



TENNESSEE ORTHOPAEDIC CLINICS
a division of TENNESSEE ORTHOPAEDIC ALLIANCE

HAND INJURIES

All Things Hand

Kent Rinehart, MD

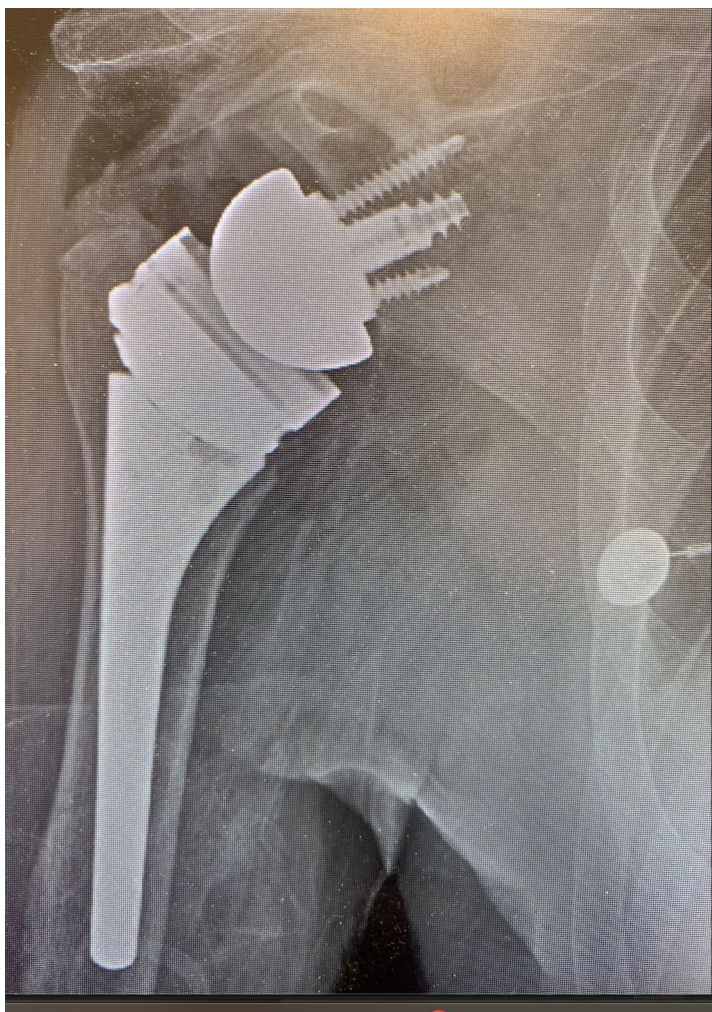
OVERVIEW

- Introduction
- My training
- Most common things I see & treat
- ?s

TRAINING....

- Farragut High School
- UTK
- ETSU Quillen COM
- U of Nebraska Orthopaedic Residency
- Indiana Hand to Shoulder Center

WHAT DO I TREAT?



TENNESSEE ORTHOPAEDIC CLINICS

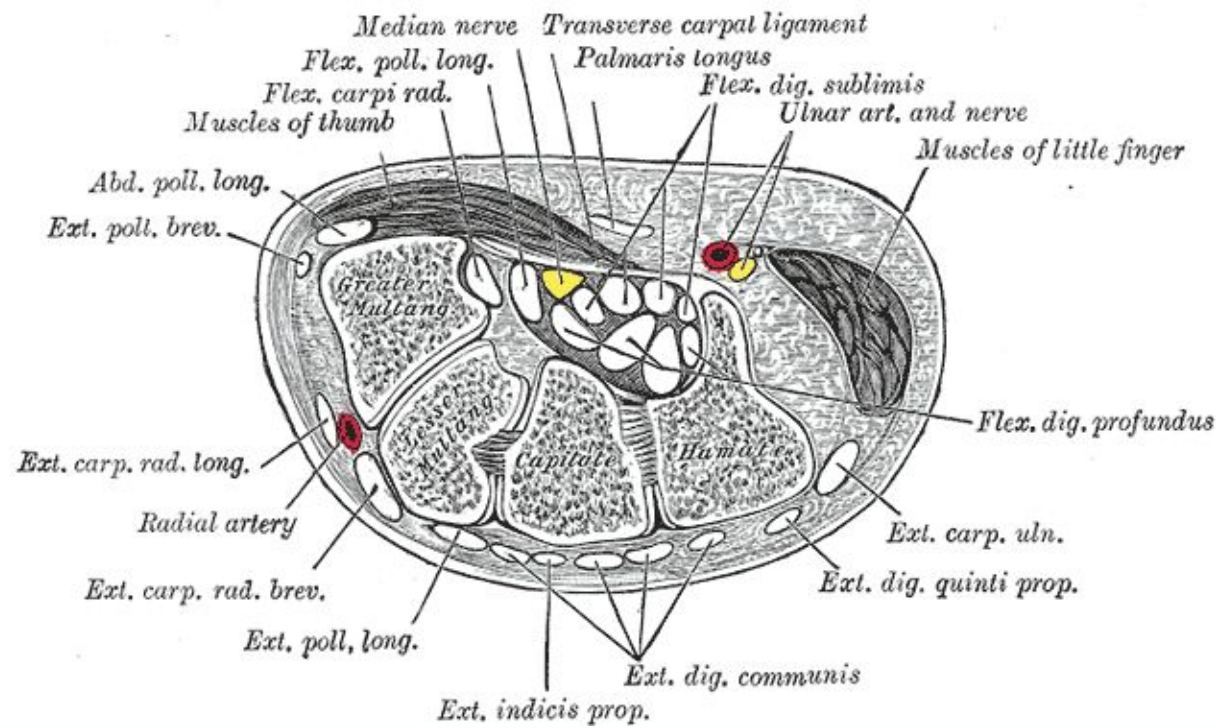
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RINEHART'S MOST COMMON

- Carpal tunnel syndrome
- Trigger finger
- Mallet/Jersey finger
- DeQuervain's wrist tendonitis
- Base of thumb arthritis
- Tennis elbow/Golfers Elbow
- Distal radius fractures
- “just a smidge of shoulder”

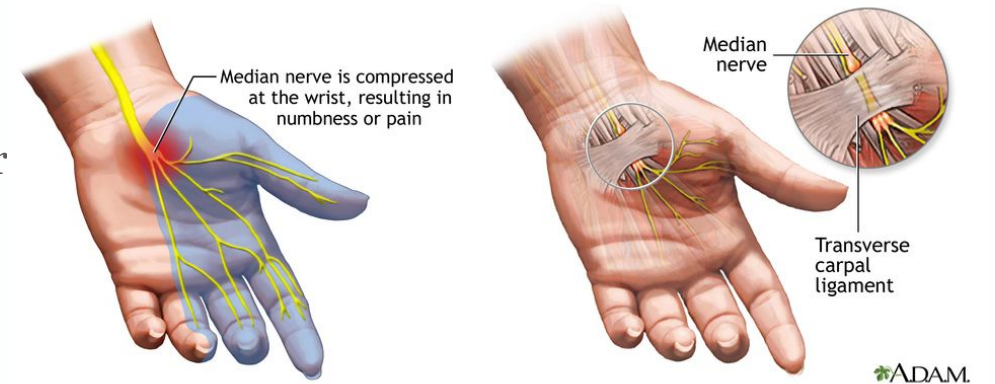
CARPAL TUNNEL SYNDROME

- The Median Nerve enters carpal tunnel along with 9 other structures
 - FPL tendon
 - 4 FDS tendons
 - 4 FDP tendons
- Roof - Transverse Carpal Ligament
- Floor – Carpal bones



