Arthroplasty Course 2023

Periprosthetic Fxs:
Hip

Utku KANDEMIR, MD

Professor

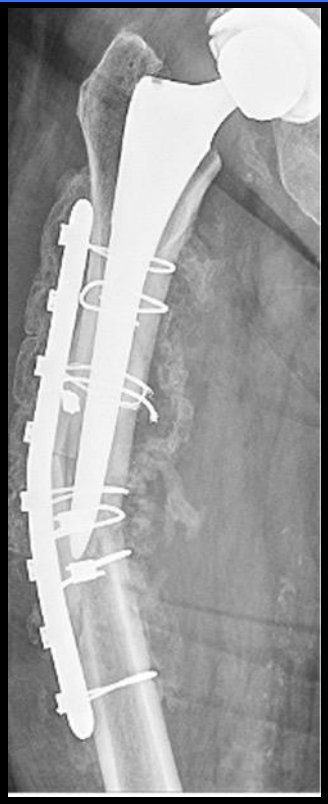
Dept of Orthopaedic Surgery

University of California, San Francisco

Orthopaedic Trauma Institute
UCSF + SAN FRANCISCO GENERAL HOSPITAL







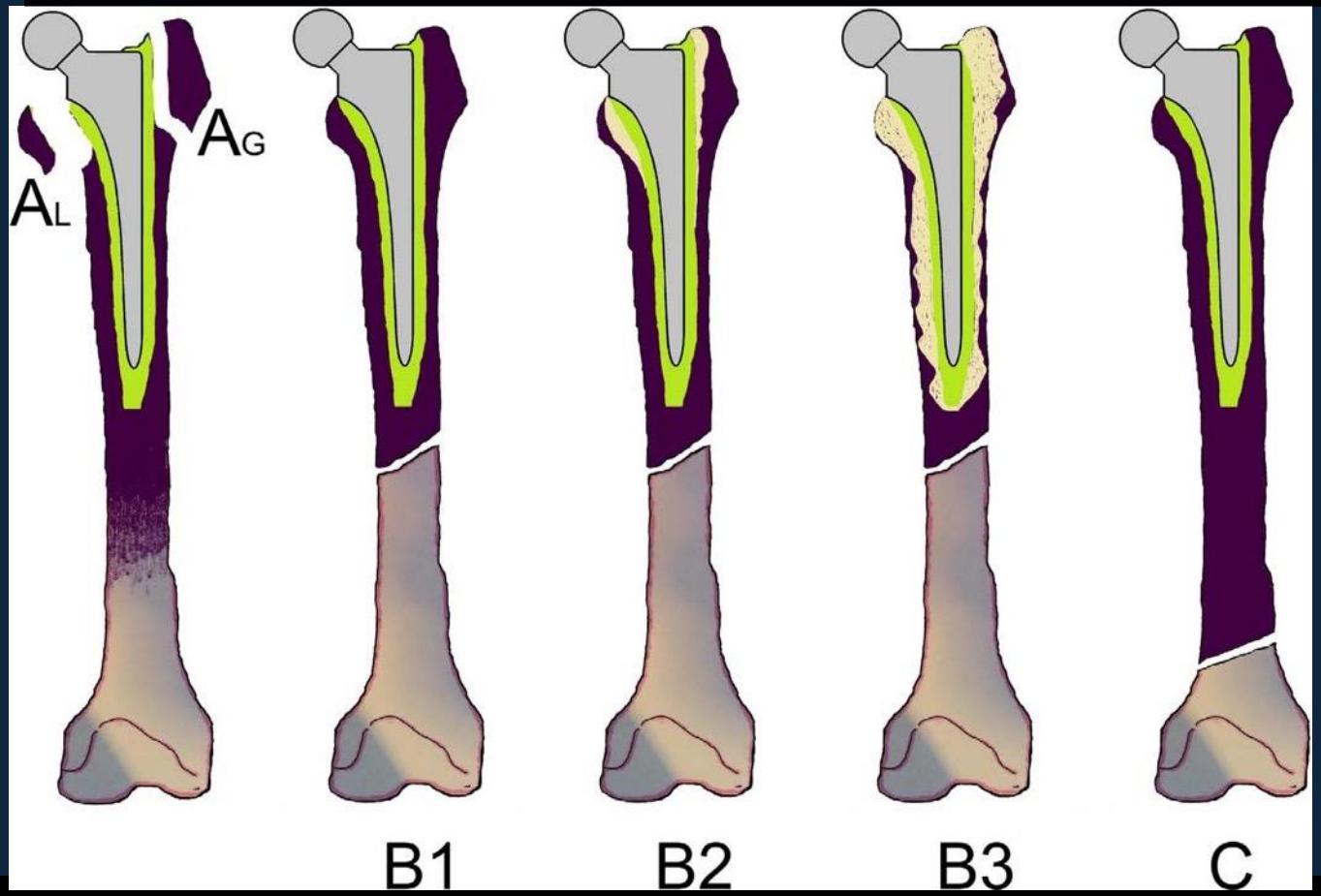

Questions

- How to know if the stem loose or not?
- How to Fix?
- MIPO vs ORIF?
- When to use an allograft strut?
- Are cables necessary?

Vancouver classification of hip periprosthetic fractures

Vancouver classification relies on:

1. The level of the fracture
2. If the prosthesis is stable or not
3. the quality of the bone



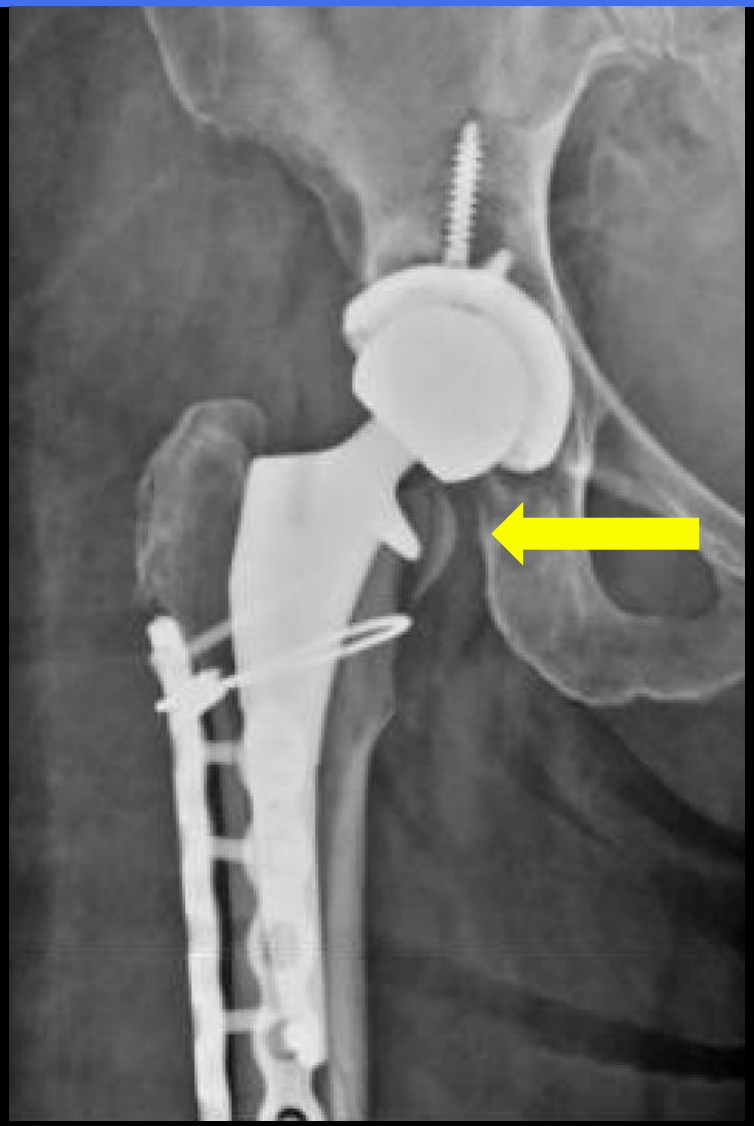
Hip periprosthetic fractures	
Type A	Peritrochanteric fractures
	AG: greater trochanter
	AL: lesser trochanter
Type B	Around or just below the tip of the femoral stem
	B1: stable stem
	B2: loose stem
	B3: loose implant with substantial bone loss
Type C	fractures occur well below the implant

