Can’t Miss Hand and Wrist Injuries in the Urgent Care

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Disclosures

• Nothing to disclose

Objectives

• Understand why certain hand and wrist injuries should not be missed in the urgent care setting.
• Recognize when these injuries are present based on history, physical exam, and imaging
• Manage these injuries appropriately so to minimize long term adverse effects of these injuries
Why is this important?

• Upper and lower injuries are common in the Urgent Care and acute care setting
• In general we are well trained to identify and manage injuries and fractures of the distal radius/ulna, elbow, and shoulder
• Delay in treatment can cause irreversible changes

What We’re Not Talking About Today

Examination of the Wrist and Hand

• Inspection
  • Skin - discoloration, erythema (cellulitis)
  • Swelling
  • Muscle atrophy
  • Deformity or asymmetry
• Palpation
  • Masses (ganglions, nodules) Wrist masses (ganglions, nodules)
  • Temperature - warm vs cold
  • Tenderness
  • Clicking or snapping (tendonitis)
  • Joint effusion (infection, inflammation, trauma)
• Range of Motion - active and passive
• Neurovascular Exam
  • Sensation
  • Motor
  • Vascular
What Injuries Will We Discuss

- Scaphoid Fracture
- Ulnar Collateral Ligament Injury
- Bennett’s Fracture
- Mallet Finger
- Volar Plate Avulsion Injury
- Flexor Digitorum Profundus Avulsion
- Carpal Dislocations
Scaphoid Fracture

Anatomy

- Links the distal and proximal carpal bones
- Attached to proximal carpal bones by volar ligaments: radioscaphoid, scapholunate, and scaphocapitate
- Prevents excessive extension of the wrist
- Blood supply from the radial artery which innervates the distal tuberosity; proximal pole is not innervated

Scaphoid Blood Supply
Why is it important to diagnose?

- Increased risk of nonunion of middle and proximal fractures
- Avascular necrosis of proximal fracture fragment

Mechanism of Injury/Presentation

- Longitudinal axial load injuries
- Falling on the extended wrist
- Typical mechanism + wrist pain
- Wrist ROM slightly reduced with pain at extremes of flexion/extension
- Point tenderness of scaphoid

Imaging

- PA and lateral wrist
- Scaphoid View
- May or may not see fracture
Treatment

- Thumb spica cast/splint
  - Nondisplaced – short arm
  - Displaced – long arm
- Follow up in 2 weeks if suspect fracture and in 1-2 weeks if non-displaced
- Referral to Orthopedic Surgery if proximal, displaced, or angulated
- If unable to follow up with Ortho Surgery in 2 weeks then repeat imaging in 7-10 day
- Consider CT, MRI, or bone scan if fracture not present but patient continues to have point tenderness

Ulnar Collateral Ligament Injury (Gamekeeper’s/Skier’s Thumb)

- The thumb is critical in pinching and grasping and accounts for 50% of hand function
- UCL is essential for stabilization of the Metacarpophalangeal (MCP) joint of the thumb when it is adducting against the other digits while gripping.
- Once an overuse injury found in hunters who broke the necks of trapped game
- More commonly seen athletes (particularly skiers) due to sudden abduction and/or hyperextension of the UCL of the thumb MCP

Taken from: Fracture Management for Primary Care, 3rd Edition
Why is it important to diagnose?

- Can result in loss of ability to pinch and decrease in grip strength.
- Can lead to early osteoarthritis of the joint

Anatomy

- MCP of the thumb is stabilized by the UCL and RCL
- The UCL originates from the metacarpal head and inserts on the lateral tubercle of the proximal phalanx
- It is covered by the aponeurosis of the adductor pollicis
  - Can be trapped between the ends of the torn ligaments if complete rupture
Mechanism of Injury

- Abduction stress to the MCP along with hyperextension
- Can occur with fall on outstretched hand

Presentation and Physical Exam

- Typical mechanism of injury
- Pain at the ulnar aspect of the MCP worsened with abduction or extension of the thumb
- Tenderness at ulnar aspect of MCP into the web space
- Swelling and ecchymosis
- Decreased pinch strength
- Stress testing AFTER imaging
  - Stabilize 1st metacarpal, flex MCP 30 degrees and apply valgus/radial stress and compare to non-injured thumb
  - Incomplete Rupture = <30 degrees of deviation
  - Complete rupture = 30 degrees of deviation
Imaging