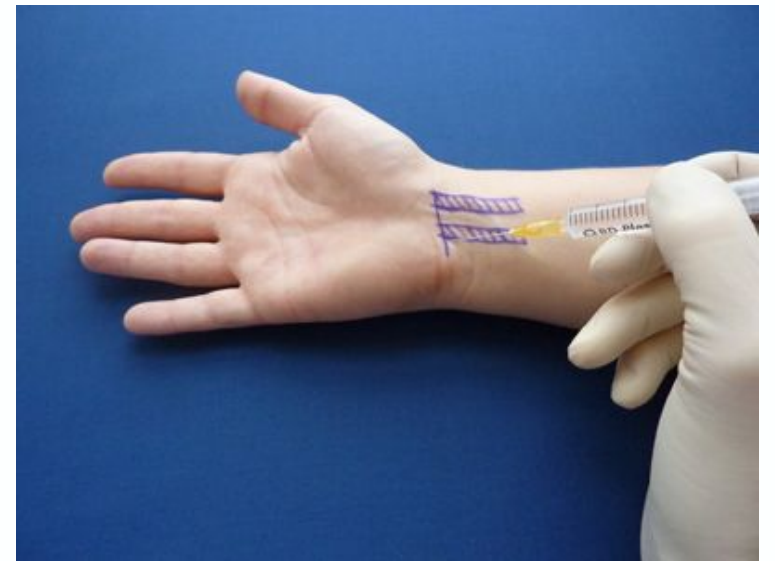
CARPAL TUNNEL SYNDROME

- Entrapment neuropathy of the median nerve at the carpal tunnel
- Characterized by numbness/tingling in the thumb through ring finger
- Volar wrist pain that can radiate proximally
- Fine motor weakness and/or atrophy
 - Clumsiness with small objects like coins or buttons
- Often symptomatic at night
 - Can disturb sleep quality in as much as 80% of patients with CTS
- Prevalence 300/100,000 in US



CARPAL TUNNEL SYNDROME

- First-line treatment typically includes a period of night splinting
- Steroid shots often considered at the time of initial presentation or after splinting has failed to relieve symptoms, or "mild CTS"



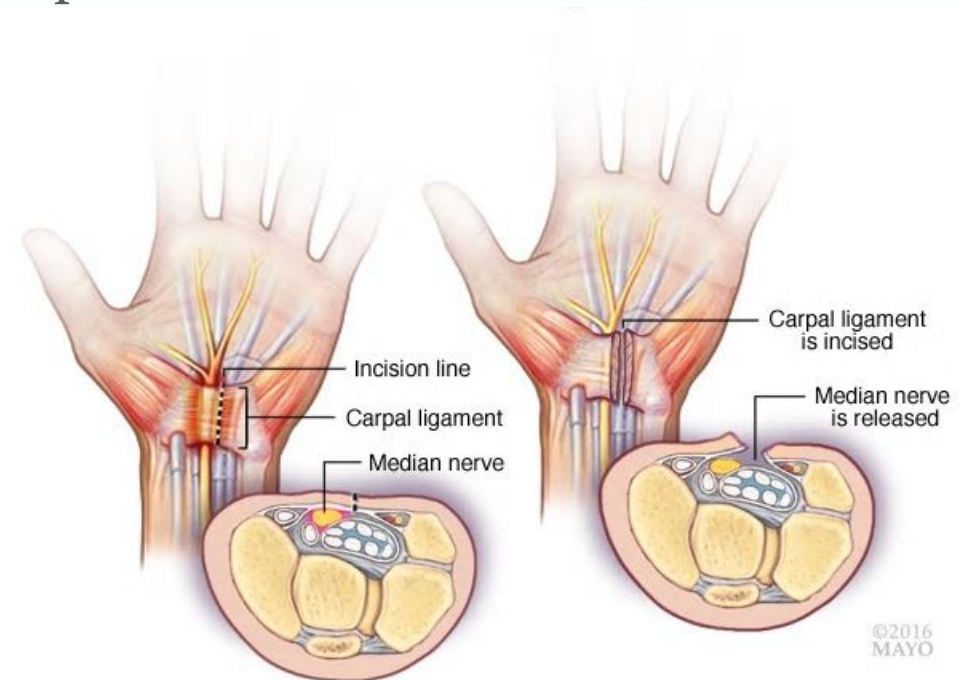
CARPAL TUNNEL SYNDROME, EMG/NCS????

- Opinions differ on utility of EMG testing for carpal tunnel syndrome
- Pros
 - Can add objective information to confirm diagnosis when diagnosis not clear
 - Different sites of compression?
 - Can serve as baseline info in case patient does not improve after surgery or if condition recurs
- Cons
 - Cost (Time and Finances)
 - Can be painful (needles involved)
 - May or may not change treatment plan



CARPAL TUNNEL SYNDROME

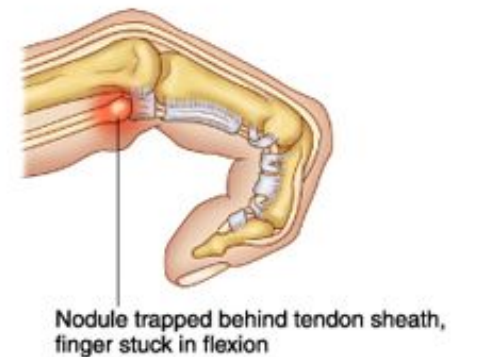
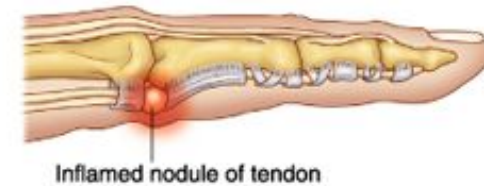
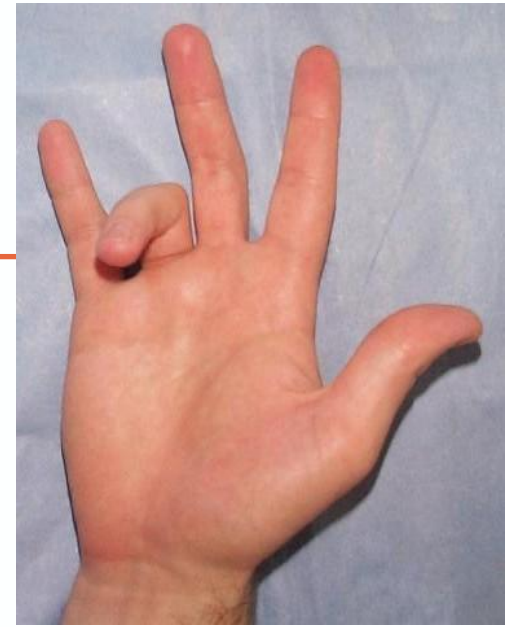
- Indicated for patients who have had persistent symptoms refractory to nonoperative treatment
- Division of the transverse carpal ligament to relieve pressure on the median nerve
- Endoscopic vs open (“mini open”)



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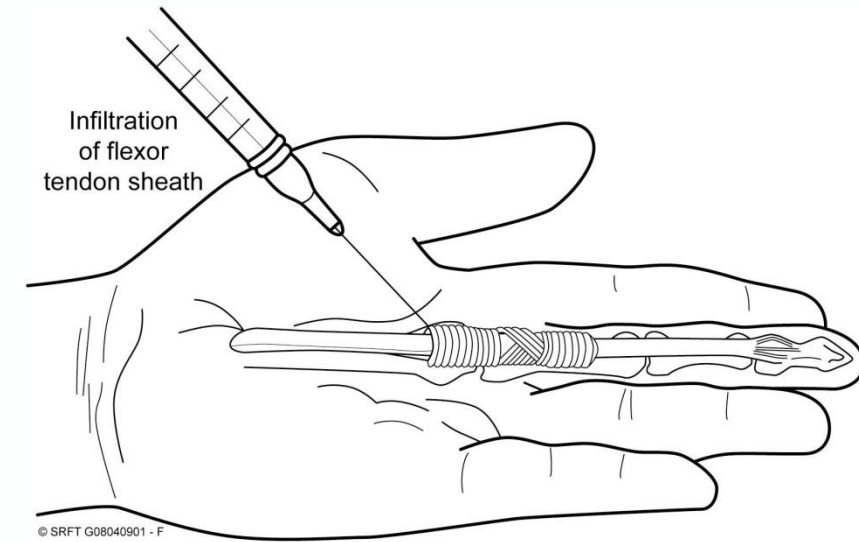
TRIGGER FINGER

