# We'll Give You a Hand: Wrist & Hand Pathologies You May Be Missing

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# DISCLOSURES

I have no personal or financial interests to declare.

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# PRE-TEST QUESTION #1

- Why is it important to diagnose Kienböck's disease as early as possible?
  A. The disease course can be reversed with early pharmacologic intervention
  B. To prevent the spread of necrosis to adjacent bones
  C. Because ultrasound can be both diagnostic and therapeutic for the condition
  D. To intervene before bony collapse of the lunate occurs

# PRE-TEST QUESTION #2

- Definitive treatment for a Jersey finger injury…
  A. is always conservative: 6-8 weeks of splinting typically does well.
  B. may be conservative or surgical, it depends on the location of the injury.
  C. is always surgical (primary tendon repair or fracture fragment repair). Long-term splinting is rarely an option.
  D. is a corticosteroid injection at the site of injury.

# PRE-TEST QUESTION #3

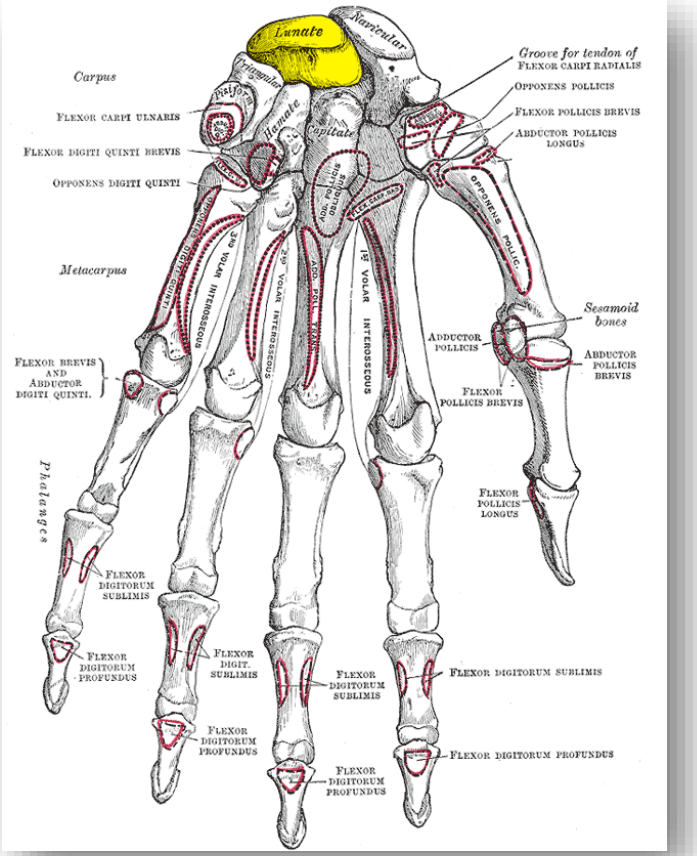
- When evaluating a patient with a suspected skier's thumb injury…
  A. it is best to obtain radiographs prior to assessing the UCL.
  B. radiographs are not necessary – it is a clinical diagnosis.
  C. it is best to obtain radiographs after assessing the UCL.
  D. MRI is the gold standard imaging that is needed.

# INTRODUCTION & BACKGROUND

- hand & wrist susceptible to injury & overuse
- hand function abnormal = disability
- ~11.3% of all ED visits in the US involved injuries to the hand, wrist, or fingers

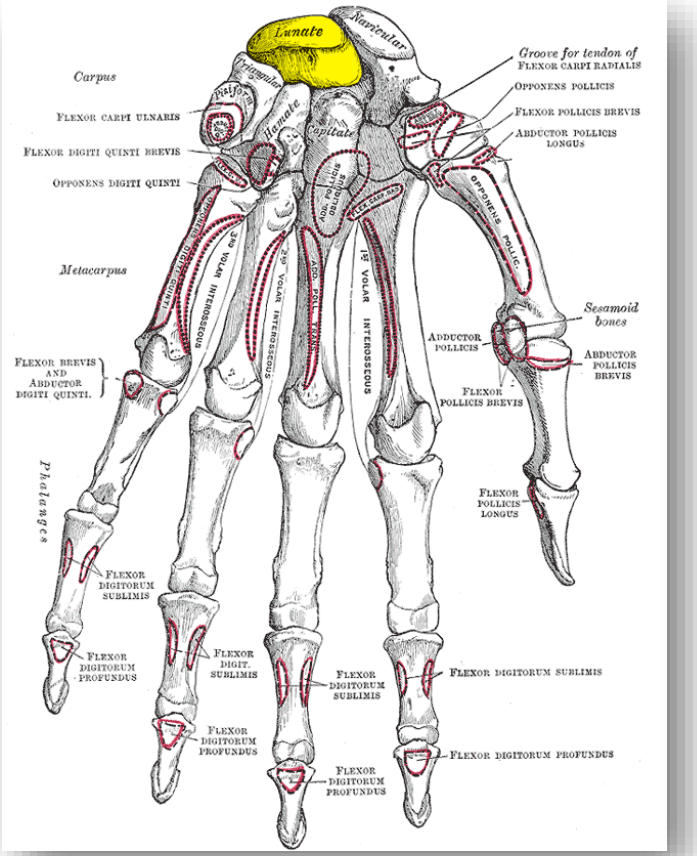
# KIENBÖCK'S DISEASE

- avascular necrosis of lunate
  - leads to progressive collapse
- etiology unknown
  - disruption of blood supply
  - undiagnosed fracture?
  - repetitive trauma?



# KIENBÖCK'S DISEASE

- more common in males
- dorsal wrist pain
- vague complaints
  - wrist swelling
  - wrist stiffness



