Common Hand Injuries in Sports: Pitfalls to Avoid and Return to Play Considerations

Elizabeth I. Langhammer, MD
Towson Orthopaedic Associates
University of Maryland St. Joseph Medical Center
Disclosures

• I have no financial disclosures.
• I don’t have all the answers.
My Most Recent Dilemma...

• 14 year old RHD boy, sophomore lacrosse player
• Fell snowboarding MLK weekend, 1/19/19
3 Weeks Post-Injury

Transitioned from cast to splint
5 Weeks Post-Injury

Returned for lacrosse tryouts, fell...
2 Weeks Post-Op

Placed into short arm cast
6 Weeks Post-Op

Cast off... When can he go back?!?
Objectives

• Review common hand and wrist injuries in athletes
• Understand return to play considerations after hand and wrist injuries for different sports and levels.
General Return to Play Guidelines

• Age and competition level dependent
  – High school different from elementary school
• Sport and position dependent
  – Quarterback demands different from linebacker
  – Ability to play protected (rugby)
  – Need for unrestricted use of hands
• For unprotected return to play, patient should be:
  – Pain-free
  – Full range of motion
  – Grip strength 80% of contralateral side

Radial Sided Pain

Scaphoid: Do not miss!!!
Scaphoid Fracture

- Most common carpal fracture
- Hyperextension, pronation, radial deviation
- Can be subtle
- Radiographs: scaphoid view
- If in doubt, immobilize in thumb spica, repeat imaging in 1-2 weeks
- Advanced imaging
  - MRI most sensitive
  - CT cheaper, better for displacement
- Consider surgery for displaced waist, proximal pole
- Return to play considerations
  - handedness
  - ability to play while immobilized

Images: Orthoinfo.aaos.org
Radial Sided Pain

Scapholunate ligament or wrist sprain?
Wrist Sprains vs. Scapholunate Tears

- Spectrum of wrist instability—hyperextension, ulnar deviation, supination
- Possible SL—pain in loaded, extended wrist
- Beware the sprain that doesn’t improve rapidly
- Radiographs: clenched fist
- Advanced imaging: MRI
- Sprains, partial tears: immobilization
- Complete tears: surgery
- Return to play depends on sport, hand dexterity needed, ability to play immobilized

Images: Orthobullets.com, Radiopedia.org
Radial Sided Pain

Tendonitis: De Quervain’s, Intersection Syndrome, FCR
Radial Tendinopathies

- Overuse, repetitive movements
- Diagnosis: physical exam
- De Quervain’s: 1st dorsal compartment
  - Most common, repetitive thumb motion
- Intersection Syndrome: 1st/2nd dorsal compartment
  - Friction of extensors crossing, rowers
- FCR Tendonitis
  - Repetitive flexion, volleyball, waterpolo
- Treatment
  - Ice, stretching, NSAIDs, splinting
  - Cortisone injections into tendon sheaths
  - Surgical release of compartments/sheath
- Return to play: as symptoms allow

Images: Duke Anatomy
Ulnar Sided Pain

Dorsal/Ulnar: ECU tendonitis, TFCC, ulnar impaction
ECU Injury

- Repetitive flexion, supination, ulnar deviation: golf, hockey, racquet sports
- Spectrum: tendonitis, subluxation, dislocation, rupture
- Pain in ECU groove, snapping with supination/ulnar deviation
- Advanced imaging: ultrasound, MRI (TFCC)
- Tendonitis
  - Rest, ice, immobilization, PT, +/- cortisone injections
  - RTP as symptoms dictate
- Subluxation/Dislocation
  - Acutely can immobilize in long arm splint in pronation
  - Often requires surgery: ECU subsheath repair vs. reconstruction
    - Can be performed in off-season
  - RTP: Strengthening at 3 months post op, sport-specific therapy once 80% strength contralateral side—may be 5-9 months

Images: Radsource.us
Ulnar Impaction

- Ulnar positive wrist $\rightarrow$ increased forces
- Insidious pain: pronation, grip, ulnar deviation, loading (racquet sports)
- Radiographs: grip PA
- MRI: lunate/TFCC
- Conservative treatment: NSAIDs, immobilization, cortisone
- Operative: elective TFCC debridement, ulnar shortening osteotomy
  - RTP after osteotomy healing, ~3 months
TFCC

- Ulnar pain with grip and rotation, clicking with rotation
- Baseball, racquet sports, golf
- Athletic injuries tend to be repetitive microtrauma rather than acute
- Radiographs normal, MRI for diagnosis
- Conservative treatment (3 months): immobilization, NSAIDs, +/- cortisone
- Operative treatment out of season if conservative treatment fails: arthroscopic debridement vs. repair
  - RTP rapid with debridement only, ~3 months with repair

Image: Joseph Schreiber, MD
Ulnar Sided Pain

Volar Ulnar: Hamate Hook Fracture, FCU tendonitis
Hamate Hook Fracture

- Direct blow of golf club to ground, checking swing in baseball
- Hypothenar pain with grip
- May have ulnar nerve symptoms
- Radiographs: carpal tunnel view
- Advanced imaging: CT
- Treatment:
  - Acute: immobilization
  - Sub-acute (more typical): hamate hook excision
- RTP 6 weeks post-op

Images: Radiopedia.org, Radiologykey.com
Hand and Finger Injuries

- Central slip injury
- Sagittal band injury
- Fractures/Dislocations
- Jersey/Mallet Finger
- Pulley rupture (volar)
- Thumb collateral ligaments
Thumb Collateral Ligament Injuries

