

DRUJ Instability: When to Open and How to Stabilize

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Disclosures

Yes, at the end of my talk

DRUJ stabilizers

Bony
congruence

Static

Dynamic

Anatomy of DRUJ – Bone (4)

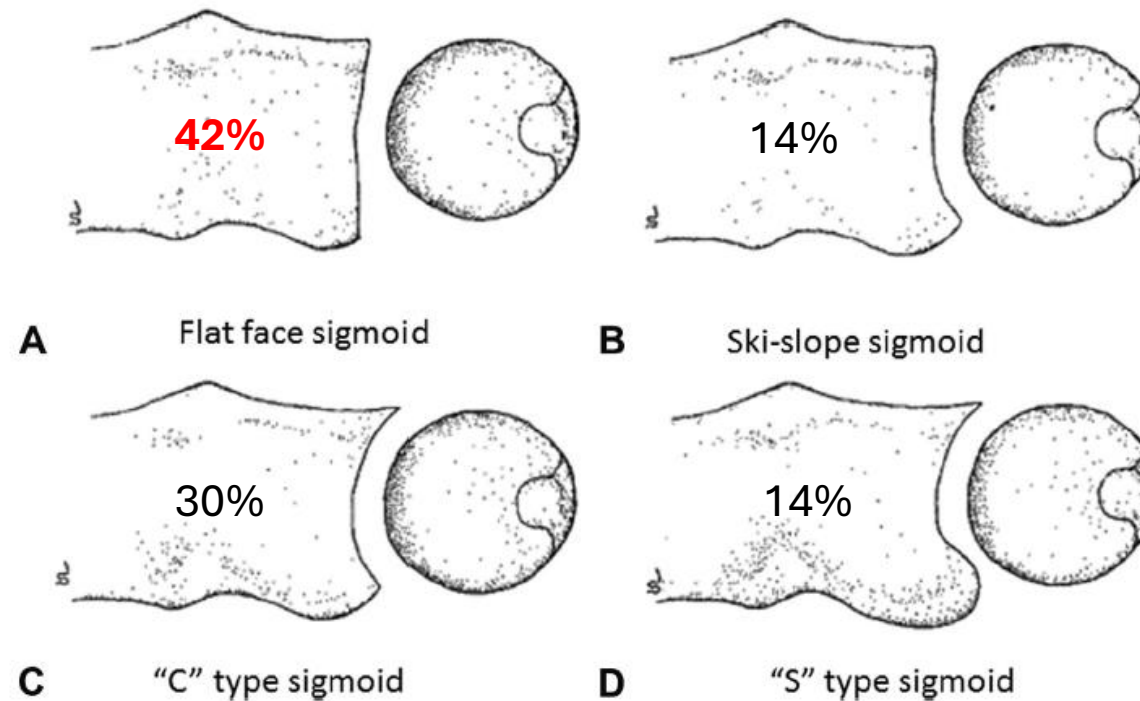
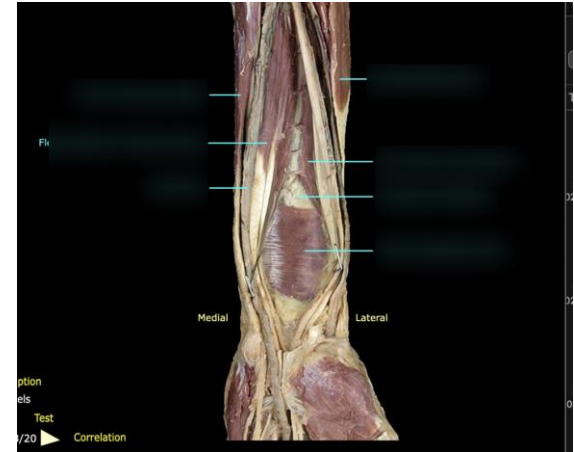


FIGURE 1: A–D Different types of sigmoid notch variations. The flat face is composed of 42% sigmoid notch types. (Reprinted with permission from Tolat AR, Stanley JK, Trail IA. A cadaveric study of the anatomy and stability of the distal radioulnar joint in the coronal and transverse planes. *J Hand Surg Br.* 1996;21(5):592.)

Anatomy of DRUJ – dynamic stabilizers (2)

- Pronator Quadratus
- Extensor Carpi Ulnaris (ECU)



<https://quizlet.com/809365017/pronator-quadratus-diagram/>

Anatomy of DRUJ – Static Stabilizers (3)