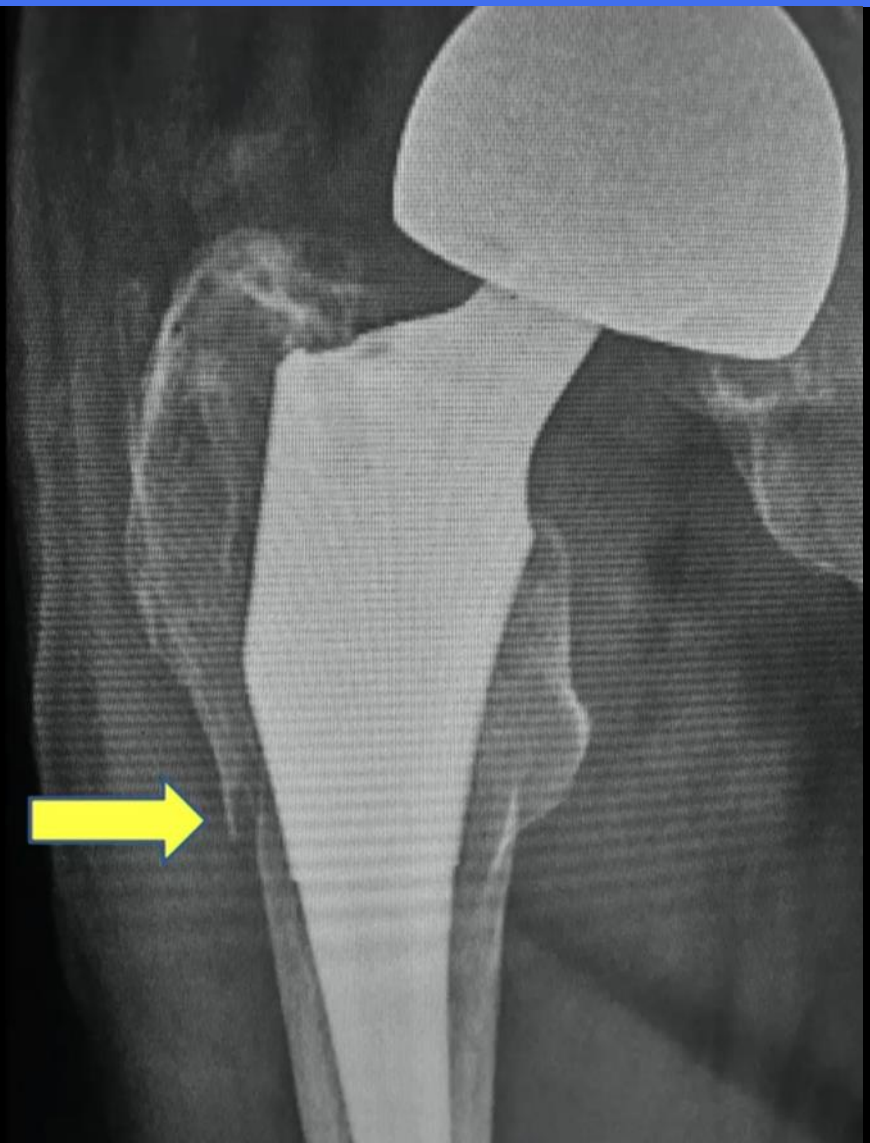
Treatment Goal

- Return to previous function
- Early Mobilization

- ***REDUCTION:*** Anatomic Alignment
- Fracture Union
- Stable Prosthesis

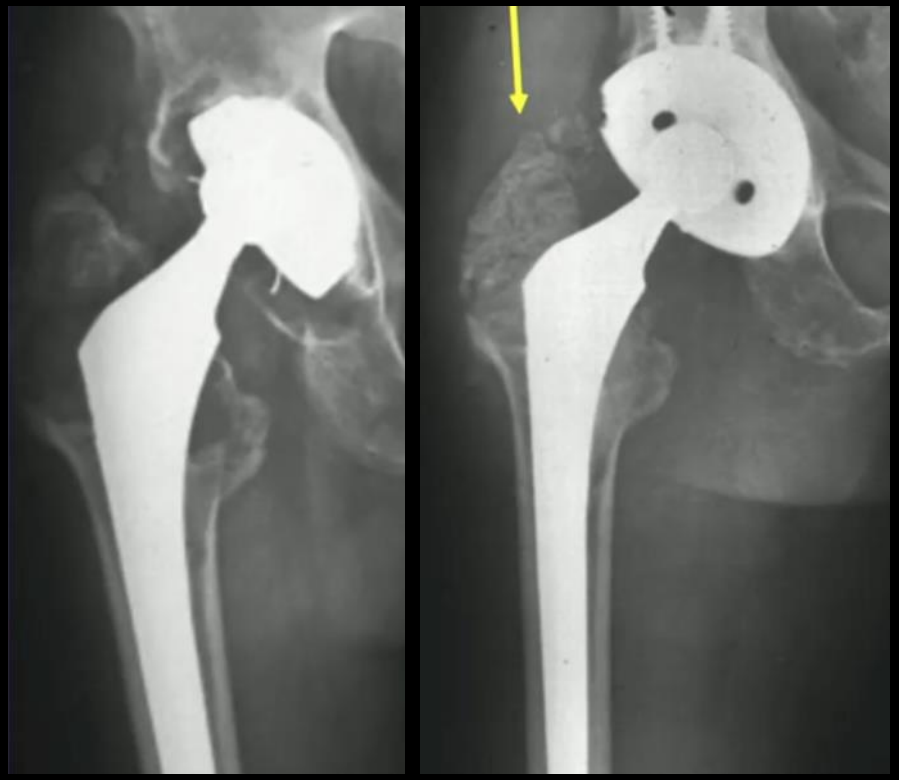
LT fx , GT fx

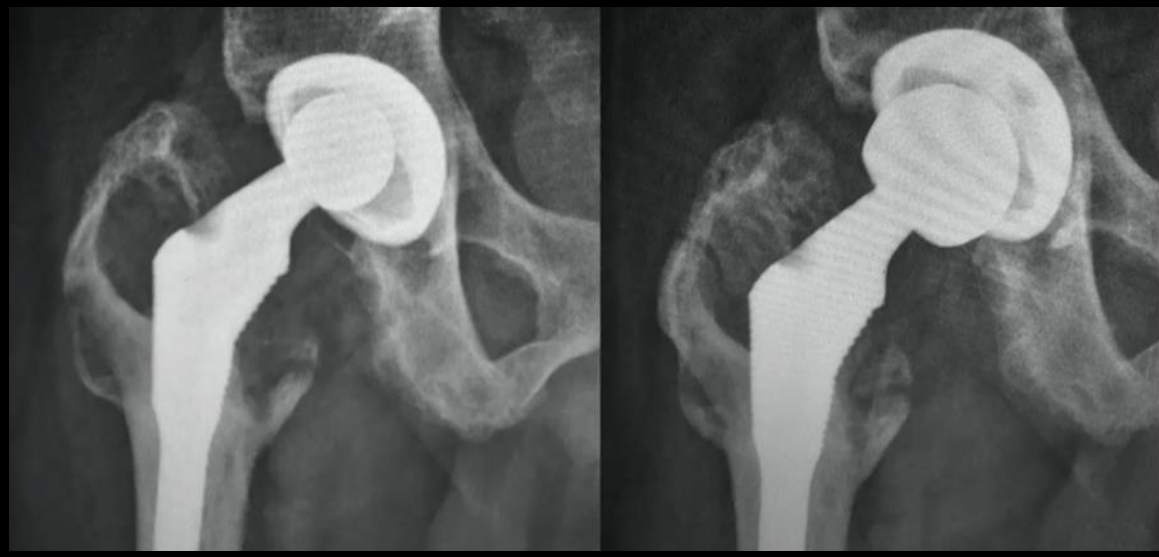




GT fx - Osteolysis

GT fx - Osteolysis

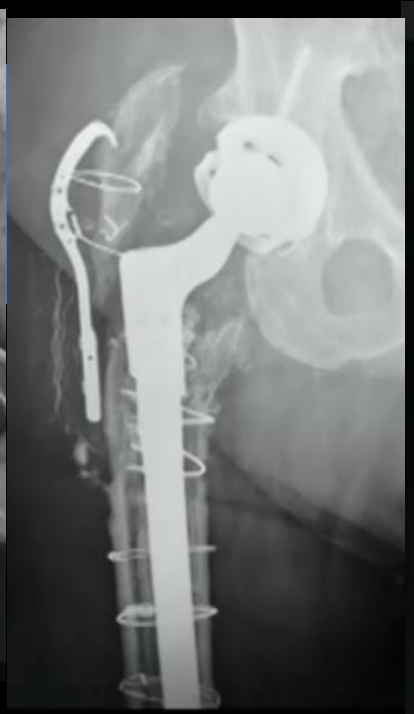
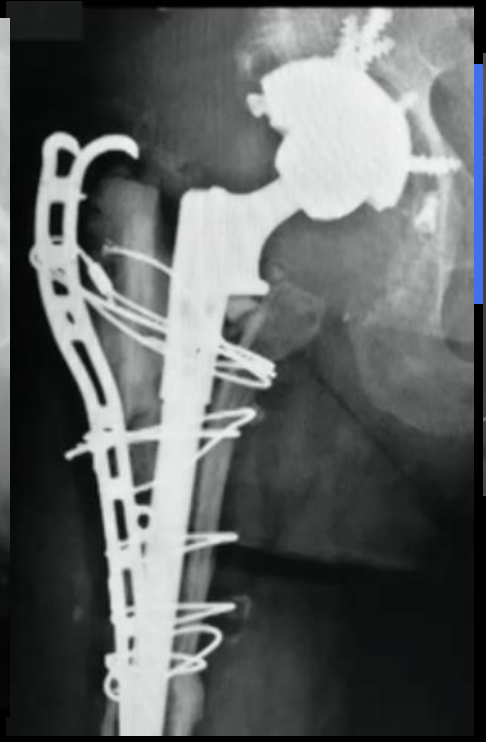





