



University of California
San Francisco



Elbow & Forearm Instability

Resident Teaching – Trauma Core 2024

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4/24/2025

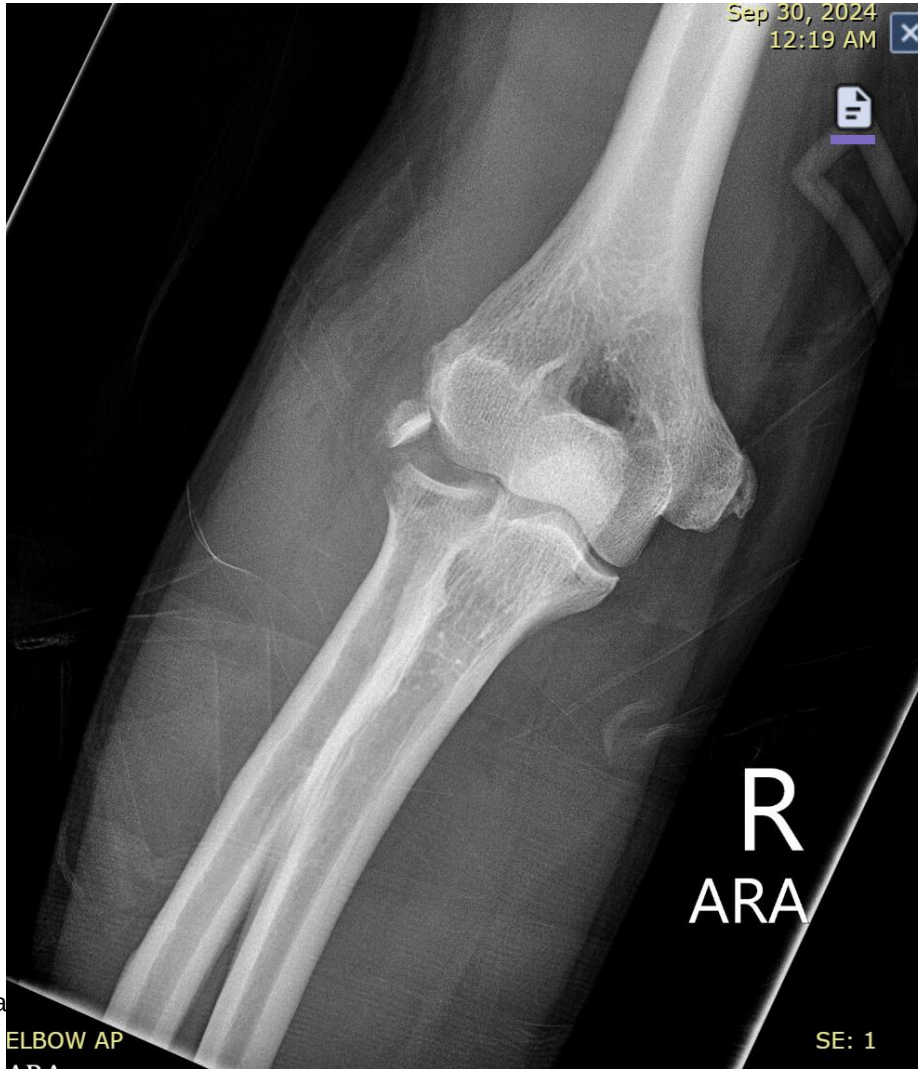
Case RF

HPI: 71 yo M fell off electric scooter, p/w R shoulder, elbow and wrist pain.

- XR show R posterior shoulder dislocation
- R elbow XR below
- DNV

Case RF

Injury XR



Case RF

Injury XR



Case RF

Injury CT

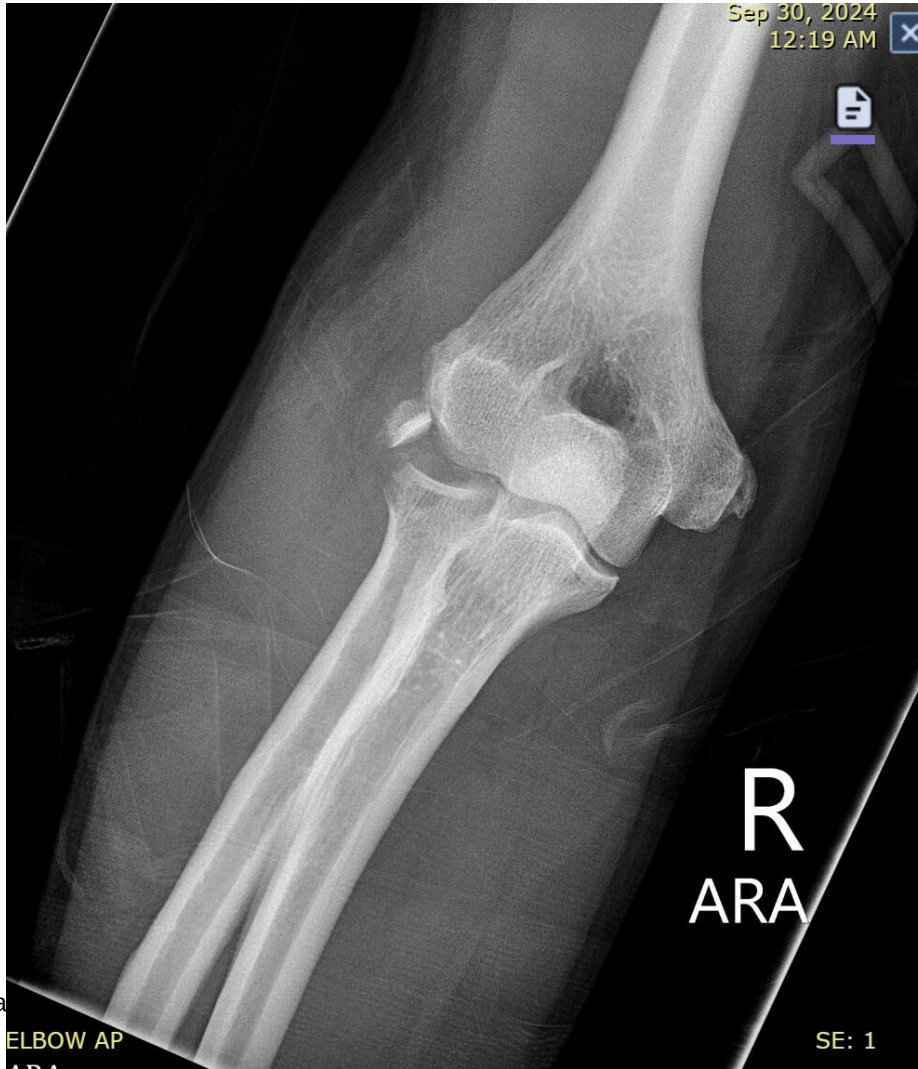


Case RF

What makes you suspicious about instability?

