

# Cases

# Forearm and Wrist Fracture

**Melvin P. Rosenwasser, MD**

Carroll Professor of Orthopedic Surgery

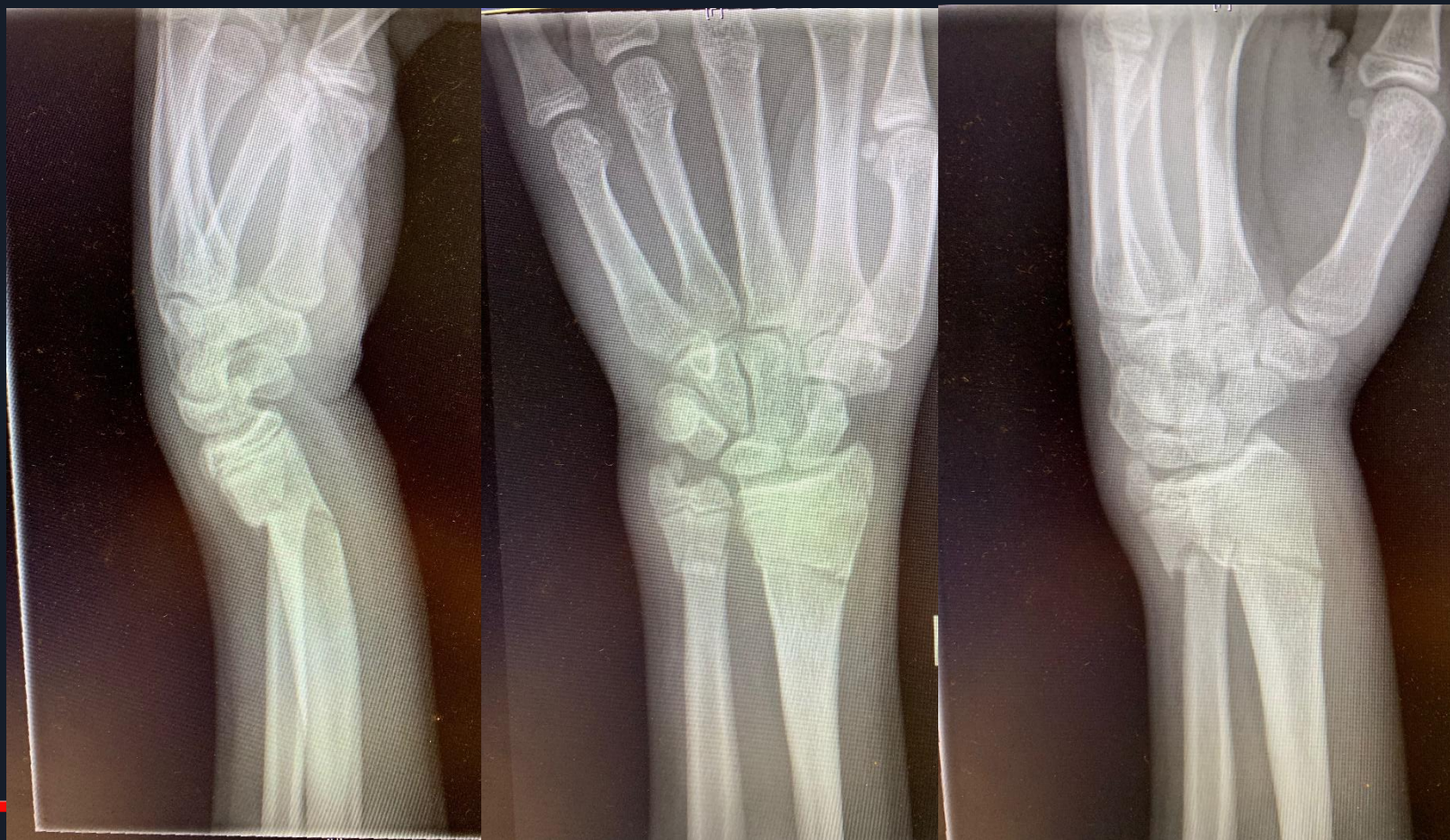
Professor of General Surgery

Director Orthopedic Hand and Trauma Services

Columbia University Medical Center

# Case: 13y RHD F s/p fall playing basketball

- **Active basketball and softball player**



# Considerations Menses started Open Physes



Treatment Options?  
In Situ splinting  
Closed Reduction LAC  
Closed Reduction Perc Pinning  
Open Reduction

