

Distal Radius Fractures Volar Plating

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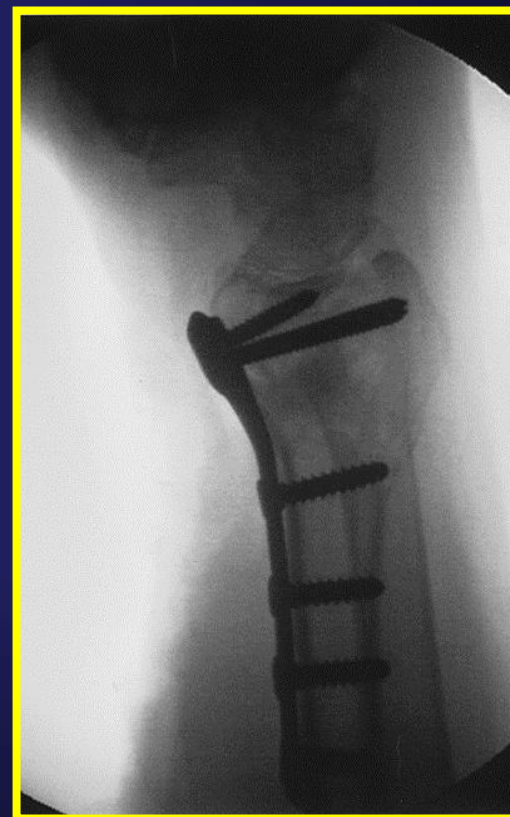
Outcomes and Fixation Type

SUMMARY

- Most studies find equivalent results at 1-2 years regardless of fixation choice
 - Internal fixation will generally provide earlier return to function in first 6-12 weeks compared to pin fixation or wrist spanning fixation
- No type of hardware is superior – use what you need to restore the skeletal anatomy

Why the Popularity

- Provides stability in osteoporotic bone by buttressing the subchondral bone
- Simple surgical approach
- Reduction usually easiest on non-comminuted volar surface
- Useful in variety of fractures
 - Metaphyseal
 - Volar shearing
 - Intra-articular if reducible



Orbay, JHS 2004
Orbay, CORR 2006

Volar Plate Complications

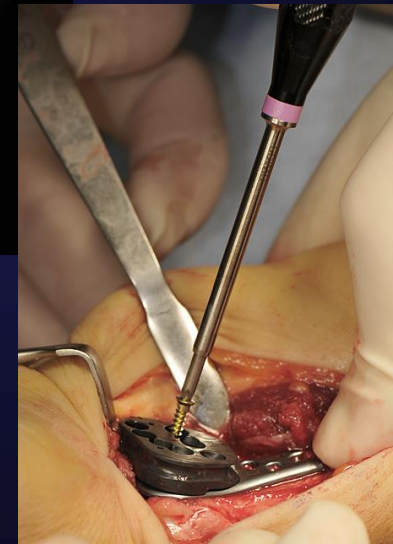
- Review by **Soong JHS 2011** demonstrated rare complications
 - 47 complications in 594 patients (**7.9%**)
 - 14 tendon irritation (1 FPL rupture)
 - 8 intra-articular screws
 - 7 loss of fixation
 - 5 DRUJ related revisions
 - Similar to **5.9%** complication rate at 5 years in 303 patients
 - **Tarallo JOT 2013**

Case 1

44 yo RHD female with left distal radius fracture treated with ORIF at another hospital 1 year prior