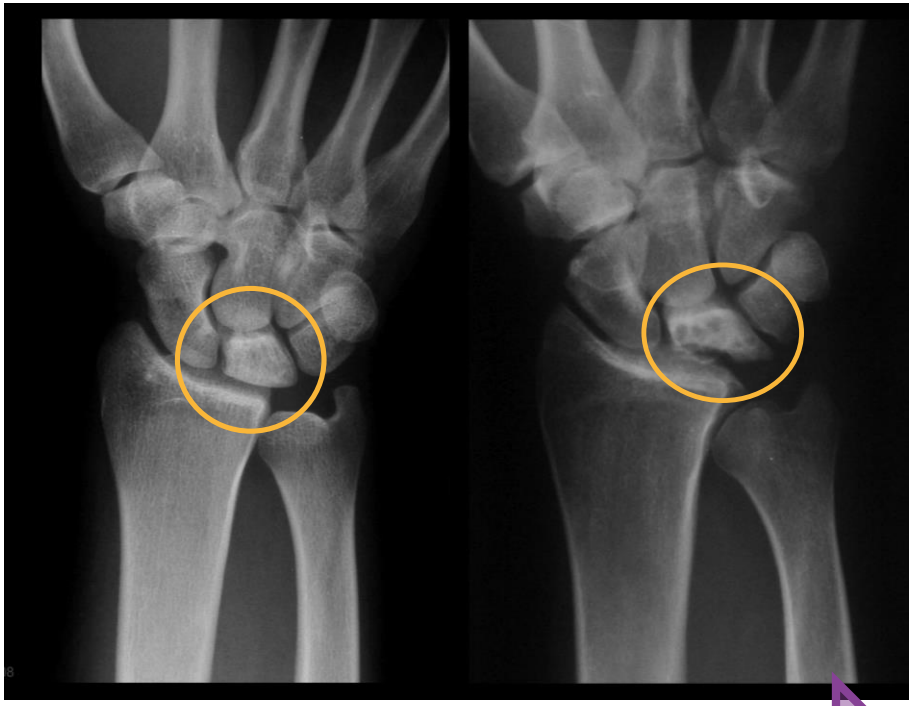
# KIENBÖCK'S DISEASE

- over time…
  - crepitus
  - ↓ ROM
  - weakness with grip

- progression varies
  - typically over several years

# KIENBÖCK'S DISEASE

- Radiographs
  - shows increased density of lunate
  - not very sensitive

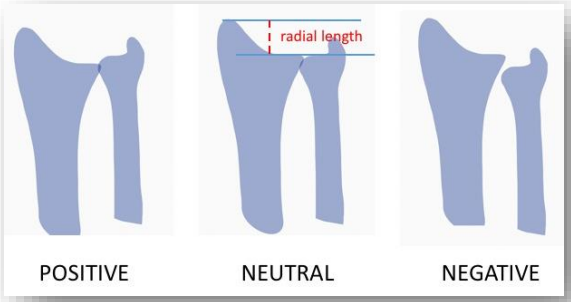


# KIENBÖCK'S DISEASE

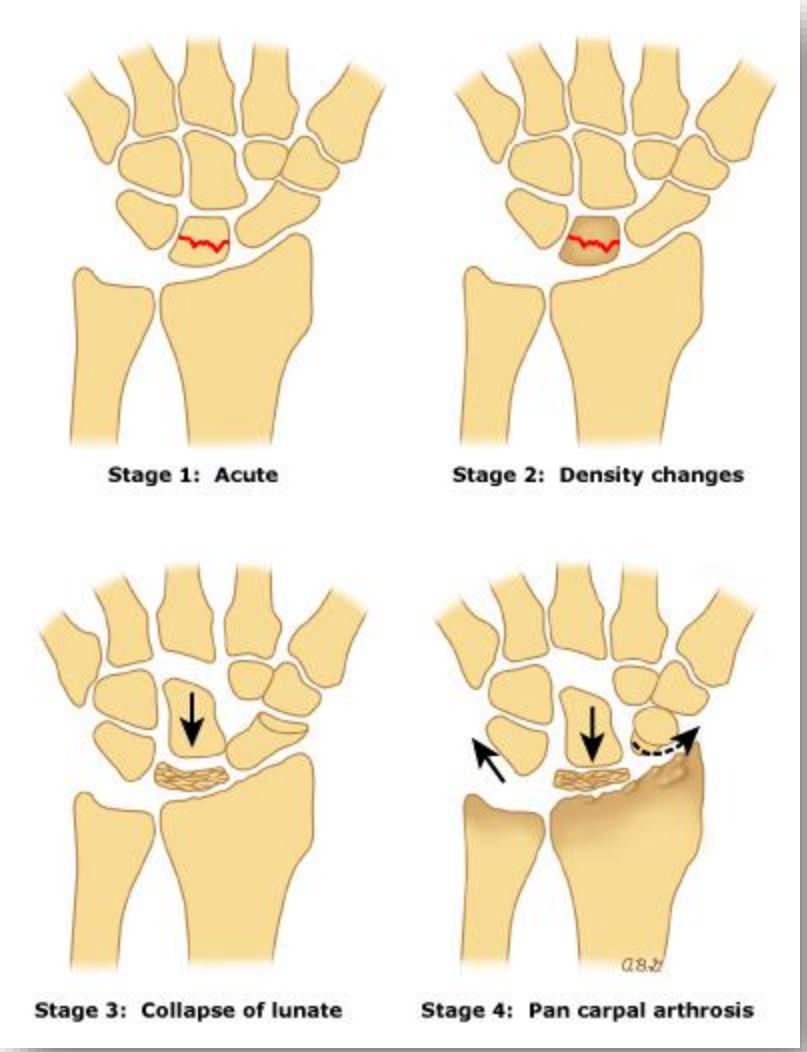
- More sensitive imaging, helpful for early disease
  - Bone Scan
    - increased uptake
  - MRI
    - decreased signal on T1 image

# KIENBÖCK'S DISEASE

- radiograph considerations:
  - "ulna positive variance" vs "ulna negative variance"




# KIENBÖCK'S DISEASE



# KIENBÖCK'S DISEASE

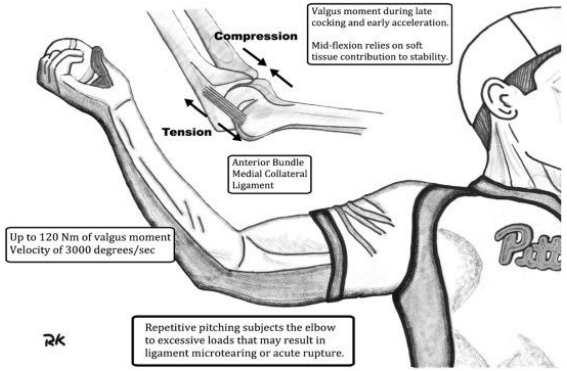

Treatment:

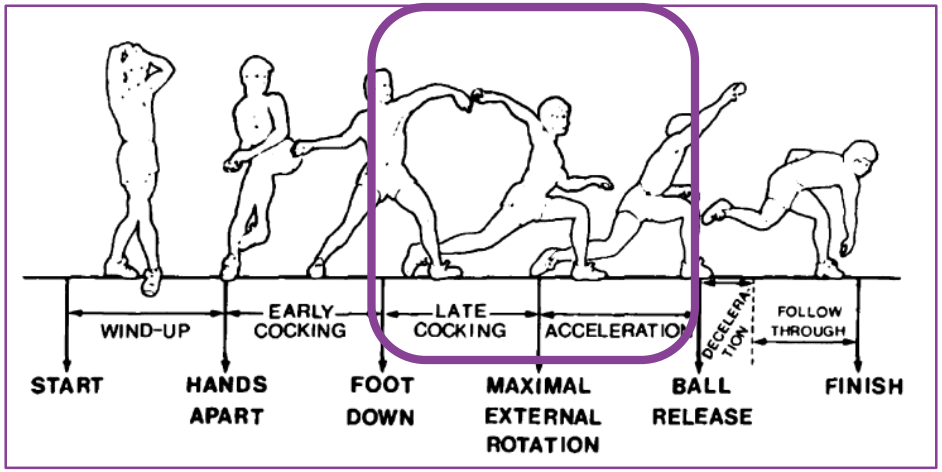
- conservative: immobilization

- surgical treatment
  - proximal row carpectomy
  - radial shortening osteotomy
  - vascularized bone graft
  - wrist arthrodesis

# COLLATERAL LIGAMENT INJURIES

- UCL Tear (MCL)
  - valgus force
  - overhead throwing athletes!
    - especially pitchers
    - late cocking, early acceleration
    - ***loss of velocity/accuracy***



# COLLATERAL LIGAMENT INJURIES

- UCL Tear Prevention

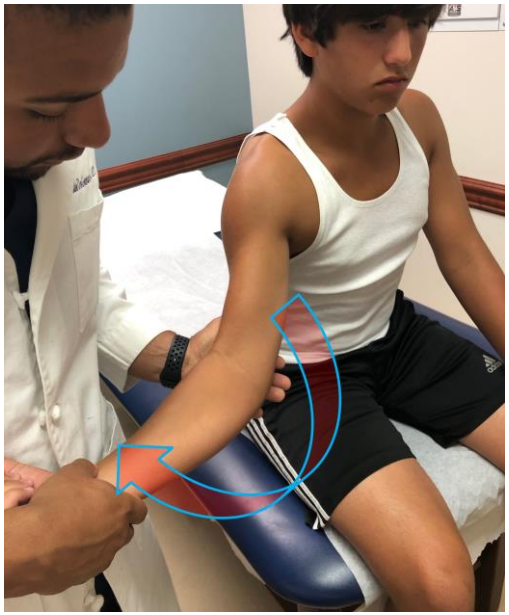
## Little League Pitch Counts

| Age | Daily Max Pitches | Required Rest Days (Pitches) | | | | |
|---|---|---|---|---|---|---|
| | | O Days | 1 Day | 2 Days | 3 Days | 4 Days |
| 7-8 | 50 | 1-20 | 21-35 | 36-50 | N/A | N/A |
| 9-10 | 75 | 1-20 | 21-35 | 36-50 | 51-65 | 66+ |
| 11-12 | 85 | 1-20 | 21-35 | 36-50 | 51-65 | 66+ |
| 13-14 | 95 | 1-20 | 21-35 | 36-50 | 51-65 | 66+ |
| 15-16 | 95 | 1-30 | 31-45 | 46-60 | 61-75 | 76+ |
| 17-18 | 105 | 1-30 | 31-45 | 46-60 | 61-75 | 76+ |

