Musculoskeletal Exam of the Hand & Wrist: A Review for PCPs

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CONFLICTS

I have no personal or financial conflicts of interest to declare

I receive no financial support from industry sources

OUTLINE

Pre-test Questions

Introduction

1. Mallet Finger
2. Jersey Finger
3. Gamekeeper's/Skier's Thumb
4. DeQuervain's Tenosynovitis
5. Scaphoid Fractures
6. Kienböck's Disease

Post-test Questions

PRE-TEST QUESTION #1

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 #2

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.

PRE-TEST QUESTION #3

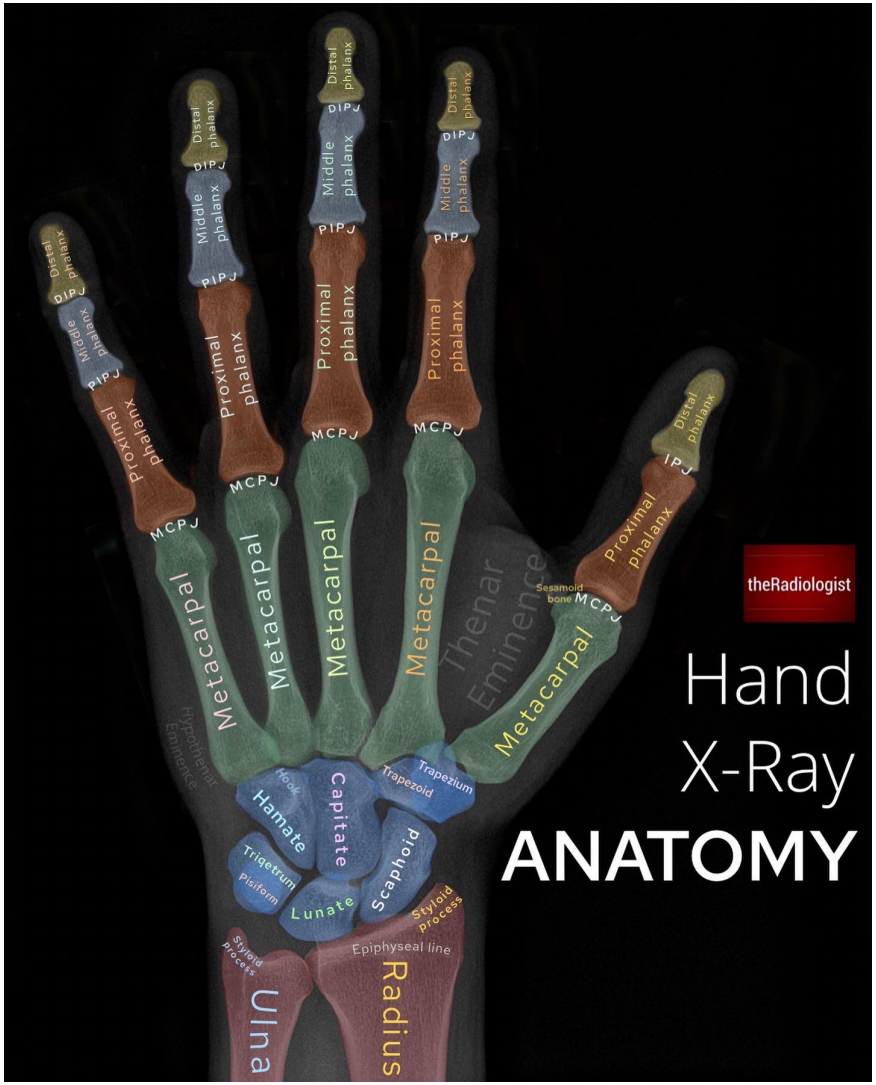
Why is it important to diagnose Kienböck's disease as early as possible?

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

INTRODUCTION

- Hand & wrist susceptible to injury & overuse
- Abnormal hand function = disability
- Approximately 11.3% of all ED visits in the U.S. involved injuries to the hand, wrist, or fingers

INTRODUCTION



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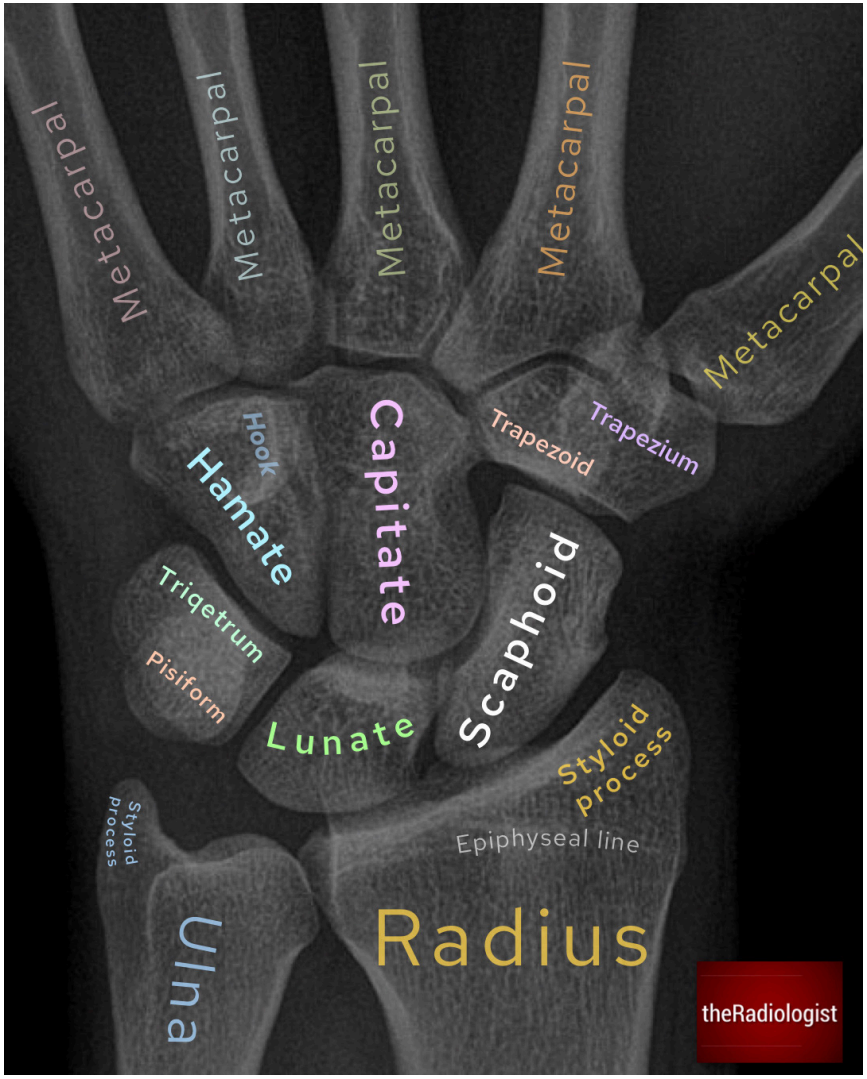
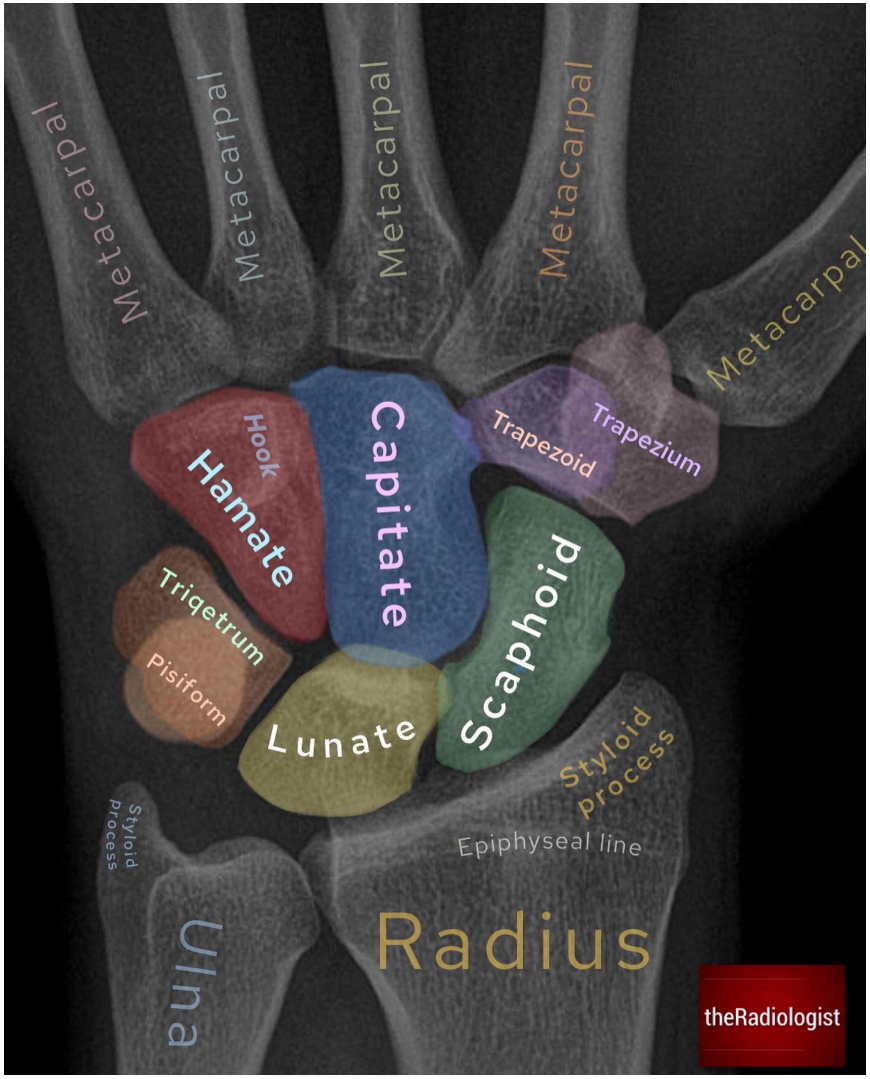
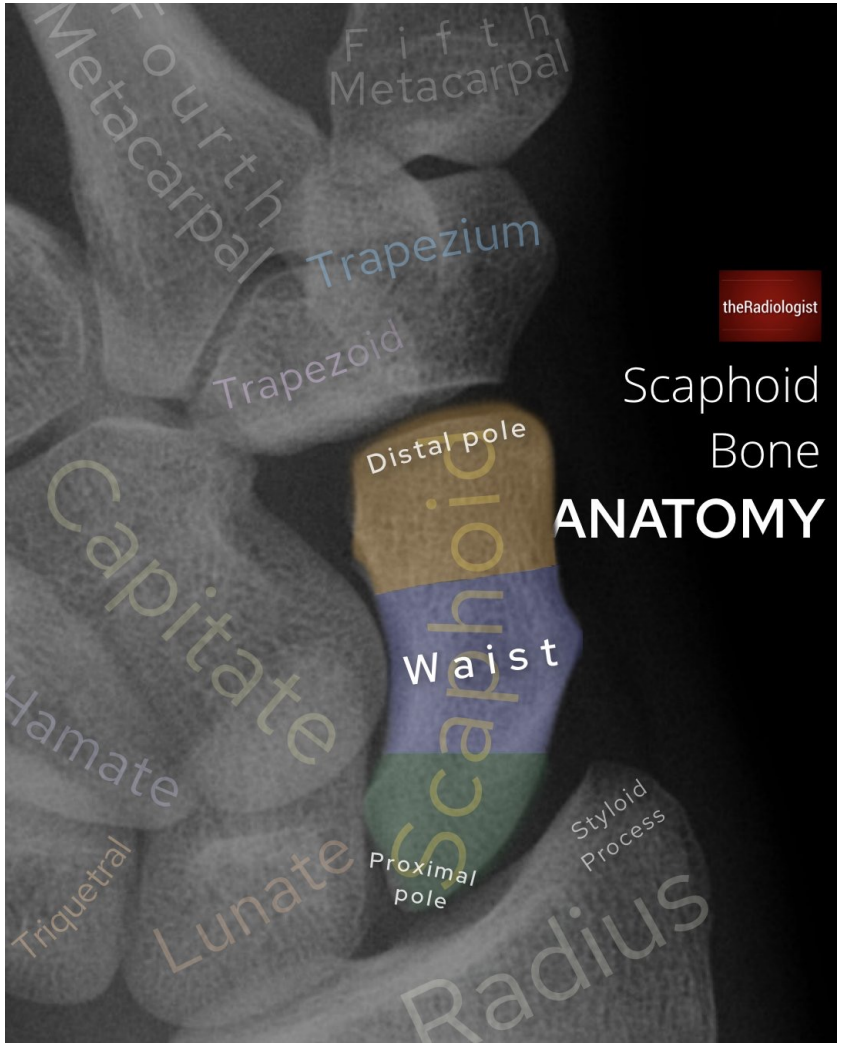


