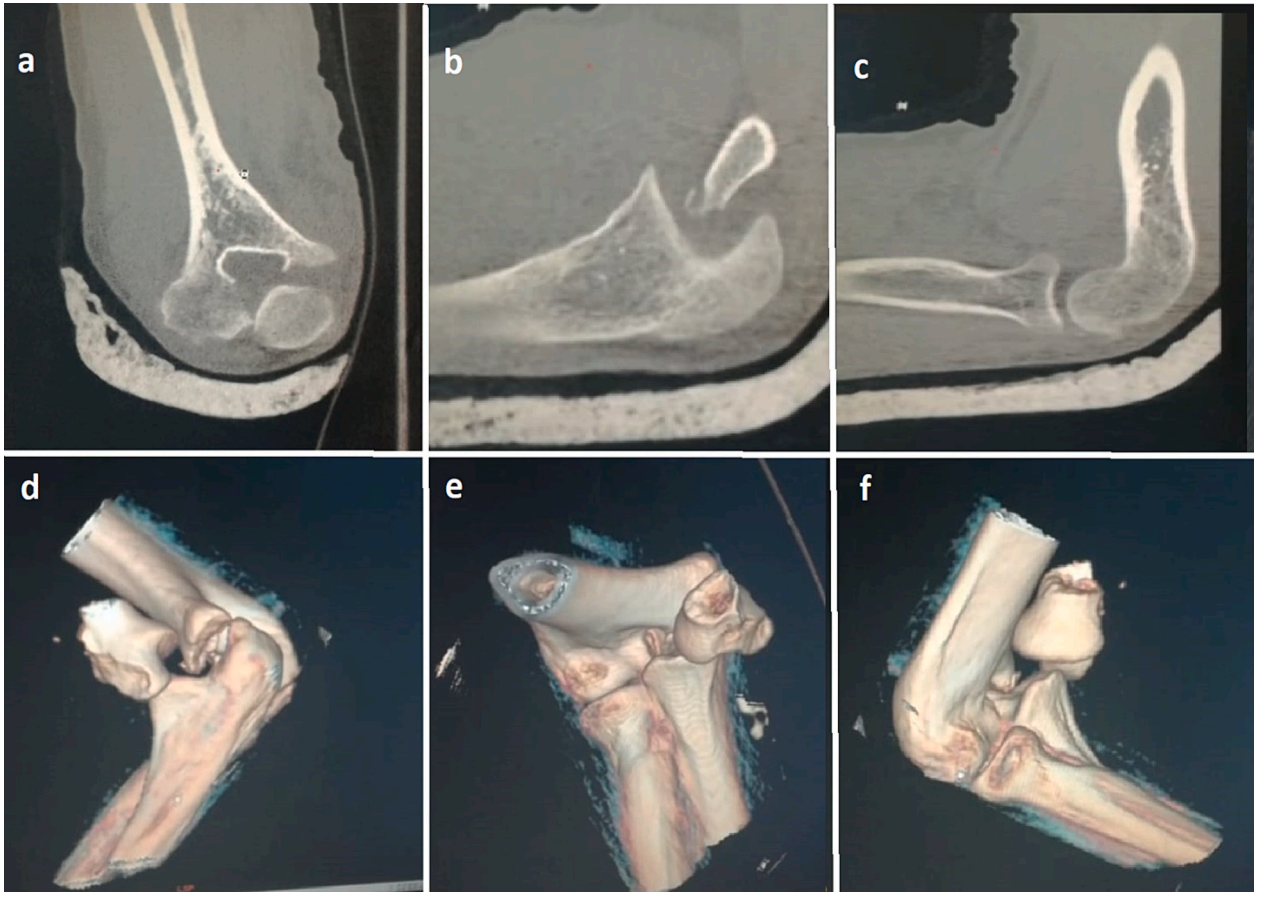

Fig. 2. Post elbow reduction CT scan. (a) Coronal cut. (b, c) Sagittal cut demonstrated reduced radiocapetellar joint and empty olecranon fossa. (d–f) Three dimensional CT scan revealed a displaced, rotated medial condyle fragment.

medial elbow approach. However, worries about difficulties with fragment reduction and the possible need for chevron osteotomy make us choose the posterior approach and utilize a medial flap.