R


Cable-Grip
Cable-Plate

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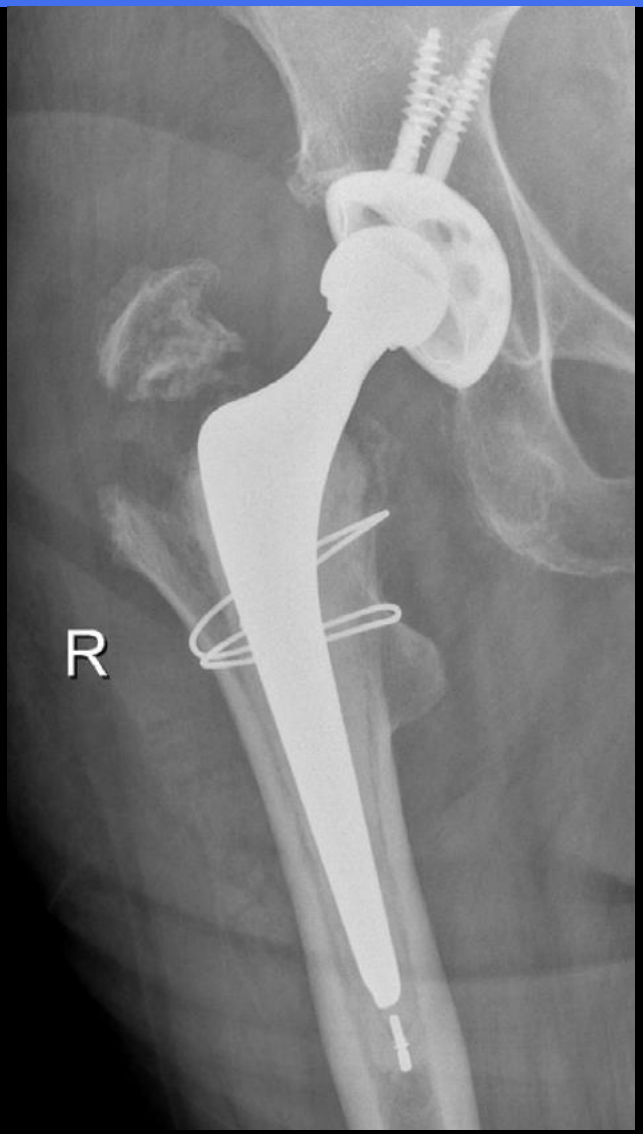
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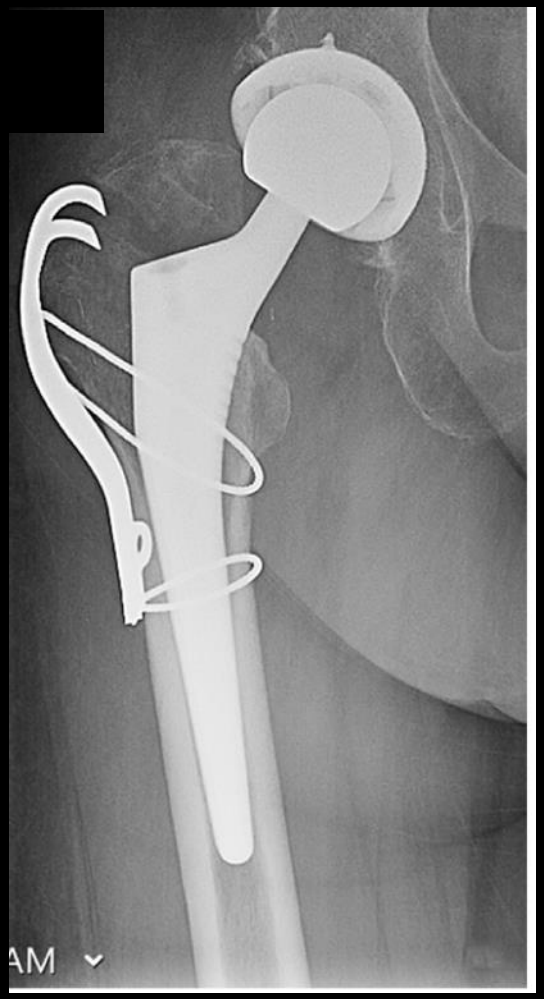
R

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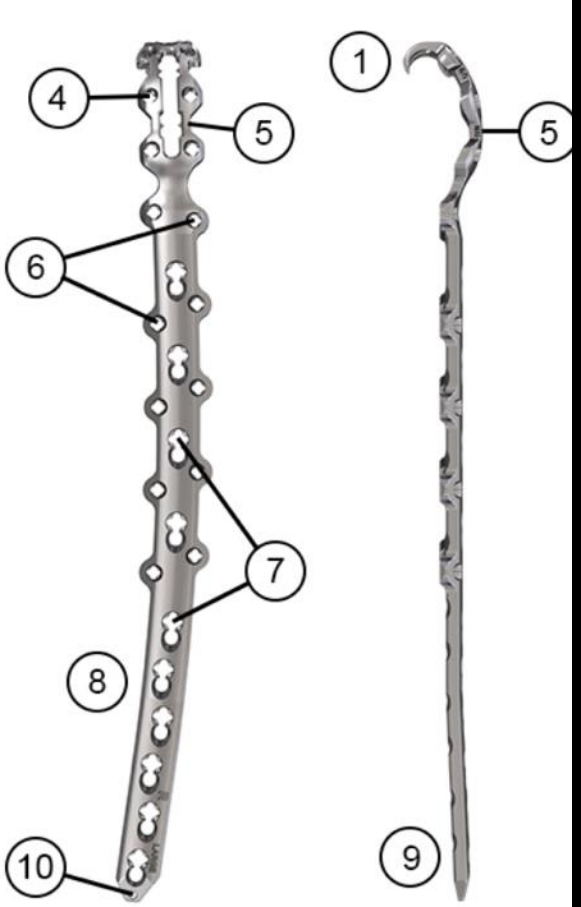
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5
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10
1
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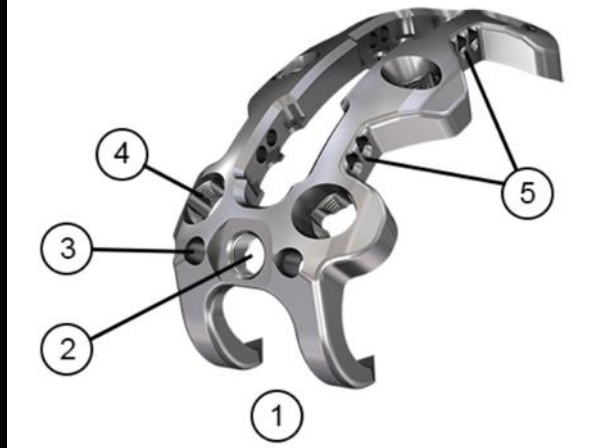
9


NEXT GENERATIO
CABLE-CLAW
LOCKING SCREW
PLATES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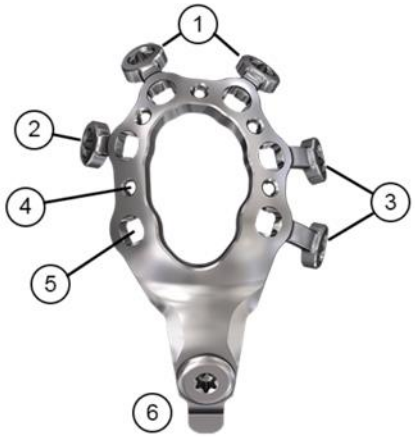
1
2
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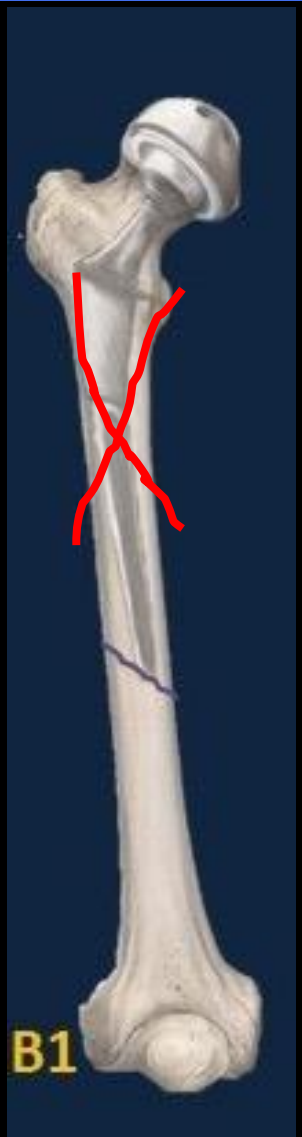
5
6