Case



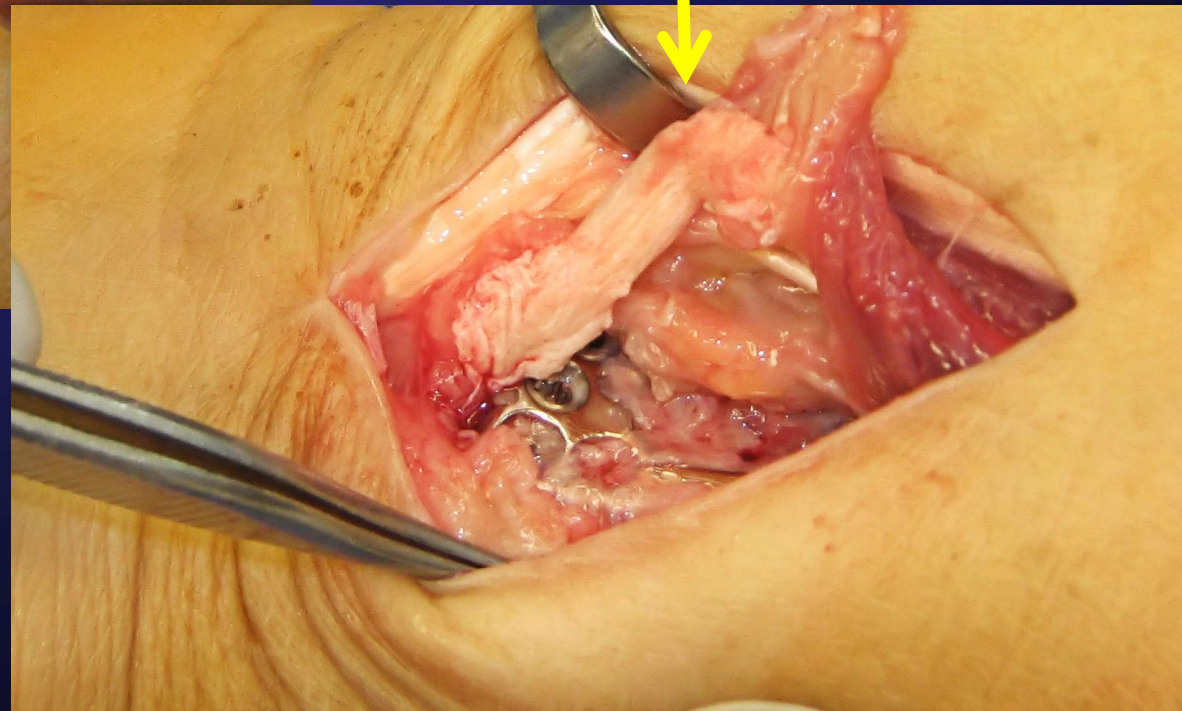
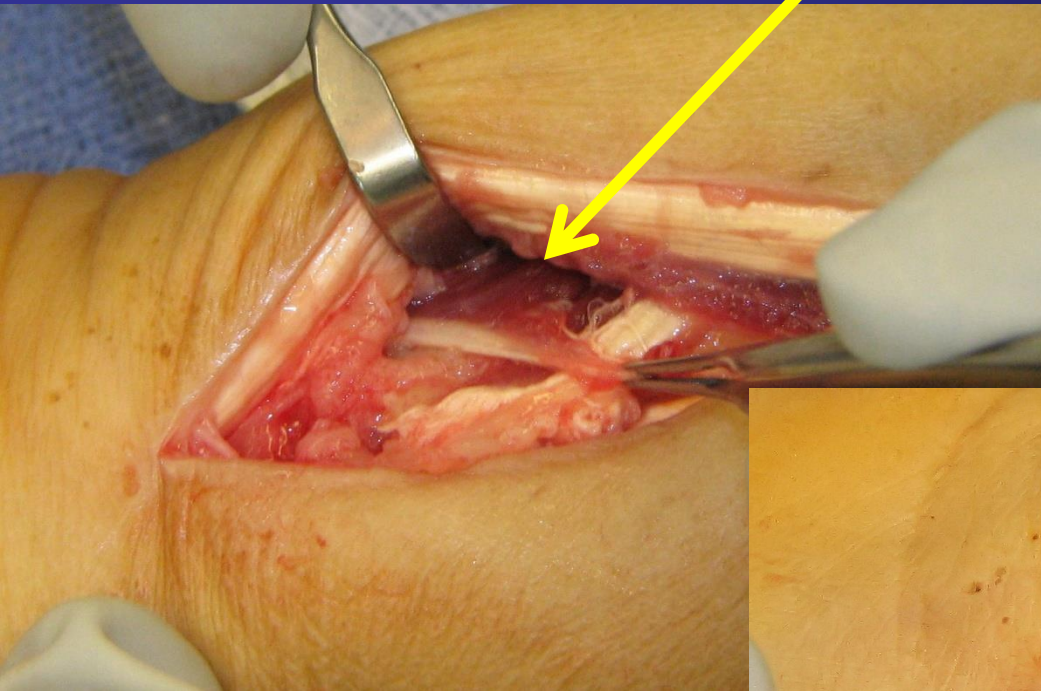
Obviated by having the first screw in the distal "T" portion of the plate non locking

Case

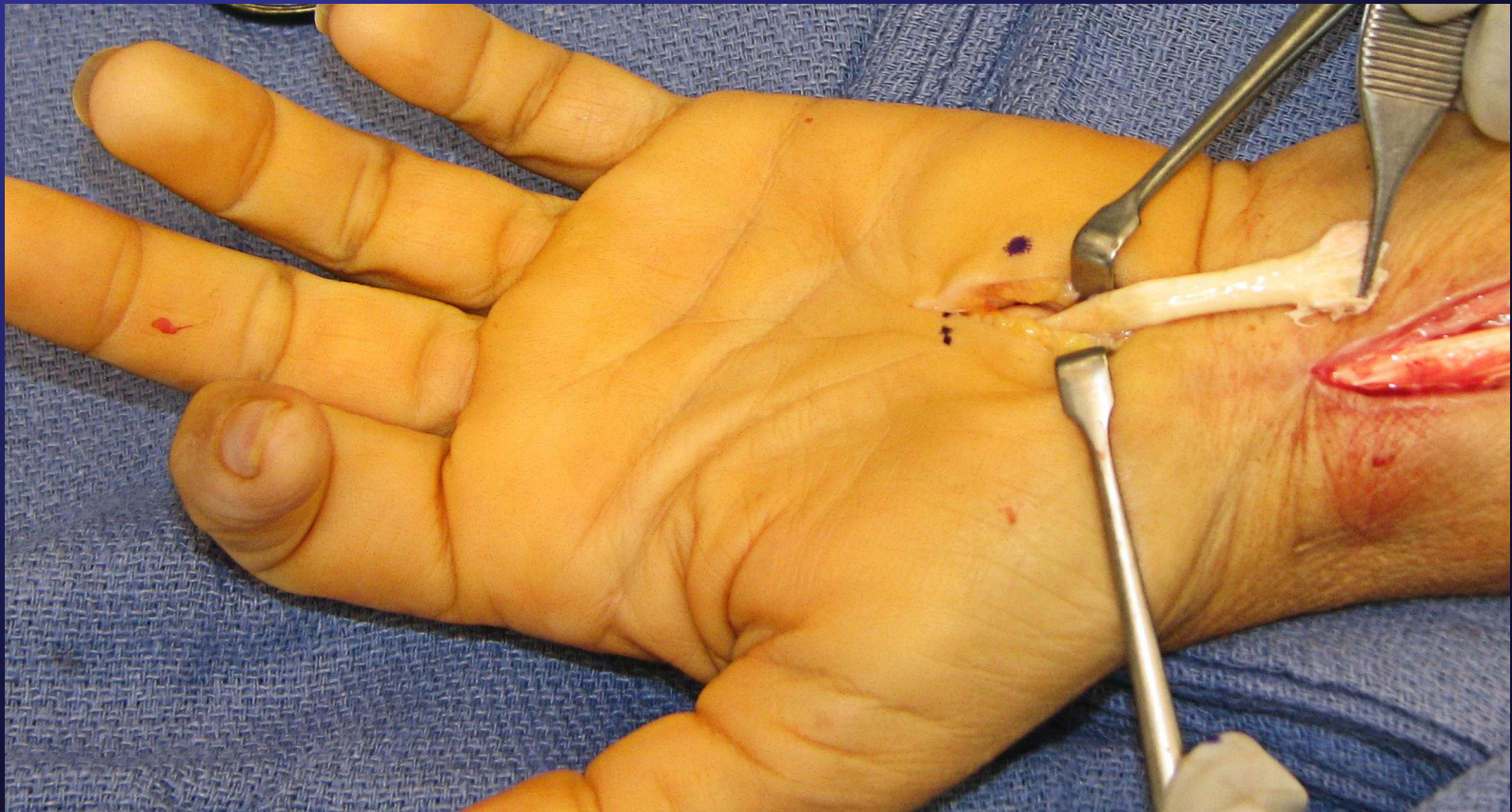
- Now presents with inability to flex index DIJ

