

# **Finger Injuries In Sports**

## **Background**

1. Finger injuries are common in sports
  - Hands frequently absorb initial contact of other athletes, equipment, ground
  - Protecting fingers often results in limited dexterity, discomfort, or reduced performance ability
  - Injuries are important to diagnose in a timely manner because delay in treatment can result in significant deformity and disability
  - Often injuries to fingers are under-reported by athletes, severity is easily underestimated
  - Most finger injuries can be effectively treated in the primary care setting, but careful evaluation for cases requiring referral is necessary

## **Tendon and Ligament Injury**

1. Mallet Finger-extensor tendon injury at distal interphalangeal (DIP) joint <sup>2</sup>
  - Background
    - M/c in ball sports
    - M/c closed tendon injury of finger
  - Pathophysiology
    - Forceful flexion caused by object hitting extended finger
    - Extensor tendon is stretched, partially or completely torn<sup>4</sup>
    - 1/3 of pts will have a bony avulsion fracture<sup>3</sup>
  - Diagnostics
    - History and exam
      - Tenderness at dorsal aspect of DIP joint
      - No active extension of DIP (characteristic flexion deformity)
      - Neurovascular status
    - Radiographs to evaluate for avulsion fracture
    - Recommendation
      - Pts w/ finger injuries should receive a minimum of anteroposterior, true lateral, and oblique radiographic views<sup>5,6</sup>
      - The only way to examine joint congruity is w/ a true lateral view
      - Correct positioning is vital<sup>7</sup>
    - Treatment
      - Splint for 6 wks in neutral or slight hyperextension of DIP
      - Proximal interphalangeal joint (PIP) should remain mobile
      - Must be uninterrupted splinting
      - If flexion occurs, 6 wks starts over
      - Pts may participate in sports while splinted
      - Excessive hyperextension with splinting may lead to necrosis of volar surface
      - Recommendation
        - Pt compliance should be monitored when treating mallet finger with splinting

- Continuous splinting imperative for successful outcomes<sup>2</sup>
    - All splints for mallet finger achieve similar results<sup>2</sup>
  - Follow-up
    - F/u after injury as clinically indicated to ensure compliance
    - After 6 weeks if active extension is present, splint at night and during sports for 6 more wks
    - Conservative treatment effective up to six mos even if initial treatment is delayed<sup>3</sup>
  - Referral
    - Refer for surgery if unable to achieve full passive extension or bony avulsion exists
    - Recommendation
      - Proximal phalanx and articular surface fractures involving more than 30 percent of the joint should be managed in consultation w/ orthopedic or hand surgeon (SOR C)<sup>8</sup>
  - Prognosis
    - Permanent flexion of DIP may persist despite adequate treatment and is usually not a factor in function<sup>3</sup>
    - Greater than 80% success w/ conservative management<sup>4</sup>
  - Prevention
    - Difficult
    - Gloves cause loss of dexterity and sensation
2. Jersey Finger (Flexor Digitorum Profundus (FDP) injury)
- Background
    - M/c in tackling sports-finger catches on article of clothing of another player
  - Pathophysiology
    - Forceful extension of flexed digit
    - 75% of time ring finger is involved
      - Weakest finger
  - Diagnostics
    - Tenderness/swelling at volar aspect of DIP joint
    - Unable to flex DIP joint w/ joint isolated
    - If tendon retracts, palpable lump may be felt
    - Evaluate neurovascular status
  - Treatment
    - Splint finger acutely
    - Wrist at 30 degrees flexion, metacarpophalangeal joint at 70 degrees flexion, PIP at 10-15 degrees flexion<sup>7</sup>
    - Recommendation
      - Pts with confirmed or suspected jersey finger should be referred to an orthopedic or hand surgeon (SOR C)<sup>7</sup>
      - Splint post-operatively for 6 wks, followed by progressive range of motion until 12 weeks
      - Return to play 4-6 months
  - Prognosis

- Worse prognosis w/ delay in treatment and severely retracted tendon
      - Best is treated w/in 7-10 days<sup>6</sup>
    - Early repair and early active rehab protocols lead to likely unrestricted use at 3-6 mos<sup>9</sup>
  - Prevention
    - Re-rupture is unlikely after 8 wks if early rehabilitation<sup>9</sup>
- 3. Central Slip Extensor Tendon Injury (usually PIP joint)
  - Background
    - Common in basketball players and other ball sports
  - Pathophysiology
    - Forceful flexion of actively extended PIP joint
    - Also caused by volar dislocation of PIP
  - Diagnostics
    - Evaluate w/ joint in 15-30 degrees of flexion
    - Tender at dorsal aspect of PIP joint
    - Inability to actively extend joint
    - Evaluate neurovascular status
  - Treatment
    - Dorsal splint in full extension for 6 wks
      - Uninterrupted splinting
      - If flexion occurs, splinting time restarts
    - DIP may have full range of motion
  - Follow up
    - Referral to surgery if cannot achieve full passive extension or avulsion fracture
  - Prognosis
    - Delay in tx may result in boutonniere deformity
      - Unopposed flexion of PIP by flexor digitorum superficialis (FDS) w/ hyperextension of DIP and metacarpophalangeal joint (MCP)
      - Required surgical exploration for tendon integrity
    - Prevention-none
- 4. Volar Plate Injury (usually PIP joint)
  - Background
    - Common in ball sports, tackling sports, and in falls
  - Pathophysiology
  - Hyperextension of finger joint causing complete or partial tearing of volar plate<sup>3</sup>
    - May include avulsion fracture
  - Diagnostics
    - History and exam
      - May have slight hyperextension deformity
      - Maximal tenderness at volar aspect of involved joint
      - Full flexion and extension preserved
      - Collateral ligaments intact
    - X-ray: evaluate for fracture
  - Treatment
    - Goal to restore joint stability