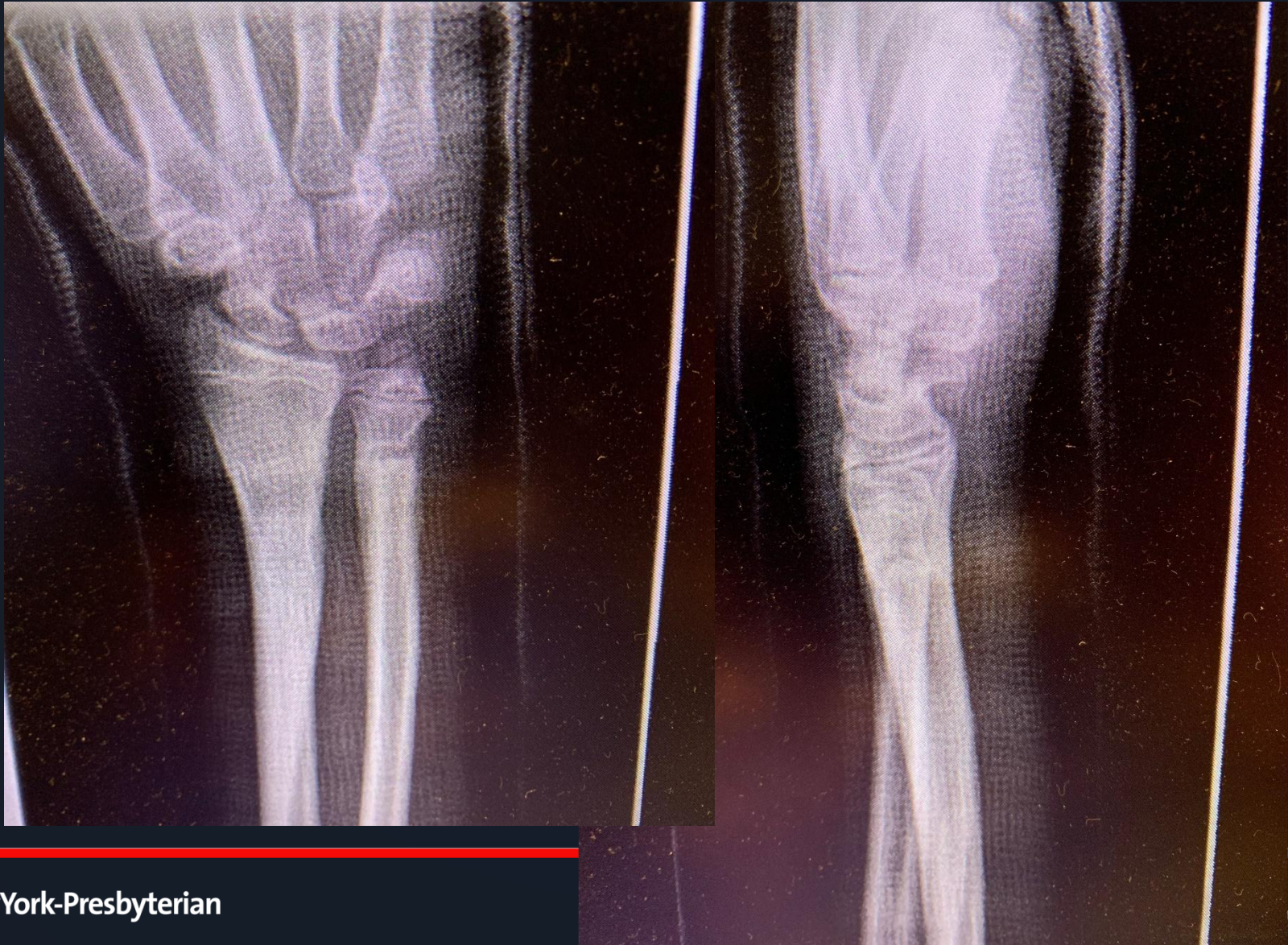
# Acceptable Reduction Criteria

- **< 9 years old**
  - Bayonet apposition
  - 15 deg angulation
  - 45 deg malrotation
- **> 9 years old**
  - 30 deg malrotation
  - Proximal Radius Fractures
    - 10 deg of angulation
  - Distal radius fractures
    - 20 deg of angulation