Source: https://www.littleleague.org/playing-rules/pitch-count/

# COLLATERAL LIGAMENT INJURIES

- UCL Tear
  - Special tests

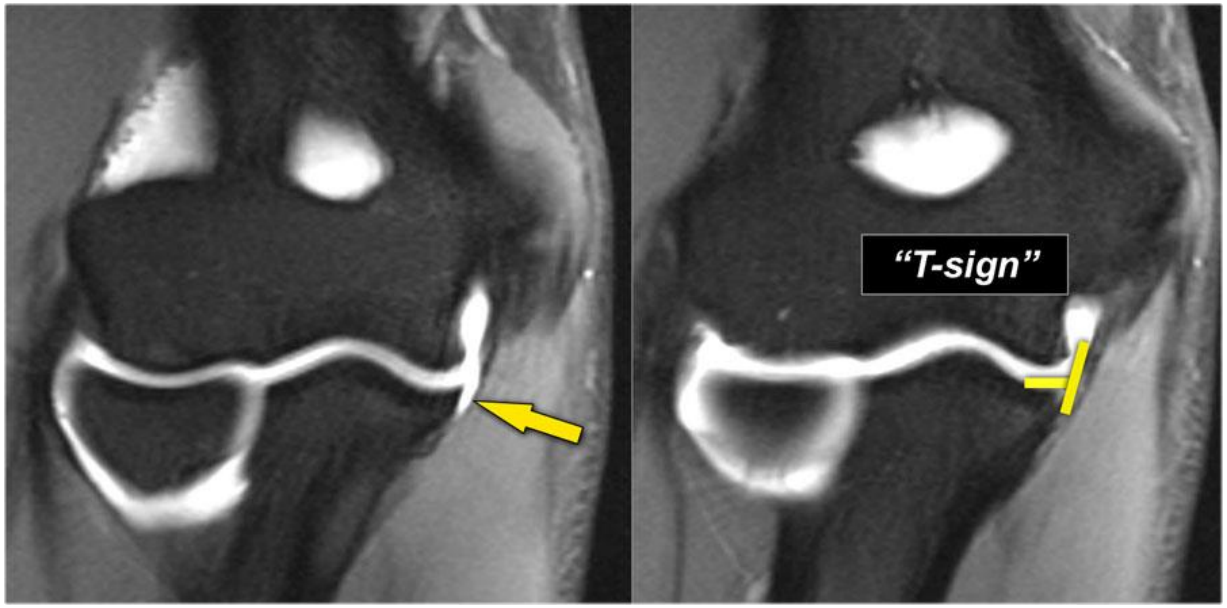


Valgus Stress Test

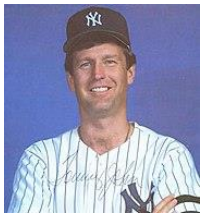

Milking Maneuver

# COLLATERAL LIGAMENT INJURIES

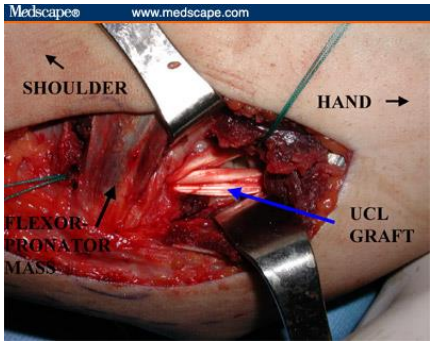
- UCL Tear
  - MRI Arthrogram

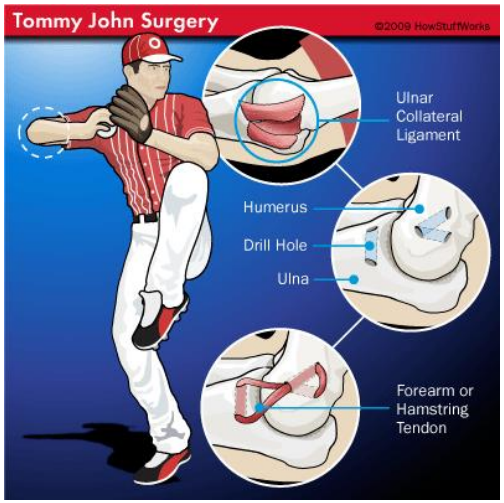


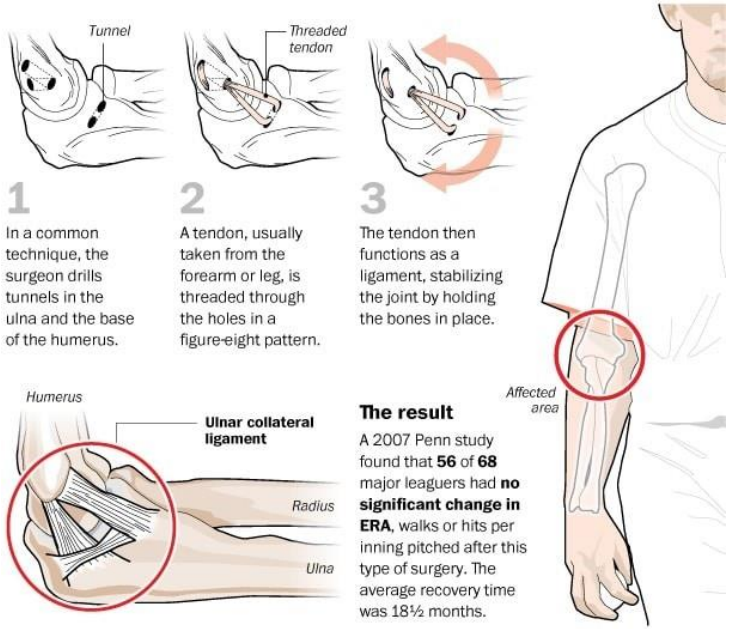
# COLLATERAL LIGAMENT INJURIES



- UCL Tear
  - no conservative treatment
  - surgery:  UCL reconstruction
    - "Tommy John"

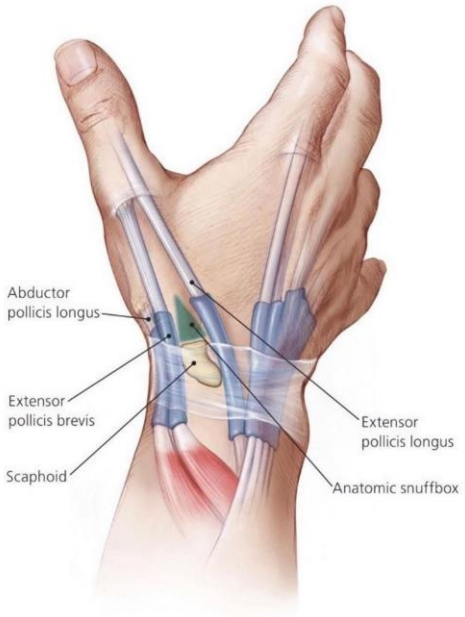


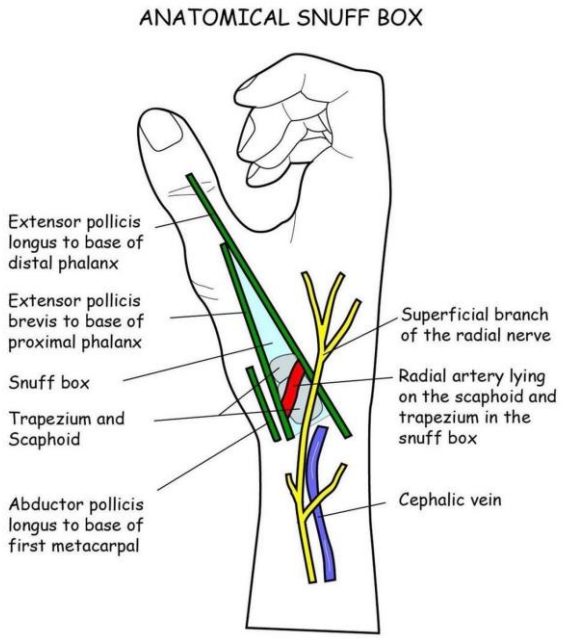



# DEQUERVAIN'S TENOSYNOVITIS

- 1st dorsal extensor compartment
  - abductor pollicis longus
  - extensor pollicis brevis
- pain with lifting ("new mommy syndrome")



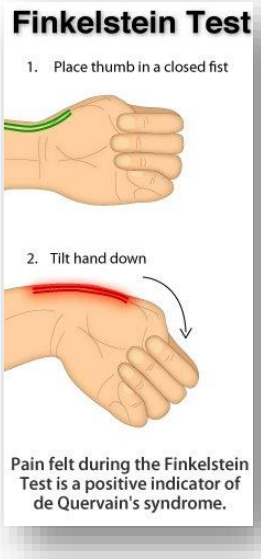



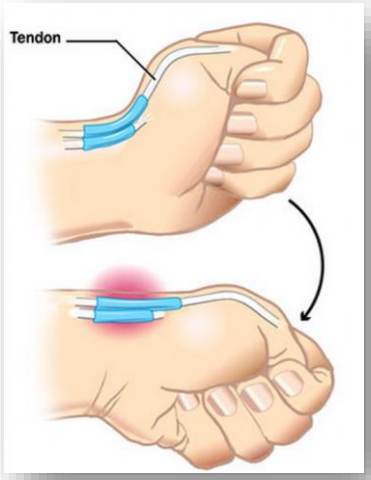
# DEQUERVAIN'S TENOSYNOVITIS

- TTP along tendons near radial styloid
- "snowball crepitus"

- pain with…
  - resistive thumb extension
  - resistive ulnar deviation of wrist

- Special Test

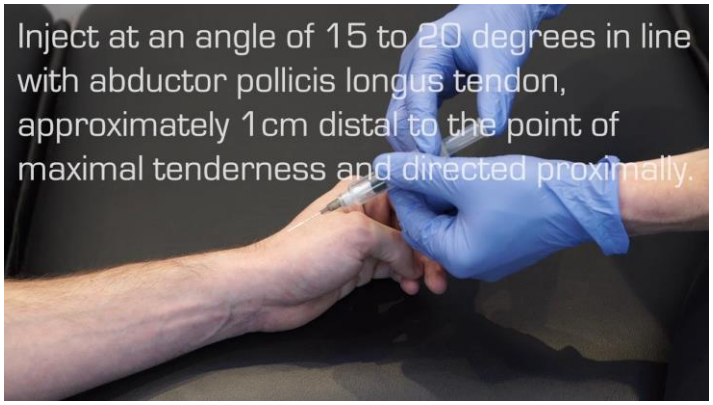


# DEQUERVAIN'S TENOSYNOVITIS

- typically no imaging necessary

- Treatment
  - NSAIDS, RICE
  - thumb spica splint
  - PT/OT referral
  - corticosteroid injection

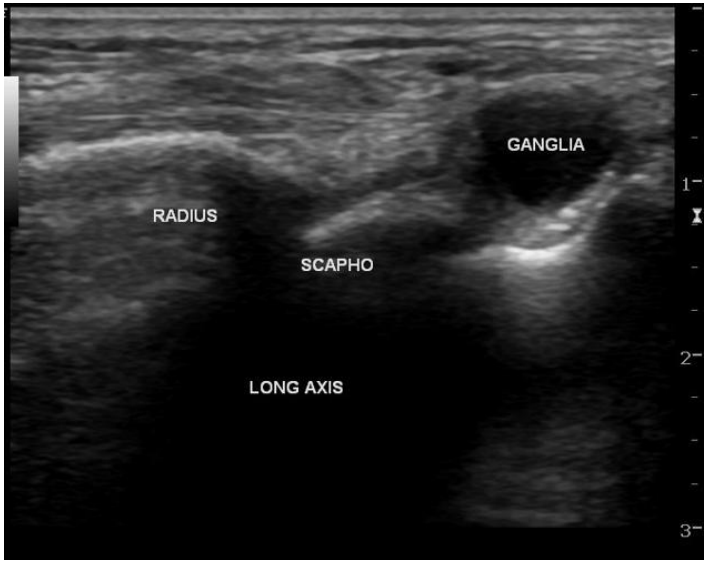


# GANGLION CYST

- most common soft tissue mass of hand/wrist
  - some are painful, not always
- more common in women, more common dorsally
  - 70% are dorsal, near scaphoid or lunate
- weakness in tendon sheath capsule
  - previous trauma?

