Distal femur fractures: Plate, Nail, or Both

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Disclosures

- VP of Board of Directors SIGN Fracture Care International, non-profit that manufactures IM nails

Case: 75yo M fall down stairs

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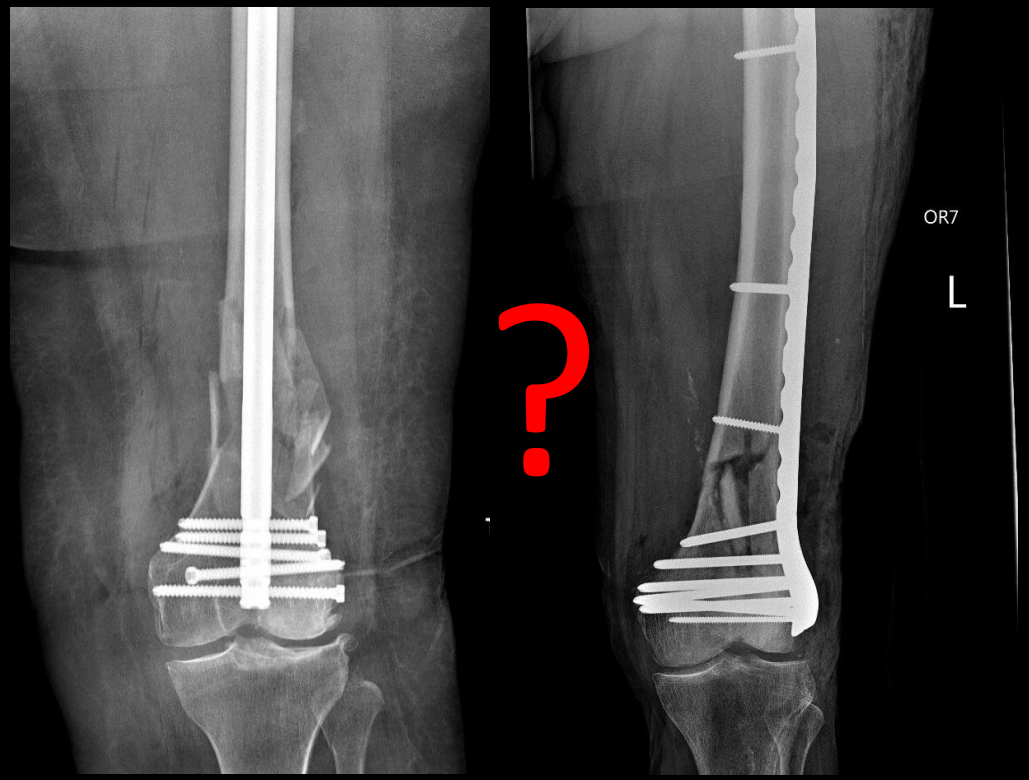
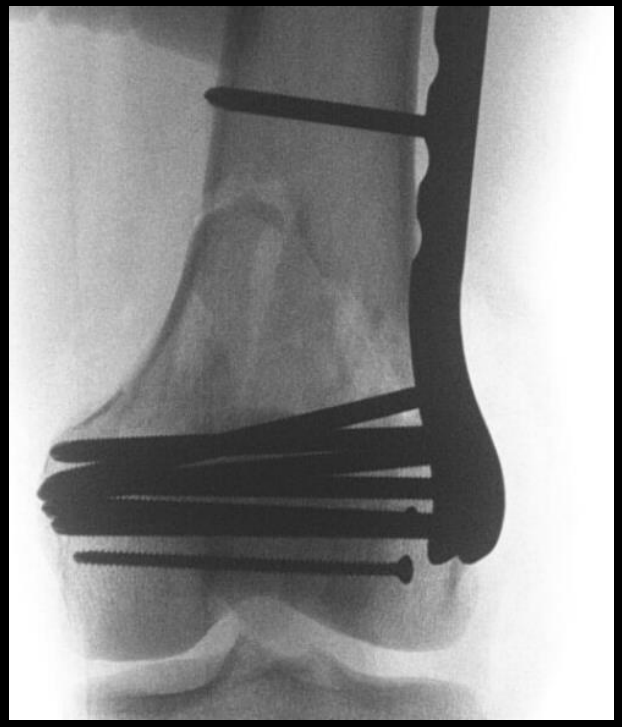


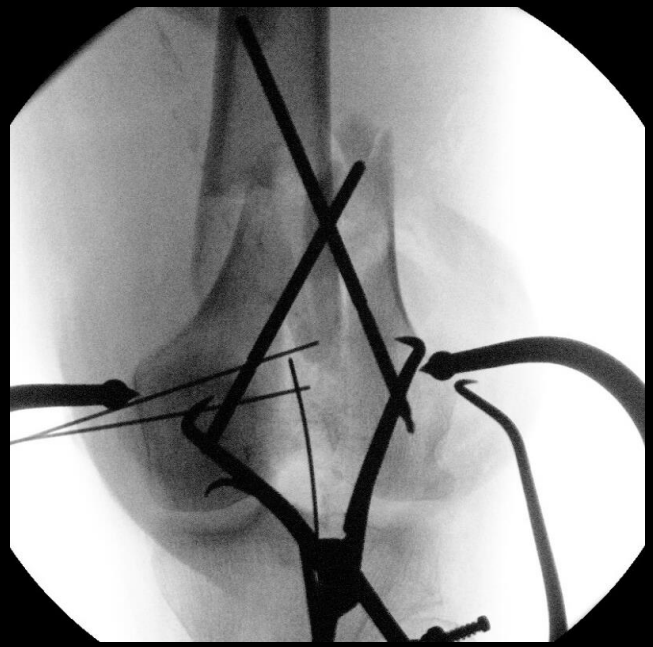
Learning objectives

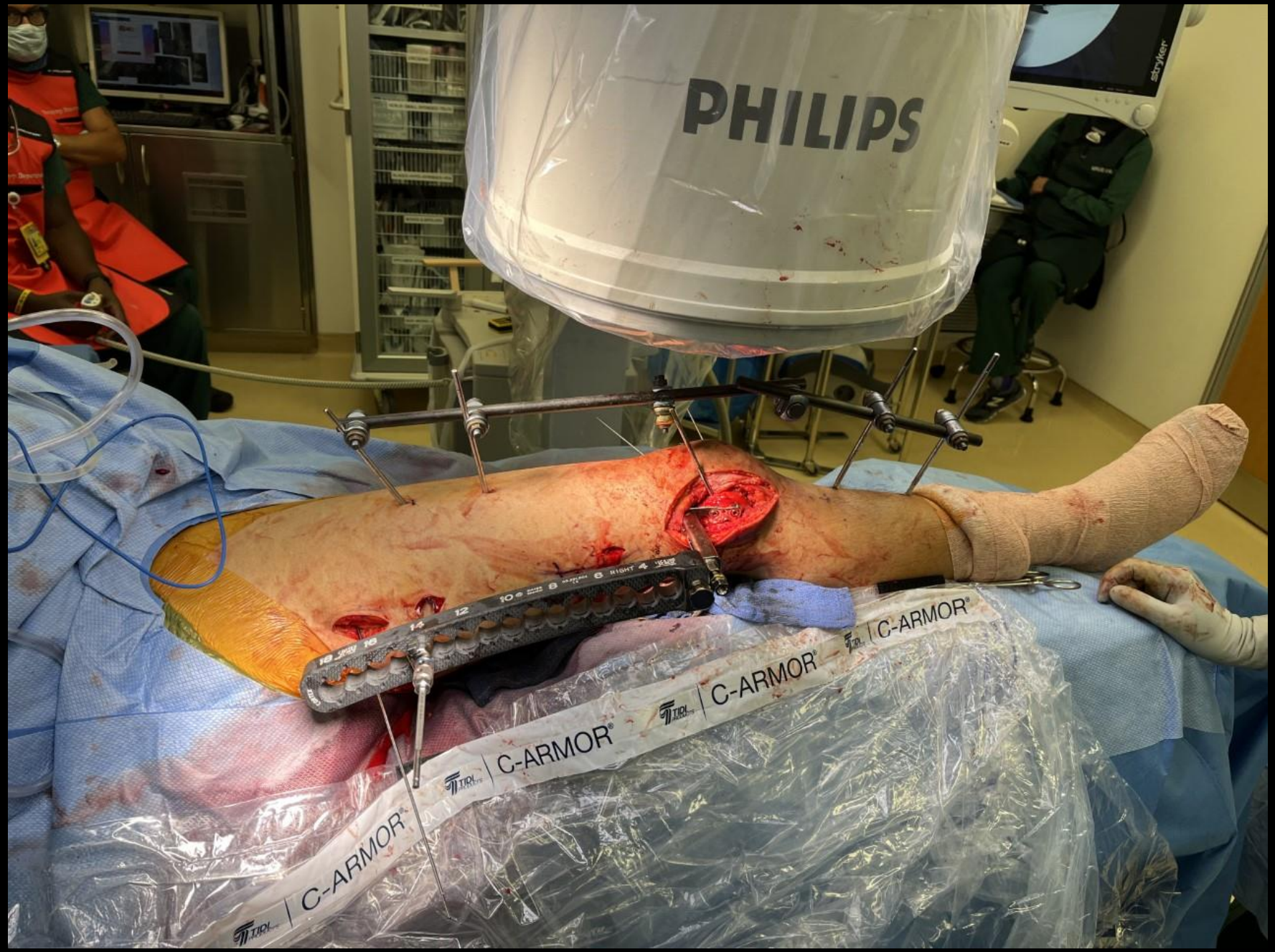
- Pros and cons of plates and nails
- Recognize fractures patterns best suited for each
- Indications for combining implants