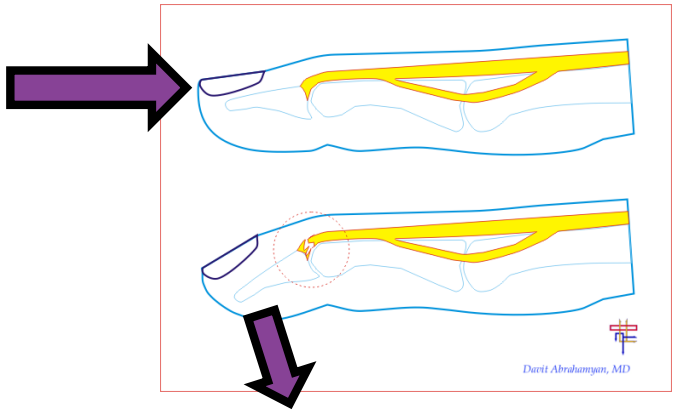


INTRODUCTION



MALLET FINGER

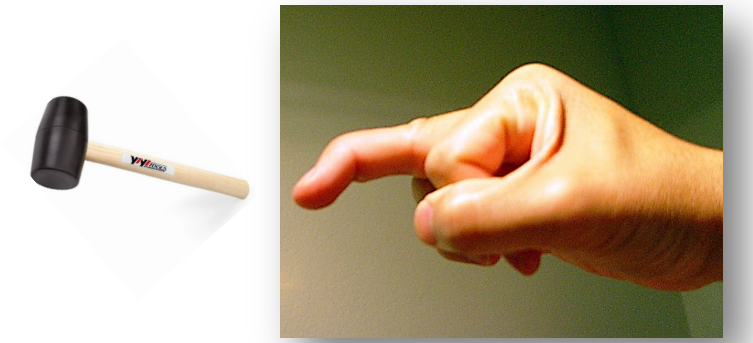
MALLET FINGER



Mechanism of Injury

- sudden flexion force -
  - typically from object

- causes ‘flexion deformity’ (extensor lag) at the ***DIP***

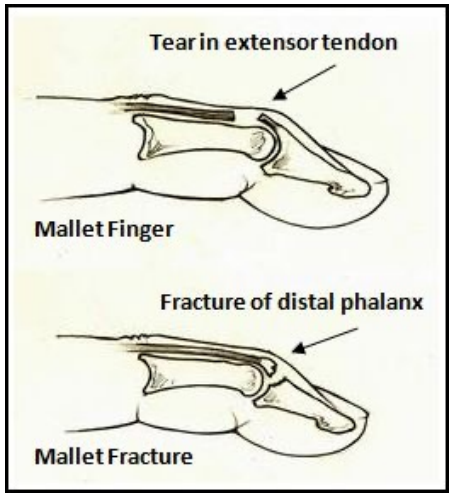


MALLET FINGER

Background

- Injury to ***extensor*** tendon @ dorsal ***DIP*** joint

- Two types:
  1. tendon rupture (aka ‘soft tissue mallet finger’)
  2. avulsion fracture (aka ‘bony mallet finger’)



MALLET FINGER

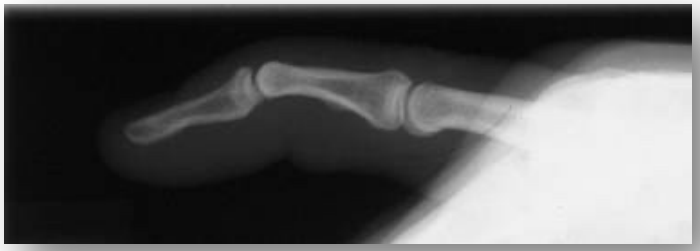
History & Physical Exam

- pain at DIP, especially with motion
- ecchymosis, swelling over DIP
- tender to palpation at DIP
- flexion deformity/extensor lag

MALLET FINGER

Finger specific X-rays (not just hand XR)

- AP, lateral, oblique



MALLET FINGER

Management: Soft Tissue Mallet

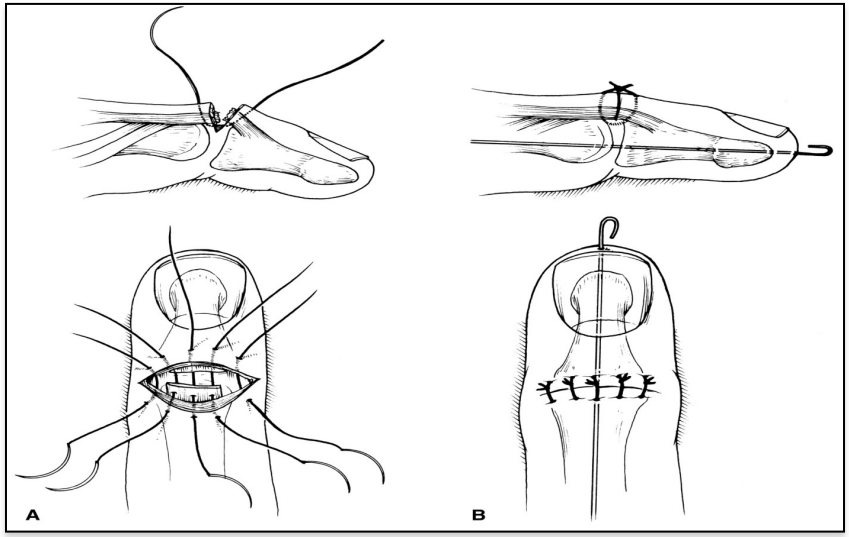
- 6-8 weeks of extension splinting
- may initiate within 3 months of injury