- Localized inflammation of flexor tendons in vicinity of A1 pulley
- Development of tender nodule in tendon distal to pulley
- Middle/Ring fingers most common
- Clicking, locking of digit, tenderness over A1 pulley



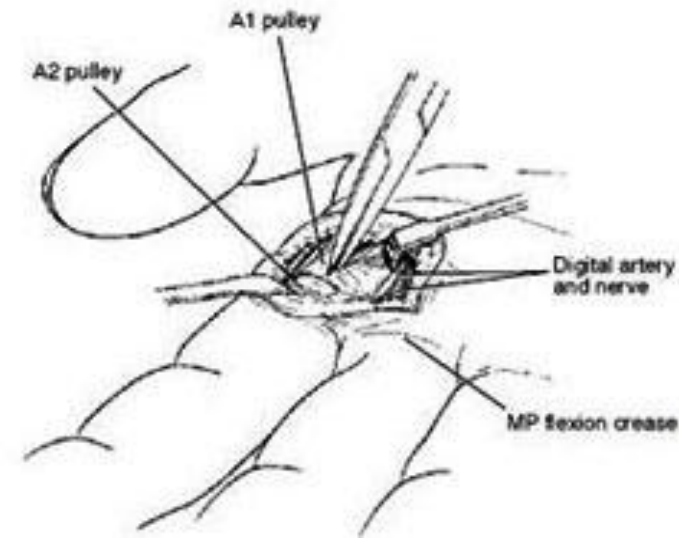
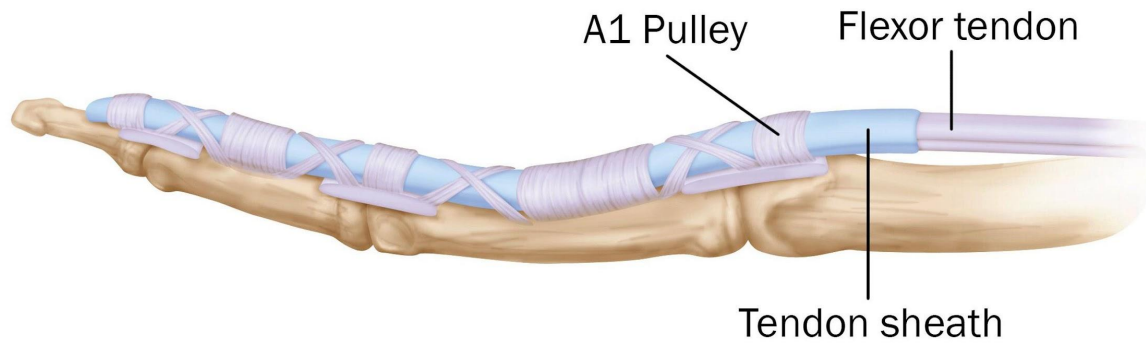
TRIGGER FINGER

- Lots of cases can be successfully treated nonoperatively
- Steroid injection
 - Into the sheath
- Diabetes = poor prognostic indicator
- Non-op treatment not recommended in pediatric cases (except thumb)



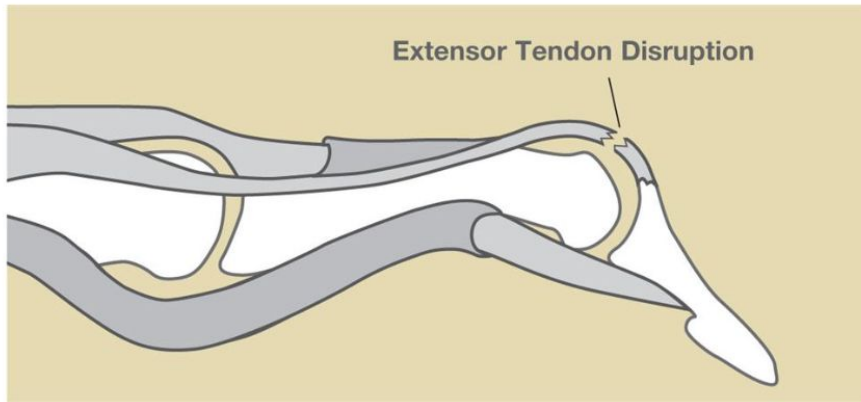
TRIGGER FINGER

- Incision over A1 pulley
- Release of A1 ± A0 pulley



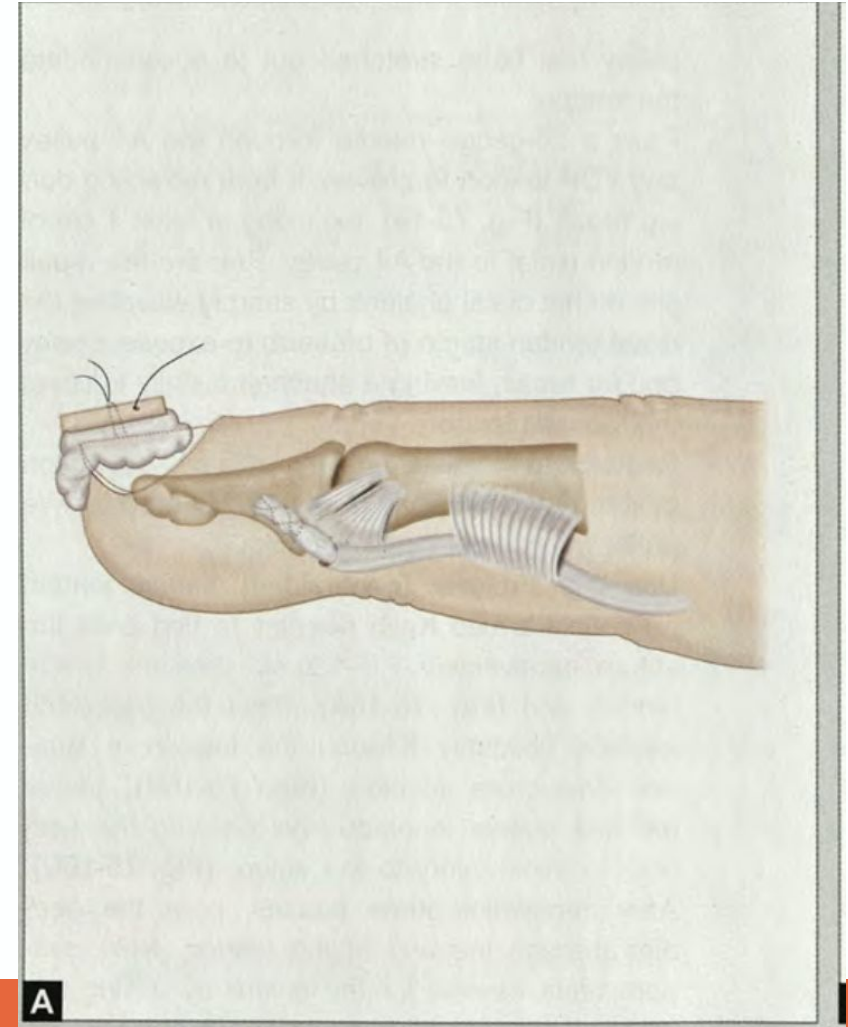
MALLET FINGER

- Forced flexion on an extended digit. Avulsion of extensor tendon at the base of distal phalanx
- Extension splinting FULL TIME 6-8 wks, if you want
- Don't immobilize the PIP joints
- Get XRs



JERSEY FINGER

- Usually results from forced extension of a flexed digit
- Avulsion of FDP tendon insertion at base of distal phalanx
- Common sports injury
- Tendon can retract fragment back in the palm



