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

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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

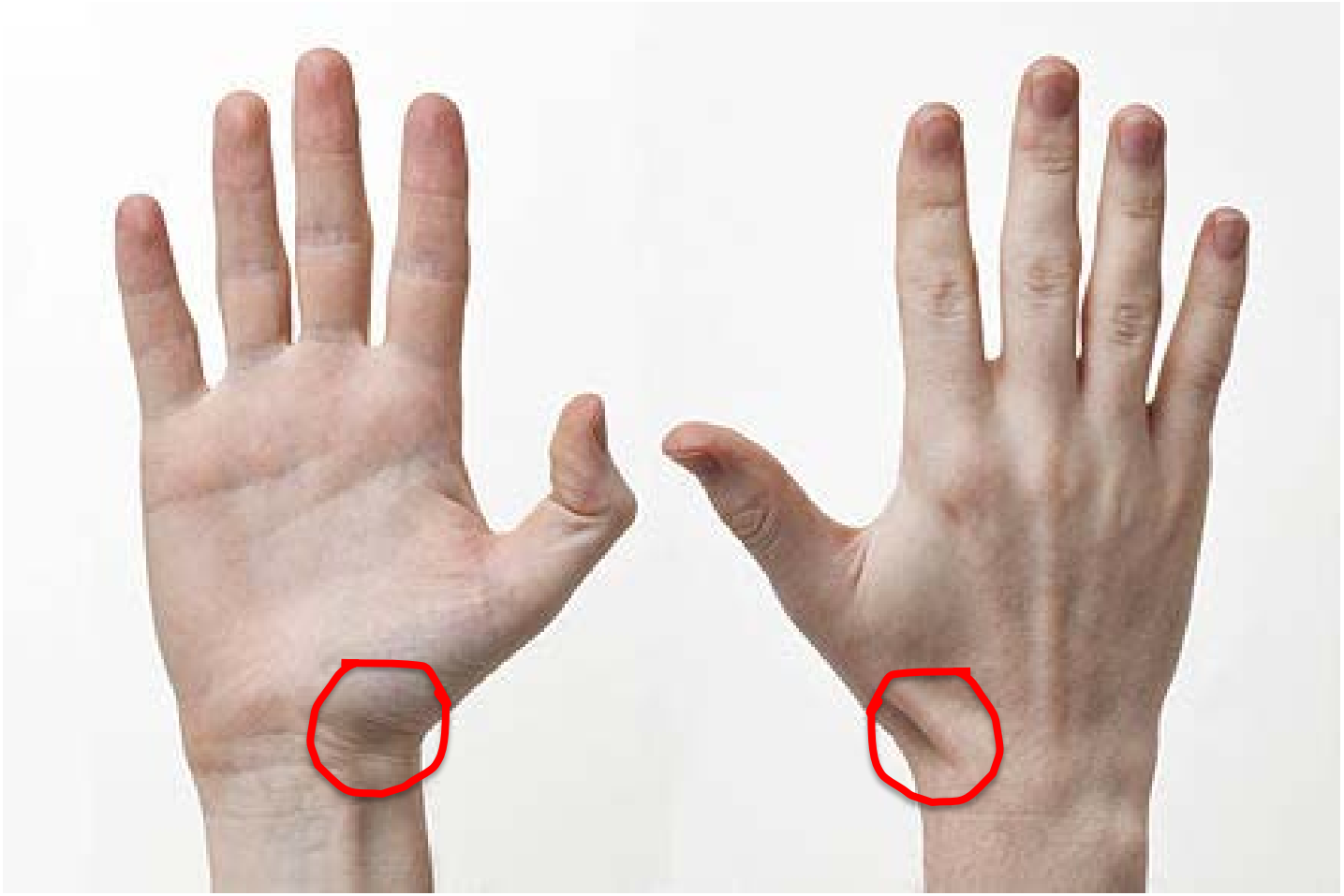
- Review common hand and wrist injuries in athletes
- Understand return to play considerations after hand and wrist injuries for different sports and levels.

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

Henn and Wolfe, Sports Med Arthrosc Review, 2014

Radial Sided Pain



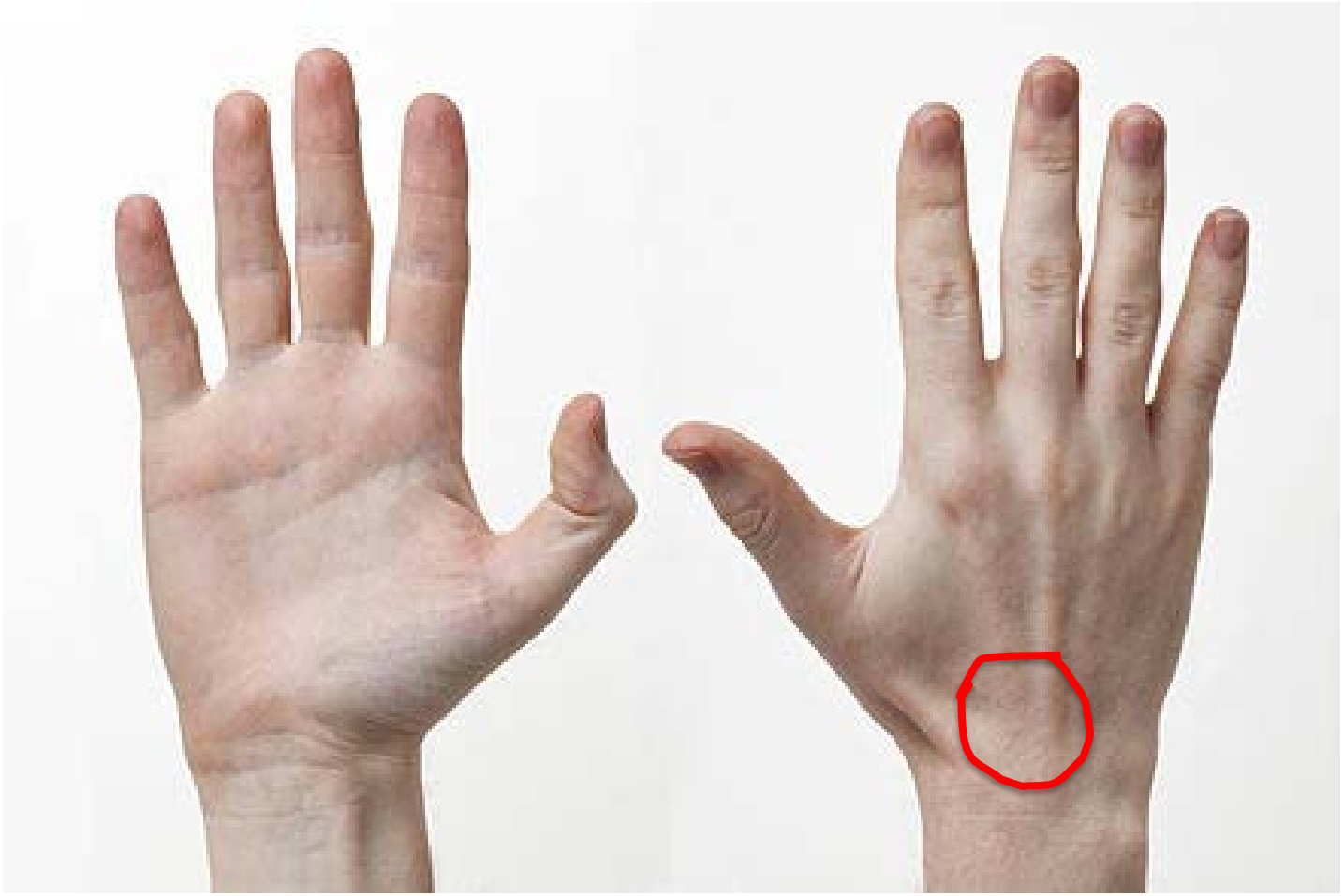
Scaphoid: Do not miss!!!