Do not immobilize PIP

MALLET FINGER

Management: Soft Tissue Mallet

- if conservative treatment fails…

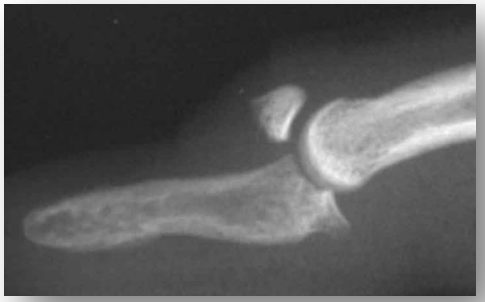


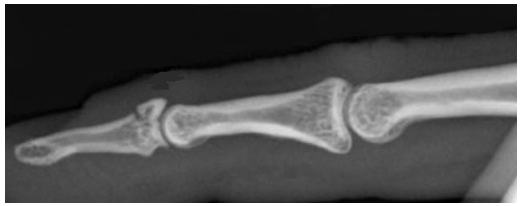
Extensor Tendon Repair

MALLET FINGER

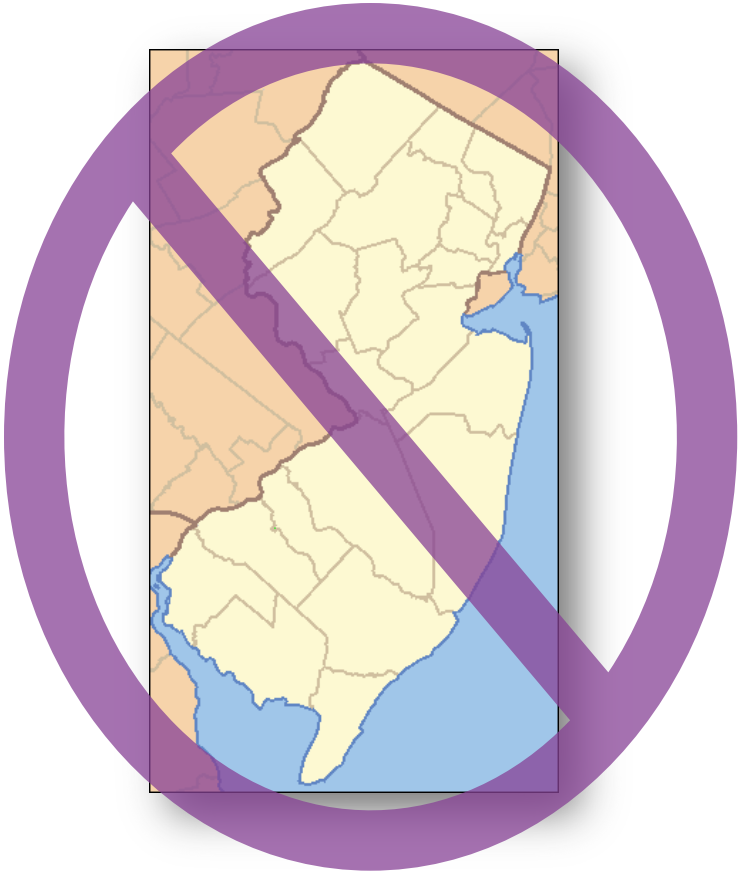
Management: Bony Mallet

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





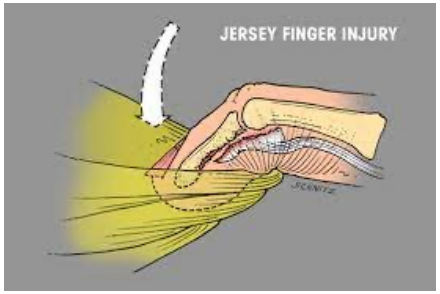
JERSEY FINGER



JERSEY FINGER

Mechanism of Injury

- sudden hyperextension of DIP *during active flexion*
  - i.e., finger caught in shirt/jersey
  - common in football, ring finger most common

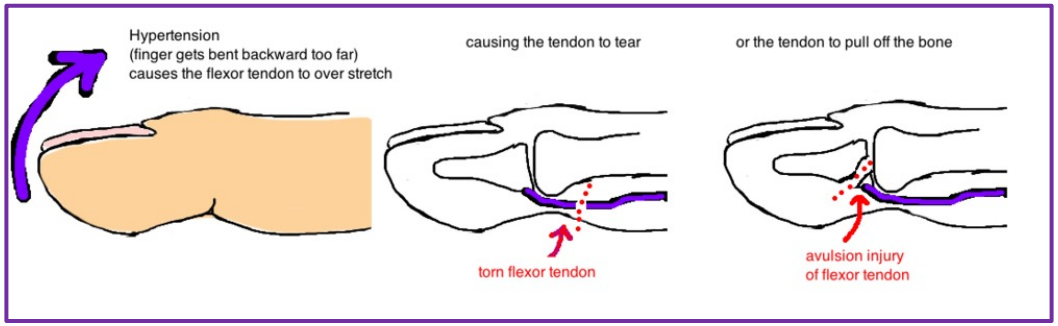


JERSEY FINGER

Background

- Injury to ***FDP tendon*** @ volar distal phalanx

- Two types:
  1. tendon rupture (aka 'soft tissue jersey finger')
  2. avulsion fracture (aka 'bony jersey finger')

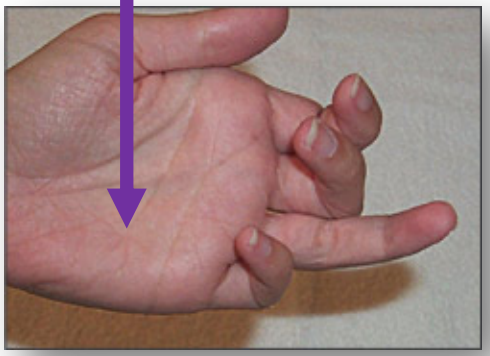


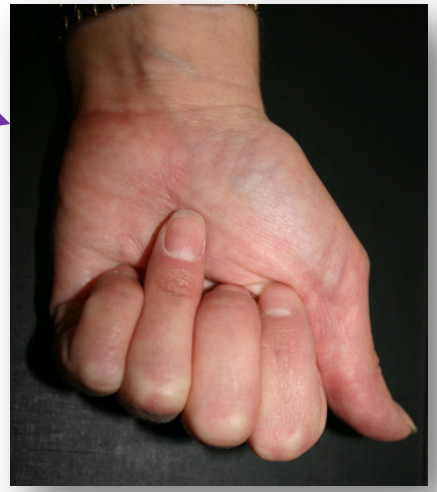
Note: bony jersey finger not as common as bony mallet finger

JERSEY FINGER

History & Physical Exam

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





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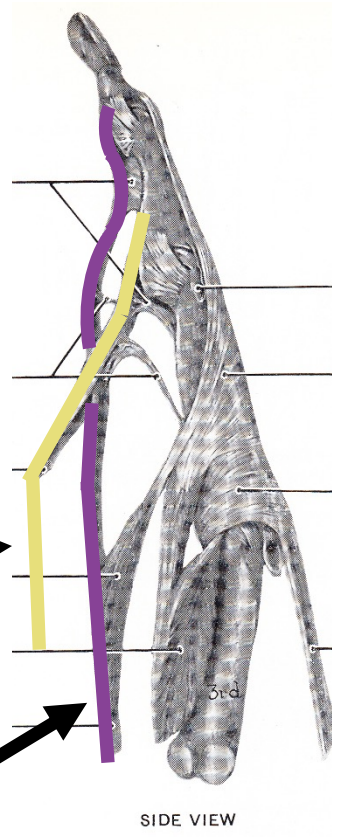
JERSEY FINGER

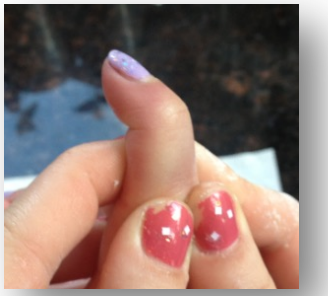
Cannot flex the ***DIP*** (yet can still flex PIP)

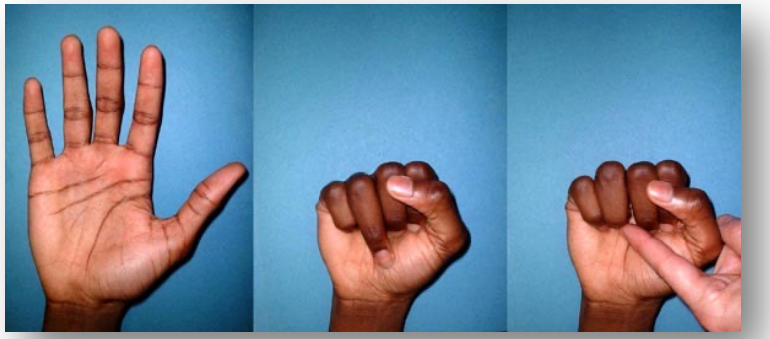
- must evaluate DIP flexion in isolation!