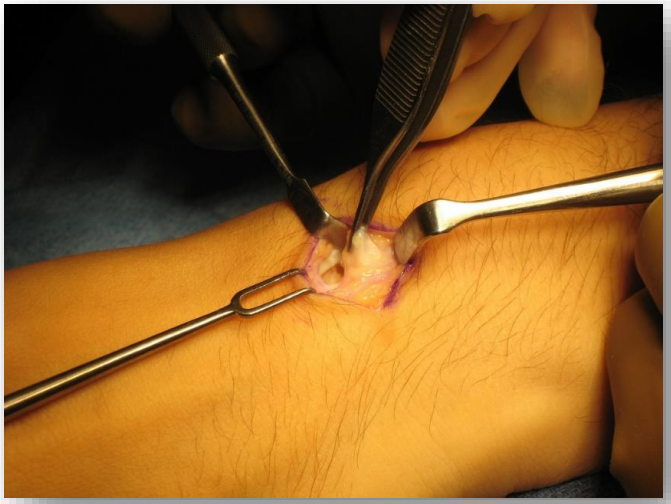
# GANGLION CYST

- clinical diagnosis
  - +/- Xrays
  - trans-illumination
  - ultrasound



# GANGLION CYST

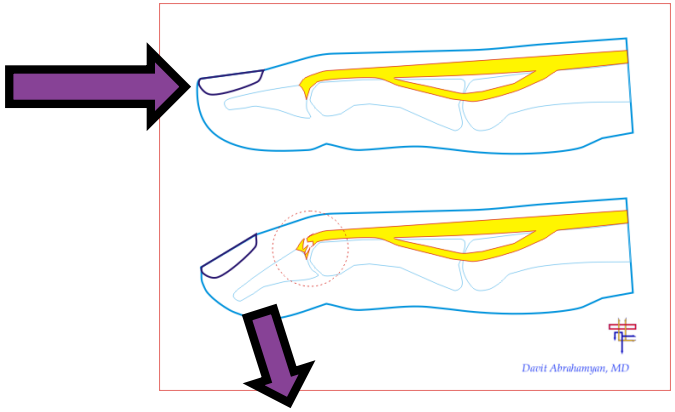
- Treatment
  - splint
  - aspiration
  - ***surgical excision***



"Bible Bump"

# MALLET FINGER

# MALLET FINGER

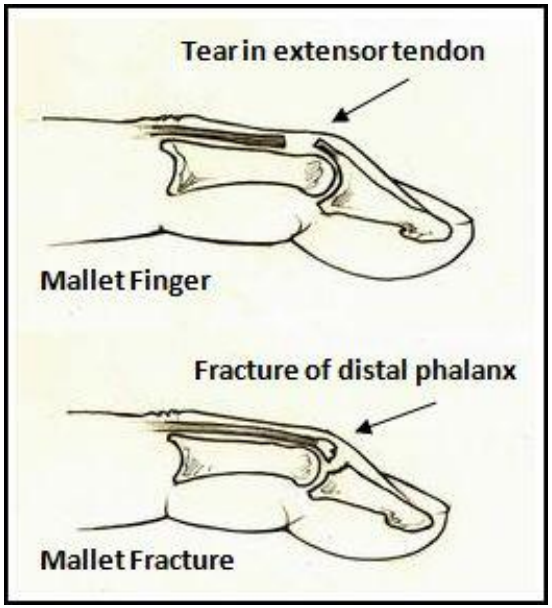



- sudden flexion force
  - typically from object

- causes flexion deformity/extensor lag at the DIP

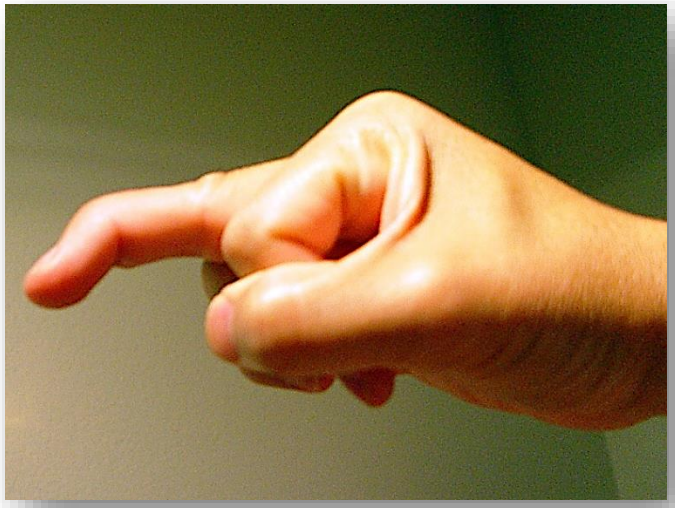
# MALLET FINGER

- injury to extensor mechanism @ dorsal DIP joint
  - may be tendon rupture
  - may be avulsion fracture



# MALLET FINGER

- ecchymosis, swelling over DIP
- TTP at distal finger (DIP), especially dorsal
- flexion deformity/extensor lag
- pain with motion



# MALLET FINGER

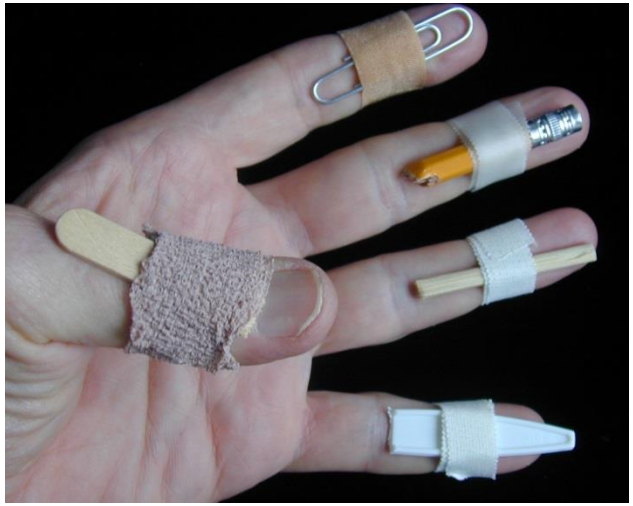
- finger X-rays (not hand)
  - AP, lateral, oblique


# MALLET FINGER

- Soft Tissue Mallet
  - 6-8 weeks of extension splinting
  - may initiate within 3 months of injury

# MALLET FINGER

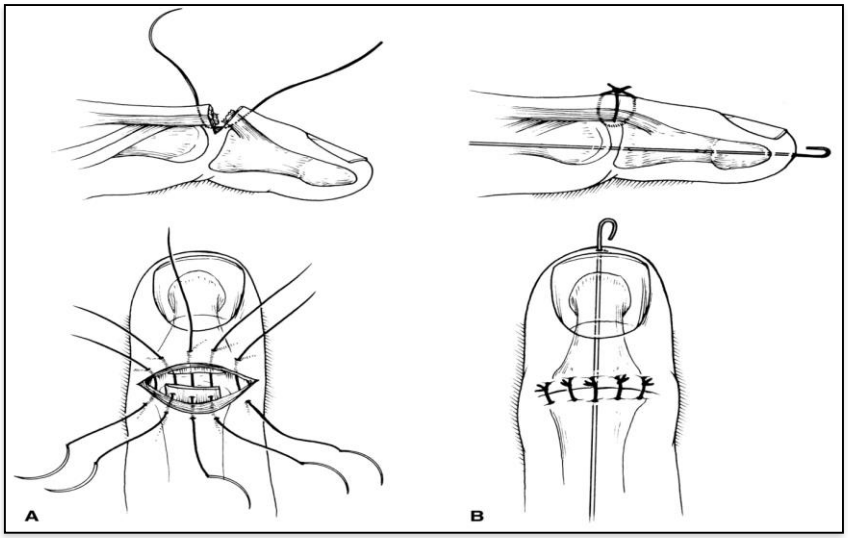
- Soft Tissue Mallet
  - 6-8 weeks of extension splinting



