Chapter 14
Adult Carpal Injuries

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Keywords Wrist • Perilunate • Scaphoid • Triquetrum • Hamate

Overview

Wrist injuries require thorough evaluation of the mechanism of injury, associated injuries, and neurovascular status. It is important to note the presence or absence of a triquetral avulsion, hook of hamate fracture, scaphoid fracture, perilunate injury, or any DISI/VISI deformity. The capitolunate angle, scapholunate angle and Gilula's lines should be evaluated.

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J.D. Hodax et al. (eds.), *The Orthopedic Consult Survival Guide*, DOI 10.1007/978-3-319-52347-7_14,

What to Ask

1. What is the neurovascular exam? Acute carpal tunnel syndrome should be ruled in or out immediately.
2. Are there any other injuries? Large distracting injuries may obscure other findings.
3. What is the mechanism of injury? Low- versus high-energy falls, assault, and crush injuries portend different needs.

What to Request

1. Patient should be immobilized until you arrive.
2. Jewelry be removed, IV access on contralateral arm.
3. Analgesia and/or anxiolytic for comfort.
4. Local anesthetic (e.g., lidocaine) for local or peripheral nerve block.

When to Escalate

1. Open injuries
2. Irreducible fractures/dislocations
3. Acute carpal tunnel syndrome

Imaging

1. AP, oblique, lateral X-rays of the wrist and hand, AP and lateral of the forearm
2. Carpal tunnel view X-ray if concerned about hook of hamate fracture
3. Postreduction X-rays and CT scan if reduction is necessary

Effective Communication

1. Presence or absence of a triquetral avulsion ("bony sprain")
2. Hook of hamate fracture
3. Scaphoid fractures (proximal pole, waist, or distal pole)
4. Greater, lesser, or interior arc perilunate injuries
5. Gilula's lines
6. Scapholunate angle
7. DISI/VISI deformity
8. Capitolunate angle

What to Bring

1. Splint material. Plaster will be necessary if molding or reduction is performed.
2. Finger traps (if a reduction is necessary).

Key Exam Pearls

1. Sensation (median/radial/ulnar nerves, individual digital nerves).
2. Motor by nerve distribution (AIN, PIN, ulnar) and individual digits (FPL/EPL/FDP/FDS/IO).
3. Compartment checks – determine fullness of all ten hand compartments, significant pain on passive stretch of fingers/wrist out of proportion, and capillary refill.
4. Vascular exam – use a Doppler probe if you cannot palpate pulses. An Allen's test is helpful if there is concern about perfusion of the hand.

Reduction

Scaphoid, Triquetrum, and Hamate Injuries (See Fig. 14.1)

No reduction maneuvers are necessary. Scaphoid fractures may be immobilized in short-arm, thumb spica splints. Triquetral avulsion fractures may be splinted temporarily for comfort. Hook of hamate fractures may be acutely casted if the injury was caused by a low-energy mechanism. Hamate body fractures may temporarily be splinted.

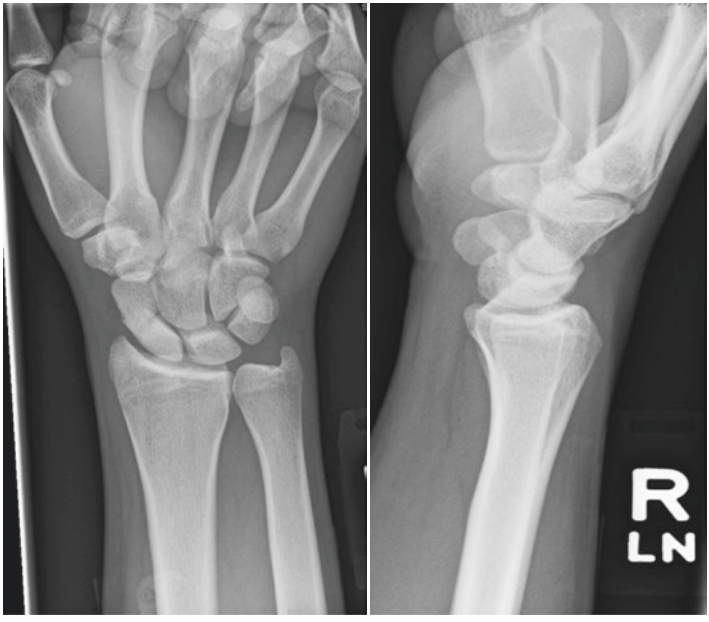

Figure 14.1 Carpal injuries. Note the radiopaque line through the scaphoid (AP and lateral images)

Perilunate Injuries (See Fig. 14.2)

Following the Mayfield classification, there is a spectrum of injuries to the carpus about the lunate. Subtle injuries with widening of the scapholunate interval do not require reduction, though higher-energy injuries in which the lunate dislocates volarly require appropriate and rapid setup and reduction to reduce the risk of acute carpal tunnel syndrome. Patients should be given an anxiolytic (e.g., 10 mg diazepam, if the patient can tolerate this dose) through an IV after a local block (e.g., 10 mL of 1% lidocaine) and hung in finger traps with roughly 10 pounds of weight placed around the distal arm with the elbow flexed at 90°. After at least 10 minutes of fatiguing of the extremity's musculature, reduction of the carpus is performed with wrist extension (exaggeration of the deformity), significant traction, and then flexion of the carpus (with force centered on the dorsal aspect of the capitate) over the dorsal lip of the lunate. A splint should be applied with the wrist in very slight flexion (excessive flexion of 20° or more will increase pressures within the carpal tunnel) and a mold of the dorsal carpus.

Follow-Up

1. Patients with perilunate injuries caused by high-energy mechanisms and/or Mayfield I–IV injuries should be admitted, and serial compartment/neurovascular checks should be performed. Operative intervention will be necessary.
2. Patients with scaphoid and hamate body fractures should follow up within 1 week of injury. Displaced fractures will require surgery.
3. Triquetral avulsion fractures are equivalent to wrist sprains, and patients will be mobilized early after routine office follow-up.

FIGURE 14.2 An acute lunate dislocation.
Note: THE DISRUPTION OF GILULA'S LINES