FDS

FDP

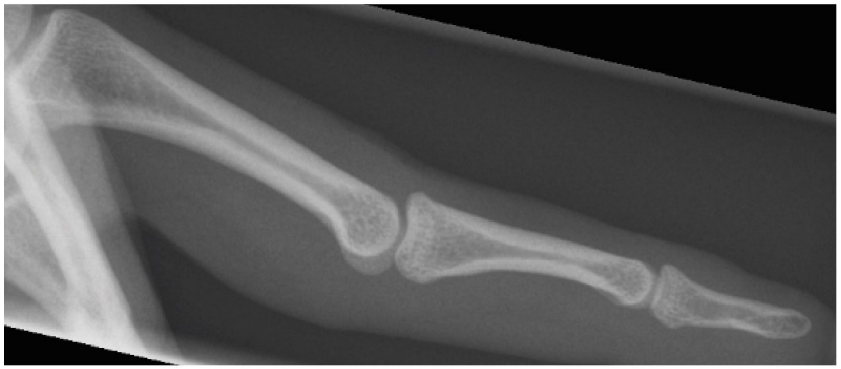




JERSEY FINGER

Finger specific X-rays (not just hand XR)

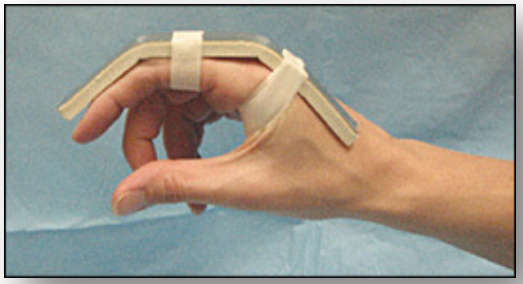
- AP, lateral, oblique



JERSEY FINGER

Acute Management: splint in flexion

- “extension block splint”



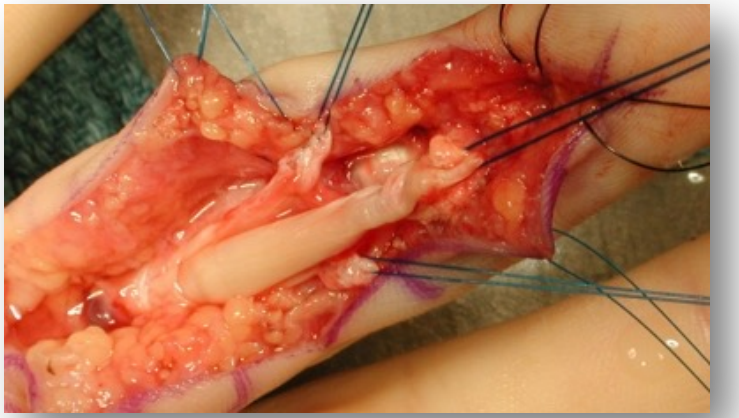
JERSEY FINGER

Definitive Management:

- typically there is no conservative treatment
  - long term splinting is *rarely* an option. WHY??

Surgery options:

- tendon repair
- fracture fragment repair



GAMEKEEPER'S THUMB & SKIER'S THUMB

GAMEKEEPER'S THUMB & SKIER'S THUMB

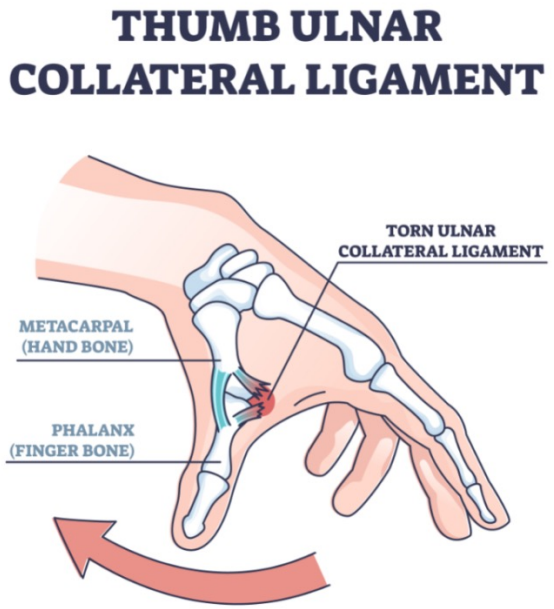
Background:

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

GAMEKEEPER'S THUMB & SKIER'S THUMB

Definition (Gamekeeper's):

- ***Overuse*** injury to ulnar collateral ligament (UCL) of the thumb
  (base of the proximal phalanx at the 1st MCP)



GAMEKEEPER'S THUMB & SKIER'S THUMB

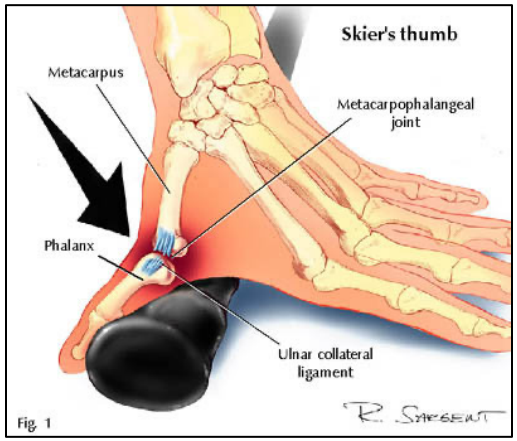
"Skier's thumb" injury

- from acute injury, usually a fall

GAMEKEEPER'S THUMB & SKIER'S THUMB

Definition (Skier's):

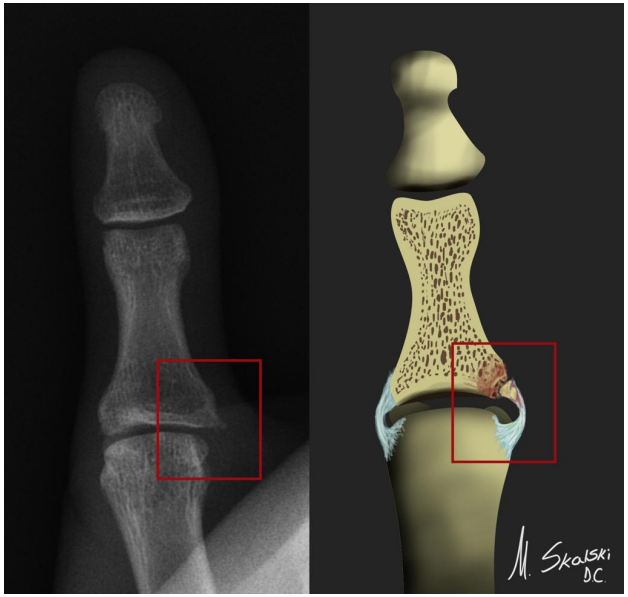
- ***Acute*** injury to ulnar collateral ligament (UCL) of the thumb
  (base of the proximal phalanx at the 1st MCP)



GAMEKEEPER'S THUMB & SKIER'S THUMB

Types:

- partial or complete tear
- with or without fracture



GAMEKEEPER'S THUMB & SKIER'S THUMB

Mechanism of Injury:

- valgus & hyperextension force to thumb
  (repetitively or acutely)

Common in:

- skiers
- football lineman
- potentially any FOOSH

GAMEKEEPER'S THUMB & SKIER'S THUMB

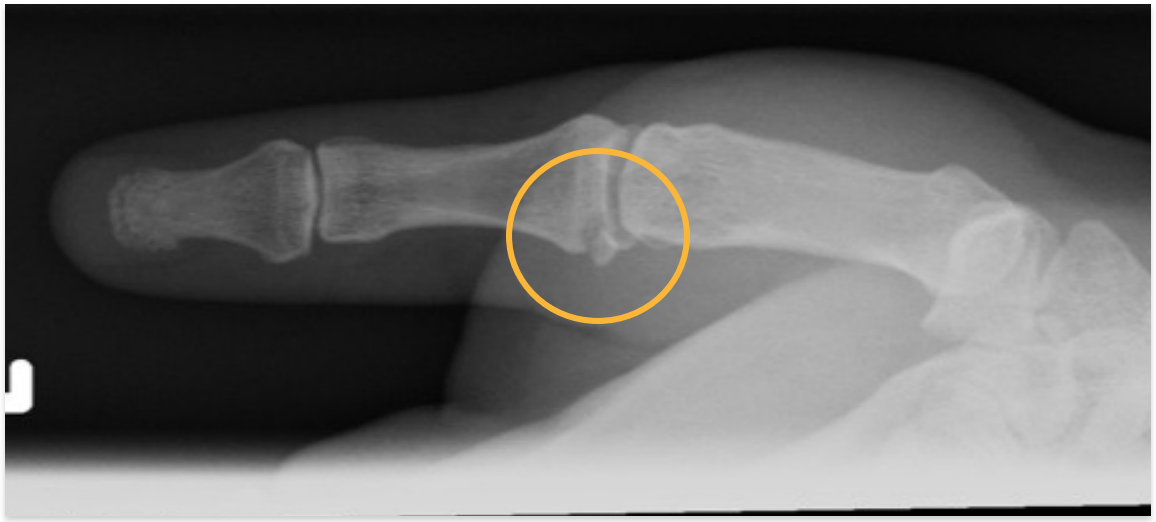
History & Physical Exam

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

GAMEKEEPER'S THUMB & SKIER'S THUMB

Do NOT stress MCP joint *prior* to X-rays!