Case RF

Injury XR



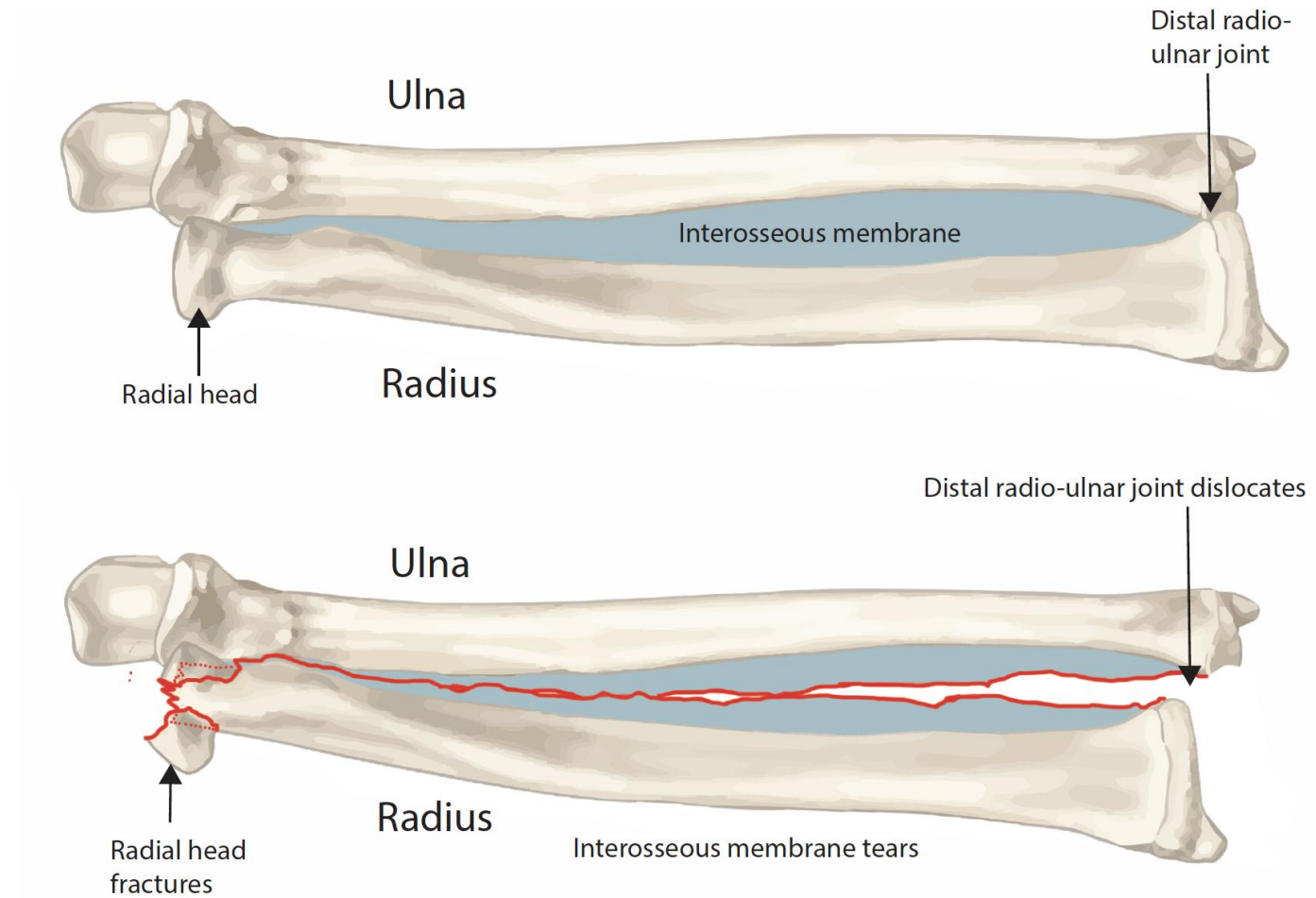
Essex-Lopresti

KEY Features

- Radial head fracture
- Longitudinal instability
- Some transverse instability?

Only 38% detected acutely

Marcotte et al. 2007



Interosseous Membrane

Anatomy and Function

- Longitudinal stability
- Load transfer
- Central band most important



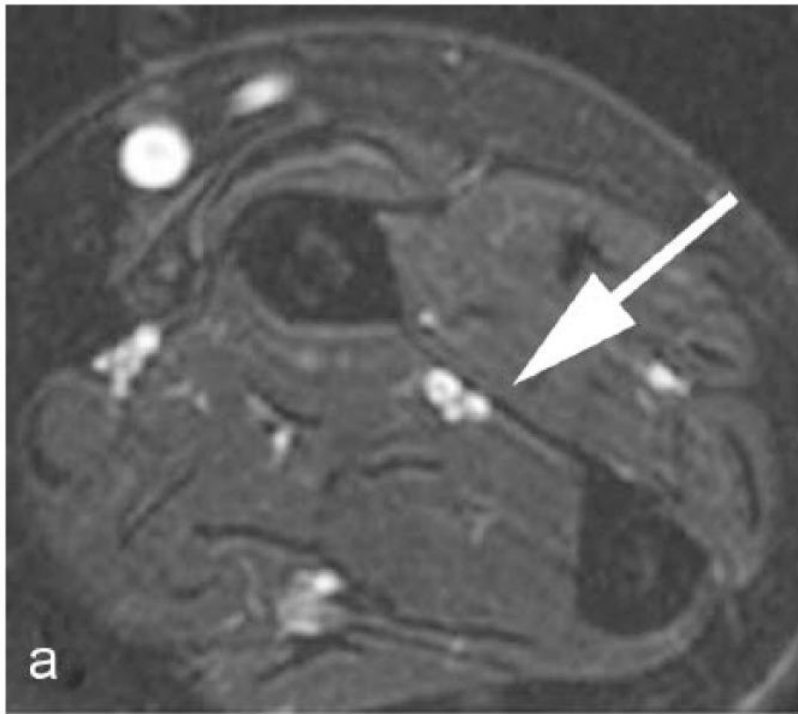
Case RF

How would you assess for longitudinal instability?

Additional imaging?

