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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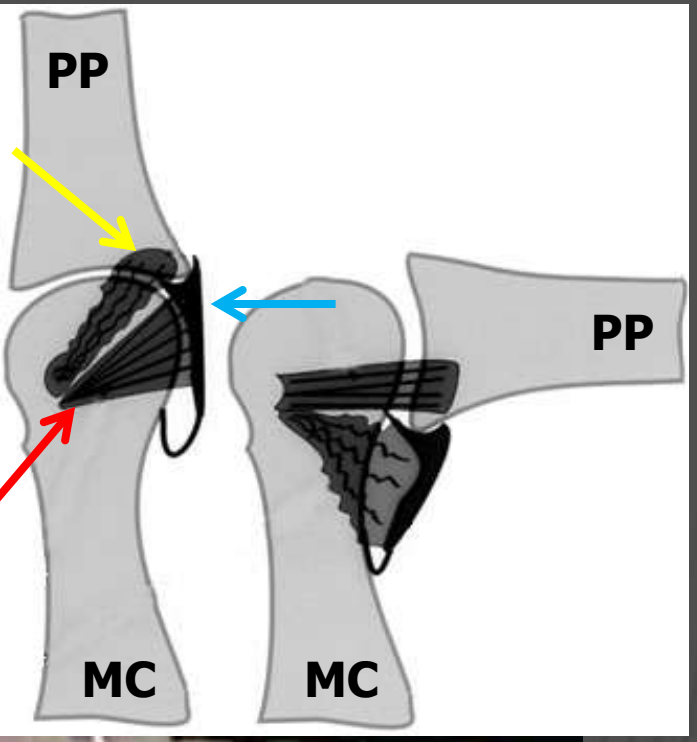
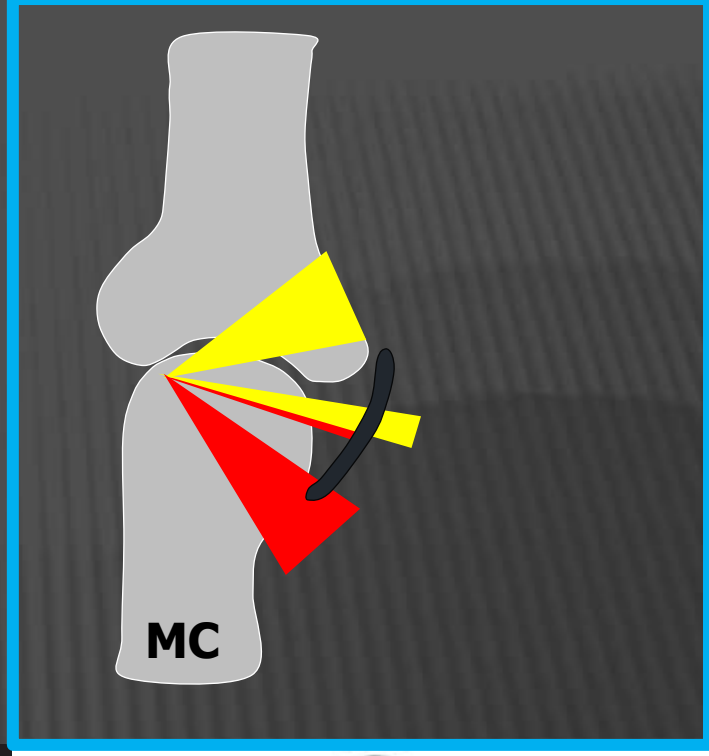
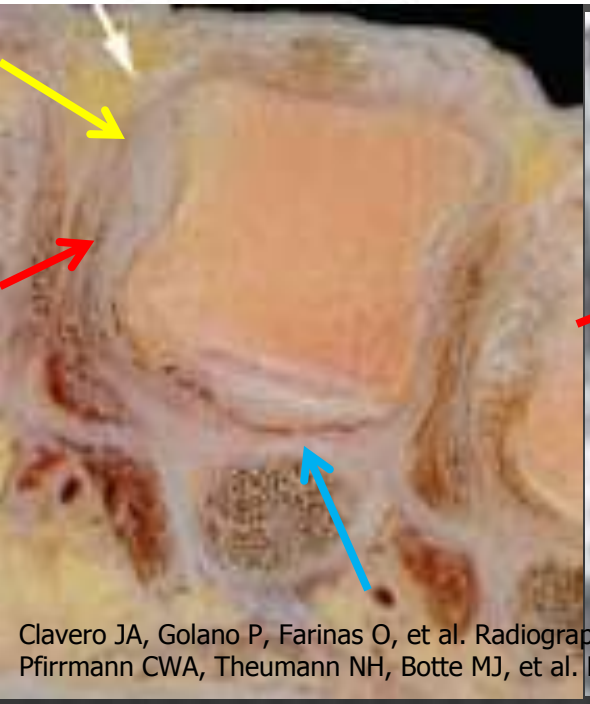
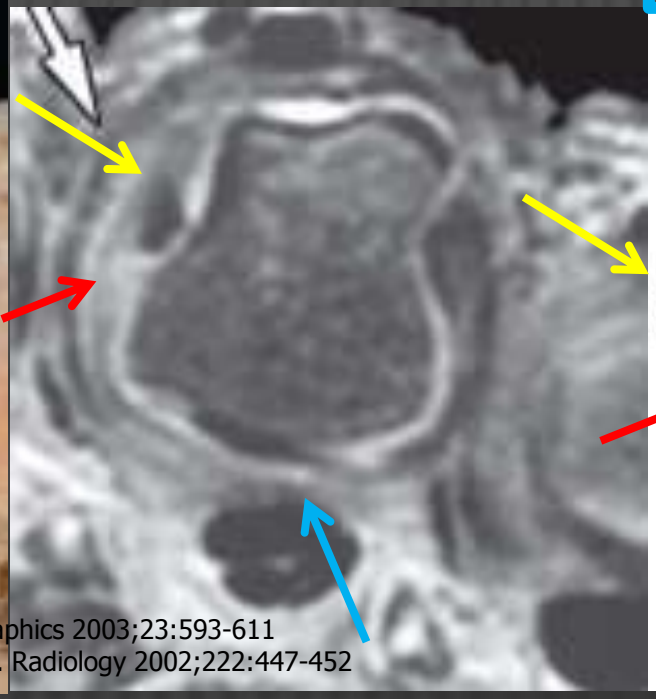
COLLATERAL LIGAMENT INJURIES

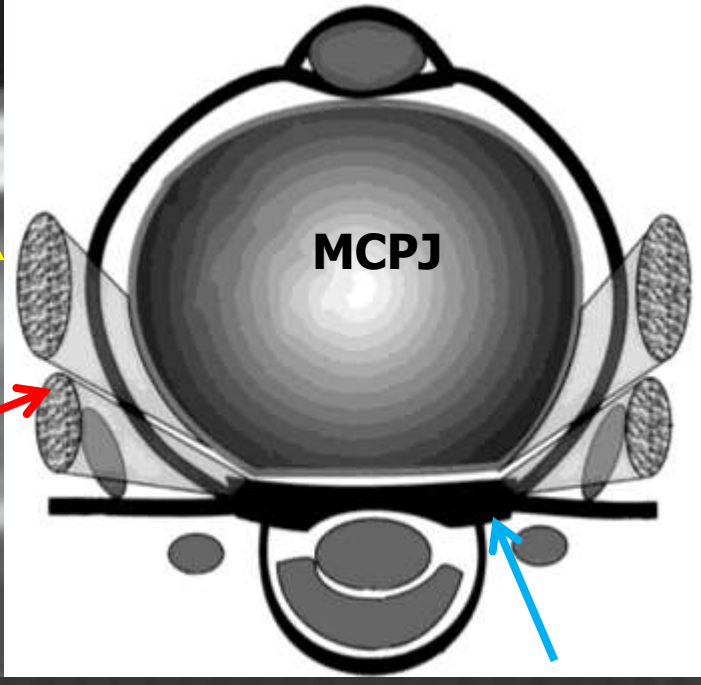
- Intro:
  - Collateral ligaments are major stabilizers of varus/valgus stressors at the MCPJs
- RELEVANT ANATOMY
  - Ulnar and radial collateral ligaments
    - Proper Collateral
    - Accessory collateral