HUBE
MR

GT Fx

- Plate: Screw + Claw+ Cable

Critical Q: Stem ***Stable vs Loose***



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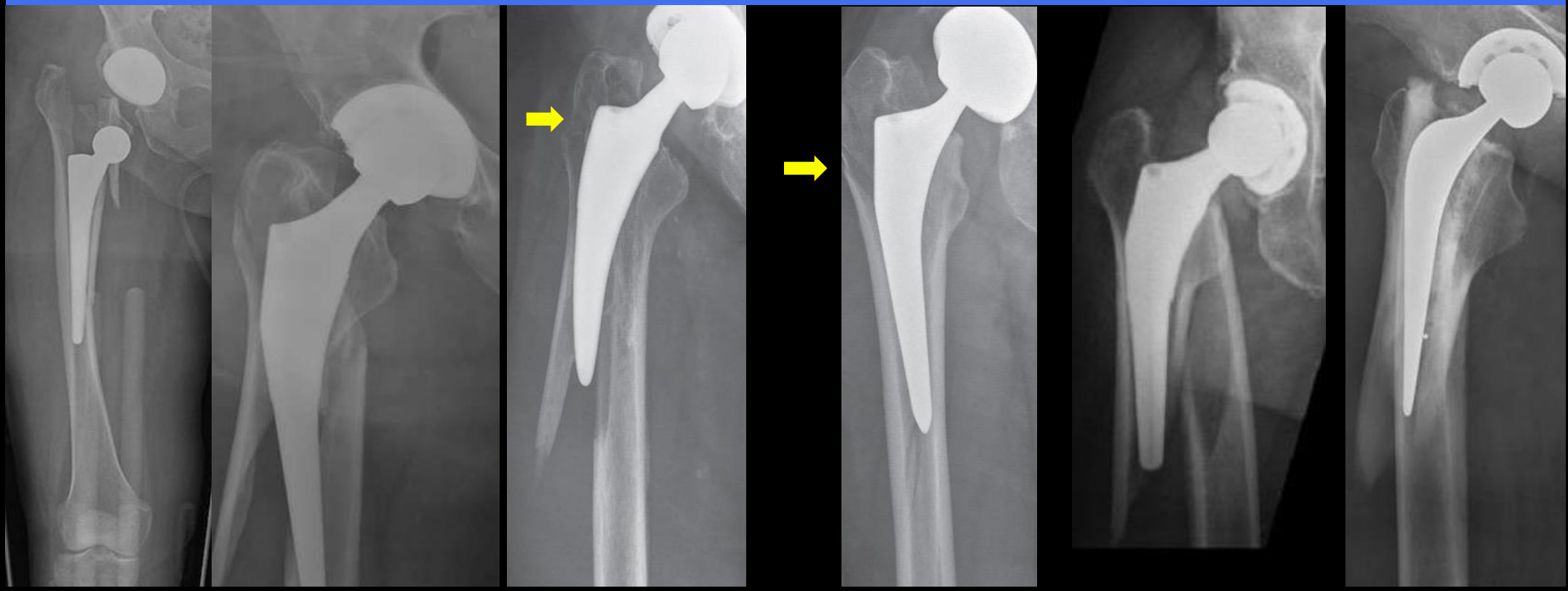
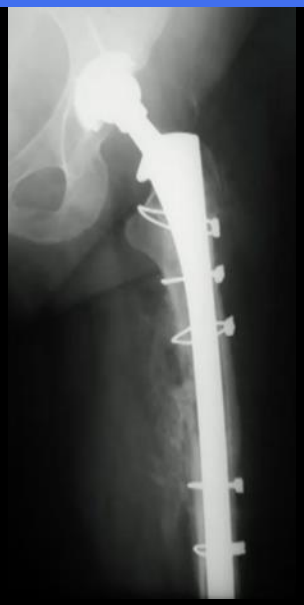
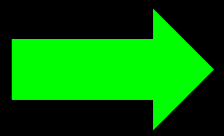


Stem Stability

Stem Loose: ***Revision***





B1: Stable Implant: ORIF

Stem: Stable vs Loose
How to check?

- Preinjury imaging – if available
  - Subsidence, haloes
- X-rays and CT scan
  - Implant bone interface proximally

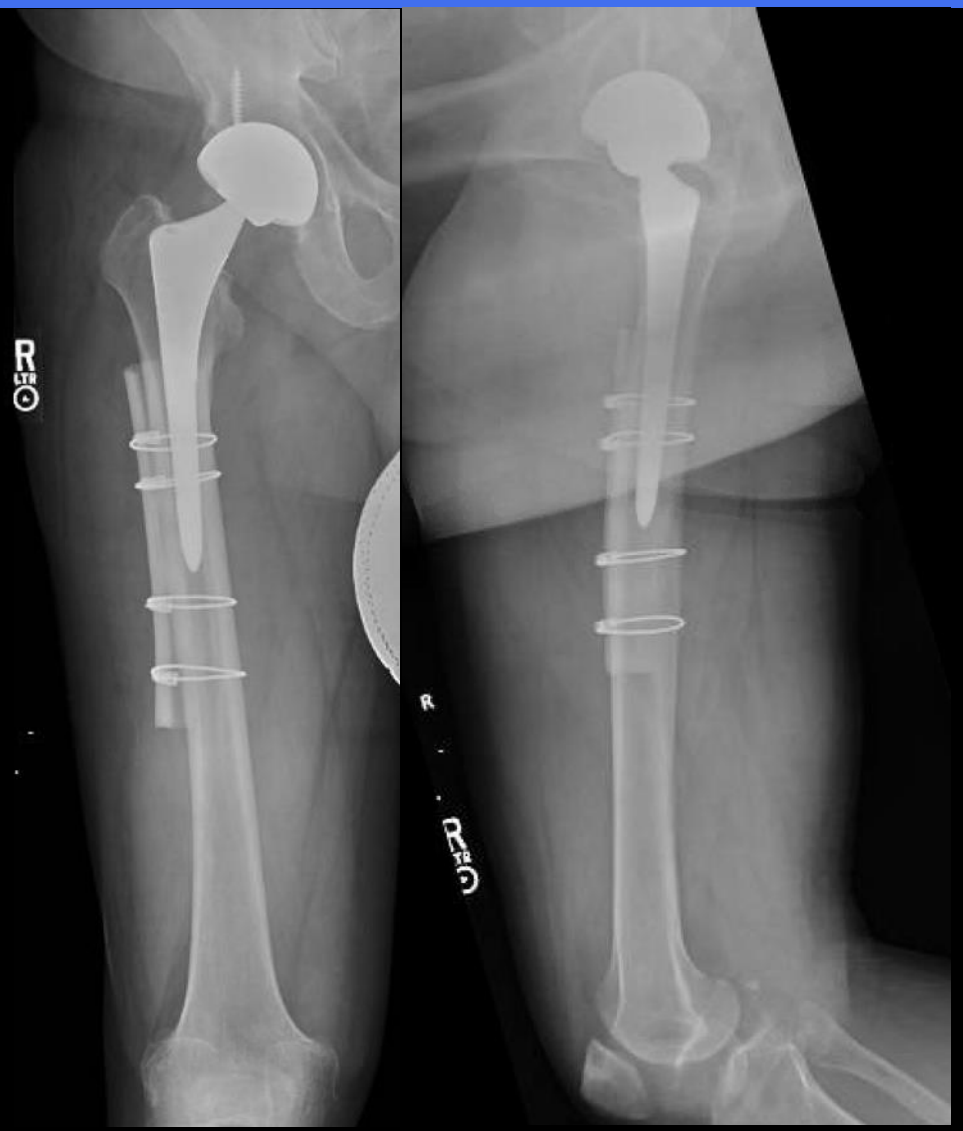
- Intraoperative
  - Through Fracture
  - Through ARTHROTOMY

Stem: Stable vs Loose: ***Implications***

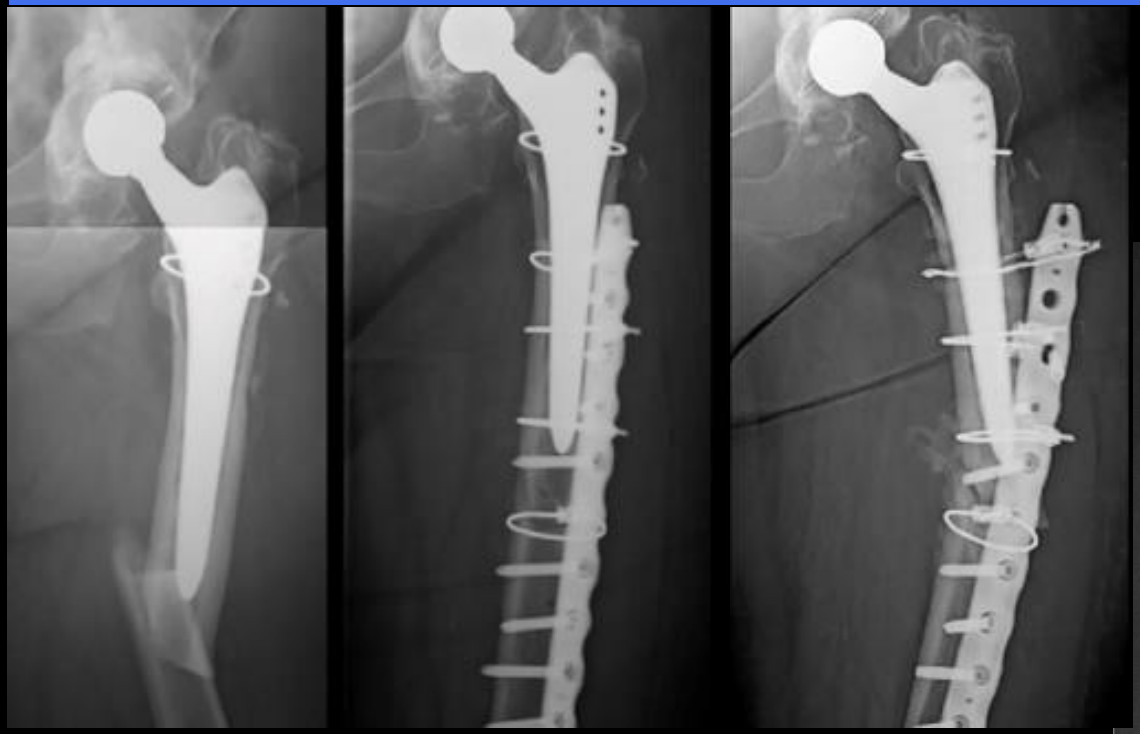
- ORIF vs Revision Arthroplasty + Fixation
- Planning:
  - Implants
  - Surgeon(s)
  - Positioning
  - *Plan B, Plan C*

Fixation / ORIF:

What you think?