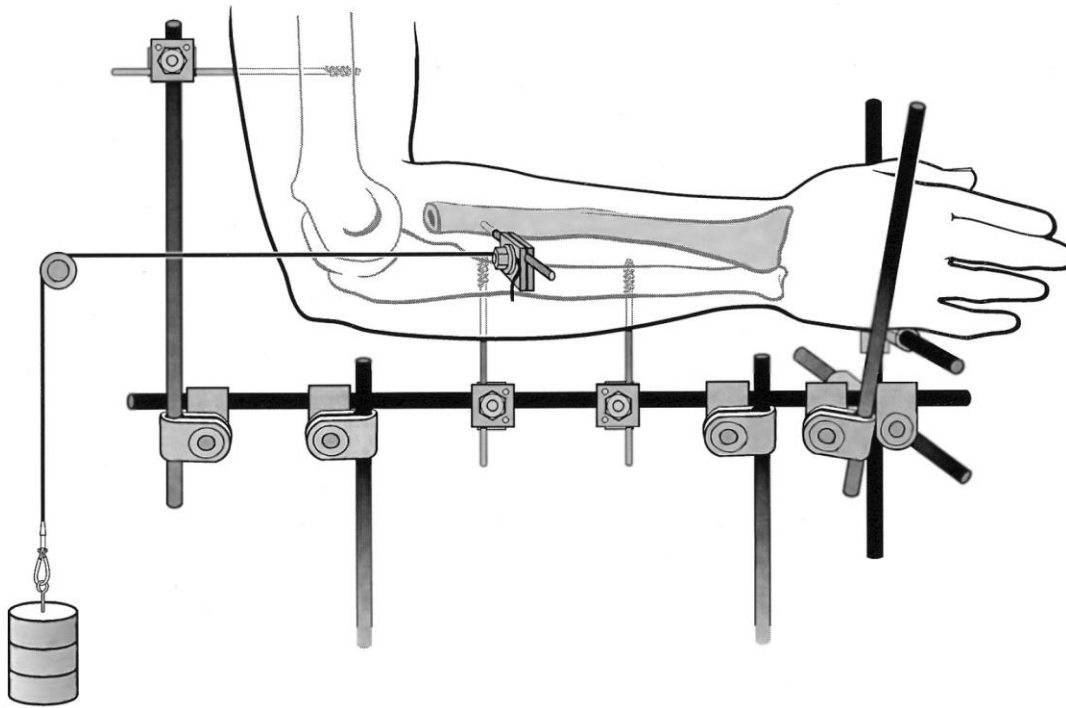
MRI for IOM Injury iso RHF_x

Unclear if IOM injury correlates with radial head fx severity



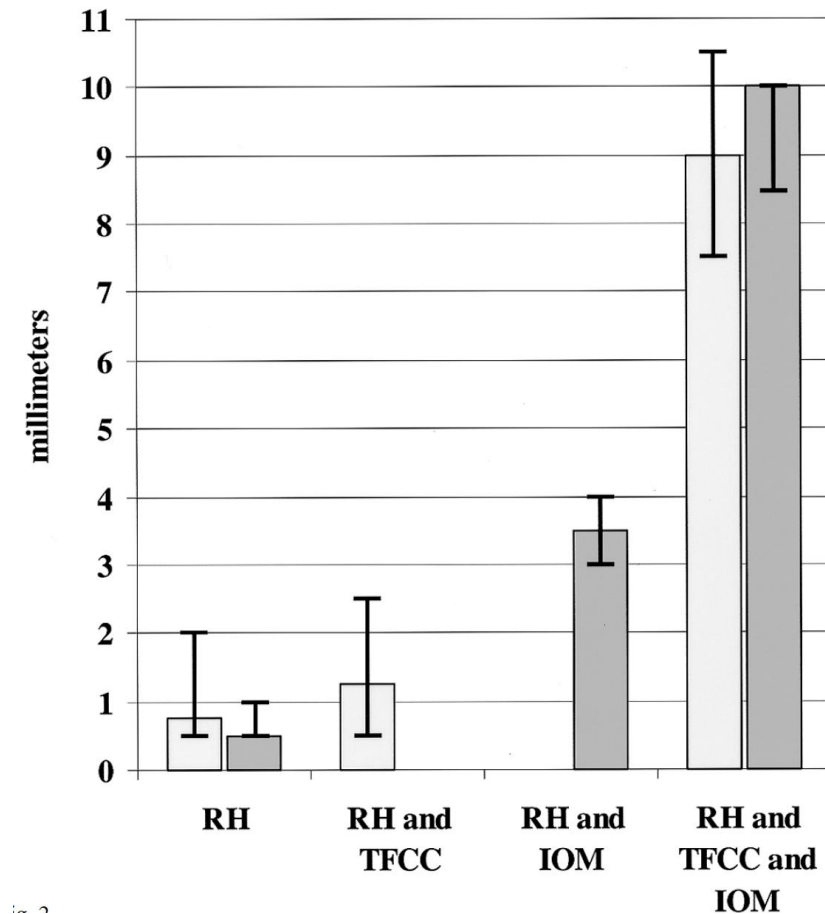
Intraoperative Assessment

Radius Pull Test



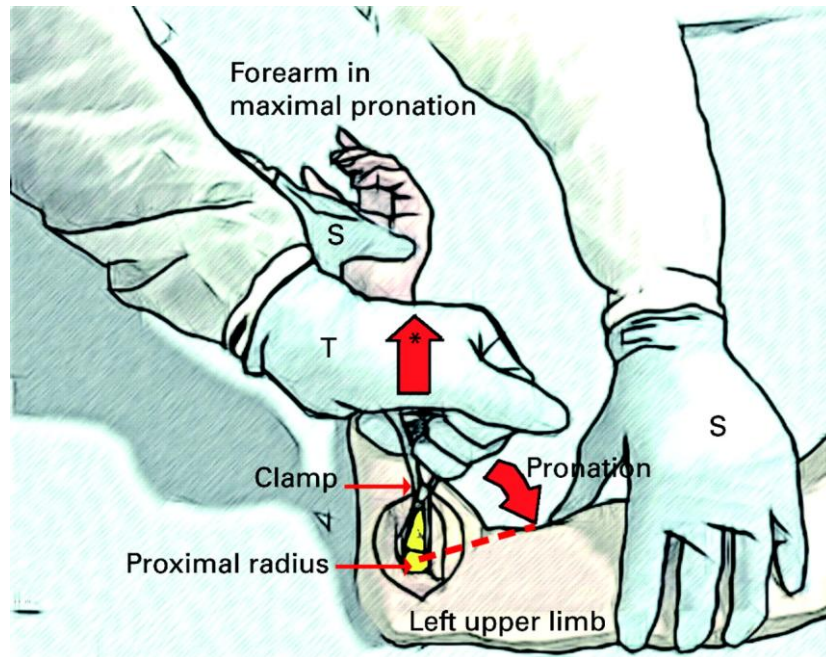
Smith et al. 2002

Radial Migration with Load

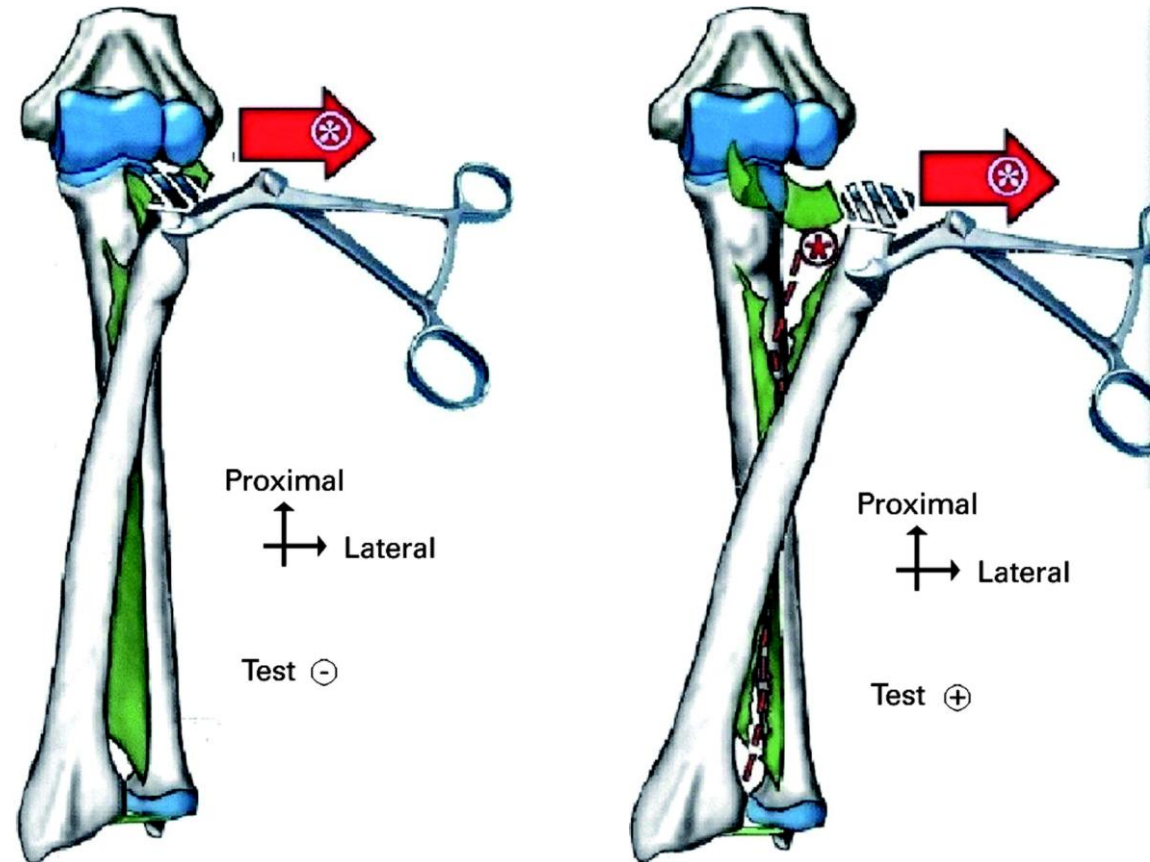


Intraoperative Assessment

Joystick test



Soubeyrand M et al. 2011



Intraoperative Assessment

SCIENTIFIC ARTICLE

Intraoperative Physical Examination for Diagnosis of Interosseous Ligament Rupture—Cadaveric Study

Amir Reza Kachooei, MD,^{*,†} Michael Rivlin, MD,[‡] Fei Wu, MD,[§] Aram Faghfour, PhD,^{*}
Kyle R. Eberlin, MD,^{*} David Ring, MD, PhD^{*}

- Fair interobserver reliability (0.35, 0.29)
- Moderate intraobserver reliability (0.44)
- Sensitivity, specificity, accuracy, PPV, NPV → ~70%