- do not immobilize PIP

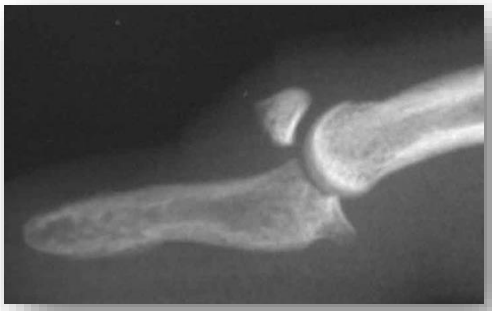
# MALLET FINGER

- Soft Tissue Mallet
  - if conservative treatment fails…

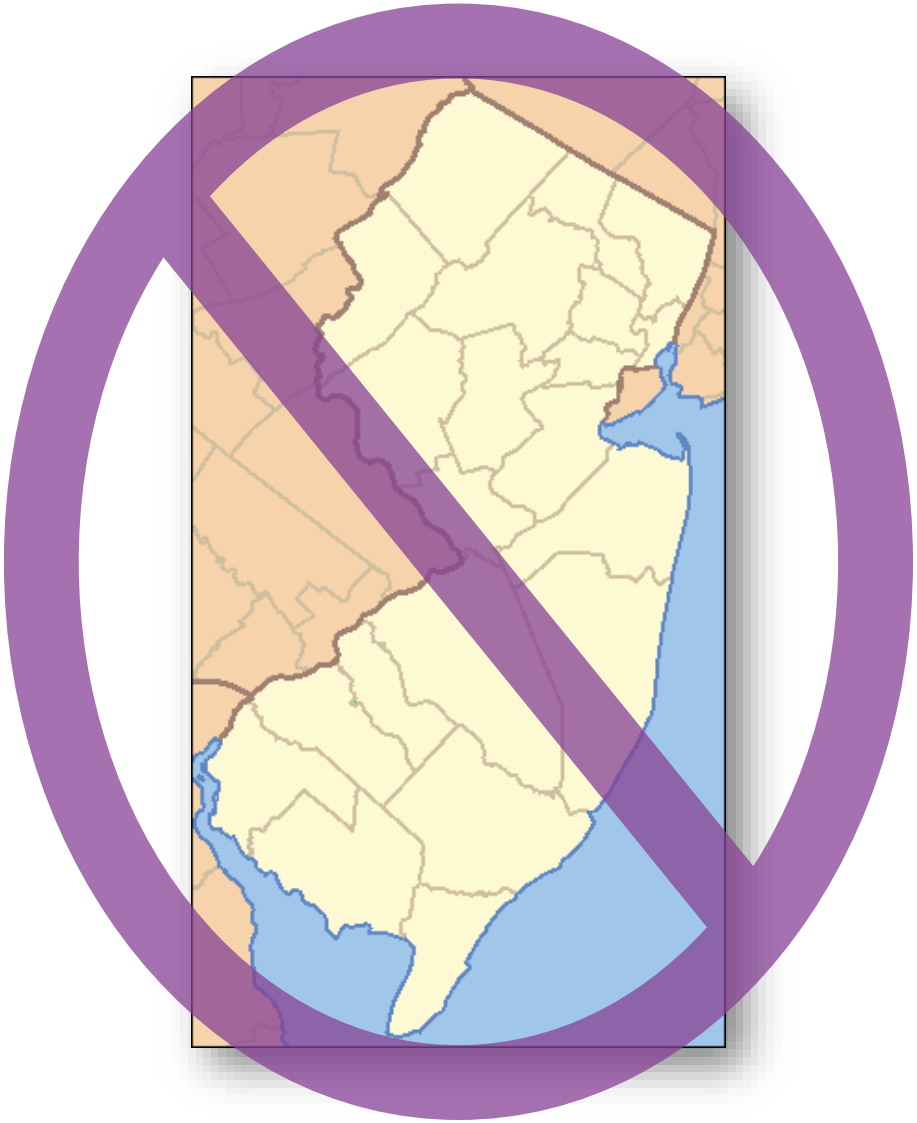


# MALLET FINGER

- Bony Mallet (fracture)
  - treat with 6-8 weeks of extension splinting unless…
    - fracture fragment > 50% articular surface
    - dislocation with fracture



# JERSEY FINGER



# JERSEY FINGER

- sudden hyperextension of DIP during active flexion
  - caught in shirt/jersey
  - football
- ring finger most common

# JERSEY FINGER

- injury to FDP tendon @ volar distal phalanx
  - may be tendon rupture
  - may be avulsion fracture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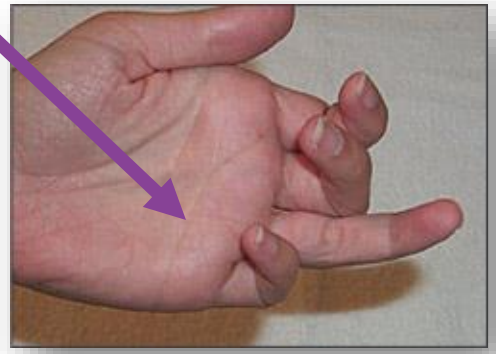
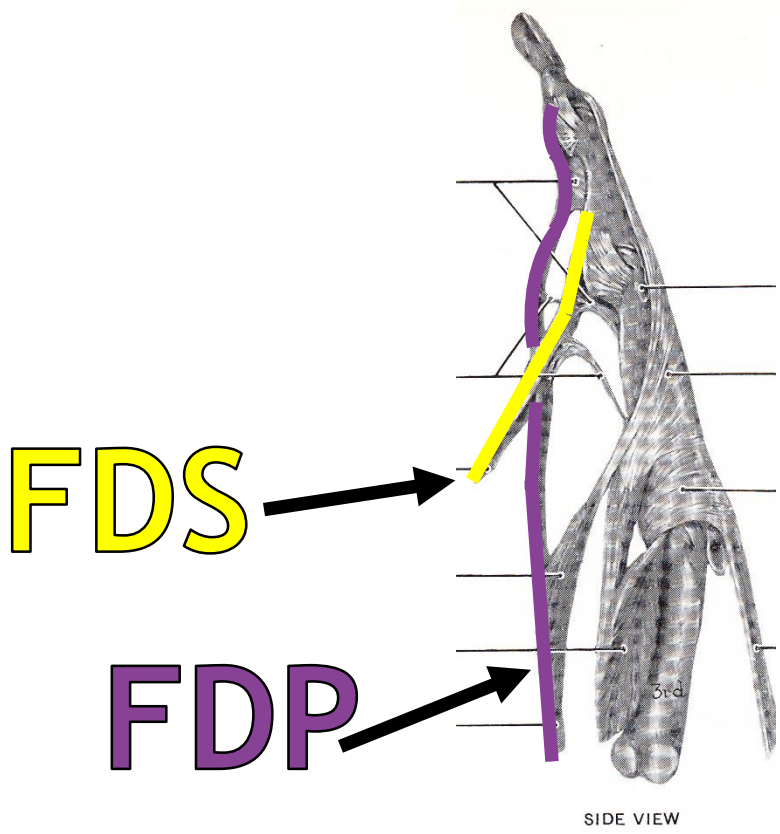
# JERSEY FINGER

- ecchymosis, swelling over volar finger
- TTP at distal finger, especially volar
- slight flexion deformity
- *may* palpate lump in palm



# JERSEY FINGER

- cannot flex the **DIP** (yet can still flex PIP)
  - must evaluate DIP flexion in isolation!



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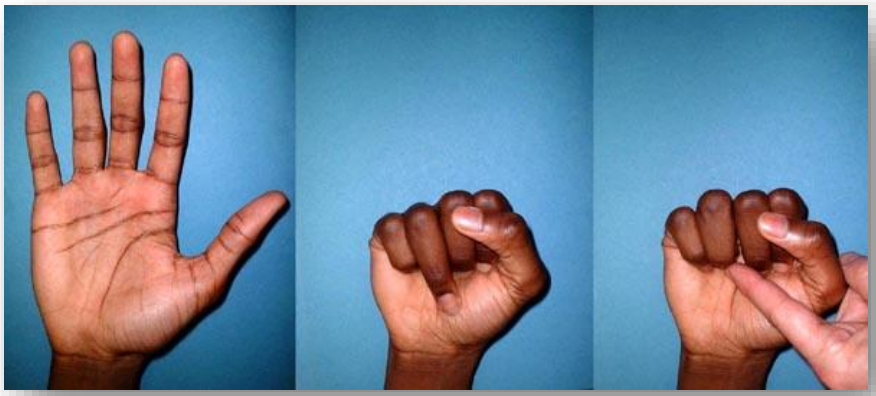
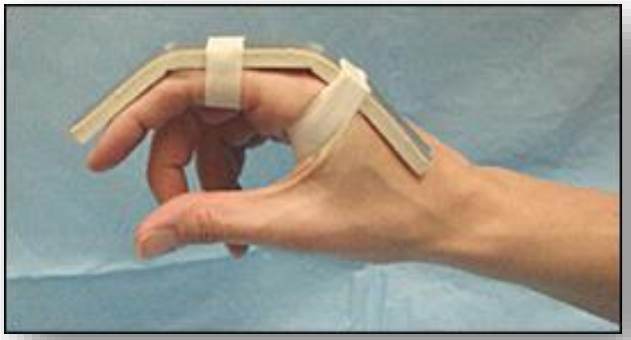


# JERSEY FINGER

- finger X-rays (not hand)
  - AP, lateral, oblique

  (bony jersey finger not as common as bony mallet finger)

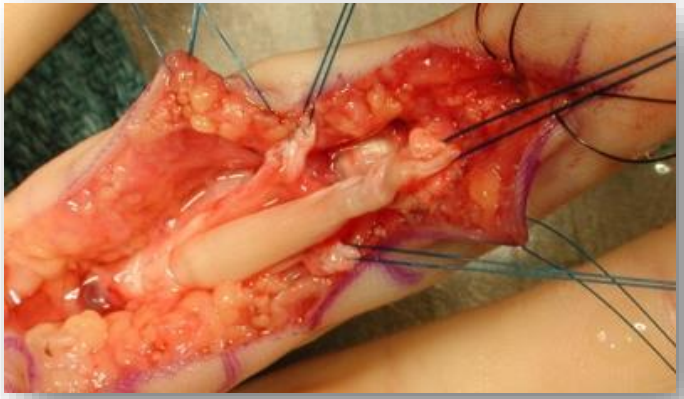
- Initially, splint in flexion
  - “extension block splint”