- **Primary Stabilizers**

1. TFCC
2. DRUJ capsule

- **Secondary Stabilizer**

1. Distal Interosseous Membrane (DIOM)
- * Distal Oblique Bundle (DOB) – if present

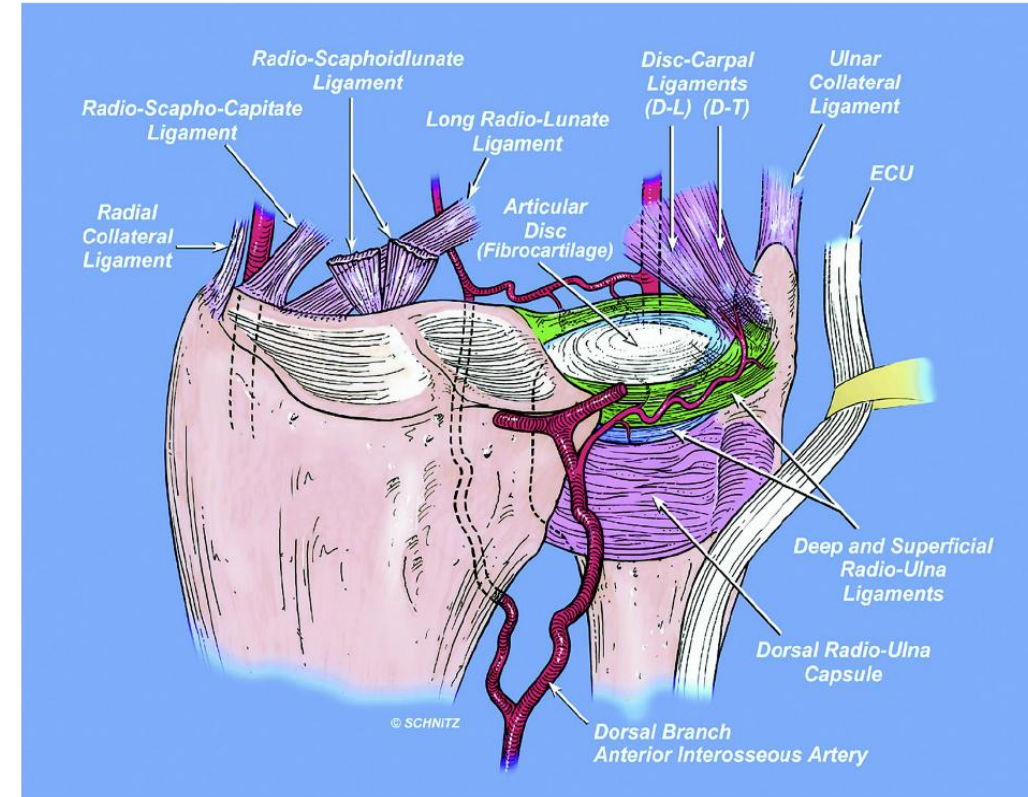
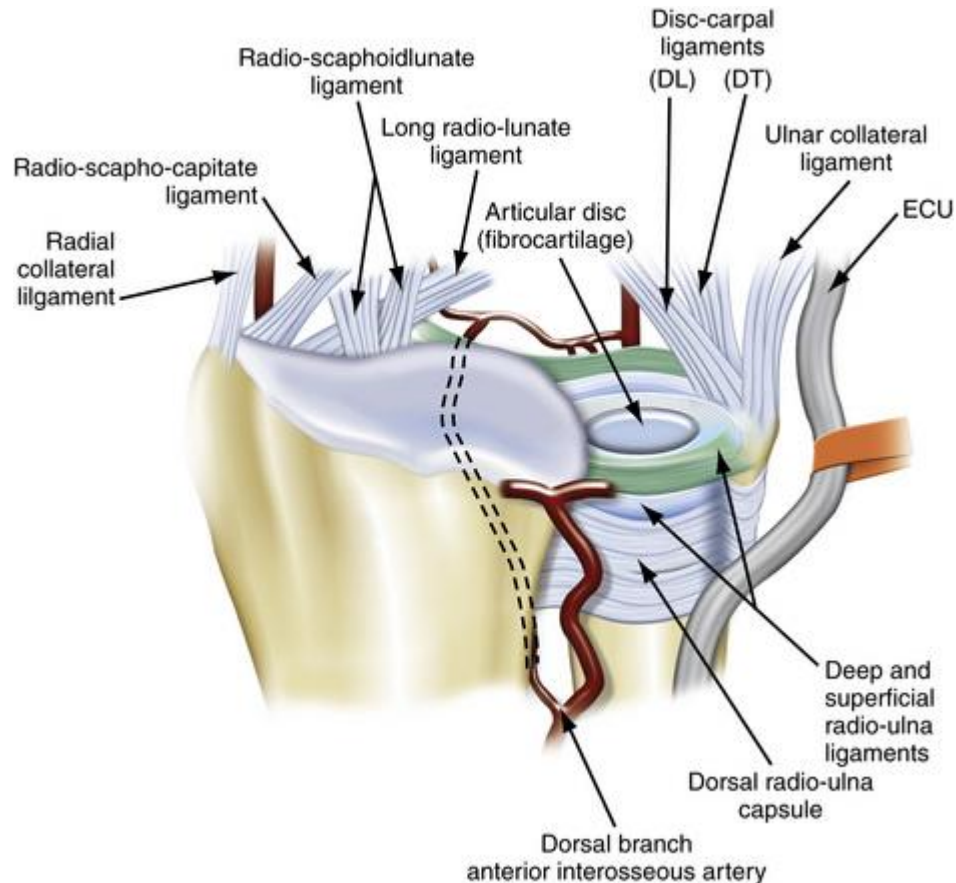


FIGURE 2: Static and dynamic stabilizers of the DRUJ. (Reprinted with permission from Kleinman WB. Stability of the radioulnar joint: biomechanics, pathophysiology, physical diagnosis and restoration of function. What we have learned in 25 years. *J Hand Surg Am.* 2007;32(7):1086–1106.)

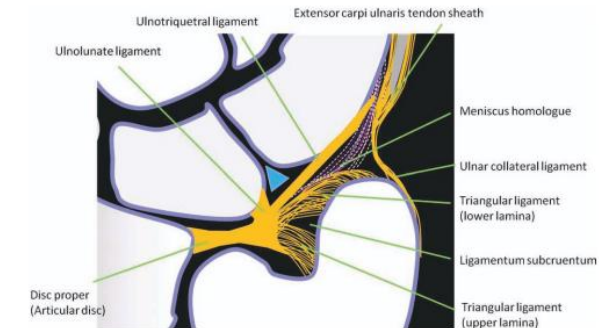
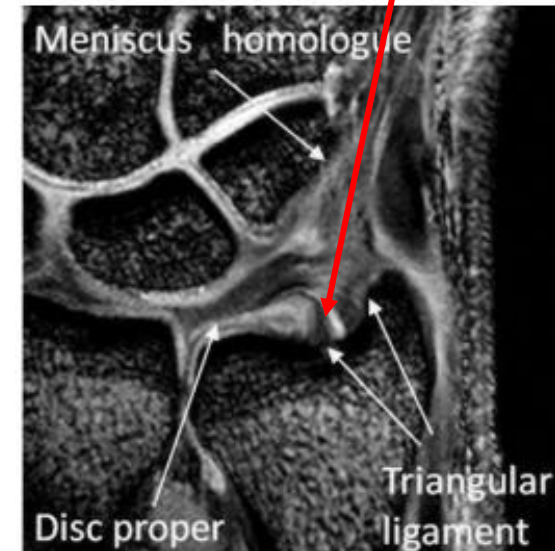
TFCC Components



TFCC

-Dorsal and Palmar radioulnar ligaments
(superficial and **DEEP**)

- Articular disc
- Ulnocarpal ligaments (UT, UL)
- Ulnar collateral ligament
- Meniscus homologue
- ECU subsheath



MR Imaging of TFCC Yoshioka et al

Distal Interosseous membrane

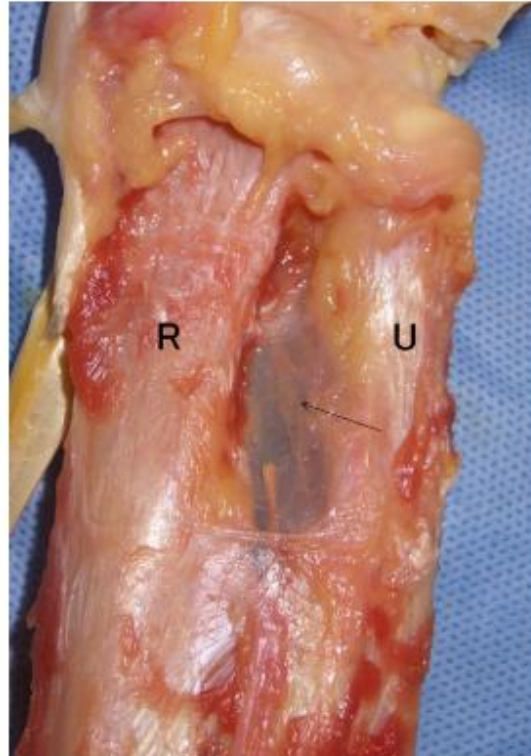


FIGURE 2: Thin DIOM (arrow). Obvious DOB does not exist. R, radius; U, ulna.