- Obtain AP, Lateral, and Oblique radiographs of the thumb
  - Indicated in all patients with significant thumb sprain
  - Rule out concomitant injuries such as scaphoid fracture and Bennett’s fracture
  - 40-50% of time will see avulsion fracture at the ulnar base of the proximal phalanx

Treatment

- Thumb spica splint for approximately 4-6 weeks
- Nondisplaced avulsion fractures typical do well with nonoperative treatment
- Refer to Ortho Surgery if fractured displaced >2mm, >20% of articular surface involved, complete tear of UCL, concern for Stener lesion, symptomatic chronic injury
  - Best if repaired within 2-3 weeks.
Bennett’s Fracture

- Fractures of the first metacarpal tend to occur at or near the base of the metacarpal
- Most common of the four first metacarpal fracture (Type I Intraarticular fracture)

Why is it important to diagnose?

- Delayed treatment or lack of treatment can:
  - Negatively impact hand function secondary to residual angulation resulting in loss of abduction,
  - Result in painful arthritis
  - Lead to malunion which may cause recurrent or chronic subluxation at the CMC

Anatomy

- The 1st Metacarpal is attached to the trapezium at the first carpometacarpal joint by small volar-ulnar ligaments
- The radial side is able to sublux proximally and radially due to abductor pollicis longus tendon
Mechanism of Injury

- Axial load against a partially flexed thumb
  - Common after a fist fight
- Hyperabduction or hyperflexion of the thumb
  - FOOSH injury

Presentation and Physical Exam

- Pain and swelling of the thumb with limited ROM after a fight or fall
- Pain and swelling over the dorsum of the thumb
- Limited ROM at the CMC joint
- Be careful not to miss concomitant injuries such as scaphoid fractures or UCL injuries

Imaging

- Best seen on AP view
- Small, triangular fragment at the first CMC with proximal displacement of the metacarpal
- Can be subtle, may only see disruption or angulation of cortex
Treatment

- Thumb Spica Splint
- Referral to Ortho Surgery
  - Typically percutaneous pin fixation or open fixation

Mallet Finger

- Also known as Baseball finger or Basketball finger
- Most common closed tendon injury of the finger
- Most commonly involves the 3rd digit followed by the 4th/2nd digits and then the 5th and 1st digit
Why is it important to diagnose?

- Failure to recognize, treat within adequate time frame, or to treat appropriately can result in permanent defect

Anatomy/Mechanism of Injury

- Avulsion of the extensor tendon from the dorsum of the base of the distal phalanx
  - With or without avulsion
- Due to forced flexion of the extended fingertip

Presentation and Physical Exam

- Patient reports: 1) Injury consistent with forced flexion of the extended DIP and 2) Pain at dorsum of DIP
- Tenderness and swelling at dorsum of DIP
- Unable to actively extend at the DIP
- May have varying degrees of extension loss
  - Partial tear: 5-20 degree deformity with weak extension
  - Complete rupture: 50-60 degree deformity with total loss of active extension
Imaging

• Best seen on Lateral and Oblique views
• May seen only flexion of distal phalanx

Treatment

• Splint in hyperextension for 6-8 weeks
  • Stack Splint, dorsal padded aluminum splint, or volar splint
• Follow up in 2 weeks - PCP vs Ortho/Hand Surgery
• Any drop into flexion resets the 6-8 week splint period
Volar Plate Avulsion

- The Proximal Interphalangeal (PIP) joint is a hinge joint capable of the greatest ROM in the hand
- Allows flexion and extension from 0-110 degrees
- Prone to injury, deformity, pain, and functional deficit
- Poor tolerance for prolonged immobilization
- Stabilized by the Volar Plate
- Mechanism of Injury
Why is it important to diagnose?

- Failure to recognize and treat can result in disabling pain, stiffness/loss of function, deformity, and early osteoarthritis.