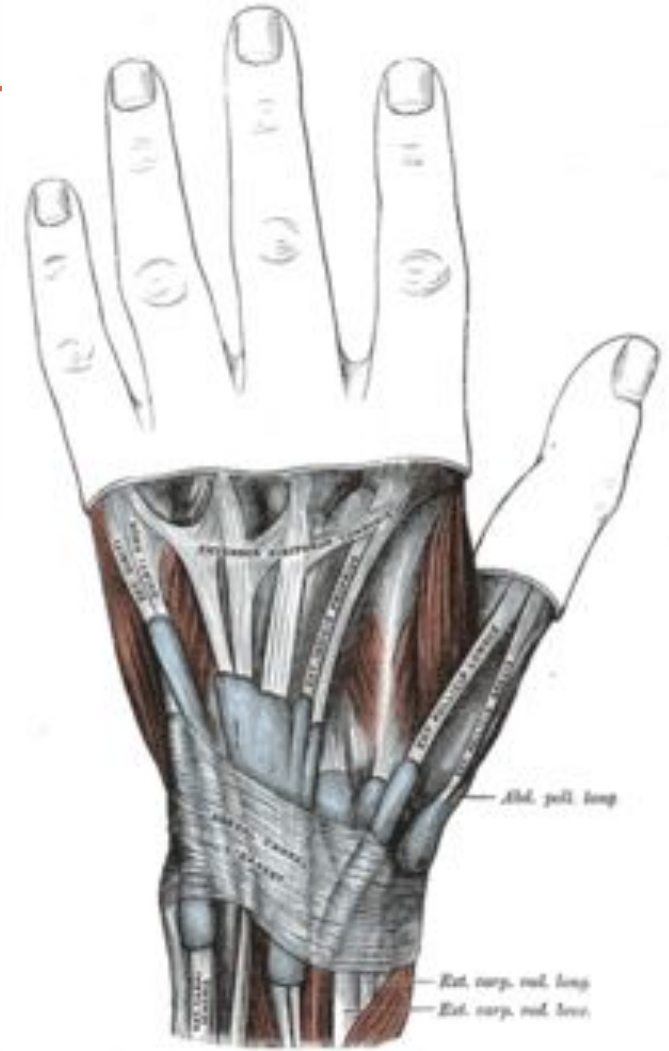
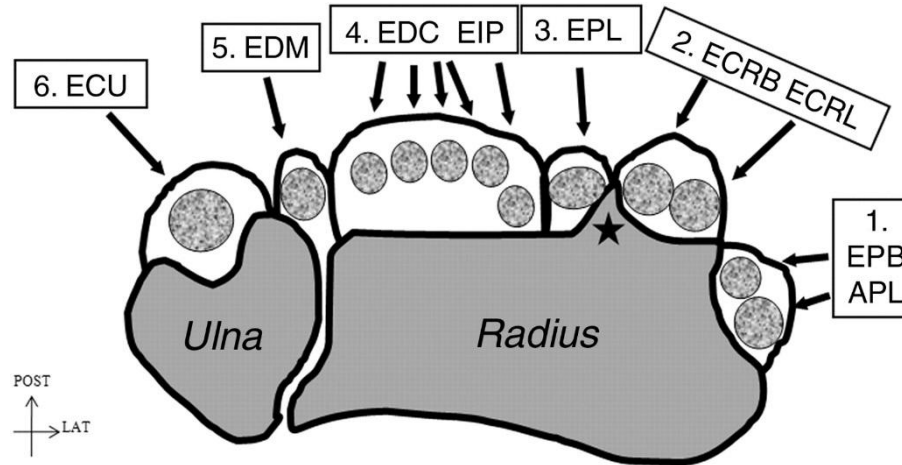


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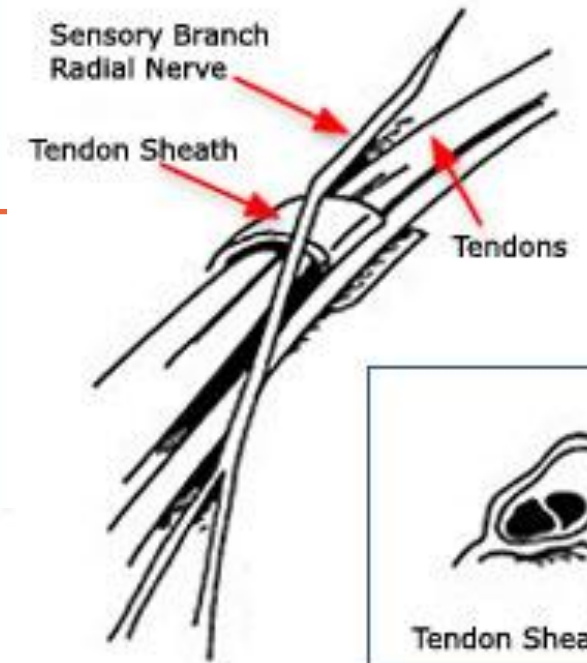
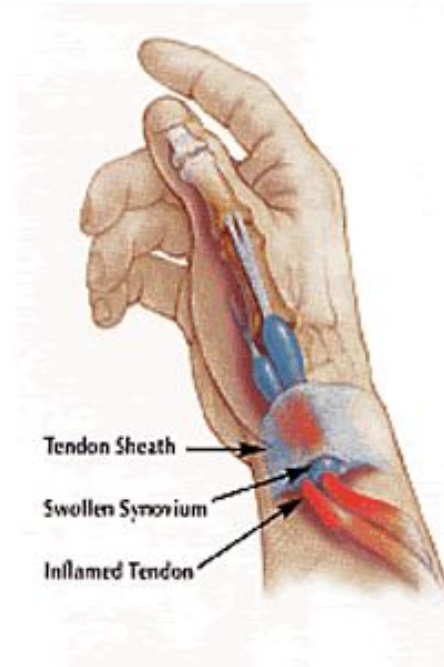
DEQUERVAIN'S

- Stenosing Tenosynovitis of the 1st dorsal compartment (APL, EPB)
- Common in females, 30-50 years of age
- Pain over radial styloid, sometimes thumb/forearm
- Tenderness and palpable thickening of 1st dorsal compartment over radial styloid
- Pain with active extension or abduction of the thumb against resistance
- Can be confused with 1st CMC arthritis



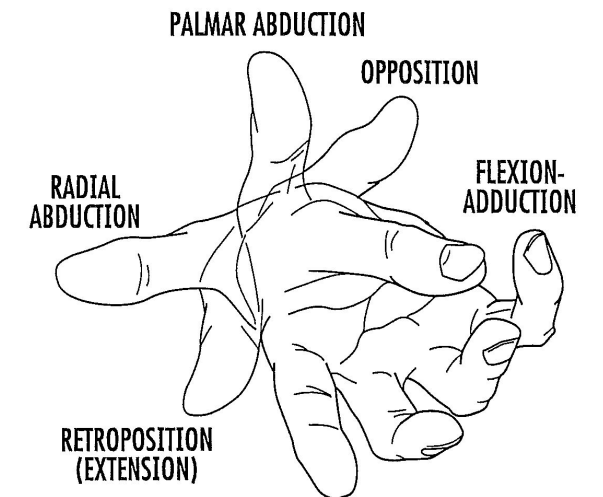
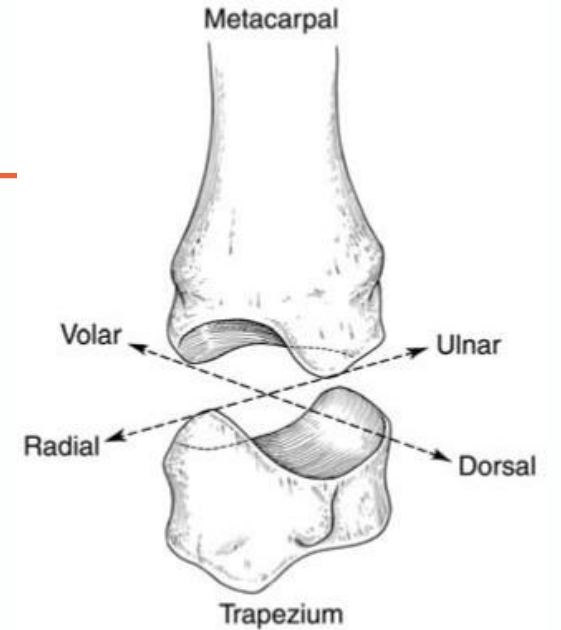
DEQUERVAIN'S

