CASE REPORT

Avulsion Fracture of the Extensor Carpi Ulnaris Due to Roller Injury

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Avulsion fractures of the radial wrist extensor from the metacarpal base are rare injuries, and have previously been reported in only a few papers. Although 2 cases of closed rupture of the extensor carpi ulnaris (ECU) were mentioned in 1 report, no case of avulsion fracture of the ECU from its insertion was found in the literature. We recently encountered such a case. The patient, a machine operator, suffered multiple fractures of his forearm, wrist and hand when his left hand was caught in a machine roller. He immediately underwent emergency operation, during which we found the avulsed bone fragment from the ECU insertion. This fragment was retracted to the ECU groove of the ulna, and was located beside the fracture fragment of the ulnar styloid on X-ray. The avulsed fragment was reattached to the base of the fifth metacarpal with Kirschner wires and wire loop, and the patient returned to work 4 months after the operation. [J Chin Med Assoc 2005;68(5):237–239]

Key Words: fracture, metacarpus, tendon injury, wrist injury

Introduction

Avulsion fracture of the radial wrist extensor insertion has been reported in the literature.1–5 Five reports (7 wrists) involved the extensor carpi radialis longus (ECRL) insertion,1–5 and 2 the extensor carpi radialis brevis (ECRB) insertion.6–7 We found only 1 case in the literature involving both the ECRL and ECRB.8 Although there was 1 report (2 cases) of non-rheumatoid closed rupture of the extensor carpi ulnaris (ECU),9 no reports were found of displaced avulsion fracture of the ECU tendon.

Case Report

A 29-year-old right-handed man had an occupational accident on 5 February 1998, when his left hand and forearm were caught in the roller of a lathe. He was sent to an emergency room soon after the accident. A type II open fracture of the radius was noted, and an X-ray initially showed transverse fractures of the mid-third of the radius and ulna, fractures of both radial and ulnar styloids, fracture of the scaphoid, and fractures of the second, third and fifth metacarpals. A bony fragment beside the ulnar styloid was also noted (Figure 1). The neuromuscular status of the hand was checked and found to be intact.

Under general anesthesia, the open wound was first debrided, and then the radius and ulna were reduced and fixed with small, 6-hole, dynamic compressive plates. The scaphoid was fixed with Kirschner (K)-wires. The bony fragment beside the ulnar styloid was identified and found to be an avulsed fragment of the ECU tendon insertion retracted to the ECU groove of the ulna (Figure 1). We reduced this fragment to the fifth metacarpal base with wire sutures and 2 supplemental K-wires. We also found an additional fracture fragment at the fifth metacarpal base, which was also fixed with K-wires. The ulnar styloid was treated with tension band wire fixation (Figure 2). The fractures of the second and third
Figure 1. (A) Anteroposterior view of the preoperative X-ray film showing fracture of the fifth metacarpal base (upper arrow) and the avulsed fragment of the extensor carpi ulnaris (lower arrow). (B) Lateral view showing the avulsed fragment (arrow) close to the fracture of the ulnar styloid.

Figure 2. Postoperative X-ray film showing the avulsed fragment reattached to its insertion site with wire sutures and 2 supplemental pins. The additional fracture of the fifth metacarpal was fixed with two Kirschner wires.

The implants in the scaphoid, fifth metacarpals and ECU insertion site were removed 6 weeks later; however, the short arm thumb spica cast remained in place until 12 weeks later, after the scaphoid had healed. Rehabilitative therapy was carried out at our outpatient department, and the patient returned to work 4 months after the injury. The plates in the radius and ulna, and other implants, were removed 1 year after surgery (Figure 3).

Discussion

The ECU passes through the ECU groove of the ulna and inserts at the dorsal base of the fifth metacarpal. It functions not only as the ulnar wrist extensor and ulnar deviator, but also as the dynamic stabilizer of the
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When the patient’s hand was caught in the roller, with the hand in a position of pronation, hyperflexion and radial deviation, the crushing force and simultaneous ECU contraction caused avulsion of the ECU insertion. This sign may provide some clues about the situation of avulsed wrist extensor insertion.

The mechanisms of avulsion fracture of the ECRL or ECRB have been discussed previously:1–8 those postulated were a force generated by falling or striking on a hyperflexed wrist, with simultaneous contraction of wrist extensors. However, Sean et al9 described 2 cases of closed rupture of the ECU with different mechanisms of injury: 1 patient twisted his wrist through a forced supination, and the other was injured when he was moving a heavy object in a resisted ulnar deviation.

Although our case was not a single tendon injury, as in other reported cases involving the radial wrist extensors, we believe the mechanism of injury was forced flexion of the wrist, by roller compression, with simultaneous contraction of the ECU. Clearly, crushing of the fifth metacarpal base also contributed to avulsion fracture of the ECU insertion (Figure 4). We also found an additional fracture of the fifth metacarpal base, which has been reported previously in cases of avulsion fracture of radial wrist extensor insertion.4,7

The associated fracture at the fifth metacarpal base was also a sign of trauma at the ECU insertion.4,7

References