Anatomy

- PIP is a hinge joint and allows flexion and extension.
- Stabilized by the Volar Plate:
  - Thick connective tissue/fibrous structure
  - Bridges the volar aspect of the PIP joint
  - Prevents hyperextension of the PIP.

Mechanism of Injury

- Hyperextension of the PIP joint
- Can occur with dorsal subluxation or dislocation of the middle phalanx
- Common injury among athletes - basketball, football...
Presentation and Physical Exam

- Pt reports hyperextension injury
- Pain and swelling at the PIP joint
- Decreased ROM

- Maximum tenderness at the volar aspect of the PIP
- Test for hyperextension laxity to passive stretch
  - Digital block helpful
- Any tenderness over the radial/ulnar collateral ligaments should lead to stressing the joint laterally

Imaging

- AP and Lateral views of involved finger
  - Lateral view is the main view
- Small avulsion fracture of the volar lip at the base of the middle phalanx
- If dorsal PIP dislocation noted be sure to assess for volar plate fracture
  - Fracture predisposes the PIP to volar instability causing middle phalanx displacement dorsally

Treatment

- Nondisplaced without subluxation - buddy taping or dorsal finger splint with PIP in slight flexion until pain resolves
  - ROM exercises after 1 week
  - Protective buddy taping for athletes for 6-8 weeks after injury
  - May remain swollen for 6-12 months and may have permanent enlargement
- Dorsal dislocation - reduce (gentle traction with flexion) and immobilize with dorsal block splint with flexion of 45-60 degrees
  - Obtain post reduction films and repeat weekly
  - Resplit weekly and reduce flexion by 10-15 degrees each week
  - After 4 weeks should be fully extended and ROM exercises started
  - Refer to Ortho Surgery if middle phalanx remains subluxed after reduction of if fracture involves ore than 40% of the articular surface
Dorsal Extension Block Splint

Flexor Digitorum Profundus Avulsion (Jersey Finger)

- Tendon responsible for flexion at the DIP
- Commonly occurs in rugby and football players
- Ring finger consist of 75% of FDP injuries
- 3 Types: I, II, III

Why is it important to diagnose?

- Frequently presents as a “jammed finger” and goes unrecognized as active flexion through the PIP and MCP are intact.
- Prompt diagnosis and treatment is important as only reattachment can restore active flexion at the DIP.
- The earlier the surgery, the more likely it is to be successful.
Anatomy

- The FDP originates at the forearm and travels through the carpal tunnel
- Along the digit it travels through a series of pulleys and inserts into the palmar based of the distal phalanx

Mechanism of Injury

- Forced extension of the digit while the DIP is actively held in flexion resulting in avulsion of the FDP tendon from the volar based of the distal phalanx

Presentation/Physical Exam

- Swollen bruised distal digit with decrease ROM at the DIP only
- Inability to actively flex the DIP with stabilization of the PIP in extension
- Site of maximal tenderness can be clue to where FDP is retracted to
Imaging

- Helpful but not diagnostic.
- Usually normal except for possibly avulsion fracture.

Types of FDP Avulsion Injuries and Treatment

- **Type I**
  - Tendon retracted to palm. Both vinculum breve and longum are ruptured. The palm is tender.
  - Treatment: Referral for surgery, should take place within 7-10 days otherwise retraction and scarring may be irreversible.

Taken from: Fracture Management for Primary Care, 3rd Edition

- **Type II**
  - Most common. Tendon is avulsed and retracted to level of PIP which is tender and swollen.
  - Treatment: Referral for surgery, can be fixed as far as 2-3 months post injury.

Taken from: Fracture Management for Primary Care, 3rd Edition
Types of FDP Avulsion Injuries and Treatment

- **Type III**
  - Due to volar avulsion fracture of the distal phalanx causing tendon to be held at level of A-4 pulley. Both vincula are intact and blood supply to tendon is preserved.
  - Treatment: Referral for surgery, can be fixed as far as 2-3 months post injury.

In other words...

- Splint (with DIP and PIP in slight flexion) and Refer

Carpal Dislocations

- Sapholunate Dislocation
- Perilunate Dislocation
References

- Poon AKC. Easily missed hand and wrist injuries. The Hong Kong Medical Diary 2010;15: 5-8.

Questions?
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Thank You