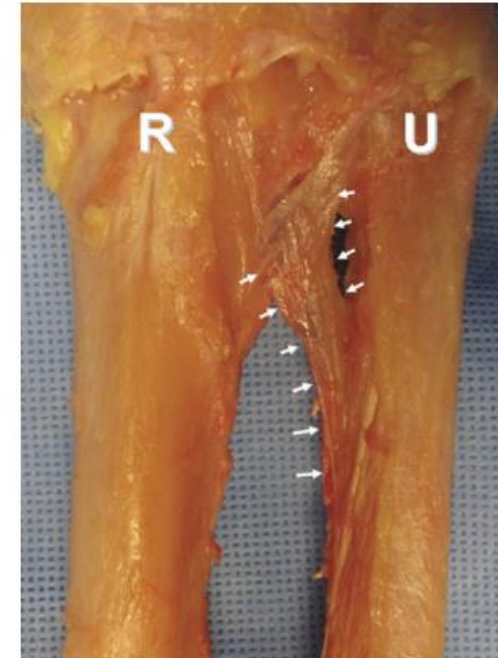
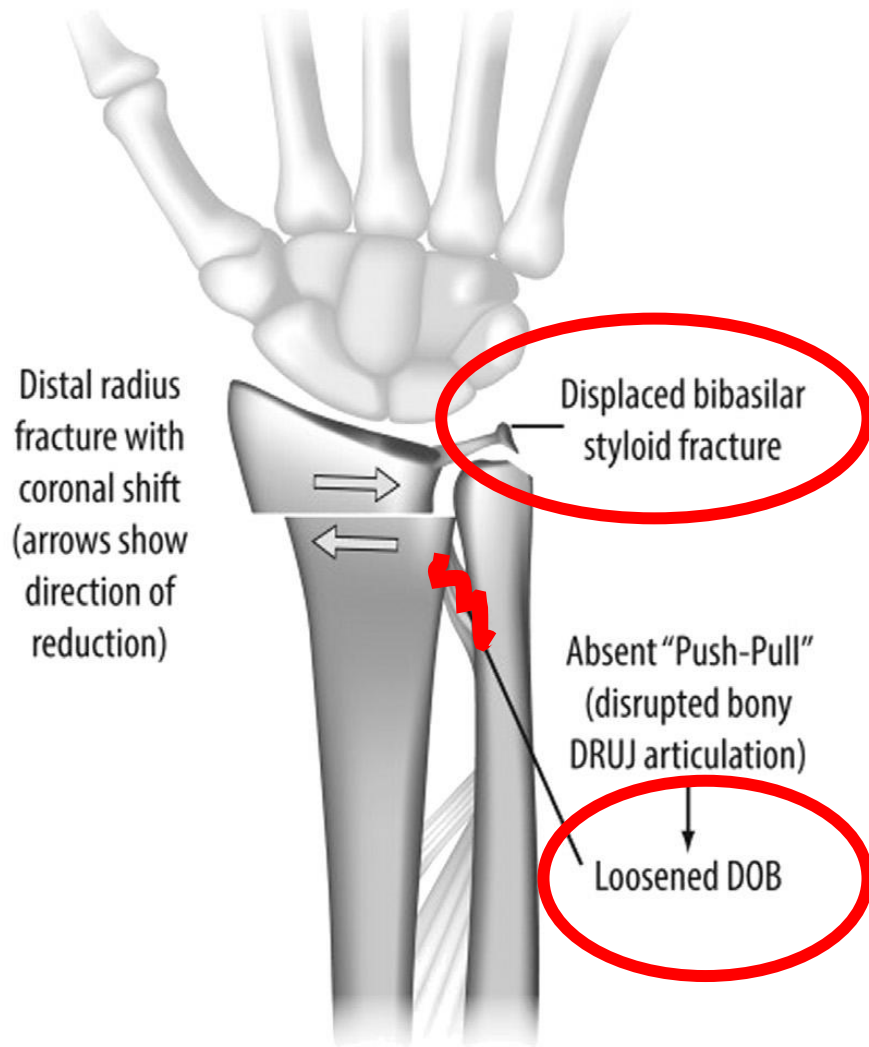


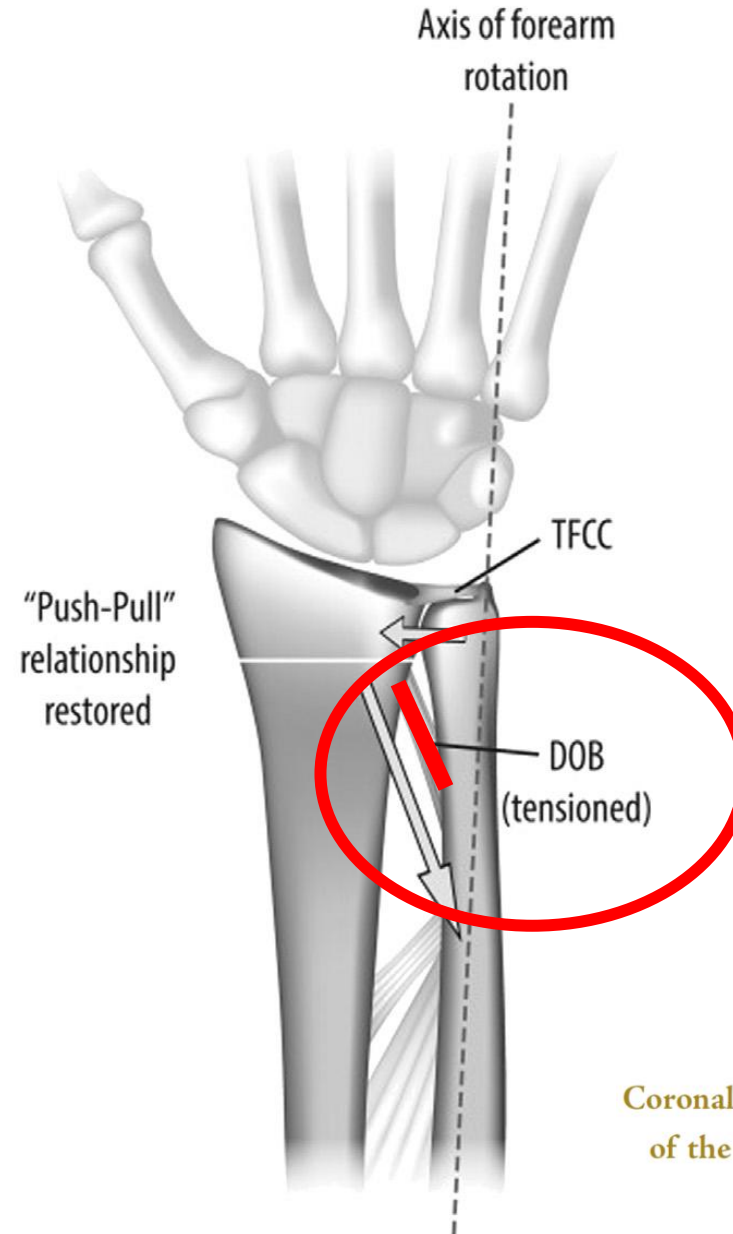
FIGURE 1: An obvious thick fiber bundle of the DOB from the DIOM (white arrows). R, radius; U, ulna. (From Kitamura T, Moritomo H, Arimitsu S, Berglund LJ, Zhao KD, An KN, et al. The biomechanical effect of the distal interosseous membrane on distal radioulnar joint stability. J Hand Surg 2011;36A:1626–1630. Reprinted with permission of Elsevier.)