Essex-Lopresti

Treatment Principles

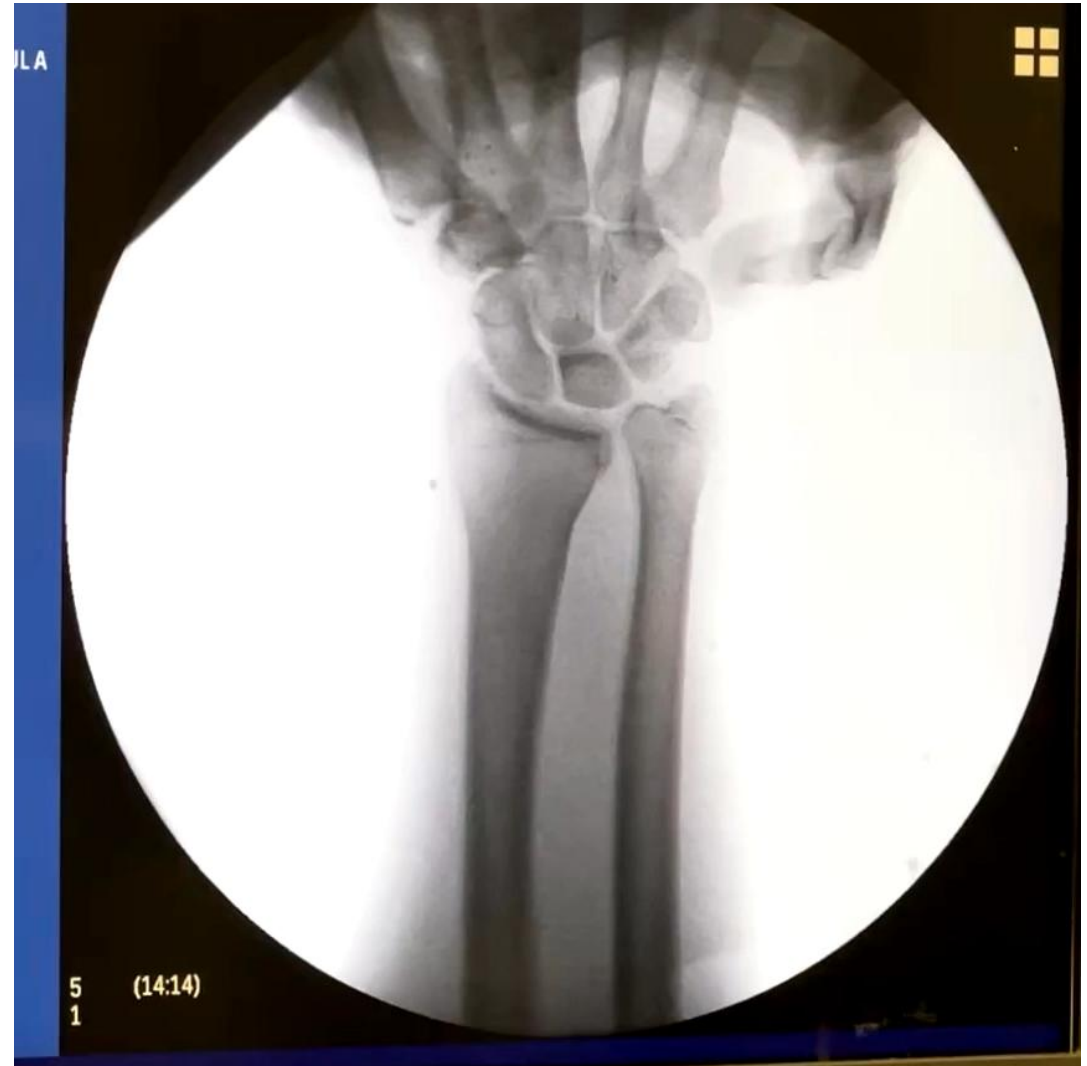
- Radial head ORIF vs arthroplasty
 - **Do NOT excise**
- DRUJ stabilization



Case RF

Intraoperative Exam

- Radial head fracture
- Longitudinal instability



Case RF

Intraoperative Exam

- Radial head fracture
- Longitudinal instability



Case RF

Intraoperative Exam

- Radial head fracture
- Longitudinal instability
- Some transverse instability?



Case RF

Treatment Approach

1. Radial head arthroplasty



Case RF

How can you judge radial implant height in setting of longitudinal instability?

