

EMERGENCY MEDICINE CASES



EPISODE 29: HAND EMERGENCY PEARLS AND PITFALLS WITH DR. ANDREW ARCAND & DR. LAURA TATE

Approach to hand injuries:

Fight Bites & Boxer Fracture

Suspect a “fight bite” when there is a laceration over an MCP joint. **10% of “fight bites” develop septic arthritis;** these injuries need prophylactic antibiotics.

For metacarpal fractures, assess for rotation & compare to contralateral hand:

- 1) phalanxes should point to the scaphoid in a closed fist (image below, left), or
- 2) look head on at the fingertips for rotation of fingernails, or
- 3) looking for scissoring with MCP in flexion (image below, right).

Reduce if rotation is present!



MC # Acceptable angulation

- 40° for 5th MC,
- 30° for 4th MC,
- 20° for 3rd MCP, and
- 10° for 2nd.

Reduce if greater angulation is present (1).

Pearls for Boxer Fracture

Reduction Provide good anesthesia (i.e. ulnar nerve block). Consider using finger-traps for traction. Reduce by pushing dorsally on the distal bone fragment while providing counter pressure on proximal fragment, and immobilize in position of safety (MCP 90° flexion, IP extension).

Early follow-up (<7 days) in clinic to confirm stability is necessary.

Tendon injuries Have a high index of suspicion. Inspect & test function of

tendon against minimal or no resistance. For <50% extensor tendon injury, a splint may be sufficient. Our experts suggest ED physicians may repair extensor tendons cut >50% if ends are easily visible and easily opposed. Use a single horizontal mattress suture and splint the hand. All flexor tendon and all complex extensor tendon injuries should be splinted and seen by plastics in <7 days.

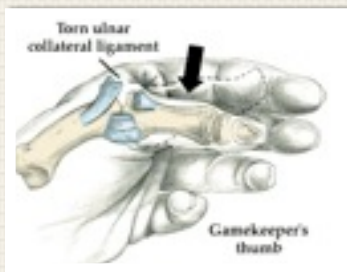
Approach to skin lacerations

Is suturing indicated? Simple hand lacerations <2cm in healthy individuals have the same outcome without sutures (2). *Digital nerve block:* single palmar injection of 2-3mL of 1% xylocaine at the base of the digit just distal to the proximal skin crease. *Irrigation:* use 19g needle with 35cc syringe to irrigate copiously with saline or even tap water (3), under pressure.

Tendon, ligament, & high pressure injection injuries...

Gamekeeper's or Skier's Thumb

Mechanism: Valgus force to abducted thumb. **Exam:** point of maximal tenderness is usually over the volar/ulnar aspect of 1st MCP. Pincer grasp often painful with partial tears. Assess stability by applying radial stress to the distal thumb while immobilizing the proximal thumb and compare to contralateral thumb.



If >30° deviation, assume instability.

Get an X-ray to rule out avulsion # of proximal phalanx.



For a partial injury, a 6-week splint may heal the tendon, but a complete tear requires surgery, so surgical exploration is often necessary for cases where a partial tear cannot be confirmed. All patients should be placed in a thumb spica splint and seen early for follow up (7 days) as nonunion of a complete tear requires extensive reconstruction.

High Pressure Injection

Injury Liquid under high pressure causes severe injury when injected into the hand by:

- 1) direct dissection of tissue planes and tissue ischemia,
- 2) cytotoxicity of materials, and
- 3) possible secondary infections.

These injuries can result in extensive damage and lead to amputation.

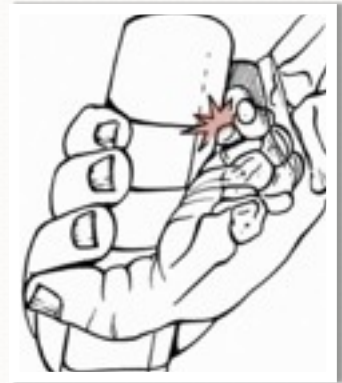
Don't be fooled: these can appear benign but pain, pallor, and edema progress like a hand "compartment syndrome". If history suggests a high pressure injection, contact plastics urgently for definitive exploration and debridement. X-ray can help determine the extent of injury.