Cable only fixation proximally



What you think?

- INADEQUATE proximal fixation
- SHORT construct

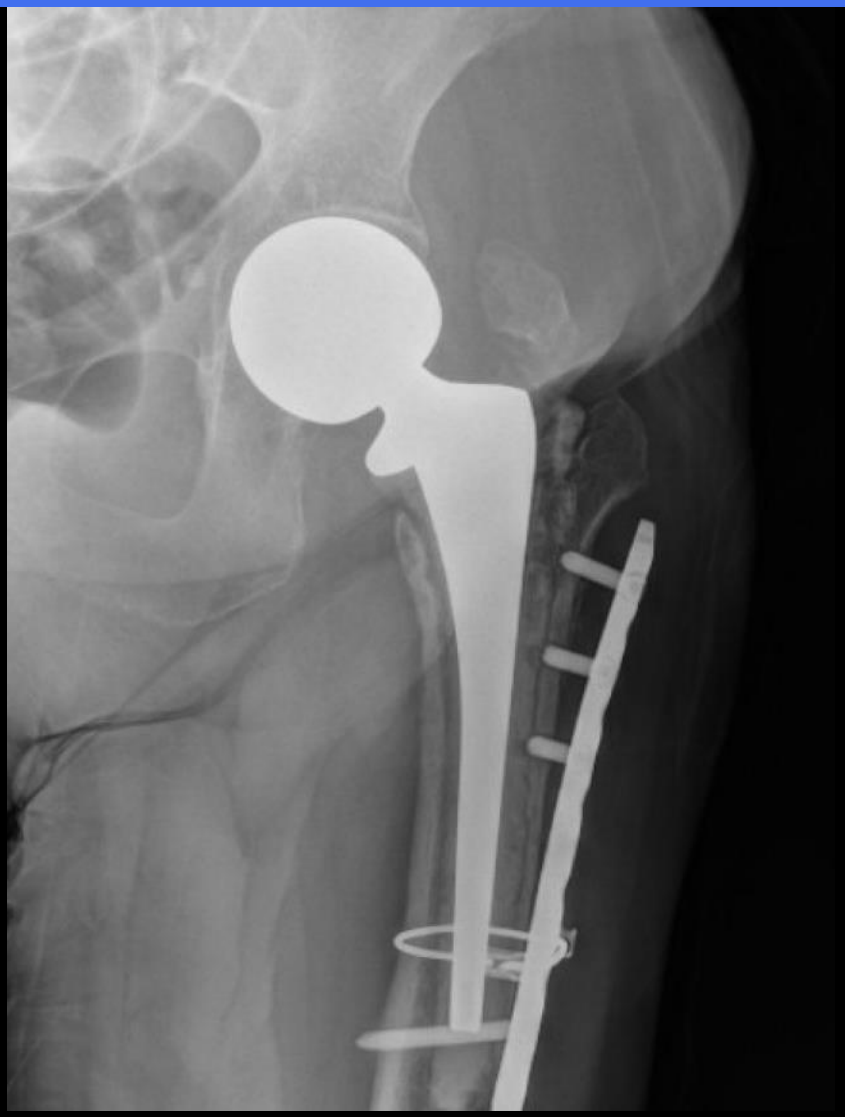
Around the Stem

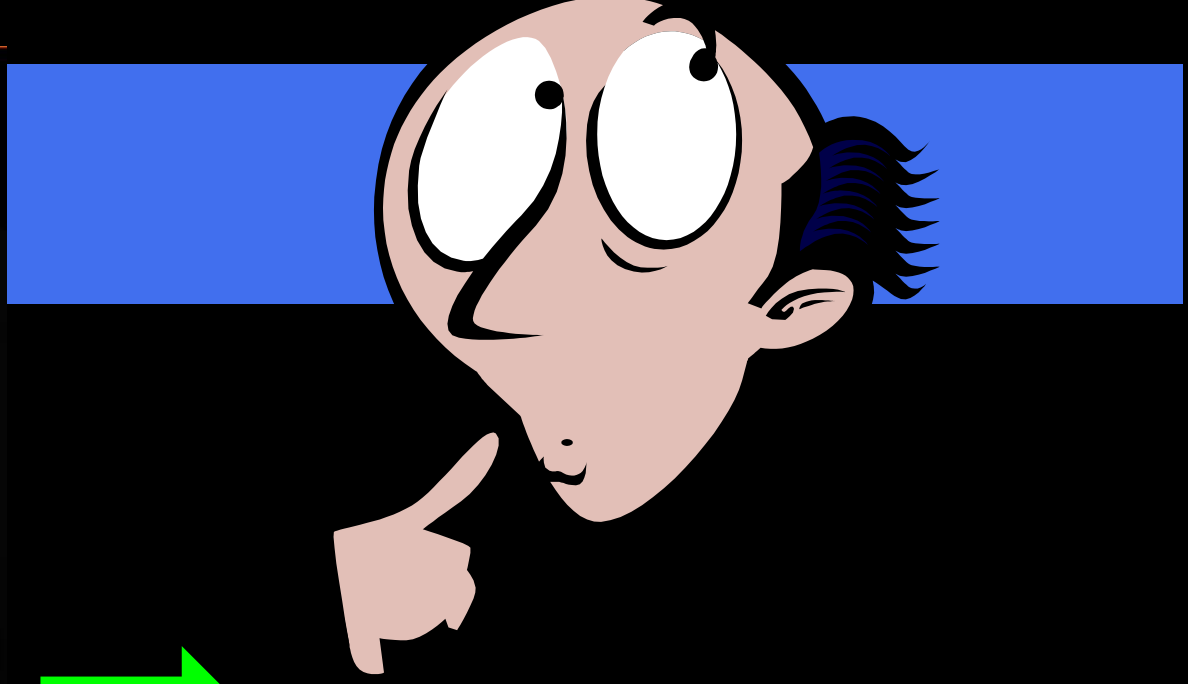
UNICORTICAL LOCKING SCREWS ***AND*** CABLES +/- bicortical/transcortical screws

