
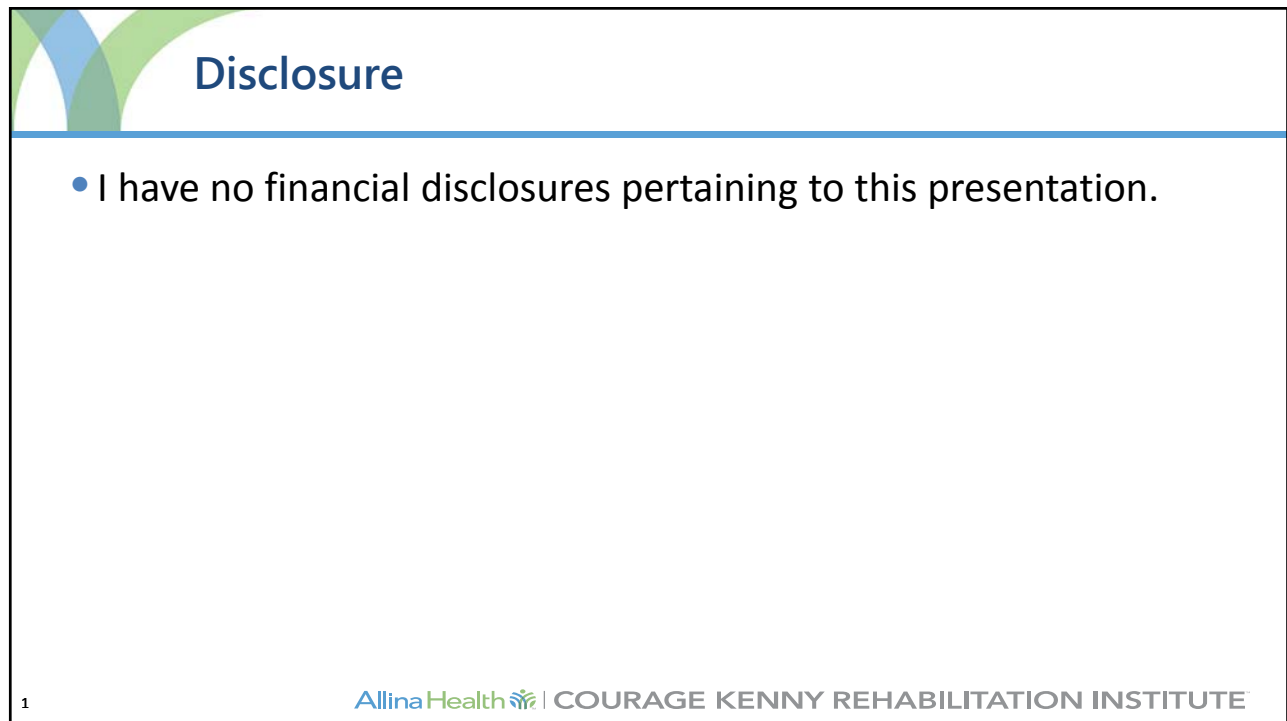


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**Rehabilitation Following
Acute Hand & Wrist Injuries**

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Disclosure

- I have no financial disclosures pertaining to this presentation.

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Objectives

1. Describe the challenges of return to play decisions for the injured athlete.
2. Describe conservative rehabilitation options for common acute hand and wrist injuries.
3. Identify post operative rehab considerations for zone one flexor tendon repairs, thumb UCL repairs and ECU subsheath repairs/stabilization.