# JERSEY FINGER

- typically no conservative treatment
  - splinting (long term) ***rarely*** an option

- surgery
  - primary tendon repair
  - fracture fragment repair



# GAMEKEEPER'S THUMB - SKIER'S THUMB

# GAMEKEEPER'S THUMB - SKIER'S THUMB

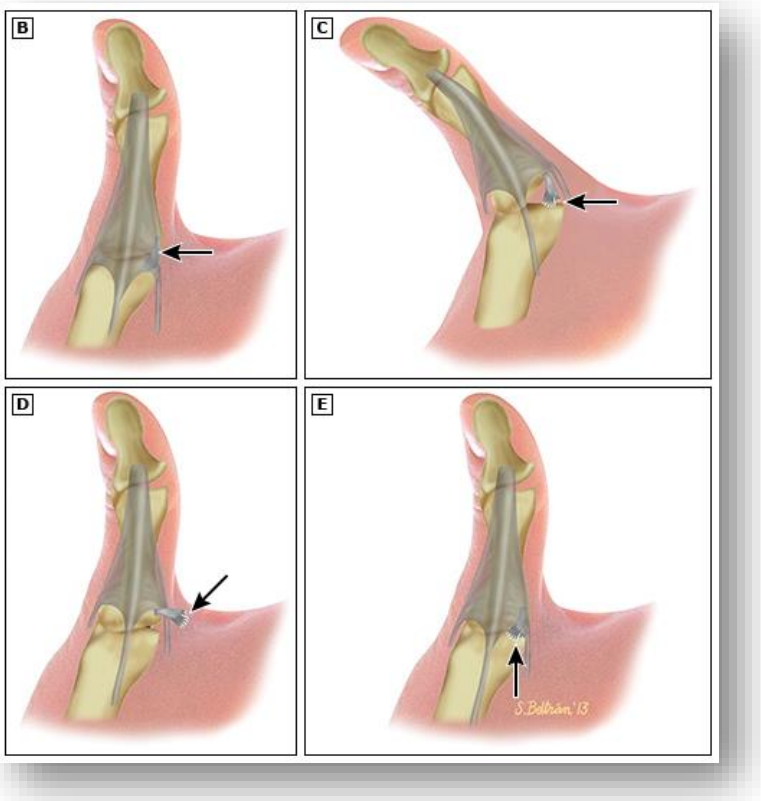
- first recognized in Scottish "gamekeepers"
  - repetitive "neck wringing' of game between thumb & index finger - "gamekeeper's thumb"

# Gamekeeper's thumb - Skier's thumb

- Skier's thumb
  - from acute injury, usually a fall

# Gamekeeper's Thumb - Skier's Thumb

- Gamekeeper's Thumb:  chronic, overuse
- Skier's Thumb:  acute injury

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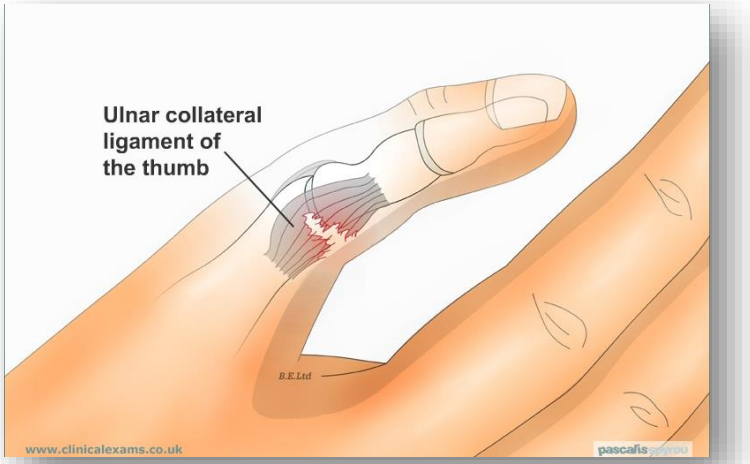
# GAMEKEEPER'S THUMB - SKIER'S THUMB

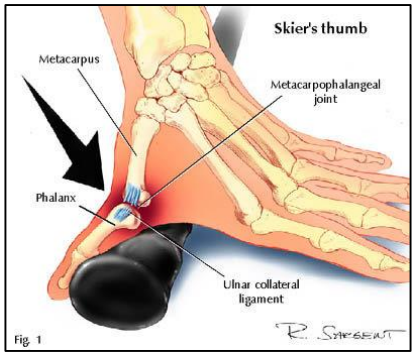
- injury to thumb ulnar collateral ligament (UCL)
  - base of the proximal phalanx at the 1st MCP
  - either partial or complete tear
  - with or without fracture
  - acute or chronic



# GAMEKEEPER'S THUMB - SKIER'S THUMB

- valgus & hyperextension force to thumb

- common injury
  - skiers
  - football lineman
  - any FOOSH

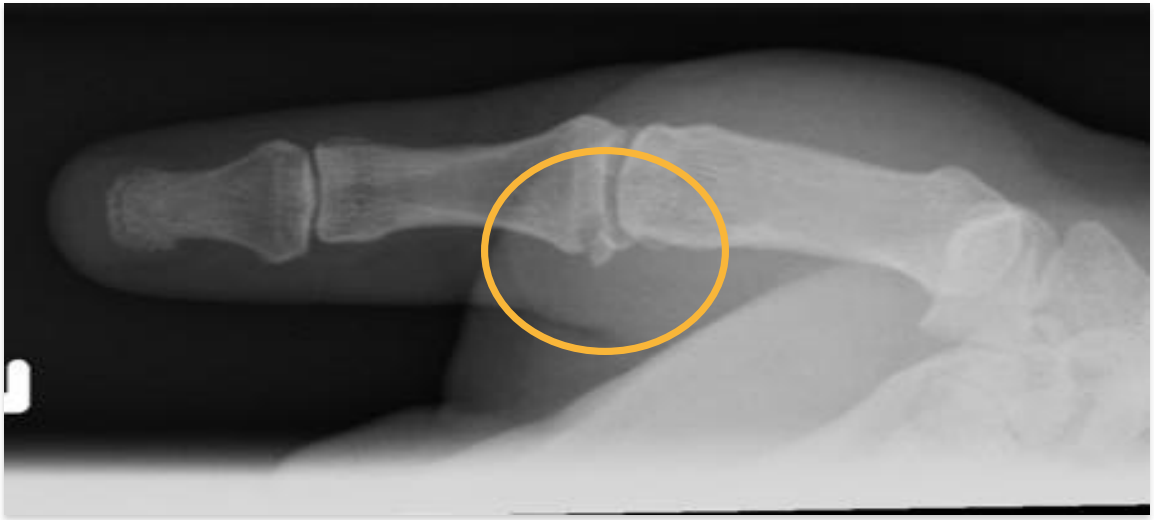



# Gamekeeper's thumb - skier's thumb

- "jammed thumb"
- pain, swelling at 1st MCP
- ecchymosis, thenar eminence
- painful ROM

# Gamekeeper's Thumb - Skier's Thumb

- do not stress MCP joint prior to X-rays!
  - must r/o fracture first
  - do not want to displace bony fragment

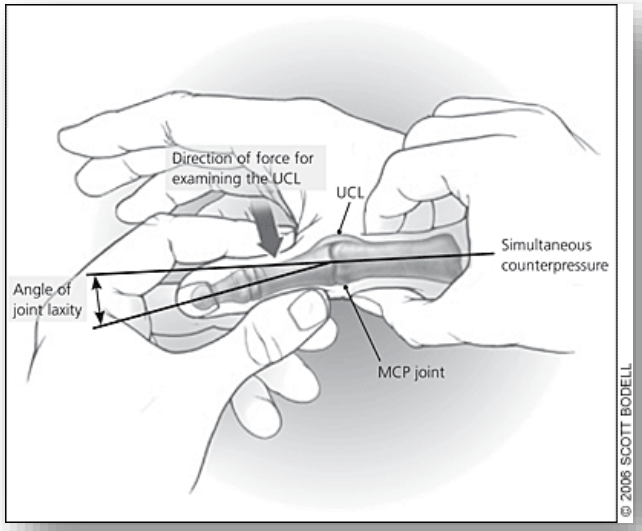


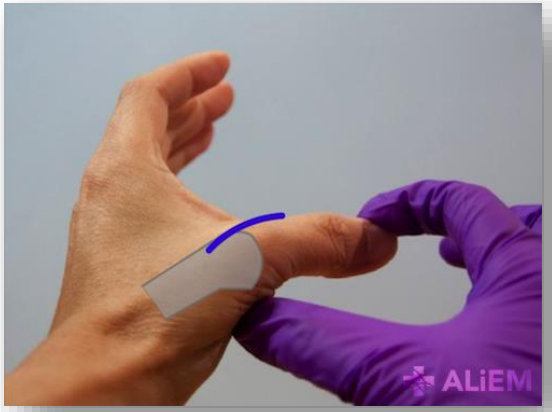
# Gamekeeper's Thumb - Skier's Thumb

- If fracture is present; orthopedic referral…
  - do not stress the ligament during physical exam

# Gamekeeper's Thumb - Skier's Thumb

- If fracture ruled out…
- Physical exam: valgus stress
  - positive exam = increased laxity = complete tear
  - more practical method: definitive endpoint?
  - compare to other side



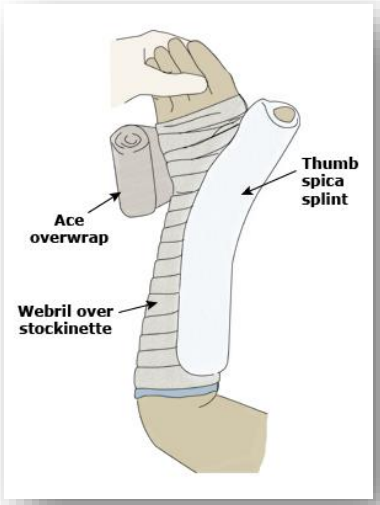



# Gamekeeper's thumb - Skier's thumb

- If physical exam is equivocal…and standard radiographs have already demonstrated no fracture:
  - stress radiographs
  - MRI may be necessary
  - ultrasound?

