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## Posterolateral elbow dislocation with incarcerated medial epicondyle in a twelve-year old male: A case report and a brief literature review

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### Abstract

Elbow is the most common dislocated joint in pediatric age group. Associated elbow injury is common and medial epicondyle fracture is the most common one; reaching up to 50%. Modality of treatment is to reduce the dislocation but still there is a controversy regarding managing associated medial epicondyle fractures. This paper reports a Posterolateral elbow dislocation that is associated medial epicondyle fracture in an adolescent male.

**Keywords:** Pediatrics, elbow, dislocation, medial epicondyle

### Introduction

Pediatric elbow dislocation is the most common large joint dislocation in pediatric age group but it constitutes only 3-5% of pediatric elbow injuries<sup>[1]</sup>. the most common mechanism of injury is falling down on outstretched hand with valgus and supination stress<sup>[2]</sup>.

Elbow dislocation can be classified according to the displacement of the distal piece into; Posterolateral, posteromedial, anterior and divergent. Posterolateral dislocation is the most common type<sup>[1]</sup>. In addition to that, it can be classified into simple and complex dislocation. Simple dislocation involves capsular or ligamentous disruption and in complex dislocation there is concomitant bone fracture such as medial epicondyle fracture, radial head, Coronoid and Olecranon fracture<sup>[3]</sup>.

It is essential to do a proper neurological exam in such injuries. It is also mandatory to obtain proper radiological views and comparison to the other limb might be helpful as accurate diagnosis may be a challenge due to the difference of appearance and fusion between ossification centers of the elbow<sup>[4]</sup>.

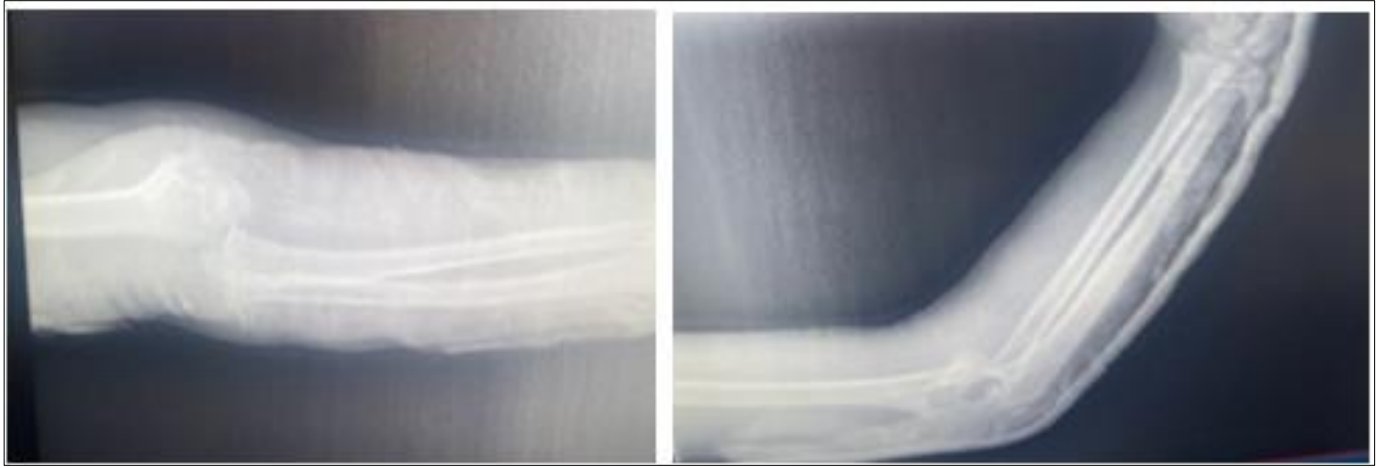
Elbow dislocation is often associated with bone fracture and the most common associated fracture is medial epicondyle avulsion<sup>[5]</sup>. Incarceration of the medial epicondyle happens in 5-18% of cases<sup>[6]</sup>.

In this paper, we discuss a case of a Posterolateral pediatric elbow dislocation with incarcerated medial epicondyle fracture and the treatment modality for such a case with a review of literature regarding treatment options and outcome.