Why Plate

- MORE DISTAL FIXATION
  - More points of fixation
  - Fixation across intercondylar split
- Reduction
  - Open exposure joint +/- metaphysis
  - Ex-fix assisted reduction



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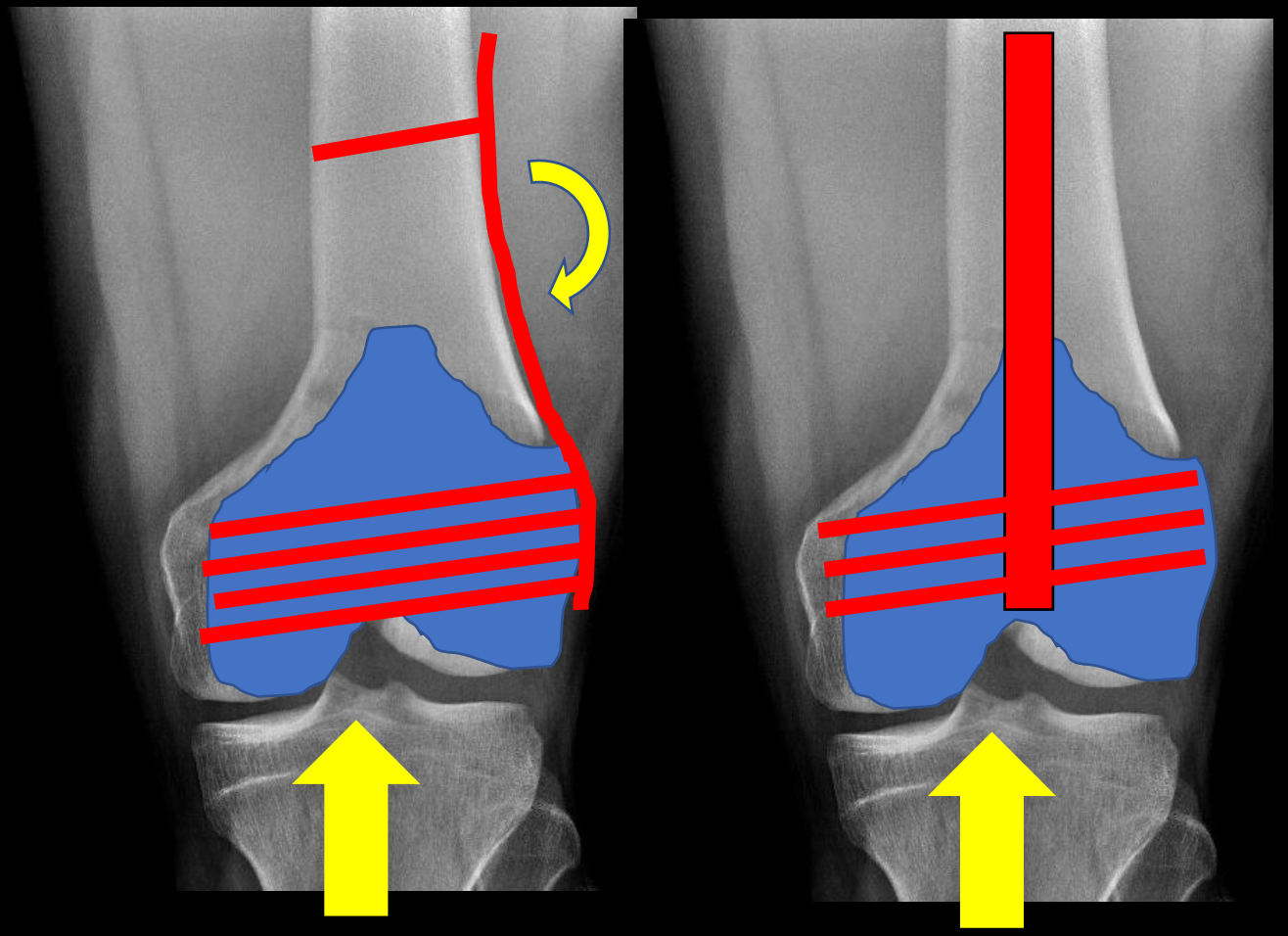
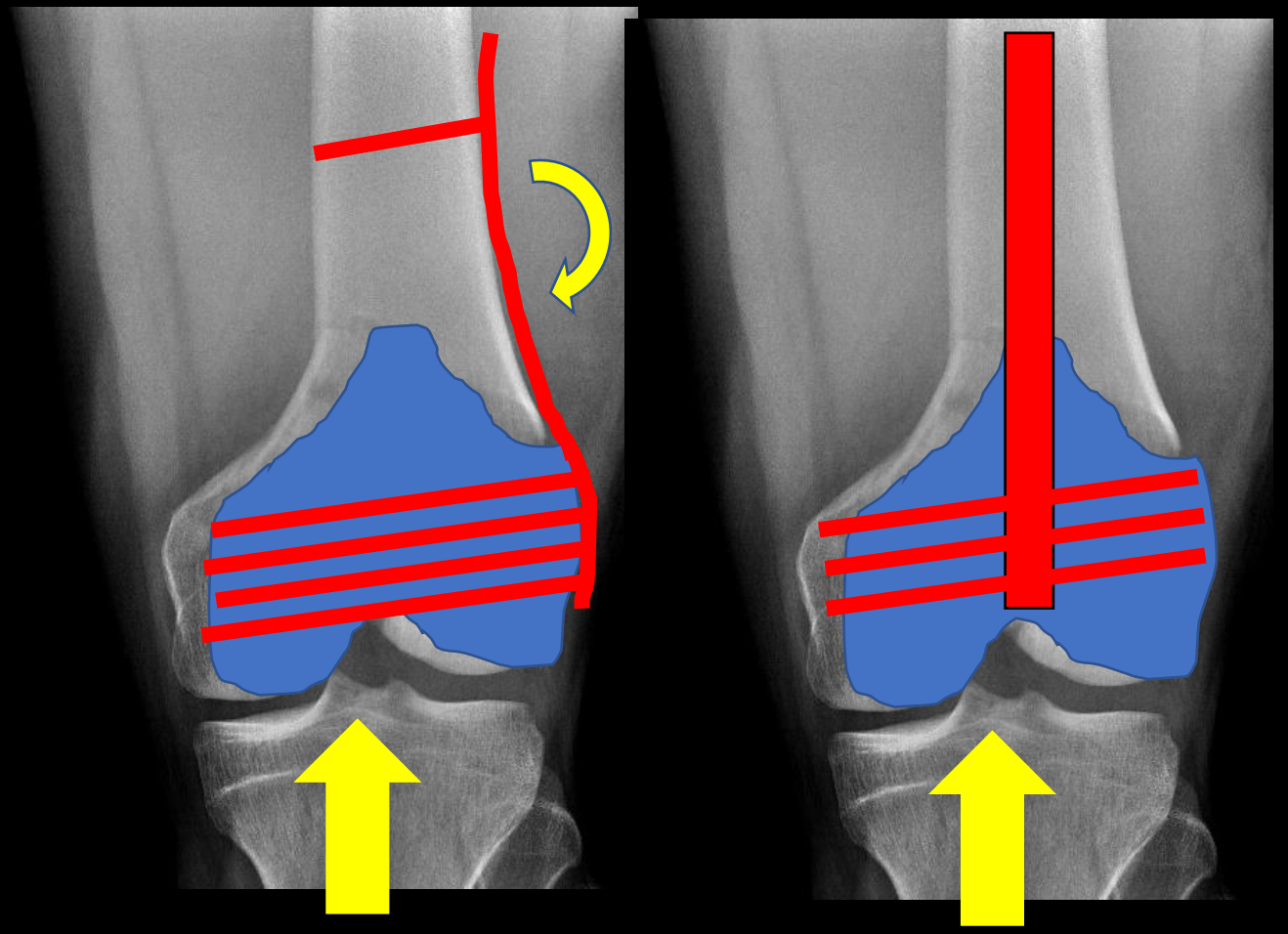
Why Not Plate

