

CASE REPORT

Spontaneous Resolution of a Post-Traumatic Isolated Ulnocarpal Translocation

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Abstract

This report describes a case of transient ulnocarpal translocation associated with a non-displaced distal radius fracture in a 21-year-old collegiate baseball player. The instability progressed gradually over six weeks, ultimately resolving spontaneously. Several months post-injury, the patient demonstrated complete restoration of range of motion and grip strength, along with satisfactory radiographic alignment.

Level of evidence: IV

Keywords: Acute wrist injury, Dislocation, Distal radius fracture, Instability, Ligament injury

Introduction

Post-traumatic ulnocarpal translocation (PUCT), with or without an associated fracture, is a rare wrist injury. The pathoanatomy involves rupture of the volar ligamentous structures of the radiocarpal joint, specifically the radioscaphocapitate ligament and the long and short radiolunate ligaments, which are the primary stabilizers of the radiocarpal joint.¹⁻³ Despite the often benign appearance on initial radiographic evaluation, the carpus translocates ulnarward over time, leading to widening of the radioscaphoid joint and subluxation of the lunate from its normal position in the radial fossa. The altered wrist mechanics ultimately result in loss of motion and pain. Even with appropriate surgical intervention, most of the few reported cases in the literature have resulted in poor outcomes.^{1,2} Persistent instability and resultant joint degeneration are commonly cited as the primary reasons for this poor prognosis.^{1,2} Persistent instability with resultant joint degeneration is commonly cited as the reason for the poor prognosis.^{1,2} The case we present is unique in that the obvious PUCT appeared to resolve spontaneously without surgical intervention.

Case Presentation

A 21-year-old right-handed male collegiate baseball player presented with right wrist pain and swelling following a collision on the field. The patient had no history of inflammatory arthritis or connective tissue disorders. On

examination, marked radiocarpal tenderness was noted, and range of motion was significantly limited in all directions due to pain. Initial x-rays showed no evidence of fracture or dislocation [Figure 1]. Given the persistence of symptoms, an MRI was performed 2 weeks post-injury [Figure 2], which revealed mild edema in the distal radius consistent with a non-displaced fracture, as well as nonspecific edema at the point of origin of the volar radiocarpal ligament on the distal radius. Given the non-displaced nature of the fracture, the patient was treated with a short-arm cast. A follow-up evaluation 6 weeks after cast application revealed persistent tenderness in the wrist, along with some loss of motion. Plain x-rays at that time showed healing of the distal radius fracture, but with substantial ulnar translocation of the carpus [Figure 3]. The patient was placed in a splint for comfort, and a repeat MRI was ordered to evaluate for potential radiocarpal ligament injury. This MRI, performed 9 weeks post-injury, demonstrated a well-reduced radiocarpal joint without signs of ulnar radiocarpal translocation or ligament injury, which was further confirmed by plain x-rays [Figure 4]. A final follow-up at 6 months post-injury revealed a normal range of motion, strength, and a full return to athletic activities without restriction. Plain x-rays confirmed complete healing of the distal radius fracture, with no evidence of radiocarpal instability.

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Figure 1. Initial plain radiograph

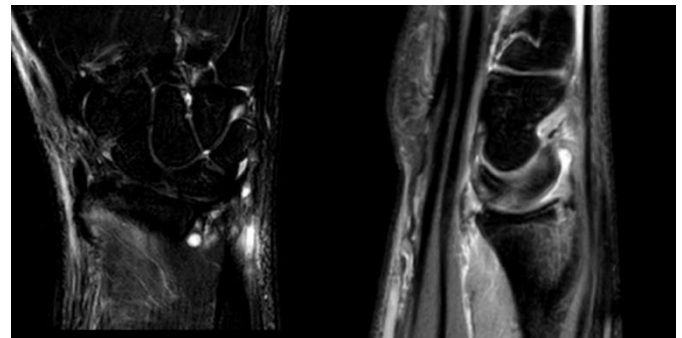


Figure 2. Two-week post-injury MRI



Figure 3. Six-week post-injury wrist radiographs. (a,b) Anteroposterior and lateral views (Lunate uncovering: 70%) (c) Anteroposterior view of the contralateral wrist (Lunate uncovering: <10%)