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Hand and wrist injuries

- Account for 25% of all sports injuries
- Common in contact sports
- Common in sports with a high risk of falling

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Decision based RTP Model

- Evaluation of health status
 - Medical factors
- Evaluation of participation risks
 - Participation risk
- Decision modifiers

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Case study



- 18 year old LaCrosse player
- Mechanism of injury: Stick vs. thumb

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Dx: thumb distal phalanx fracture (minimally displaced)



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Treatment



- Casted 2 days post injury
- Return to game play
 - immediately after casting

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Hand Therapy Treatment

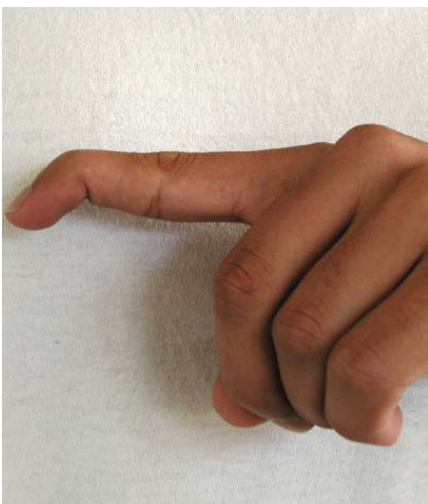


- 5 weeks post injury:
 - Custom orthosis for play only
 - Initiated thumb IP blocking 3-4x/day

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Mallet fingers

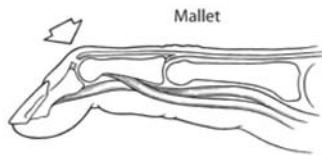


- Disruption of the distal attachment of the extensor tendon (complete or partial)
- DIP flexion deformity with weak or no active extension
- Mechanism of injury: Axial load on finger tip
- Commonly occurs in baseball, basketball and volleyball players

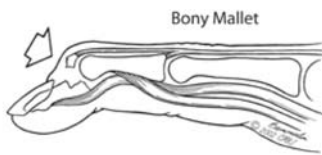
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Type dictates treatment



Tendinous mallet fingers
rupture of the extensor tendon



Bony mallets
Avulsion fracture at the distal phalanx extensor tendon attachment

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Treatment



- Tendinous mallet fingers
 - 8 weeks of casting/orthosis with DIP in slight hyperextension, PIP free
 - 8-12 weeks: removable orthosis for additional for hours of sleep.
 - 8-12 weeks: daytime wear varies
 - 8 weeks: Limited active range motion initiated if less than 15 degree ext. lag
- Bony mallets
 - 6 weeks casting/orthotics positioning DIP in slight hyperextension, PIP free

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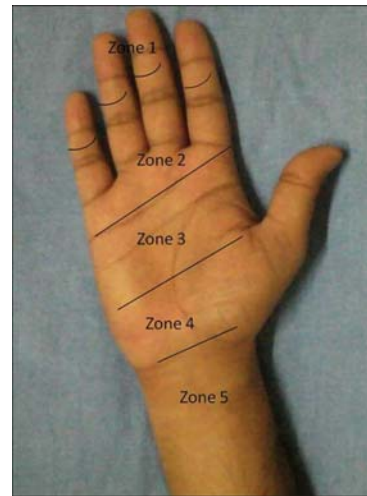
Jersey finger

Zone I flexor tendon injury

Mechanism of injury: finger is abruptly hyperextended

Most common in football and rugby players

Most commonly occurs in the ring finger



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Treatment

- Surgery followed by Hand Therapy
- Zone I injuries are treated the same as zone II
- Post operative Rehab protocols vary
 - includes passive, active and early active protocols depending on the severity of injury, timing of surgery and anticipated compliance of pt

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No Consensus on tendon rehab

- A Cochrane review concluded that there was no firm evidence to define optimum mobilization strategies for flexor tendon repair rehab.
- Considerable evidence to suggest that restoring tendon glide is essential
- No universal way of measuring success of the outcome

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Concepts to guide rehabilitation of flexor tendons

Work of flexion (WOF)

Gliding resistance

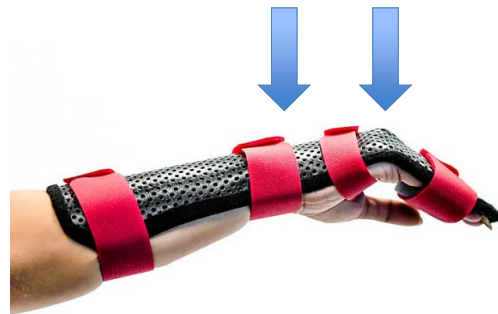
Synergistic motion

- Su et. al. (2005)
 - Synergistic motion utilizes a tenodesis effect, increasing tendon excursion while eliminating laxity and buckling of the tendon at the pulleys.

