SPORTS RELATED LIGAMENTOUS & TENDINOUS INJURIES OF THE FINGERS

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OVERVIEW

- Each Topic
  - Relevant Anatomy
  - Mechanism of Injury
  - Cases

- LIGAMENTOUS INJURIES
  - Collateral Ligament Injuries
  - Extensor Mechanism
  - Pulley Injuries

- TENDINOUS INJURIES
  - Boutonniere deformity
  - Mallet Finger
  - Jersey Finger
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COLLATERAL LIGAMENT INJURIES

Intro:
+ Collateral ligaments are major stabilizers of varus/valgus stressors at the MCPJs

RELEVANT ANATOMY

+ Ulnar and radial collateral ligaments
  - Proper Collateral
  - Accessory collateral
COLLATERAL LIGAMENT INJURIES

- **Mechanism of injury**
  - dorsally directed force in a radial or ulnar trajectory
  - index finger: lower incidence of RCL injuries (as few as 6 reported cases in literature)
    - shielded or buttressed from ulnar stresses
  - little finger: highest incidence of RCL tear
    - not shielded or buttressed by other digits
  - middle finger has an equal propensity for RCL and UCL tears
UCL injures at the first MCPJ. 60% of all collateral ligament injuries of the digits.

- Gamekeepers thumb

Case 1:
65M presented h/o UCL repair 6 years earlier
Case 2:
47M w right thumb pain.
Case 3: STENER LESION

http://www.proscan.com/
Case 4:
28-year-old-man with a right hand injury and pain

STENER-LIKE LESION
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**Relevant Anatomy**

- Focus our attention to the MCPJ
  - Sagittal bands
  - Intrinsic muscles of the hand (interrosei, lumbricals)
  - Extensor tendon
    - Central slip
    - Medial and lateral slips
    - Lateral bands/conjoined tendon
EXTENSOR MECHANISM

- Sagittal band:
  - Dorsal attachment: extensor tendon
  - Palmar attachment: palmar plate, deep transverse metacarpal ligament

- Function: stabilizes extensor tendon
EXTENSOR MECHANISM

Mechanism of Injury:
20-year-old man with middle knuckle pain after punching a wall 3 weeks ago

**BOXER’S KNUCKLE**
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PULLEY INJURIES

Intro:

- maintain the flexor tendon in close apposition to subjacent bone allowing for tendon tracking during flexion.

+ ANNULAR PULLIES
  - Allow tendon excursion without deformation

+ CRUCIATE PULLIES
  - Allow tendon excursion with deformation
PULLEY INJURIES

Relevant Anatomy

1. MCPJ
2. PIPJ
3. DIPJ

Mechanism of Injury:
- Seen in rock climbers
- Crimp grip position
  - DIPJ and MCPJ extension
  - PIPJ flexion

http://climbing.about.com/od/cliimbingtechniques/a/OpenHandGrip.htm
Measurements in the sagittal plane at the level of the distal 2/3 of the proximal phalanx may demonstrate a normal tendon-to-bone gap of 6-8mm, and a gap exceeding 2.0 cm in the setting of pulley disruptions.

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Intro:

- French for ‘buttonhole’
  - gap created as the extensor central slip becomes incompetent and retracts proximally allowing the lateral bands to displace volar.
    - allows the proximal phalangeal head and PIPJ to pop through the ‘buttonhole.’

- flexion of the PIPJ + extension at the DIPJ.
BOUTONNIERE DEFORMITY

- Relevant Anatomy
  - Extensor tendon
    - Central slip
    - Lateral slips
  - Intrinsic muscle contribution
    - Interossei
    - Lumbricals
  - Conjoined tendon / lateral bands
  - Terminal tendon

BOUTONNIERE DEFORMITY

- Mechanism of Injury

- Direct trauma to central slip
- Lateral bands migrate palmar
  - PIPJ flexes
  - DIPJ extends

http://img.orthobullets.com/Hand/Deformities/Boutonniere%27s/Images/Lineage%20Medical%20500.jpg
http://medicalpicturesinfo.com/boutonniere-deformity/
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Intro:

- Mallet finger, also referred to as baseball finger
- May be associated with sports such as baseball, basketball, and volleyball.
- Direct trauma to the tip of the finger
  - Injury to the terminal tendon
  - May or may not be associated with bony avulsion of the distal phalangeal base
- Relevant Anatomy
- Lateral bands / conjoined tendons
- Terminal tendon
- Triangular ligament
Mallet Finger – Baseball Finger

Mechanism of Injury

- Direct blow to fingertip of an extended DIPJ

Causes forced DIPJ flexion
CASES

- 42-year-old woman with a left fourth digit in jury

- Surgery if:
  - Distraction > 3mm
  - >30% articular surface involvement
  - Palmar subluxation of the distal phalanx
TREATMENT

- Treatment
  - Conservative: splinting 6-8 wks
  - Microanchors
  - Extension block pinning

http://www.congress-info.ch/abstracts/eurohand2008/
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**JERSEY FINGER**

- **Intro:**
  - seen in athletes >> typically football
  - Player grabs jersey of opponent
  - DIPJ in flexion at time of grab
  - Opponent pulls away
  - Forced extension of the DIPJ
**JERSEY FINGER**

- **Relevant Anatomy**

  - **Flexor digitorum superficialis**
    - tendon bifurcates @ proximal phalanx
    - tendon slips spiral
    - insert on the mid portion of the middle phalanx.
    - Function > PIPJ flexion.
  
  - **Flexor digitorum profundus**
    - runs deep to the FDS
    - inserts > base of the distal phalanx
    - Function > DIPJ flexion.
  
  - **Vincula brevis, longus**
    - Attaches to dorsal surface of FDS and FDP
    - Mesotendon which also serves as dorsal vascular supply to the FDS and FDP

http://www.aafp.org/afp/2006/0301/p810.html
JERSEY FINGER

- Mechanism of Injury

http://www.netterimages.com
22-year-old man with laceration to the left third digit.

**TYPE 2 JERSEY FINGER**
45-year-old man with a history of flexor digitorum profundus rupture and reconstruction. While doing physical therapy the patient felt a pulling in his right index finger and a slight pop with subsequent inability to flex the DIPJ.
Types of Jersey Fingers

Type 1:
- FDP retracts to palm

Type 2:
- FDP retracts to PIP

Type 3:
- FDP attached to avulsed fragment of distal phalanx
- retracted to A4 pulley

Type 4:
- Type 3 + superimposed avulsion of FDP off avulsed fragment w retraction of FDP into palm
- (Combination of Type 3 + Type 1)

Type 5:
- Complex w/ comminuted fracture of distal phalanx
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