Concomitant Fractures of Capitellum and Radial Neck in an Adolescent

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Fractures of the capitellum in association with fractures of the radial head have been described in adults, but to our knowledge this is the first reported case of concomitant fractures of the capitellum and radial neck in an adolescent. The authors have obtained written informed consent from the patient's guardian for print and electronic publication of the case report.

Case Report

While riding a horse, a 15-year-old girl fell on her left elbow. She presented with pain, swelling, and limitation of movement. On examination, the elbow joint was swollen, and there was tenderness over the radial head. There was no bruising or tenderness on the medial side of the elbow. Radiographs showed a fracture of the capitellum associated with a fracture of the radial neck (Figure 1), and computed tomography confirmed these findings. The type I capitellar fracture had a substantial portion of cancellous bone and was considered fixable.[1]

With use of a Kocher posterolateral approach, the capitellar fracture was reduced and internally fixed with 2 Herbert screws. The radial neck fracture was reduced by manipulation, and the achieved position was satisfactory. Given the patient's pain and excessive soft-tissue swelling, she was immobilized in above-elbow plaster for 3 weeks and subsequently managed with physiotherapy.

At 12 weeks, the patient had painless range of motion (0°-130°) with full pronation and supination. Injuries of this severity are usually followed by restricted motion for months, if indeed there is a complete return to normal, but in this case we found full range of motion. There was no evidence of valgus instability. Radiologically, the fracture was united (Figure 2). At 3 years, the elbow was functionally normal and had a full range of pain-free movement. There was no evidence of collapse or osteonecrosis on the radiographs (Figure 3).

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Discussion

Fractures of the capitellum are rare, particularly in children.[1] The mechanism of injury is usually a fall on the outstretched hand with the elbow in an extended position, such that the radial head exerts a shearing force on the capitellum. This injury seldom occurs in children younger than 12 because of the largely cartilaginous composition of the capitellum at that age. As the capitellum grows and ossifies in older children, it becomes more susceptible to shear injury.[1] However, an association of capitellar fracture with fracture of the radial neck has not been reported in a patient younger than 11.

There are several case reports of concomitant fractures of the capitellum and the radial head in adults. In 1931, Milch[2] was the first to describe this unusual fracture pattern (2 cases). Reviewing 7 cases in 1988, Ward and Nunley[3] suggested that best results were obtained with early open reduction of the larger fragments combined with excision of smaller fragments and early initiation of motion. Ott and colleagues[4] investigated 5 cases with combined injury to the capitellum and radial head and suggested that direct screw fixation with mini-implants and resorbable pins allowed early functional rehabilitation. In our patient's case, Herbert screws were used because there was sufficient cancellous bone in the capitellar fragment to hold them. The results were sound bony union and excellent elbow function.

Figure 1. Anteroposterior (A) and lateral (B) radiographs of elbow show fractures of capitellum and neck of radius.

Figure 2. Anteroposterior (A) and lateral (B) postoperative radiographs show accurate reduction and fixation of capitellar fracture with Herbert screws.

Two case reports have suggested that combined fractures of the capitellum and radial head may be associated with injury to the medial collateral ligament of the elbow.[5,6] In our patient's case, clinically there was no evidence suggesting any such ligamentous injury.

Capitellar fractures can be easily overlooked on radiographs, particularly when there is an obvious distracting injury (eg, to the radial head or neck). Our patient's case highlights the need to assess radiographs thoroughly to ensure that rarer injury patterns may be identified and treated appropriately. During surgery, it is often difficult to achieve accurate reduction of the capitellar fragment. Associated with these fractures is considerable morbidity, such as osteonecrosis, posttraumatic degenerative arthritis, and elbow stiffness. In particular, dissection around the posterolateral aspect of the distal humerus carries the risk for disrupting the blood supply to the capitellum. Careful dissection avoiding excessive soft-tissue stripping is mandatory.

This is the first reported case of concomitant fractures of the capitellum and radial neck in an adolescent. The capitellar fracture was fixed internally, and the functional result 12 and 36 months after injury was excellent.

Authors' Disclosure Statement

The authors report no actual or potential conflict of interest in relation to this article.

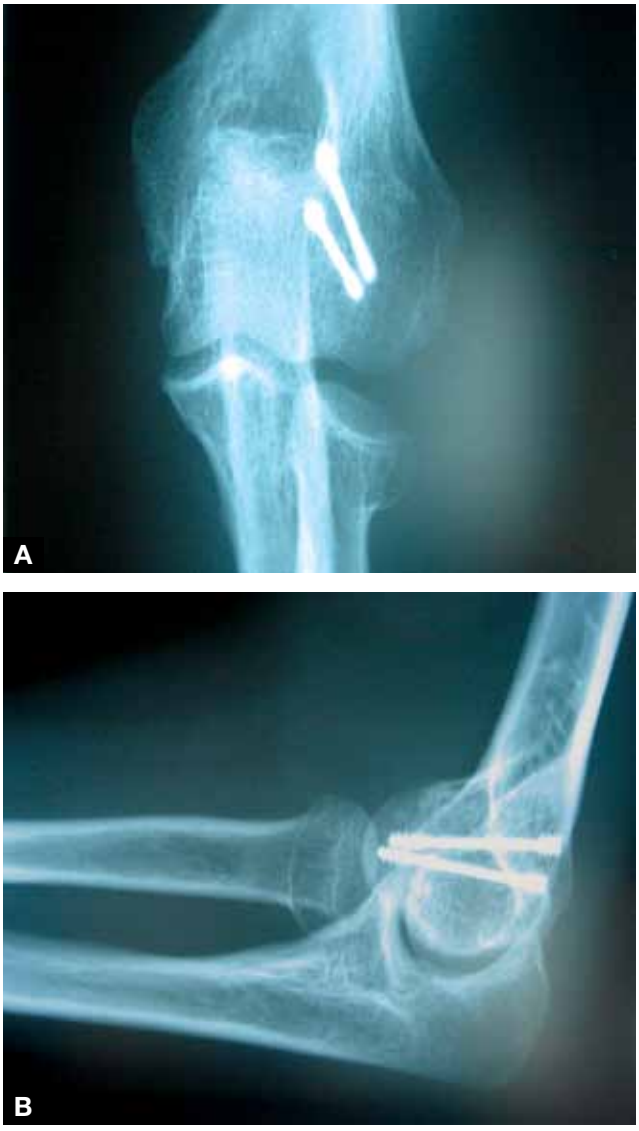

Figure 3. Anteroposterior (A) and lateral (B) radiographs at 3-year follow-up.

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