

Transradial Radial Perilunate Dislocation: A Case Report

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Abstract

We report a rare case of transradial styloid radial perilunate dislocation in a patient who presented with ulnar nerve symptoms, and we describe our treatment approach to this unusual injury. In a literature search, we found no other report of such an injury.

Transradial styloid perilunate dislocations or greater arc injuries are not uncommon.^{1,2} Most often, the carpus dislocates dorsally. In the final stage, the lunate dislocates volarly, often causing median nerve symptoms because of pressure on the nerve within the carpal tunnel.³ Ulnar nerve symptoms have seldom been described in open radiocarpal dislocations and in carpal dislocations.^{4,9} In all the cases, the ulnar nerve recovered with reduction of the dislocation.

In this article, we report a rare case of transradial styloid radial perilunate dislocation in a patient who presented with ulnar nerve symptoms, and we describe an approach to treating this unusual injury. In our literature search, we found no other report of such an injury. The patient provided written informed consent for print and electronic publication of this case report.

CASE REPORT

A 43-year-old man presented to the emergency department after running his motorcycle off the road and into a ditch. His helmet was dented, but he had not lost consciousness. Injuries included a closed fracture-dislocation of the left wrist and a nondisplaced left fibula fracture. Examination of the left wrist revealed obvious swelling, deformity, and tenderness to palpation. At initial evaluation, there were noticeable paresthesias and decreased sensation in the ulnar nerve distribution

distal to the wrist. Radiographs showed a radial perilunate dislocation (Figure 1).

After a failed closed reduction in the emergency department, the patient was taken to the operating room for surgical repair. During surgery, combined dorsal and palmar approaches were necessary for reduction. The lunate was retrieved palmarly through an extended carpal-tunnel incision, and the dorsal approach included the intervals from the first extensor compartment through the fourth. The median nerve was found to be contused but intact. The lunate was attached to the short radiolunate ligament, dorsal to the flexor tendons and relatively ulnar, while the triquetrum, hamate, and capitate were radial to it. There were no carpal bone fractures, but the scaphoid articular surface of the radius was comminuted with pieces of articular cartilage and subchondral bone scattered throughout the radiocarpal joint. The scaphoid articular surface was intact on gross examination.

With reduction of the dislocation, tension on the ulnar soft-tissue structures was felt to be released. The reduction was held with multiple Kirschner wires. The dorsal radiocarpal, scapholunate interosseous, radioscapocapitate, and radiolunate ligaments were repaired, and the radius was fixed with a volar plate and bone cement (HydroSet Stryker, Kalamazoo, Michigan) (Figure 2). After surgery, the patient experienced complete neurologic recovery.



Figure 1. Posteroanterior (A) and lateral (B) radiographs of radial perilunate dislocation.

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Figure 2. Posteroanterior (A), lateral (B), and oblique (C) radiographs after open reduction and internal fixation. Bone cement was added to radial styloid.

Two and a half weeks after surgery, moderate swelling continued, and the patient was started in therapy for digital range of motion (ROM). He continued to progress, with significant improvement in swelling and ROM 1 month after surgery. At 8 weeks, he continued to report stiffness, but swelling and ROM were markedly improved, and pins were removed. Eight months after surgery, he had full finger ROM,

45° wrist extension, 50° flexion, full pronation/supination, and grip strength of 92 pounds (right side, 81 pounds). The patient returned to work with no restrictions.

At 1-year follow-up, the clinical evaluation remained unchanged, but radiographs showed significant static scapholunate gapping and the beginning of radiographic arthritic changes (Figure 3).



Figure 3. Posteroanterior (A), lateral (B), and oblique (C) radiographs at 1-year follow-up show static scapholunate instability and narrowing of radioscaphoid joint.

DISCUSSION

Perilunate dislocations usually follow a predictable pattern, and, as their name implies, the carpus dislocates around the lunate. The direction of the dislocation is usually dorsal, but volar dislocations have been described.¹⁰⁻¹² In our patient's case, the carpal bones, including the ulnar carpal bones (triquetrum and hamate) dislocated radially, leaving the lunate in an ulnar position. The lunate was found to be intact, but its ligamentous attachments had been injured. A large part of the radial articular surface was shattered, not only the radial styloid (avulsion), suggesting a mechanism different from the accepted pattern of perilunate injuries. We could not find a case of radial perilunate dislocation described in the literature.

Our patient's mechanism of injury was unclear. We surmised that this was a high-energy injury and that the force most likely passed ulnar to radial. The lunate may have dislocated/moved volarly "out of the way" and then settled back in an ulnar position, as it had not been fractured but obviously had sustained an injury (probably not complete) to its ligamentous connections. The radius possibly was fractured by the carpus or, more specifically, the intact scaphoid. Had the lunate not remained in its position, this injury would have been a radial radiocarpal dislocation. Girard and colleagues¹³ found a high incidence of intracarpal injuries associated with radiocarpal dislocations. In 2008, Chin and Garcia-Elias¹⁴ described a complex wrist injury that included intracarpal and radiocarpal components. Their patient, like ours, was a motorcycle rider. Clearly, this suggested mechanism is speculative and cannot be proved from one case.

Our patient presented atypically with ulnar nerve symptoms, which can be explained by traction on the ulnar nerve with the radial dislocation. The nerve was not explored at time of surgery because it was felt that, with reduction, the tension on the neurovascular structures was relieved. In other studies with reported ulnar nerve symptoms, recovery was achieved with no further intervention after reduction.^{5,6}

In summary, we have described a rare transradial radial dislocation in which the ulnar carpal bones were

found radial to the lunate. Treatment with open reduction and internal fixation necessitated volar and dorsal approaches as well as repair of the distal radial articular surface, yielding an acceptable clinical short-term outcome but an already poor radiographic outcome 1 year after surgery. It is reasonable to expect that this injury will not yield the usual satisfactory long-term outcome seen in typical perilunate fracture-dislocations. The mechanism of injury and treatment strategy has been suggested but cannot be proved or outlined based on this one case.

AUTHORS' DISCLOSURE STATEMENT

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

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