- Thumb spica splint
 - Should be applied to allow function/pinch
- Steroid injection
 - Role of repeated injections controversial
- Surgical Treatment
 - Oblique incision
 - Identify EPB (absent in 5%), usually sub sheaths around
 - Multiple slips of APL are often present, must release individual slips



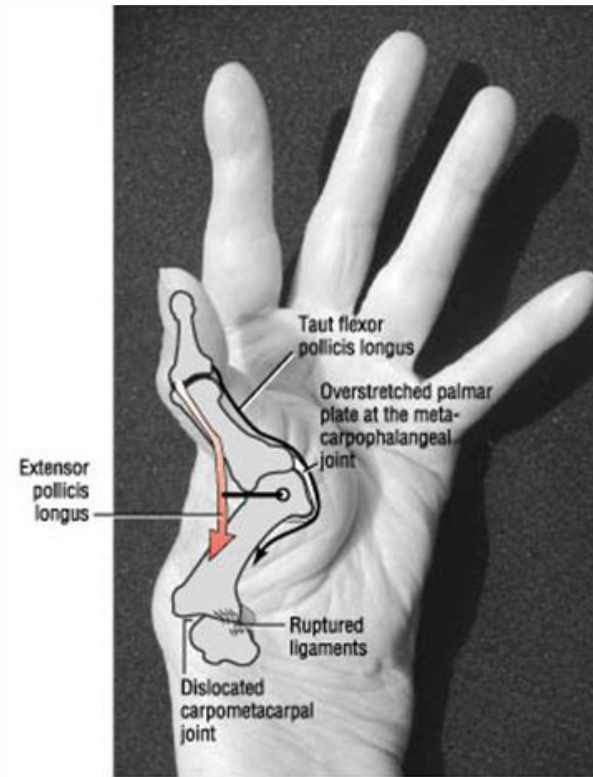
BASE OF THUMB ARTHRITIS

- The thumb represents approximately 40% hand function
- Nearly 1/4 of overall bodily function
- Prevalence of degenerative changes on radiography in people over 75 years of age
 - 25% in men
 - 40% in women
- Present in 15% of women over 30 years of age



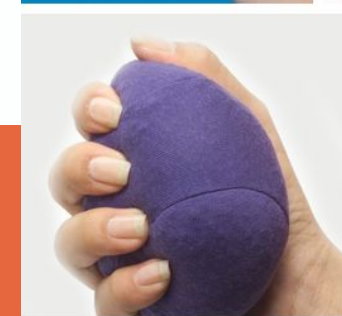
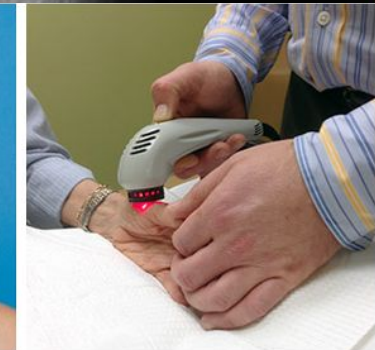
BASE OF THUMB ARTHRITIS

- Wide range of symptomatology
- Diffuse ache localized to thenar or thumb abductor region
- Pain with forceful pinch
- Tenderness over dorsal or dorsoradial capsule of CMC
- Localized swelling and warmth at base of thumb
- CMC grind test
- BEWARE ZIG ZAG COLLAPSE!



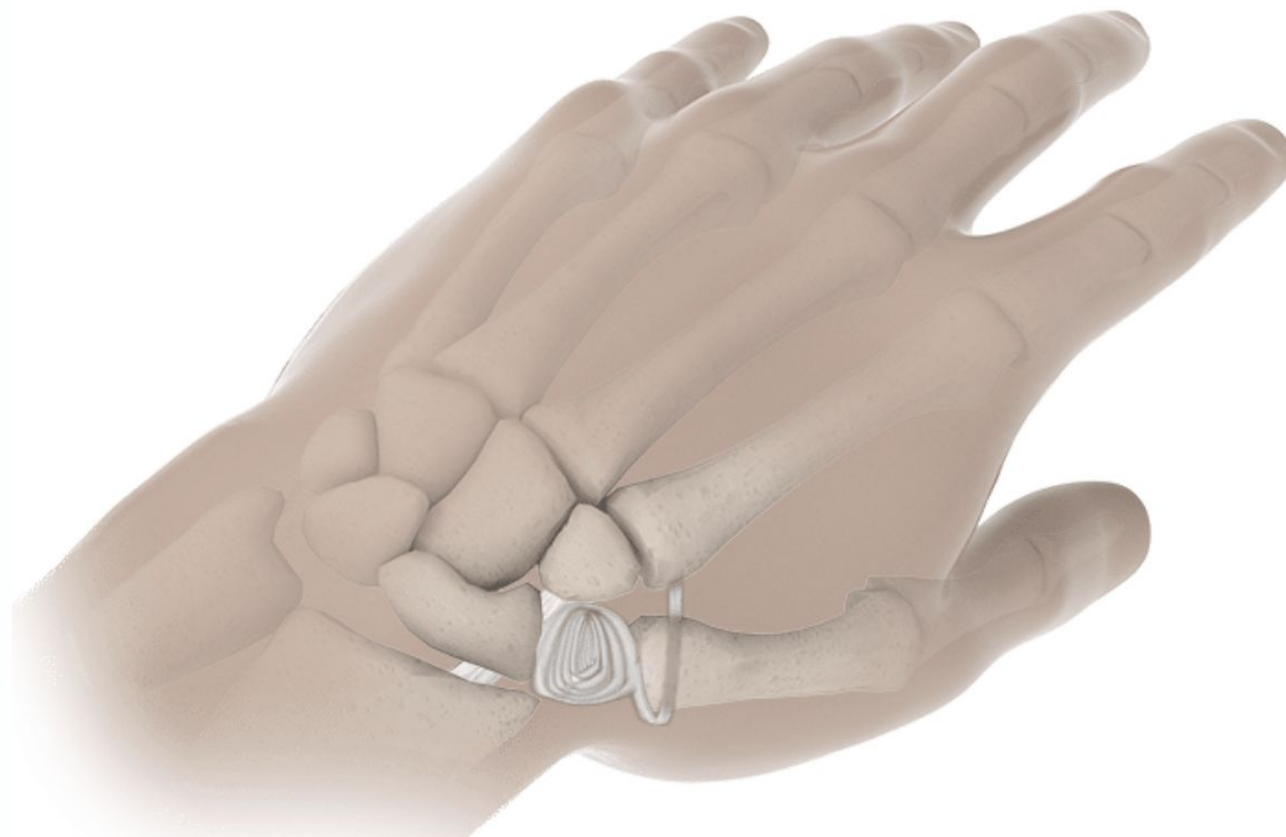
BASE OF THUMB ARTHRITIS

- Treatment goals- decrease pain & disability
- Hand therapy
- +/- splinting or glove
- CSI, ok with 3-4/ yr as needed
- Visco not FDA approved