Surgery was performed under the brachial plexus block, the patient was placed in supine position, and his arm was supported on the arm board. No tourniquet was used. A standard midline posterior incision was made while the arm was cross-chest, and a medial flap was done to approach the fragment medially. Then the arm was placed on the arm board, and soft tissue dissection was done medially. The ulnar nerve was identified and protected, and the fragment was dissected from the surrounding tissue. The attached flexor-pronator mass and medial collateral ligament to the medial epicondyle explain the significant fragment displacement and rotation. The articular cartilage was facing cephalic, and the ulnar nerve was significantly swollen secondary to compression from the fragment; nevertheless, there were no motor nor sensory deficits of the ulnar nerve preoperatively. Medial elbow soft tissue disruption allowed the valgus opening of the joint for better visualization and facilitated the reduction of the fragment.

The reduction was confirmed clinically and radiologically, and three Kirshner wires were used for preliminary fixation. Definitive

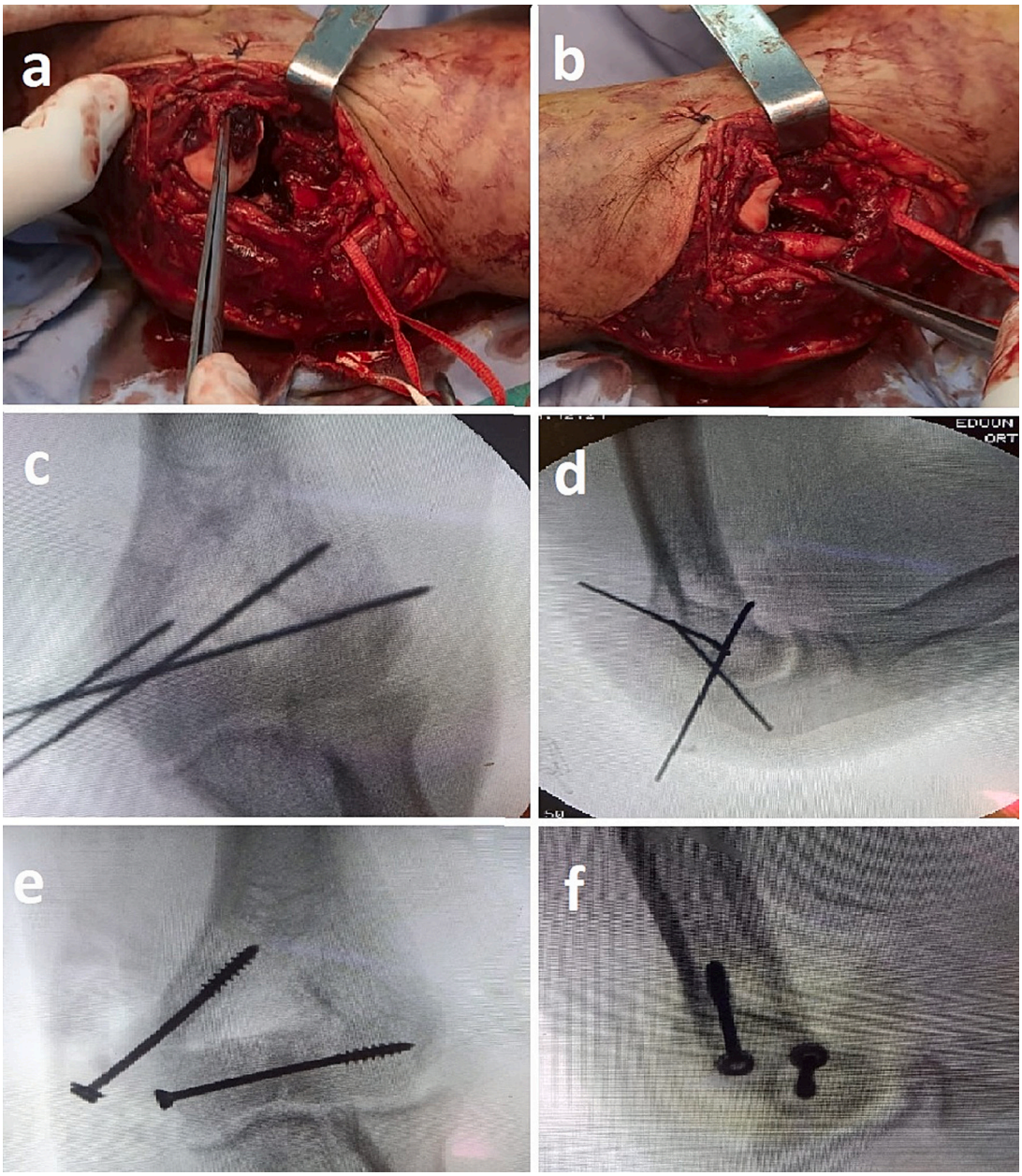

Fig. 3. (a, b) Intraoperative findings demonstrated a displaced medial condyle fragment by pulling the flexor pronator mass and attached ulnar collateral ligament, the ulnar nerve is swollen. (c, d) Preliminary fixation with three Kirshner wires. (e, f) Definitive fixation with two partially threaded 3.5 mm screws.

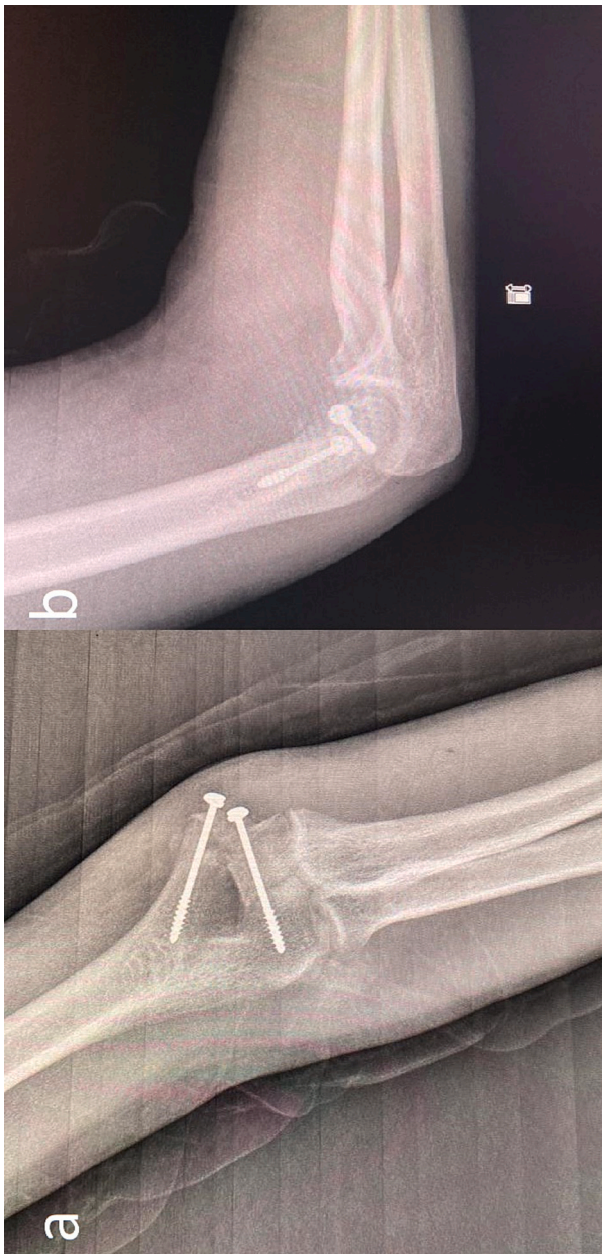

Fig. 4. Postoperative follow-up elbow radiographs demonstrated healed fracture. a) Anteroposterior view b) lateral view.