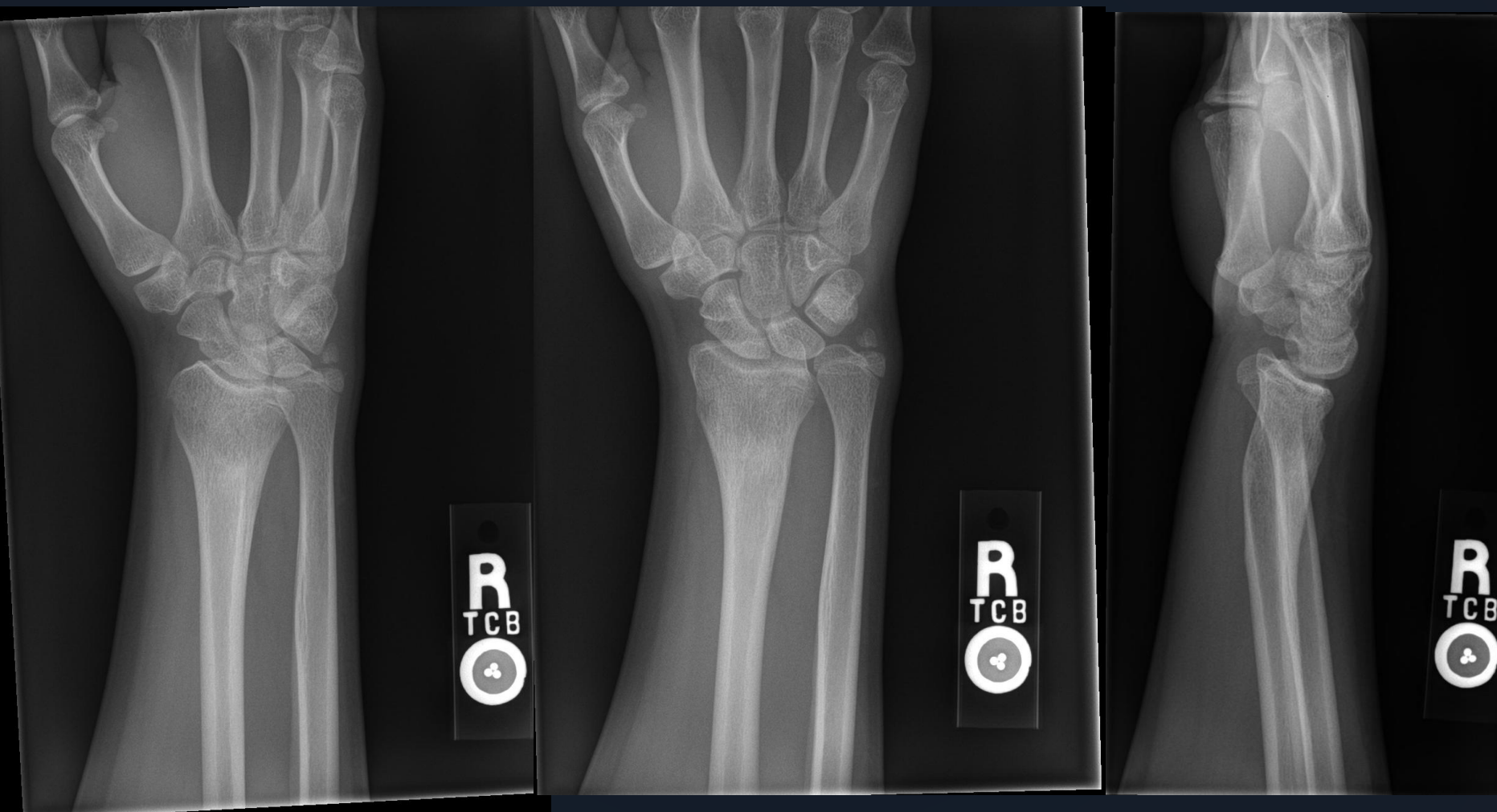


J Am Acad Orthop Surg. 1998 May-Jun;6(3):146-56.

# Healed ? Acceptable?



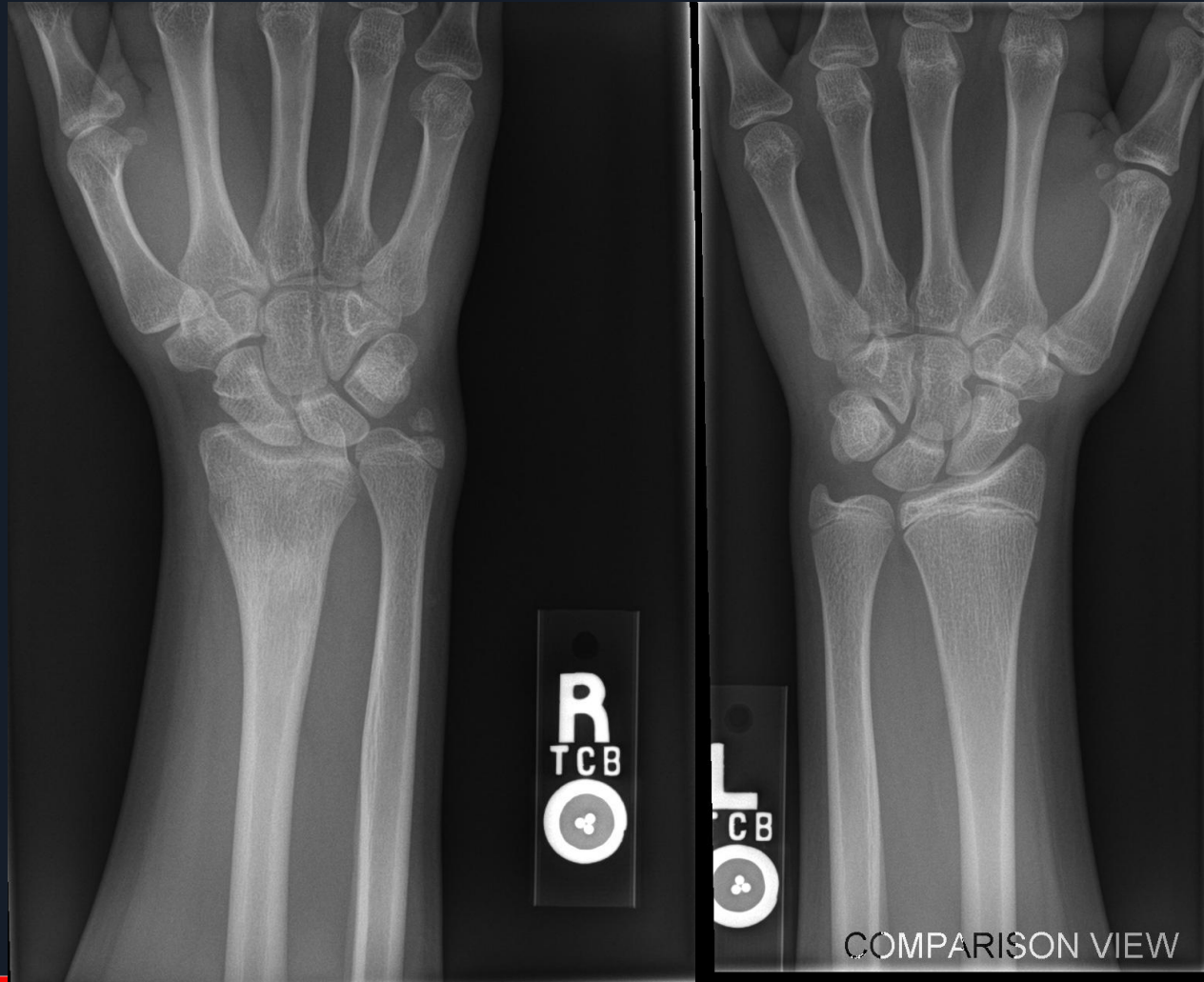
10 months later...



10 months later...

