A rare pediatric trauma: Lateral condyle humerus fracture with concomitant postero-medial elbow dislocation

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ABSTRACT

The association of elbow dislocation with fracture of the lateral condyle in paediatrics is considered very rare and only a few isolated cases have been reported in the literature. Due to its rarity, some of the authors have classified this injury as a complex elbow injury and have deemed them technically demanding. A ten-year-old boy presented to us with a lateral condyle humerus fracture (Milch type 2) with concomitant postero-medial elbow dislocation following a fall on his outstretched hand. At 34 months of follow-up, the child regained a full range of motions around the elbow joint without any deformities. This combination injury, although rare, is not technically different or difficult to treat.

Key words: Lateral condyle humerus, elbow dislocation, paediatrics, open reduction

Introduction

The elbow is a vulnerable region to injury in the pediatric population. Isolated traumatic elbow dislocations are very rare in the pediatric population and are associated with avulsion fractures of the medial epicondyle (most common). Rarely, the coronoid process, radial head, olecranon, trochlea and lateral condyle (very rare) are involved [1]. A lateral condyle humerus is fractured either due to a varus force acting on an extended elbow or secondarily due to the pull of the lateral collateral ligament and the extensor muscles [2]. Lateral condyle fractures are notorious for developing complications, such as non-unions, avascular necrosis, myositis ossificans, recurrent dislocations, cubitus valgus deformities, and tardy ulnar nerve palsy [3]. Many reports in the past have described this combination as complex injury patterns and deemed them technically demanding to repair.

Case Report

A ten-year-old boy came to our emergency room with a swollen right elbow. There was a history of a fall on outstretched hands from about ten feet height at home. On examination, the limb was internally rotated and semiflexed at the elbow. There were no open wounds. The neuro-vascular examination was normal. There were no other bony injuries. Plain x-rays, antero-posterior and lateral views of the elbow revealed a lateral condyle humerus fracture (Milch type 2) with a postero-medial elbow dislocation (Figures 1A,B).

The child was taken in for surgery six hours after the injury. First, a closed reduction of the elbow was performed under anaesthesia and confirmed under an image intensifier. Open reduction for the lateral condyle fracture was performed through a standard lateral approach and fixed with one 4 mm partially threaded...
cancellous screw with a washer and a 1.6 mm K-wire (Synthes, USA) (Figures 2A,B).

The limb was immobilized in a long arm posterior splint with the elbow in a 90 degrees flexion. Post-operative days were uneventful and the child was discharged two days later. The child was admitted three weeks later for suture and splint removal. Active and assisted elbow range of motion was initiated. The initial flexion-extension range was 70-100 degrees, with restricted supination, but gradually recovered to full range within two months. Hardware removal was performed nine months later. At 34 months follow-up, the child had a full range of motion and no deformities (Figures 3A-D).

**Discussion**

The incidence of traumatic isolated elbow dislocations in the pediatric age group is approximately 3-6% and isolated lateral condyle fractures is approximately 12-20% [4]. However, a combination of these two injuries is an extremely rare occurrence, thereby complicating case management. Boys are more frequently affected and the mean age for lateral condyle fractures associated with an elbow dislocation is 6.7 yrs [4].
The majority of traumatic elbow dislocations in the pediatric age group occur in the postero-lateral direction. Associated fractures of the condyles render it unstable. The lateral collateral ligament is considered as a major elbow stabilizer. It has been pointed out that the lateral condyle or epicondyle fracture may actually represent a variant of a lateral collateral ligament injury, as fixation of this small fragment restores the integrity and prevents recurrent dislocations [2].

Several isolated cases of ‘fracture–dislocation’ combinations have been reported in the literature, with lateral condyle fractures being of the Milch type 1 [5,6] or 2 and dislocation being postero-lateral (more common) [2,7,8] or postero-medial [9-13]. A few authors have classified these combinations as complex elbow injuries and have deemed them technically demanding. However, regardless of the direction of the dislocation, the modality of treatment for all of these described cases has been identical.

In our case, the combination injuries were obvious on the initial x-rays. However, as these cases are rarely encountered, they can be easily overlooked unless there is a high index of suspicion. In doubtful cases, it is recommended to obtain oblique, heterolateral, and varus stress films, or even an arthrography (to view the unossified capitellum if < 2 years of age) [7].

Kirkos et al. reported a case series of 4 children with this concomitant injury pattern and followed up these patients for a mean duration of 7 years and 6 months. In all patients, closed reduction for dislocation and open reduction and internal fixation of the fracture were performed. In one child, a lack of an extension of 15 degrees was seen due to inappropriate fracture reduction [10]. Cheng et al. reported a case series of 3
children, all of which were treated similarly. However, two children had developed cubitus varus deformities associated with a poor range of motions because of inadequately reducing the fractures [11].

Three cases require special mention. First, Poliart et al. described a case of postero-medial elbow dislocation with a lateral epicondyle trapped in the joint [12]. They concluded that flushing out the joint to remove possible osteochondral fragments and restoring the bony anatomy was essential to achieve stability. Second, Rovinsky et al. [5] and Murnaghan et al. [6] each described elbow dislocations associated with a Milch type I lateral condyle fracture. In both cases, despite being regarded as a stable injury pattern, the elbow remained unstable after closed reduction and warranted fixation for the fracture to achieve stability.

Conclusion
Dislocation of the elbow, along with a lateral condyle fracture, is an unstable injury pattern but does not necessarily imply poor outcomes. Most authors have reported excellent outcomes with closed reduction of the dislocations followed by open reduction of the lateral condyle fracture appropriately fixed with either K-wires or cancellous screws. Direct visualization of the fracture reduction and joint congruity is preferred to avoid complications. If the lateral condyle remains displaced after the reduction of the elbow joint, it is preferable to perform an open reduction with internal fixation. Post-operatively, a close clinico-radiological follow-up is recommended to diagnose any early loss of reduction. Therefore, from this case report, as well as from a review of the literature, we would like to emphasize that although this combination injury is rare, it is not technically different or difficult to treat. Prompt recognition and appropriate alignment of the articular surfaces and the growth plate are essential for a favorable outcome.

Conflict of interest statement
The authors have no conflicts of interest to declare.

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