- Avoid overstuffing radiocapitellar joint
- Proximal migration of radius

Case RF

Contralateral Wrist Imaging

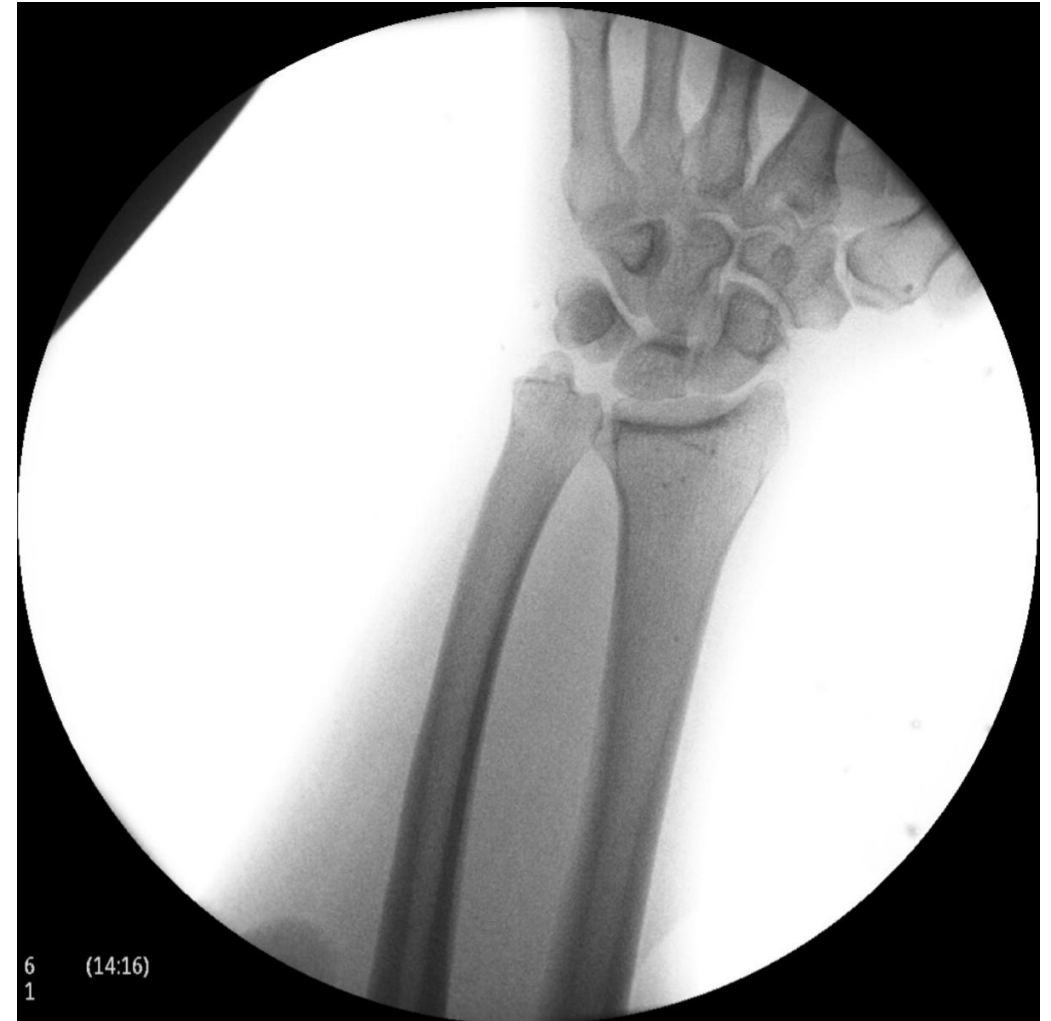


21 F 1 (13:11)
1



3 (13:12)
1

Case RF



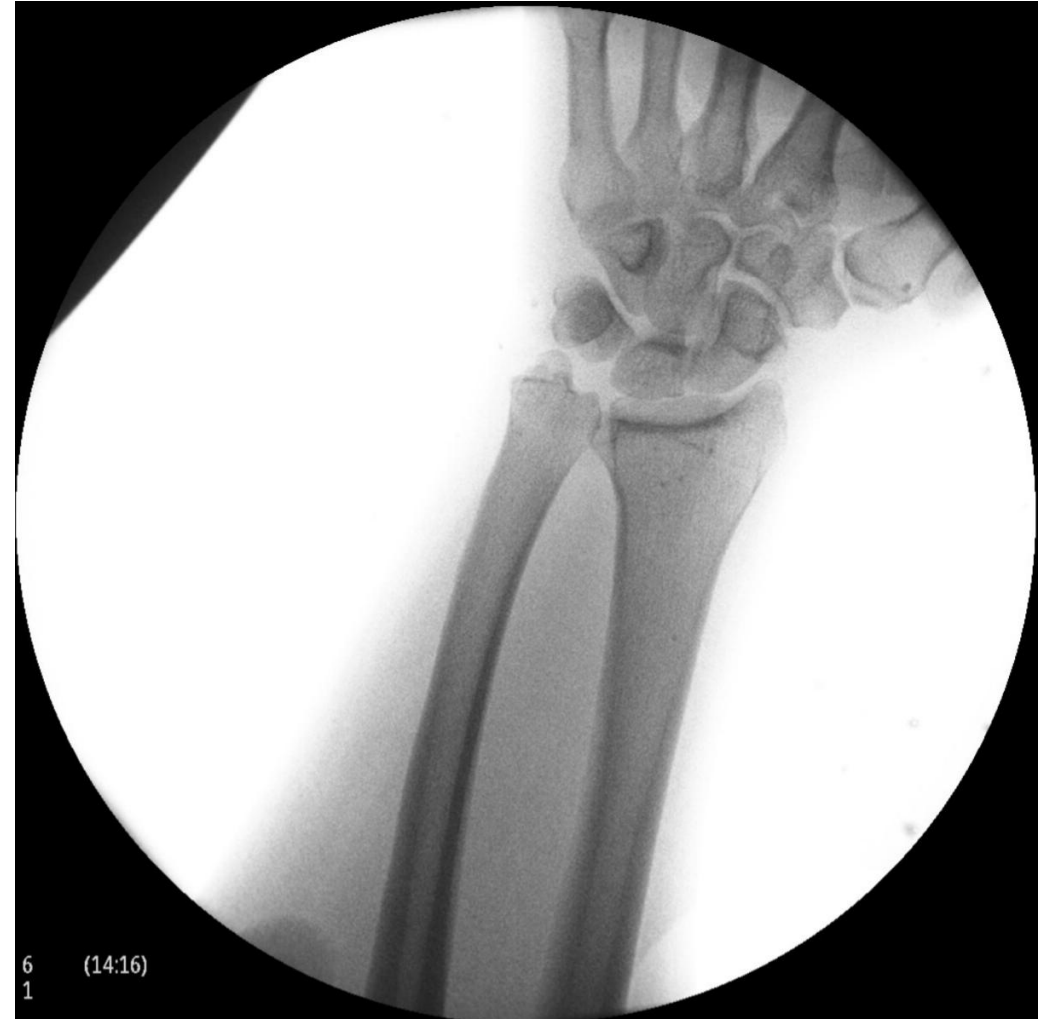
Case RF

Treatment Approach

1. Radial head arthroplasty
2. DRUJ pinning vs IOM recon?

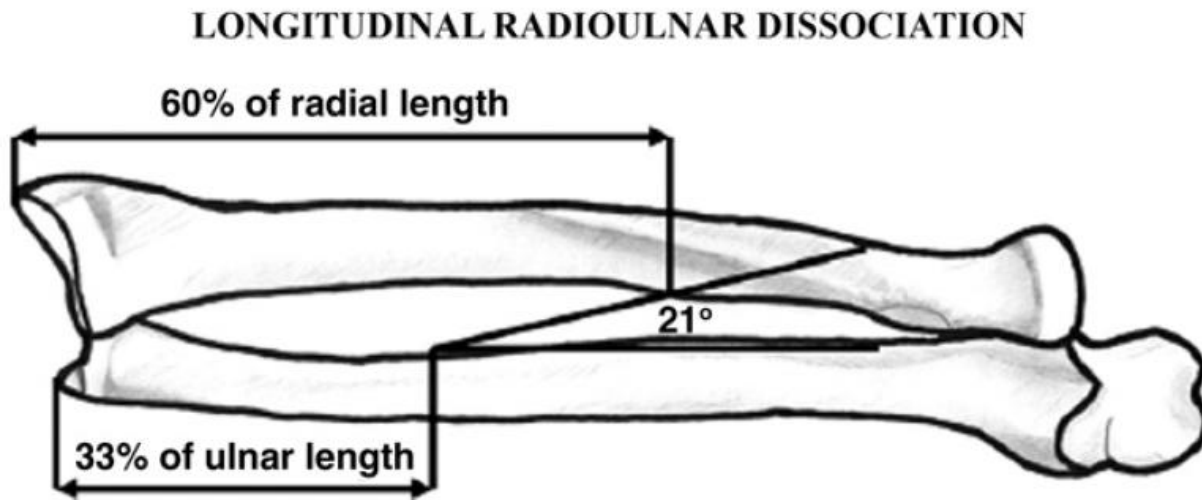