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

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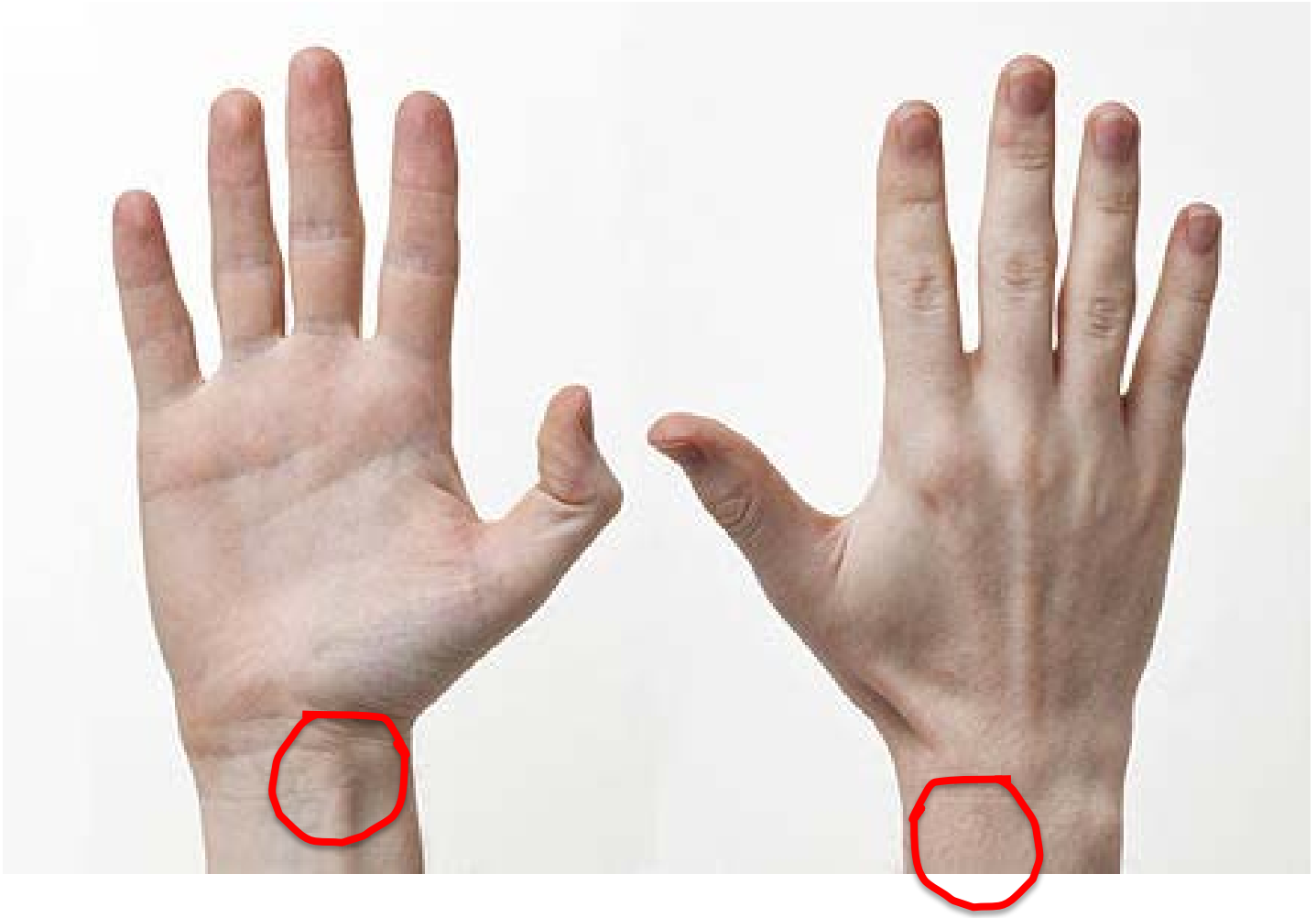
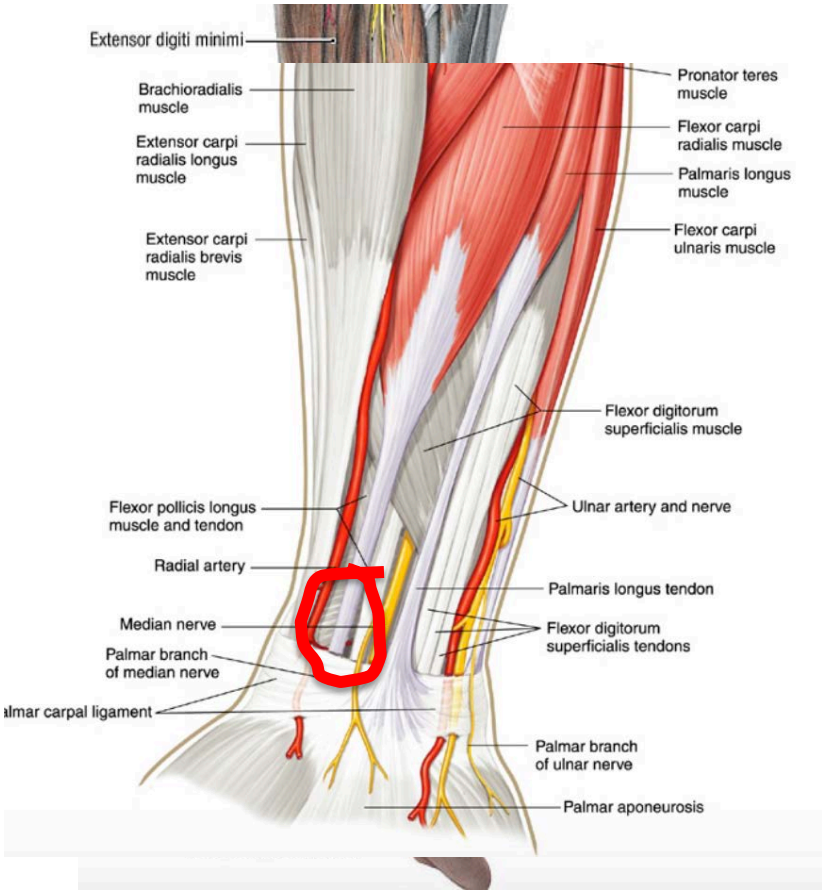


