

A Unique Case of Isolated Lateral Epicondyle Fracture in an Adolescent Boy

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Abstract

Background: The lateral epicondyle fracture in children is a rare condition and only few cases have been reported in the literature. The isolated fracture without concomitant fracture/dislocation is even more uncommon, with unclear outcome and treatment approach.

Case Report: We present a case of an 11-year-old boy with restricted right elbow range of motion (ROM) after falling. The radiograph and computed tomography (CT) scan showed a displaced lateral epicondyle fracture without accompanying fracture or dislocation. Due to the stability of the joint and patient's compliance, a closed reduction with Kirschner wires (K-wires) was selected for treatment. Follow-up results were satisfactory and showed no complications.

Conclusion: Closed reduction of dislocated lateral epicondyle fracture in children can result in acceptable outcomes.

Keywords: Avulsion Fracture; Humerus; Fracture Fixation

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Background

Fracture of lateral epicondyle is an extremely rare condition in children (1), and a few cases have been reported in this age group (1-3) and even adults (4, 5). The main mechanism that has been described is avulsion forces from the extensor muscles of the wrist and forearm (1, 6). If the fracture lines involve the origin of the extensor carpi radialis longus area, considerable displacement of fracture can occur. Otherwise, there would be no or little displacement (1).

In this report, we present an extremely rare case of isolated right lateral epicondyle fracture with displacement in a boy.

Case Report

An 11-year-old right-handed boy presented to the emergency department with pain and limited range of motion (ROM) in the right elbow joint. The injury occurred due to falling on fully extended and supinated right elbow. The joint area was edematous in physical examination. The elbow had limited ROM due to pain, as well as obvious tenderness without any crepitus. Neither right shoulder nor right wrist ROM showed limitation. Neurovascular examination of the right upper extremity was normal.

The anteroposterior (AP) and lateral X-rays of the right elbow revealed displaced lateral epicondyle fracture with mild to moderate soft tissue swelling and no accompanying fracture/dislocation (Figure 1).

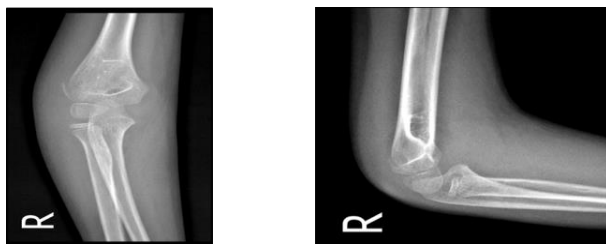


Figure 1. Anteroposterior (AP) and lateral plain radiographs of the right elbow, showing isolated lateral epicondyle fracture

Computed tomography (CT) scan confirmed the diagnosis (Figures 2 and 3).



Figure 2. Right elbow computed tomography (CT) scan with three-dimensional (3D) reconstruction confirming fracture of the lateral epicondyle

The patient was transferred to the operating room. Under general anesthesia, we performed precise physical examinations including posterolateral rotatory instability (PLRI) test (flexion of fully extended and supinated arm with valgus stress and axial compression force till 40°), varus stress test (applying varus stress to 20°-flexed and slightly-supinated arm), and valgus stress test (applying valgus stress to the elbow in 25° flexion).

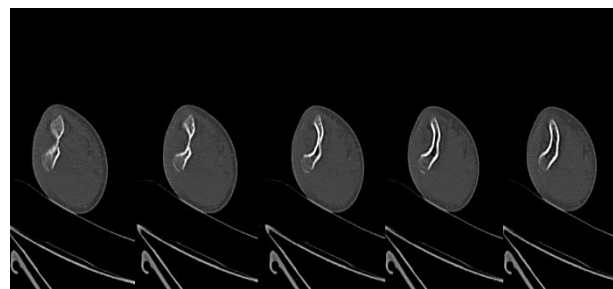


Figure 3. Axial views of computed tomography (CT) scan showing lateral epicondyle fracture of the right elbow

The elbow was stable with acceptable ROM. With fluoroscopic guidance, the elbow underwent close reduction and fixation using two Kirschner wires (K-wires) (core diameter of 2 mm), placed from the lateral side of the elbow to hold the displaced fragment. The elbow was splinted at 90° flexion and 45° pronation (Figure 4).



Figure 4. Closed reduction of the elbow with two Kirschner wires (K-wires)

Three weeks later, the cast was opened and K-wires were removed. An acceptable union was evident in the control X-ray (Figure 5). After six weeks, the patient was painless with full ROM and no abnormality in the physical exam.



Figure 5. The elbow at 3 weeks after injury

Informed consent was obtained from the patient and his parents for the publication of this report.

Discussion

The most common mechanism of lateral epicondyle fracture in adults is direct trauma, while in children, the avulsion forces from forearm extensor muscles are the main mechanism. The literature available on the pediatric lateral epicondyle fracture is scarce, with few cases reported previously (1-3, 7). A similar avulsion mechanism has been reported once in an adult, but the force was applied by the anconeus muscle (6).

Capo et al. reported lateral epicondyle fracture accompanied by posterolateral instability of the elbow. They believed that detachment of lateral ulnar collateral

ligament (LUCL), which originates from lateral epicondyle, was the main mechanism of instability. The fracture was reduced in an open manner with acceptable outcomes (2). In another case report, Rincon et al. used closed reduction and percutaneous fixation with K-wires for management of fracture dislocation of the lateral epicondyle in a 5-year-old girl (3). Zions and Mirzayan used nonoperative management and reported malunion as a consequence (7). Other reported complication related to this condition is entrapment of fractured fragment, either in the elbow joint (8) or between the capitellum and radial head (9).

Since pediatric epicondyle fracture is an extremely rare condition, treatment options are limited and there is no consensus on the best management approach (1). In our case, the patient had pain and restricted ROM, as well as displacement of lateral epicondyle fragment on X-rays. Therefore, we decided to use closed reduction and fixation by K-wire. To the best of our knowledge, this procedure was previously reported only once with acceptable outcomes (3).

Isolated lateral epicondyle fracture without any dislocation or associated ligamentous injury is very rare. We treated this condition with close reduction and internal fixation using K-wires which have led to satisfactory outcomes.

Conflict of Interest

The authors declare no conflict of interest in this study.

Acknowledgments

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