# Gamekeeper's Thumb - Skier's Thumb

- Initial Management
  - thumb spica splint
  - refer to Orthopedics

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# Gamekeeper's Thumb - Skier's Thumb

- Definitive Management
  - partial tear or non-displaced fracture:  cast/splint

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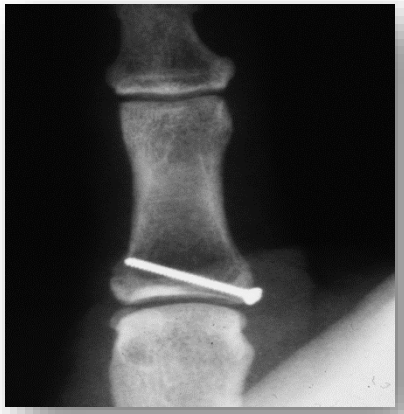
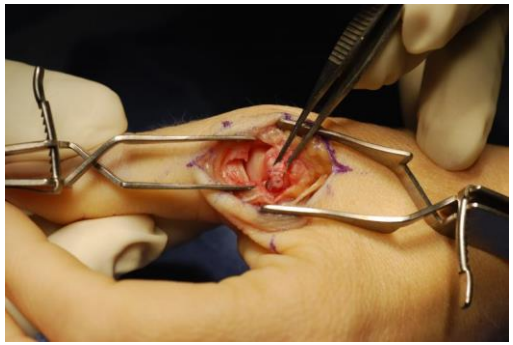
# GAMEKEEPER'S THUMB - SKIER'S THUMB

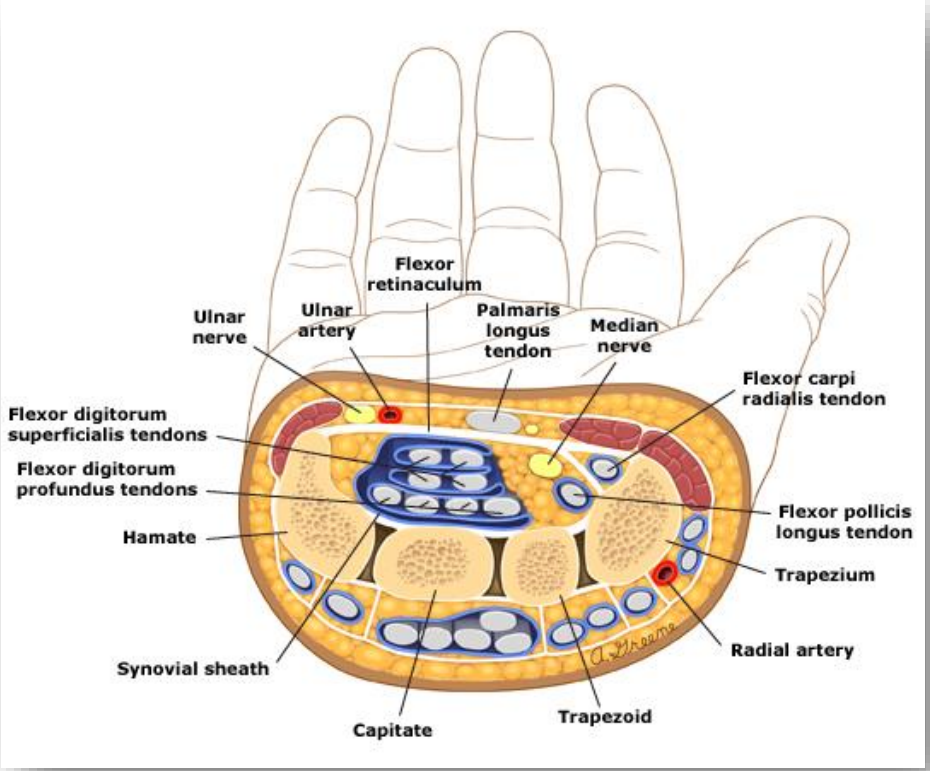
- Definitive Management
  - partial tear or non-displaced fracture:  cast/splint
  - complete tear or displaced fracture:  surgery





# CARPAL TUNNEL SYNDROME

- elevated pressure within carpal tunnel puts pressure on median nerve
  - short term = numbness and tingling in the fingers
  - long term = nerve damage and muscle weakness

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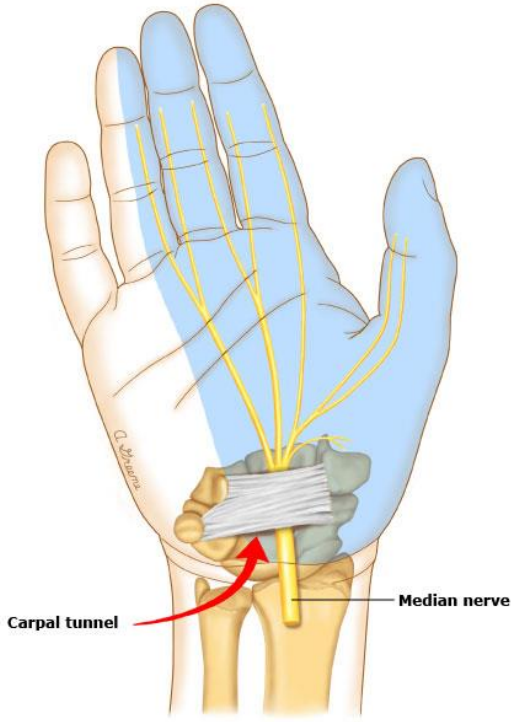


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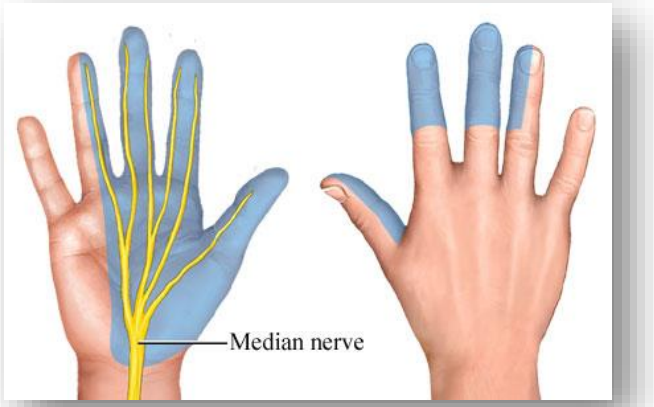
# CARPAL TUNNEL SYNDROME

- more likely in:
  - overweight/obese
  - females > males
  - occupation w/ repetitive hand use
  - pregnancy

# CARPAL TUNNEL SYNDROME

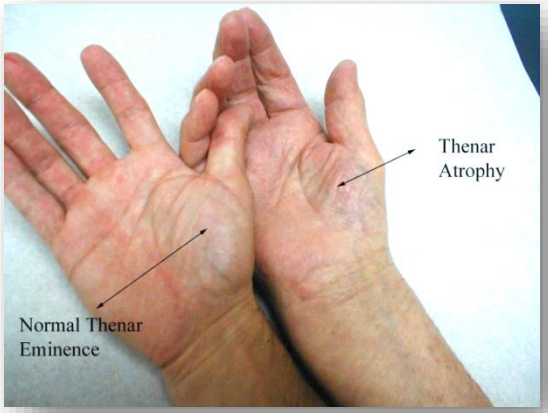
- symptoms
  - pain & paresthesia's in lateral 3 ½ digits
  - worse at night/sleep
  - worse with driving
  - worse with repetitive activities
  - clumsiness with hand



# CARPAL TUNNEL SYNDROME

Physical Exam:

- muscle loss (late finding)
- muscle weakness (late finding)
- Tinel Sign
- Phalen Test*
- Carpal Compression Test*

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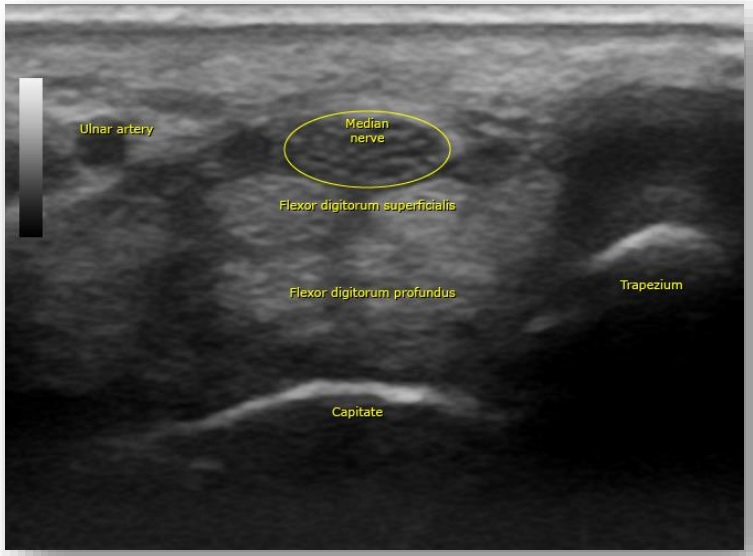
# CARPAL TUNNEL SYNDROME

- clinical diagnosis:  no imaging studies needed
  - EMG and/or NCV – only if diagnosis is not clear

# CARPAL TUNNEL SYNDROME

- clinical diagnosis:  no imaging studies needed
  - bedside ultrasound?

