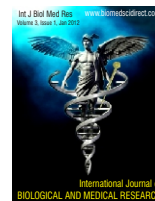


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### Case Report

## Ipsilateral Fracture Dislocation of Elbow with Distal Radius Fracture in A Child

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#### ARTICLE INFO

#### ABSTRACT

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Fracture dislocation of elbow joint is a common injury seen in skeletally matured people, when seen in children it presents in adolescent age group around of 12-14 years. We present a seven year old boy with ipsilateral postero medial elbow dislocation, with lateral humeral condyle fracture and compound type IIIA (Gustilo-Anderson classification) distal radius fracture. This combination of injury has not been described in literature. We managed the case with closed reduction of elbow, percutaneous fixation of lateral condyle, K-wire fixation for distal radius and split skin grafting. The child was followed regularly for one year, at final follow up, elbow was stable and fracture was totally united. High velocity injuries can produce fracture dislocation of elbow in children which requires early reduction and fixation of lateral condyle. Concomitant injury like open distal radius fracture and lateral humeral condyle fracture in this child were addressed properly to produce good functional outcome. Medial elbow dislocation associated with a fracture of the lateral humeral condyle is a distinct fracture-dislocation pattern.

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### 1. Introduction

The elbow joint is the second most common joint to dislocate following trauma after the shoulder joint in adults[1] and is the second most common site of traumatic skeletal injury in children after the distal forearm fractures. The incidence of elbow dislocation is only 3% of all elbow injuries in children. Posterior and postero lateral dislocation along with medial condyle fracture constitutes 70-80% of paediatric elbow dislocations. Because of its rarity, we report a case of posteromedial elbow dislocation with lateral humeral condyle fracture and ipsilateral type 3A open distal radius fracture.

#### Case presentation:

A 7 year old boy presented to our casualty following a road traffic accident with pain, swelling, deformity of right elbow and forearm along with an open wound in the distal one third of forearm. Examination revealed a contaminated type IIIA (Gustilo-Anderson classification) open wound exposing muscles and tendons on the volar surface of distal forearm with no distal neurovascular deficit, and elbow was deformed. On examination there was no generalized ligamentous laxity. Radiographs showed postero-medial dislocation of elbow with Milch type 2 lateral

condyle fracture and displaced distal third radius fracture[Fig 1].Immediately in the casualty under analgesia primary wound irrigation with copious amount of saline and closed reduction of elbow was performed, the upper limb was then immobilized in a posterior slab. After work up, thorough wound debridement, fracture reduction and K-wire stabilization of distal Radius fracture was done under general anaesthesia. As our patient would require repeated dressings for the compound wound over the forearm, as there was a chance of redisplacement of lateral condyle every time the slab is removed, and grossly displaced lateral condyle is known for its non union, we fixed the lateral condyle with a percutaneous K-wire[fig-2].Following this procedure lateral condyle was clinically stable throughout the range of movement. Repeated dressings were done for 2 weeks after which the forearm wound was granulated for which a split skin grafting was performed. Four weeks after the primary surgery patient was allowed intermittent active assisted elbow range of motion exercises. At 6 weeks follow-up K-wires were removed and full active ranges of motion exercises were allowed for both the elbow and wrist. 3 months post operatively union was confirmed radiologically and patient had terminal restricted elbow extension [Fig 3, 4].

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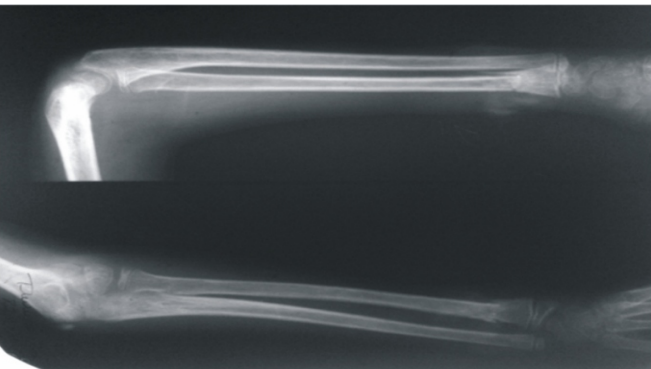
**FIGURE-1 : Clinical Photo and pre-op X-ray**



**FIGURE-2: Immediate Post-reduction X-ray**



**FIGURE-3: 3 months Follow-up X-ray**



**FIGURE-4: 3 months clinical photograph**



**Discussion:**

In children elbow is the most common joint to dislocate [1] unlike adult where shoulder is the commonest to dislocate. Majority of elbow dislocations are closed injuries. Posterior dislocation is the most common type of dislocation and the non-dominant extremity is more frequently injured [2]. In a study of 1,579 injuries around the elbow in skeletally immature patients, only 45 dislocations were seen accounting to an overall incidence of 3%, the peak incidence of supracondylar fractures was in the first decade of life, where as that of elbow dislocation was in the second decade usually between 13 and 14 years of age when the physis begin to close [3]. Similar second-decade peak incidence was reported in other studies and most elbow dislocations occurred due to sports injuries [4] unlike in our case. In a study author reported 58 elbow dislocations in children and adolescents all were posterior with a mean age of 12 years (range from 8 to 15 years), there were 41 boys (71%) and 35 left elbows (60%), associated elbow fractures occurred in 37 children (64%) [5]. The youngest patient with elbow dislocation reported in literature is in a one year old kid [6].