- **Increased wrist extension and decreased wrist flexion**
- **Restricted pronation/supination due to pain**
- **DRUJ instability with increased shuck testing**

# What's Going On Here?



What is Most Important?

**Radial length**

**Articular Facet Tilt**

**Both**

# Sigmoid Notch can accommodate shortening but not excessive tilt



## DRUJ Congruence

**Reversal of Tilt accentuates radial shortening**

**One can accept up to 4 mm of radial shortening**

**If Reversed tilt < 10 degrees**

# The Effects of Pain, Supination, and Grip Strength on Patient-Rated Disability After Operatively Treated Distal Radius Fractures

Eric Swart, MD, Kate Nellans, MD, MPH, Melvin Rosenwasser, MD

JHS • Vol 37A, May 2012

- Supination is a function of anatomy and congruence of the DRUJ
- It is the most sensitive predictor of patient satisfaction post distal radius fracture

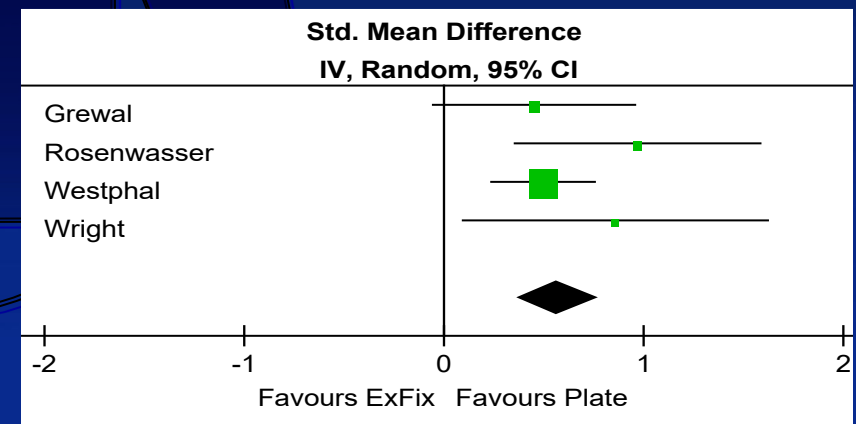
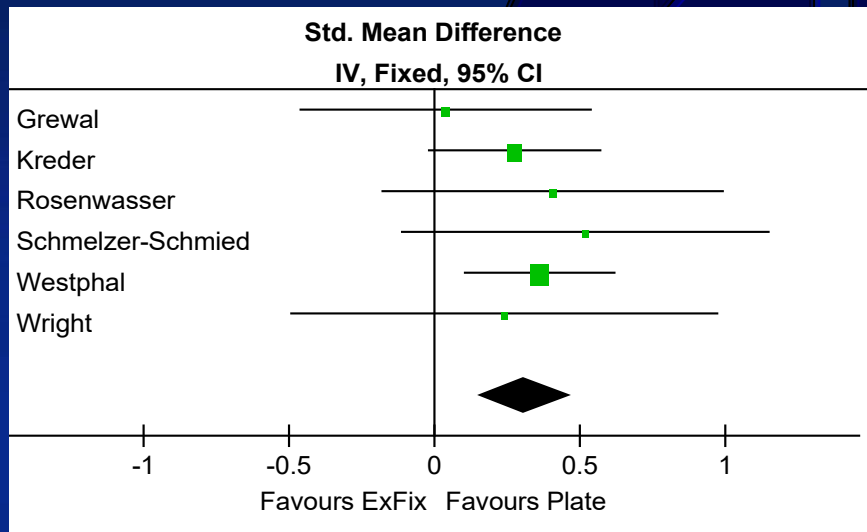
# External Fixation Versus Internal Fixation for Unstable Distal Radius Fractures: A Systematic Review and Meta-Analysis of Comparative Clinical Trials

David H. Wei, MD, MS,\* Rudolf W. Poolman, MD, PhD,† Mohit Bhandari, MD, MSc,‡  
Valerie M. Wolfe, MD,\* and Melvin P. Rosenwasser, MD\*

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**SUPINATION**  
*favors Plating*