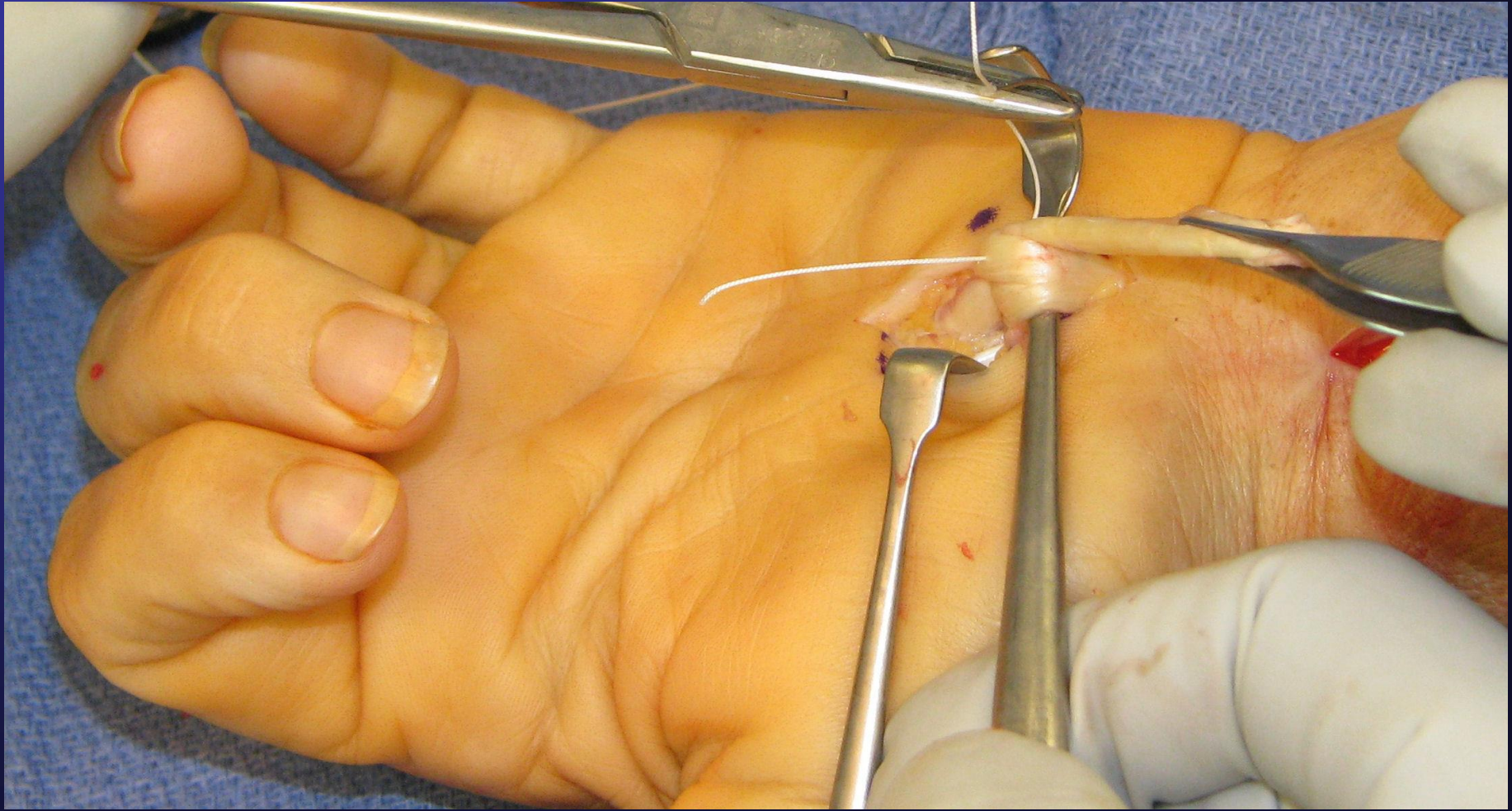


Remaining FDS index, FPL 60%



Index FDP Distally

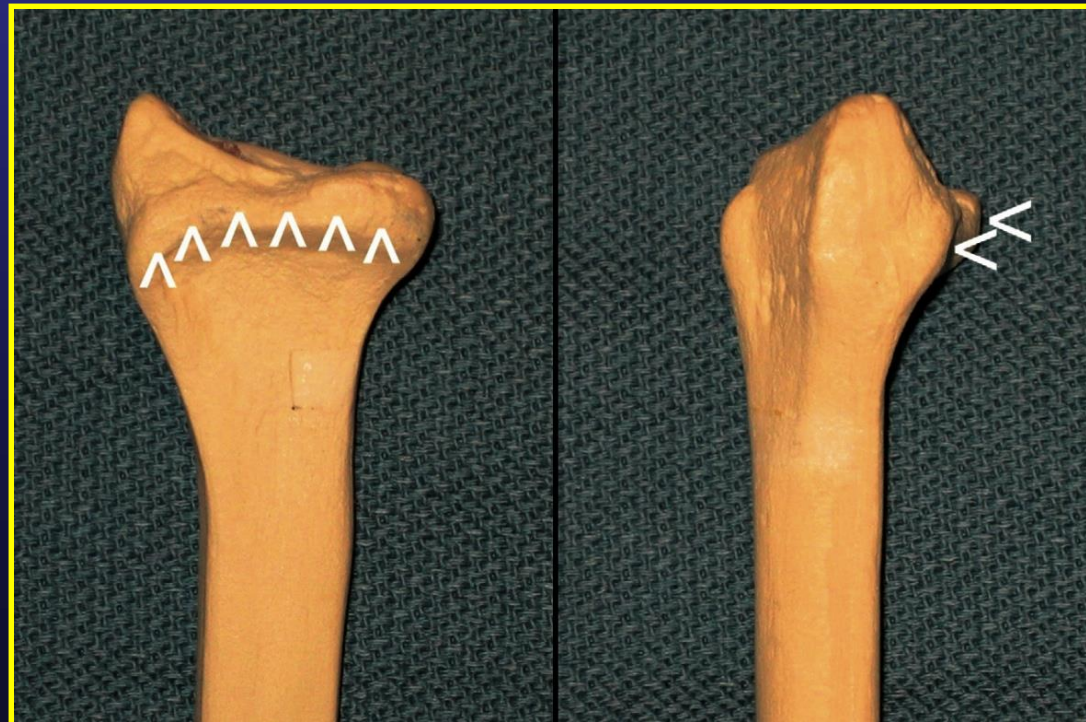




Volar Plate Complications