- *Screws:* Keep length and anti-torsion

- *Cables:* anti pull out/anti-bending stress

84 yo

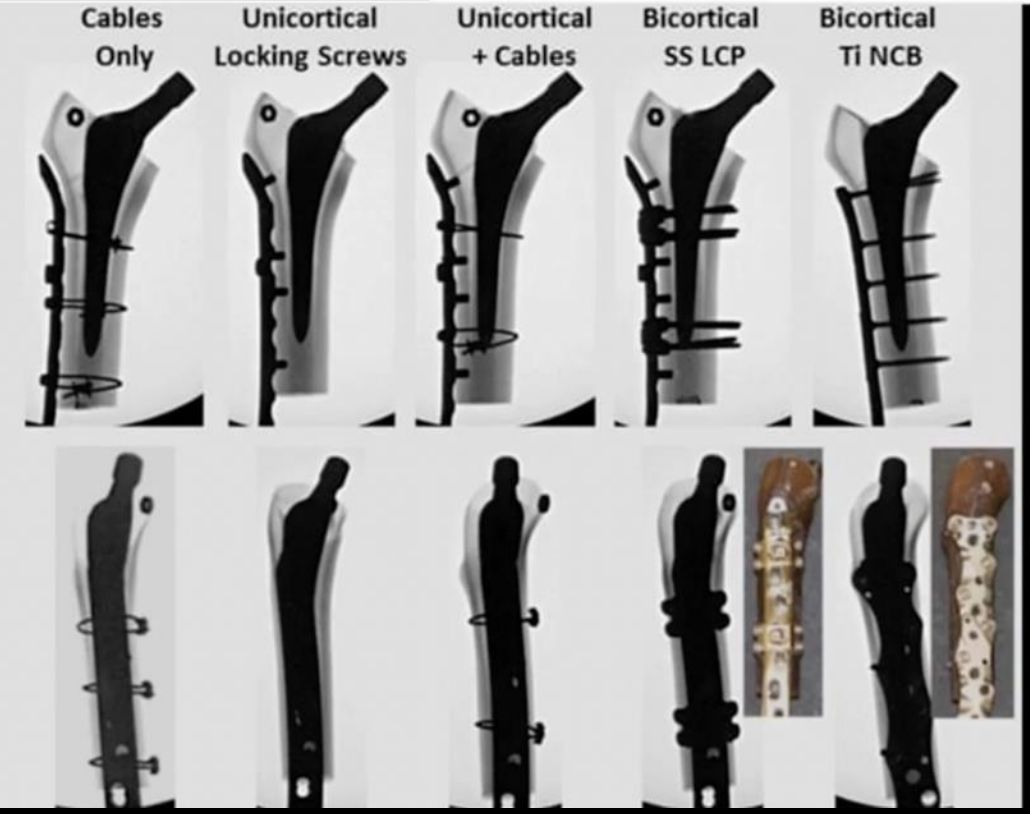


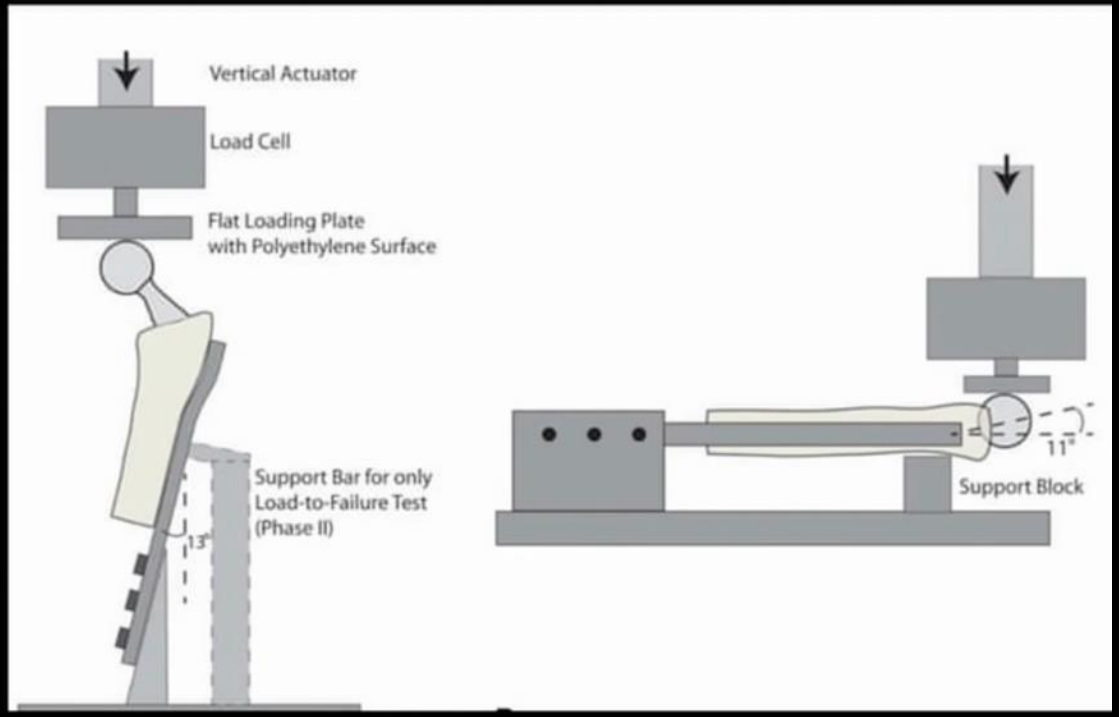


ORIGINAL ARTICLE

Tangential Bicortical Locked Fixation Improves Stability in Vancouver B1 Periprosthetic Femur Fractures: A Biomechanical Study

Gregory S. Lewis, PhD, Cyrus T. Caroom, MD, Hwabok Wee, PhD, Darin Jurgensmeier, MD, Shane D. Rothermel, MD, Michelle A. Bramer, MD, and John Spence Reid, MD





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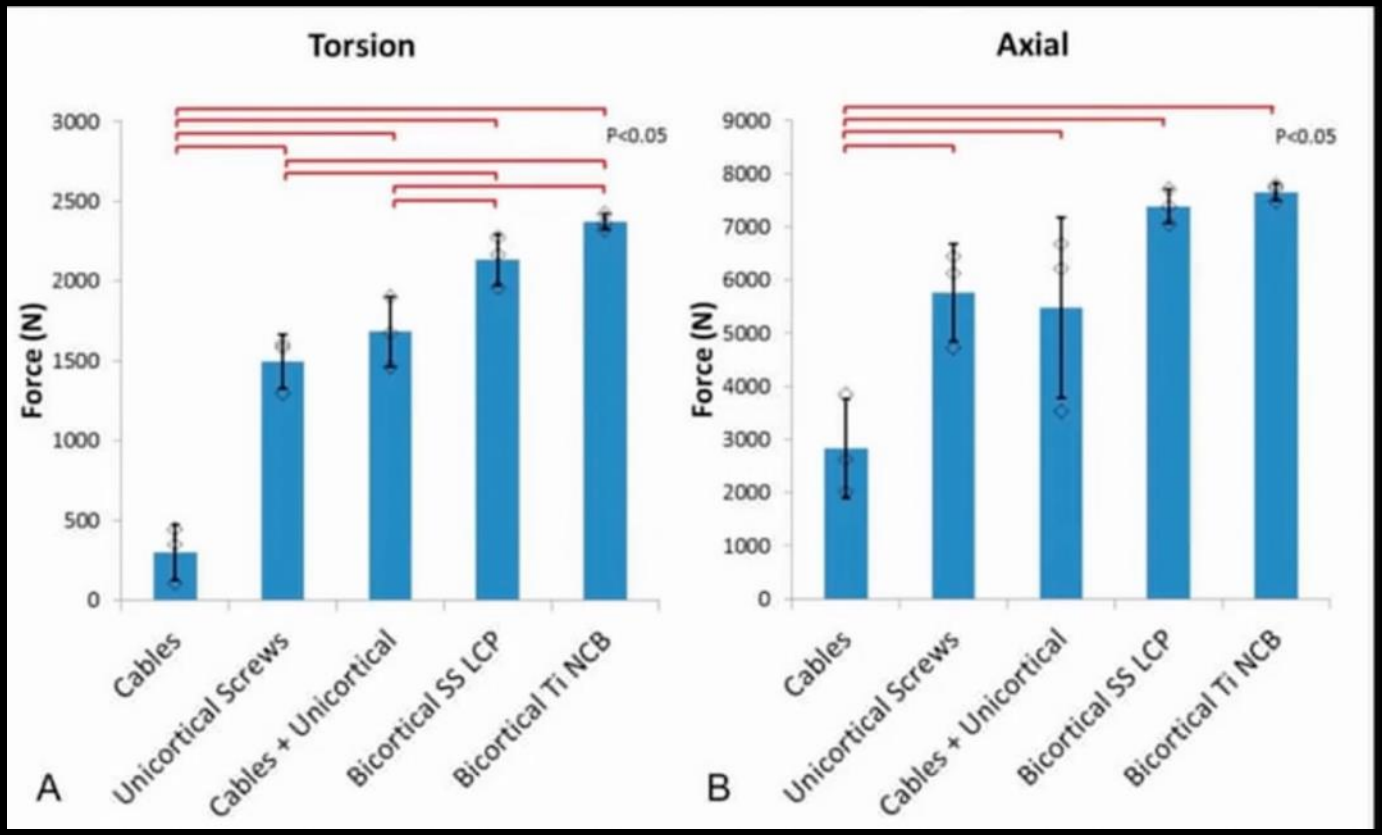
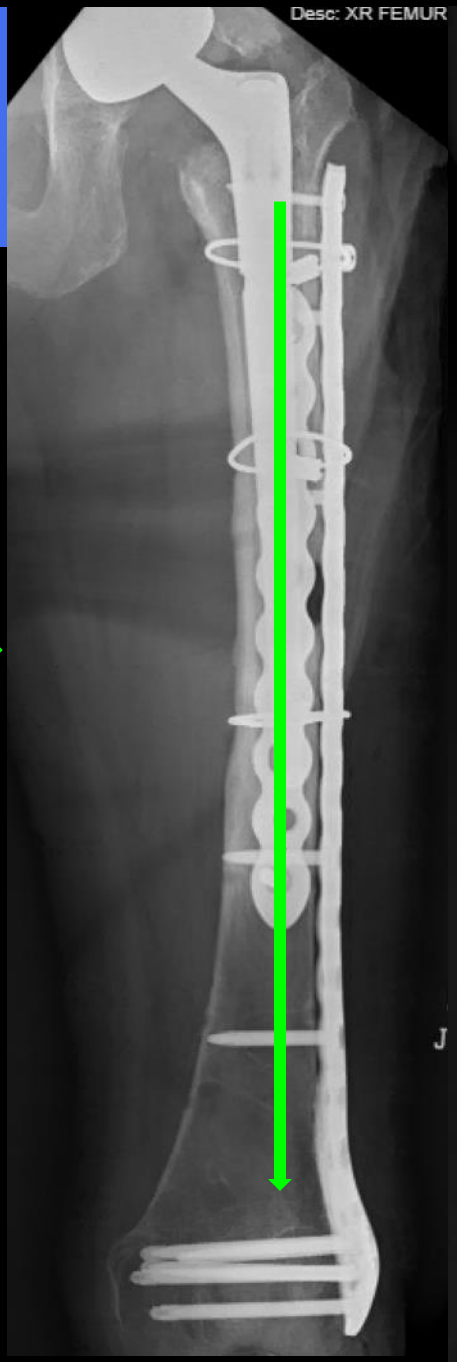
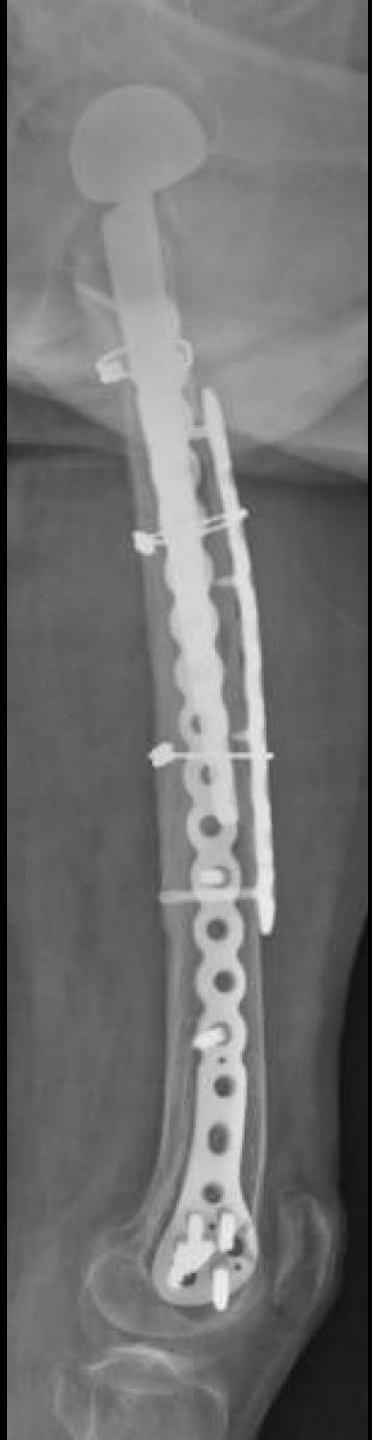
- Cable only constructs half as strong or less