**VOLAR TILT**  
*favors Plating*



## Treatment Options

### **Radial Osteotomy**

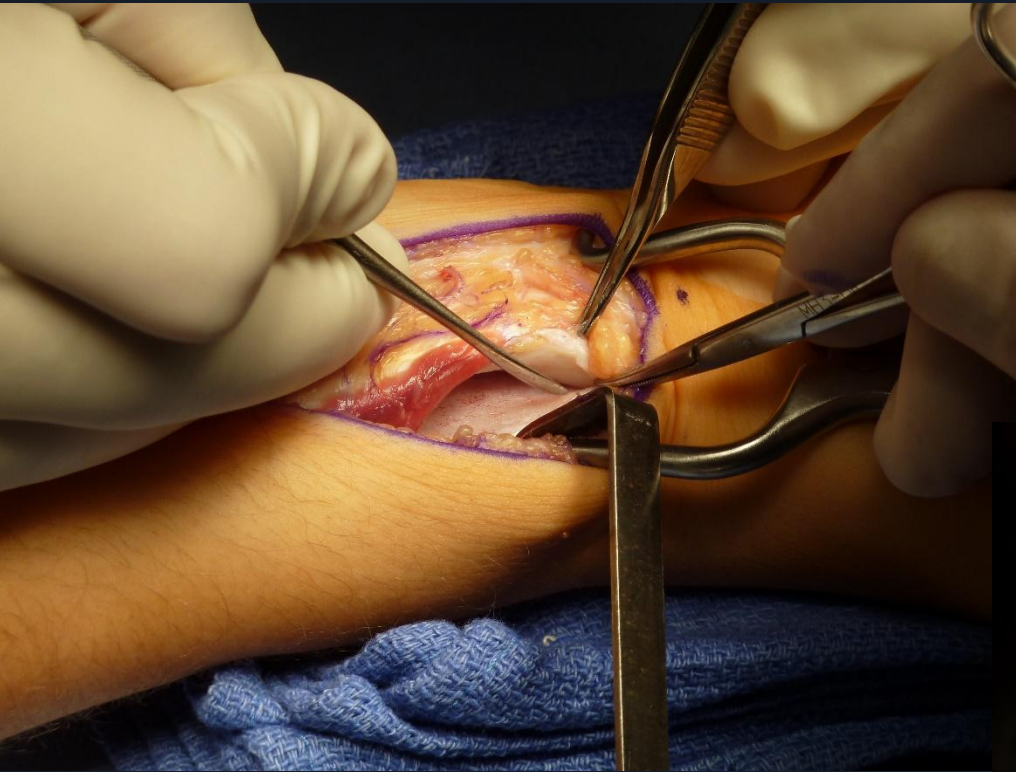
**? Opening wedge, closing wedge**

**+/- Bone Graft**

**Concomitant Ulnar shortening**

**+/- DRUJ ligament stabilization/  
reconstruction**

# Opening wedge osteotomy, Volar Plating and cancellous allograft

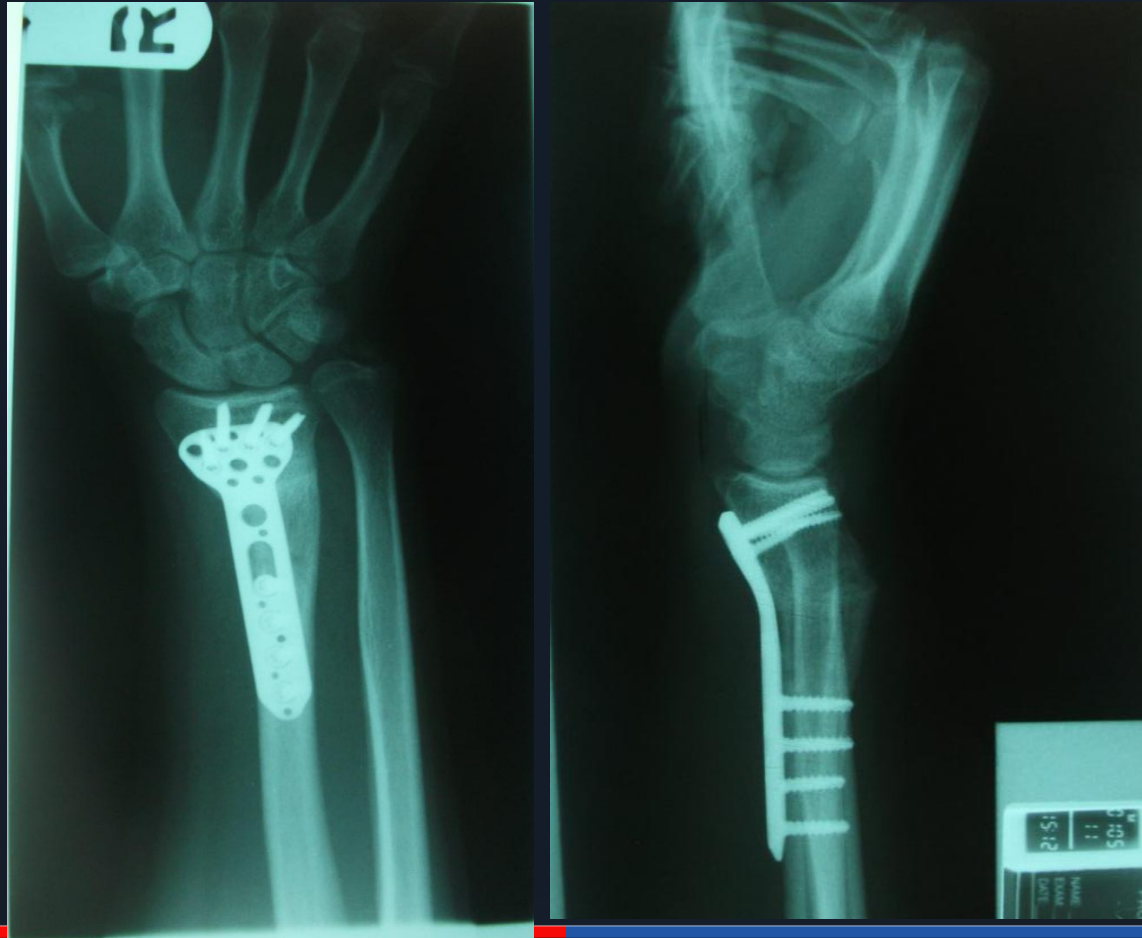


# Forearm realignment



@ 2 months

Articular tilt corrected to neutral  
Ulna still long- Is this adequate correction?