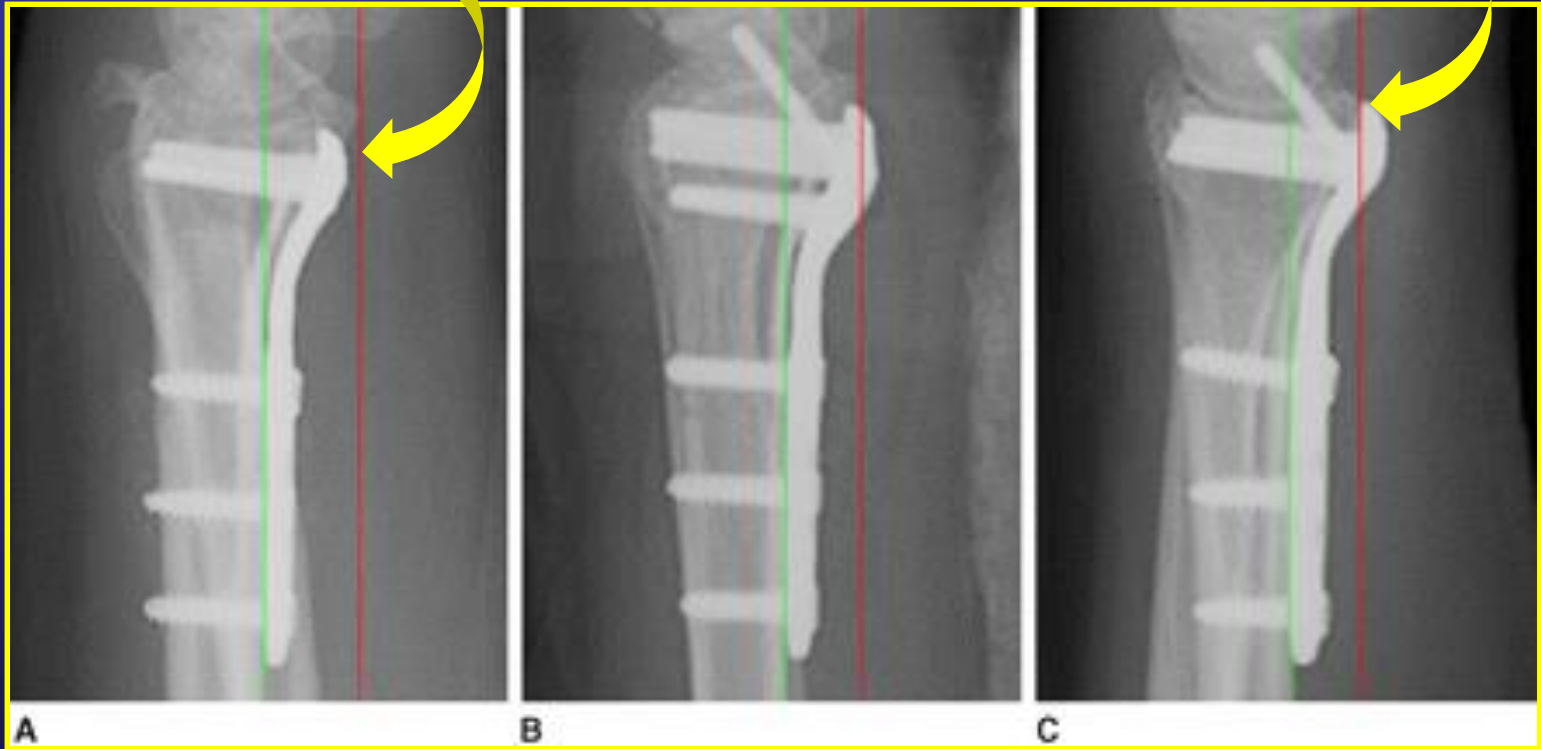
- Flexor tendon complications
 - Watershed line 2mm proximal to ulnar side joint line and 10-15mm proximal to radial side joint line

