

# Concomitant Posteromedial Elbow Dislocation with Lateral Condyle Humerus Fracture in a 7 Years Old – A Rare Case Report and Review of the Literature

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## Learning Point of the Article:

Emergent reduction of the elbow dislocation and anatomic reduction of the lateral condyle fracture is important to achieve satisfactory outcomes

## Abstract

**Introduction:** Traumatic dislocations of the elbow are a rare injury in children. Concomitant elbow dislocations and lateral condyle fractures are even rarer. There is a wide variability in the outcomes of these injuries as there is no consensus regarding its management. We report one such rare case in a 7-year-old child.

**Case Report:** A 7-year-old child was brought to the emergency room with an alleged history of fall on outstretched hand sustaining injury to the left elbow. He was diagnosed with a posteromedial elbow dislocation, along with fracture of the lateral condyle. The patient underwent emergency reduction of the elbow under appropriate anesthesia following which there was persistence of varus and valgus instability, for which the lateral condyle was fixed with a standard pinning through a lateral approach with three Kirschner wires. The patient was immobilized for 6 weeks in a plaster, after which mobilization was started. At 3 months follow-up, the patient showed good functional outcome with full range of motion.

**Conclusion:** We report an exceedingly rare case of concomitant elbow dislocation and fracture of the lateral condyle in children. If emergent reduction of the dislocation and anatomic reduction of the fracture is achieved, satisfactory outcomes can be expected. Delayed recovery of the elbow motion is common, but full range of motion can be expected in the long run.

**Keywords:** Elbow, lateral condyle, dislocation, trauma.

## Introduction

Traumatic dislocation of the elbow is a rare injury in children constituting 3–6% of all elbow injuries [1, 2]. Ninety-five percent of elbow dislocations constitute posterior and of these 70% are posterolateral. Although both elbow dislocations [3] and lateral condyle fractures (LCFs) of the humerus [4] are common in the pediatric population, the concomitant presentation of both these injuries is rare.

More commonly, elbow dislocation in this population is associated with fracture of the medial epicondyle [3]. Reports of

a concomitant pediatric LCF of the humerus and an elbow dislocation are scarce, with only some anecdotal cases reported [5, 6, 7, 8, 9, 10, 11, 12]. A direct adducting force exerted on a partially flexed elbow during a fall on an outstretched hand [5] is responsible for the avulsion of the lateral condyle of the humerus and posteromedial dislocation of the elbow [7, 8, 9, 10, 11]. There is wide variability in the reported outcomes of this injury, although some authors have reported good results with the early reduction of the dislocation with either closed or open reduction and internal fixation of the LCF [6, 8, 9]. Others have described suboptimal outcomes associated with malunion, nonunion, and

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## Author's Photo Gallery



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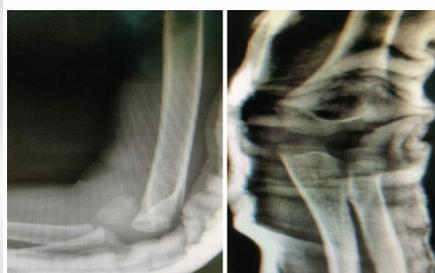
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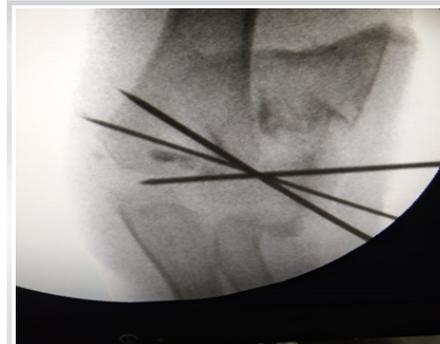




**Figure 1:** AP and lateral views of elbow joint showing posteromedial elbow dislocation with lateral condyle fracture.



**Figure 2:** AP and lateral views of elbow joint confirming concentricity of the reduction.



**Figure 3:** Intraoperative arthrogram view to confirm articular reduction and fixation.

limitations in range of motion [5, 7, 10, 11].

The purpose of this case report is to discuss the treatment and outcomes of these exceedingly rare injury and to review the literature.