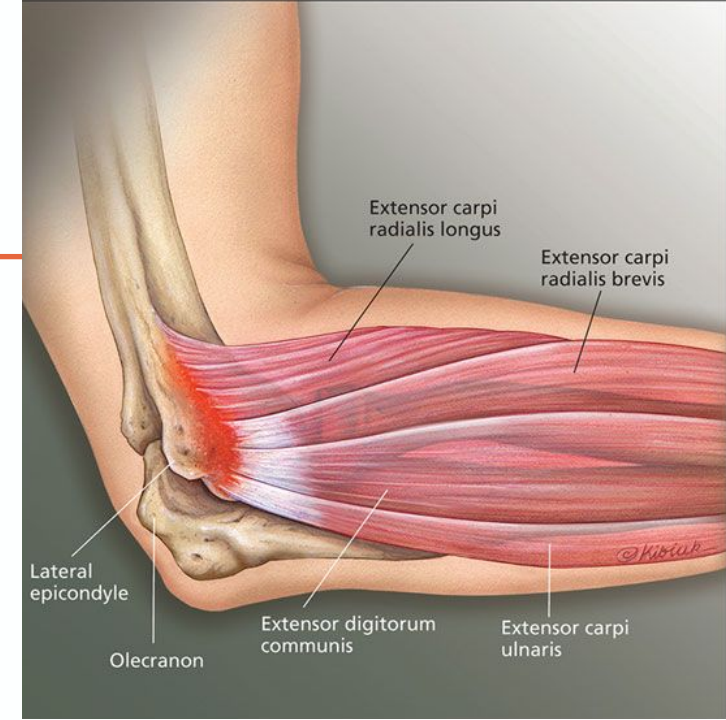
BASE OF THUMB ARTHRITIS

- Trapezium resection with “FCR LRTI”
- Hand based splint 6 wks, RTS ~8-10 wks
- Start hand therapy 4 wks
- Usually 3-6 month recovery



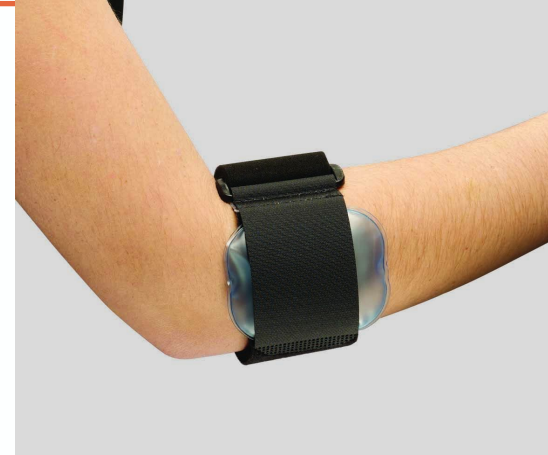
TENNIS ELBOW

- Lateral and medial epicondylitis are common!
 - Lateral: Medial 4-7:1
 - 2.4 per 1000 persons in 2012
 - 3.2% of diagnosed pts go on to surgery
- Results from tendinous micro-tearing followed by an incomplete reparative response
- Burning rather than mechanical pain
- Pain exacerbated by
 - Resisted wrist extension
 - Reaching out to lift
 - Greater pain with elbow extended



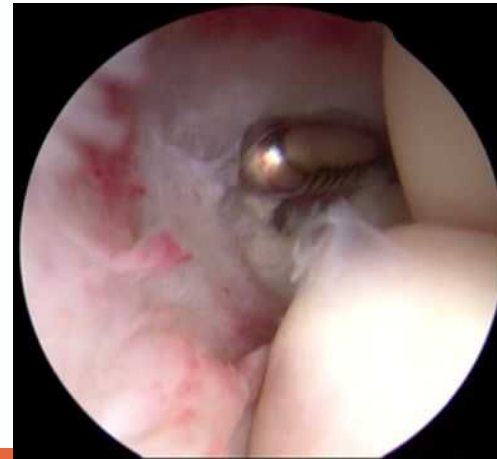
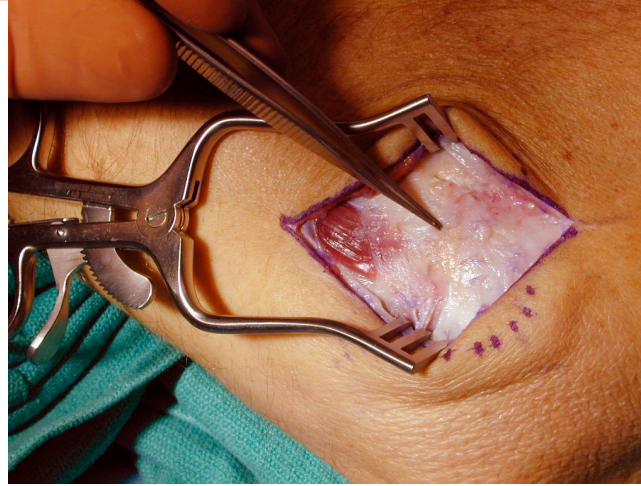
TENNIS ELBOW

- NSAIDs
- PT
- Splints/Braces
- Steroid injections
- None proven universally effective
- Most patients are asymptomatic at 1 year regardless of treatment used



TENNIS ELBOW

- Indicated if nonoperative treatment fails
- Several techniques described with similar results
 - Release of common extensor origin
 - Open
 - Endoscopic
 - Percutaneous
 - Debridement of pathologic tissue in ECRB
 - Open
 - Arthroscopic



DISTAL RADIUS FRACTURES

- In U.S., 17% of ER visits are for wrist injuries
- Distal radius and ulna fractures
 - Most common UE fracture
 - 16.2 fx's for 10,000 person-years
- Bimodal distribution
 - Under 18 years old
 - 30.18 fx's per 10,000 person-years
 - M:F ratio – 3:1
 - Over 65 years old
 - 25.42 fx's per 10,000 person-years
 - M:F ratio – 1:4



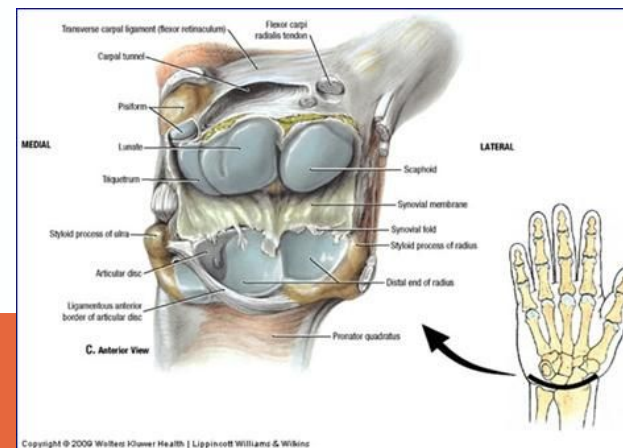
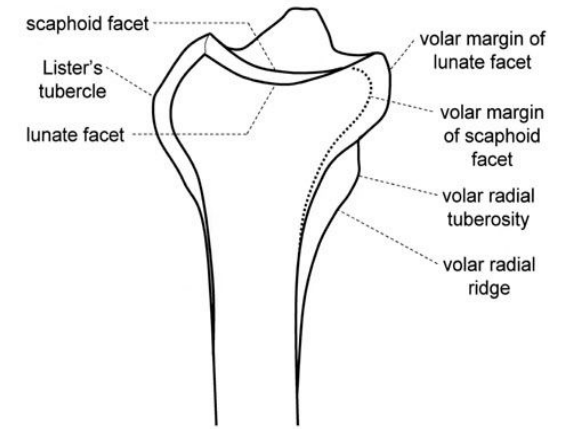
DISTAL RADIUS FRACTURES

- Often result from
 - Fall on Outstretched Hand
 - Lower-energy injury common in postmenopausal women
 - High-energy trauma
 - MVC
 - Specific fracture pattern determined by
 - Position of wrist
 - Direction and force of applied load



DISTAL RADIUS FRACTURES

- Distal radius – foundation of the wrist joint
 - Wrist dependent on osseous and ligamentous integrity for mobility and load-bearing
 - 2 facets
 - Radioscaphoid
 - Radiolunate
 - Separated by a well-defined ridge
 - Distal radius slopes palmarly and ulnarly
 - Lends itself to ulnocarpal translation
 - Resisted by intracapsular and intraosseous carpal ligaments



DISTAL RADIUS FRACTURES, XR EVAL

- What's important?