# 2 months postoperatively



# 1 year postoperatively



# 8 years postoperatively



# 8 years postoperatively



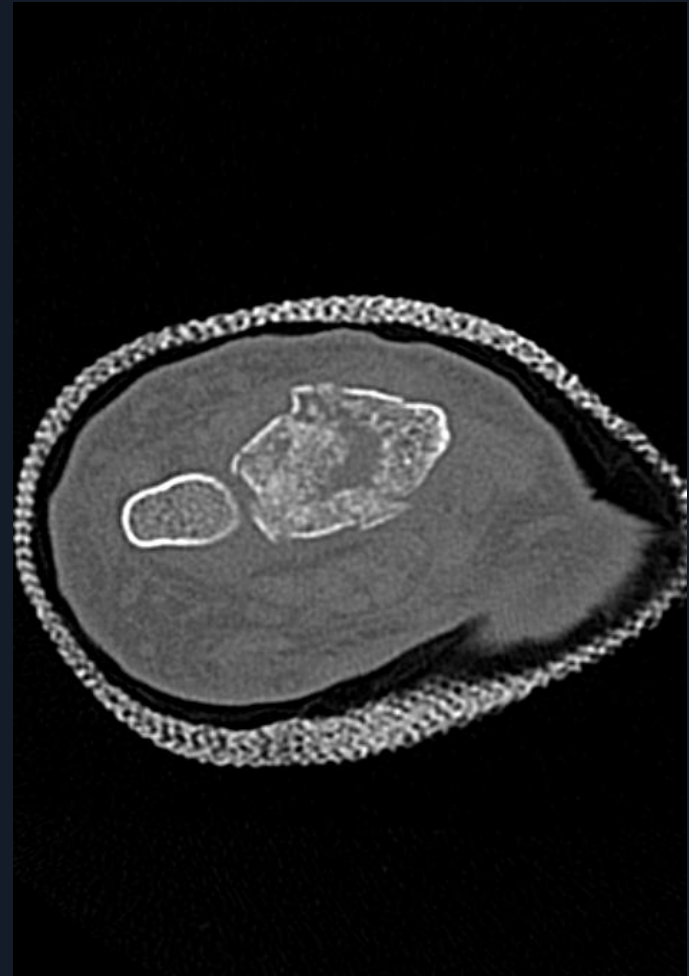
Lunate facet malunion= Loss of DRUJ congruence



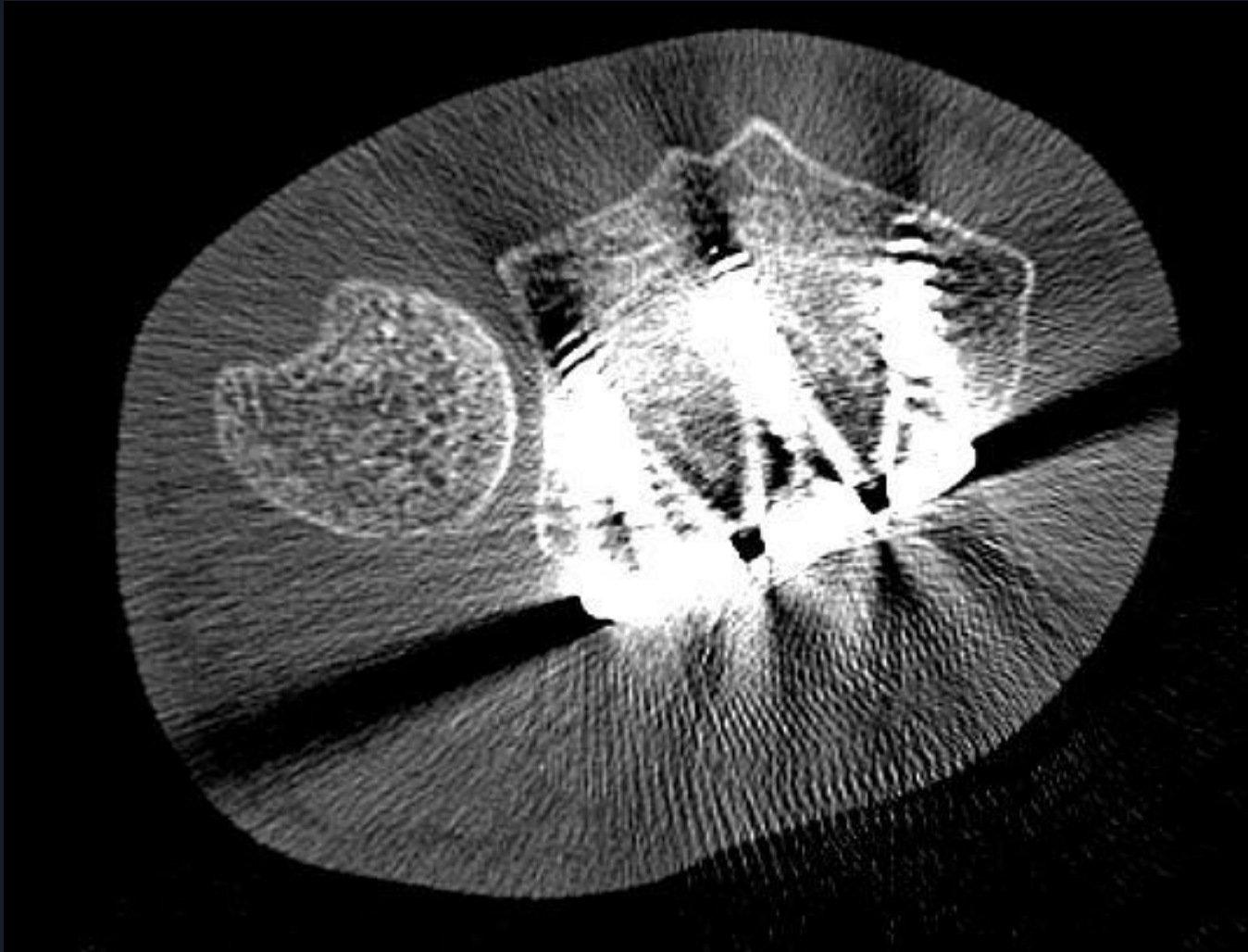
Axial CT explains the block to forearm rotation  
Lunate facet malrotated