- Biomechanically disadvantaged



Why Not Plate

- Biomechanically disadvantaged
- Too stiff



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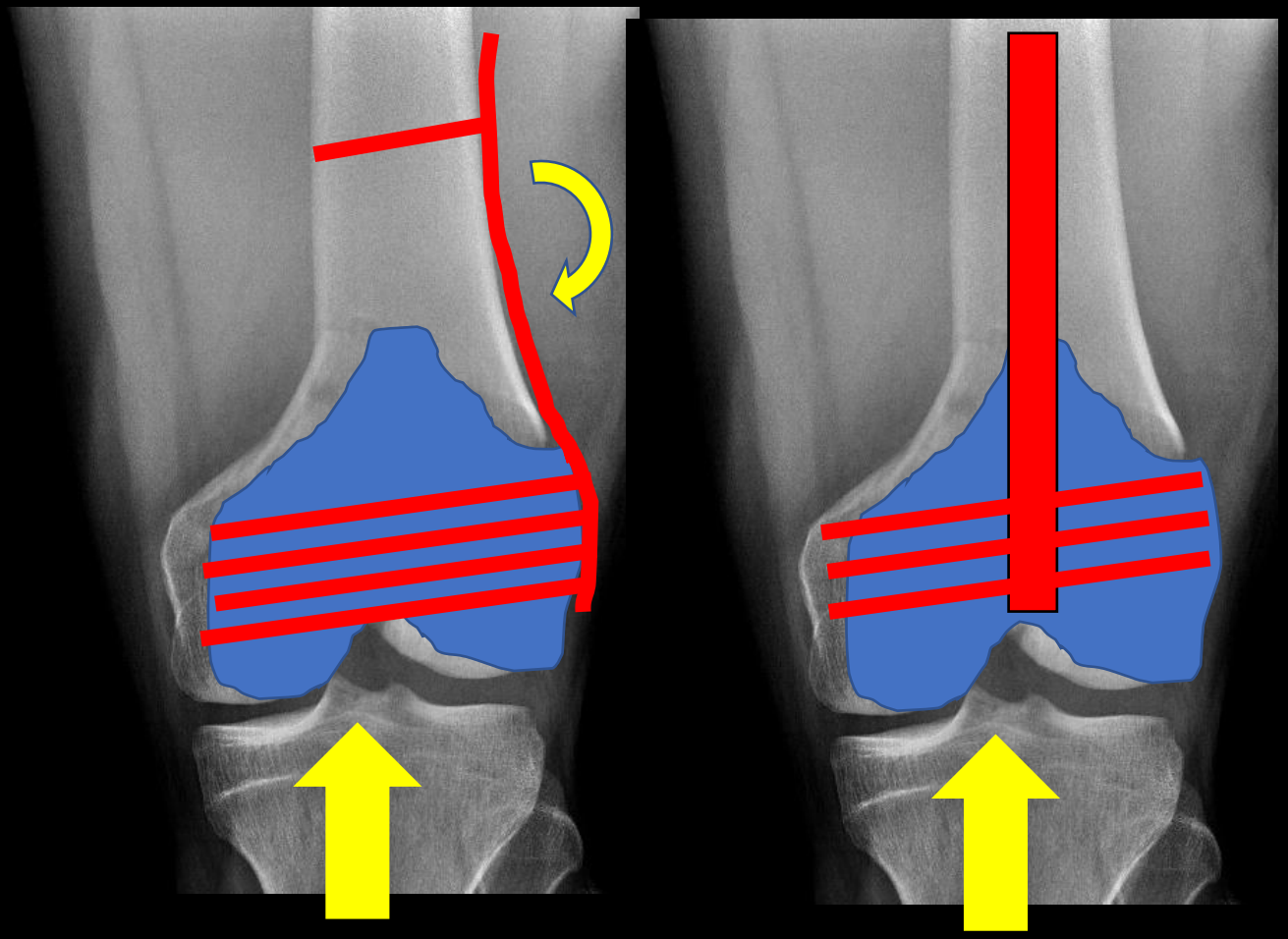

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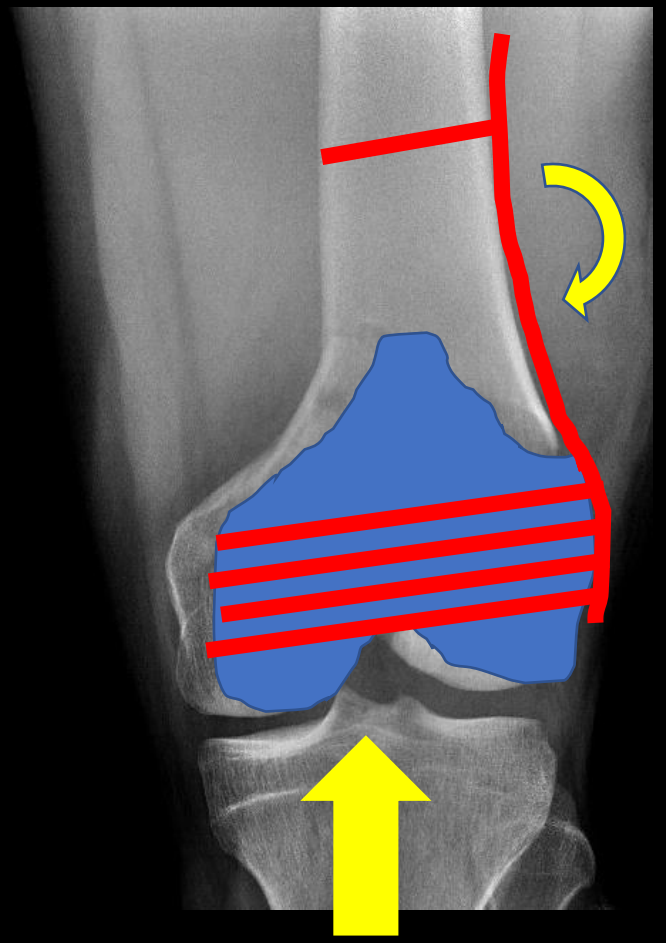
→Propensity for nonunion +/- plate breakage



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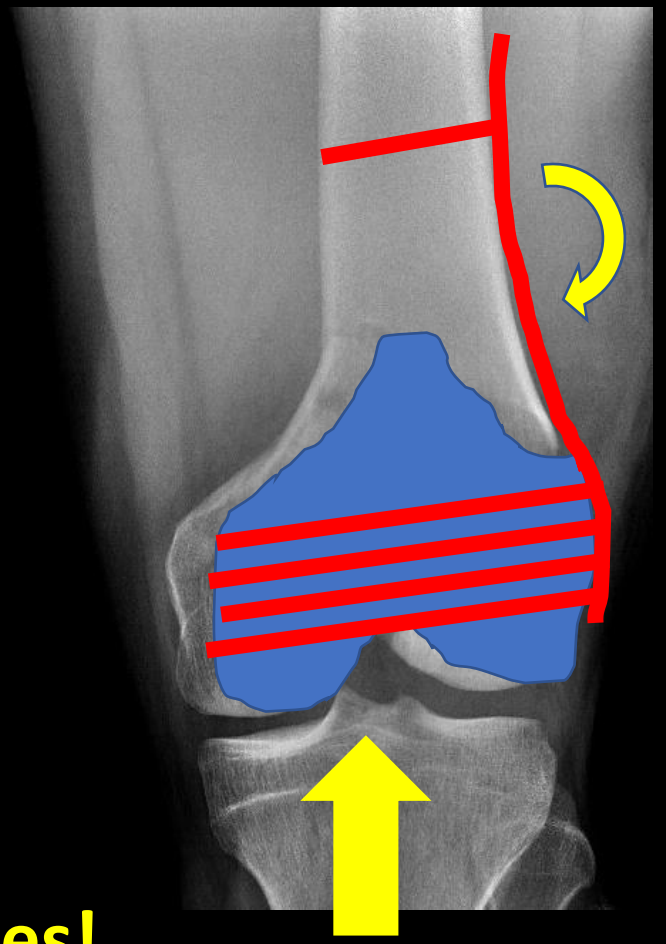


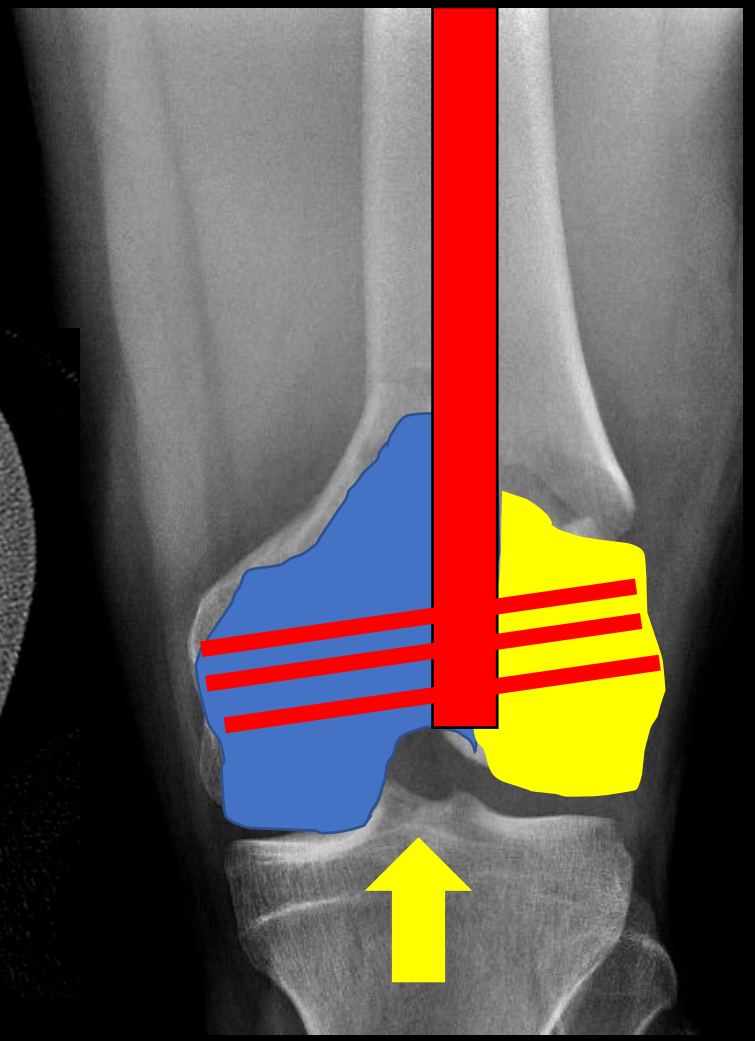
Failure rates 18-25% in modern series!