- must rule out fracture first
- do not want to displace bony fragment



GAMEKEEPER'S THUMB & SKIER'S THUMB

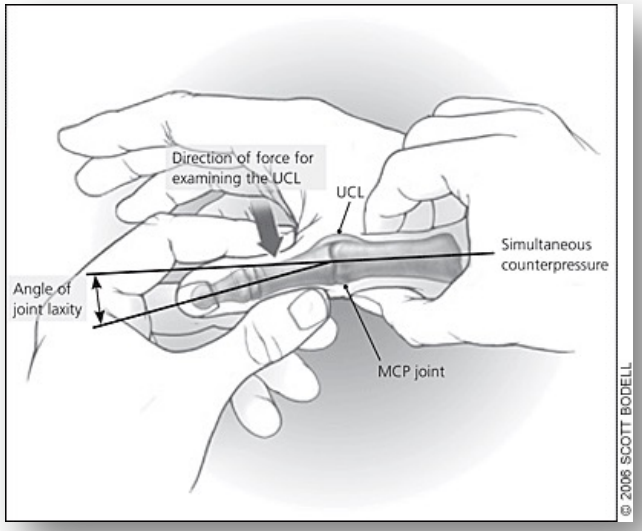
If fracture is present; orthopedic referral…

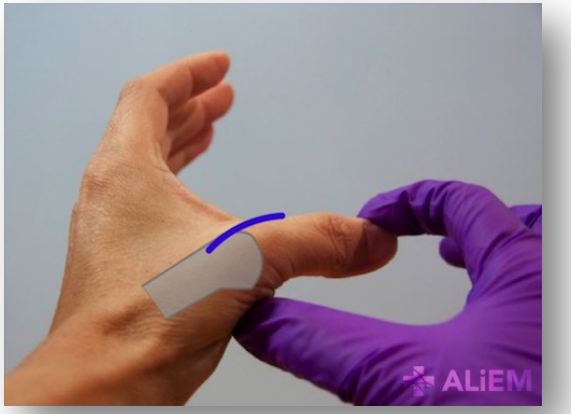
- do not stress the ligament during physical exam
  (i.e., do not apply valgus force)

GAMEKEEPER'S THUMB & SKIER'S THUMB

If fracture ruled out…

- *Valgus stress test*
  - increased laxity? definitive endpoint?
  - compare to other side





Sens	Spec
94%	46%

GAMEKEEPER'S THUMB & SKIER'S THUMB

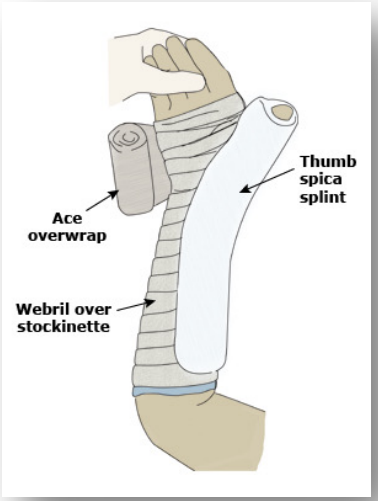
If physical exam is ***equivocal***…and standard radiographs have already demonstrated no fracture:

- stress radiographs
- MRI may be necessary
- bedside 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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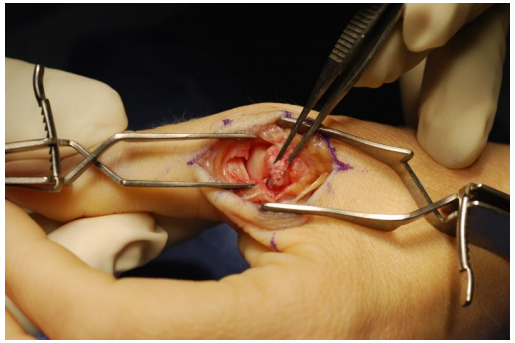
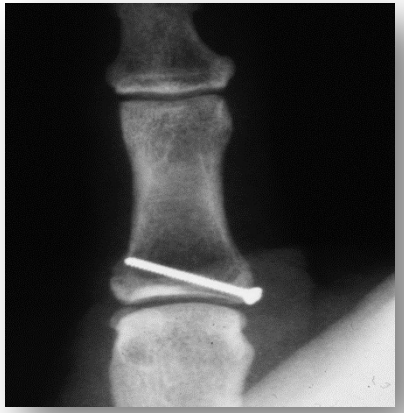
GAMEKEEPER'S THUMB & SKIER'S THUMB

Definitive Management

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

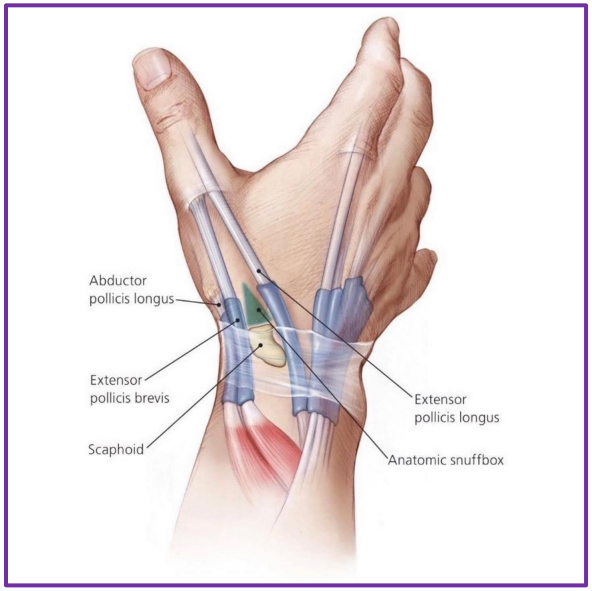


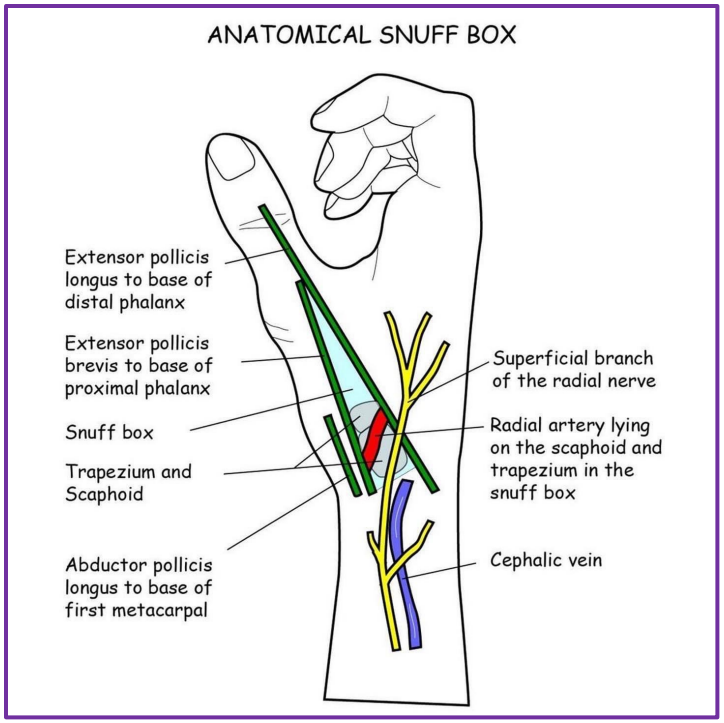


DEQUERVAIN'S TENOSYNOVITIS

Background:

- Affects the 1st dorsal extensor compartment
  - abductor pollicis longus
  - extensor pollicis brevis

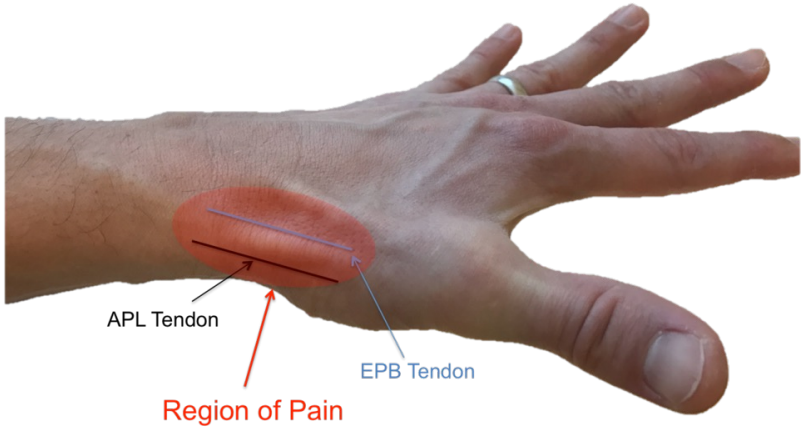




DEQUERVAIN'S TENOSYNOVITIS

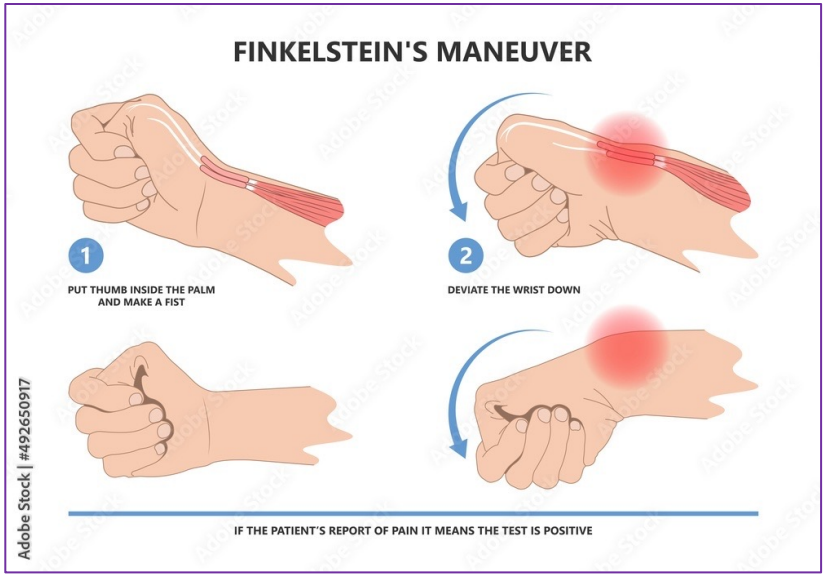
History & Physical Exam

- pain at wrist & base of the thumb
  - lifting a baby from the floor? ("new mommy syndrome")
- TTP along tendons near radial styloid
- "snowball crepitus"
- pain with ROM…
  - which motions?