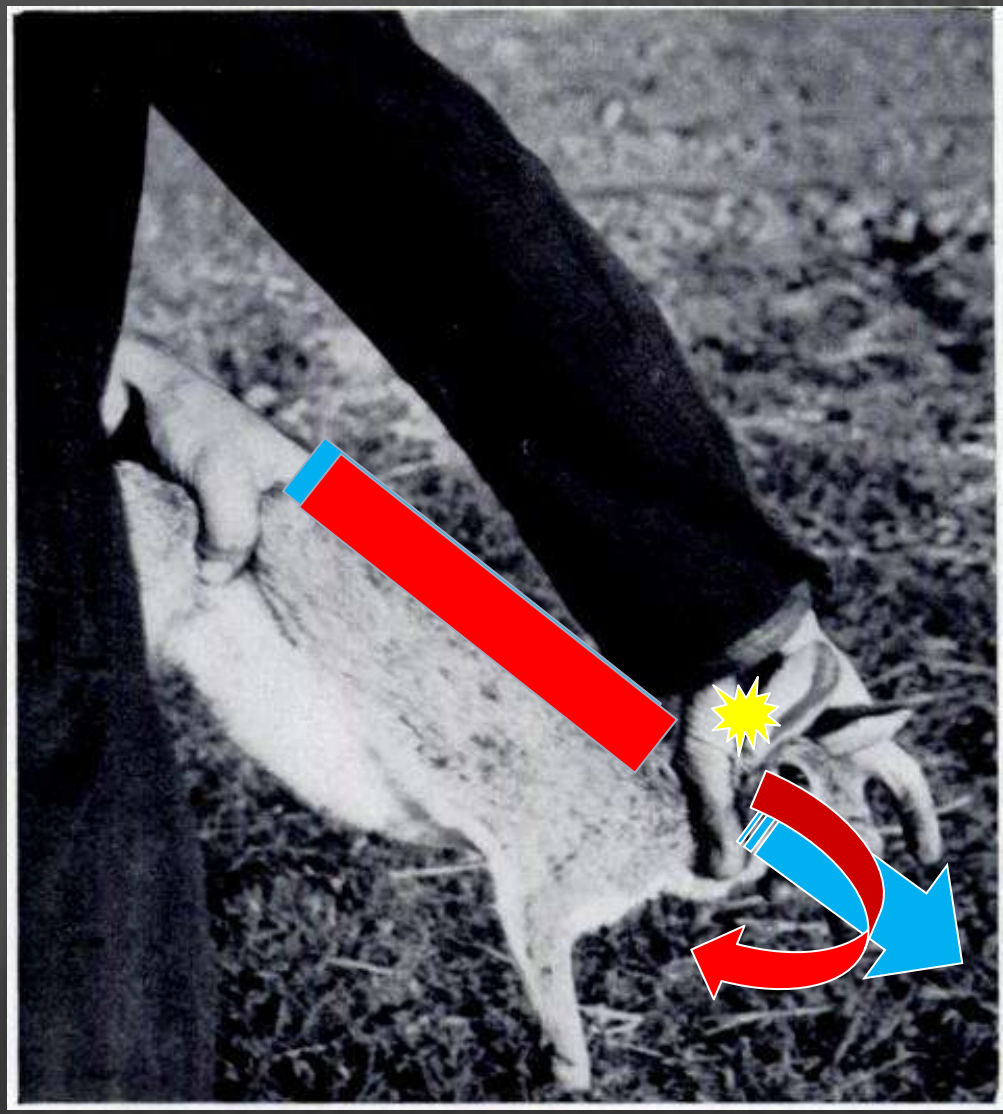
Clavero JA, Golano P, Farinas O, et al. Radiographics 2003;23:593-611
Pfirrmann CWA, Theumann NH, Botte MJ, et al. Radiology 2002;222:447-452

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

COLLATERAL LIGAMENT INJURIES

- UCL injures at the first MCPJ 60% of all collateral ligament injuries of the digits
  - Gamekeepers thumb



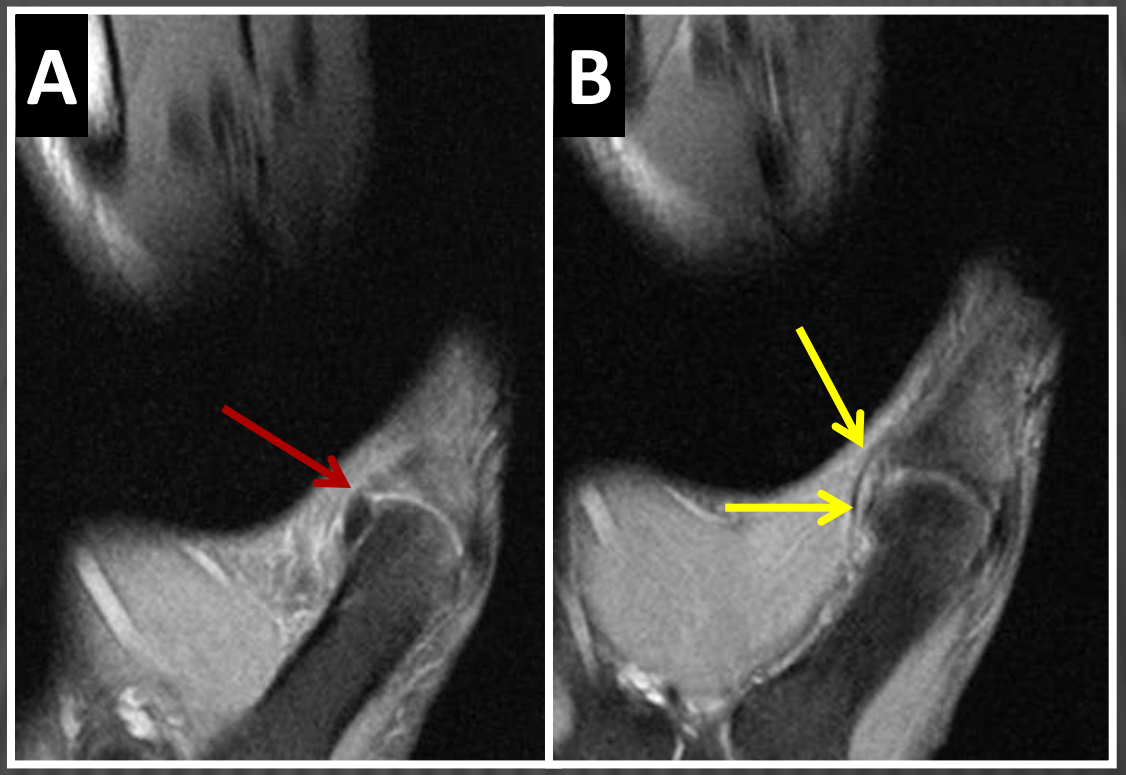
Campbell CS. Gamekeeper's thumb. J Bone Joint Surg Br 1955;37:148-149

CASES

Case 1:

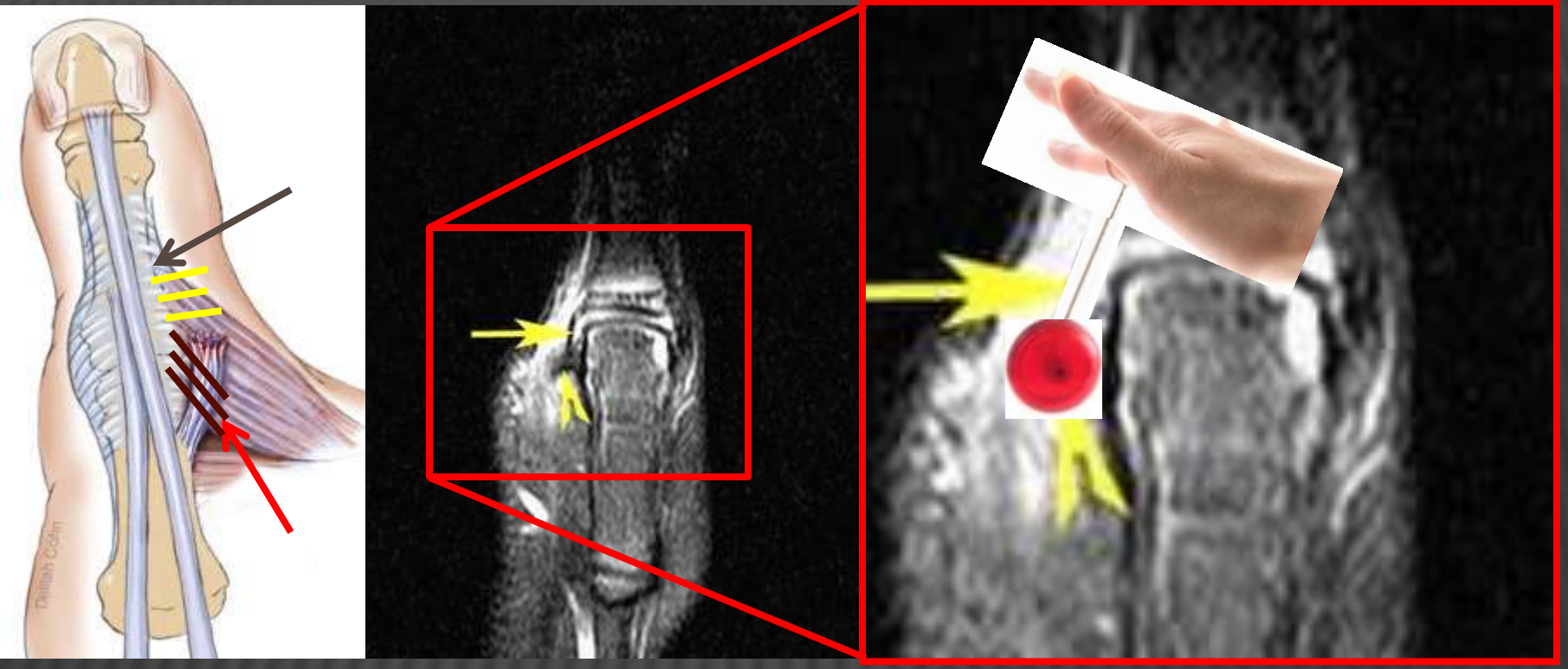
65M presented h/o UCL repair 6years earlier

COLLATERAL LIGAMENT INJURIES



Case 2:
47M w right thumb pain.