Tendonitis: De Quervain's, Intersection Syndrome, FCR

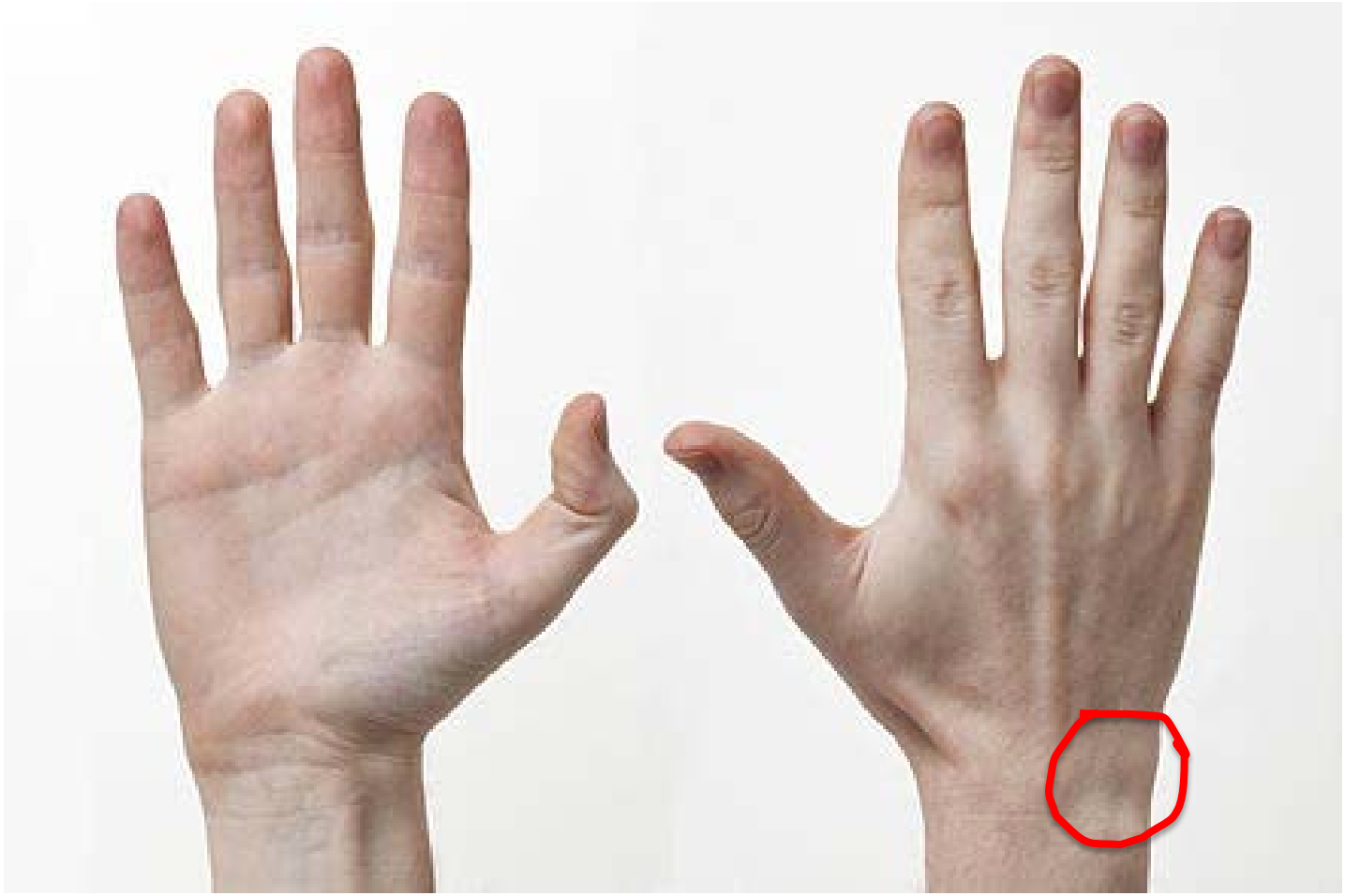
Radial Tendinopathies

- 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

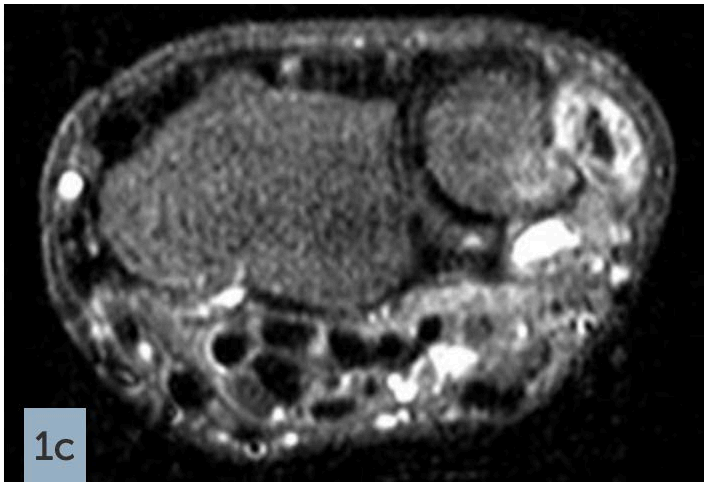
Ulnar Sided Pain

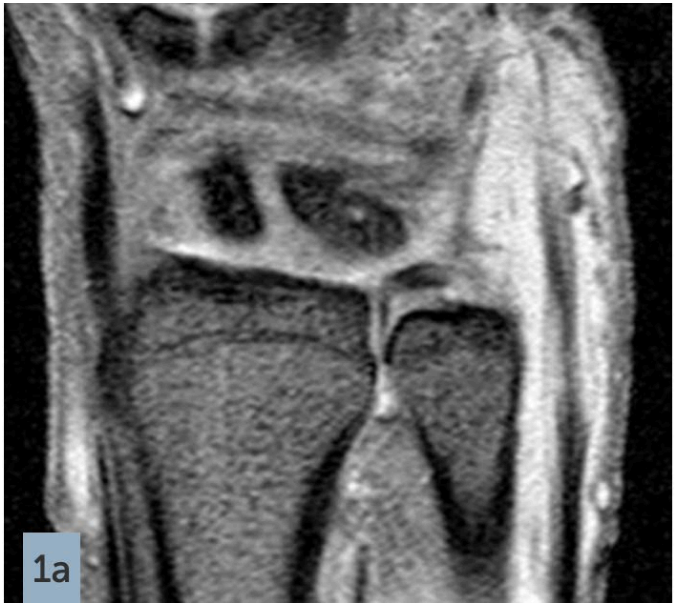