Ideal Case: Plate

- Intra-articular displacement
- B-type fractures
- Some periprosthetic fractures
- Very distal

Intra-articular displacement

- Less ”traffic” for lag screws
- Better fixation individual condyles



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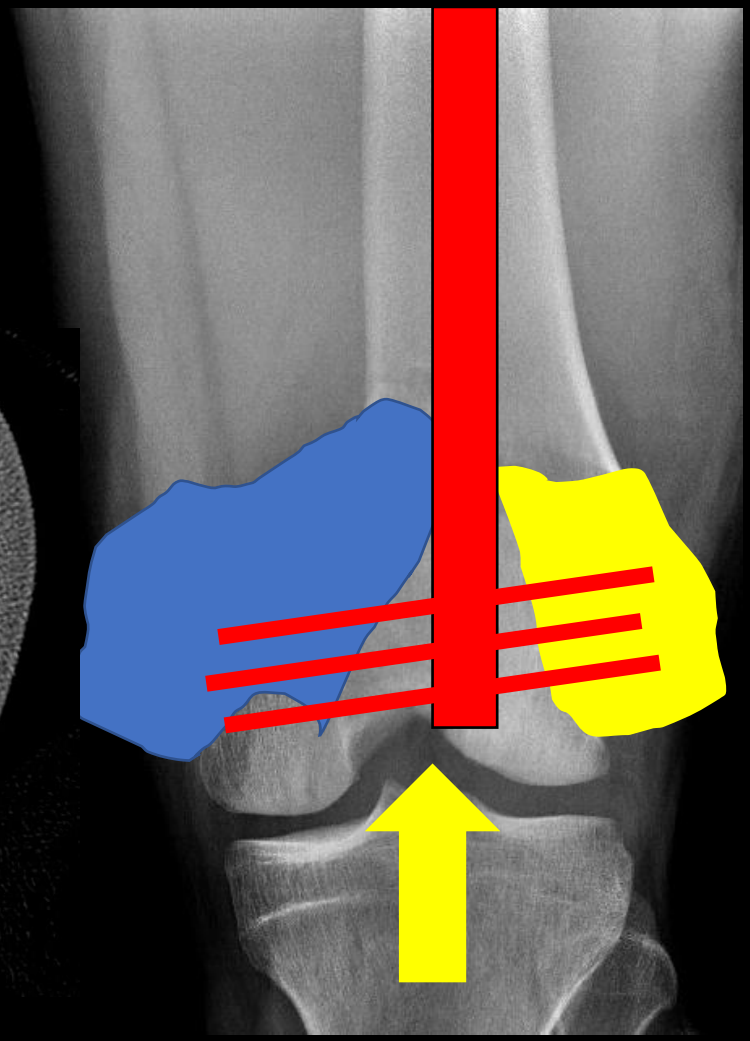

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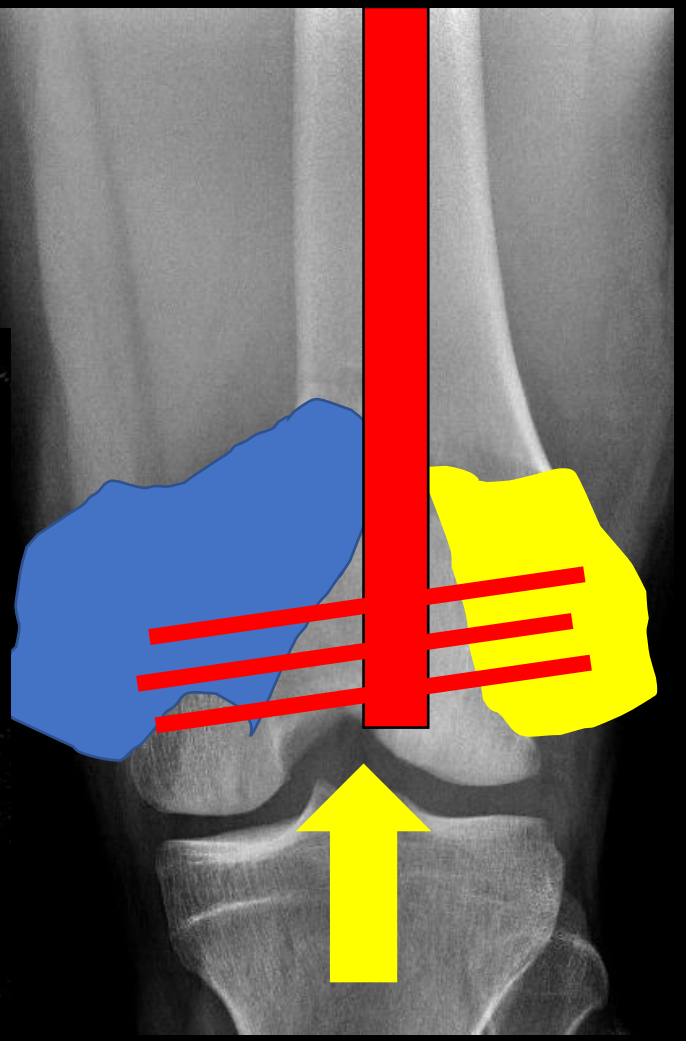
→PLATE



IMN failure in intra-articular fracture

From Miller et al. Cereus, 2002

B-type fracture pattern

- B = Buttress plate
- Apply plate over apex
- No benefit to nailing

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→PLATE

Periprosthetic Fractures

- TKA
  - Must know specific design
  - Is notch compatible with nail?

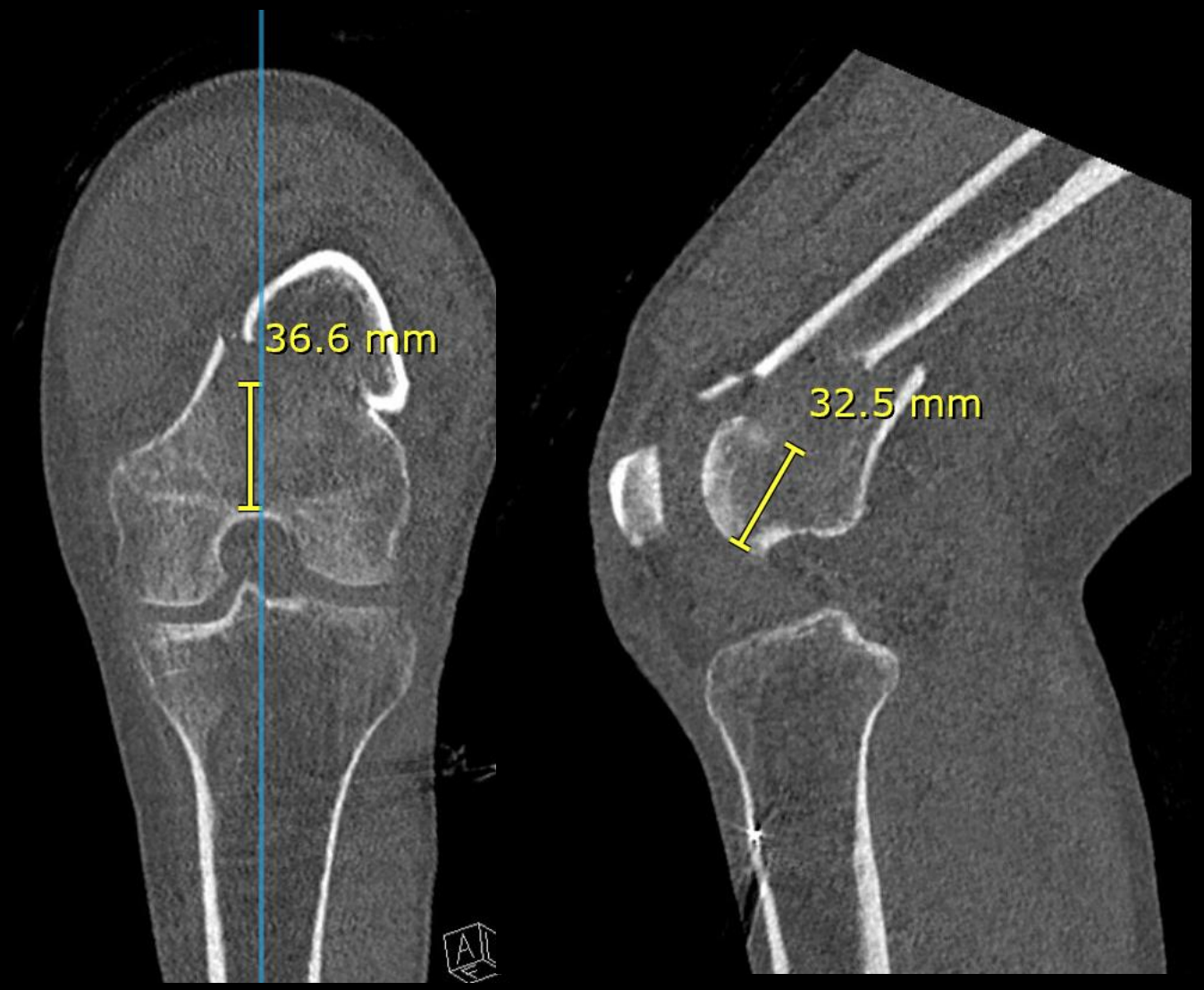
Thompson SM, Lindisfarne EAO, Bradley N, Solan M. Periprosthetic Supracondylar Femoral Fractures Above a Total Knee Replacement: Compatibility Guide for Fixation With a Retrograde Intramedullary Nail. The Journal of Arthroplasty. 2014 Aug;29(8):1639–41.