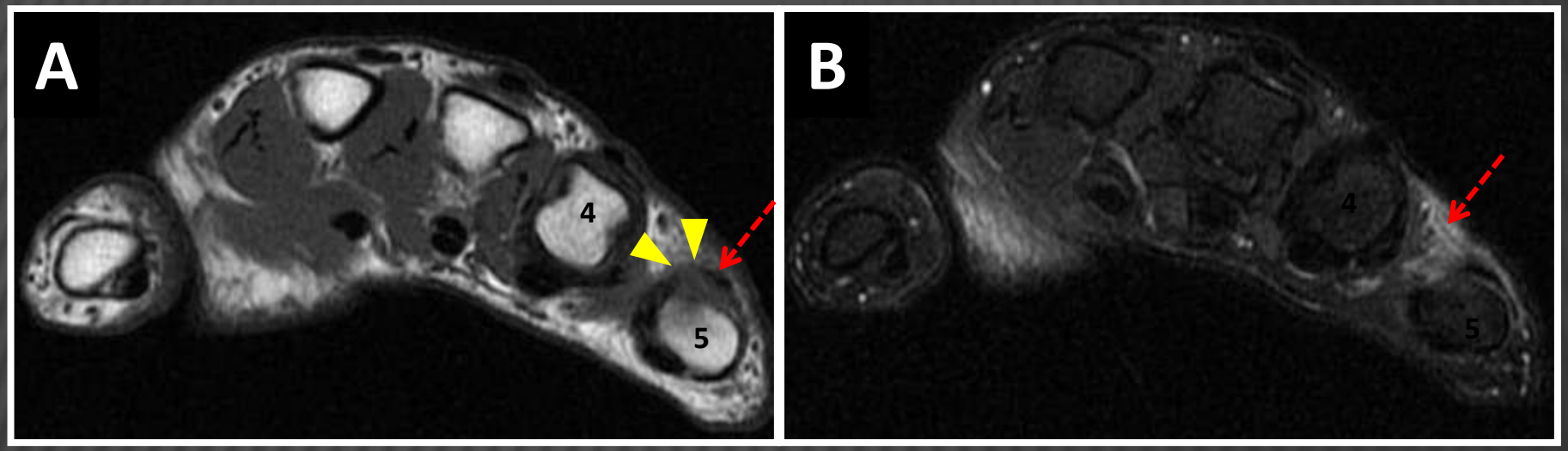
CASES



Case 3:

STENER LESION

CASES



Case 4:
28-year-old-man with a right hand injury and pain

STENER-LIKE LESION

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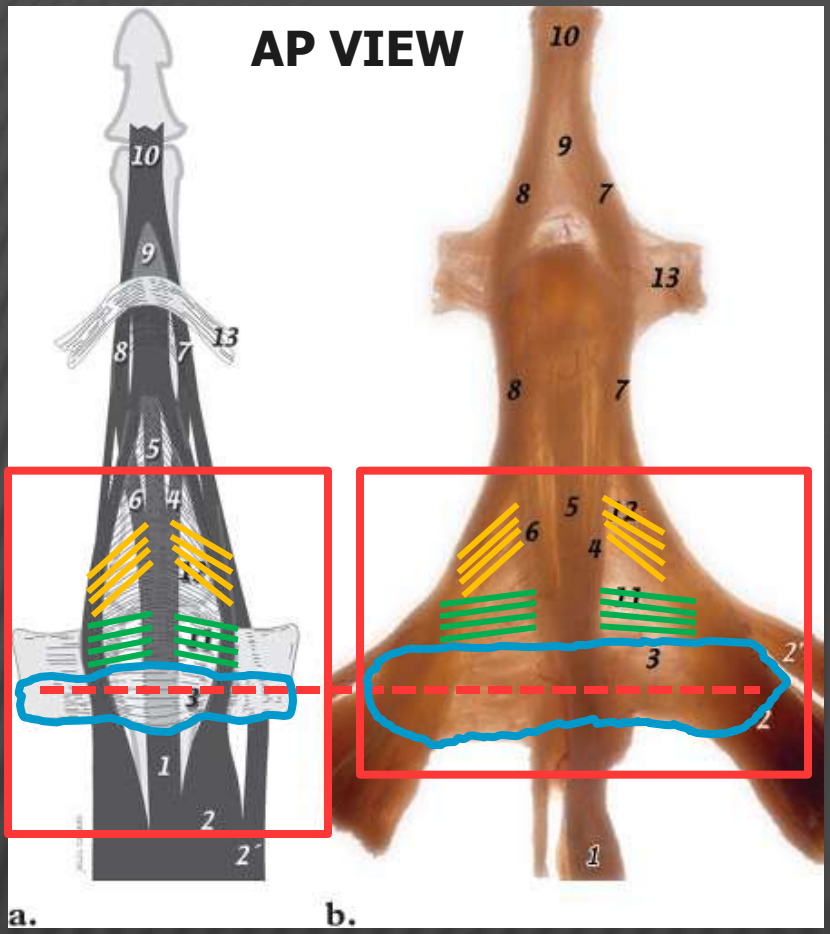
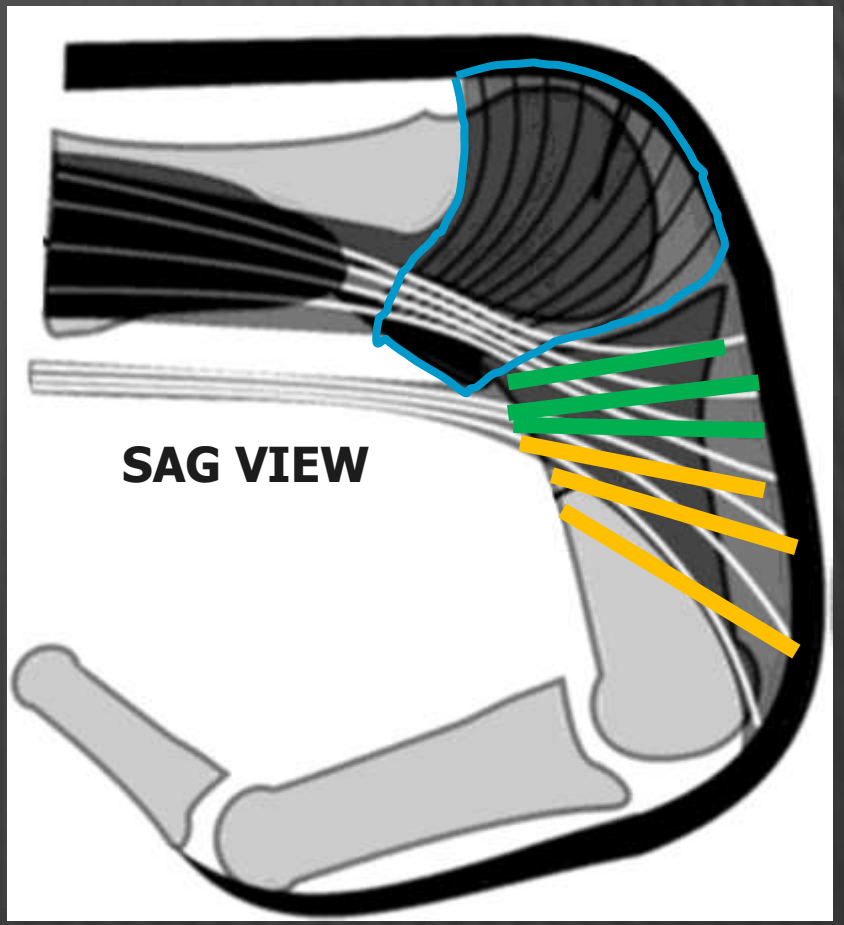
EXTENSOR MECHANISM