Dorsal/Ulnar: ECU tendonitis, TFCC, ulnar impaction

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 → 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

Images: Radiopedia.org

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

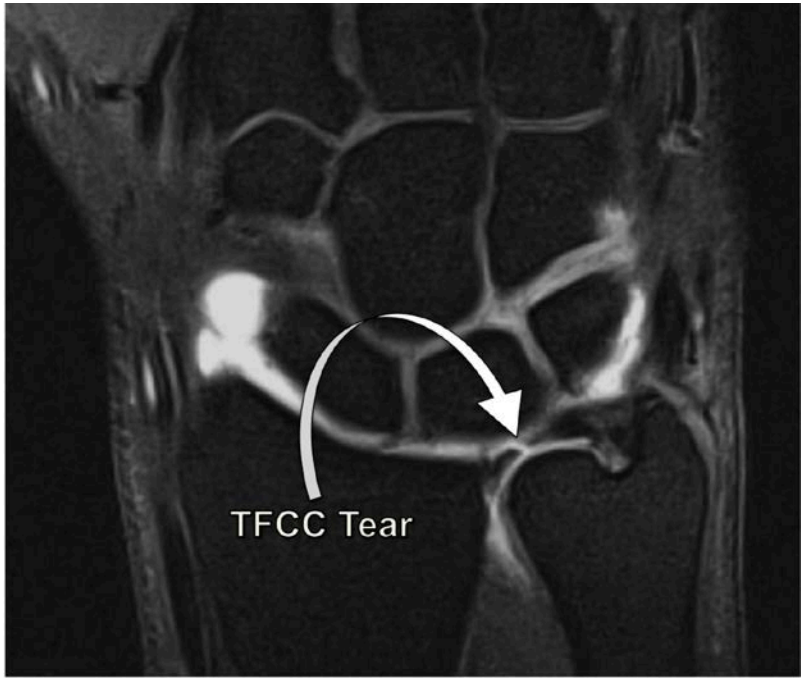
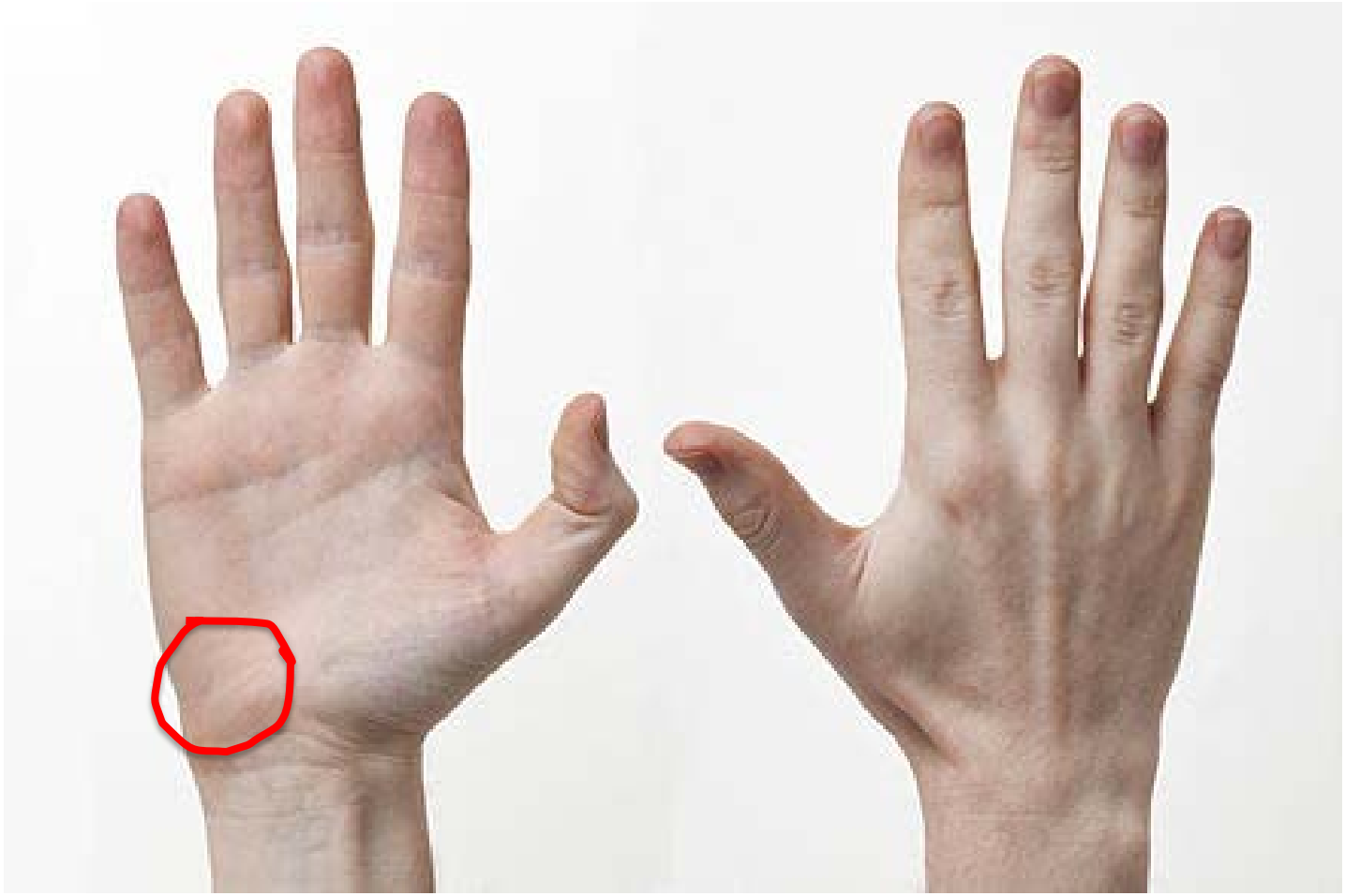