40%

Coronal Shift – radial translation of distal radius



A



B

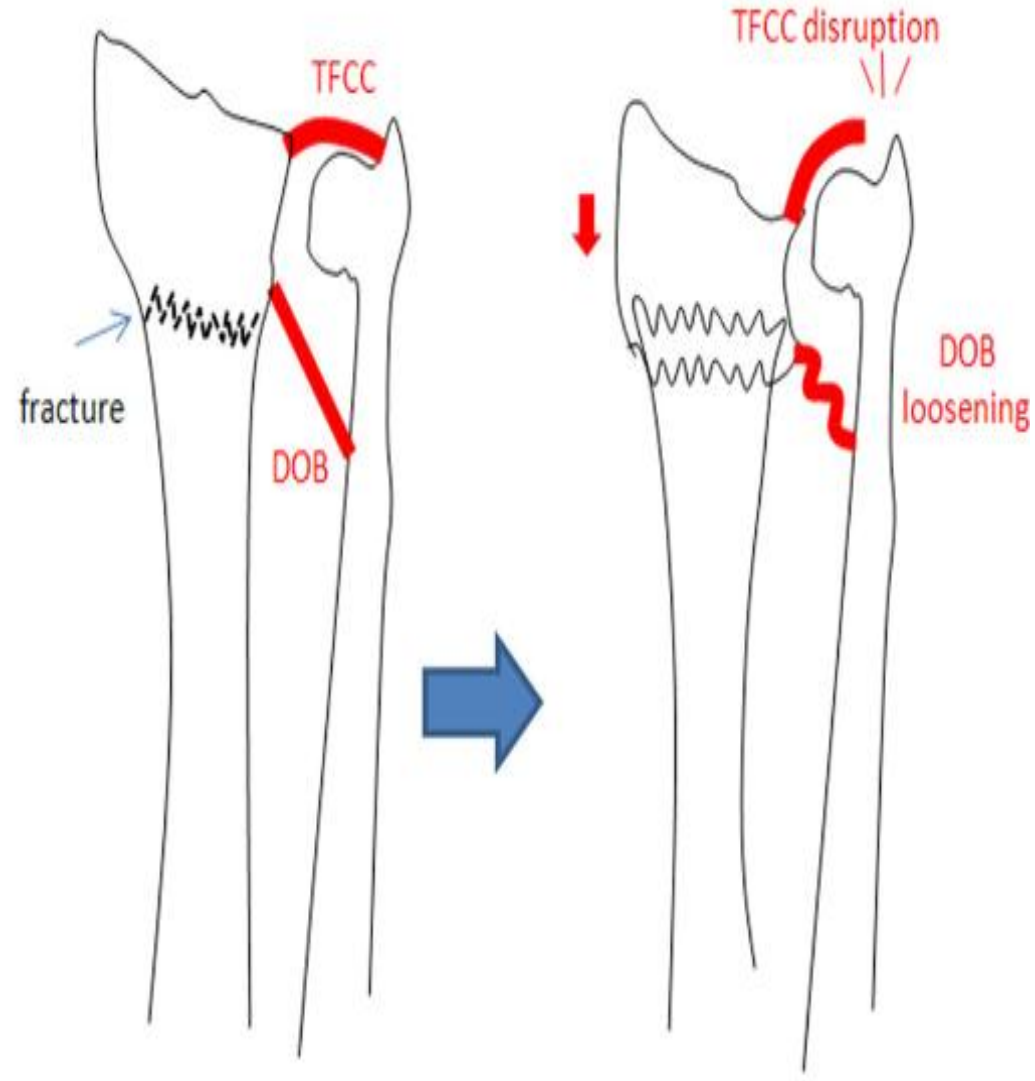
Coronal Shift of Distal Radius Fractures: Influence of the Distal Interosseous Membrane on Distal Radioulnar Joint Instability

Samir K. Trehan, MD, Jorge L. Orbay, MD, Scott W. Wolfe, MD

TFCC tear + 2 mm coronal shift can lead to DRUJ instability

Loss of radial height
(DRUJ instability)