• Abduction/Adduction moment at thumb MP joint
• Skiing, football, basketball
• Stress exam: thumb extended, 30° of flexion
  – Laxity of 30°, 15° side to side difference, no endpoint: suggest high grade injury
• Radiographs: rule out bony involvement, MRI confirms
• Partial tears: cast/splint 4-6 weeks (ability to play dependent on sport)
• Complete tear: repair
  – Often done out of season in high level athletes (Werner et al, JASM, 2016)
  – Early RTP if able to be protected
  – Strengthening at 6 weeks, unprotected RTP around 8 weeks

Pulley Ruptures

- Rock climbers
- Typically involve A2 or A4 pulleys, usually middle or ring finger
- History: pop
- Pain over volar finger
- Advanced imaging: MRI/ultrasound
- Isolated pulley rupture: pulley ring or taping
  - Return to sports after 6-12 weeks
- Multiple pulley ruptures/failed non-operative treatment: pulley reconstruction
  - High loading not allowed until 6 months post-op

Images: Emily Altman, DPT, Scott Wolfe, MD
Sagittal Band Rupture

- “Boxer’s knuckle” – leads to subluxation of EDC tendon ulnarly
- May be unable to actively extend finger (but can maintain extension)
- Can be mistaken for trigger finger due to catching
- Most common in central digits
- Clinical diagnosis
  - Reducible, acute injury: immobilize 6 weeks with MP in extension, IP joints free (versus relative motion splint)
  - Chronic injury, not reducible: sagittal band repair vs. reconstruction
  - Strengthening at 10 weeks post-op, return to boxing 5-6 months

Images: Orficast
Central Slip Injury

- Volar dislocations or forced flexion at PIP
- Basketball, volleyball
- PIP joint flexion, DIP hyperextension → boutonniere deformity
- Radiographs: look for bony avulsion
- Nearly all treated conservatively—6 weeks of splinting with PIP in extension, DIP free
- RTP depends on ability to play in splint, demands of sport on finger
Mallet Finger

- Jamming injury: closed rupture of extensor tendon at insertion
- Long finger most common
- May be painless so present delayed
- Extensor lag at DIP joint
- Radiographs: bony or soft tissue
Mallet Finger: Treatment

• Soft tissue only or bony with concentric joint:
  – Full time mallet splinting x 8 weeks
  – After removal, night splinting x 4 weeks
  – Slight hyperextension across DIP
  – Must be religious about wearing splint!

• RTP depends on finger demands, ability to wear splint during play
Mallet Finger: Treatment

• **Bony without concentric joint:**
  - Extension block pinning
  - Leave pins in 6-8 weeks
  - RTP after pins removed

• **Can also pin soft tissue mallet to allow earlier return to activities (eg surgeons)**
Jersey Finger

- Closed rupture of FDP
- Typically tugging or lifting: football, rugby
- Ecchymosis, unable to flex at DIP joint
- Radiographs: may have associated bony avulsion
Jersey Finger: Treatment

- Operative: repair of FDP tendon
- The sooner the better
- No resistive activity x 6 weeks, RTP ~3 months

Images: AO Surgery Foundation
Hand Fractures and Dislocations

- Exam: Look closely for angular/rotational malalignment
- Sometimes subtle fractures can lead to large deformities
- Radiographs: best if of smallest available area (eg finger if phalanx fracture)
Phalangeal Fractures

- Malrotation of digits poorly tolerated
- Extension at fracture can lead to loss of motion
- Most stable, minimally displaced fractures can be treated with splinting/buddy taping
  - Minimal shortening
  - Less than 10-15° angulation
  - Extra-articular
- Operative treatment
  - CRPP vs. ORIF
  - Pins typically removed at 3-4 weeks, RTP unprotected 6-8 weeks
Metacarpal Fractures

- Neck>>shaft>>base
- Shaft fractures tend to be held in place by intra-metacarpal ligaments
- Apex dorsal deformity
- Increasing angulation tolerated from radial to ulnar, more angulation tolerable in neck than shaft
- Shortening >2 mm poorly tolerated
- Assess rotational deformity: all fingers should point to scaphoid
- Many can be treated with immobilization in cast or brace x 6 weeks
- Operative:
  - Rotational malalignment
  - Unacceptable flexion
  - Intra-articular step off > 1 mm
  - Multiple fractures
  - ORIF, percutaneous pinning, intramedullary screw
  - RTP depends on sport and fixation type, typically 6-8 weeks
PIP Dislocation

• Dorsal most common
  – Mechanism: PIP joint hyperextension with longitudinal compression
  – Injury to collateral ligaments and volar plate

• Volar more rare
  – Rupture of central slip

• Can be lateral
  – Rupture of 1 collateral ligament and volar plate
PIP Dislocation: Diagnosis

- Careful history → may have spontaneously reduced on field
- Physical examination: obvious deformity
- Carefully observe direction of displacement → determines management!
- Described by where distal segment is relative to proximal segment
- Look for associated fractures (typically volar lip if dorsal)
PIP Dislocation: Treatment

• Dorsal
  – Reduce, check stability through full ROM
  – Longitudinal traction, hyperextend, palmar force on P2
  – If stable, buddy tape and begin ROM
    • Typically can RTP as symptoms allow, 3-4 weeks
  – If unstable, dorsal block (alumifoam splint across PIP) at 10° more than stable angle
    • Weekly increase extension
  – Make sure concentric reduction

• Volar
  – Reduce, splint in full extension (central slip injury → treat for that)

• Lateral
  – Reduce, buddy tape
  – RTP 3-4 weeks, as symptoms allow
PIP Dislocation: Treatment

- If irreducible, may be entrapped volar plate
- If concentric reduction not possible/large bony joint fragment, will need surgery

Images: AO Surgery Foundation
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Back to Case... 8 Weeks Post Op

Full ROM, grip strength 100% contralateral... back to lacrosse.
References