### Case Report

A 7-year-old boy was brought to the emergency room with an alleged history of fall on an outstretched hand while cycling sustaining injury to his right elbow. Following injury, the patient developed swelling, deformity, and difficulty in using the extremity. There was no history of other related or remote trauma. The radiographs of the affected region were advised and showed a posteromedial elbow dislocation with a fracture of lateral condyle (Fig. 1).

An emergent reduction of the dislocation was planned with simultaneous fixation after informed consent of the parents and under appropriate anesthesia. Elbow was reduced with gentle traction and flexion with pressure from the medial aspect of the elbow to guide it into reduction. Clinical assessment of reduction was done with the regain of the normal contour of the elbow and smooth motion arc. The adequacy and concentricity of the reduction were confirmed by the image intensifier (Fig. 2). Post-reduction the joint was unstable to varus and valgus stresses. Through a standard lateral approach, the lateral humeral condyle was anatomically reduced and three (1.25 mm) Kirschner's wires were used to fix it. Reduction checked under image intensifier and intra-operative arthrogram (Fig. 3).

Postoperatively, a back slab was applied for 2 weeks. Stitches were removed and the slab was converted to a long-arm cast. At 6 weeks, the cast and wires were removed, radiograph (Fig. 4) was found to be satisfactory, and rehabilitation started with an active-assisted range of motion. Final follow-up at 3 months revealed good functional and radiologic results (Fig. 5, 6). The range of motion was 0–110° (as compared to 0–120° in opposite elbow) and there was no varus/valgus instability.

### Discussion

In the pediatric population, the association of elbow dislocation and a LCF is rare. Available reports on this issue are scarce and mostly limited to single cases, with wide variability in the reported outcomes. As the elbow joint is a hinge requiring mobilization to avoid notorious stiffness, prompt diagnosis and emergent reduction of the dislocation followed by stable fixation of lateral condyle fragment are necessary for achieving the objective.

According to Milch Classification, Milch type 2 injuries which include the fracture line traversing the trochlear groove are more common than Milch type 1 injuries which are thought to be more stable due to the presence of trochlear rim [10].

The present study reports the outcome of a 7-year-old boy who presented to our institution with concomitant elbow dislocation and a LCF Song type V. The initial radiographs demonstrated a posteromedial dislocation. The elbow dislocation was successfully reduced by closed manipulation



**Figure 4:** Anteroposterior and lateral views of elbow joint showing post-reduction and internal fixation with K-wires.



**Figure 5:** Radiographs of the elbow after K-wire removal showing satisfactory union and alignment.



**Figure 6:** Three-months, follow-up shows good functional outcome with full range of motion.

followed by an anatomic reduction of the LCF by open reduction. No complications were seen in the perioperative period, and full range of motion was observed within 6 weeks after removal of the wires with union ensured clinico-radiologically.

Kirkos et al. [7], in a study, observed excellent range of motion in three patients and 15 degrees extension lag in one patient due to a small intra-articular gap due to inappropriate reduction. Cheng et al. [5] reported three cases with elbow dislocation associated with LCF and observed suboptimal range of motion in two cases, the authors observed that poor functional range of motion is inevitable in case of unsatisfactory anatomical reduction by either open or closed reduction and if the joint is incongruent. Tomori et al. [13] emphasized to increase awareness of these injuries for achieving satisfactory outcomes. Silva et al. [14] reported that satisfactory outcomes can be expected if prompt reduction and anatomical reduction is achieved in his case series of 12 cases with a mean follow-up of 51 weeks.

Available literature data have suggested that the combination of

an elbow dislocation and a LCF in the pediatric population is rare and often suboptimal articular reduction can culminate in nonunion/malunion/stiffness, thereby resulting in poor outcomes. Author recommends use of intraoperative arthrogram for anatomical reduction.

### Conclusion

We report an exceedingly rare case of concomitant posteromedial elbow dislocation with LCF in the pediatric age group. Emergent reduction and anatomical reduction is the key to satisfactory outcomes. Delayed recovery of elbow motion is common, but full recovery of the ROM can be expected in the long term.

### Clinical Message

Emergent reduction and anatomical reduction is the key to achieving good outcomes in concomitant elbow dislocation with LCF.

**Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

**Conflict of interest:** Nil **Source of support:** None

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