Case Report

Ipsilateral Pediatric Supracondylar Humerus Fracture and Radial Head Dislocation

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Keywords

Pediatrics · Elbow · Trauma · Supracondylar humerus · Radial head dislocation

Abstract

Case: A 5-year-old boy presented with left elbow pain after a fall. Radiographs revealed a radial head dislocation without ulnar involvement which was treated with closed reduction in the emergency department. Two-week follow-up radiographs revealed a periosteal reaction along the medial epicondyle at the supracondylar region, consistent with a type 1 supracondylar humerus fracture. The elbow was treated with closed reduction and casting for 2 weeks. One year after injury, the patient had full painless range of motion. **Conclusion:** This case report highlights an injury pattern not previously described in the literature, and no previous recommendations exist regarding treatment. Although rare, radial head dislocation with simultaneous supracondylar humerus fracture can occur in pediatric patients. Our patient obtained a good result without surgical treatment.

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Case Report/Results

A 5-year-old boy fell off a ladder roughly 5 feet and landed on his left elbow. The patient presented with elbow tenderness to palpation as well as limitation of flexion/extension and pronation/supination. He was seen in the emergency department that evening and was diagnosed with a radial head dislocation after radiographs. The emergency department staff attempted to reduce the dislocation but were unsuccessful, resulting in an urgent orthopedic consultation (Fig. 1).

The patient's radial head dislocation was treated with closed reduction in the emergency department with appropriate alignment of the radial head with the capitellum. No fracture could be seen along the distal humerus with a small anterior and posterior fat sign present. The patient was diagnosed with an isolated radial head dislocation that was reduced and placed into a long arm cast in neutral forearm rotation (Fig. 2).

At the 2-week follow-up, the patient was able to tolerate elbow range of motion from 15° short of full extension to 120° of flexion with full pronation and supination. A periosteal reaction was seen along the medial epicondyle at the supracondylar region, consistent with a healing supracondylar humerus fracture. Alignment of the distal humerus and elbow joint remained anatomic. The patient was placed in an upper extremity sling and allowed gentle range of motion as tolerated within the sling (Fig. 3).

The patient was allowed to continue range of motion as tolerated, and the sling was discontinued at 4 weeks after the injury. Motion continued to improve and X-rays showed a healed supracondylar humerus fracture with maintenance of reduction of the radiocapitellar joint. Final follow-up 1 year after injury reveals full painless active range of motion in flexion/extension and pronation/supination.

Discussion/Conclusion

Supracondylar humerus fractures are the most common elbow fractures in pediatric patients, with an incidence of 60–72 fractures per 100,000 children in the US yearly [1, 2]. When associated with an ipsilateral forearm fracture, this injury has been described as a floating elbow, which occurs 2–13% of the time [3]. The most common concomitant injury with a supracondylar fracture is a fracture of the distal radius, which makes up 5–6% of these injuries [4].

There have been very few previously reported cases of ipsilateral supracondylar humerus fracture and radial head dislocation in the literature; however, these reports all describe this injury in the setting of a Monteggia fracture, which involves a fracture of the proximal ulna along with the radial head dislocation [5–8]. No previous reports have described an ipsilateral supracondylar humerus fracture with an isolated radial head dislocation without a fracture of the ulna. Furthermore, isolated radial head dislocations without ulnar pathology might be extremely rare in general, and there is controversy whether this phenomenon can occur at all from an anatomic basis [9].

Traumatic bowing of the radius and ulna in the sagittal plane have been well documented [10–12], sometimes with associated dislocation of the other bone with only one forearm bone exhibiting bowing deformity. Lincoln and Mubarak [9] described an “ulnar bow sign,” in which plastic deformity of the ulna with possible radial head dislocation is suspected when the posterior border of the ulna in a lateral radiograph deviates at all from a straight line. However, the proximal ulna is not a straight bone in the sagittal plane. The anatomy of the proximal ulna

has an anatomic sagittal plane bow called the proximal ulna dorsal angulation [13], which varies between 0 and 14° with an average of 6°. Maintenance of this anatomy is crucial for proximal alignment of the radiocapitellar and proximal radioulnar joint [13].

Several reports have been published describing isolated radial head dislocations without ulnar involvement [9, 14, 15]. In our case, close scrutiny of the lateral radiographs at pre-reduction and at final follow-up seems to indicate a radial head dislocation without associated ulna injury, as evidenced on final follow-up with no sign of any deformity or periosteal reaction at the ulna and with maintenance of radial head reduction. Initial films show a normal proximal ulna dorsal angulation and a straight posterior border of the ulnar shaft consistent with normal anatomy.

Most of the previously reported pediatric floating elbow case reports have described obvious deformities in the distal humerus which were treated with closed reduction and percutaneous pinning [7, 16]. Powell and Bowe [7] described a Gartland type II supracondylar humerus fracture with a Bado I Monteggia fracture, treated with K-wire fixation of both the supracondylar humerus and ulna. Similarly, Arazi et al. [6] fixed an ipsilateral supracondylar humerus with a K-wire and stabilized the ulna with a 3.5-mm screw. In our case, the supracondylar humerus fracture component of the injury was not visible initially and became apparent on follow-up X-rays with the appearance of a periosteal reaction medially. The Gartland type I supracondylar humerus fracture and radial head dislocation were treated nonoperatively with early range of motion with a good outcome.

This case report highlights an injury pattern not previously described in the literature. Our patient obtained a good result without surgical treatment. Although rare, radial head dislocation with simultaneous supracondylar humerus fracture can occur in pediatric patients.

Statement of Ethics

Informed consent was obtained authorizing treatment, radiological examination, and photographic documentation. Thorough discussion was had with the parents regarding publication of data from the case, to which they consented.

Disclosure Statement

The authors of this article have no conflicts of interest to declare.

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Fig. 1. Initial emergency department radiographs revealing an anterior radial head dislocation without ulnar pathology. Anterior and posterior fat pad signs are present.

Fig. 2. Post-reduction radiographs in the emergency department revealing reduced radiocapitellar alignment. Anterior-posterior radiograph reveals subtle lucency in the supracondylar region of the humerus without displacement on the sagittal or coronal planes.

Fig. 3. Two-week follow-up radiographs with maintained radiocapitellar articulation; the periosteal reaction is most visible along the medial supracondylar region, consistent with healing callus.