### Case presentation

A twelve-year old healthy male was brought to the emergency room by his family after falling down while he was running outdoor. He had an isolated closed right elbow injury represented by a gross deformity and swelling. Neurological and vascular exam was intact. X-rays did not provide an accurate diagnosis, figure 1. Proper X-rays could not be obtained due to pain, that is why a CT scan was done, figure 2.

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**Fig 1:** Initial X-rays taken in the emergency room.



**Fig 2:** Sagittal and axial views showing the Posterolateral elbow dislocation and the incarcerated medial epicondyle

The patient was admitted and the plan was to reduce the elbow and to fix the medial epicondyle fracture. Under general anesthesia and with C-arm guidance, closed reduction done and the medial epicondyle fracture was released spontaneously from the joint, figure 3. The technique that was used; good muscle relaxation was asked to be ensured by the anesthesia team, then traction while moving the elbow in 30 degrees of flexion and extension accompanied by varus/valgus thrust.

Stability was checked upon reduction. Then, open reduction of the medial epicondyle fracture was done using direct medial approach to the elbow where the Ulnar nerve was identified and protected. No transposition was done. The medial epicondyle piece was reduced under vision and fixed with 2 k-wires, figure 3. Backslab in 90 degrees of flexion was applied and to be kept for 3 weeks.



**Fig 3:** shows intra-operative x-rays showing the medial epicondyle piece after elbow dislocation reduction (image in the left) and the fixation with k-wires.

## Discussion

Medial epicondyle incarceration in elbow dislocation should be suspected and proper imaging and examination including good ulnar nerve assessment can guide the treatment properly [7].

Closed reduction of stable simple pediatric elbow dislocation can yield a good clinical outcome [8].

Current absolute indications for open reduction and internal fixation of medial epicondyle fractures include incarceration of the medial epicondyle fracture in the joint, suspected entrapment and dysfunction of the ulnar nerve, marked instability for soft tissue repair, and open fracture [9].

Whereas many studies recommend operative treatment of isolated medial epicondyle fracture [10, 11], numerous studies report equivalent or even better outcomes with non-operative treatment of isolated medial epicondyle fracture. [12, 13].

The choice of implant is also debatable. There are many modalities of fixation; suture fixation, k-wires, conventional screws and cannulated screws. K-wires fixation is more stable than suturing but it may limit range of motion as splint is needed. Cannulated screws can achieve approximately 100% union rate with early range of motion. But the drawback of such modality is the symptomatic skin prominence of implant [14].

Ulnar nerve neuropraxia is infrequent injury associated with such cases and there is no consensus whether or not to do ulnar decompression and transposition. In such cases, it is hypothesized that ulnar neuropraxia is caused by the compression of the bony structures or due to entrapment which will be resolved after reduction of the dislocation and the incarcerated medial epicondyle fracture [15].

Boden *et al.* suggested a novel technique to reduce elbow dislocation associated with medial epicondyle fracture where also the medial epicondyle fracture treated in conservative manner [16].

This case shows that we can look to this injury as two entities; elbow dislocation and the incarcerated medial epicondyle. In addition to that, it shows that the incarcerated medial epicondyle can be freed after the closed reduction without doing any open surgical intervention yet. By this we can now look to deal with this injury as an isolated medial epicondyle fracture [14, 17].

In our case, the decision was made to fix the medial epicondyle fracture as it showed more than 5 mm displacement after reducing the elbow. Neither soft tissue repair nor ulnar decompression was done as the patient showed intact neurological exam preoperatively and the elbow was stable upon reduction.

## Recommendation

Make a precise diagnosis using proper views and CT if needed.

Although this injury look a little complicated at presentation but approaching the injury step by step could make it easier than expected; at first, reduce the fracture and remove any incarcerated fracture fragment then you can manage it as a medial epicondyle fracture.

## Conclusion

High suspicion of concomitant injuries in pediatric elbow dislocation should be considered. Proper examination and radiological assessment should be done. Surgical and

conservative manners are viable options in treating pediatric elbow dislocations with concomitant injuries.

## Disclosure

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