- THA
  - Stems high risk for interprosthetic fx

Case: Closed box TKA

Distal Fractures

- Goal for IMN 3-4 multiplanar, interlocking screws
- Dependent on nail design
- Modern IMN ~3-4cm from notch



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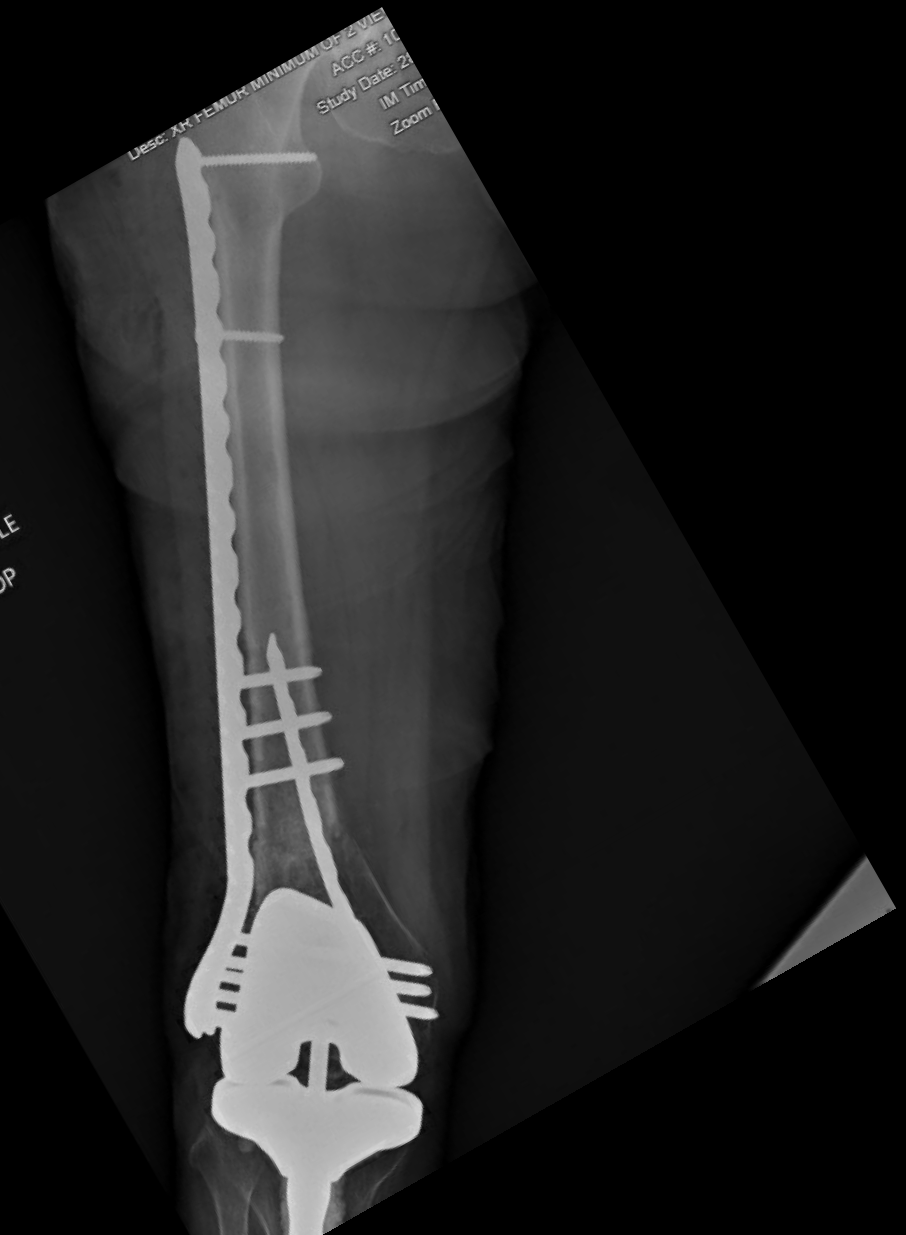
Ideal Case: ~~Plate~~ IMN

- ~~Intra-articular displacement~~ Extra-articular
- ~~B-type fractures~~ A-Type Fracture
- Some periprosthetic fractures
- ~~Too distal~~ Not too distal

Combined implants



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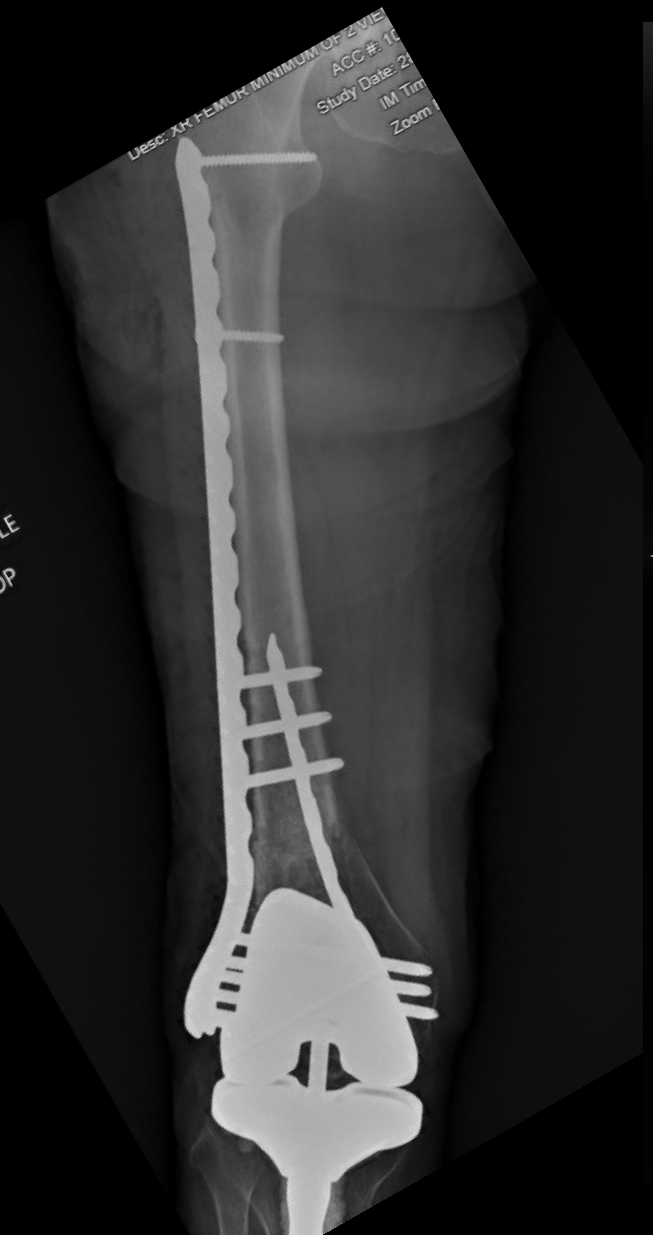

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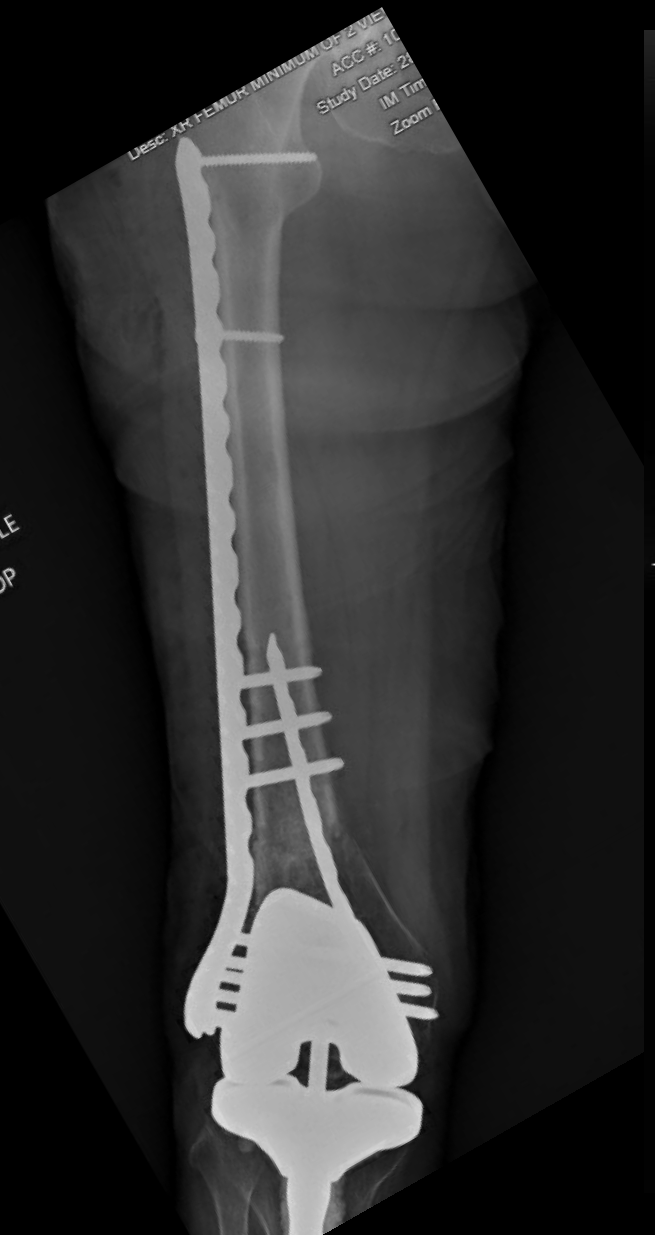