fixation was maintained by two partially threaded 3.5 mm screws, one transverse, and the others to the medial humeral column avoiding the olecranon fossa, Fig. 3. Elbow joint stability was tested and found stable. No need for ulnar nerve transposition upon intraoperative assessment. The wound was closed, and a dressing and a posterior slab were applied for two weeks. Postoperative ulnar nerve examination was intact.

At two weeks, the slab and stitches were removed, and the patient was initiated on a rehabilitation program. The fracture healed at six weeks, Fig. 4. The patient regained at eight weeks after surgery 125° of flexion and 25° of extension lag (contralateral elbow 140° – 0°) and 80°-85° pronation supination arc (contralateral 90° – 90°), Fig. 5.

Discussion

Elbow fracture dislocation in adults usually has common patterns of associated fractures like radial head, coronoid process, and terrible triad. This study reports an exceptional complex elbow dislocation in an adult male who developed posteromedial elbow dislocation with an irreducible medial condyle fracture. The patient cannot disclose the exact mechanism of injury; however, he

Fig. 5. Elbow range of motion at eight weeks' post-operation. (a) elbow flexion. (b) extension. (c) supination. (d) pronation.

mentioned landing on the lateral side of his body while carrying a teapot; in another scenario, he mentioned landing directly on the flexed elbow. Nevertheless, we believe in the first scenario to explain the mechanism of elbow dislocation. The patient felt on the hand that carries a teapot and the elbow get flexed gradually with posterior direct force and varus stress on the elbow where a teapot acts as a fulcrum to increase varus stress. Along with the posterior direct force, the elbow dislocated posteromedially, and the medial condyle failed. Upon closed reduction of the elbow, flexor-pronator mass pull prevented the reduction of the medial condyle fracture, which mandates open reduction.

Manocha et al. reported a case of isolated fracture dislocation of the medial humeral condyle in an adult in which the elbow joint remains in position, while the medial condylar fracture fragment gets dislodged from the olecranon notch. A possible mechanism of injury is explained by that a force being applied to the extended elbow lead to an abduction avulsion fracture by Ulnar Collateral Ligament or attached flexors with downward displacement of the medial condyle [6].

Medial humeral epicondyle fractures are common in children, account for 12 % of pediatric elbow injuries, and are avulsion-type fractures caused by the pull of forearm flexor muscles after falling on an outstretched hand in the extended elbow with valgus [7]. If a medial epicondyle fracture happened with the elbow dislocation, the avulsion happened secondary to pull of the ulnar collateral ligament. However, the dislocation is mostly posterolateral direction [8,9].

Cho et al. retrospectively reviewed 20 cases of simple posteromedial elbow dislocations without relevant osseous lesions, and they conclude, according to MRI findings, that this pattern of injury is associated with a more severe soft-tissue injury, especially to the lateral complex, resulting in a high rate of surgical treatment [10].

Conclusion

Complex elbow dislocation is an unpleasant injury and is associated with significant morbidity. Proper bone fixation and awareness of soft tissue injury with proper physiotherapy improve the outcomes.

Consent

Written consent was obtained from the patient to publish this case report and any accompanying images.

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Ethical approval

The study protocol was reviewed and approved by the local ethical committee of the Jordanian Royal Medical Services.

Credit authorship contribution statement

The authors have accepted responsibility for the entire content of this submitted manuscript and approved submissions.

Declaration of competing interest

The authors state no conflict of interest.

Data availability

The data used to support the study can be available upon request.

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