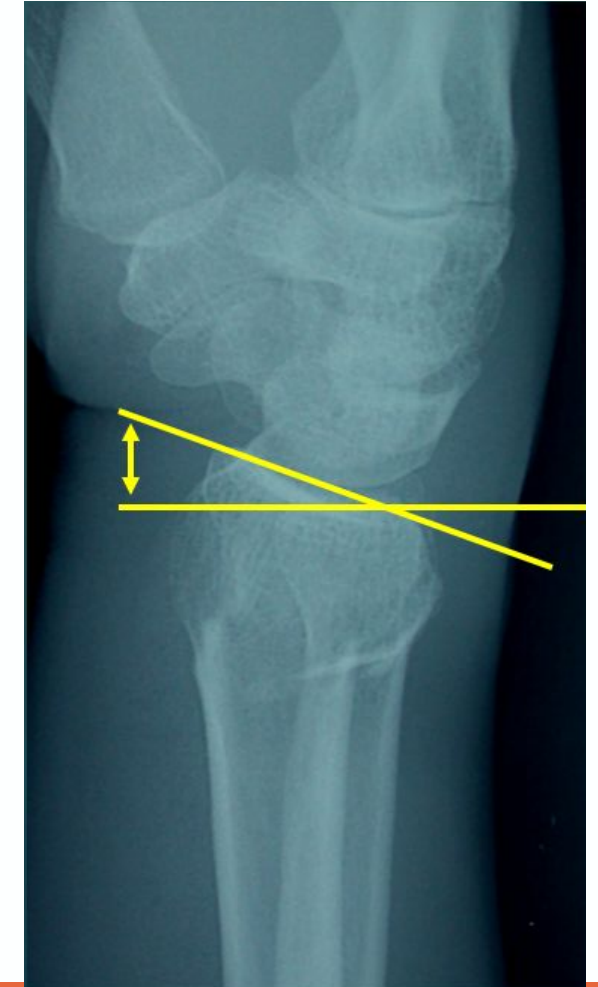
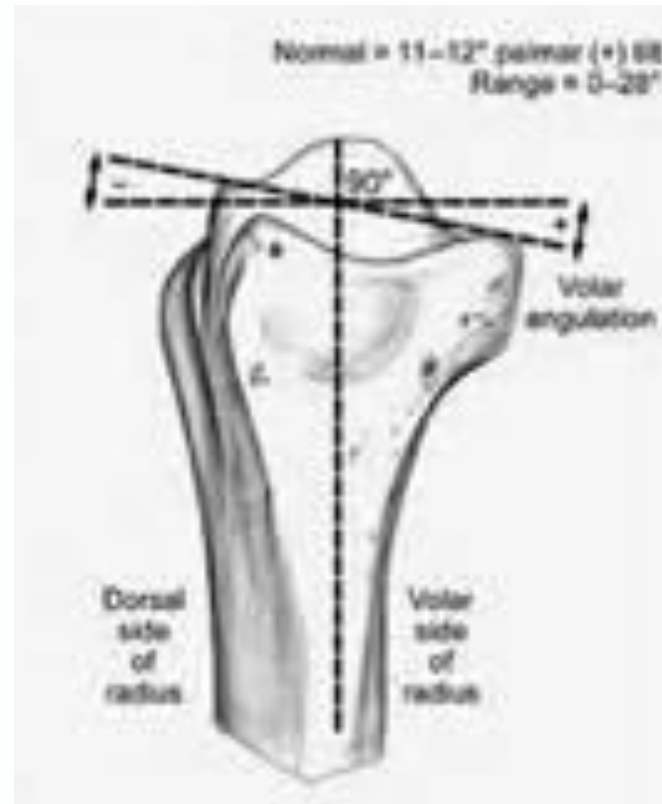
Radial inclination = 23°

Radial length = 12 mm

Ulnar Variance = 1 mm

Volar tilt = 11°

Step & Gap = 0-2 mm



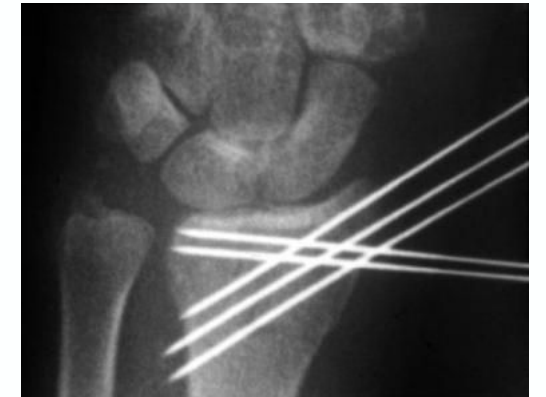
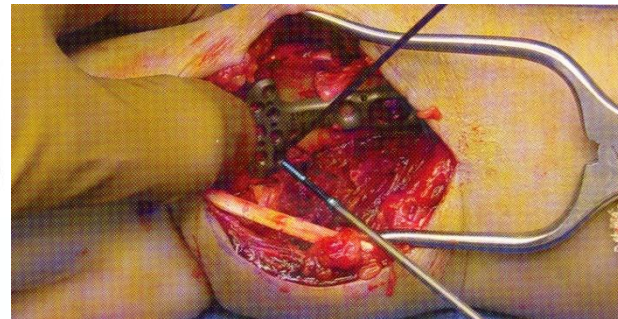
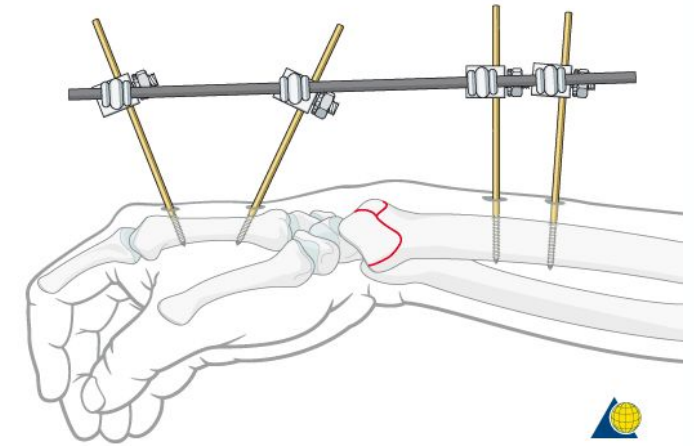
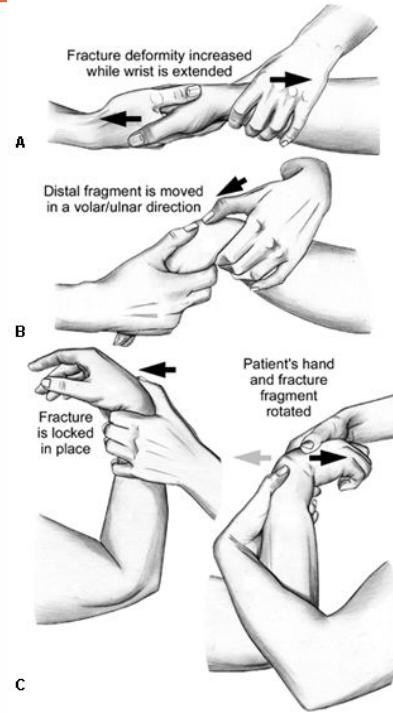
WHEN DO I WORRY?