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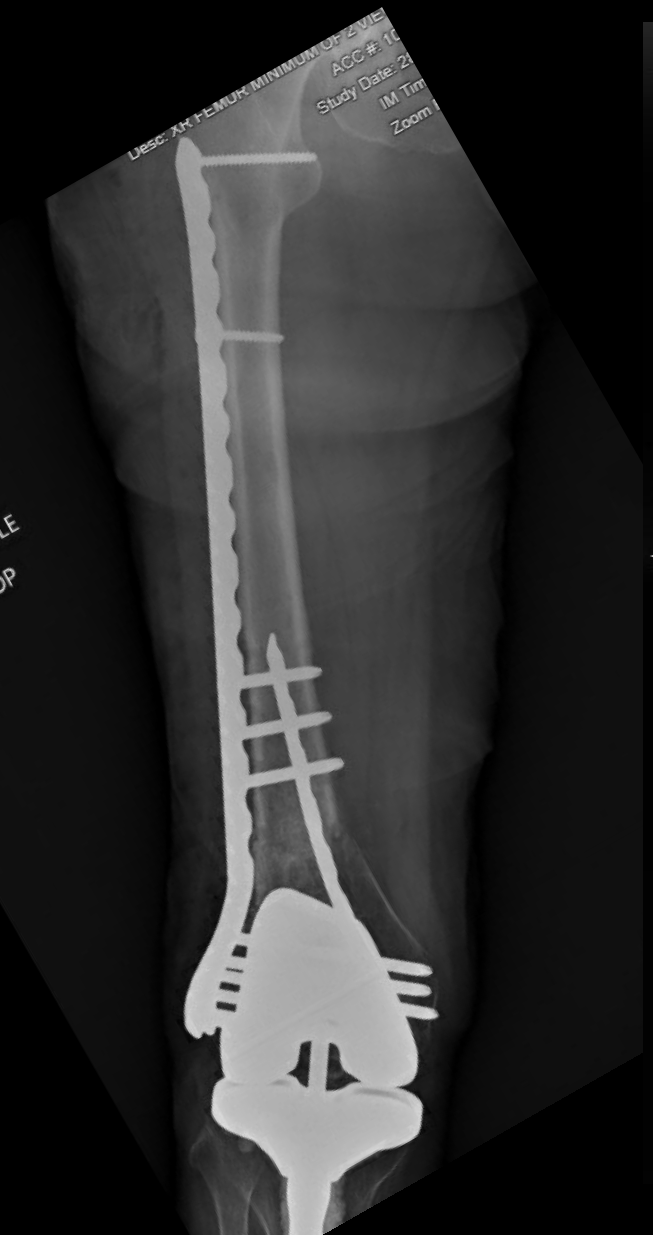

Indications for Combined Implants

- Nonunion Repair
- High risk acute fracture
  - Example: open fracture + bone loss
- Geriatric for early weight bearing

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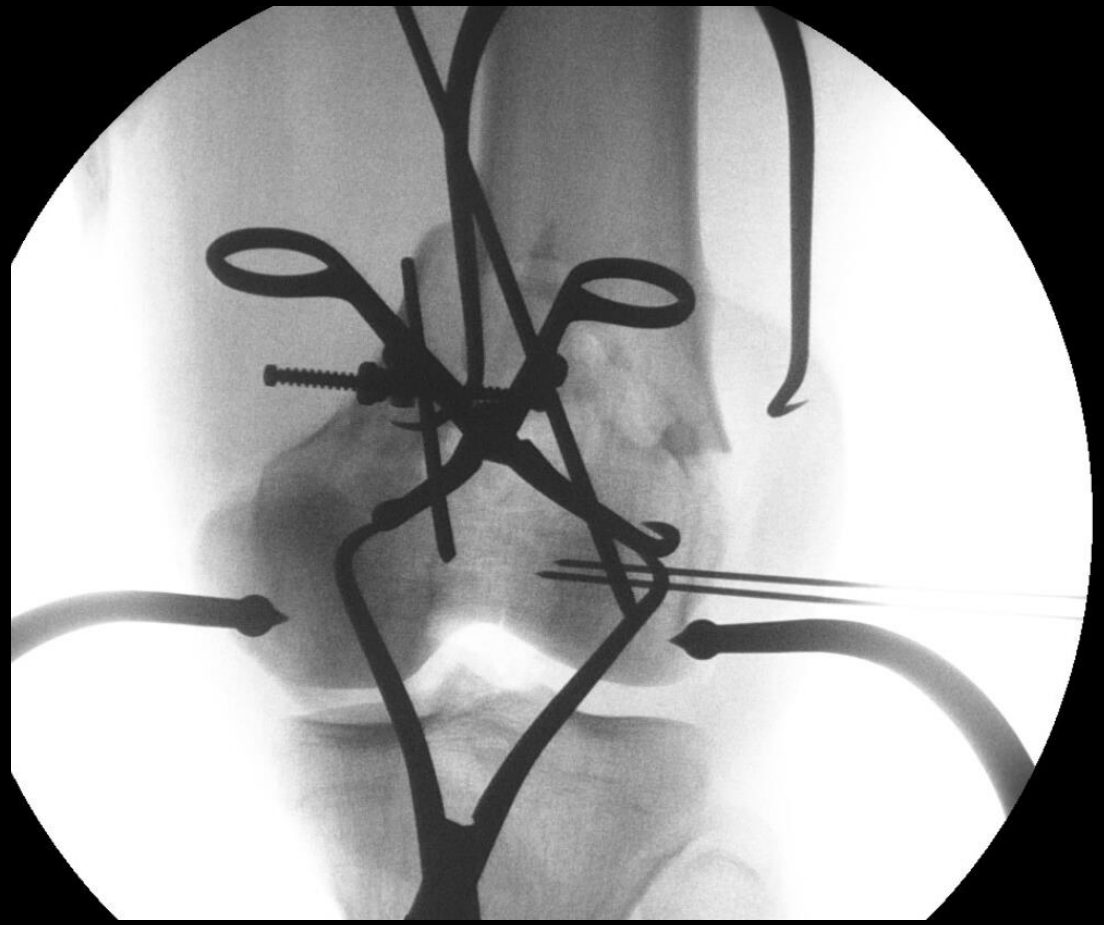
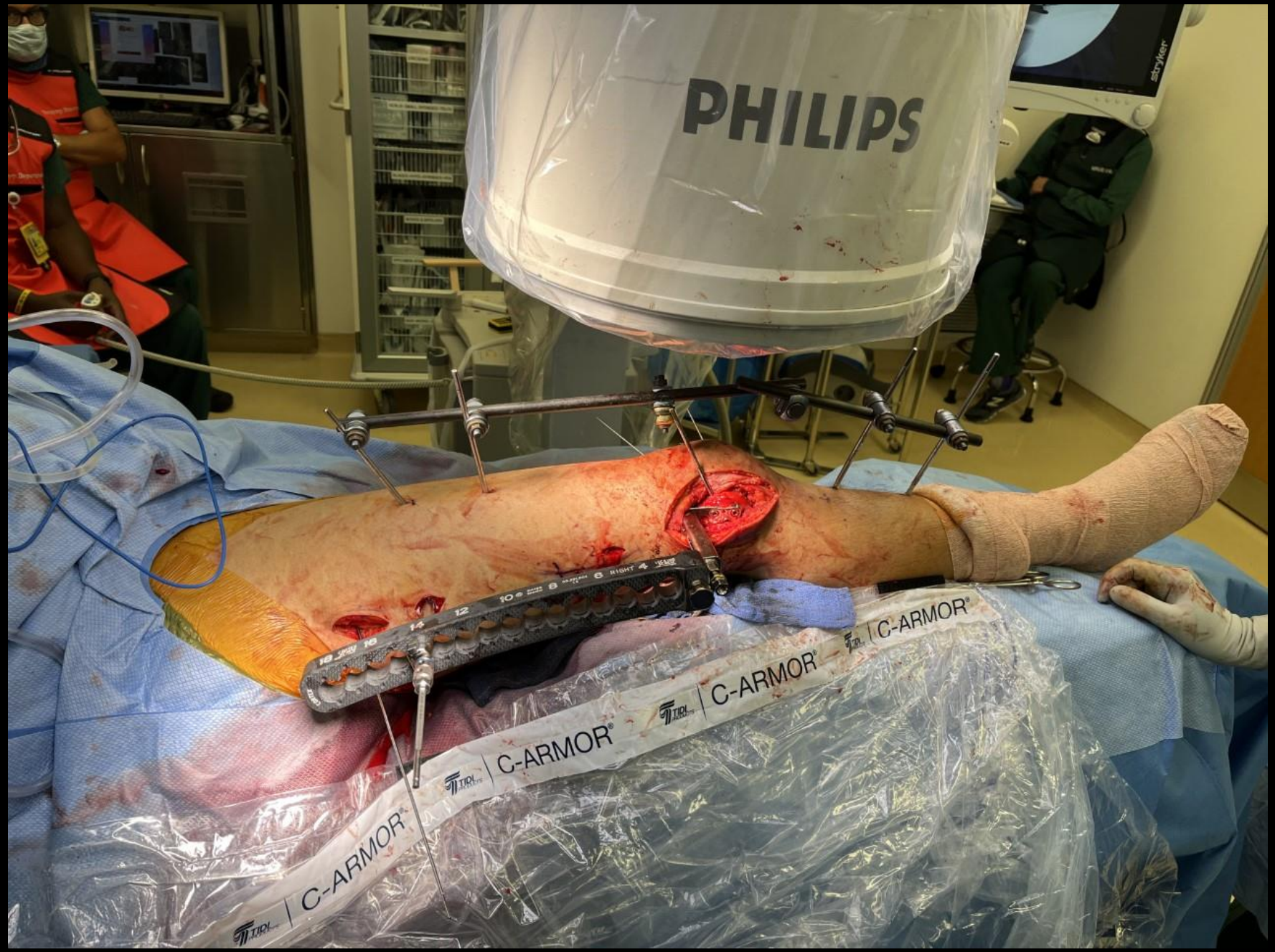
Disclaimer:
Hot topic but very little hard data to support these approaches

