

CASE REPORT

IRREDUCIBLE DORSAL RADIOCARPAL FRACTURE DISLOCATION WITH DISSOCIATION OF THE DISTAL RADIOULNAR JOINT : A CASE REPORT

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We report a case of dorsal radiocarpal fracture dislocation with dissociation of the distal radioulnar joint. Closed reduction was unsuccessful due to interposition of the osteochondral fragments and open reduction and fixation was carried out with a satisfactory end result. The advantages of volar approach and use of external fixator in the management of this injury are discussed.

Keywords : radiocarpal ; fracture ; distal radioulnar joint ; dislocation.

Mots-clés : radio-carpienne ; fracture ; articulation radio-ulnaire distale ; luxation.

CASE REPORT

A 32-year old, left handed manual worker came to the emergency department after falling from a first floor window. He landed on the roof of a parked car sustaining an isolated injury to his left wrist. On examination, he had gross swelling and deformity of the left wrist. There was paraesthesia and numbness in the median nerve distribution but the circulation to the fingers was adequate. A clinical diagnosis of fracture dislocation of the wrist was made. Closed manipulation under intravenous sedation in the emergency department to improve the position, was unsuccessful. Radiograph of the left wrist showed dorsal radiocarpal fracture dislocation with fracture of the radial styloid and dissociation of the distal radioulnar joint (fig. 1a, b). The patient underwent immediate closed reduction of the dislocation under general anaesthesia with trans-styloid K wire fixation of the wrist under

image intensifier control. After closed reduction, the deformity at the wrist was corrected and the distal radioulnar joint was reduced but intra-operative radiographs showed radiocarpal subluxation with loss of joint space (fig. 2). It was then decided to proceed with open reduction and fixation of the fracture dislocation. Before exploring the wrist, a Penning external fixator was applied across the wrist to help in reduction of the fragments and maintain the position in the postoperative period. The wrist was explored through a volar approach and the median nerve was decompressed. The volar radiocarpal ligament was found infolded into the joint with the volar lip of the distal end of the radius. Distraction with the external fixator and gradual traction on the capsule allowed retrieval of the osteochondral fragments and reduction of the radiocarpal joint. Distraction was then decreased and the volar osteochondral fragments were reduced and fixed with K wires passing from volar to dorsal. The radial styloid was also reduced and fixed with a K wire. The external fixator was locked in slight volar flexion at the wrist to maintain the reduction. The check radiographs showed the reconstitution of the radiocarpal joint (fig. 3a, b).

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Fig. 1a, b. — Radiograph of the left wrist showing dorsal radiocarpal fracture dislocation with dissociation of the distal radioulnar joint.



Fig. 2. — Radiograph of the wrist after closed reduction and K wire fixation showing reduction of the distal radioulnar joint but with persistent subluxation of the radiocarpal joint with loss of joint space.

The patient made a satisfactory recovery from the operation. He recovered complete median nerve functions in two weeks. The external fixator and K wires were removed after six weeks and an intensive physiotherapy program was commenced. At six months follow-up the patient had no residual pain and achieved a palmar flexion of 70° and dorsiflexion of 60°.

DISCUSSION

Radiocarpal fracture dislocation is an uncommon and complex injury, which usually follows a high velocity trauma. Dorsal radiocarpal fracture dislocation is often associated with fracture of the dorsal rim of the distal articular surface of the



Fig. 3a, b. — Radiograph of the wrist after open reduction and fixation of the volar lip fragments and the radial styloid showing reconstitution of the joint space.

radius, rupture of the palmar radiocarpal ligament and fracture of the radial and the ulnar styloid process. Also, there can be associated injuries of the distal radioulnar joint and the carpus (1). Moneim *et al.* classified these injuries into two types based on the severity of the injury. In type I dislocation, the carpus moves as one unit on the distal radius whereas in type II dislocation associated intercarpal dislocation is also present (4). Only a few cases have been reported in the literature where this injury was associated with dislocation of the distal radioulnar joint (1, 3, 6, 8). Dorsal dislocation of the ulna at the distal radioulnar joint is caused by hyperpronation of the forearm on a fixed hand (2). Weiss *et al.* in cadaveric studies, were able to produce dorsal radiocarpal dislocation with disruption of the radioulnar joint by applying

strong compressive and torsional force to the hyperextended, pronated wrist (8).

Dislocation of the radiocarpal joint is usually easily reduced by closed method. But sometimes the radiocarpal joint cannot be reduced because of bony or soft tissue interposition requiring operative treatment (3,8). Even if reduction is achieved by closed manipulation a congruent reduction of the fracture fragments is difficult. A careful analysis of the radiographs would show incongruent joint though alignment may look normal (fig. 2). The osteochondral fragments can be seen in the joint space and often open reduction and internal fixation is required (1,7). Bilos *et al.* could achieve satisfactory reduction in only one of their five cases. The remaining four cases required open reduction and internal fixation leading them to

recommend operative treatment for these injuries (1). Moneim *et al.* carried out open reduction and internal fixation in five cases in a series of seven patients and recommended open reduction and internal fixation for all type II dislocations but only for selective cases of type I dislocations (4).

Both volar and dorsal approaches have been recommended in the literature. The approach to open reduction should be dictated by the fracture pattern, associated carpal bone injuries and presence of nerve injury. Repair of the volar capsule and accurate reduction and fixation of the radial styloid are important for stability of the wrist (1,5). In this particular case we found the volar approach quite useful. This approach allowed median nerve decompression, retrieval and fixation of the volar fragments and the capsule and anatomical reduction of the radial styloid. The use of external fixator as an initial step in operative treatment is useful not only in reduction of the fracture fragments but also in the postoperative period as a definitive mode of immobilization obviating the need of a plaster cast (5, 7).

In summary, good functional results can be achieved by aggressive management of the radiocarpal fracture dislocation injury. The treating surgeon should have a low threshold for open reduction and fixation of the fracture dislocation, particularly in cases with persistent loss of radiocarpal joint space after closed reduction.

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SAMENVATTING

C. I. AYEKOLOYE, N. SHAH, A. KUMAR, N. KURDY. Conservatief niet reduceerbare radiocarpale fractuur-luxatie met dorsale verplaatsing en ontwrichting van het distaal radio-ulnair gewricht.

Een dorsaalwaarts verplaatste fractuur-luxatie met disruptie van het distaal radio-ulnair gewricht wordt beschreven. Open reductie en interne fixatie leidde tot een voldoening gevend eindresultaat. Een volaire toegangsweg en uitwendige fixator bieden voordelen bij de behandeling van dergelijke letsels.

RÉSUMÉ

C. I. AYEKOLOYE, N. SHAH, A. KUMAR, N. KURDY. Fracture-luxation radio-carpienne irréductible avec disjonction radio-cubitale inférieure : présentation d'un cas.

Les auteurs rapportent un cas de fracture-luxation radio-carpienne avec déplacement postérieur associée à une disjonction radio-cubitale inférieure. Un traitement chirurgical par réduction à foyer ouvert et ostéosynthèse a été réalisé en raison de l'irréductibilité de la fracture-luxation ; le résultat final a été satisfaisant. Les auteurs discutent les avantages de l'abord palmaire et de l'utilisation du fixateur externe dans le traitement de cette lésion.