- 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





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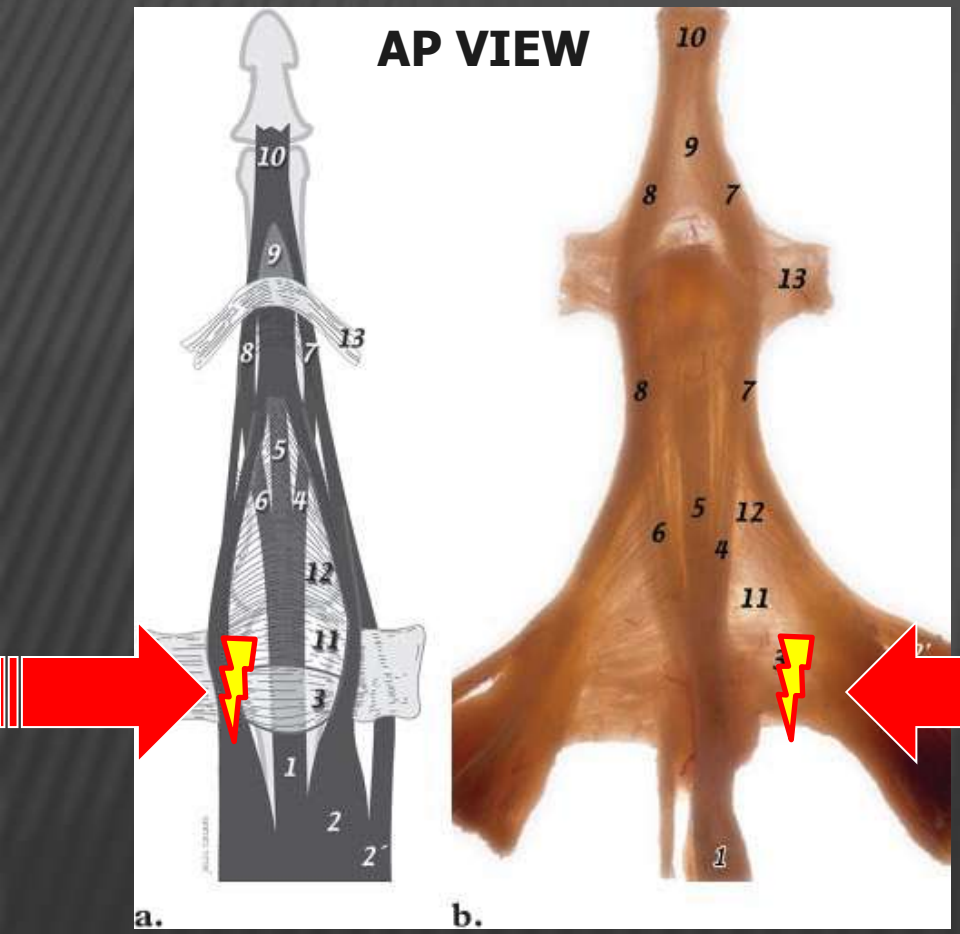
Clavero JA, Golano P, Farinas O, et al. Extensor mechanism of the fingers: MR imaging-anatomic correlation. Radiographics 2003;23:593-611

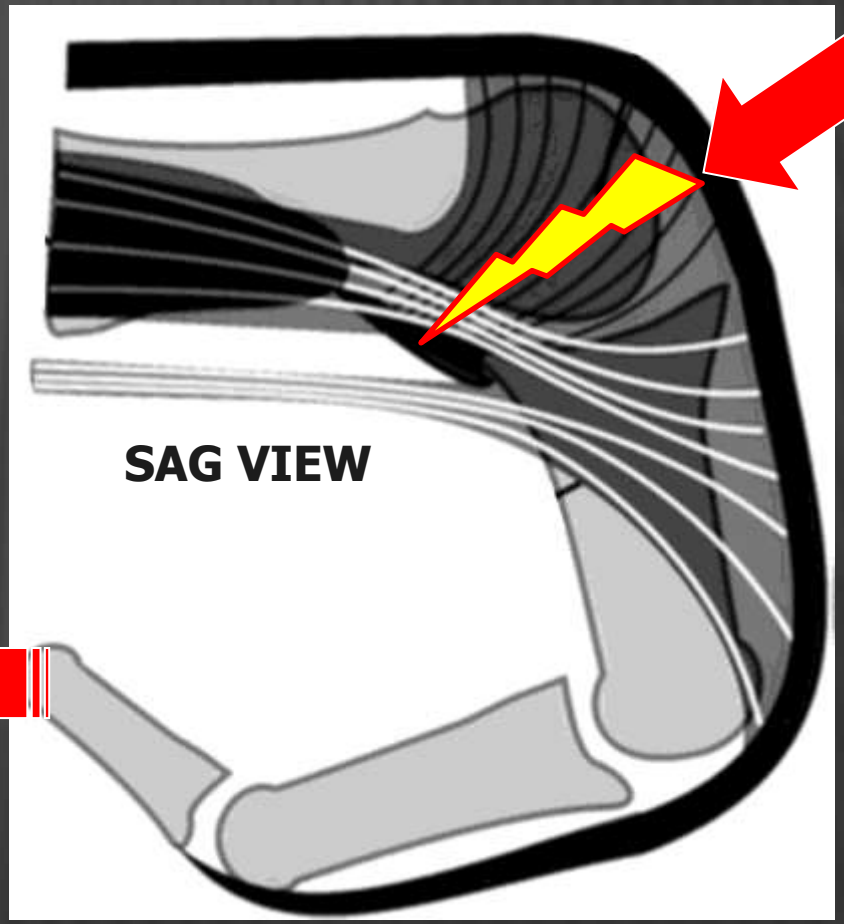
EXTENSOR MECHANISM

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

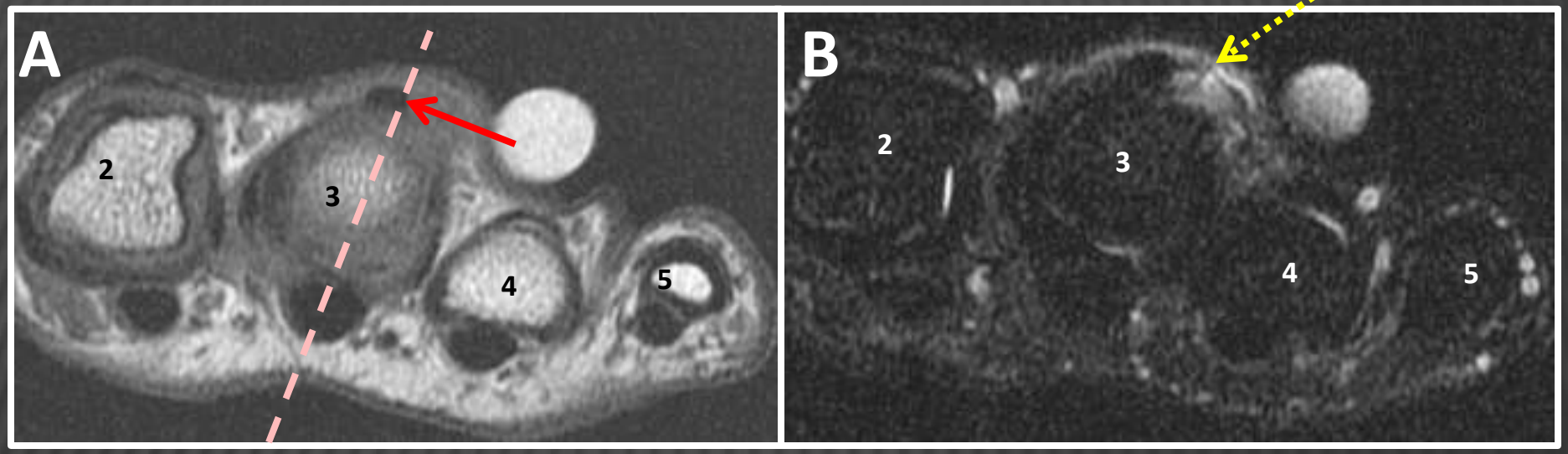
EXTENSOR MECHANISM

- Mechanism of Injury:





CASES



- 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

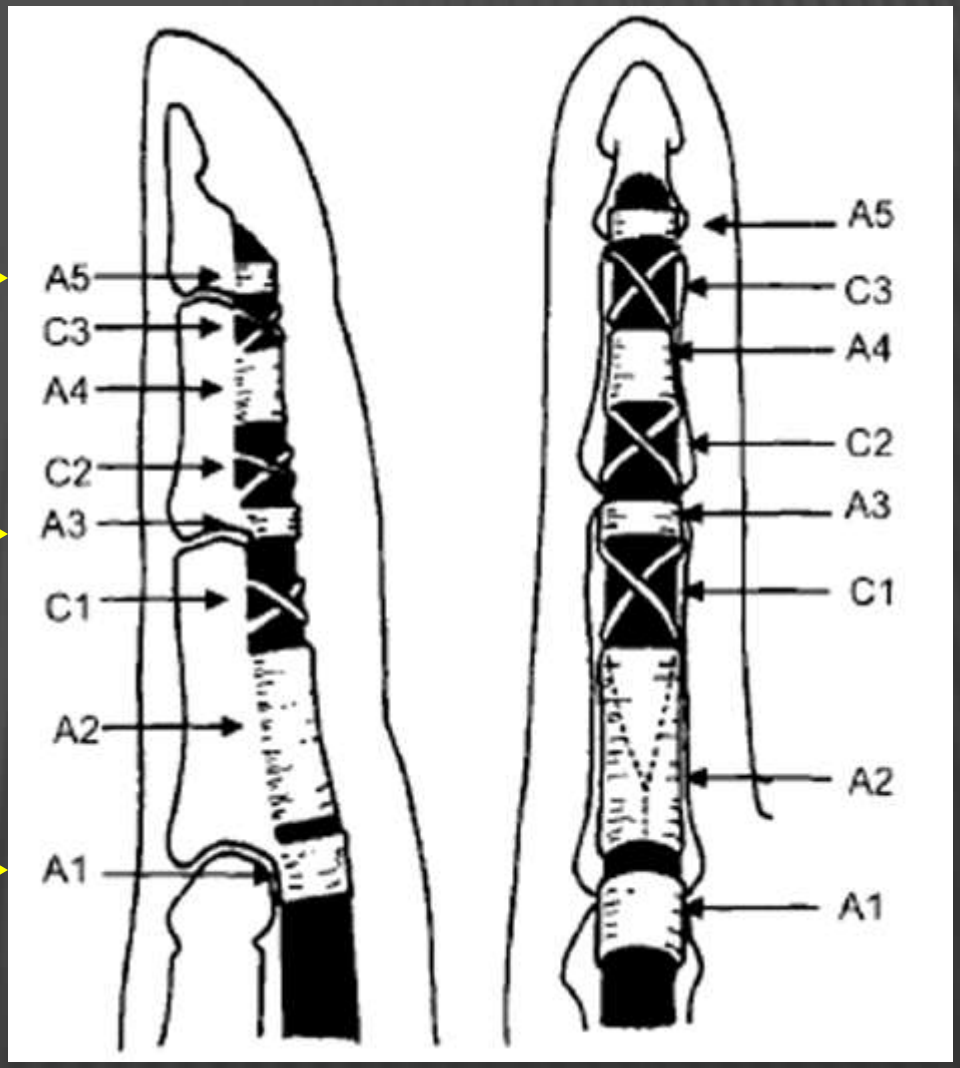
3 5 DIPJ

2 4

3 PIPJ

1 2

1 MCPJ



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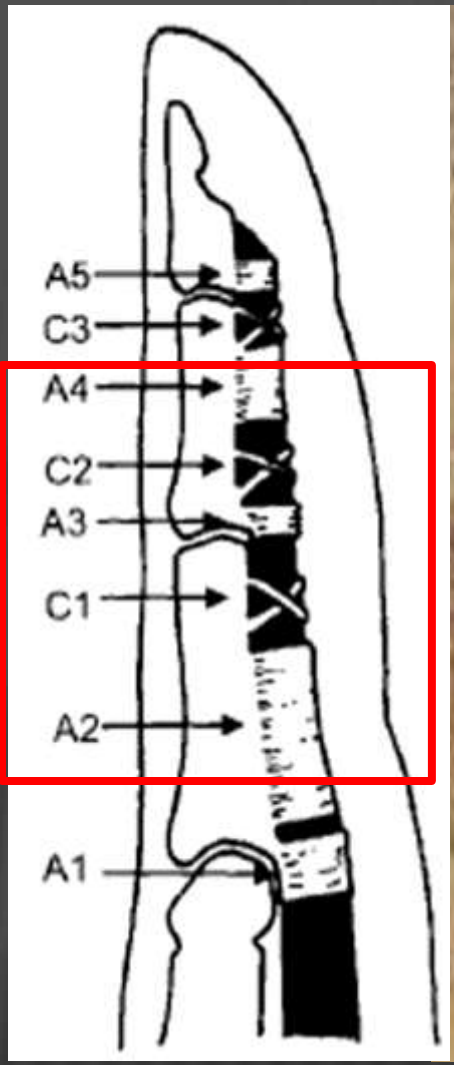
PULLEY INJURIES

- 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

CASES

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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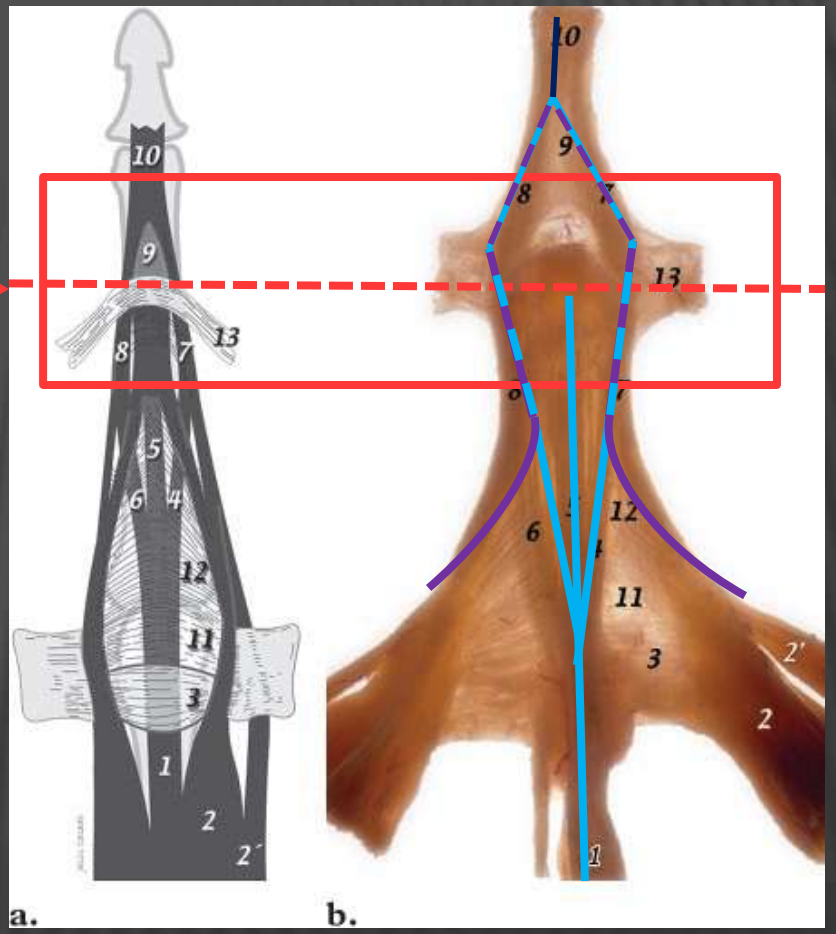
BOUTONNIERE DEFORMITY

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



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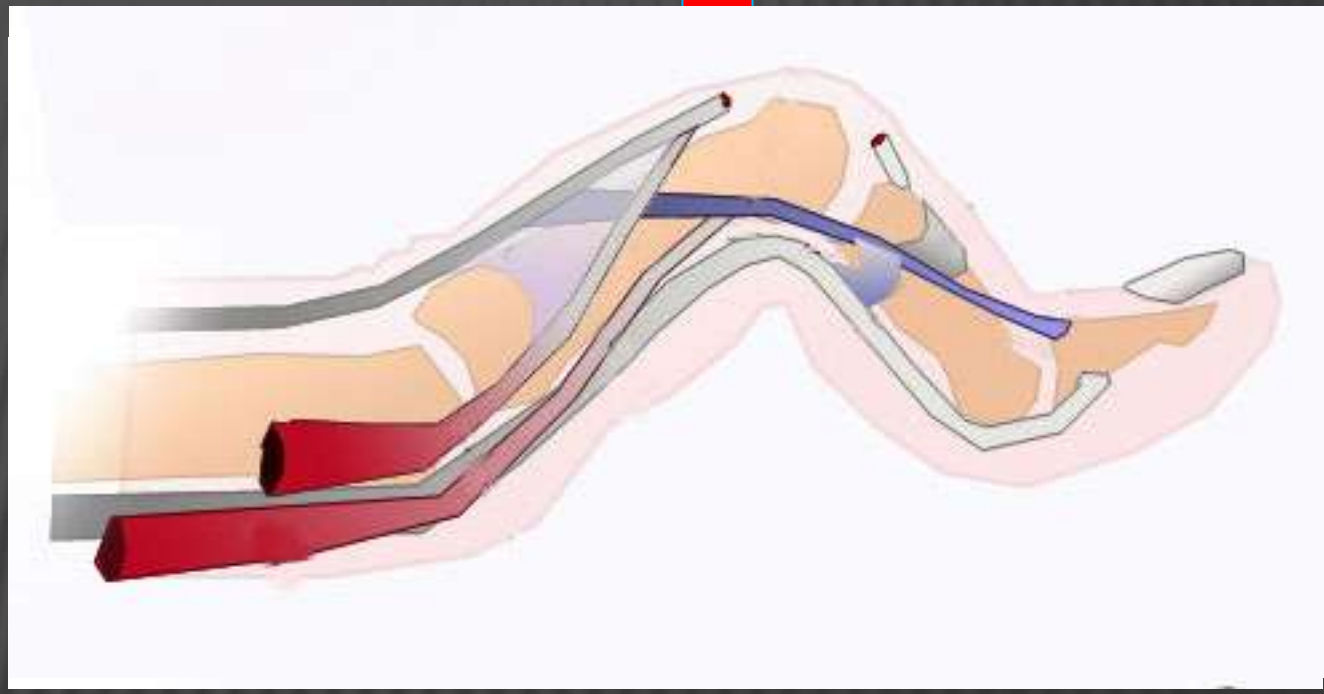
BOUTONNIERE DEFORMITY