# CT @ 2 weeks if incongruent joint ORIF indicated



# Reduce Notch=Restore Supination



# Supination Blocked pre op evaluation

## Supination restored post ORIF Lunate facet



# Case: 75 yo F s/p mechanical fall



# Post-Reduction ? Acceptable



## Radial Malunions in the Elderly

**Multiple papers state that patient outcomes are acceptable**

**Cavaet: Need forearm rotation**

**Avoid excessive radial shortening**

**DRUJ alignment**

# Ext Fix with Adjunctive K wire DRUJ and lunate facet better reduced



@ 2 Months- Nontender stable to exam  
Fixator removed and patient splinted



@ 4 months noted increased deformity  
No evidence for infection



# OPTIONS?

**Keep splinting**

**Revision surgery – repair nonunion**

**Arthrodesis**

**Total wrist fusion**

**Radio-scapho-lunate fusion**

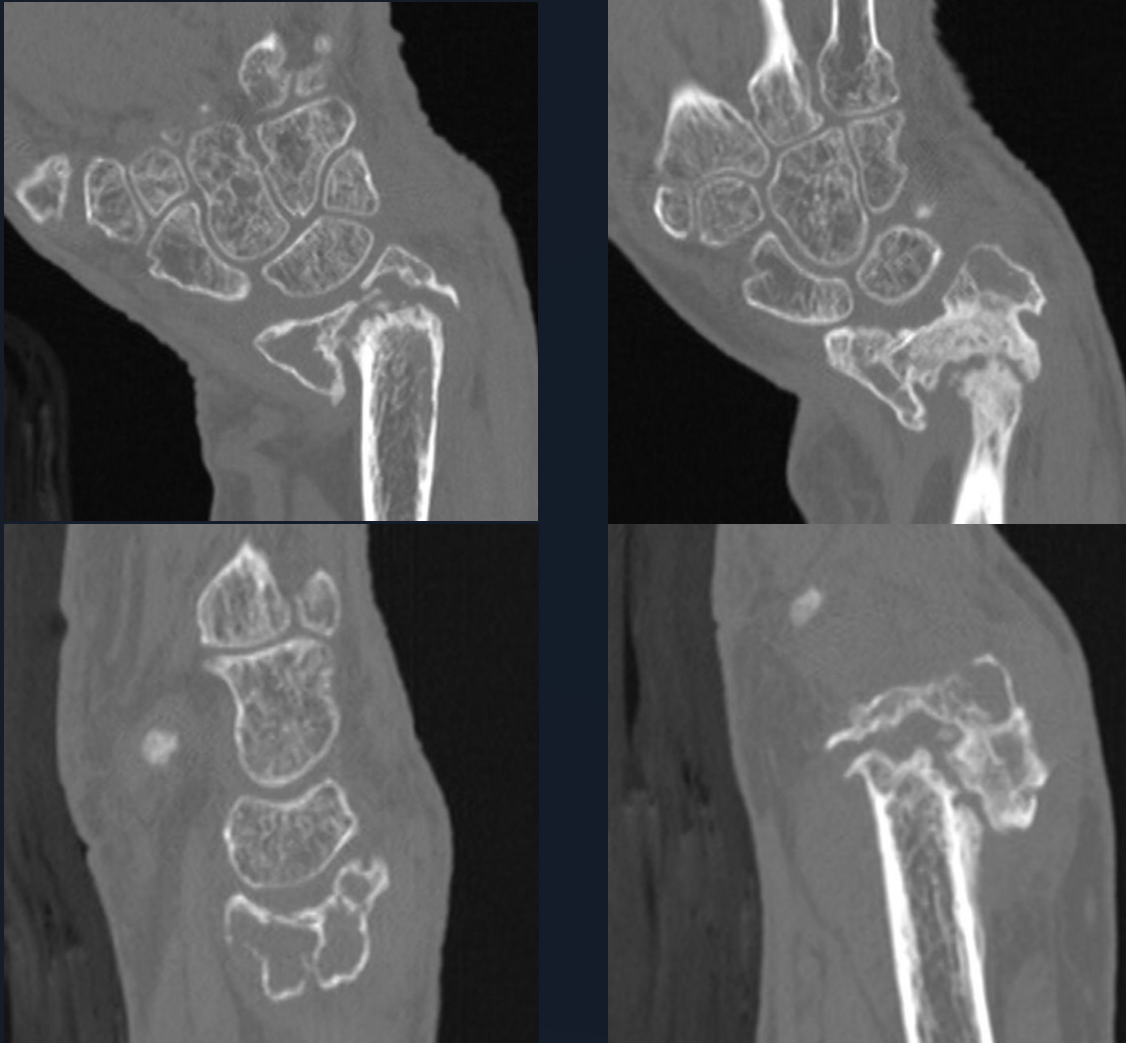
@ 1 Year Unhappy Patient  
Weak, no forearm rotation  
Now What?