Flexor Tenosynovitis

4 cardinal signs (Kanavel signs):

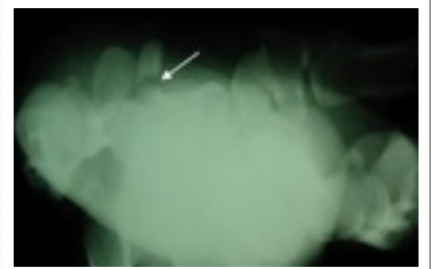
1. Finger held in slight flexion,
2. Fusiform swelling of the digit,
3. Tender along tendon sheath, &
4. Pain with passive extension.

Time is key because adhesions can form and permanently disable the digit. These must be urgently evaluated by plastic surgery, treated with IV antibiotics, and often admitted for either close monitoring, or urgent surgical irrigation and drainage. Start antibiotics, splint and elevate the hand, and refer to plastics.



Hook of Hamate Fracture:

Mechanism - either FOOSH, or an impact of a club or racket forced into the palm. Hook of the hamate fractures may not be seen on usual Xray views of the hand. The "carpal view" (supinated lateral view) should be ordered if suspicious about this fracture, and/or if pain is felt over the hypothenar eminence.



Not all hamate fractures appear on Xray. Some need further imaging (CT), and nonunion is very common. Excision of the fracture fragment is often necessary if there is nonunion (4).

If a fracture is seen, immobilize the hand (in a volar slab, with MCP joints in flexion) and refer for follow-up within 4 weeks.

Hand emergencies, continued:

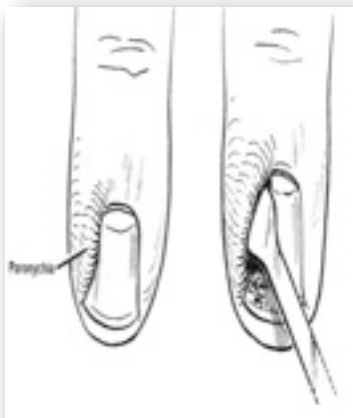
Paronychia

Paronychia (nail edge infections, image at right) should be managed depending on the extent of the infection. A small infection without an abscess may improve with soaking the finger, and oral antibiotics.

However, if an abscess has formed, it needs blunt dissection with a surgical blade, elevation of the lateral nail fold (image at right) and drainage of the sulcus between the lateral nail plate and the lateral epithelium.

Irrigate copiously, and instruct the patient to soak the finger to keep the abscess open, or place a wick.

If the abscess tracks under the nail, consider wedge resection of the nail plate, or nail plate removal if the entire nail plate is involved.



Felon Compartments of the volar skin may form abscesses which need careful and thorough surgical decompression. See image (right). If urgent referral to a hand surgeon is not available, these must be managed in the ED. Cut and detach septae along whole length of distal phalanx nearest to the abscess site, releasing and irrigating very thoroughly.

Avoid making incisions across the lateral aspect, to avoid injuring the digital nerve. After releasing all septae, swab, pack and treat with IV antibiotics, splinting, and elevation. Ensure urgent follow-up.



TIPS FOR HAND INJURIES

When considering when to remove sutures in the hand, **leave sutures that are over areas of tension** (i.e. over a joint) **for longer** (at least 12 days) so they heal completely.

If controlling bleeding is an issue, **do NOT clamp any digital arteries**, as the digital nerve is very nearby and hard to visualize. Use pressure, limited tourniquet and elevation to control bleeding safely.

Prophylactic antibiotics are indicated for for all animal bites to the hand, and for certain complex injuries (crush wounds, wounds over a joint, or for immune-compromised patients).

If referring a hand abscess to a clinic, consider swabbing the drained fluid so MRSA status can be determined.

Immobilizing the PIP joint in extension can stiffen the collateral ligaments causing permanent disability, **so don't splint PIP joint for greater than 1-2 weeks unless necessary**, and if splinting, ensure an early referral time. (within 1-2 weeks).

References:

- 1) Friedrich JB, et al. *Plast Reconstr Surg*. 2010;126:2205.
- 2) Quinn J. *BMJ* 2002;325:299.
- 3) Valente, JH. *Ann Emerg Med*. 2003;41:609.
- 4) Smith P et al. *J Hand Surg Am*. 1988;13:612.



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