Case RF



Case RF

Acute IOM Reconstruction



Case RF

Acute IOM Reconstruction



Case RF



Case AM

HPI: 18 yo RHD M sustained multiple GSW, including to LUE

PE: GSW proximal forearm

Intact sensation in median, radial and ulnar nerves

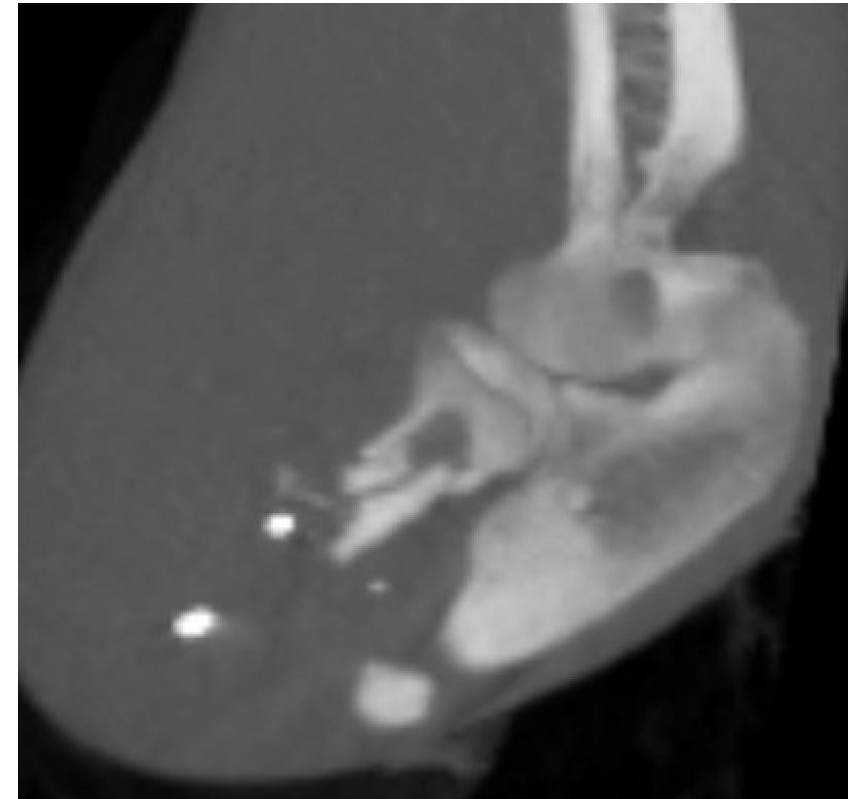
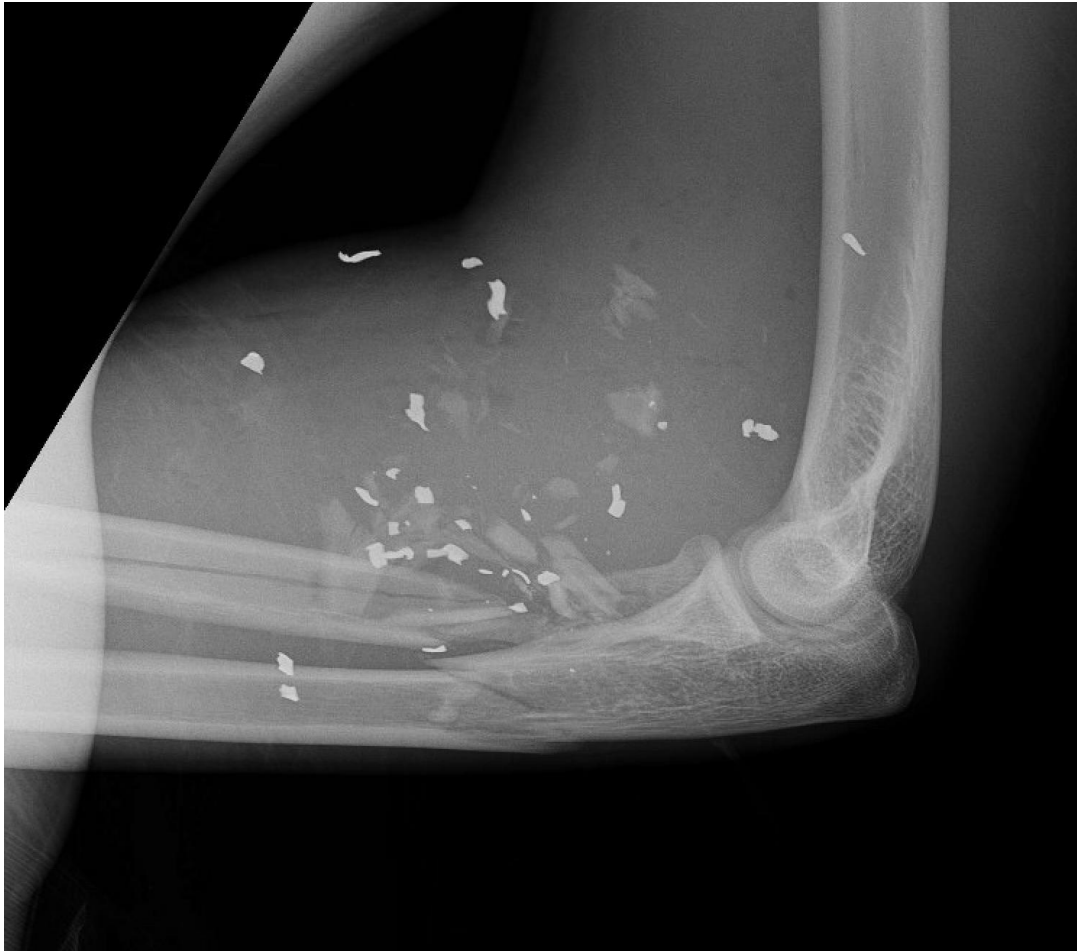
Unable to extend fingers or wrist