# Clinical appearance



# Can/ should this joint be saved? How?



## My Plan

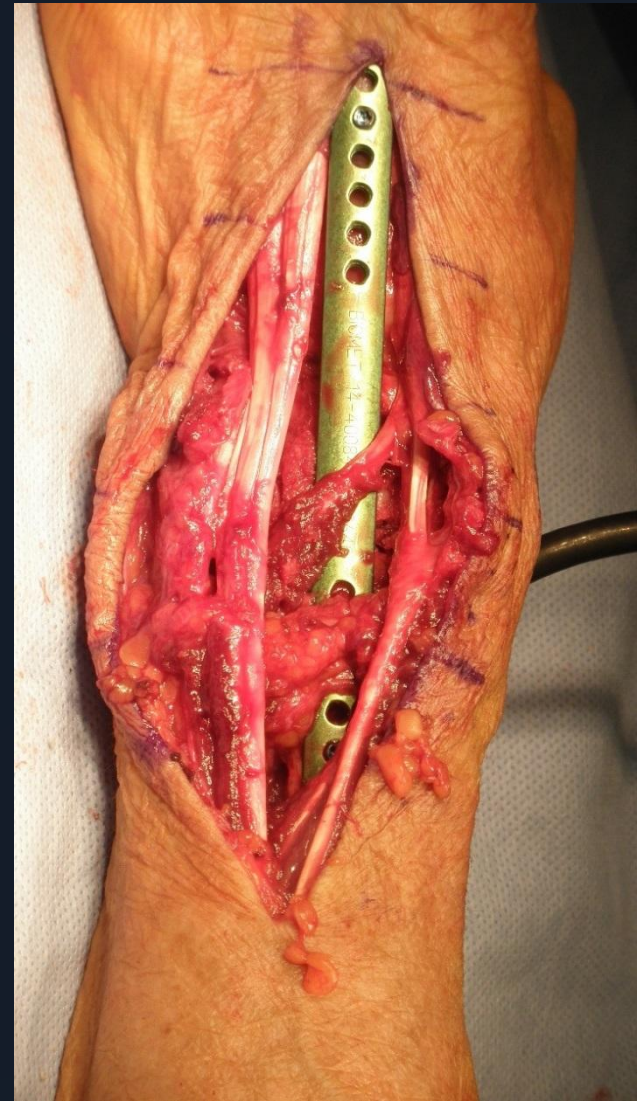
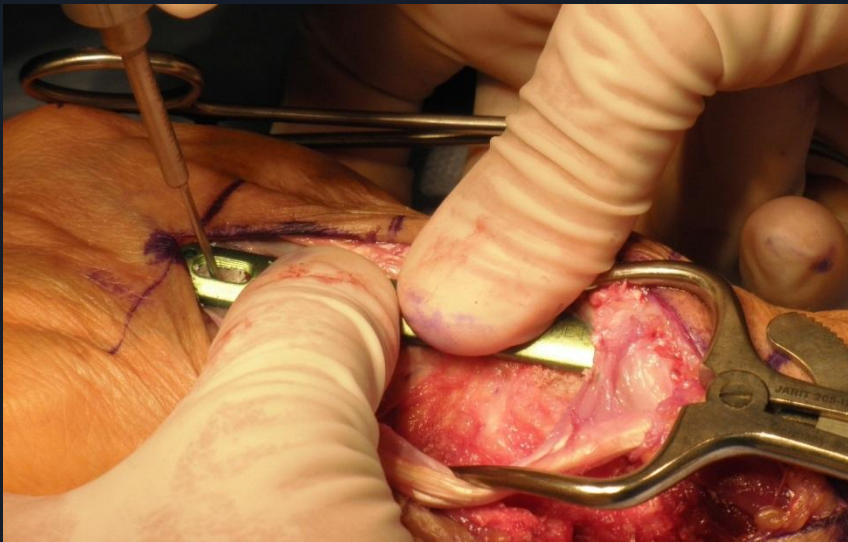
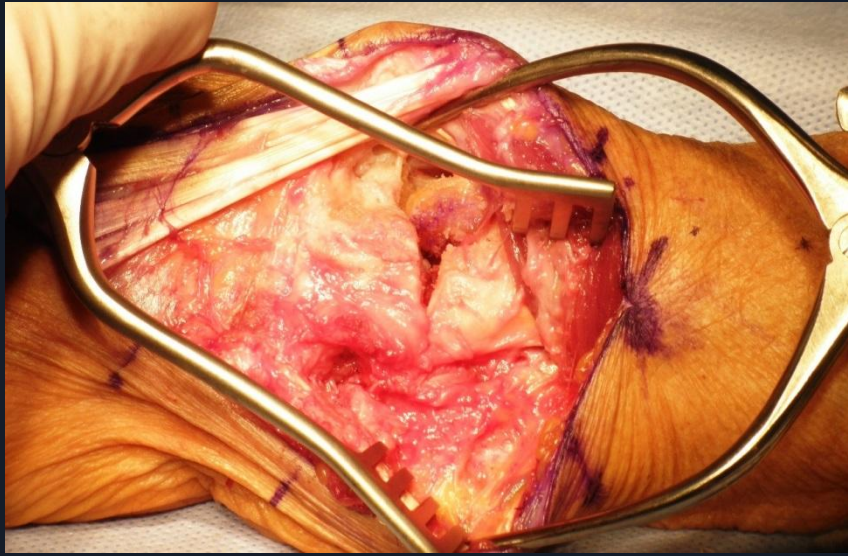
**Repair Nonunion**

**Bone graft the defect**

**Spanning Plate**

**Distal ulnar resection**

# Dorsal approach through 4th compartment



# Alignment Corrected Metaphyseal void post correction allografted



# Radial length cannot be fully restored Distal Ulnar Resection required



@ 1 year- Patient satisfied  
Flex/Ext 40/40 : Pro/Sup 60/60



# Thank You

AMAZING  
THINGS  
ARE  
HAPPENING  
HERE