Image: Joseph Schreiber, MD

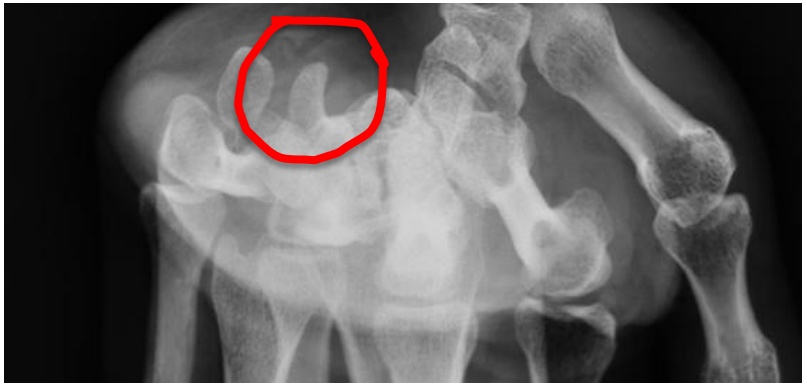
Ulnar Sided Pain

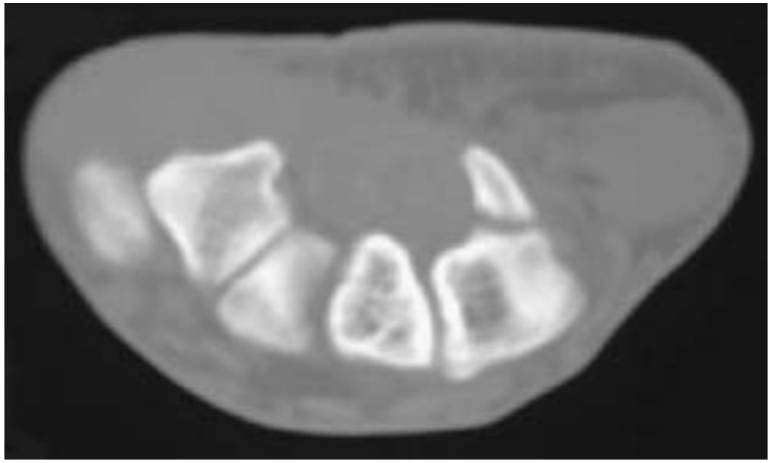


Volar Ulnar: Hamate Hook Fracture, FCU tendonitis

Hamate Hook Fracture

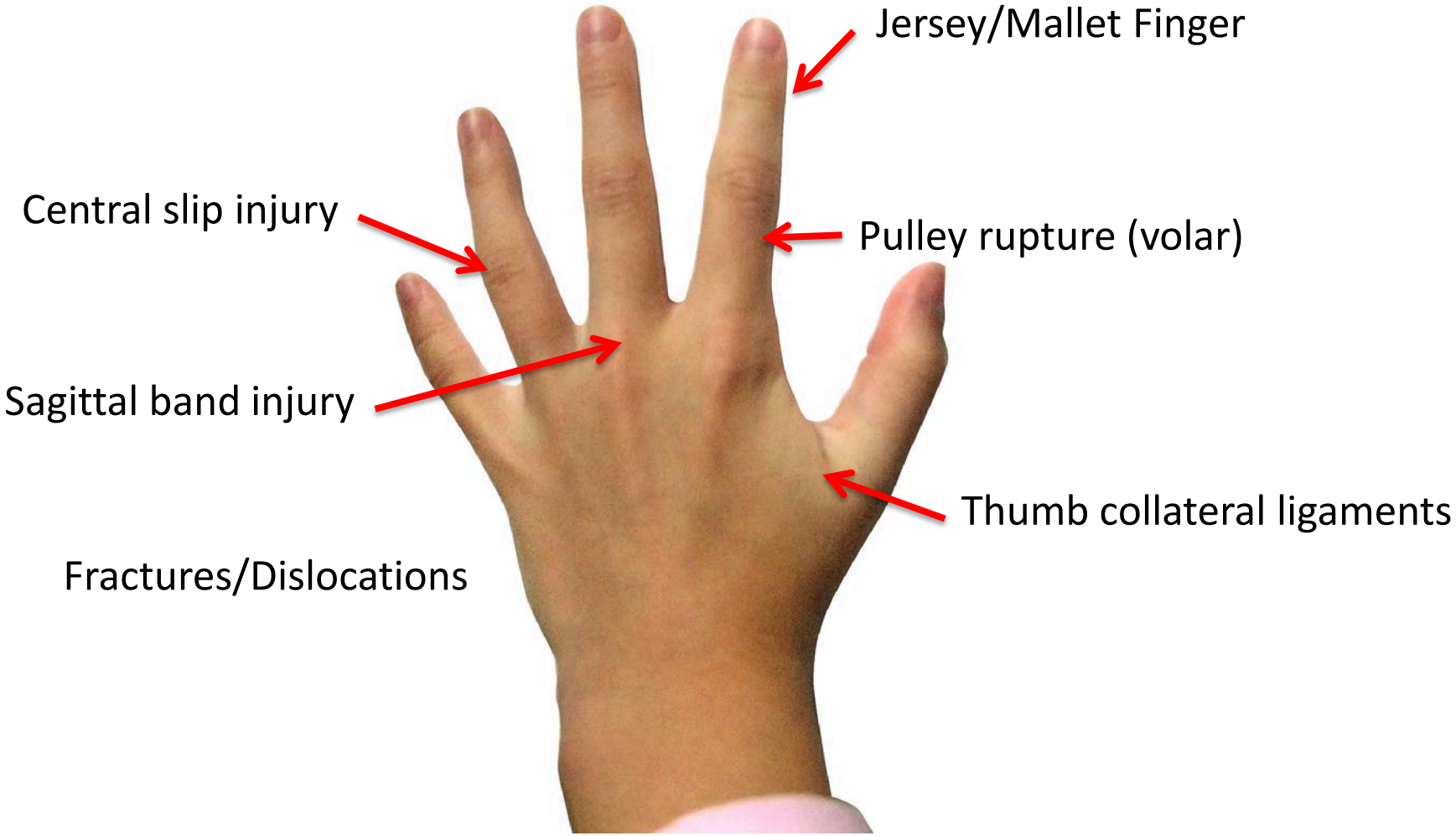
- Direct blow of golf club to ground, checking swing in baseball
- Hypothenar pain with grip
- May have ulnar nerve symptoms
- Radiographs: carpal tunnel view
- Advanced imaging: CT
- Treatment:
  - Acute: immobilization
  - Sub-acute (more typical): hamate hook excision
- RTP 6 weeks post-op





