

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 ²
 - 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 torn⁴
 - 1/3 of pts will have a bony avulsion fracture³
 - 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^{5,6}
 - The only way to examine joint congruity is w/ a true lateral view
 - Correct positioning is vital⁷
 - 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 outcomes²
 - All splints for mallet finger achieve similar results²
 - 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 delayed³
 - 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)⁸
 - Prognosis
 - Permanent flexion of DIP may persist despite adequate treatment and is usually not a factor in function³
 - Greater than 80% success w/ conservative management⁴
 - 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 flexion⁷
 - Recommendation
 - Pts with confirmed or suspected jersey finger should be referred to an orthopedic or hand surgeon (SOR C)⁷
 - 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 days⁶
 - Early repair and early active rehab protocols lead to likely unrestricted use at 3-6 mos⁹
 - Prevention
 - Re-rupture is unlikely after 8 wks if early rehabilitation⁹
- 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 plate³
 - 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 weeks¹⁰
 - 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 outcome¹⁰
 - 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)³
 - Prognosis
 - Usually heals well w/ no long term problems
 - Prevention
 - None
- 6. Dislocations and Fractures¹¹
 - 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 finger⁴
 - 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
 - Treatment¹¹
 - 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 alignment³
 - 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 reduced⁸
 - 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 phalanx⁴
 - 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 fractures⁴

- 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 alignment⁷
 - 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)⁸
- Prognosis
 - Malunion may cause significant loss of function and visible deformity
- Prevention
 - None

References

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