- Likely to displace over time when....
 - Age > 60
 - Shortening
 - Volar (M/F) or Dorsal (F) comminution
 - Loss of radial inclination
 - Dorsal tilt > 20 degrees
 - Ulna fracture



DISTAL RADIUS FRACTURES

- Manual Reduction
- Casting
- External Fixation
 - Joint-spanning
 - Non joint-spanning
- Percutaneous pinning
 - +/- Plaster
- Internal Fixation
 - Volar plating
 - Dorsal plating
 - Fragment-Specific
 - Combined volar/dorsal
- Bone Graft
- Arthroscopic Assisted



DISTAL RADIUS FRACTURES

□ Casting

□ Indications

- Low-energy “Stable” fractures
 - Minimal radial metaphyseal comminution
 - Minimal or no loss of radial height
 - No substantial displacement or angulation
- Low-demand patient
- Non-dominant hand
- Medical co-morbidities or High surgical risk
- Must obtain and maintain an acceptable reduction with frequent follow-ups
- Usually achieved with a short-arm cast



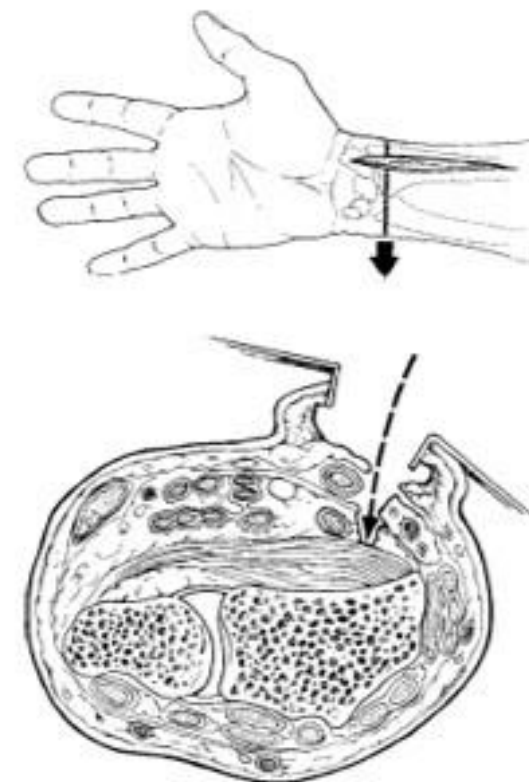
DISTAL RADIUS FRACTURES

Internal fixation choices

- Volar plating
- Dorsal plating
- Combined plating
- Fragment-Specific
- Joint-spanning bridge plating

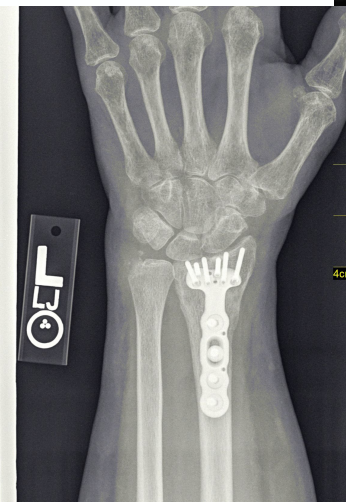
Indications

- High-energy injury
- Secondary loss of reduction
- Articular comminution, step-off, or gap
- Metaphyseal comminution or bone loss
- Loss of volar buttress with displacement
- DRUJ incongruity



DISTAL RADIUS FRACTURE, 65 & UP?

- Pts over age 65 with unstable distal radius fractures can expect similar functional outcomes of operative versus nonoperative treatment
- Expect very different radiographic and cosmetic outcomes
 - Is a clinical deformity worth a scar?
 - Do pts worry about their alignment if they can do most all the things they want to do?
- Statistically improved grip strength in those treated operatively
- Significantly lower complication rate in pts treated non-operatively
- These factors are important for patient counseling
 - Do risks of surgery outweigh potential benefits?





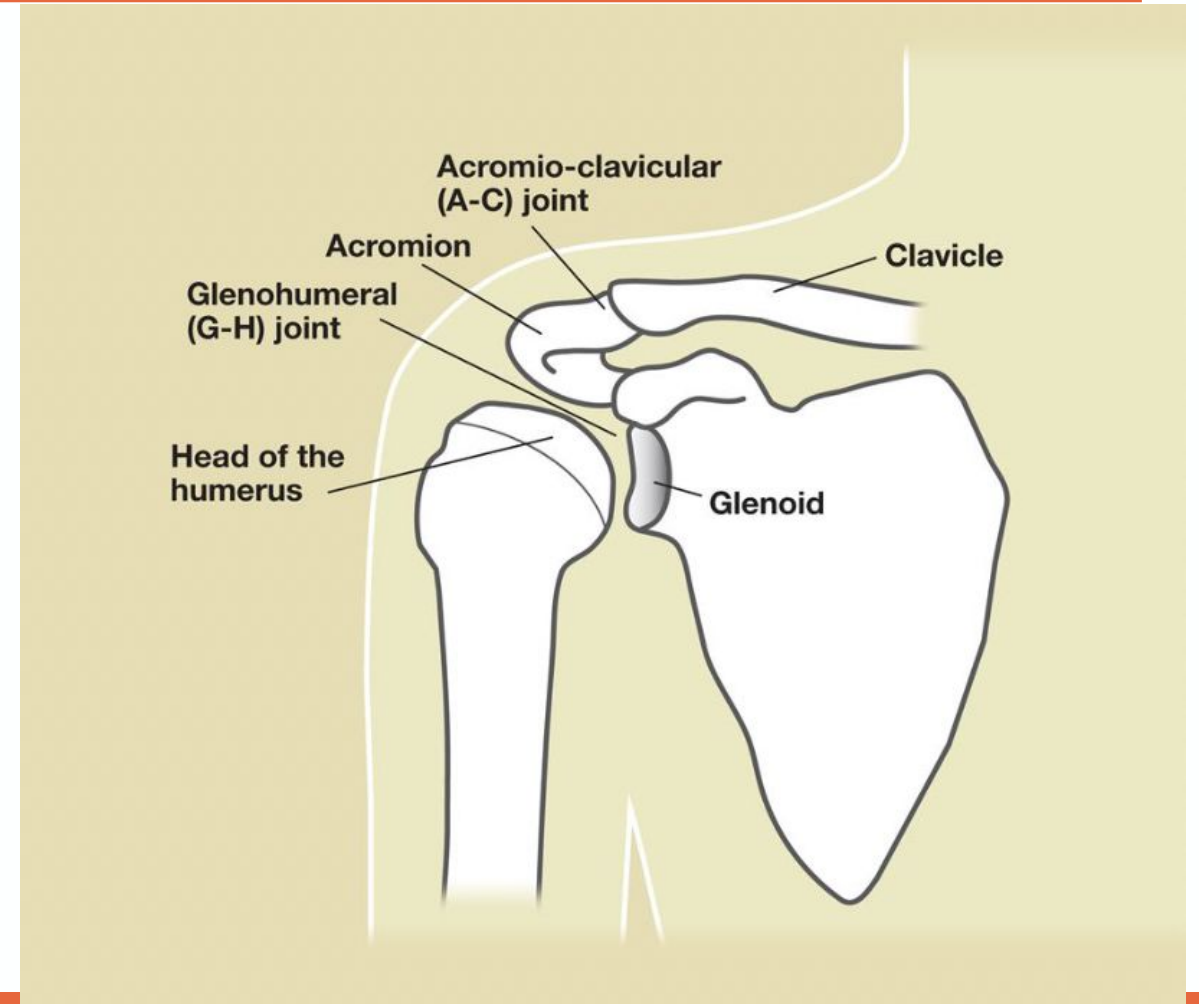
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SHOULDER ARTHRITIS

- Pain when moving the shoulder or arm
- Grinding of the joint
- Weakness of the shoulder
- Tenderness to touch



SHOULDER ARTHRITIS

- Rest
- Activity modifications
- Physical therapy
- NSAIDs such as ibuprofen
- Ice/Heat
- Steroid injections
- Surgery



RESOURCES

- www.assh.org/handcare
- orthoinfo.aaos.org



THANK YOU



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Thank you!

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