Ruptures noted in cases where the plate was placed volar to the “critical line” and at/or distal to the volar rim



Critical line

Volar rim



A

B

C

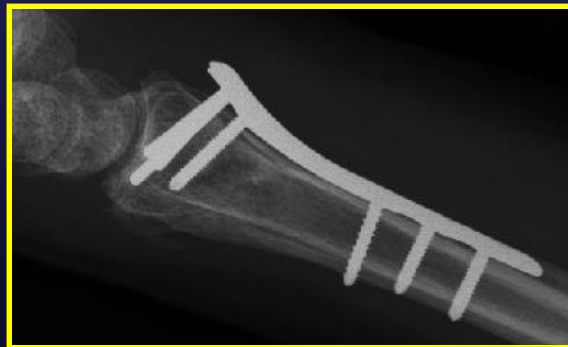
Grade 0

Grade 1

Grade 2

Avoiding Flexor Tendon Complications

- Position plates proximal to watershed line and tightly applied to bone
- Remove hardware if signs of tendon irritation to prevent rupture
- No clear evidence of benefit to repairing pronator quadratus



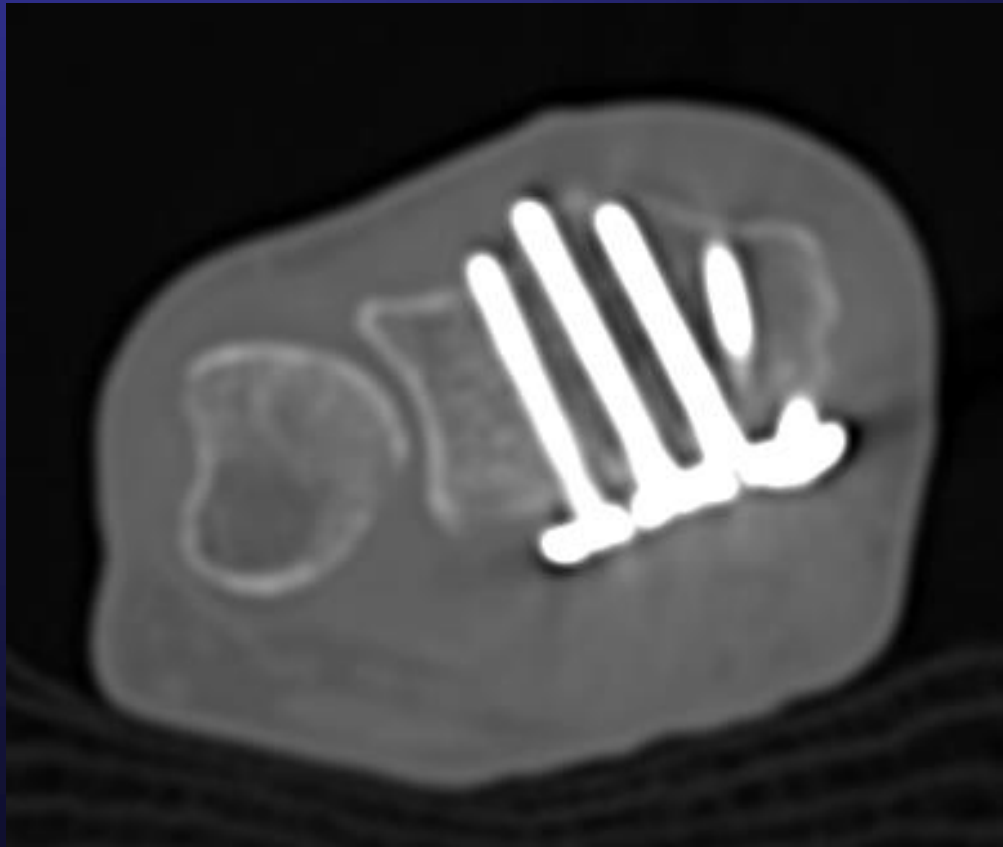
Case 2

- 71 year old female 5 months after volar plating with inability to extend thumb IP joint
 - Told to continue therapy