Case: 42yo M MVC intra-articular fracture

1. Articular reduction



2. Metaphyseal reduction (ex-fix assisted)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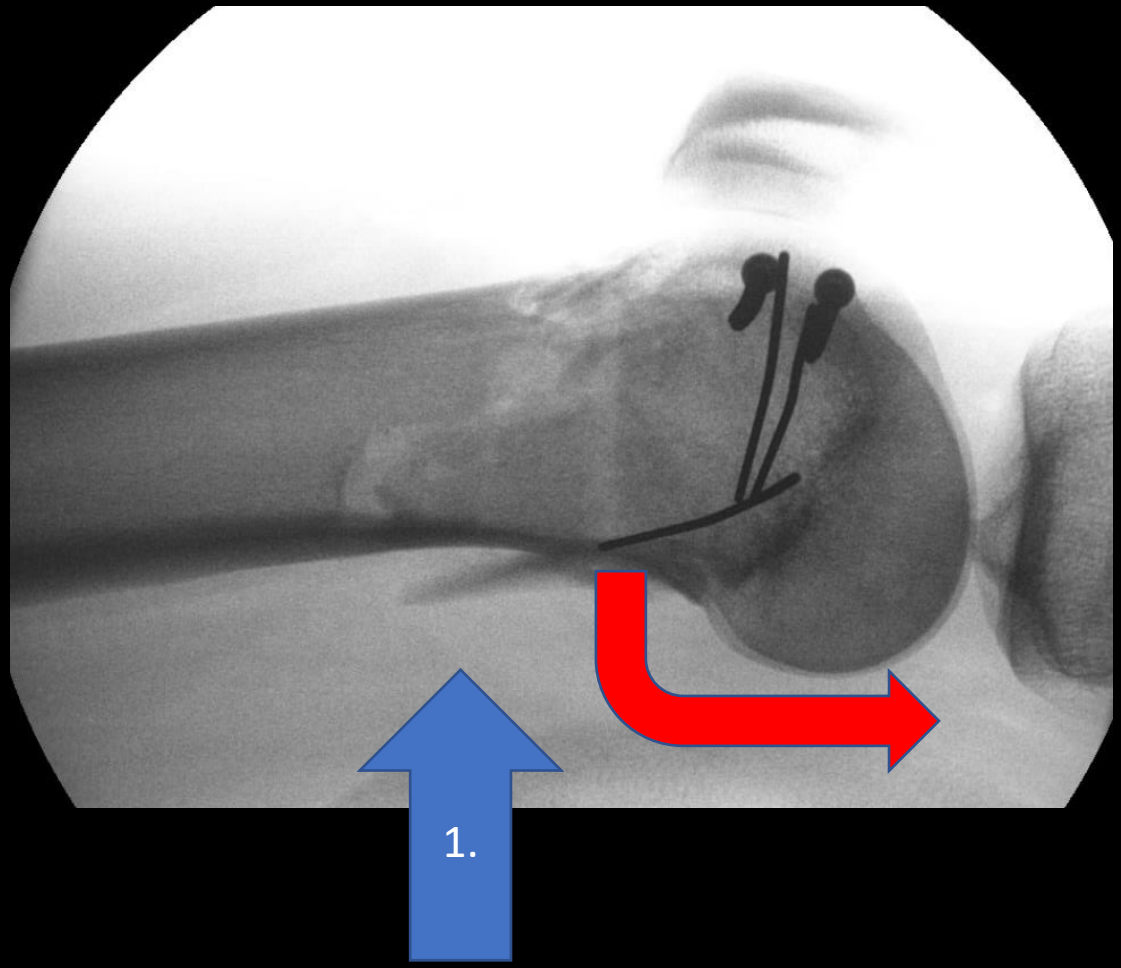

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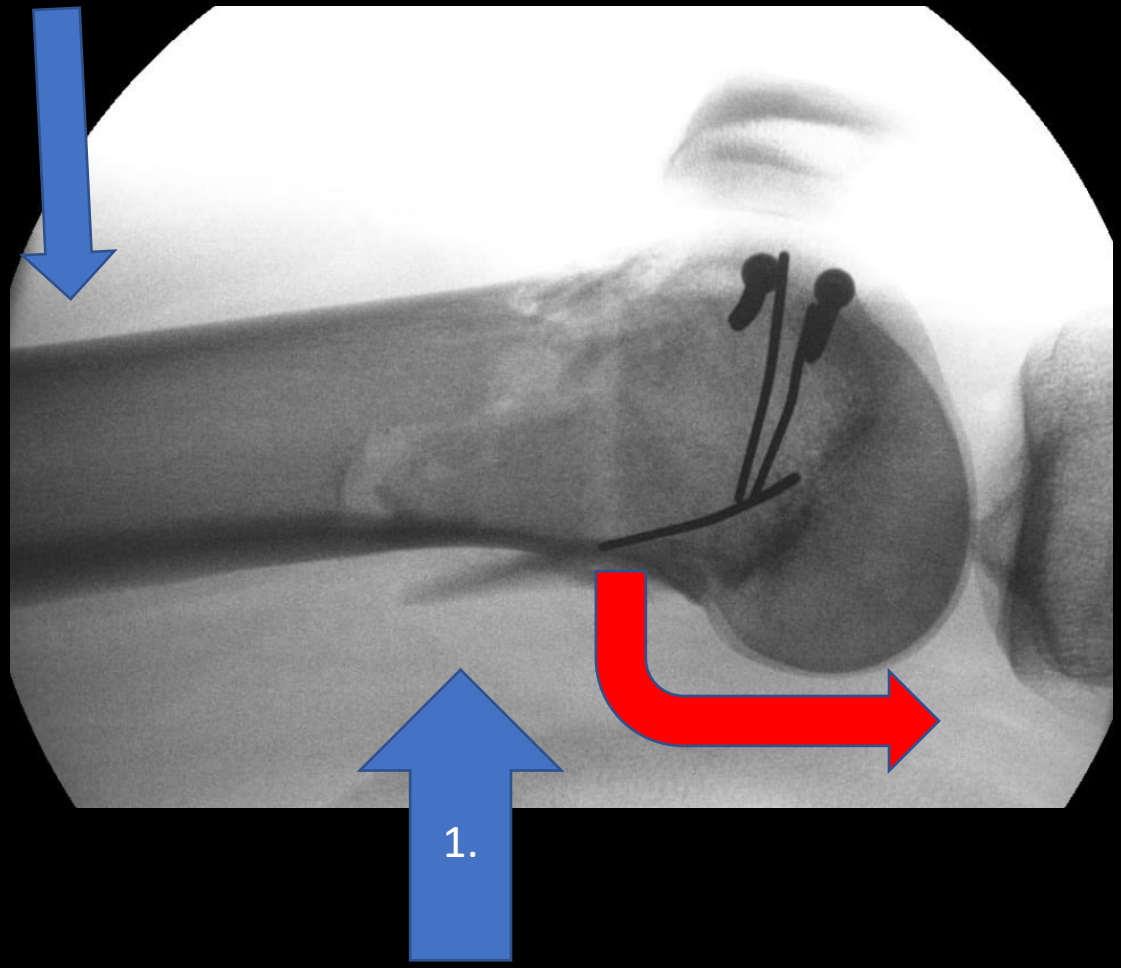