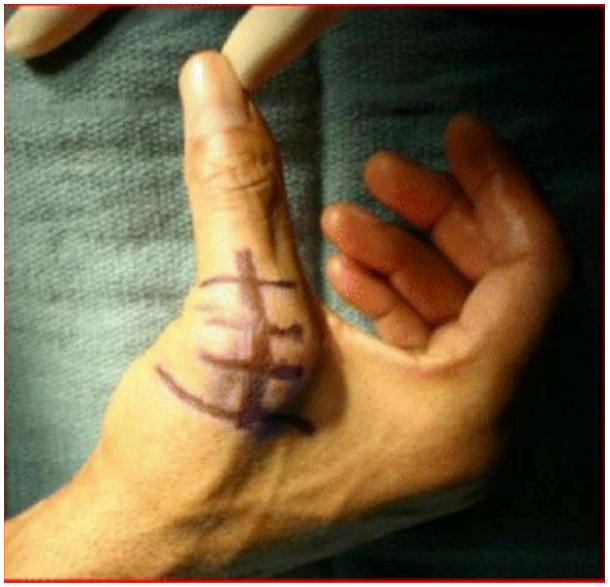
Images: Radiopedia.org, Radiologykey.com

Hand and Finger Injuries



Thumb Collateral Ligament Injuries

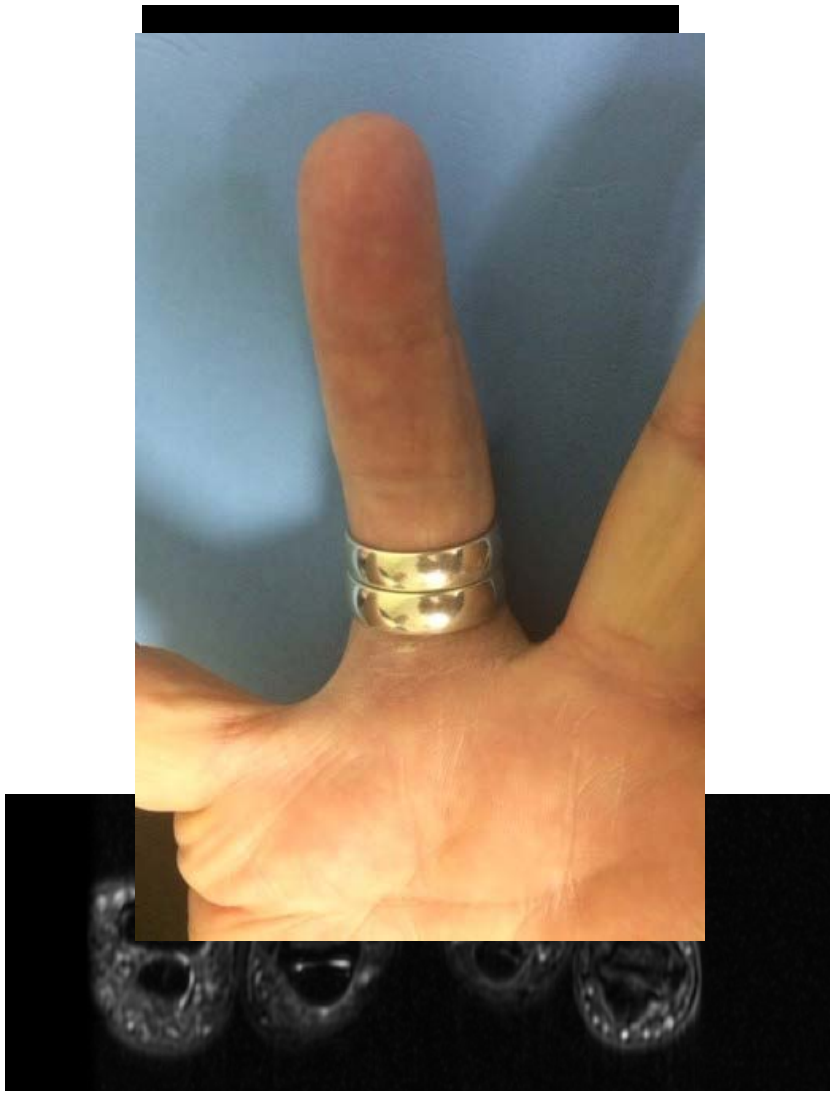
- Abduction/Adduction moment at thumb MP joint
- Skiing, football, basketball
- Stress exam: thumb extended, 30° of flexion
  - Laxity of 30°, 15° side to side difference, no endpoint: suggest high grade injury
- Radiographs: rule out bony involvement, MRI confirms
- Partial tears: cast/splint 4-6 weeks (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