Compartments compressible, no pain with passive finger extension

2+ radial pulse

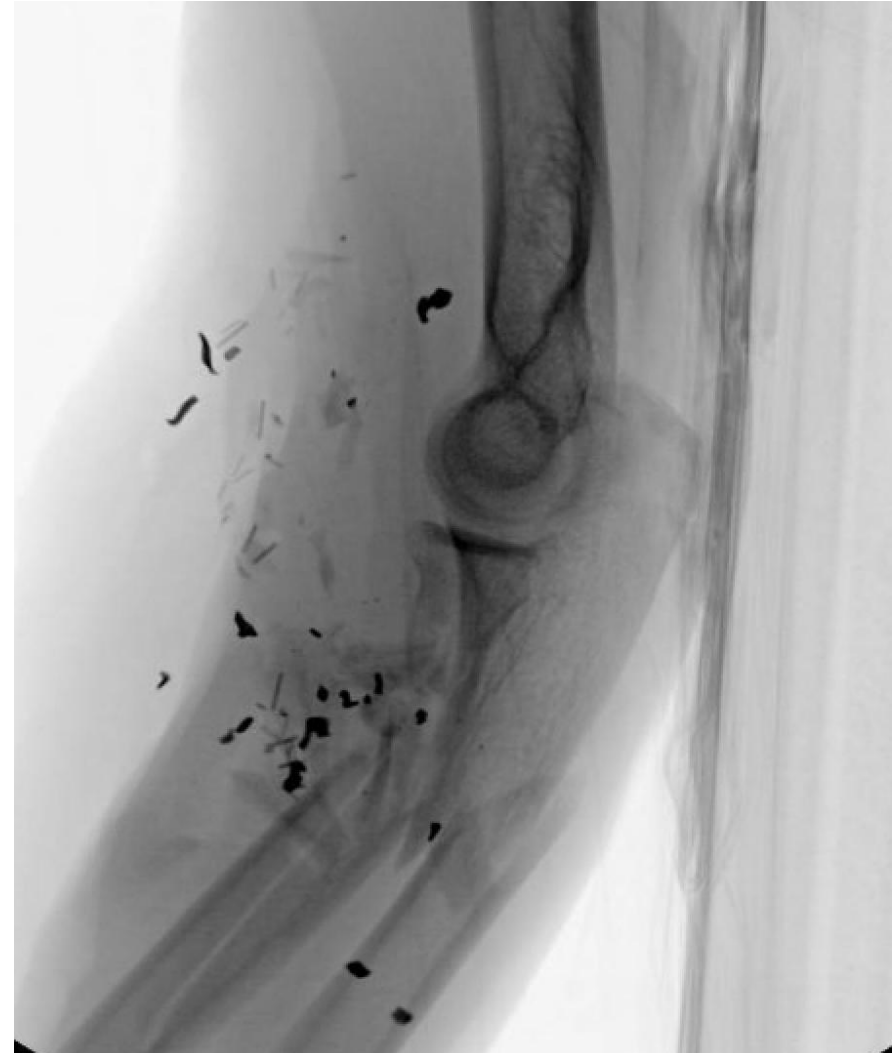
Case AM

Injury Films



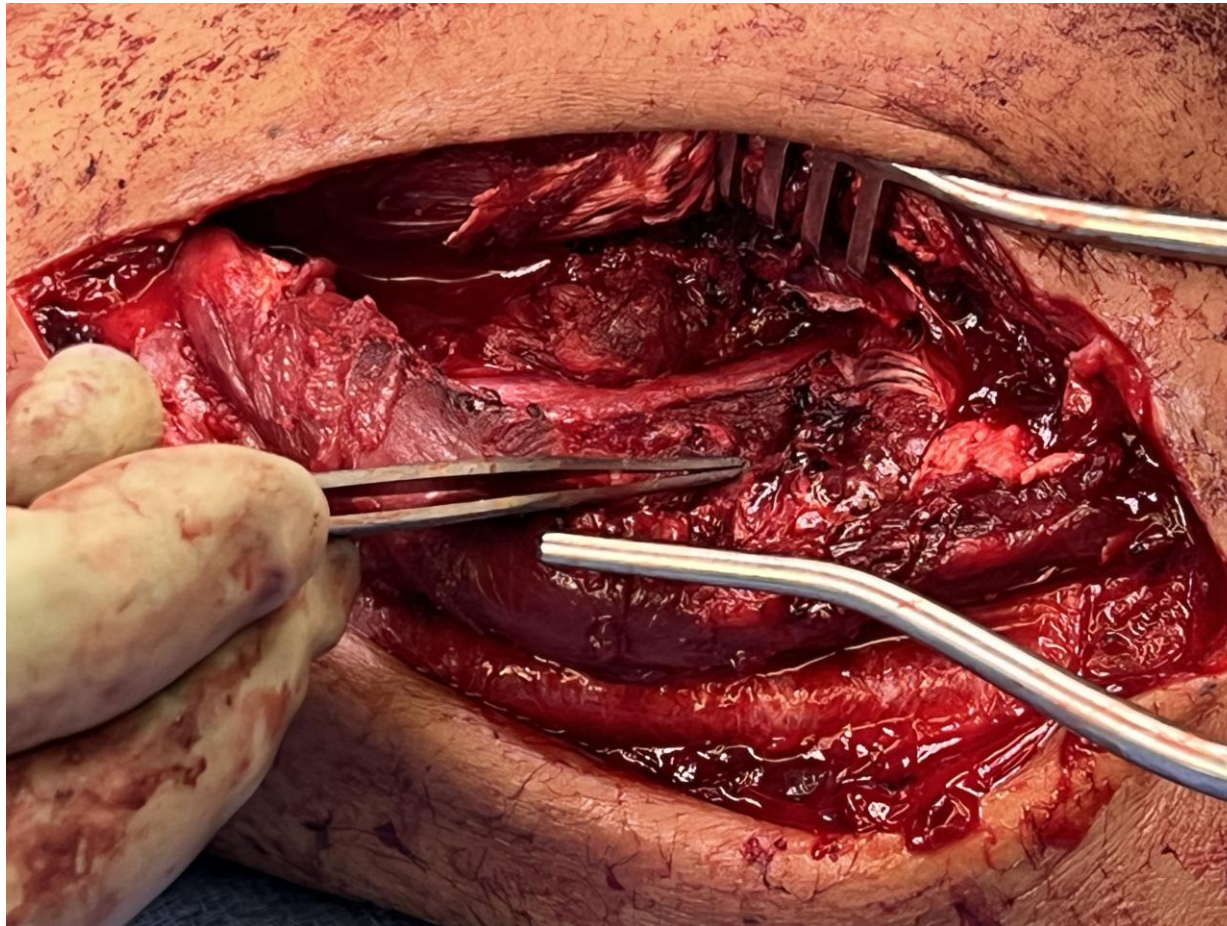
Case AM

2/27: OR for I&D



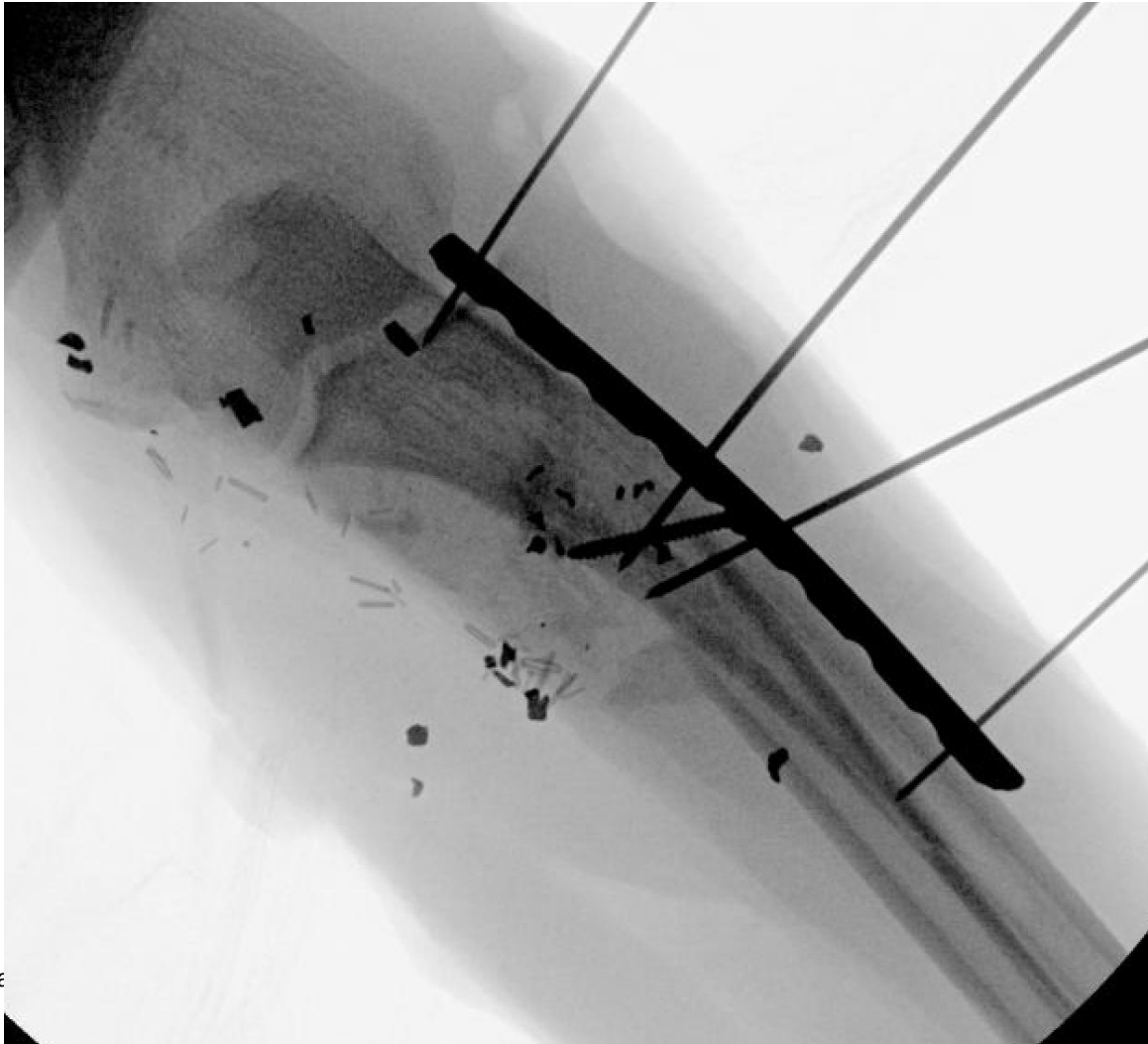
Case AM

3/2: OR for I&D, PIN exploration, ORIF proximal ulna



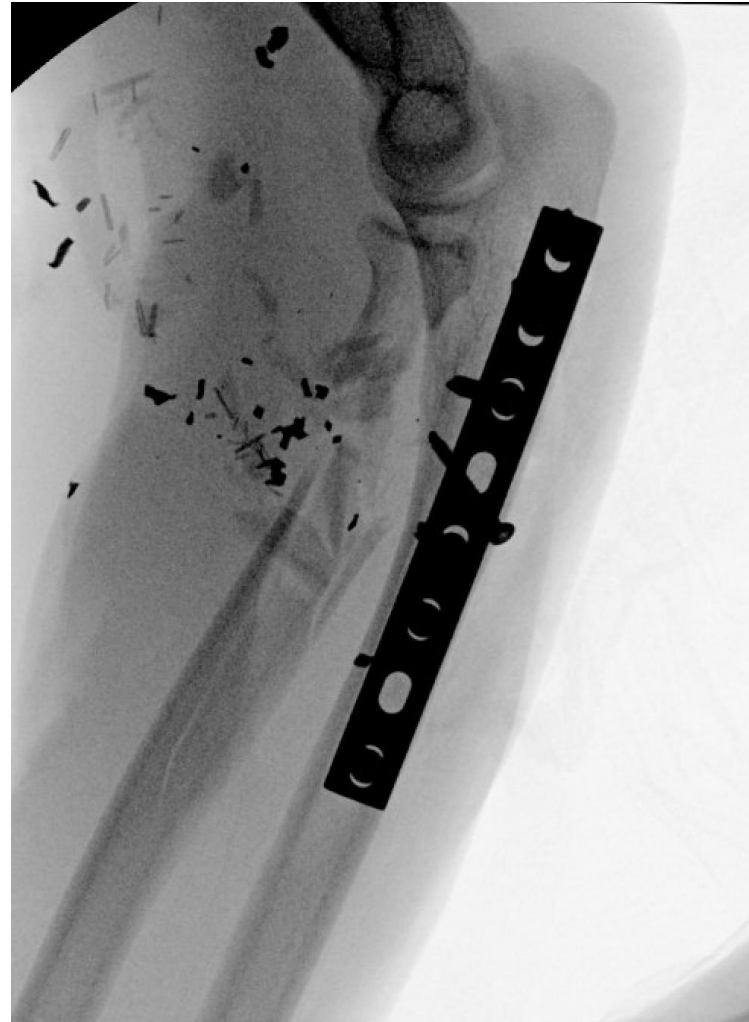
Case AM

3/2: OR for I&D, PIN exploration, ORIF proximal forearm



Case AM

3/2: OR for I&D, PIN exploration, ORIF proximal forearm



Case AM

What about proximal radius?