Figure 4. Nine-week post-injury Wrist radiograph and MRI

Discussion

Rayhack and colleagues were the first to describe post-traumatic ulnocarpal translocation (PUCT) resulting from complete disruption of the volar radial extrinsic ligaments.¹ In a case series of eight patients, the authors reported a delay in diagnosis, averaging 7.3 months, and found only subtle changes on initial radiographs that provided a clue to the diagnosis. Despite undergoing surgical reconstruction of the injured ligaments, all patients in this series experienced joint degeneration or recurrent partial ulnar shifting of the carpus. The authors also demonstrated in a single cadaver specimen

that PUCT occurs only when the radiosaphocapitate and radiolunate ligaments are disrupted. They speculated that the lack of ulnar head buttressing in ulnar-negative patients may predispose them to this injury, as four of their eight cases were ulnar-negative, while the other four were ulnar-neutral. Berschback et al. similarly noted that all of their ten cases were ulnar-neutral to negative. The patient presented here is ulnar-negative, which is consistent with the findings mentioned by the authors above.

PUCT is thought to occur following a wrist injury when the wrist is fixed in hyperextension, ulnar deviation, and forearm

pronation, which places maximum tension on the ligaments^{1,4,5} Patients with PUCT may present with an ulnar shift deformity of the wrist, a history of wrist dislocation, or simply with pain and discomfort without any obvious deformity, as seen in our case.¹ Initial radiographs may appear insignificant and could be interpreted as normal. Indeed, many cases reported in the literature were diagnosed with a delay of at least one month.^{3,6} Suspicion should arise when more than 44% of the lunate is uncovered, there is abnormal shifting of the scaphoid away from the radial styloid, or the proximal pole of the scaphoid is positioned within the lunate fossa on an anteroposterior (AP) wrist radiograph.² However, a comparison to the contralateral uninjured side is recommended.^{7,8}

There is no consensus regarding the optimal management approach for PUCT. All reported cases with non-operative management have developed arthritis and a reduced range of motion.^{2,6} However, Nasra recently reported a case of a 71-year-old man who achieved an acceptable outcome despite persistent ulnar translocation six months after the injury.⁶ Most authors believe that conservative treatment is generally ineffective and that earlier intervention is preferable.

Surgical reconstruction tends to produce better outcomes. However, post-surgical recurrent ulnar translocation and wrist arthritis, which often require arthrodesis, have been widely reported as inevitable complications.¹⁻³ Innocenti described an excellent result after volar ligament reconstruction using a vascularized interosseous membrane flap, resulting in a pain-free wrist without recurrence and minimal degenerative changes on X-ray.⁹ Brushback reported the recurrence of ulnar translocation and late arthritis in nearly all of his cases following ligament repair. Rayhack reported that three patients required arthrodesis, and five had a partial recurrence of ulnar translocation, with three of them achieving near-normal function.¹

To our knowledge, this is the first report of PUCT resolving spontaneously with conservative treatment, resulting in the restoration of normal radiocarpal segmental alignment and without residual instability. We have no specific pathomechanical explanation for the resolution of the instability pattern in this patient. The patient may have an underlying, unrecognized connective tissue or rheumatologic disorder contributing to ligamentous laxity.

Alternatively, the period of casting may have eliminated the stabilizing contribution of the periarticular muscle groups, which could have led to static instability, as seen in the post-casting plain X-rays. Given the universally poor outcomes following surgical intervention, a period of observation may be warranted in these patients, especially in the event of spontaneous resolution, as seen in this case. Conservative treatment can lead to successful outcomes in cases of PUCT, provided the condition is diagnosed early and managed appropriately.

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