Anterior elbow dislocation without associated fracture in an adolescent

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Elbow dislocations are the most common dislocations to occur in pediatric population reaching annually 3-6%.4 The elbow is a complex joint consisting of 3 articulations; ulnohumeral joint, radiocapitellar joint, and radioulnar joint with arc of movement extending from flexion and extension to pronation and supination. Multiple directions of elbow dislocations have been described in the literature with posterior dislocation being the most common and anterior being the rarest.6,9 Simple anterior elbow dislocation is a rare entity because most of them are associated with fractures around the joint. Isolated anterior elbow dislocations are very uncommon because most anterior elbow dislocations are trans-olecranon with associated fracture of the olecranon process.7

Herein, we present a case of an isolated anterior elbow dislocation with no associated fracture in an 11-year-old boy.

Case presentation

An 11-year-old boy presented to the emergency department after sustaining a fall from a 2-stage-bed with his forearm caught between the metallic bed keel and his body falling on the ground. The patient was in severe pain, and his left upper limb was impotent. Neurovascular examination was normal. Elbow radiographs showed a pure anterior elbow dislocation without any associated fracture (Fig. 1).

The decision was to do reduction in the emergency room using inhalation sedation with a 50% nitrous oxide/oxygen premix after administering adequate analgesia. The reduction maneuver used was a traction of the forearm from a flexed position to disengage the distal humerus, followed by posteriorly directed force toward the olecranon. The reduction of the elbow was tested, and it was found to be stable in varus, valgus, and throughout the range of motion. The elbow was immobilized using a posterior elbow splint. A postreduction radiograph is shown in Fig 2.

At 1-week follow-up visit, the patient was in good condition, and there were no signs of complication. Radiographs are shown in Fig 3.

At 4-week follow-up visit, the stability of the elbow was tested and verified to be normal; the patient was able to achieve full range of motion, and radiographs show no sequela (Fig. 4). We decided to stop immobilization; the posterior splint was removed, and the patient’s active range of motion was allowed.

At 18-month follow-up visit, the patient was free of symptoms without any sequela. Radiographs and physical examination findings are shown in Figs 5 and 6, respectively.

Discussion

The first case of anterior elbow dislocation was described by Evers in 1787. Very few anterior dislocations have been defined in the literature since that initial description.6 The annual rate of elbow dislocation in children is 6.4 per 100,000 cases with anterior dislocation comprising 1.9% of the total number as reported by Hyvonen et al.5

The mechanism of injury for anterior elbow dislocations is usually by an anteriorly directed force to the posterior aspect of the elbow at the olecranon process with the elbow bieng in flexion.1,5
Figure 1 Radiographs of the elbow at the presentation to the emergency department.

Figure 2 Anteroposterior and lateral radiographs of the elbow after performing reduction.

Figure 3 Anteroposterior and lateral radiographs of the elbow at 1-week follow-up visit.
Figure 4 Anteroposterior and lateral radiographs of the elbow at 4-week follow-up visit.

Figure 5 Anteroposterior and lateral radiographs of the elbow at 18-month follow-up visit.

Figure 6 Range of motion of the elbow of the patient at 18-month follow-up visit.
Tees and McKim reported a case in the year 1923 where the mechanism of dislocation was a twisting injury where the arm of the patient was caught by the rollers of the washing machine.\textsuperscript{11} This mechanism was similar in our case.

As it is well known the elbow gains its stability from primary and secondary stabilizers. The primary stabilizers are the ulno-humeral joint, anterior band of the medial collateral ligament, and the lateral collateral ligament complex (primarily the lateral ulnar collateral ligament).\textsuperscript{9} While the secondary stabilizers are comprised of the radiocapitellar joint, common extensors and flexors origins, joint capsule, and the dynamic stabilizers consisting of the muscles crossing the elbow joint.\textsuperscript{3}

Most of the reported cases of anterior elbow dislocations are associated with olecranon fractures, which is a key element for anterior dislocation, making an isolated anterior dislocation a rare entity.\textsuperscript{2,7} Most isolated elbow dislocations are treated with closed reduction, and operative treatment is reserved for cases where closed reduction fails, for associated displaced fractures that have to be reduced and fixed, for late presentation with chronic dislocation, and if the elbow was found to be unstable after closed reduction.\textsuperscript{5,7} Closed reduction should be performed gently to avoid fractures, growth plate injury, and nerve entrapment.\textsuperscript{1} Rasool reported that the outcome of closed reduction was improved over open reduction regarding range of motion restoration.\textsuperscript{7}

**Conclusion**

Uncomplicated anterior elbow dislocation is a rare injury, especially in the pediatric population. Most reports in the literature occur in combination with olecranon fracture or other associated fractures. This report adds to existing literature regarding uncomplicated anterior elbow dislocations in children, allowing for a better understanding of this particular injury pattern.

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