3/2: OR for I&D, PIN exploration, ORIF proximal forearm



Case AM

Nonoperative Treatment for Proximal Radius

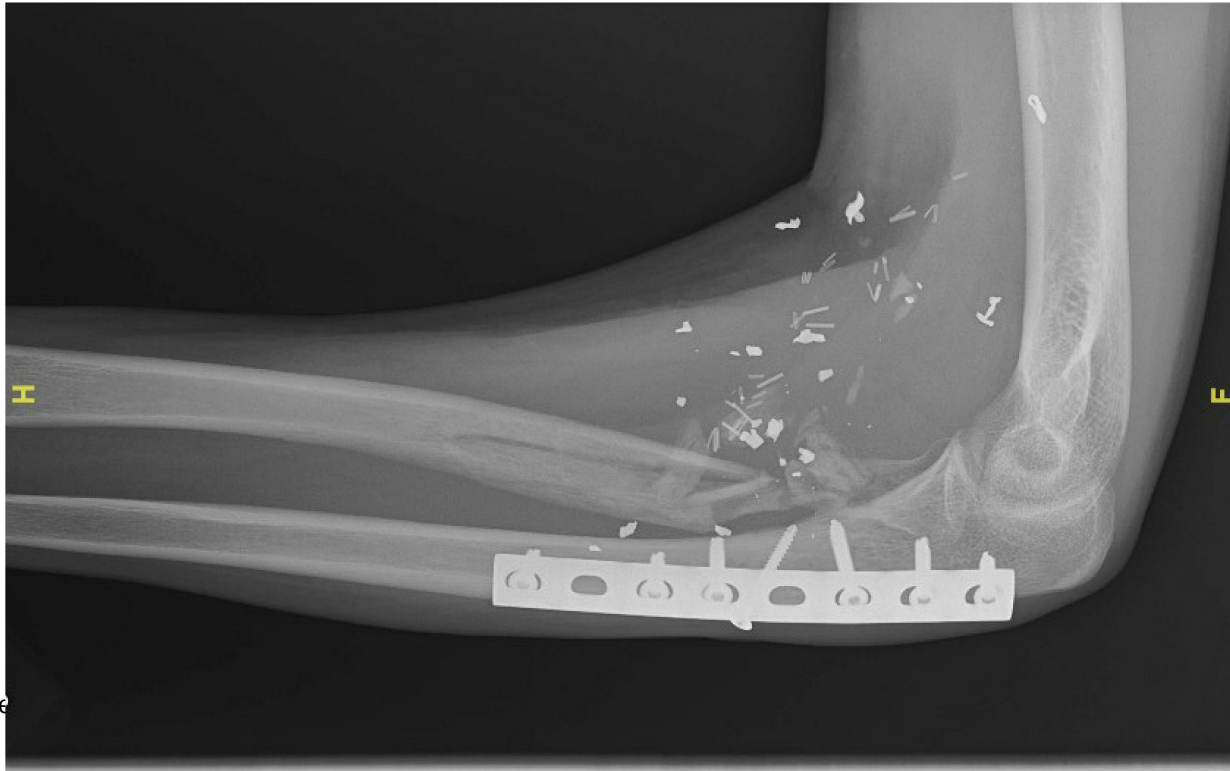
- Wks 0-2: Posterior long arm splint in supination
- Wks 2-6: Munster cast in neutral
- Wks 6-12: Active forearm rotation



Case AM

5/17 Clinic Follow-Up

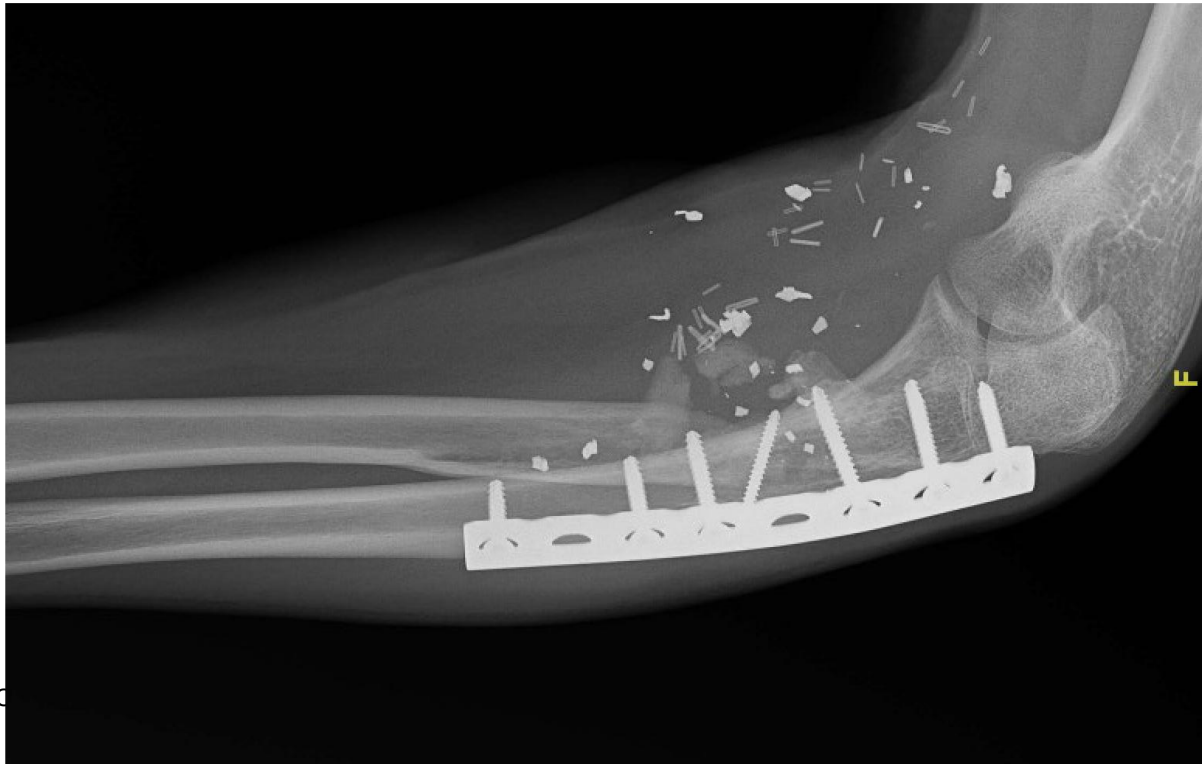
- Munster cast x6wks then active rotation
- Improving forearm rotation and pain
- PIN recovering



Case AM

8/30 Clinic Follow-Up

- Near full pronation/supination
- No pain
- PIN recovering (4/5 strength)



Thank You

