Case report

Distal radius fracture with associated ulnar head fracture

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ABSTRACT

Ulnar head and neck fractures are rare and the mechanism of injury is not always clear. We describe a case of a distal radioulnar joint (DRUJ) fracture dislocation. The fracture included a distal radius fracture with a vertical ulnar head fracture that was treated with open reduction and internal fixation with a headless screw. We describe the mechanism of injury and approach to the treatment of this injury.

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1. Introduction

Whereas fractures of the ulnar styloid are very common, especially accompanying fractures of the distal radius, ulnar head and neck fractures are rare.^{1–3} Fractures of the ulnar head and neck are described in case reports but the mechanism of injury is not always clear.^{2,4} Since they are intra-articular fractures the treatment must be either open reduction and internal fixation or excision. We describe a case of a distal radioulnar joint fracture dislocation. The fracture included a distal radius fracture with a vertical ulnar head fracture that was treated with open reduction and internal fixation with a headless screw and a good clinical result. We discuss the treatment of this fracture pattern.

2. Case report

A 26 year-old right-handed male laborer fell into a 2-m open grave sustaining an injury to his left wrist. The patient fell from a height onto the left wrist. The position of the wrist at the time of impact was described by the patient as “outstretched hand”. He was seen in the emergency department (ED) with swelling and deformity of the wrist and tenderness over the whole area. There was no obvious neurovascular or skin injury.

Past medical history yielded a history of heavy smoking. A review of systems was within normal limits.

Radiographs on arrival demonstrated a dorsally displaced distal radius fracture without comminution and an associated shear and avulsion fracture of the ulnar head with dislocation of the distal radioulnar joint (DRUJ). The fracture of the distal radius was extraarticular in the radiocarpal joint but intraarticular in the DRUJ (Figs. 1 and 2).

An attempt at closed reduction in the emergency room under hematoma block was not successful. The fracture of the ulnar head was intraarticular and remained unstable. He was then worked up for open reduction. An open reduction and internal fixation through a dorsal approach was performed. The reduction of the fracture of the radius reduced the ulnar head almost completely. The radioulnar ligaments were injured (since there was evidence of hematoma), but there was no clear tear and therefore the dorsal radioulnar ligaments were believed to be grossly intact. There were 2 large pieces of the ulnar head but some comminution close to the neck.

The reduced ulnar head fracture was maintained with one Acutrak 2 headless compression system screw (Acumed Hillsboro, Oregon) and the reduced radius fracture was maintained with 2 Kirschner wires (K wires) from the ulnar head into the radius. We decided not to plate the radius since it was well reduced and stable but as stated did fix the DRUJ using the K wires between the ulnar head and the distal radius (Fig. 3).

The patient was splinted (including the wrist and the elbow) following surgery for 5 weeks after which the K wires were removed under local anesthesia. Occupational therapy was started early following surgery. At 6 months post surgery the patient had full wrist flexion and extension, full pronation but still had –30° of

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Fig. 1. Posteroanterior (PA) radiograph of the left wrist at the time of initial injury (imperfect view).

supination as compared to the uninjured side. He returned to work without limitations despite the restriction in supination (Figs. 4–6).

3. Discussion

We have described a rare case of a radius fracture with an ulnar head fracture and dislocation of the DRUJ. The mechanism of injury is unclear but since this is a very rare injury, we can assume that a particular wrist position together with a specific direction of force infrequently occur simultaneously. The vertical fracture line suggests shear through the head and the comminution at the proximal junction with the ulnar neck suggests that the force passed through the DRUJ and exited through the radius and ulna at the level of the neck. It is likely that a vertical force passed through the ulnar head. Since there are no ligamentous attachments in this area, it is probable that the distal radius fragment pulled the ulnar neck through the intact ligaments causing the comminution that occurred in this fracture pattern.⁵

The use of a headless screw is particularly suited to a fairly large fracture fragment involving articular cartilage.^{6,7} Though this is not a novel concept, it facilitates rigid intraarticular fixation. The screw was inserted horizontally at almost 90° to the fracture line. Since the ligaments seemed to be intact, we thought that rigid fixation was needed for the head to prevent redisplacement. We did add K wires through the DRUJ both to hold the radius as well as the joint.

Fig. 2. Oblique radiograph of the left wrist at the time of initial injury.

Fig. 3. Lateral radiograph of the left wrist at the time of initial injury.

We did not otherwise fix the radius because it felt very stable. Although we had a good result, this may have been a mistake and we suggest that it is probably more prudent to rigidly fix the radius in this setting. The use of K wires across the DRUJ may well have

Fig. 4. Posteroanterior (PA) radiograph of the left wrist at 4 weeks postoperative. The K wires and screw are in place.

Fig. 5. Posteroanterior (PA) radiograph of the left wrist at 8 weeks postoperative. The K wires have been removed and the fractures have healed.

contributed some temporary rigidity to the head fixation as well but may also contribute to postoperative stiffness.^{8–10}

In summary, this is a rare injury pattern; the mechanism of injury includes shearing of the ulnar head. ORIF with both a

Fig. 6. Lateral radiograph of the left wrist at 8 weeks postoperative.

headless screw and trans-articular K wires seemed to be helpful in providing immobilization without hindering the ultimate functional (ROM) result.

Conflicts of interest

The authors have none to declare.

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