

Posttraumatic ulnar translation of the carpus

A case report

Tom Mulier¹, Piet Reynders², Paul Broos² and Guy Fabry¹

A 24-year-old miner sustained wrist trauma in a car accident. The initial radiographs showed a dorsal rim fracture of the radius without any dislocation of the wrist. Fourteen days later, radiography revealed a

total ulnar translation of the carpus. Open reduction was performed with a good clinical and radiographic result.

Catholic University Leuven ¹Departments of Orthopedics, Pellenberg, and ²Traumatology, Leuven, Belgium
Correspondence: Dr. P. Reynders, Department of Traumatology, U.Z. Gasthuisberg, Herestraat 49, B-3000 Leuven, Belgium
Tel +32-16 21 46 66. Fax +32-16 21 55 00
Submitted 91-03-26. Accepted 91-08-17

A 24-year-old miner was involved in a serious car accident in which he sustained injuries to the left acetabulum, the right talocalcaneal joint, and the right wrist. Radiographs of the wrist showed a minor dorsal rim fracture of the radius (Figure 1). After the patient had complained of increasing pain, it became apparent that there was prominent ulnar deviation of the wrist. Reduction was possible by distracting the wrist and pressing against the triquetrum, but redisplacement occurred instantly upon release of pressure. Radiographs showed an ulnar displacement of the entire carpus along the radial articular surface.

Three weeks after the trauma, the wrist was explored through a dorsal and volar approach. The dorsal radiocarpal (radiolunate-triquetrum) ligament was detached from the proximal radial insertion. The palmar radiolunate and radiocapitate ligaments were attenuated, but intact. Luxation of the extensor pollicis brevis and abductor pollicis longus tendons to the volar side was apparent. After reduction, a 10-cm strip of half of the extensor carpi radialis brevis was transferred through a tunnel from the dorsal surface of the scaphoid across the scapholunate joint and then sutured to itself. Two Kirschner wires were inserted from the distal radius into the scaphoid, lunate, and capitate. Repair of the dorsal radiocarpal complex was not performed. The wrist was immobilized in a forearm plaster cast for 6 weeks. Six months after surgery, he had 40° extension, 30° flexion°, 15° radial deviation, 20° ulnar deviation, and a grip strength that was 75 percent of the uninjured side. A slight scapholunar dissociation was noted on the radiographs, although no scapholunar lesions could be found during surgery.

Discussion

The pathogenesis of posttraumatic ulnar translation appears to be a hyperextension injury, similar to that producing perilunar dislocation, with pronation of the forearm on the fixed hand (Lindscheid et al. 1972, Dobyns et al. 1975, Lindscheid et al. 1983, Taleisnik 1985, Rayhack et al. 1987).

In chronic or delayed cases, attenuation of the scapholunate ligament after initial trauma is responsible for a progressive scapholunate dissociation with the lunate moderately ulnarly translated. The lunate displaces until the radiolunate ligaments are torn. This allows the carpus, including the scaphoid, to slide ulnarly on the radial articular surface. Ulnar translation can also be seen in combination with other instabilities, such as triquetrolunate dissociation (Rayhack et al. 1987). In severe trauma, we believe that direct ulnar carpal translation can occur without lesions of the intercarpal scapholunate ligament. In our case, radiographs and peroperative exploration showed no lesions of the scapholunate ligament, although a mobile dorsal proximal pole of the scaphoid was found.

Radiographic diagnosis is easily made with ulnar carpal translation, enlarged scapholunate space, proximal pole of the scaphoid overriding the scapholunate ridge, and an increased carpal translation index noted on anteroposterior radiographs. Volar Intercalated Segment Instability (VISI) or Dorsal Intercalated Segment Instability (DISI) is sometimes found on the lateral projections (Linscheid et al. 1972, Green and O'Brien 1980, Bellinghausen et al. 1983, Linscheid et al. 1983, Rayhack et al. 1987).

Treatment in the acute phase should include surgical repair of the disrupted volar capsular ligamentous



Figure 1 A. At admission. Normal anteroposterior view and a minor dorsal rim fracture (Bellinghausen et al. 1983) on the lateral view.



C. Postoperatively. Reduction of the ulnar translation with Kirschner wires.



D. Six months after injury.

B. Fourteen days later. Ulnar translation of the carpus, enlarged scapholunate space, proximal pole of scaphoid overriding the scapholunate ridge, increased scapholunate interval suggesting dissociation, and increased carpal translation index.

complex (Green and O'Brien 1980, Rayhack et al. 1987). Damage to the weak dorsal ligaments is often so extensive that repair is difficult and ineffective (Green and O'Brien 1978, Green and O'Brien 1980, Linscheid et al. 1983, Rayhack et al. 1987). Ligament reinforcement by a tendon is often effective.

In chronic cases, results of delayed repair are somewhat disappointing with suture loosening and ligament attenuation. Bone stabilization procedures, such as radiolunate or wrist arthrodesis, could be considered. In pure ulnar translation without associated dislocations, a radiolunate fusion is preferred (Rayhack et al. 1987).

References

Bellinghausen H W, Gilula L A, Young L V, Weeks P M. Post traumatic palmar carpal subluxation. Report of two cases. *J Bone Joint Surg (Am)* 1983; 65 (7): 998-1006.

Cave E F. Injuries to the wrist joint. *A A O S Instruct Course Lect* 1953; 10: 9-24.

Dobyns J H, Linscheid R L, Chao E Y S, Weser E R, Swanson G E. Traumatic instability of the wrist. *A A O S Instruct Course Lect* 1975; 24: 182-99.

Green D P, O'Brien E T. Open reduction of carpal dislocations: indications and operative techniques. *J Hand Surg (Am)* 1978; 3 (3): 250-65.

Green D P, O'Brien E T. Classification and management of carpal dislocations. *Clin Orthop* 1980; 149: 55-72.

Linscheid R L, Dobyns J H, Beabout J W, Bryan R S. Traumatic instability of the wrist: Diagnosis, classification and pathomechanics. *J Bone Joint Surg (Am)* 1972; 54: 1612-32.

Linscheid R L, Dobyns J H, Beckenbaugh R D, Cooney W P, Wood M B. Instability patterns of the wrist. *J Hand Surg (Am)* 1983; 8 (5): 682-6.

Rayhack J M, Linscheid R L, Dobyns J H, Smith J H. Post-traumatic ulnar translation of the carpus. *J Hand Surg (Am)* 1987; 12 (2): 180-9.

Taleisnik J. The wrist. In: *Proximal carpal instability*, Churchill Livingstone, New York 1985: 305-7.