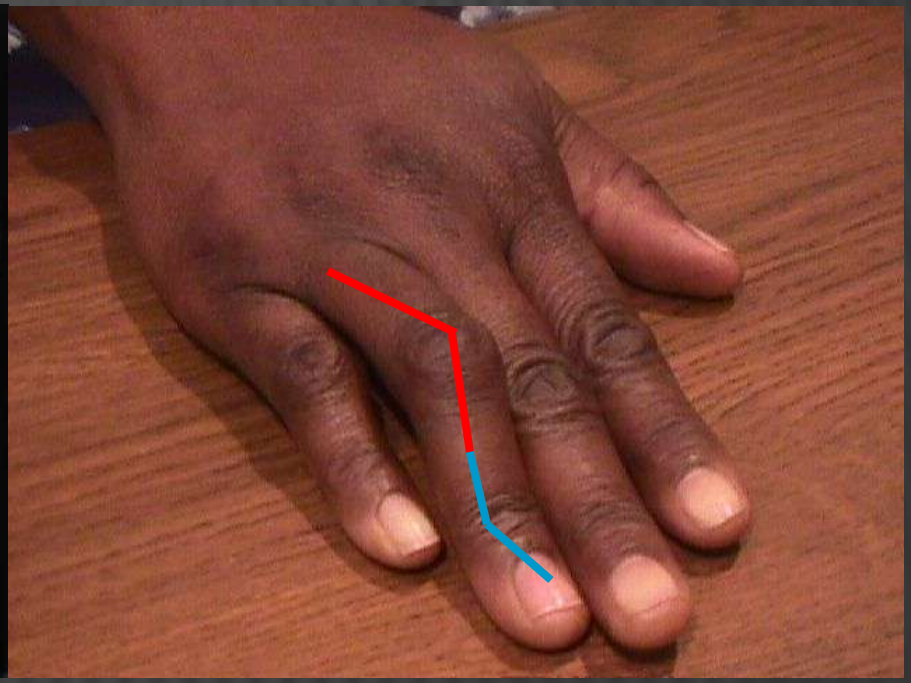
- Mechanism of Injury

- 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

CASES



http://medicalpicturesinfo.com/boutonniere-deformity/

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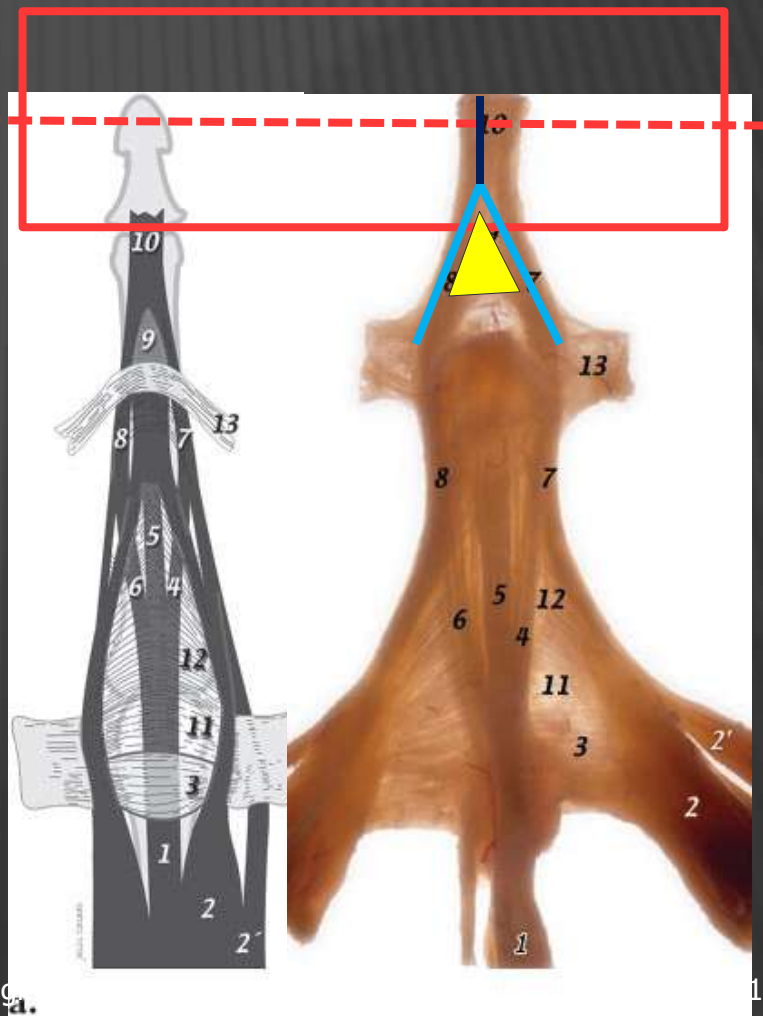
MALLET FINGER

- 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

MALLET FINGER

- Relevant Anatomy
- Lateral bands / conjoined tendons
- Terminal tendon
- Triangular ligament

DIPJ



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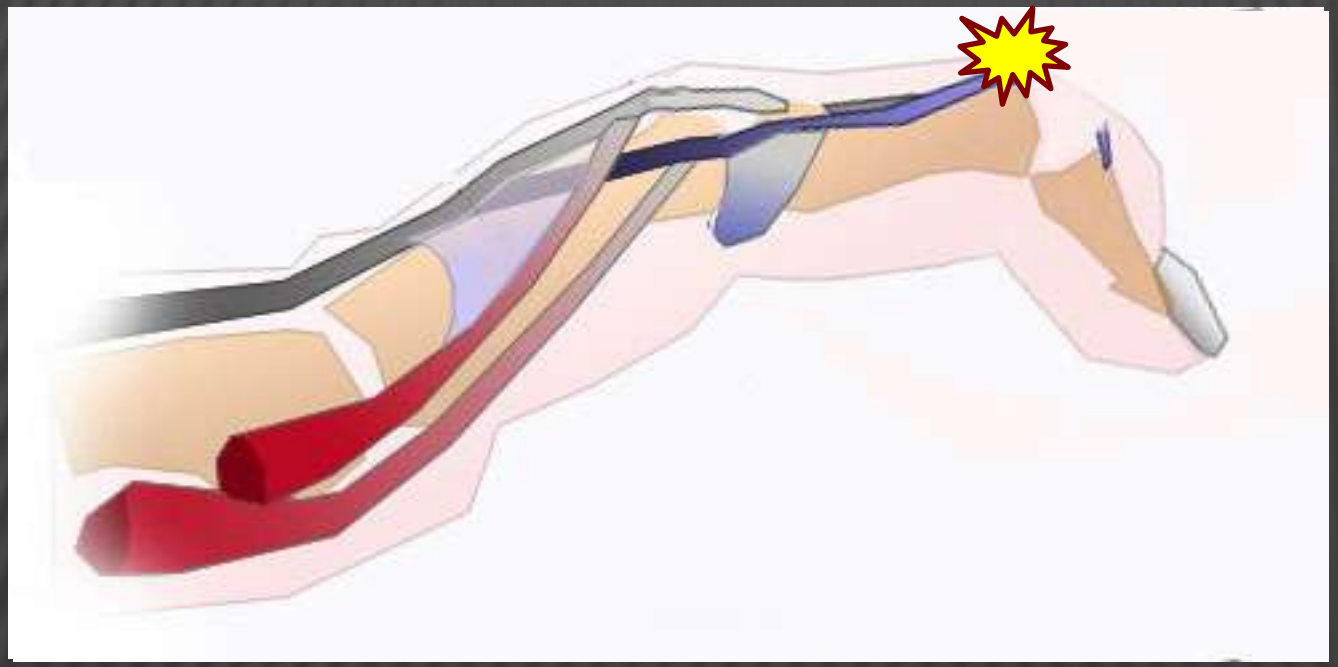
MALLET FINGER – BASEBALL FINGER

- Mechanism of Injury



Direct blow to fingertip of an extended DIPJ

Causes forced DIPJ flexion

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

CASES

- Surgery if:

- Distraction > 3mm

  or

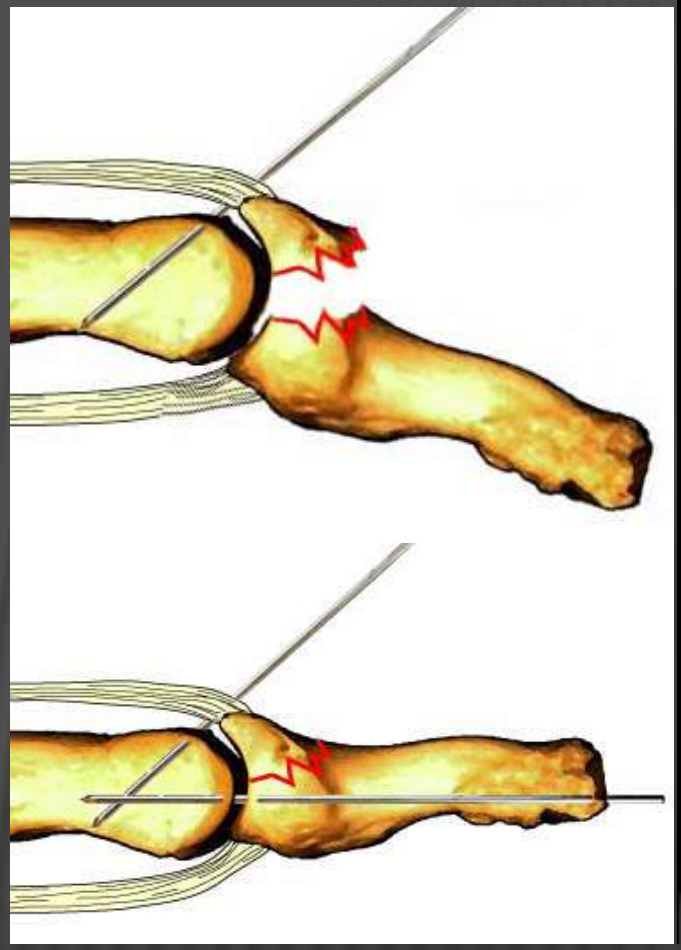
- >30% articular surface involvement

  or

- 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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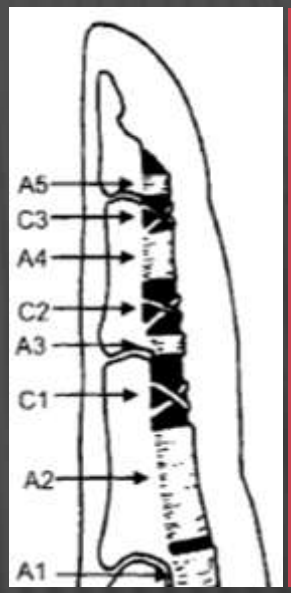
JERSEY FINGER