Our patient stands unique as he was a seven year old with an etiology of road traffic accident and the involved extremity was the dominant right upper limb.

Pure dislocations are uncommon and the radiographs must be evaluated carefully for associated avulsions and fractures around the elbow. Avulsion of the medial epicondyle is the most common associated injury, and the other injuries are coronoid process, radial head, olecranon, trochlea and lateral condyle fractures, very rarely disruption of the proximal radio-ulnar joint of divergent type may also be seen [7]. In a study of 33 children elbow dislocations, 22 of the dislocations were postero lateral, 7 postro medial, 1 posterior, 2 antero medial, and 1 antero lateral dislocation [7]. 25 of the 33 elbow dislocations were fracture dislocations, 18 of 25 fracture dislocations were associated with a single fracture or avulsion and in the remaining 7 there were various combinations [7]. Posterolateral dislocation with medial condyle fractures are common type of fracture dislocation in children. Posteromedial dislocation of elbow in a child was classified into four types, type 1- isolated medial elbow dislocation, type 2 constitutes fracture involving the entire distal humeral physis and is therefore a pseudo dislocation because the actual joint structures remain intact, type 3 includes dislocation secondary to traumatic trochlear hypoplasia, and the fourth type consists of posteromedial dislocation of the elbow with lateral condyle fracture [8]. This fourth type is the commonest type in postero medial dislocations along with lateral condyle fracture. The reasons to have Postero medial dislocation in these patients are due to loss of buttress in elbow due to lateral condyle fracture.

Our patient presented with a postero medial dislocation of the elbow and fracture of the lateral humeral condyle due to high violence injury. We do not believe a medial or posteromedial dislocation of elbow is related to the instability established by the fracture of the lateral condyle. In our case probably the deforming force primarily caused the ulna and radius to dislocate medially, and then the lateral humeral condyle fractured due to pull of the lateral collateral ligament and extensor muscles. This type of injury is a different entity from dislocations with instability caused by fractures of the lateral humeral condyle, which contain the lateral aspect of the trochlea (Milch type II) wherein the humero ulnar joint is rendered unstable by loss of the support provided by the lateral trochlea[9]. Our patient also had open type 3A distal radius fracture which is not described in literature as concomitant injury along with elbow dislocation.

An immediate closed reduction and back slab under general anaesthesia is usually successful in most cases, especially in pure elbow dislocation. A few cases may require open reduction to deal with associated fractures and of neuro-vascular injuries. A short period of immobilization i.e., 2 weeks followed by active movements is advisable and will favour a good functional outcome [6]. Most authors strongly recommends the fixation of the lateral condyle fractures in posteromedial dislocations [10]. Associated compound injuries are to be treated by Gustilo-Anderson guide lines [11]. In our case under general anaesthesia it was found that elbow was unstable probably due to high velocity injury indirectly evidenced by ipsilateral open type IIIA (Gustilo-Anderson classification) radius fracture and the associated displaced lateral condyle fracture in elbow. We fixed lateral condyle fracture percutaneously. Patient was followed subsequently and his elbow was found to be clinically stable and Lateral condyle fracture was united.

The terminal restriction of movements observed in our case was probably due to ligamentous and capsular injury of the elbow secondary to high velocity injury, and some amount of adhesions also. Fractures are not "tailor made" more so for elbow fracture dislocations. Our aim is to consider our rare fracture pattern which has not been earlier described. So that its treatment guide lines can be well framed. We have given the basic guide lines that could help in such similar fracture.

#### Conclusions:

Posteromedial dislocation of elbow with lateral humeral condyle fracture in a 7 year old child is a rare entity. Ipsilateral type IIIA (Gustilo-Anderson classification) radius fracture associated with this rare entity has not been documented in literature. We should consider this entity in the evaluation of elbow fracture-dislocations as the management guidelines have not been clearly specified. It was the elbow joint which dislocated first and then the

lateral condyle was fractured. In these injuries lateral condyle fracture demands fixation due to gross displacement. As this injury is of high velocity in nature, closed reduction alone is not sufficient, it is necessary to fix both lateral condyle and distal radius to facilitate early mobilization and for good functional outcome. Associated compound injuries are to be dealt with by the usual guide lines as advised by Gustilo-Anderson.

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