DEQUERVAIN'S TENOSYNOVITIS

Special Test: Finkelstein's test



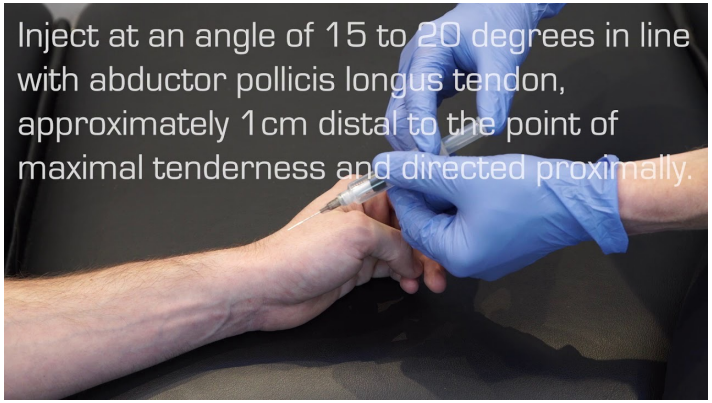
Sens	Spec
81%	50%

Workup: none, no imaging is necessary

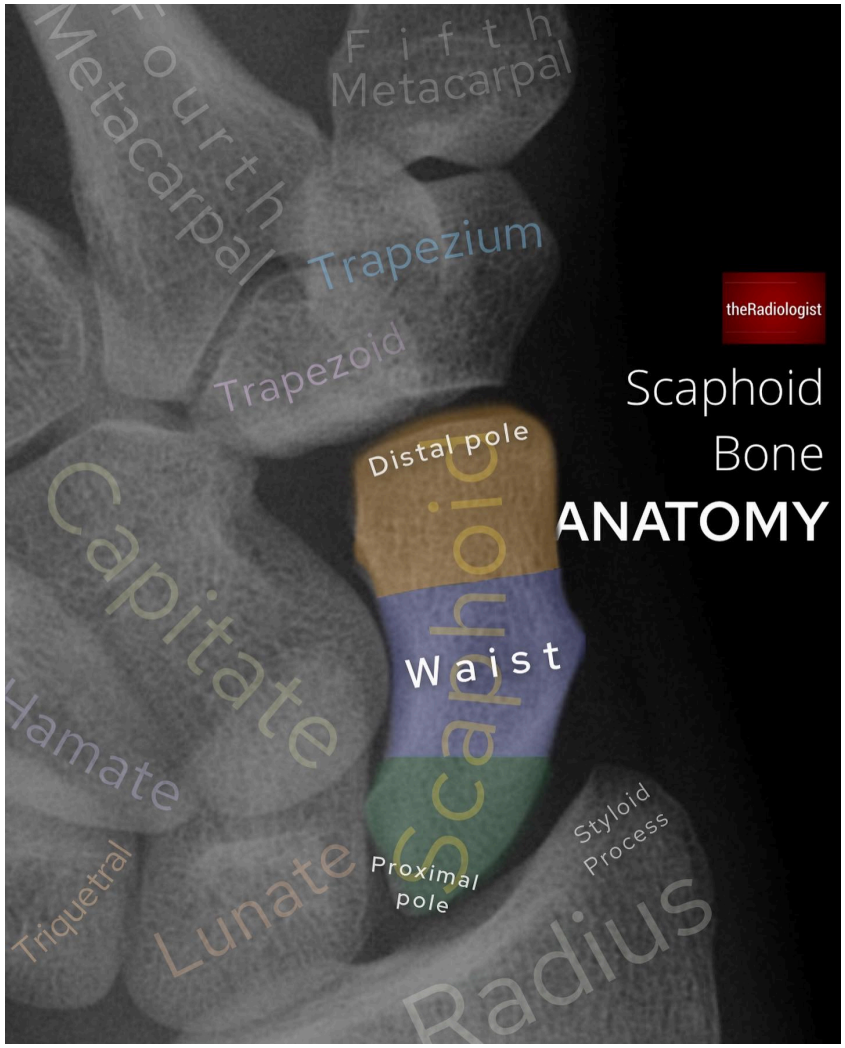
DEQUERVAIN'S TENOSYNOVITIS

Management

- NSAIDS, RICE
- *thumb spica splint*
- PT/OT referral
- corticosteroid injection into *sheath*



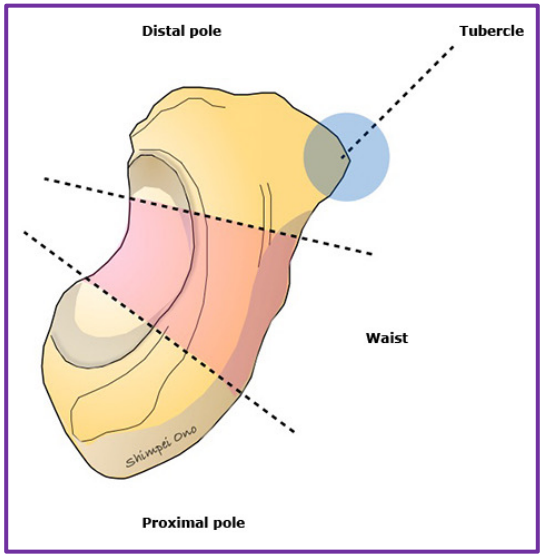
Scaphoid (navicular)



Scaphoid (navicular)

- Most commonly fractured carpal bone (75%)
- Easily located in the anatomical snuffbox

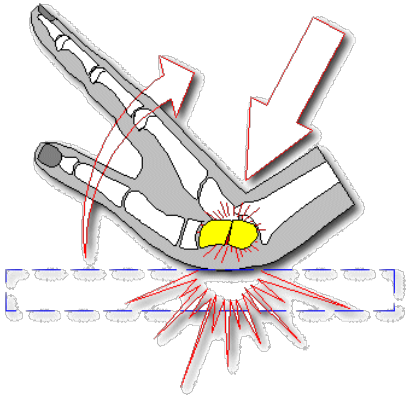
- Scaphoid is Greek for “boat”
- Navicular is Latin for “little boat”

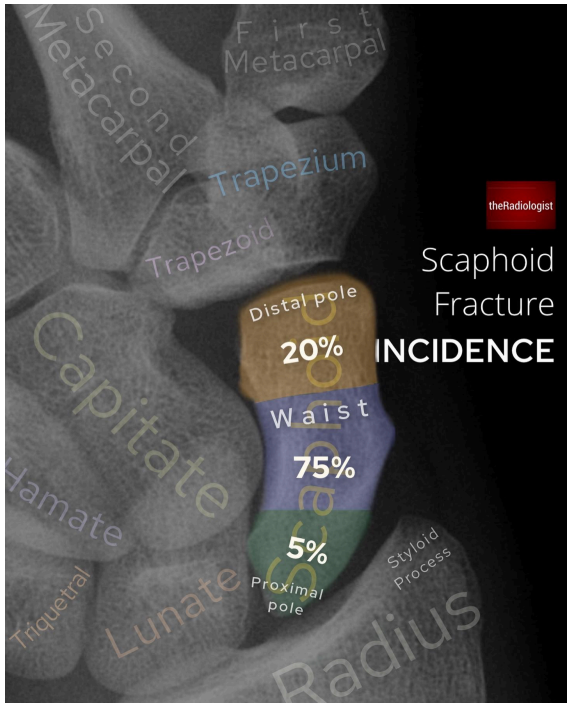


Scaphoid (navicular)

Background:

- males age 13-40
- common MOI: FOOSH
- football lineman also at risk





Scaphoid (navicular)

History

- sharp pain at onset
- dull & achy pain later

Physical Exam

- point tender in ***snuffbox***
- palpable crepitus
- pain with passive radial deviation
- pain with axial loading of the thumb

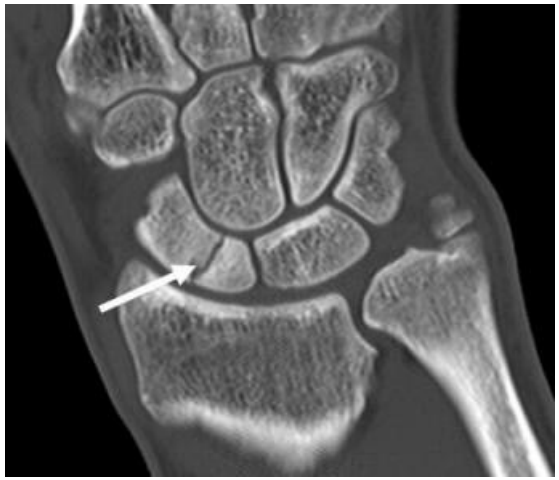
Scaphoid (navicular)

X-rays

- standard wrist X-rays (A/P, lateral, oblique)
- …but also consider dedicated “scaphoid views”
- may not show up on initial films, repeat films in 1-week

Scaphoid (navicular)