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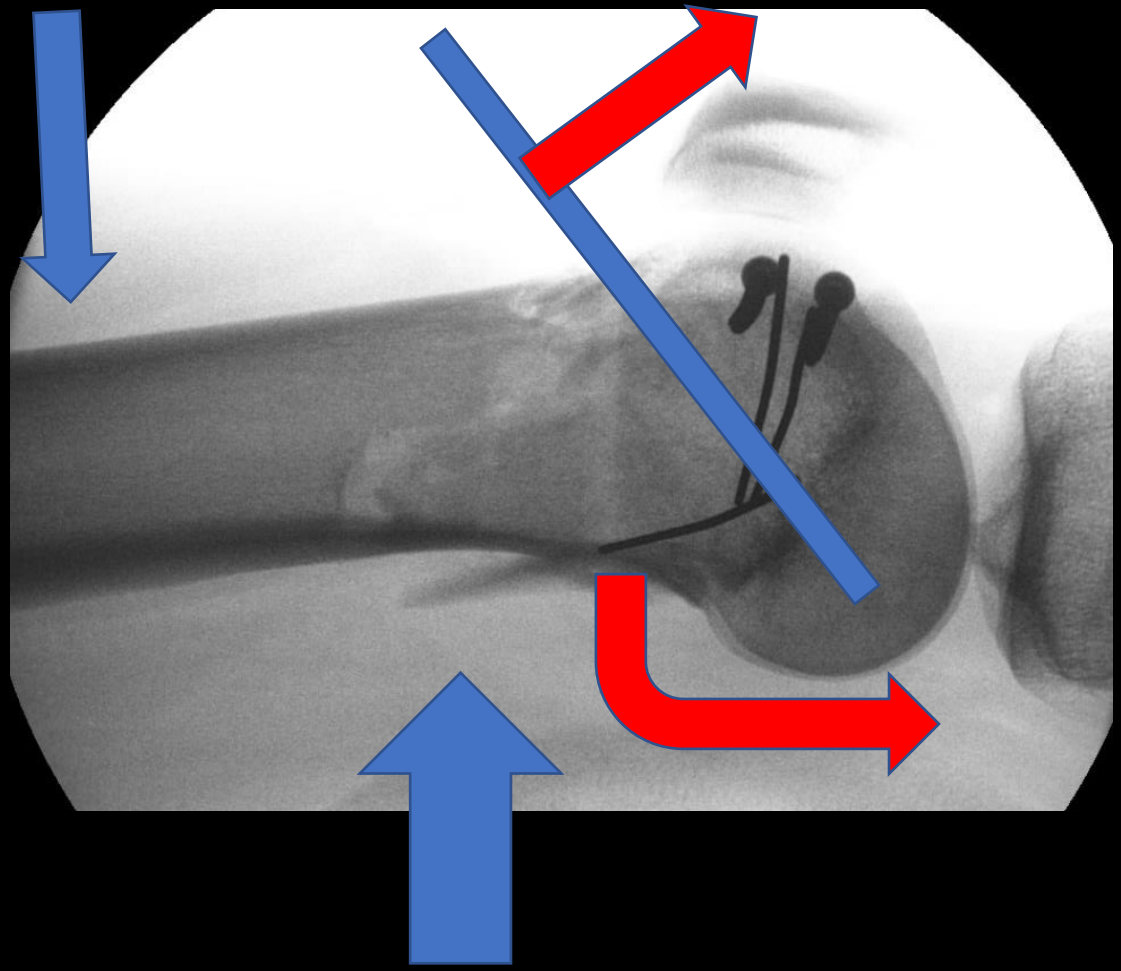

3. Metaphyseal fixation

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Case 2: 32yo M MCC extra-articular fracture


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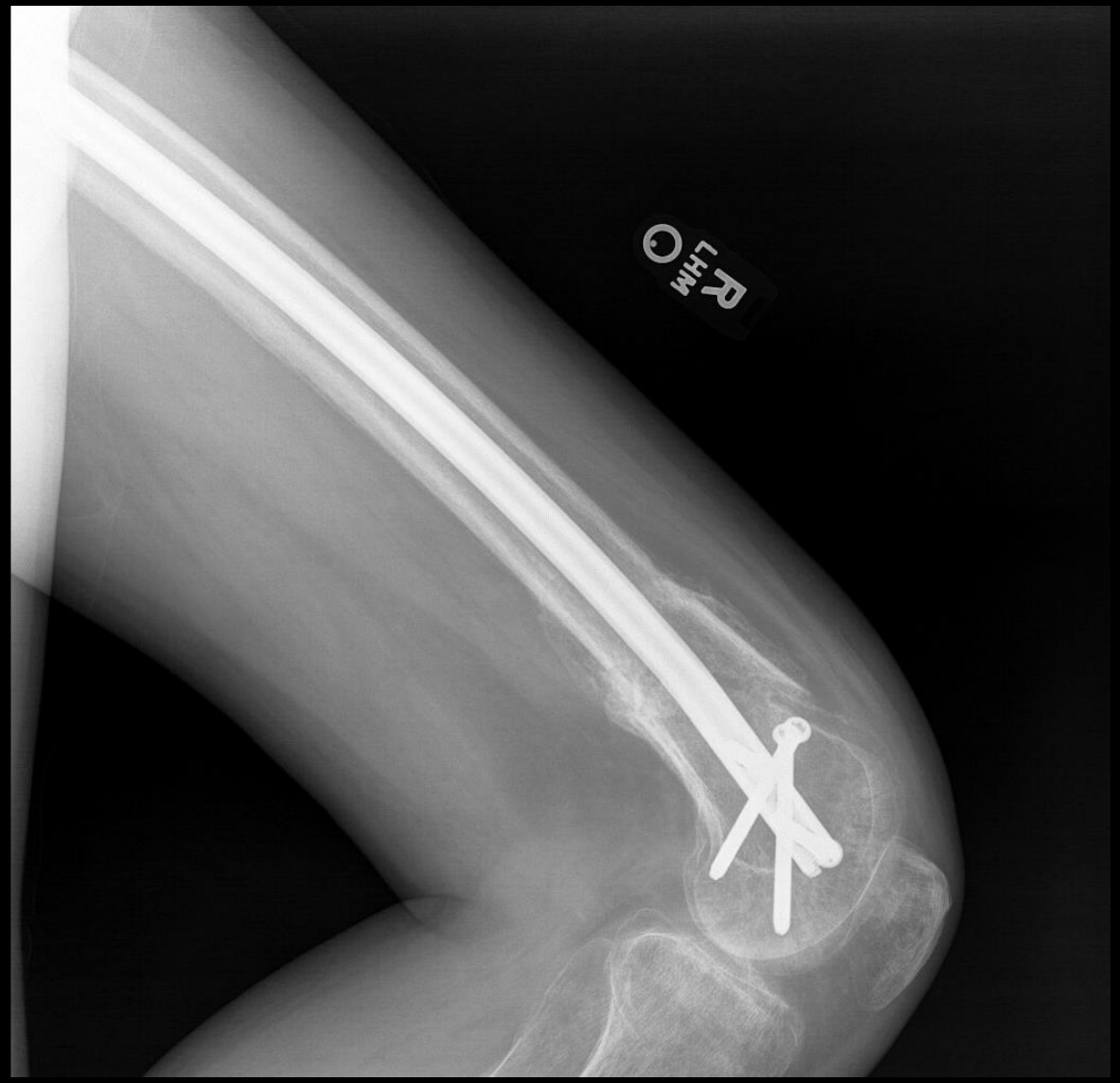
Follow up 4 months



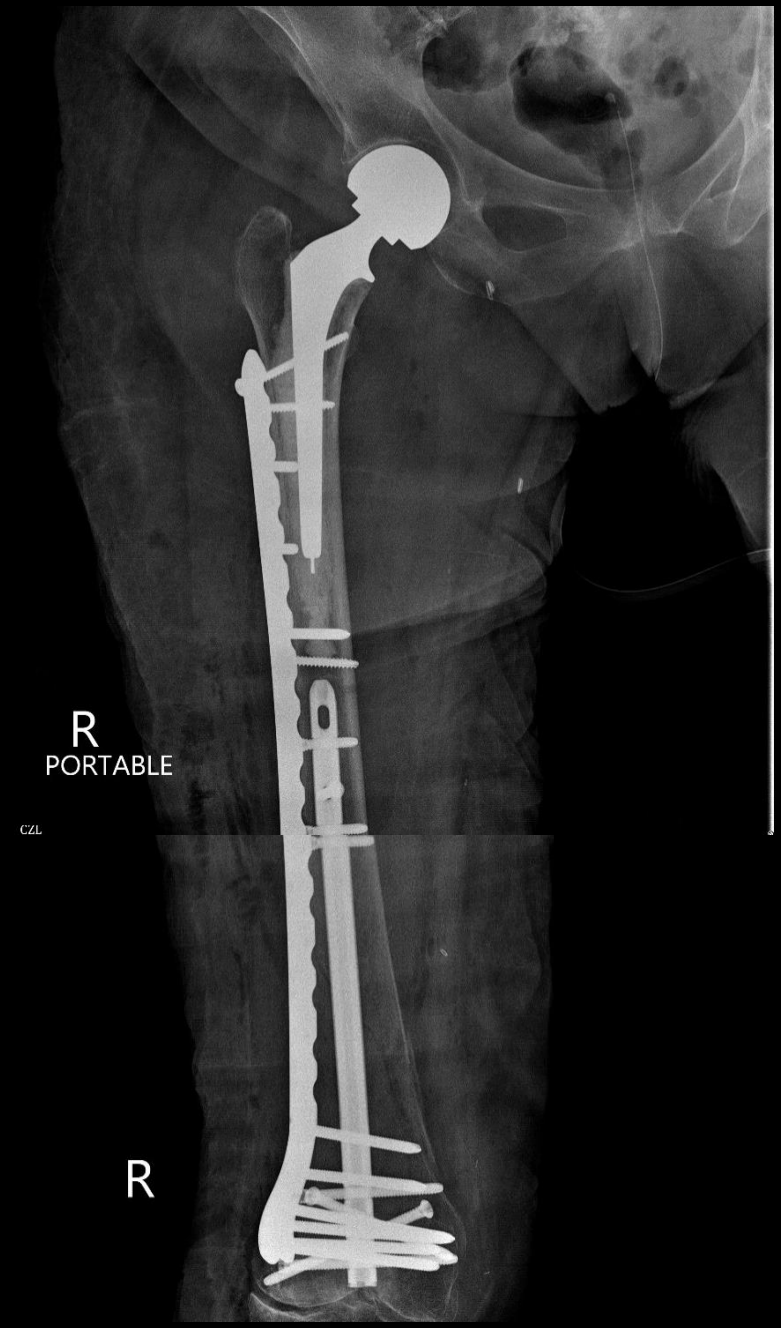
Case 3: 80yo F fracture below THA

Nail plate

- Weight bearing
- Femur protected

Take-home messages

- Distal femur failure rates remain high
  - Reduction
  - Respect soft-tissues
- Plates versus nail
  - Joint involvement, fx location
  - Periprosthetic
- Consider combined implants (plate nail)
  - Complex cases
  - Geriatric for WB



Thank you!

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