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# Carpal Tunnel Syndrome

- *Clinical* grading of severity:

# CARPAL TUNNEL SYNDROME

- *Clinical* grading of severity:
  - **Mild**:
    - **subjective** symptoms: numbness, tingling, discomfort
    - no **sleep** disruption
    - not affecting **ADLs**

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  - **Mild**:
    - **subjective** symptoms: numbness, tingling, discomfort
    - no **sleep** disruption
    - not affecting **ADLs**
  - **Moderate**:
    - **objective sensory loss** in median nerve distribution
    - occasional **sleep** disruption
    - symptoms that interfere w/ function but do not limit **ADLs**

# CARPAL TUNNEL SYNDROME

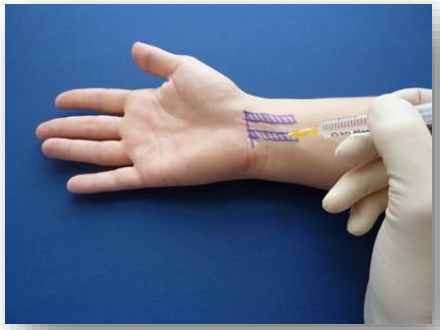
- *Clinical* grading of severity:
  - **Mild**:
    - **subjective** symptoms: numbness, tingling, discomfort
    - no **sleep** disruption
    - not affecting **ADLs**
  - **Moderate**:
    - **objective sensory loss** in median nerve distribution
    - occasional **sleep** disruption
    - symptoms that interfere w/ function but do not limit **ADLs**
  - **Severe**:
    - **weakness** in median nerve distribution
    - routinely disrupt **sleep**
    - symptoms prevent/limit **ADLs**

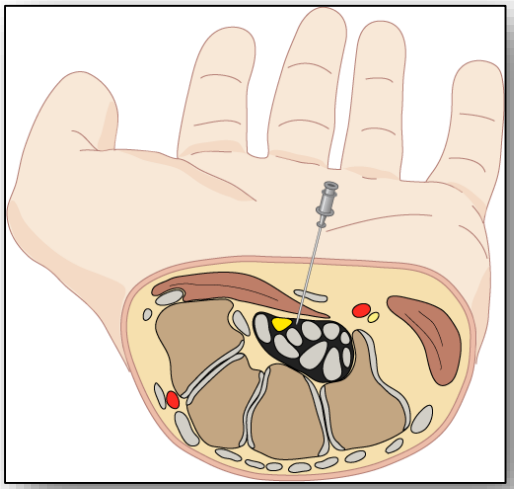
# CARPAL TUNNEL SYNDROME

- conservative management
  - rest
  - activity restriction
  - NSAIDS
  - bracing (daytime vs. nocturnal)
  - therapy (PT/OT) to improve function, strength
    - nerve gliding
    - therapeutic ultrasound
    - carpal bone mobilizations

# CARPAL TUNNEL SYNDROME

- conservative management
  - methylprednisolone injection: **40mg** vs. 80mg
  - 80% get relief initially.  Lidocaine effect?
  - Duration of relief?
  - No more than 2x per year?





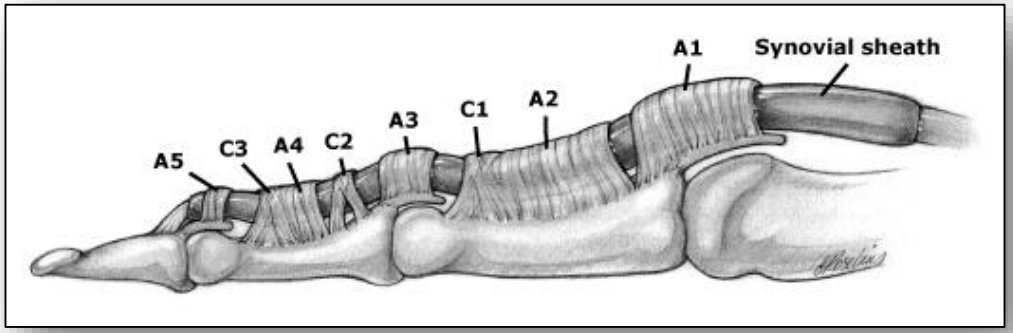
# CARPAL TUNNEL SYNDROME

- surgical management
  - open or endoscopic
  - earlier return to work/activity w/ endoscopic
  - no difference in long term outcomes & complications

# TRIGGER FINGER

# TRIGGER FINGER

- "stenosing flexor tenosynovitis"
  - thickened "pulley"
  - more likely in 2, 3, 4th fingers
  - worse morning & night
  - palpable nodule

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# TRIGGER FINGER

- limited use for conservative treatment
  - NSAIDS
  - bracing

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# TRIGGER FINGER

- Corticosteroid Injection
  - persistent relief beyond 1 year, in 50% of patients
  - other 50% may need 2nd injection

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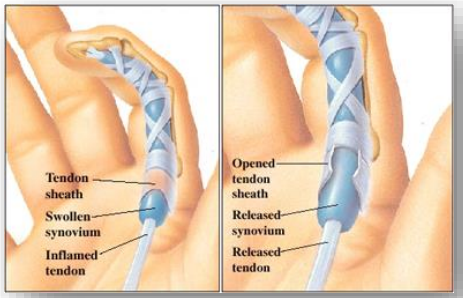
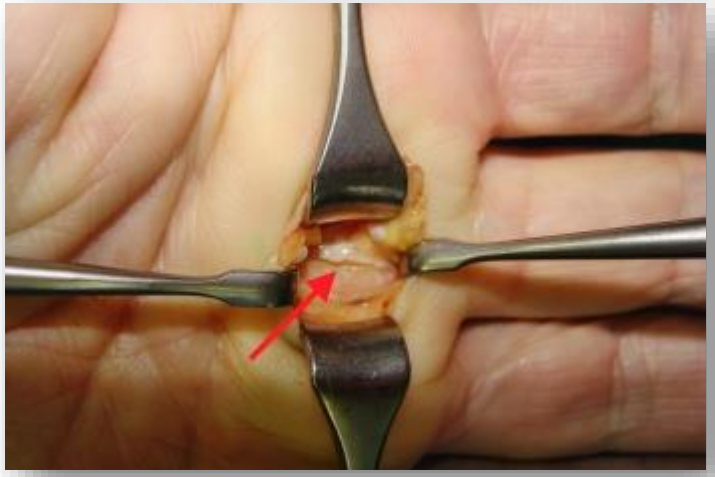
# TRIGGER FINGER

- Surgical Release
  - 94% success rate overall
  - 87% in diabetics



# SUMMARY

| Special Tests | |
|---|---|
| Valgus Stress (elbow) | UCL Tear |
| Milking Maneuver | |
| Finkelstein's Test | DeQuervain's Tenosynovitis |
| Valgus Stress (thumb) | Gamekeeper/Skier Thumb |
| Tinel Sign | Carpal Tunnel Syndrome |
| Phalen Sign | |
| Carpal Compression Test | |

# LESSONS FOR PRACTICE

- **Keinböck's:** MRI needed to see early density changes
- **UCL Tear:** present when they notice a loss of velocity/accuracy
- **DeQuervain's:** snowball crepitus, Finkelstein test
- **Ganglion cyst:** trans-illumination, ultrasound
- **Mallet finger:** extension splint, +/- surgery
- **Jersey finger:** check DIP flexion, all will need surgery
- **Gamekeeper's/Skier's:** no ligamentous testing until after X-rays
- **Carpal tunnel:** clinical grading of severity

# POST-TEST QUESTION #1

- Why is it important to diagnose Kienböck's disease as early as possible?
  A. The disease course can be reversed with early pharmacologic intervention
  B. To prevent the spread of necrosis to adjacent bones
  C. Because ultrasound can be both diagnostic and therapeutic for the condition
  D. To intervene before bony collapse of the lunate occurs

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# POST-TEST QUESTION #2

- Definitive treatment for a Jersey finger injury…
  A. is always conservative: 6-8 weeks of splinting typically does well.
  B. may be conservative or surgical, it depends on the location of the injury.
  C. is always surgical (primary tendon repair or fracture fragment repair). Long-term splinting is rarely an option.
  D. is a corticosteroid injection at the site of injury.

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# POST-TEST QUESTION #3

- When evaluating a patient with a suspected skier's thumb injury…
  A. it is best to obtain radiographs prior to assessing the UCL.
  B. radiographs are not necessary – it is a clinical diagnosis.
  C. it is best to obtain radiographs after assessing the UCL.
  D. MRI is the gold standard imaging that is needed.

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# CLINICAL CITATIONS


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