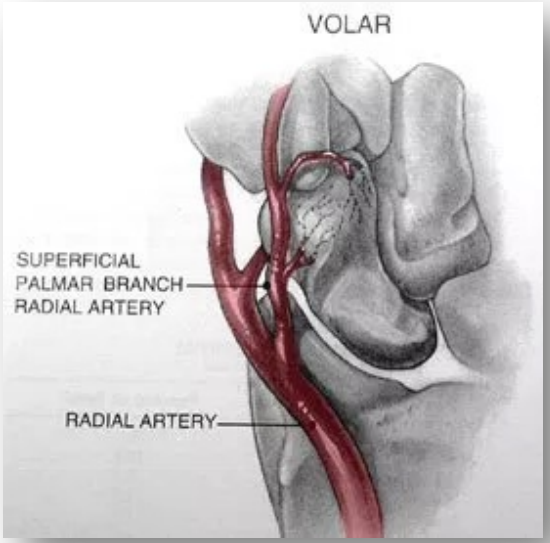
Bone scan, CT, & MRI are more sensitive

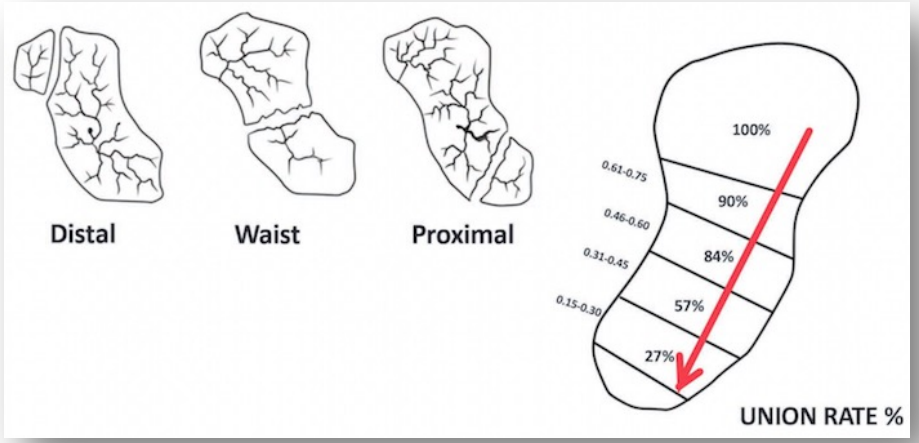


Scaphoid (navicular)

Pathophys: fractures problematic due to poor blood supply

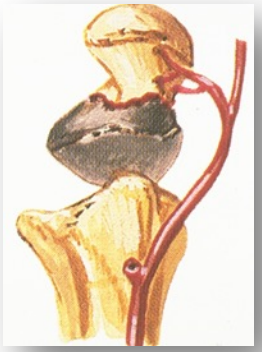
- "watershed area"
- fracture site determines healing potential

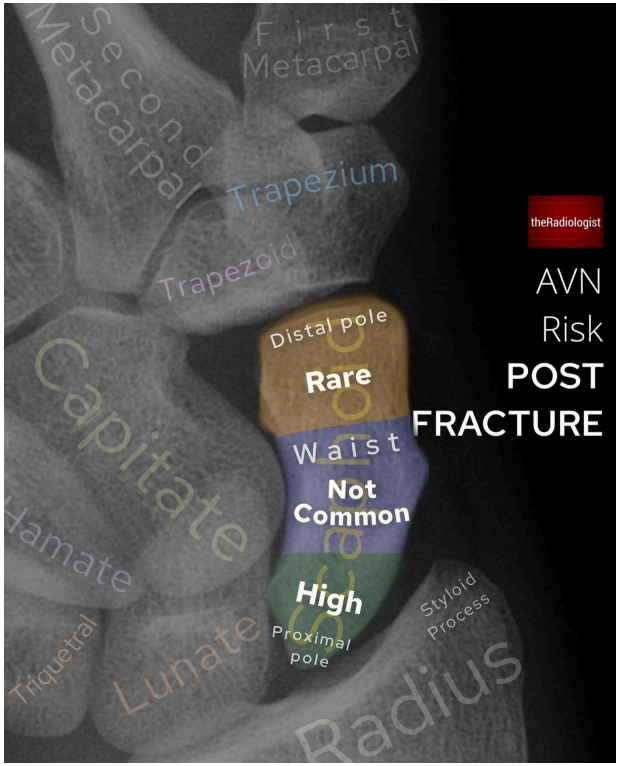




Scaphoid (navicular)

Close to 100% of ***proximal pole*** fractures develop AVN

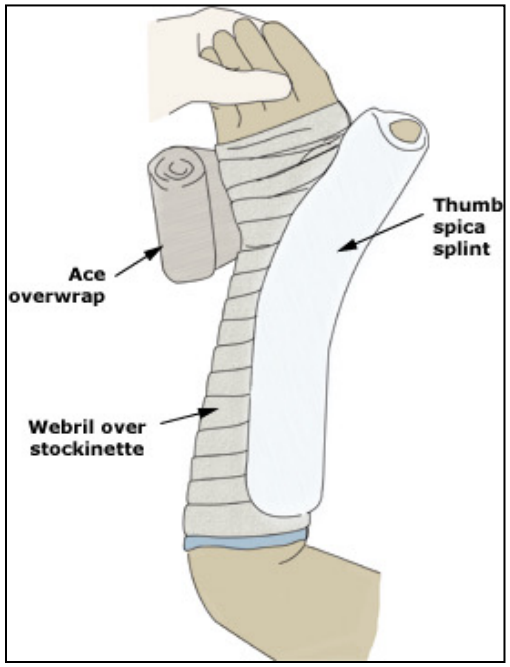


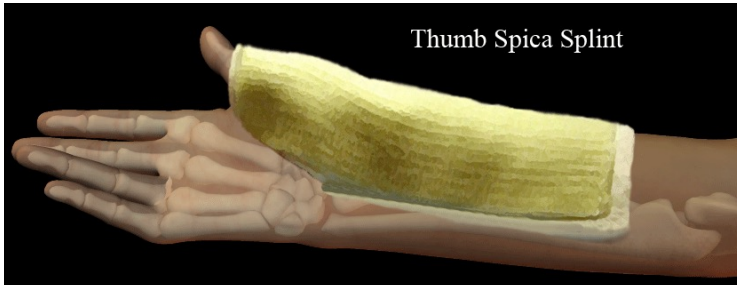


Scaphoid (navicular)

Management

- acute setting (ED, PCP office): thumb spica splint





1. wrap around thumb
2. include radial wrist/forearm
3. “soda can” position

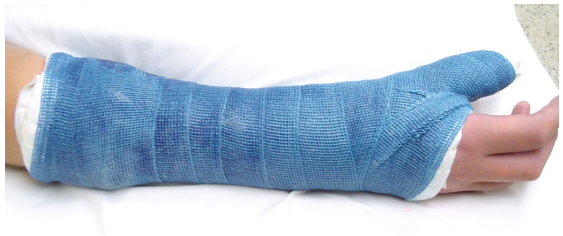
Scaphoid (navicular)

Management, long term

- scaphoid fractures should be referred to Orthopedics

Non-operative

- thumb spica cast
- bone stimulator

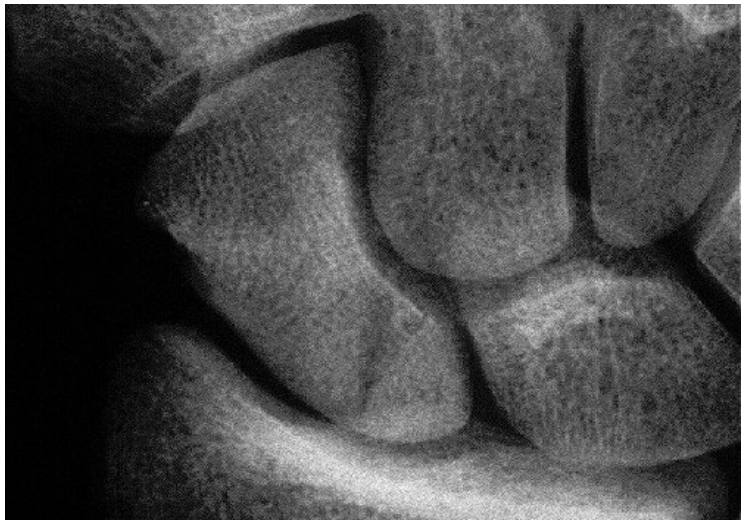


Operative

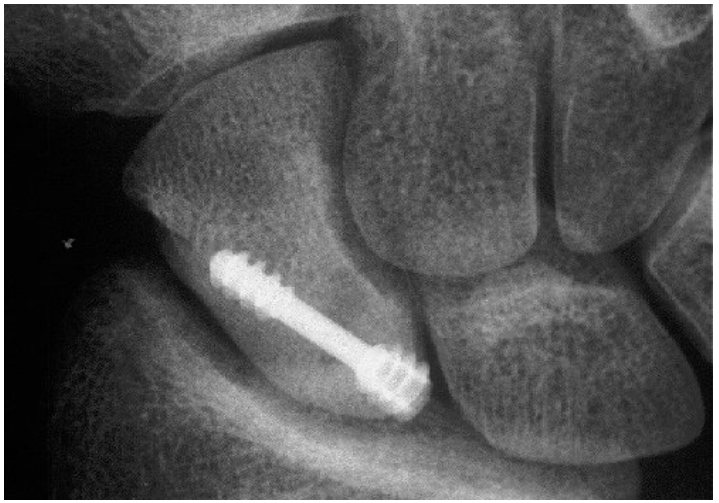
- screw or pin, with or without bone graft

Scaphoid (navicular)

Pre-op Radiographs



Post-op Radiographs

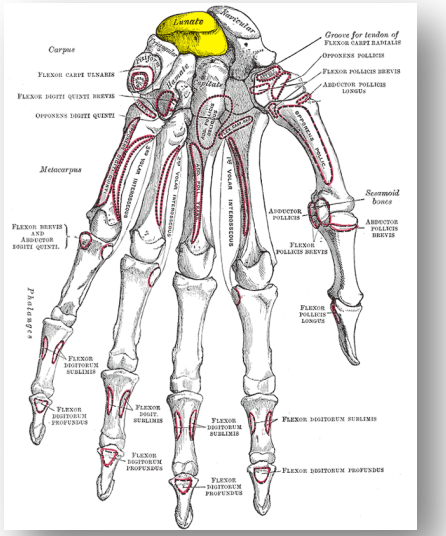


Scaphoid (navicular)