Case

- Hardware immortalizes mistakes



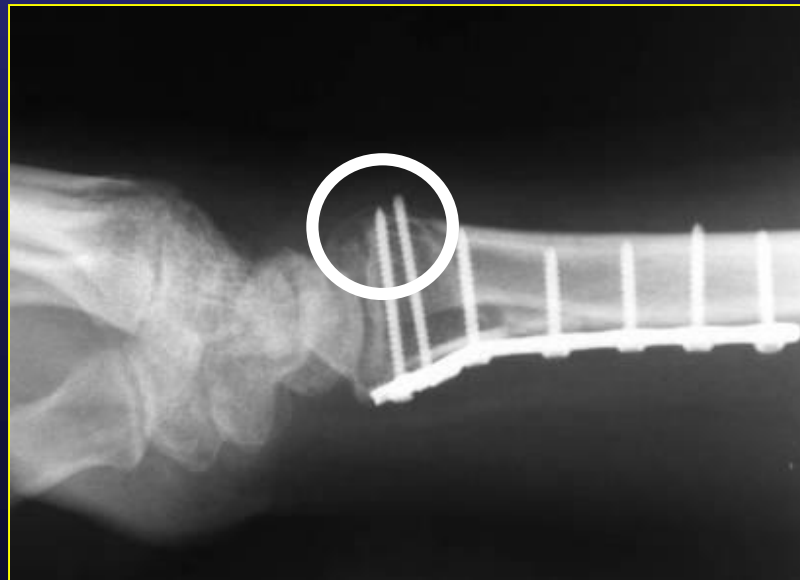
Case

- Distal screws removed and EIP to EPL transfer



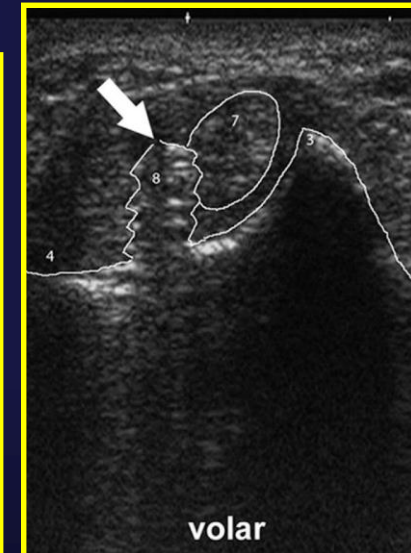
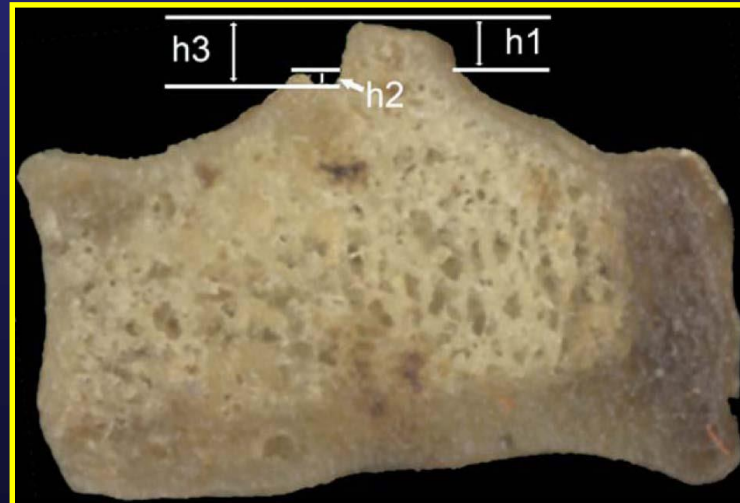
Volar Plate Complications

- Extensor Tendon Complications
 - EPL, EDC, ECRB/ECRL
 - Possibly related to vascular compromise with fracture, drill penetration, screw prominence