Desc: XR FEMUR

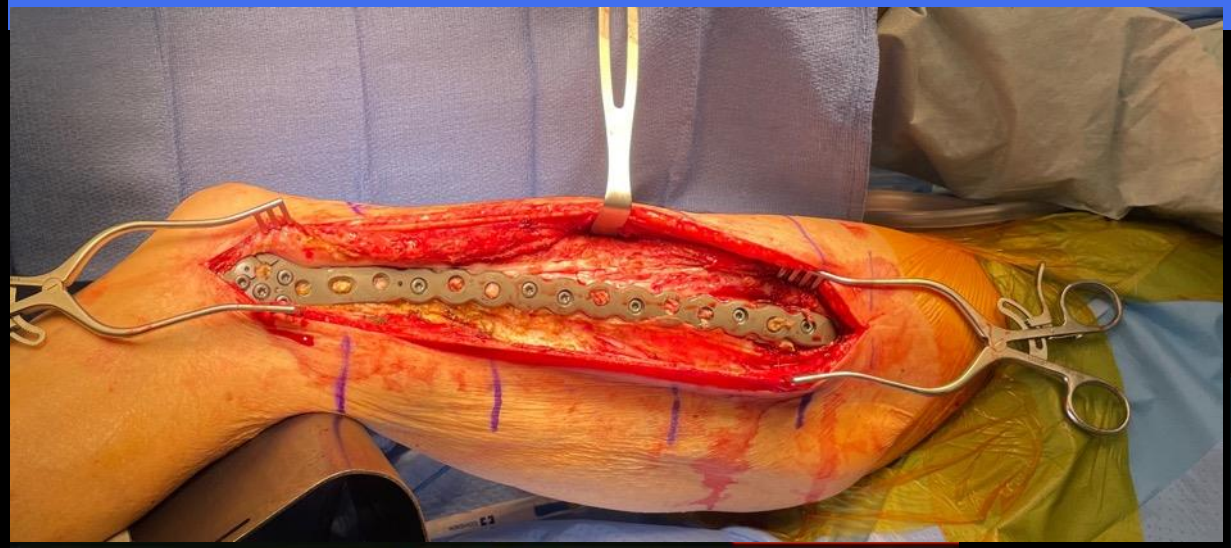

6 months f/u



Fixation / ORIF Strategies

- REDUCE it well and BUILD it strong
- *SCREWS ONLY* are stronger than *CABLES ONLY*
- SPAN the whole bone