Scaphoid Summary

- Often missed fracture, misdiagnosed as wrist sprain
  - snuffbox tenderness
  - scaphoid views, CT, MRI
- Poor blood supply
  - prone to non-union, avascular necrosis
- Don’t use standard wrist splint, must have ***thumb spica***

KIENBÖCK'S DISEASE



Background:

- *avascular necrosis* of lunate
- leads to progressive collapse

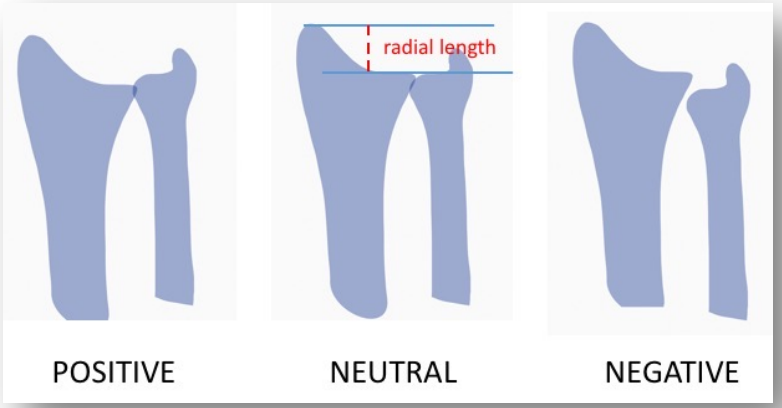
Etiology: unknown

- disruption of blood supply?
- undiagnosed fracture or repetitive trauma?

KIENBÖCK'S DISEASE

Risk Factors:

- more common in males
- "ulnar negative variance"



KIENBÖCK'S DISEASE

History & Physical Exam

- Early:
  - dorsal wrist pain
  - vague complaints…wrist swelling & stiffness

- Over time:
  - crepitus
  - decreased ROM
  - weakness with grip

Progression rate varies - typically over several years

KIENBÖCK'S DISEASE

Radiograph Considerations

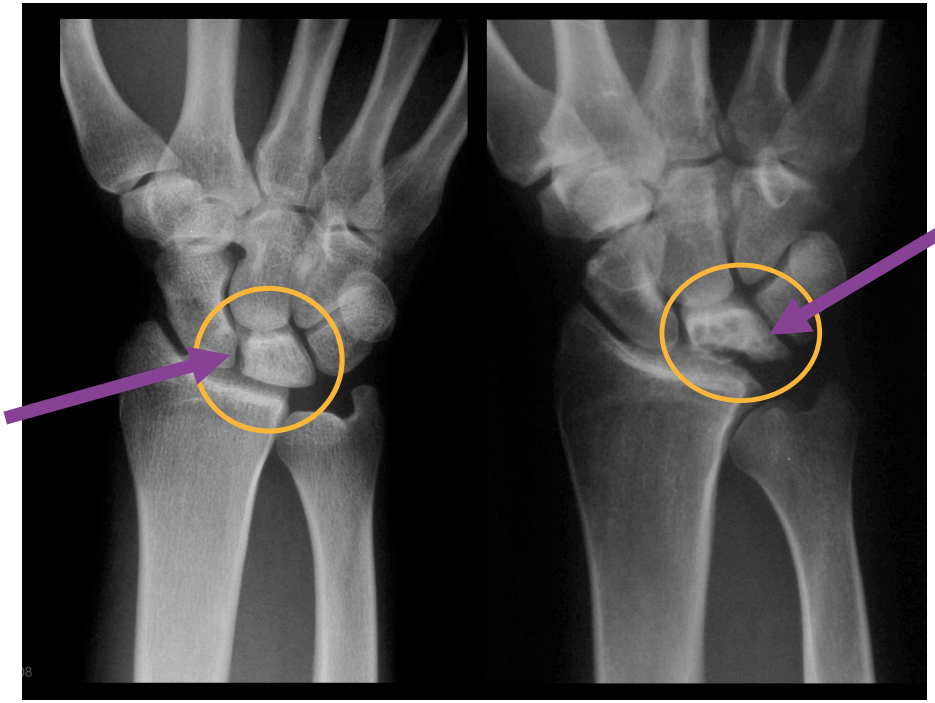
ulnar negative variance

ulna positive variance

KIENBÖCK'S DISEASE

Radiographs, continued:

- shows increased density of lunate
- not very sensitive

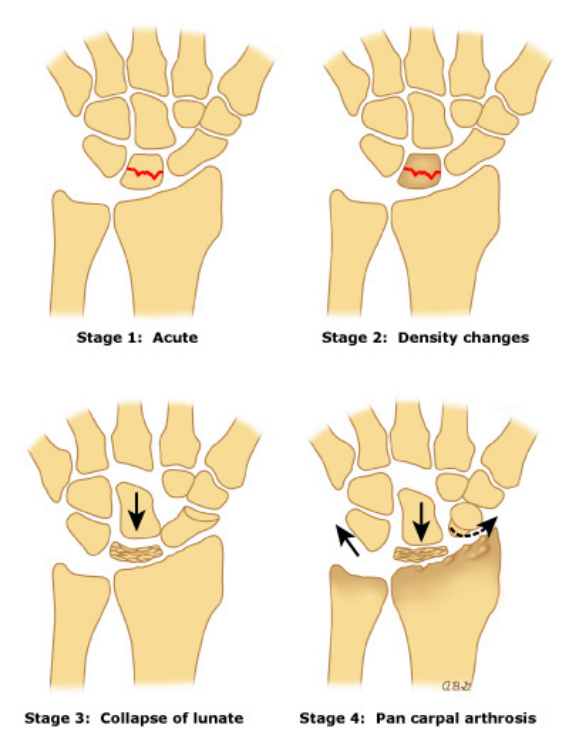


KIENBÖCK'S DISEASE

More sensitive imaging is helpful for early disease

- MRI: decreased signal on T1 image

KIENBÖCK'S DISEASE



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KIENBÖCK'S DISEASE

KIENBÖCK'S DISEASE

Management (conservative):

- immobilization

KIENBÖCK'S DISEASE

Management (surgical):

First line options:

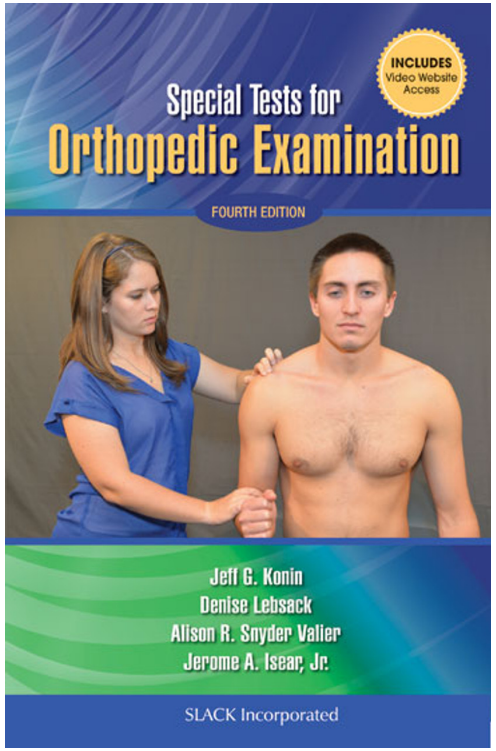
- radial shortening osteotomy
- vascularized bone graft

"Salvage procedures":

- proximal row carpectomy
- wrist arthrodesis

Special Tests

Finkelstein's test	DeQuervain's Tenosynovitis
Valgus Stress Test (at the thumb)	Gamekeeper/Skier Thumb



OUTLINE

Pre-test Questions

Introduction

1. Mallet Finger
2. Jersey Finger
3. Gamekeeper's/Skier's Thumb
4. DeQuervain's Tenosynovitis
5. Scaphoid Fractures
6. Kienböck's Disease

Post-test Questions

POST-TEST QUESTION #1

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 #2

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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POST-TEST QUESTION #3

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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CITATIONS

1. Blazer, PE. History and examination of the adult with hand pain. In: UpToDate, Curtis, MR (Ed), UpToDate, Waltham, MA, 2018

2. Boggess, BR. Evaluation of the adult with acute wrist pain. In: UpToDate, Grayzel, J (Ed), UpToDate, Waltham, MA, 2018

3. Boggess, BR. Evaluation of the adult with subacute or chronic wrist pain. In: UpToDate, Fields, KB (Ed), UpToDate, Waltham, MA, 2018

4. Bray, J and Neal, S. Evaluation of the patient with thumb pain. In: UpToDate, Grayzel, J (Ed), UpToDate, Waltham, MA, 2018

5. Jayanthi, N. Elbow tendinopathy (tennis and golf elbow). In: UpToDate, Fields, KB (Ed), UpToDate, Waltham, MA, 2020

6. Miller, MD, Thompson, SR. Miller's review of orthopaedics. 6th ed. Philadelphia, PA: Elsevier; 2012.

7. O'Connor, FG. Evaluation of elbow pain in adults. In: UpToDate, Fields, KB (Ed), UpToDate, Waltham, MA, 2020

8. Rynders, SD, Hart JA. Orthopedics for physician assistants. Philadelphia, PA: Elsevier; 2013.

9. Young, C. Throwing injuries of the upper extremity: Clinical presentation and diagnostic approach. In: UpToDate, Fields, KB & Chorley J (Ed), UpToDate, Waltham, MA, 2020

THANK YOU!!

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