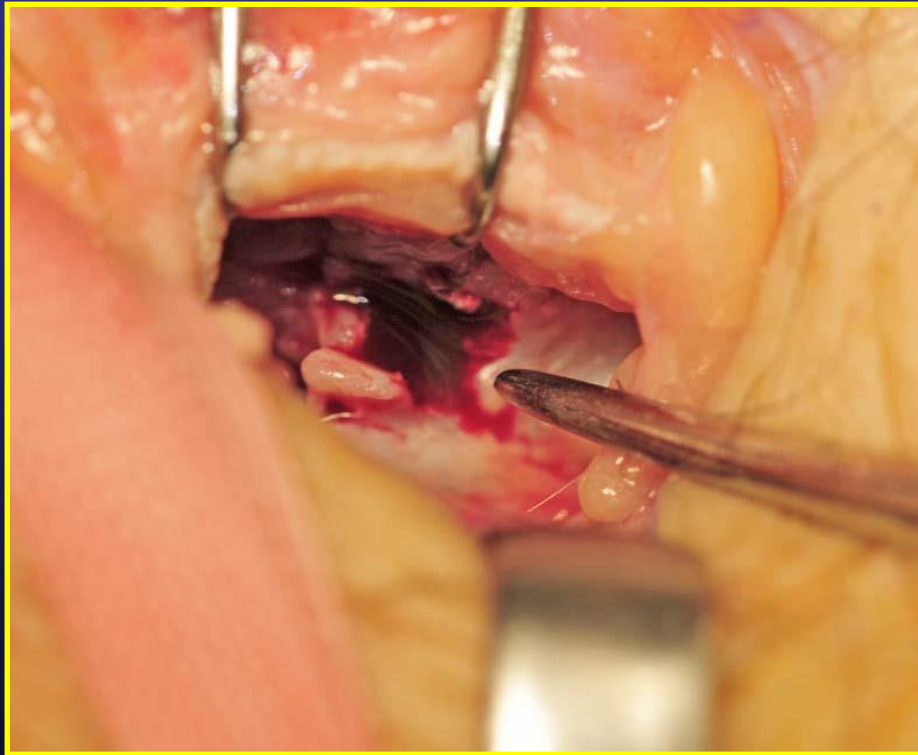
Extensor Complications

- Dorsal anatomy creates difficulty determining screw length accurately
 - Convex surface
 - Lister's tubercle “hides” depressed 3rd compartment
 - 7mm (4-10)



Avoiding Extensor Complications

Unicortical drilling for extra-articular fractures



“... penetrating the third extensor compartment by drilling may harm the EPL tendon.”

Al-Rashid JBJS-B, 2006

Screws at least 75% length to dorsal cortex do not sacrifice construct strength

Wall, JHS 2012

Osseous Complications

- Strength of support decreases as screws increasingly proximal to subchondral bone
- Recognizing loss of lunate facet
 - Lateral xray: volar subluxation of carpus
 - PA xray: apparent shortening of radius

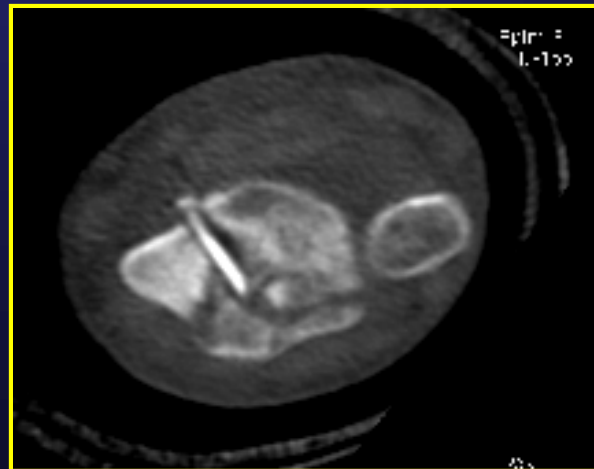
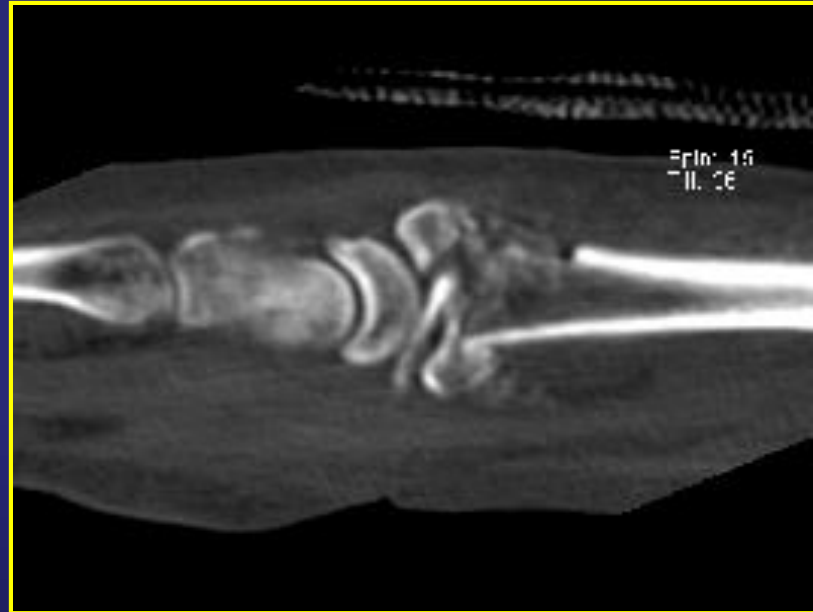


I don't have an answer for tiny lunate facet

When I Put the Volar Plate Away

Case

- 67 year old physician who fell on outstretched wrist



Dorsal approach to reduce articular surface

Case

- 50 year old female fell while dancing to “Shout”



Dorsal fixation and treatment of
SL rupture

Not the Typical Fracture But...