Changes in distal
oblique bundle
(DOB) tension can
lead to DRUJ
instability



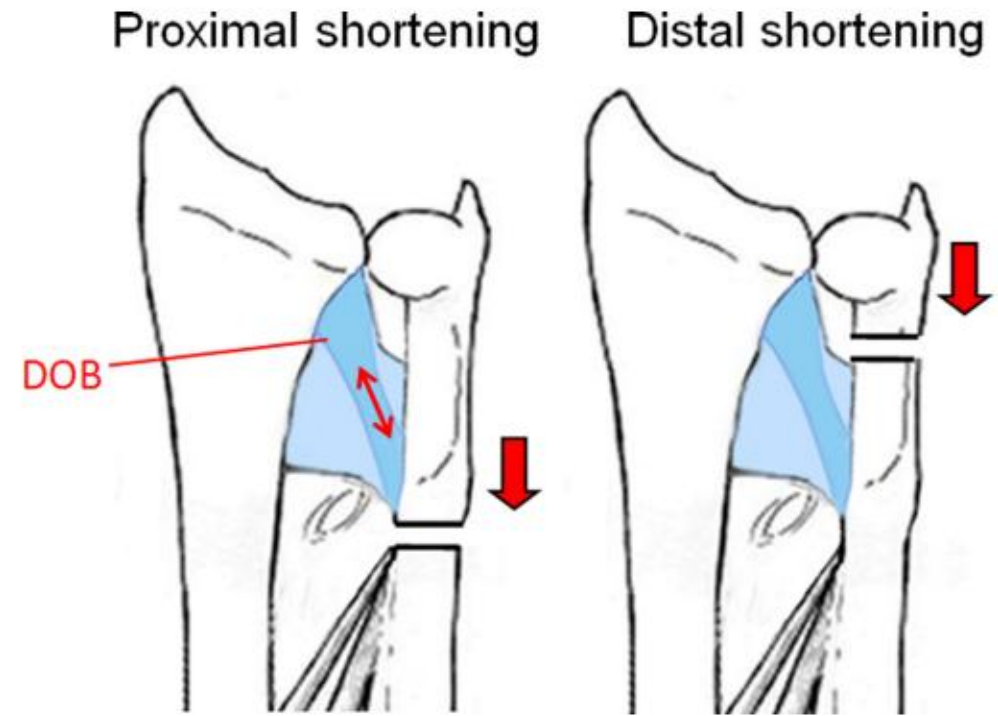
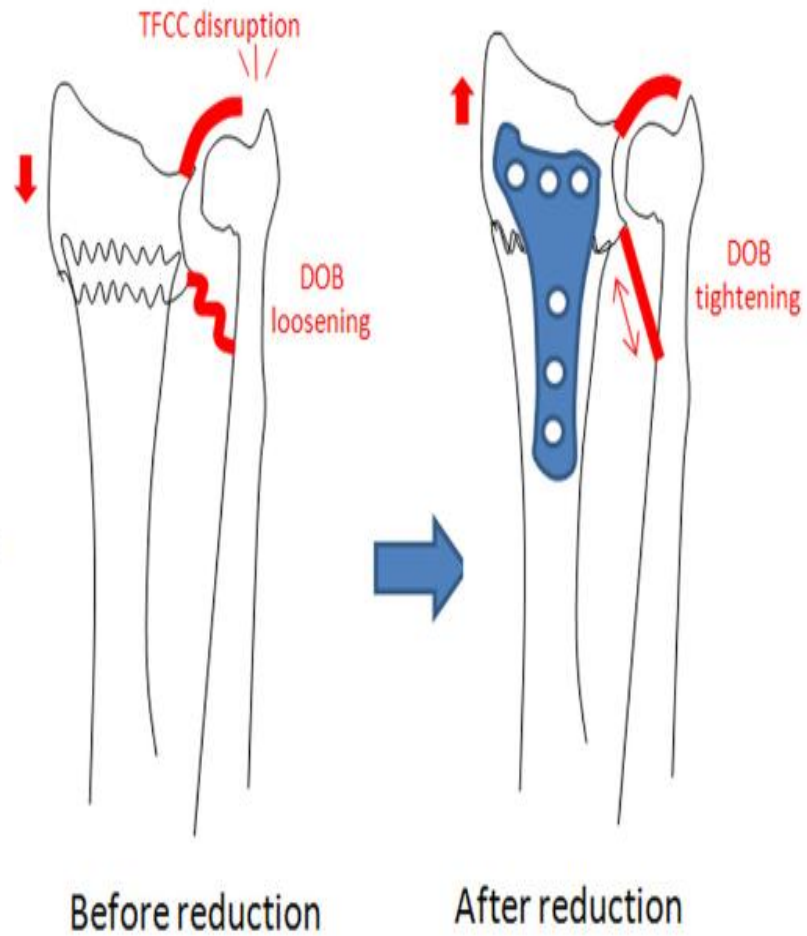


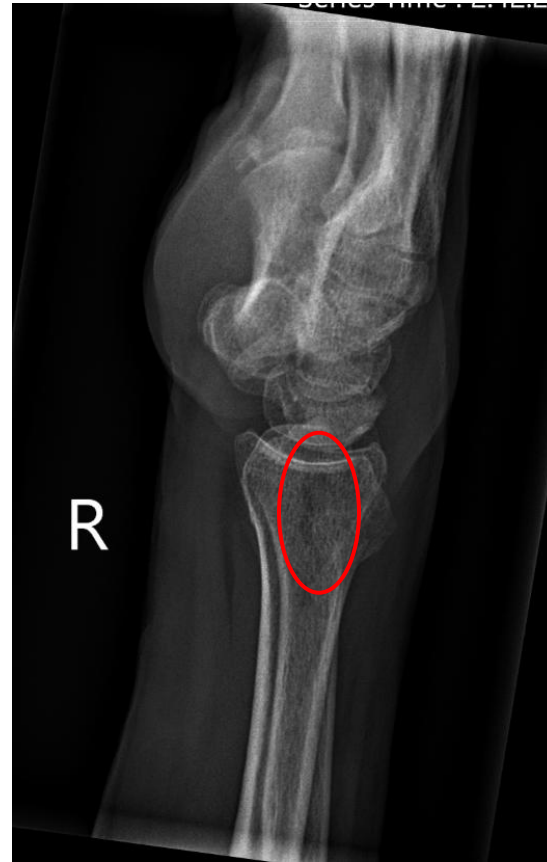
FIGURE 6: The longitudinal resistance to ulnar shortening and stability of the DRUJ were significantly greater for proximal shortening than for distal shortening ($P < .01$).