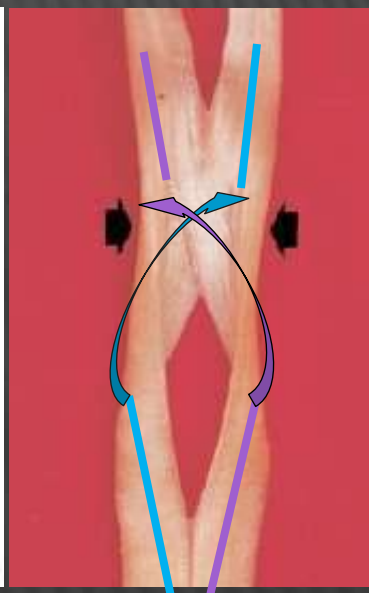
- Intro:
- seen in athletes >> typically football
  - Player grabs jersey of opponent
  - DIPJ in flexion at time of grab
  - Opponent pulls away
  - Forced extension of the DIPJ

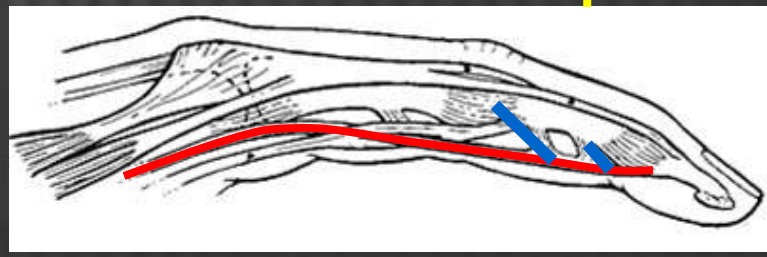
JERSEY FINGER

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







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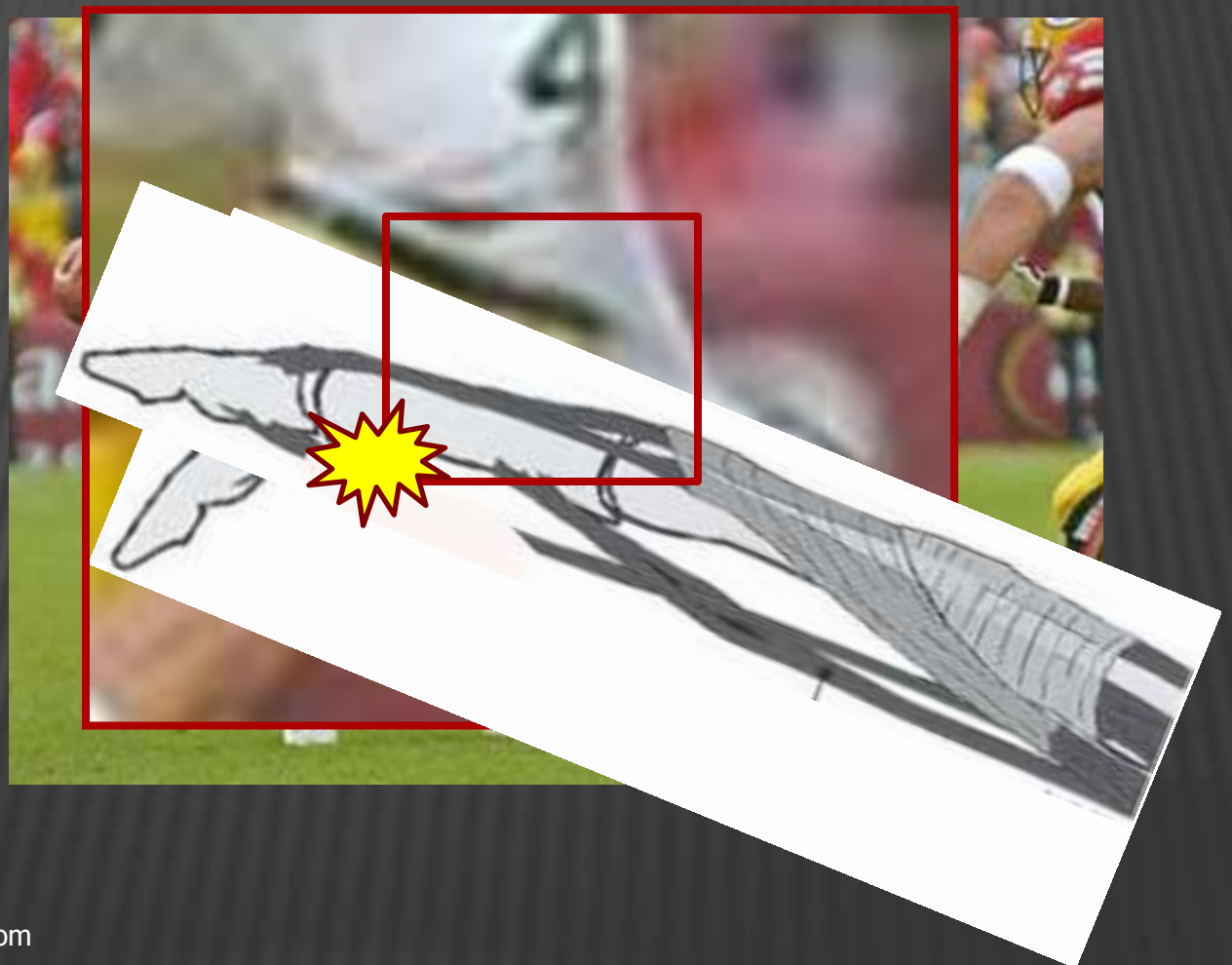
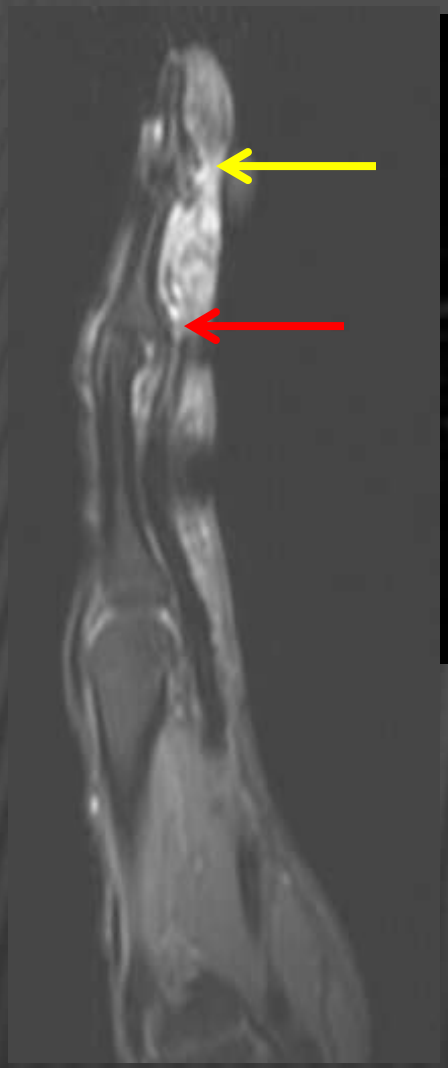
http://www.aafp.org/afp/2006/0301/p810.html