- Splint at 30 degrees flexion
    - Increase extension slowly over 2-4 wks
    - Buddy taping should follow until pain free
      - At least 4-6 weeks<sup>10</sup>
    - Joint swelling may persist for 6-12 mos
  - Follow up
    - Refer for surgery if joint unstable or large avulsion fracture
  - Prognosis
    - Early active range of motion improves outcome<sup>10</sup>
  - Prevention
    - None
- 5. Collateral ligament injury (usually PIP joint)-"Jammed finger"
  - Background
  - Pathophysiology
    - Forced ulnar or radial deviation of IP joint causing partial or complete tear of collateral ligament
  - Diagnostics
    - X-ray: evaluate for fracture
    - Tenderness at involved collateral ligament
    - Test stability of joint at 30 degrees flexion with MCP joint flexed 90 degrees
      - Apply valgus or varus stress
      - Extended MCP tightens collaterals and inhibits exam
  - Treatment
    - Stable joint is buddy taped for 2-4wks
      - Never leave 5th finger exposed as it is naturally extended, thus prone to injury
    - May have avulsion fracture
    - May continue to participate while taped
  - Referral
    - Unstable joint referred for surgery
    - Low threshold for referral should exist for collateral ligament injuries in children because of growth plate involvement (SOR C)<sup>3</sup>
  - Prognosis
    - Usually heals well w/ no long term problems
  - Prevention
    - None
- 6. Dislocations and Fractures<sup>11</sup>
  - Joint Dislocation
  - Background
  - Pathophysiology
    - PIP m/c dislocated
    - Severity often underestimated
    - May be associated with significant morbidity
    - Usually due to high velocity blow to end of finger<sup>4</sup>
  - Diagnostics
    - History and Exam
    - Obvious deformity

- Dorsal more common than volar or lateral
    - Volar plate injury and/or avulsion fracture may result
    - Reduction may be attempted without radiography
  - Treatment<sup>11</sup>
    - During an athletic event:
      - Pain medication not usually necessary
      - Apply distal traction to injured finger
      - Volarly directed pressure to middle phalanx
      - If unsuccessful, may hyperextend distal portion while applying volar pressure on middle phalanx
      - If successful, buddy tape
      - Radiographs at end of contest to evaluate alignment<sup>3</sup>
    - In office:
      - Digital or hematoma block for pain control if treatment delayed >1 hour
      - Radiograph prior to reduction
      - Reduce as above
      - Radiograph post-reduction for alignment
      - Splint at 30 degrees for 2-3 wks followed by buddy taping
      - Radiograph at 1 wk to ensure healing
  - Volar dislocation may result in central slip of extensor tendon
    - Attempt reduction after radiographs only
    - Hyperflexion of distal phalanx
    - Then apply traction to joint
    - Only try one time
    - If successful, splint in extension for 6 wks
  - Lateral dislocation often easily reduced<sup>8</sup>
    - Buddy tape for 3 wks
    - Evaluate neurovascular status, range of motion after reduction
    - Appropriately treat any soft tissue injury found
  - Referral
    - Refer to surgery if large avulsion fracture or irreducible
  - Prognosis
    - No long term issues if managed quickly w/ reduction or surgical evaluation if necessary
  - Prevention
    - None
7. Phalanx Fracture
- Background
  - Pathophysiology
    - M/c caused by crush injuries
    - Usually distal phalanx<sup>4</sup>
  - Diagnostics
    - Hx and exam
      - Obvious deformity w/ pain and swelling
    - Radiographs for angulation, displacement, rotation of fracture
      - Transverse fractures usually more stable than oblique or angular fractures<sup>4</sup>

- Treatment
  - Reduce only closed fracture and w/o obviously contaminated skin
  - Administer digital or hematoma block prior to reduction
  - Gently manipulate fragments to get proper alignment<sup>7</sup>
    - Rotation is assessed by looking at fist or slightly flexed fingers
    - All fingernails in same plane when digits flexed
    - On volar surface, all point at scaphoid bone
  - Splint in extension for 6 weeks
    - Dorsal aluminum splint
  - Rest, ice, elevation
  - Followed by buddy taping for 6 wks
- Referral
  - Refer to surgery if unable to align bones properly, fracture is displaced, or open fracture
  - Recommendation
    - Proximal phalanx and articular surface fractures involving more than 30 percent of joint should be managed in consultation w/ orthopedic or hand surgeon (SOR C)<sup>8</sup>
- Prognosis
  - Malunion may cause significant loss of function and visible deformity
- Prevention
  - None

## References

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**Authors:** Lisa Spidell, MD & Isaac Pierre, MD, *WI- Medical College of Wisconsin*

**Editor:** Carol Scott, MD, *University of Nevada Reno FPRP*