Images: Avery et al, J Orth Surg Res, 2016

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

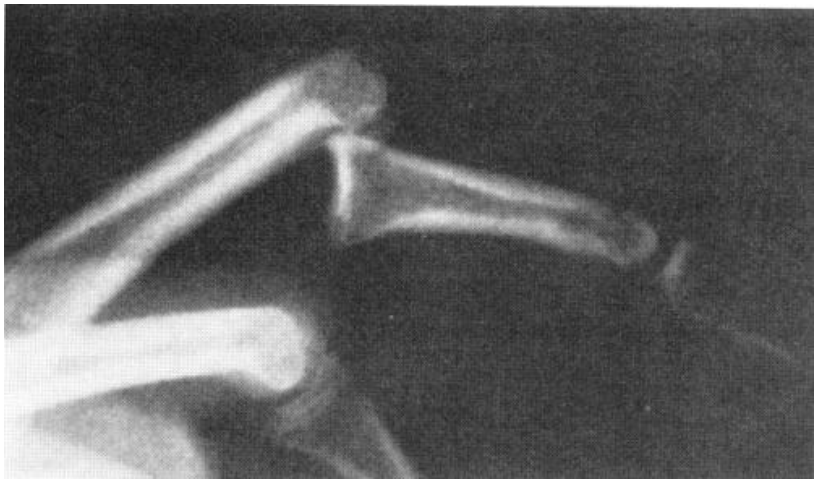
Sagittal Band Rupture

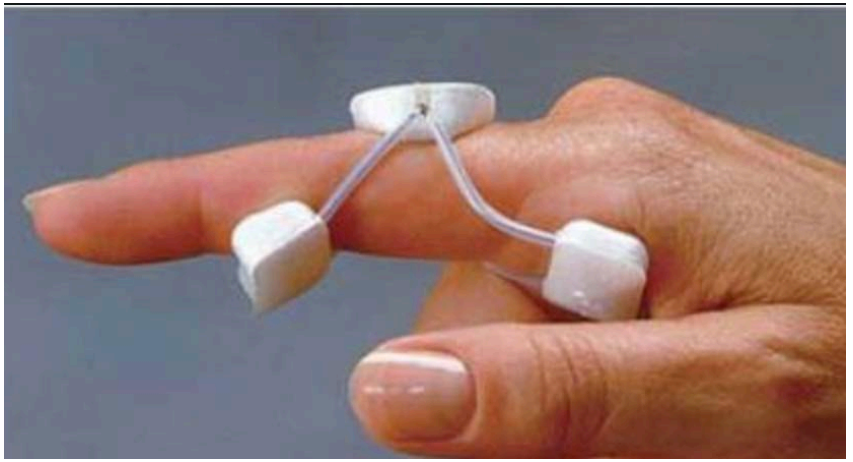
- “Boxer’s knuckle”– leads to subluxation of EDC tendon ulnarly
- May be unable to actively extend finger (but can maintain extension)
- Can be mistaken for trigger finger due to catching
- Most common in central digits
- Clinical diagnosis
- Reducible, acute injury: immobilize 6 weeks with MP in extension, 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

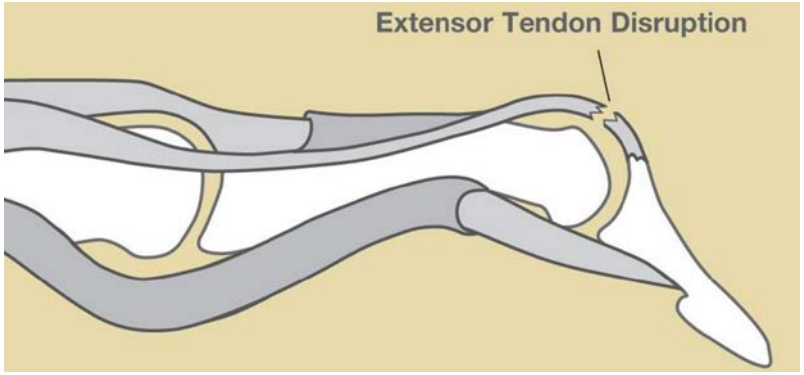
- Volar dislocations or forced flexion at PIP
- Basketball, volleyball
- PIP joint flexion, DIP hyperextension → boutonniere deformity
- Radiographs: look for bony avulsion
- Nearly all treated conservatively– 6 weeks of splinting with PIP in extension, DIP free
- RTP depends on ability to play in splint,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

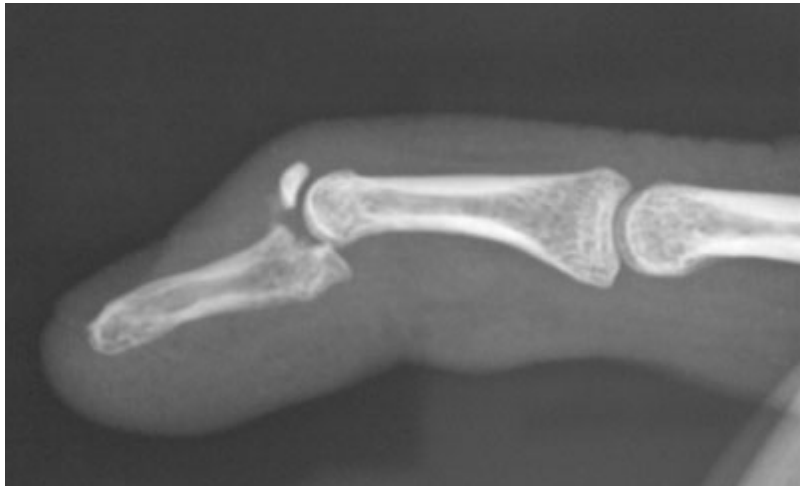


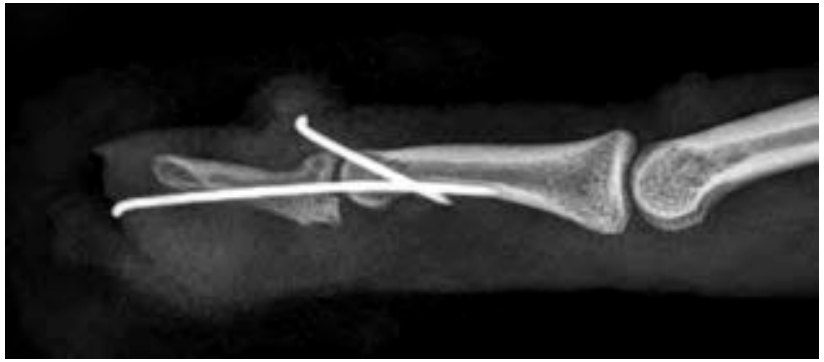
Mallet Finger: Treatment

- 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)