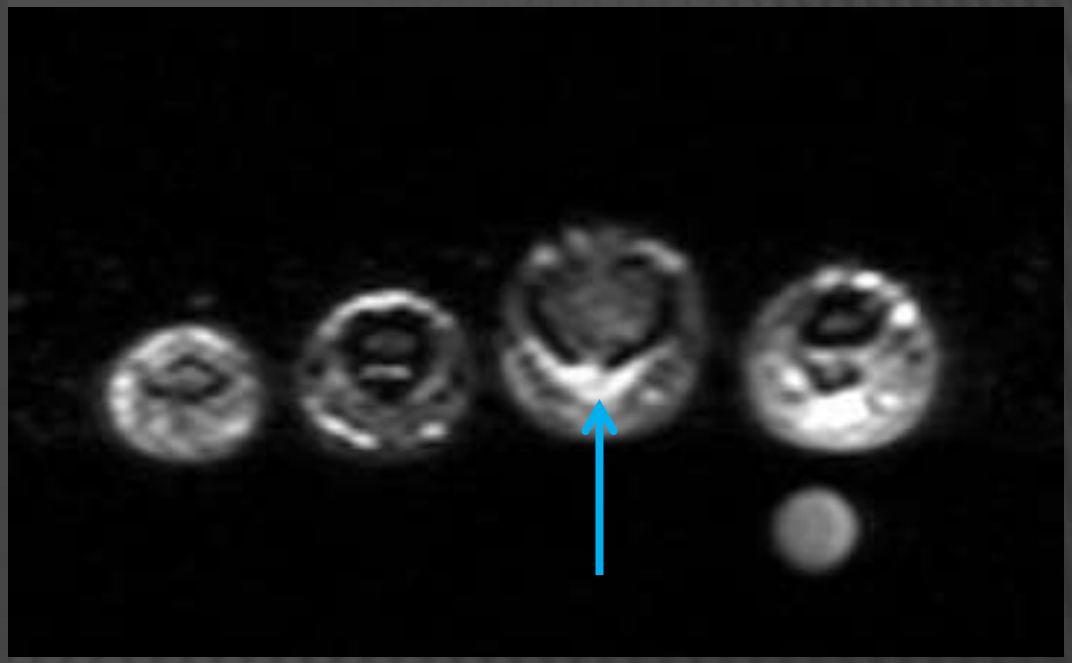
JERSEY FINGER

- Mechanism of Injury



CASES



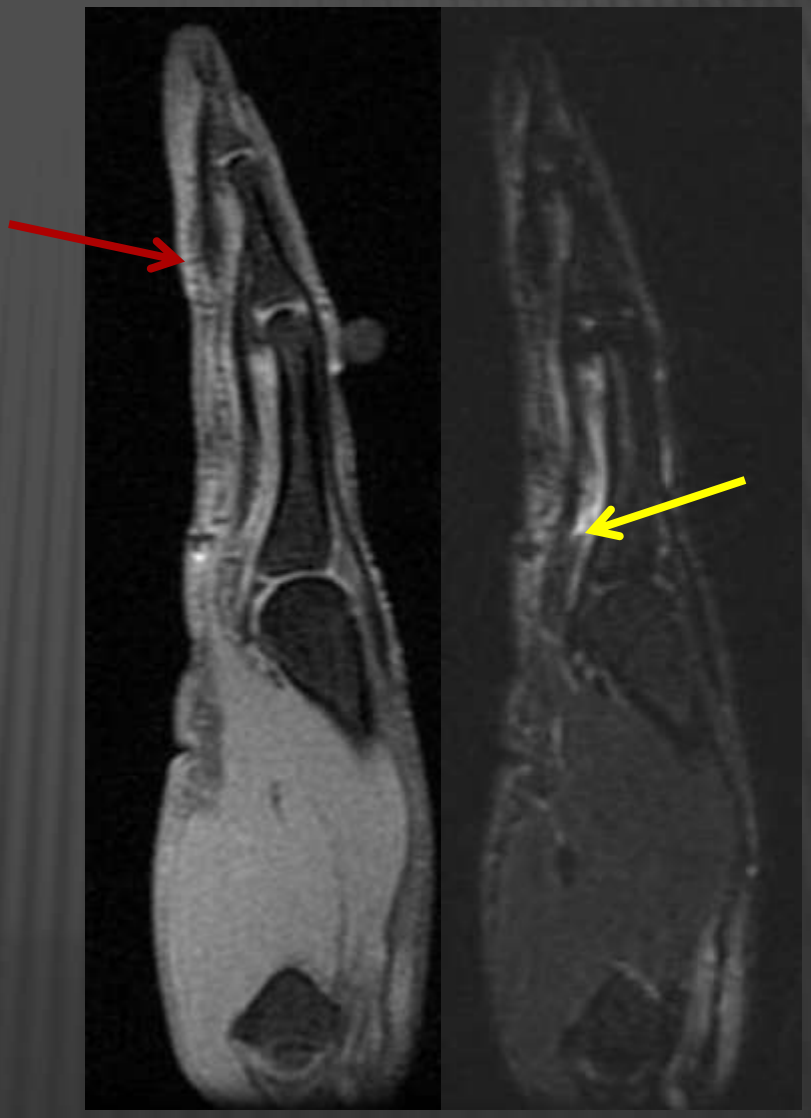


22-year-old man with laceration to the left third digit.

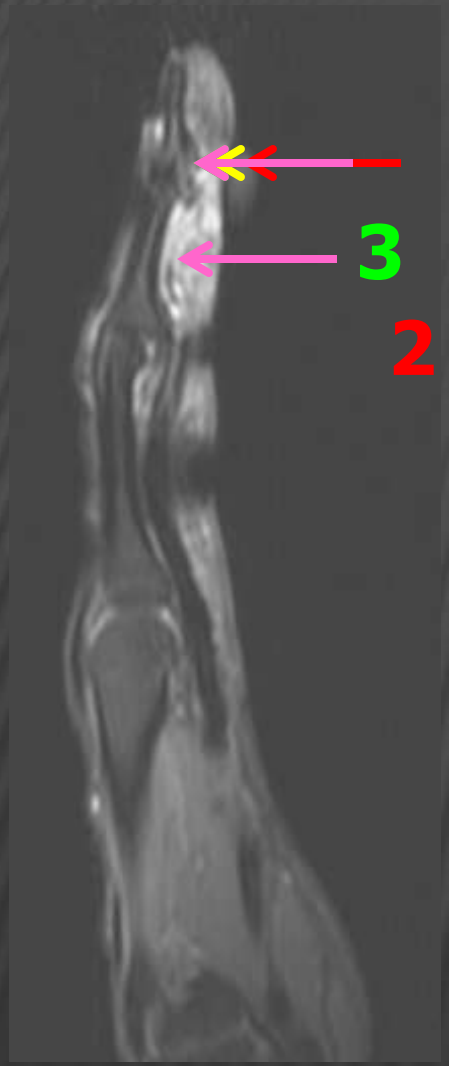
TYPE 2
JERSEY FINGER

CASES

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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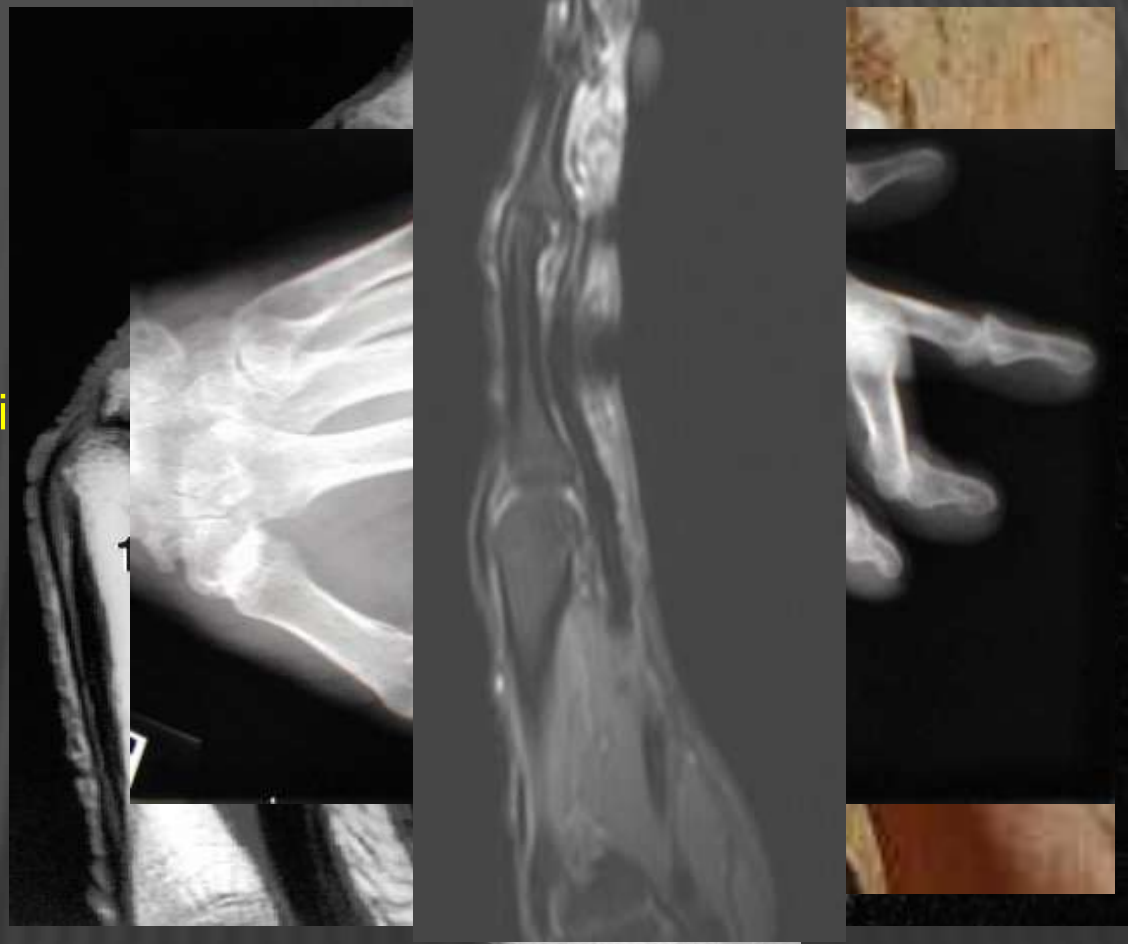

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