Orthopedics Lends a Hand in Management of Hand and Upper Extremity Injury

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Objectives

At the end of this session participants should be able to

- Recognize common traumatic injuries of the hand and wrist
- Appropriately evaluate these conditions
- Initiate or provide nonoperative treatment
- Recognize which injuries need to be referred for specialty care
Introduction

- Simple and straightforward hand trauma can frequently be handled by non-surgically trained physicians
- Often the 1\textsuperscript{st} point of contact
- Often better/easier for patient
- Don’t want to miss a “surgical” injury
Palmar digital lacerations

What can be cut?
Lacerations-supraficial

Flexor tendons
Nerves or vessels
How do you assess?
Assessment

- Vascularity - color, capillary refill

Pressure is applied to nail bed until it turns white

Blood returned to tissue
Assessment

- Sensation
  - Does this feel sharp? How many points? Does this feel the same as your other fingers?
Don’t

- Try to locally explore the wound
- Ask them to “wiggle” their finger
- Ask, “can you feel this?”
- Numb them up before doing sensory exam!
- Blow off a small laceration b/c “couldn’t possibly have cut anything deep”
Do…

- Do digital block after sensory exam if necessary to complete tendon exam
- Wash with antiseptic/skin cleanser (like Hibiclens)
- Irrigate wound with sterile Normal Saline
- Close with nylon (or monofilament) suture
- Splint for comfort
  - Refer acutely (not to ER) to surgical colleague
  - Start ROM and advance activity in 1-14 days if referral not necessary
Digital block
Extensor Tendons

- Very broad - may have partial tendon laceration even if able to extend
  - May be able to see in wound
For a tendon laceration over the dorsum of the hand... could a person extend their IP joints even if an extensor tendon was cut?
Partial extension by *junctura*
For a tendon laceration over the dorsum of the hand... could a person extend their IP joints even if an extensor tendon was cut?

Yes... remember that the intrinsic muscles/tendons go volar to MCP joint and dorsal to IP joints

--firing intrinsics makes MCPs flex... but IP’s extend
Don’t....

- Get fooled by partial extension or extension of wrong joint
- Miss “fight bite”
Do...

- Anesthetize to get “good” exam
- Check for full/strong extension
- Immobilize in extension suspected partial tendon injuries (for 4-6 weeks)
- Clean wound and close
- Refer suspected “significant” tendon lacerations
Twisting, jamming, crushing

Present with swelling, pain, possible deformity
What are you worried about?
What are you worried about?

- Think bone, joint, ligaments (dislocation or sprains)
- Closed tendon inj can give deformity
- Can have “soft tissue injury” (contusion)
How do you assess?
How do you assess?

- Start w/ xray
- Looking for fractures
….Or both
Management

- Check for open wounds
- Check neurovascular status
- Not all fractures need formal treatment
  - Tuft fractures
  - Nondisplaced (linear)
  - Avulsion fractures
Stable:
- No or little displacement
- Isolated
- Intact soft tissue

Unstable:
- Rotated spiral fxs
- Comminuted
- Some short oblique fxs
- Displaced articular

Functional alignment…
does not necessarily mean anatomic alignment
Nail bed injuries
Treatment objectives

- Relieve pain
- Normal-appearing/functioning nail
  - Few reconstructive options later
- Tuft fracture treated symptomatically–base treatment on nail bed injury
  - Of note... significantly displacement will be associated with soft tissue injury
Spectrum of injuries

- Contained hematoma
- Nail avulsions
- Complex injuries

refer!
Trephination

Figure 1. A: Lightly twist the point of an 18-gauge needle back and forth between the index finger and the thumb until a small amount of blood appears at the tip of the needle. B: Normal appearance of a nail after decompression of a subungual hematoma.

-- finger splint for comfort!!
Not the same thing....
Nondisplaced

3-4 weeks

VCU

Virginia Commonwealth University
Other fractures...need treatment... but not necessarily a hand surgeon

- Minimally displaced boxer’s fractures
- Most Mallet fracture
- Small avulsion fractures
Boxer’s fractures
- Less than 50% joint involvement
- Splint full time for 6 weeks (like soft tissue Mallet)

More than 50% joint involvement
Joint is subluxed
Refer!

Henry and Ingari, “Mallet Finger” In Essential Orthopaedics 2009
Soft tissue Mallet

- Acute loss of ability to extend finger tip
- Usually after minor trauma (neg x-rays)
Treatment- 6 wks constant ext splinting

Can pin if unable to wear splint (pin will act as internal splint)
Volar plate avulsion fractures

- Fleck bone pulls off with volar plate
- Really a sprain
Displaced, Unstable or worrisome...
Dislocations/sprains

- Reduced dislocation is now a sprain
- A sprain may have been a dislocation that popped back into place
  - Localized swelling, stiffness, point tender (over lig)
PIPs are very stable

From Slade, J. Dislocations and Ligament Injuries of the Small Joints of the Hand.
ASSH Comprehensive Hand Review
PIP Dorsal Dislocation

- Hyperextension
  - Volar plate ruptures
  - Collateral ligaments split

Eaton and Littler 1976
Lateral dislocations

- One collateral and volar plate rupture
  - >20 deg deviation
- Soft tissue can get interposed

From Slade, J. Dislocations and Ligament Injuries of the Small Joints of the Hand. ASSH Comprehensive Hand Review
Volar Dislocation

- Rare
- Associated tendon injury
- Hard to reduce

Like a Chinese finger trap

Treatment

- Pop it back (gentle traction)
- Check stability (under block)
  - Active ROM, passive stability
- If stable - protect injured structure and early mobilization
  - Dorsal splint (30deg), buddy tape (6wks)
- If unstable, can’t reduce, suspected tendon injury....refer

*Prolonged immobilization is bad!*
Finger sprains

- Hurt for a long time!
  - Often 3 months
  - May be permanently enlarged
  - Beware of flexion contracture
Gamekeepers thumb...usually need to be fixed
Assess like other sprains... xray and test stability
If stable....
The wrist

- Approach is fairly analogous to hand/fingers
What are you worried about?
What are you worried about?

- Fractures, dislocations, sprains
  - Patient may be able to localize pain and you can look for focal swelling and point tenderness to fine-tune your focus
Assess with x-rays first
Identified fracture

- Most should be further evaluated by specialist
  - Splint and refer

Except...
Triquetral avulsion fx...
Treat like a sprain
Significant ligament injuries

“suspect scapholunate ligament injury”…
“recommend MRI”

Just refer…
Don’t waste time or money
What if initial films are normal? Can there still be a significant injury?

- Yes---can have occult scaphoid fracture or can have a scapholunate ligament tear
  - Look for tenderness (or swelling) over snuff box and over scapholunate interval
Get x-rays with dedicated scaphoid view and stress view
MRI– if worried about occult scaphoid fracture

- If still not clear but suspect occult fracture (regular xrays should pick up 97% of fractures) or ligament injury
If “sprain” ... treat symptomatically
Thank you

- If in doubt... talk to your hand surgery colleagues
- Many hand injuries can be and should be treated by primary care docs!