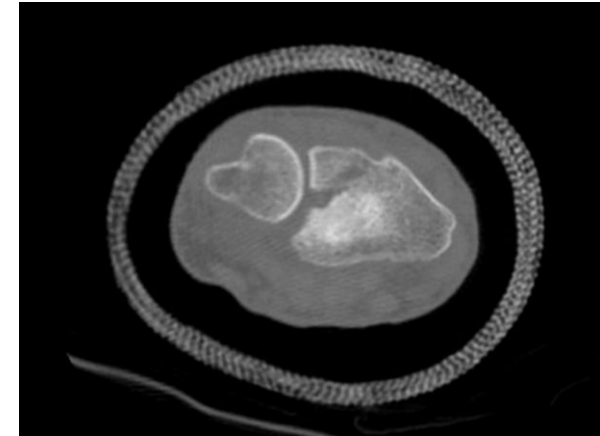
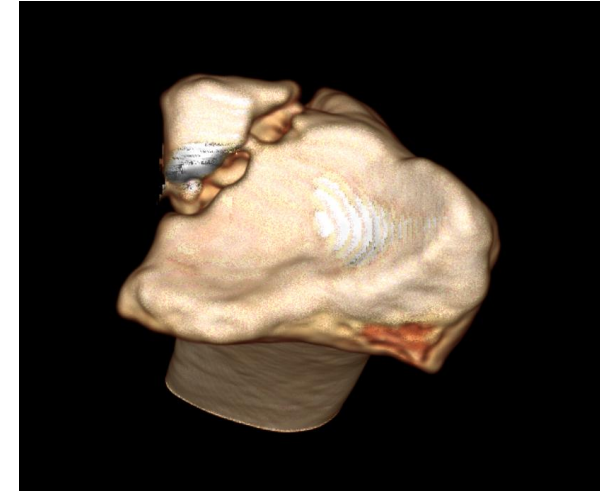
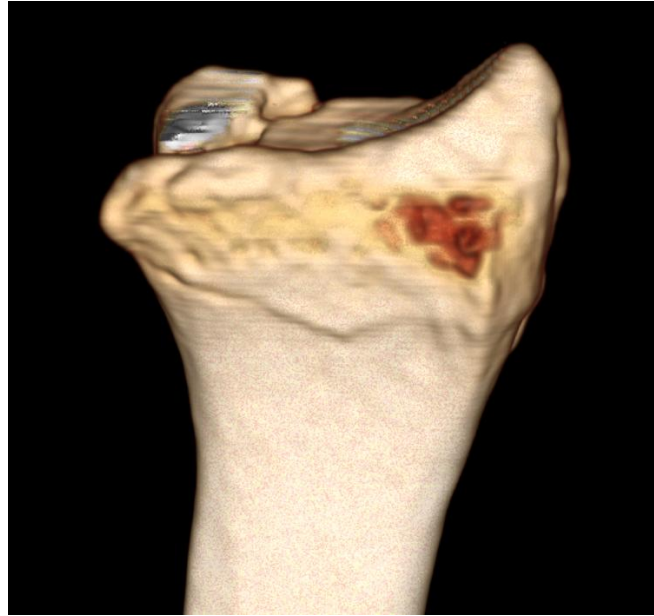
3 clinical scenarios to open reduce DRUJ

- **Case #1: Displaced Sigmoid Notch**
- Case #2A/2B: Open DRUJ dislocation
- Case #3A-D: Large Ulna styloid fracture with insufficient secondary stabilizer (DIOM/DOB)

Case # 1: 67F s/p GLF



Displaced Sigmoid Notch



Intraop (Preop): Unstable DRUJ with increase AP shuck and crepitus

Dorsal approach



Dorsal Tangential View

SCIENTIFIC ARTICLE

Reliability of the Dorsal Tangential View in Assessment of Distal Radioulnar Joint Reduction in the Neutral, Pronated, and Supinated Positions in a Cadaver Model

Ashraf N. El Naga, MD,* Matthew E. Jordan, MD,† David T. Netscher, MD,† Brian D. Adams, MD,†
Scott A. Mitchell, MD†

DORSAL TANGENTIAL VIEW OF THE DRUJ

359.e3

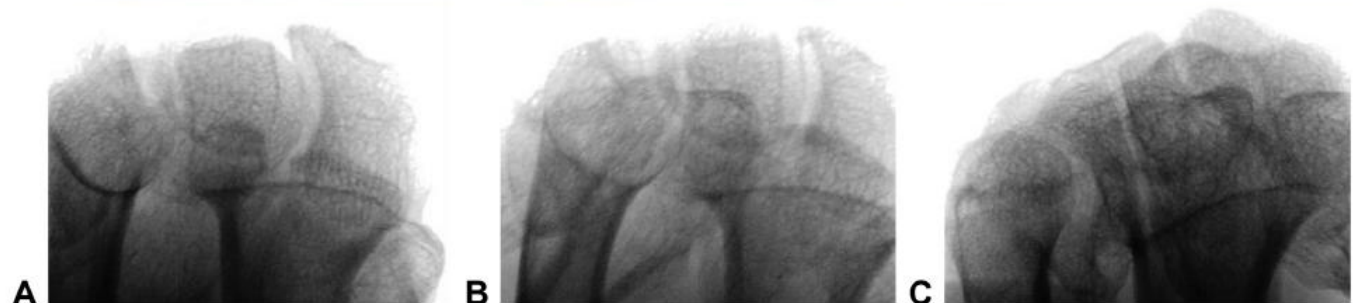
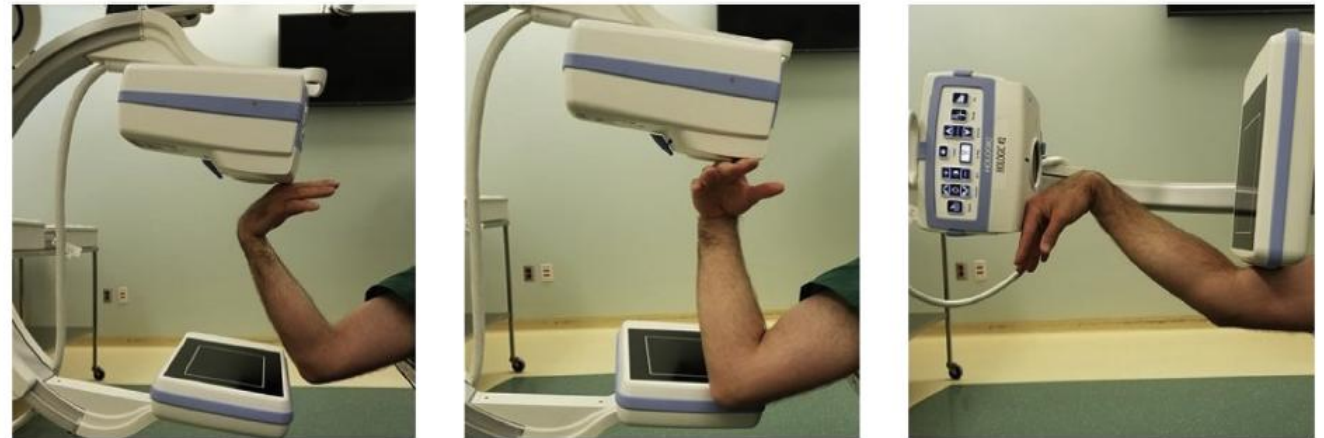
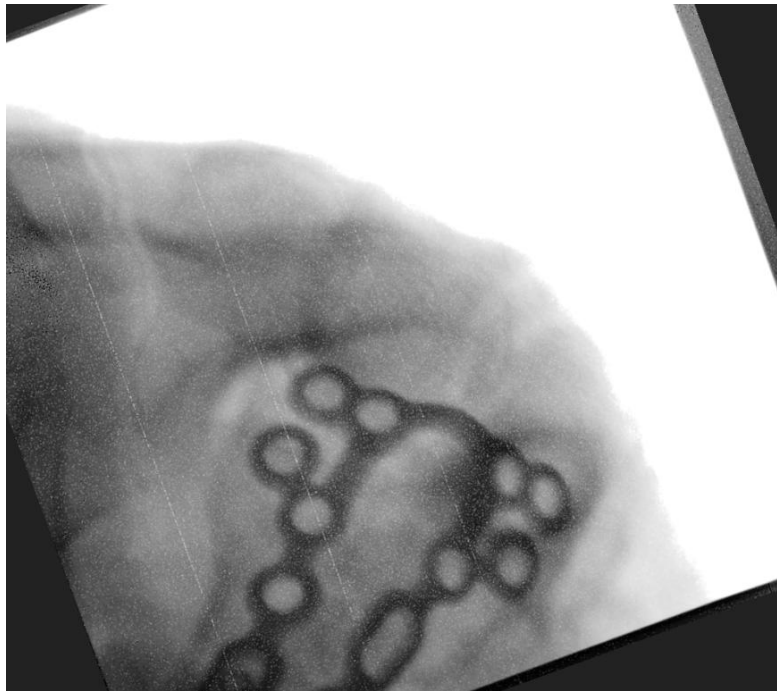


