Laceration of the Ulnar Nerve With a Closed Fracture of the Distal Radius and Ulna
A Case Report

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ABSTRACT: Injury to the ulnar nerve with closed fractures at the wrist are rare. A case of an ulnar nerve laceration as a result of a closed Colles’ fracture is presented. Rationale for early exploration of the ulnar nerve due to persistent palsy following fracture reduction is discussed.

Introduction
Injuries to the median and ulnar nerves have been described in closed fractures of the distal radius and ulna. Median nerve neuropathy, mostly delayed in onset, has been reported in several large series of Colles’ fractures with incidence varying from .2% to 3.7%. Isolated ulnar nerve injury associated with fractures at the wrist, however, is uncommon. In Bacorn’s and Kurtzke’s study of 2,000 Colles’ fractures, only one ulnar nerve injury was reported, and it was described as a “traumatic neuritis.” Although there are several reports in the literature of ulnar nerve injuries associated with closed distal radius and ulna fracture, to our knowledge a laceration of the ulnar nerve as a result of a closed fracture has not been reported.

Primary neuropathy of the median or ulnar nerve associated with fractures can be caused by a contusion, laceration, or a traction injury. A primary delayed neuropathy in the immediate post-injury period may be caused by increasing edema, poor fracture reduction or improper cast immobilization. Delayed neuropathy is attributed to either extra- or intraneural fibrosis.

We are presenting a case of an ulnar nerve laceration in association with a closed fracture of the distal radius and ulna. In addition, we will discuss the indication for exploration of an injured ulnar nerve with fractures at the wrist.

Case Report
A 21-year-old woman sustained fractures of the distal radius and ulna (Fig. 1) when she was thrown off of a motorcycle. On presentation for treatment several hours following the accident, she was noted to have a “silver-fork” deformity of the right wrist and considerable swelling and ecchymosis. Neurologic examination revealed a complete, low-ulnar nerve palsy. The patient underwent prompt reduction of the fractures, and an anatomic restoration of the distal radius and ulna was achieved. The patient’s neurologic status was monitored and since there was no improvement within 72 hours, the nerve was surgically explored. The ulnar nerve was found to be lacerated at the level of the ulnar fracture with only epineurium on the dorsal aspect of the nerve intact (Fig. 2). The fractures were transfixed with Kirschner wires in a reduced position (Fig. 3) and an epineurial repair of the ulnar nerve was performed after proximal mobilization of the nerve and resection of 3 cm of the contused nerve. The epineurial repair was made through normal-appearing neural tissue (Fig. 4). Six weeks postoperatively the fractures were healed and the patient had an advancing Tinel’s sign indicating early regeneration of the nerve.
Discussion

Vance and Gelberman have shown that the ulnar nerve may be tethered over the proximal fracture fragment of the ulna. The degree of tension on the nerve depends on the amount of dorsal displacement of the distal ulna fragment. The rarity of ulnar nerve palsy when compared with median nerve injury is attributed to the fact that the ulnar nerve is not firmly bound at the wrist as is the median nerve and, therefore, has a greater excursion potential. Unless there is prompt improvement of the palsy following fracture reduction, one may conclude that the nerve has been severely injured and an exploration is indicated. Vance and Gelberman stated that decompression of the ulnar nerve should be performed no later than 36 hours following the injury. An early decompression of a contused nerve may maximize the probability of recovery, and an early repair of a
lacerated nerve would result in a higher grade of motor reinnervation.24 For every six days of delay in repairing a nerve, there is a loss of 1% of maximal motor recovery.5

Conclusion

Ulnar nerve palsy after a closed Colles’ fracture should be observed closely. If despite prompt anatomic reduction of the fracture the neuropathy does not resolve rapidly, i.e., within 36 hours, then exploration is indicated. If the nerve is contused, decompression and lysis will afford a better prognosis for return of function. If the nerve is lacerated, an end-to-end epineurial repair through normal nerve tissue affords the best chance for functional recovery.

References