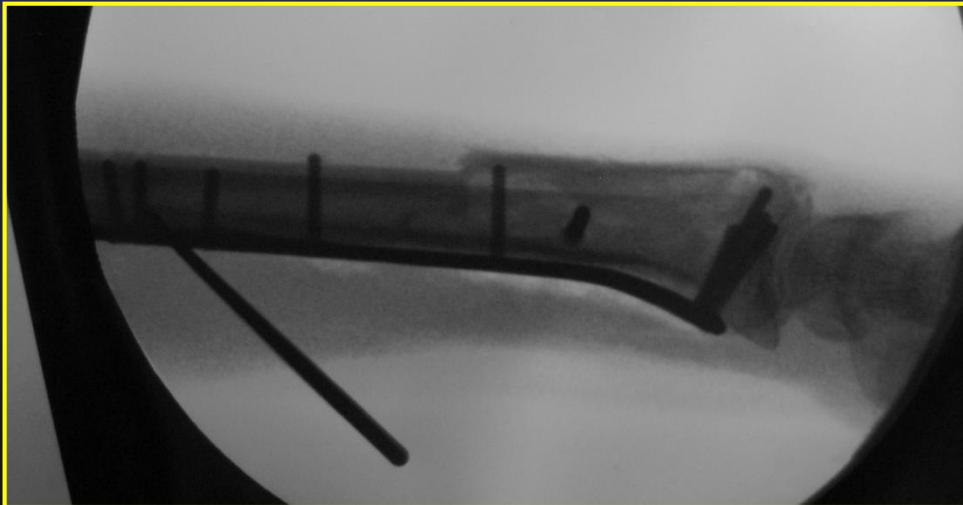
Case

- 54 yo female with MCA at 40 mph
- Injured dominant wrist
- Perfect health.
- Brother-in-law is a hand surgeon



Case

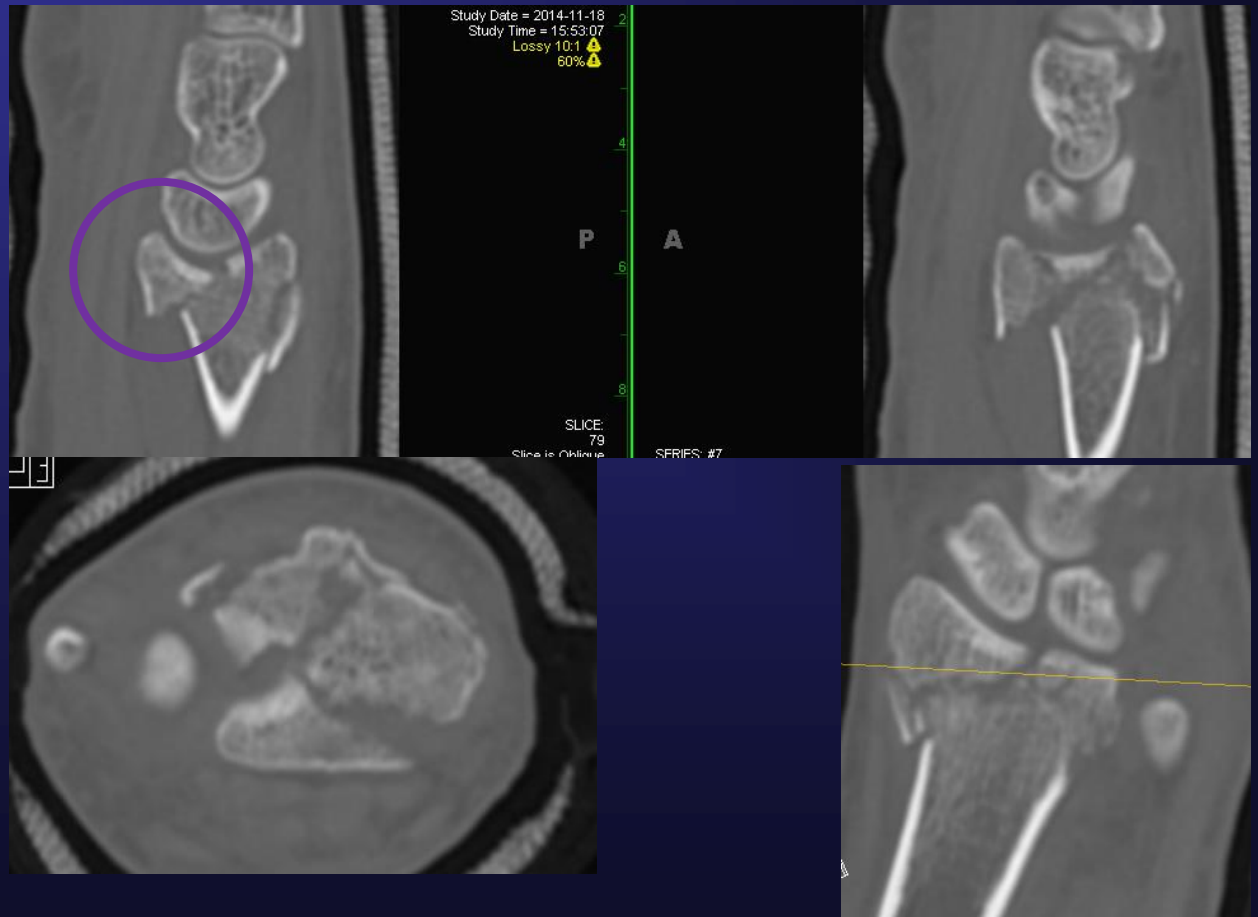
- Long volar plates available but dorsally only long implants are spanning



Case

- 26 year old who fell off pull-up bar doing cross-fit

I don't de-rotate that piece well dorsally or correct with spanning plate



Case

- Required articular reduction
 - BR release
 - Compress styloid against lunate facet
 - Push up impacted surface through fracture



Final Technical Points

- Adjuncts include:
 - Small dorsal incision to fine tune articular reduction then place distal screws in plate
 - May go bicortical +/- dorsal incision to capture dorsal lunate facet
 - May add radial styloid plate through volar incision if needed for ulnar translation of radius shaft
 - Some lunate facet fragments get a volar plate over the critical line with plan to remove after healing

Volar plates can be “fracture specific” fixation

Thank You

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