FIGURE 1: The mini—C-arm can be used to obtain fluoroscopic images with the forearm positioned in **A** supination, **B** neutral, **C** pronation as demonstrated previously.

3 months postop



Full pronosupination
Stable DRUJ
Flexion and Extension 50 deg

3 clinical scenarios to open reduce DRUJ

- Case #1: Displaced Sigmoid Notch
- **Case #2A/2B: Open DRUJ dislocation**
- Case #3A-3D: Large Ulna styloid fracture with insufficient secondary stabilizer (DIOM/DOB)

Case #2A: 29F s/p highway MVC





Open TFCC (bone tunnels) + capsular repair

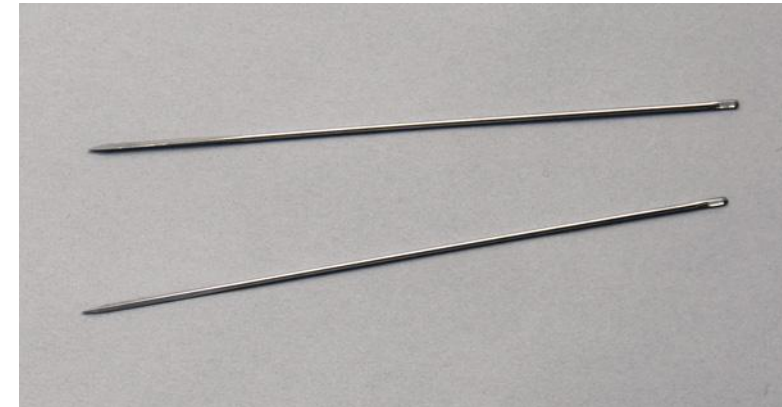


Procedures:

1. I&D DRUJ dislocation
2. ORIF Radius
3. Extricated EDM from DRUJ
4. TFCC primary repair to fovea (keith needles)
5. DRUJ capsule repair

Rehab:

1. Posterior long arm x 2 weeks
2. Muenster cast x 4 more weeks



Case #2B - Suture anchor through Fovea – 34M s/p MVC



6 weeks postop



3 clinical scenarios to open reduce DRUJ

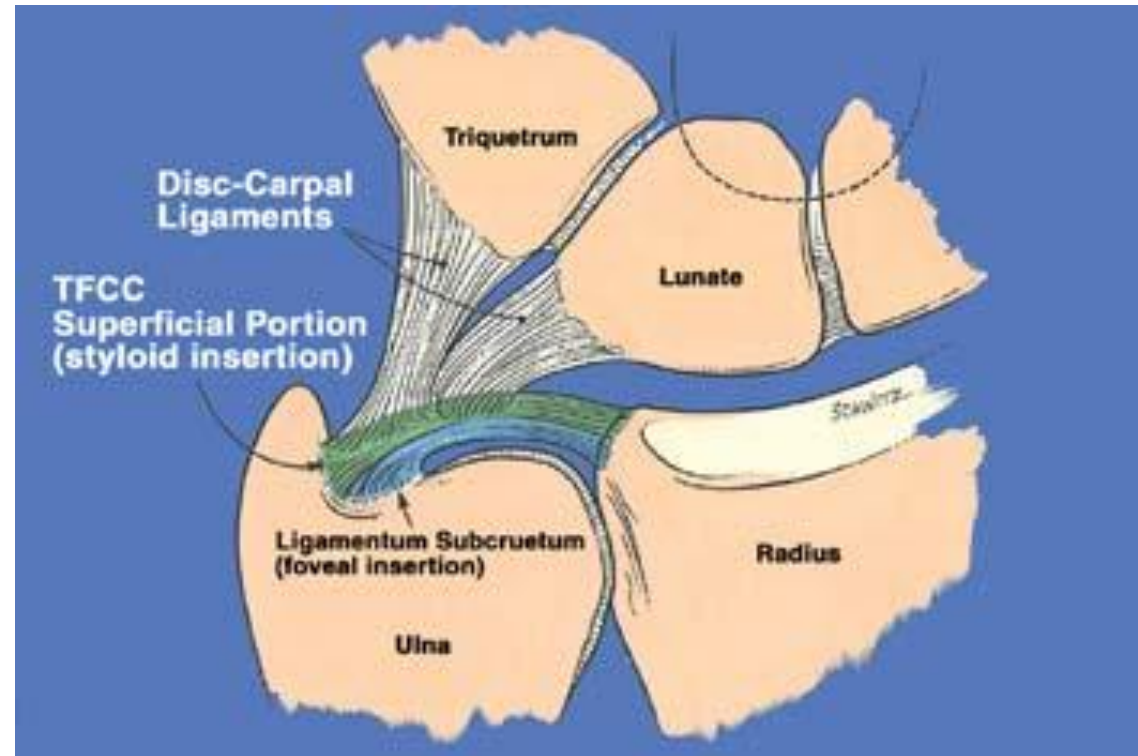
- Case #1: Displaced Sigmoid Notch
- Case #2A/2B: Open DRUJ dislocation
- **Case #3A-3D: Large Ulna styloid fracture with insufficient secondary stabilizer (DIOM/DOB)**
 - **No coronal shift**
 - **Radial height restored**