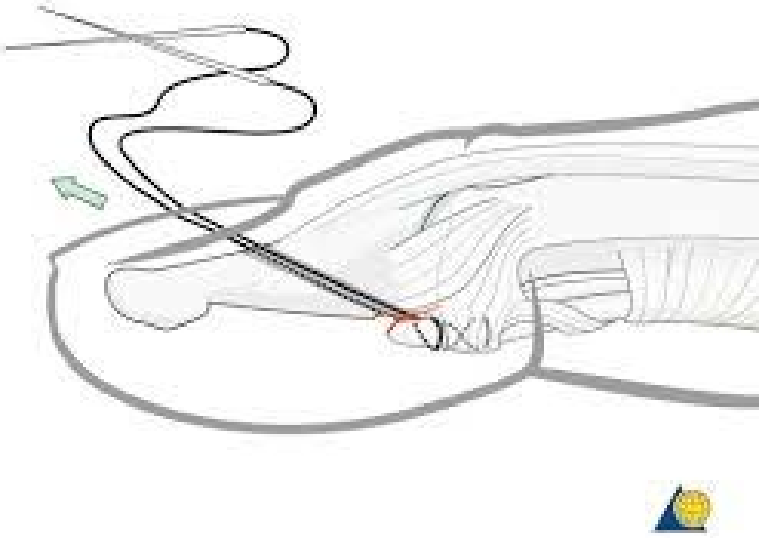


Jersey Finger

- 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

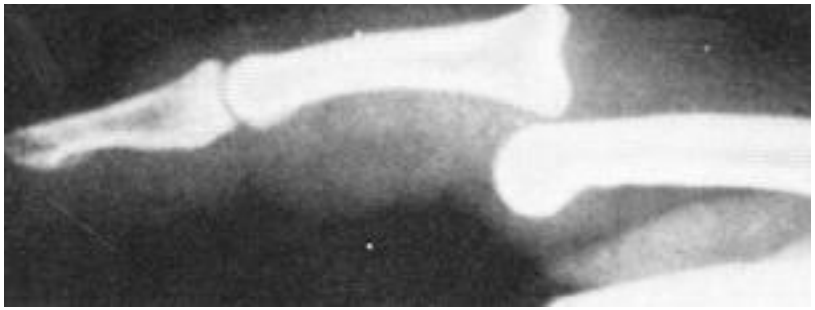
- Malrotation of digits poorly tolerated
- Extension at fracture can lead to loss of motion
- Most stable, minimally displaced fractures can be treated with splinting/buddy taping
  - Minimal shortening
  - Less than 10-15° angulation
  - Extra-articular
- Operative treatment
  - CRPP vs. ORIF
  - Pins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

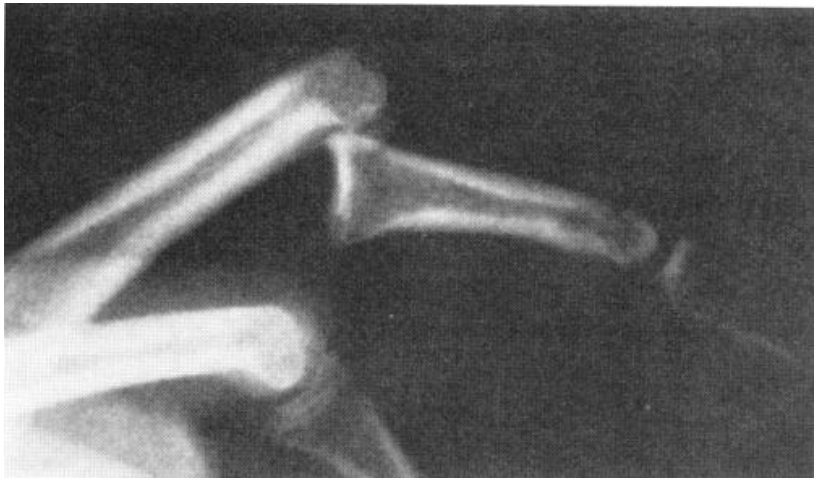
Metacarpal Fractures

- 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

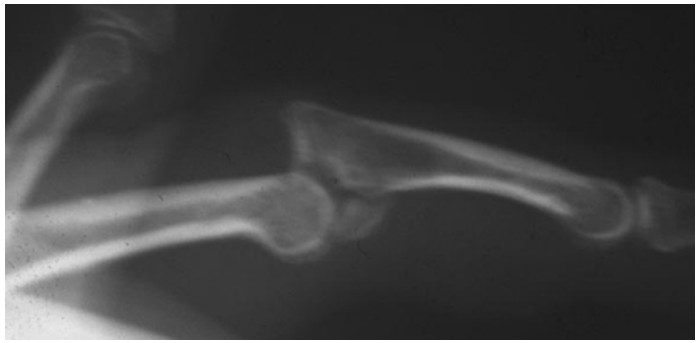
- Dorsal most common
  - Mechanism: PIP joint hyperextension with longitudinal compression
  - Injury to collateral ligaments and volar plate
- Volar more rare
  - Rupture of central slip
- Can be lateral
  - Rupture of 1 collateral ligament and volar plate





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)



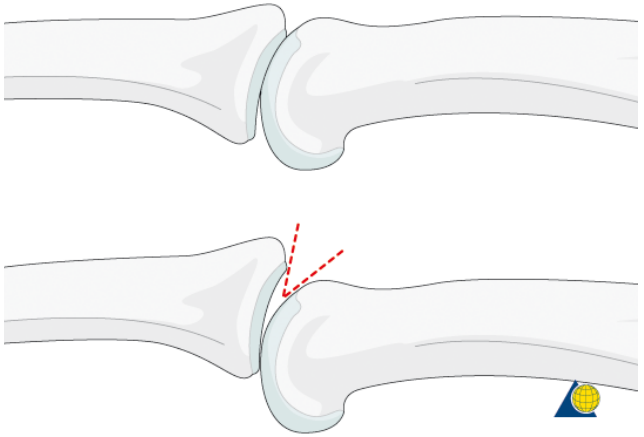
PIP Dislocation: Treatment

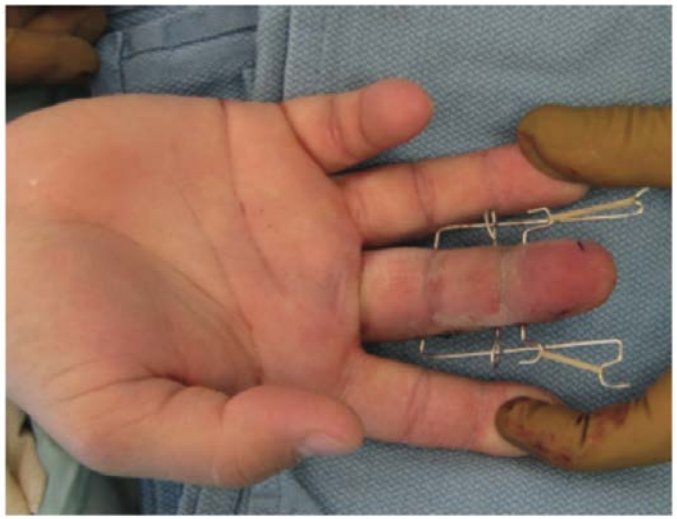
- Dorsal
  - Reduce, check stability through full ROM
  - Longitudinal traction, hyperextend, palmar force on P2
  - If stable, buddy tape and begin ROM
    - Typically can RTP as symptoms allow, 3-4 weeks
  - If unstable, dorsal block (alumifoam splint across PIP) at 10° more than stable angle
    -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

Source: Peter Brukner: *Brukner & Khan's Clinical Sports Medicine: Injuries, Volume 1*, 5e
www.csm.mhmedical.com

PIP Dislocation: Treatment

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





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  - Need for unrestricted use of hands
- For unprotected return to play, patient should be:
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  - Full range of motion
  - Grip strength 80% of contralateral side

Henn and Wolfe, Sports Med Arthrosc Review, 2014

Back to Case… 8 Weeks Post Op

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

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