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Changes in orthotic recommendations



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Manchester short splint (used with some early active protocols)



- limits wrist extension to 45 degrees.
 - Savage R (1988)
 - There is the least resistance to active flexor tendon ROM when the wrist was in 45 degrees of wrist extension vs. neutral or flexed.
- Positions the MCPs at 30 degrees flexion
 - allows initiation of motion at the DIP joints to maximize differential glide (Tang 2003).
 - Pettingill (2005): excessive MP flexion can lead to intrinsic tightness
- Allows for active synergistic wrist movement

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Most flexor tendon protocols include the following:

- Passive flexion
- Active extension to the limit of the splint
- Patient education
- Edema control
- Incision management
- Scar management
 - Ultrasound
 - Scar mobilization
 - Scar silicone scar pads or silopos

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Gamekeeper's thumb aka Skier's thumb



- Partial or total ruptured of the thumb's ulnar collateral ligament
- Mechanism of injury
 - Forced radial deviation/abduction
- Symptoms
 - Pain, tenderness and swelling, bruising on ulnar side of thumb MP joint.
 - Rule out Stener's lesion

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Conservative management: sprains/partial tears



- Partial tears and sprains
 - 0-4 weeks HBTSS
 - 4-6 weeks, Cont. full-time orthosis but may remove for AROM and hygiene
 - 6-8 weeks, begin weaning out of splint
 - initiate PROM and grip strengthening
 - Initiate pinch strengthening once near full ROM or at 6 weeks.
 - 8 weeks, strengthen thumb in all planes
 - Return to sport
 - 2-4 weeks with protective orthosis for low contact

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Post surgical Thumb UCL repairs

- For both repairs and reconstructions
 - 0-6 weeks
 - Full time casting and/or orthosis
 - 6 weeks
 - Begin ROM avoiding radial stress to MP jt
 - 8 weeks
 - Begin strengthening
 - 12-16 weeks
 - Unrestricted
 - Return to sport
 - Can return early on if immobilization is allowed and sport can be performed without the thumb.

(Owings et al)

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Acute ECU instability



- Definition: The disruption or dysfunction of the ECU subsheath
- Mechanism of injury
 - Wrist flexion, ulnar deviation, and supination.
 - In golf, ECU tendonitis may be from unlocking of the wrist early during the downswing
- Sports
 - Occurs with golfers, tennis and Rugby players

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Rehab following ECU sub sheath surgical repair

- Day 3-10 (cast or orthosis)
 - Option's are: LAS elbow 70 degrees flexion and neutral fa, wrist included
 - Sugar tong or Muenster splint
- Hand Therapy
 - No Sup or pron ROM
 - No wrist ROM
 - Begin finger and neutral elbow flexion/extension
 - Edema control
 - Scar management

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Sugar tong vs. Muenster orthotic



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Custom long arm splint with wrist included



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Custom fitted zipper wrist orthosis



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Phase II –post surgical sub sheath repair

- Post operative week 4
 - Discontinue LAS
 - May use pre-fab wrist splint for h.s., travel, crowds
 - A/AAROM for wrist, AROM for sup and pron
- Weeks 6-8
 - Light wrist wrap prn if needed
 - Begin strengthening program, putty or soft foam (grip)
 - Progressive resistive activities – isometrics to weights
- Weeks 10-12
 - Progress resistive strengthening
 - Goal: Full ROM and 75% grip strength by 10-12 weeks post op

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