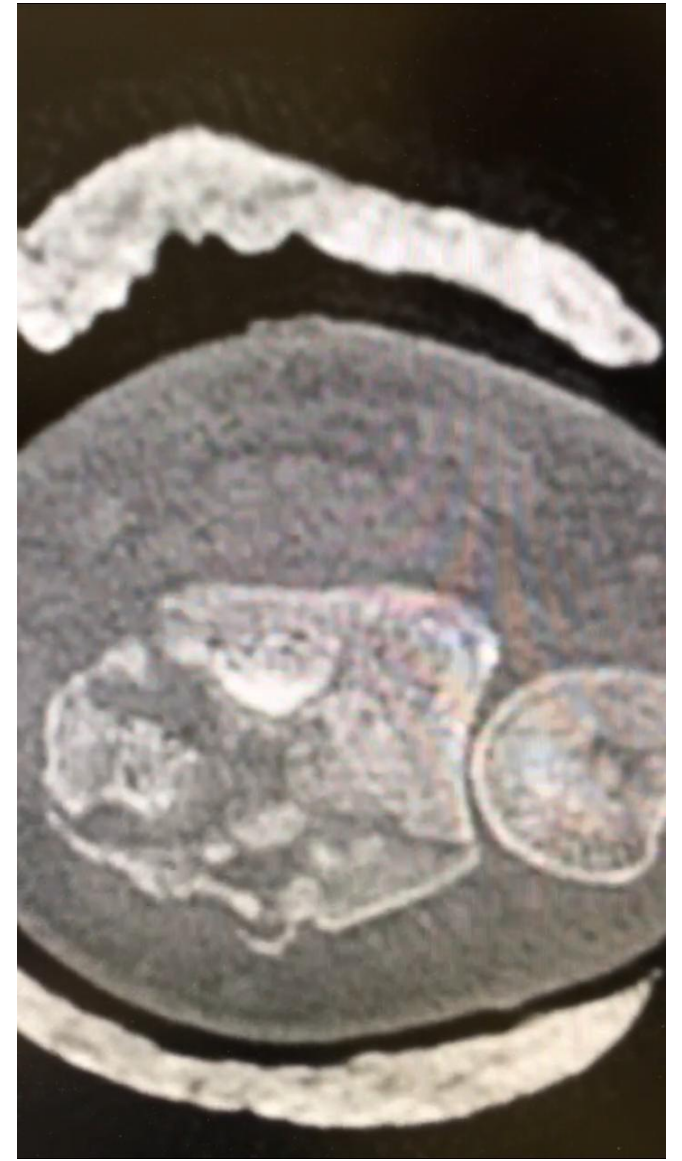
Case #3A: 36M s/p motorcycle accident

Grade I open distal radius fx

When do I go after the Ulna Styloid?

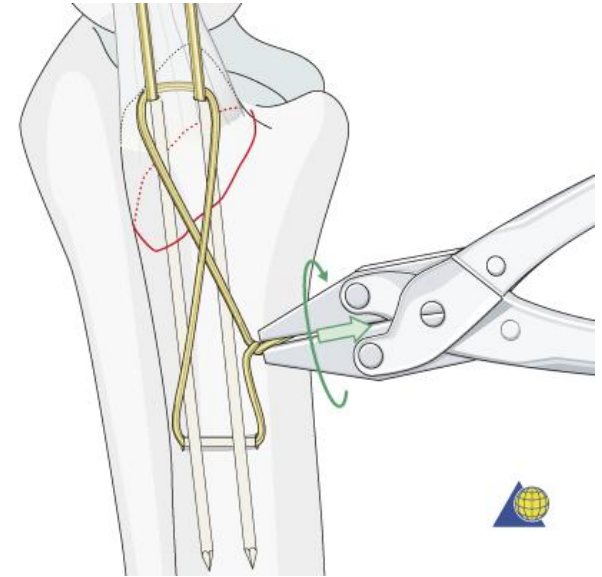
















Case # 3B: 32F s/p assault + CTS



TFCC injury + coronal shift + CTS



Immediate Postop



6 weeks postop



3 months postop – full ROM, no pain



I&D and HWR



Lost to f/u 3/2020



Case #3C: 36F s/p PVA



Intraop

DRUJ unstable



6 weeks postop

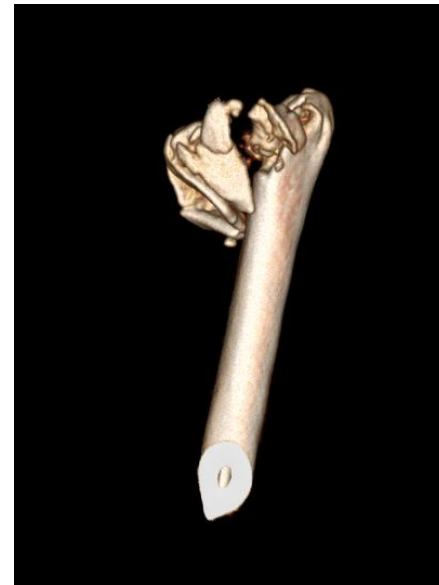


3 months postop

Wrist flexion: 80 degrees
Wrist extension 80 degrees
Pronation: full
Supination: full

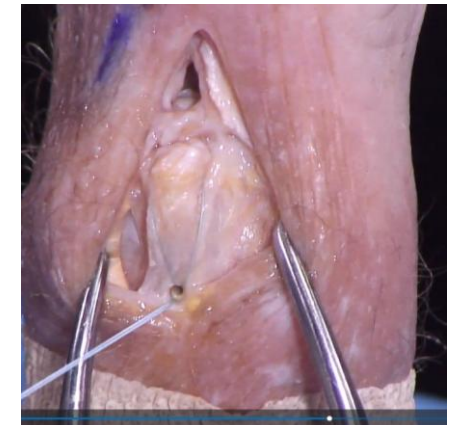


Case #3D – 2.5 mm Pushlock (40M s/p fall off bike)





TFCC Repair with 2.5 mm Pushlock



Disclosure

Journal of Hand Surgery Global Online 3 (2021) 133–138



Contents lists available at [ScienceDirect](#)

Journal of Hand Surgery Global Online

journal homepage: www.JHSGO.org



Original Research

Management of Acute Distal Radioulnar Joint Instability Following a Distal Radius Fracture: A Systematic Review and Meta-Analysis



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3 Groups:

1. Cast immobilization in supination
2. K-wire stabilization
3. Open TFCC repair

Findings:

1. ROM highest with cast immobilization in supination
2. Grip strength highest with k-wire stabilization
3. DASH same across all 3 groups

Summary – Open Stabilization of DRUJ

1. Sigmoid Notch Displacement (look at **AXIAL** CT scan)
2. Open dislocations
 - Capsule
 - Look for interposed tendons
 - Tension band
 - Bone tunnels (Keith needles)
 - Suture anchor/2.5 mm pushlock
3. After DR fixation (no coronal shift) and DRUJ is unstable
 - Large styloid attached to TFCC – static tension band (I prefer buried k-wire)
 - Small styloid with ulna styloid base present – 2.5 mm pushlock
 - Controversial – maybe just splint or K-wire fixation?

A large orange circle is positioned on the left side of the slide, partially cut off by the edge.

Thank You

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