ORIF: OPEN vs MIPO



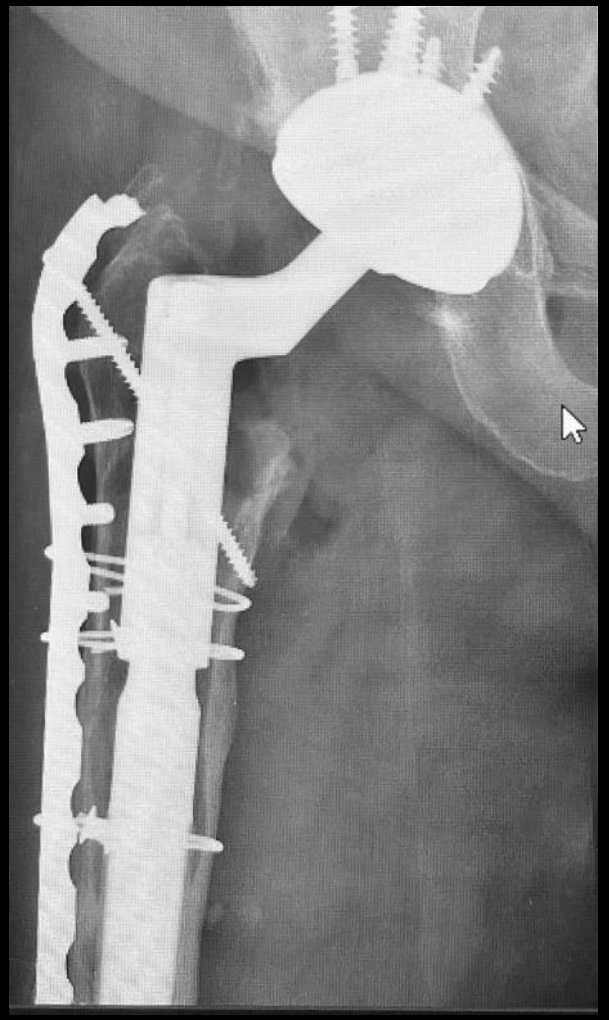
How to Fix

- Plate
- Plate + Allograft strut
- Plate + Plate

+

- CABLES around the STEM

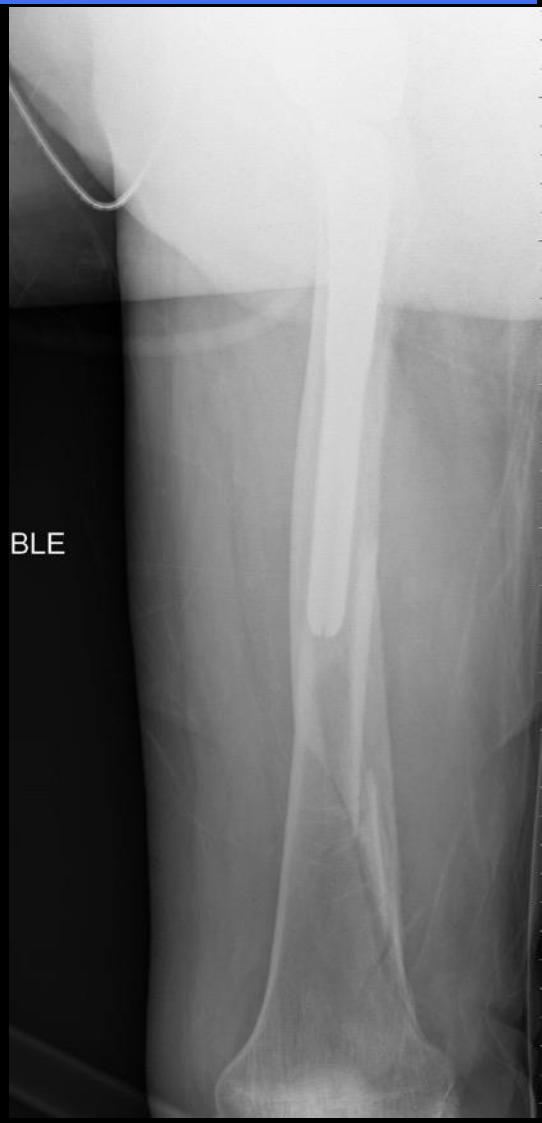
Needed Secondary Implant



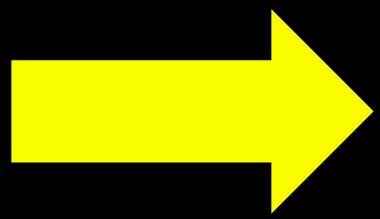
Case example

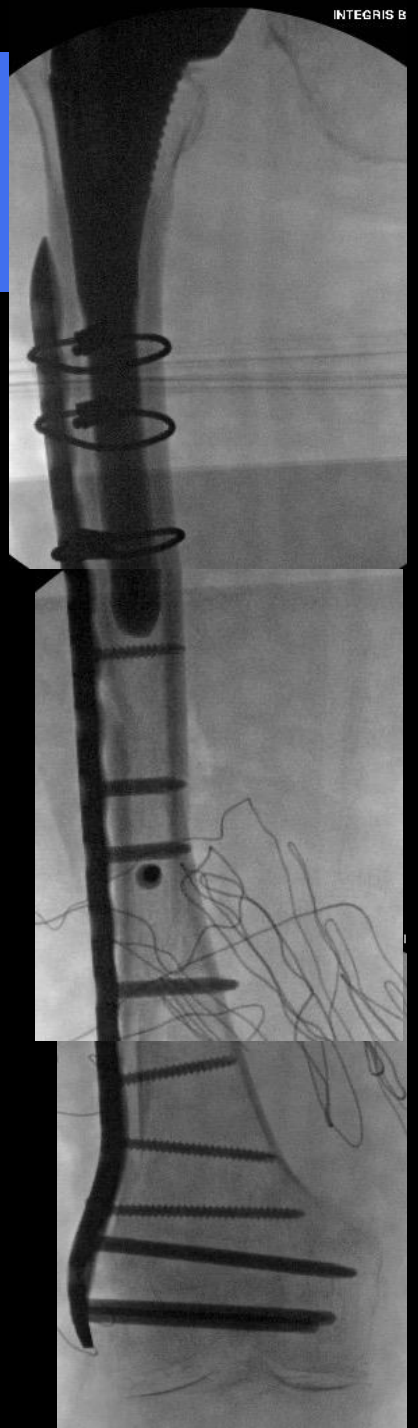
89 year old female

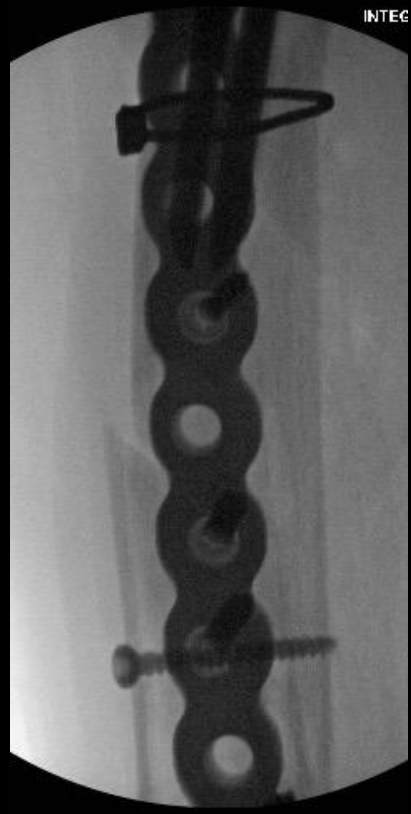
- Ground level fall
- Remote history of Right THA



88 yo

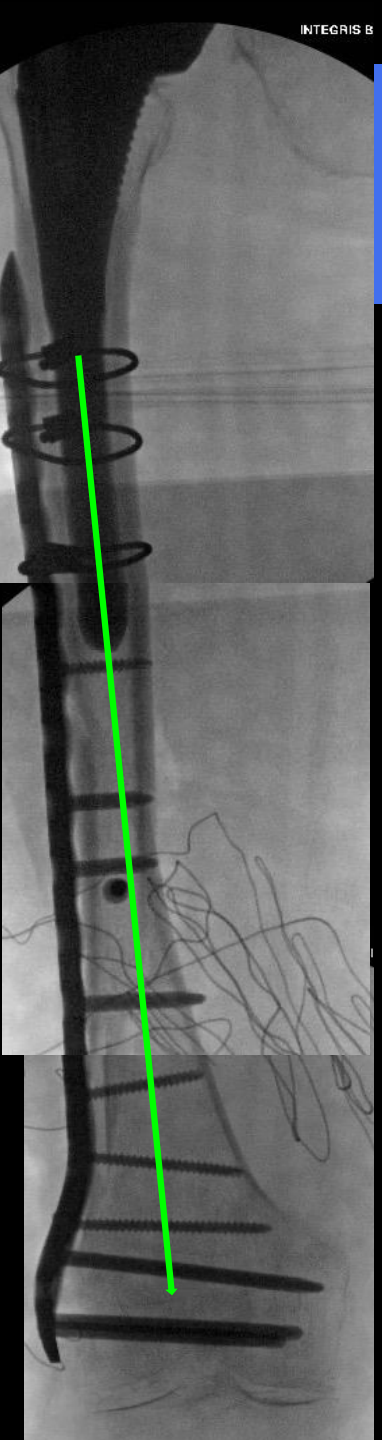


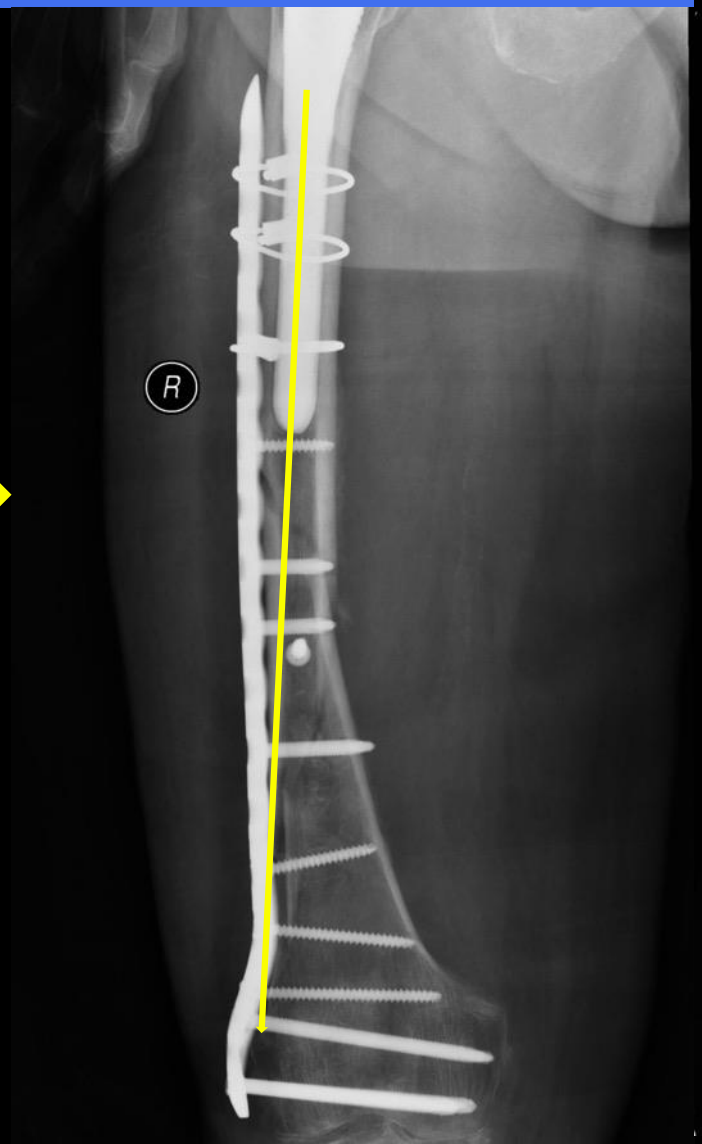




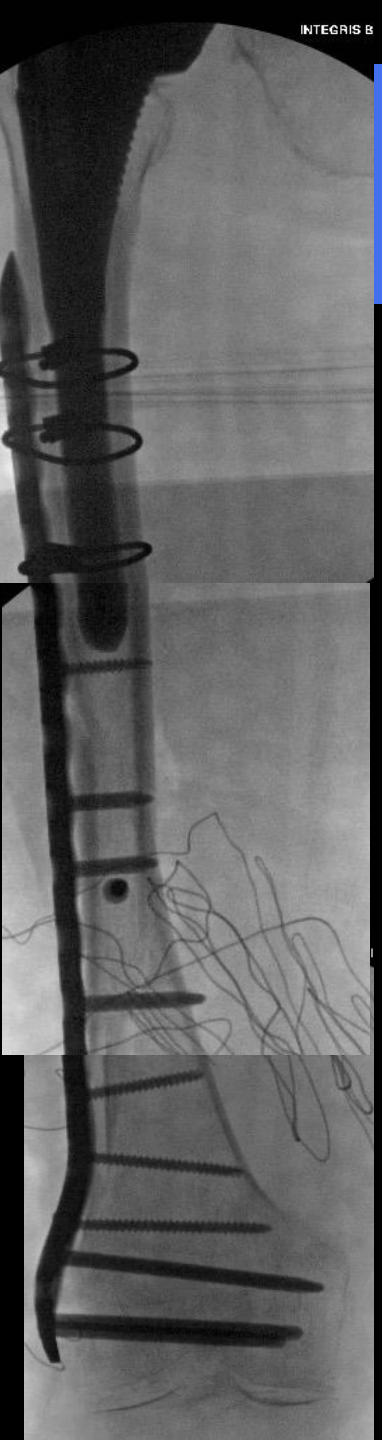
88 yo, 2 months postop

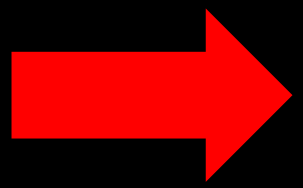
- WBAT

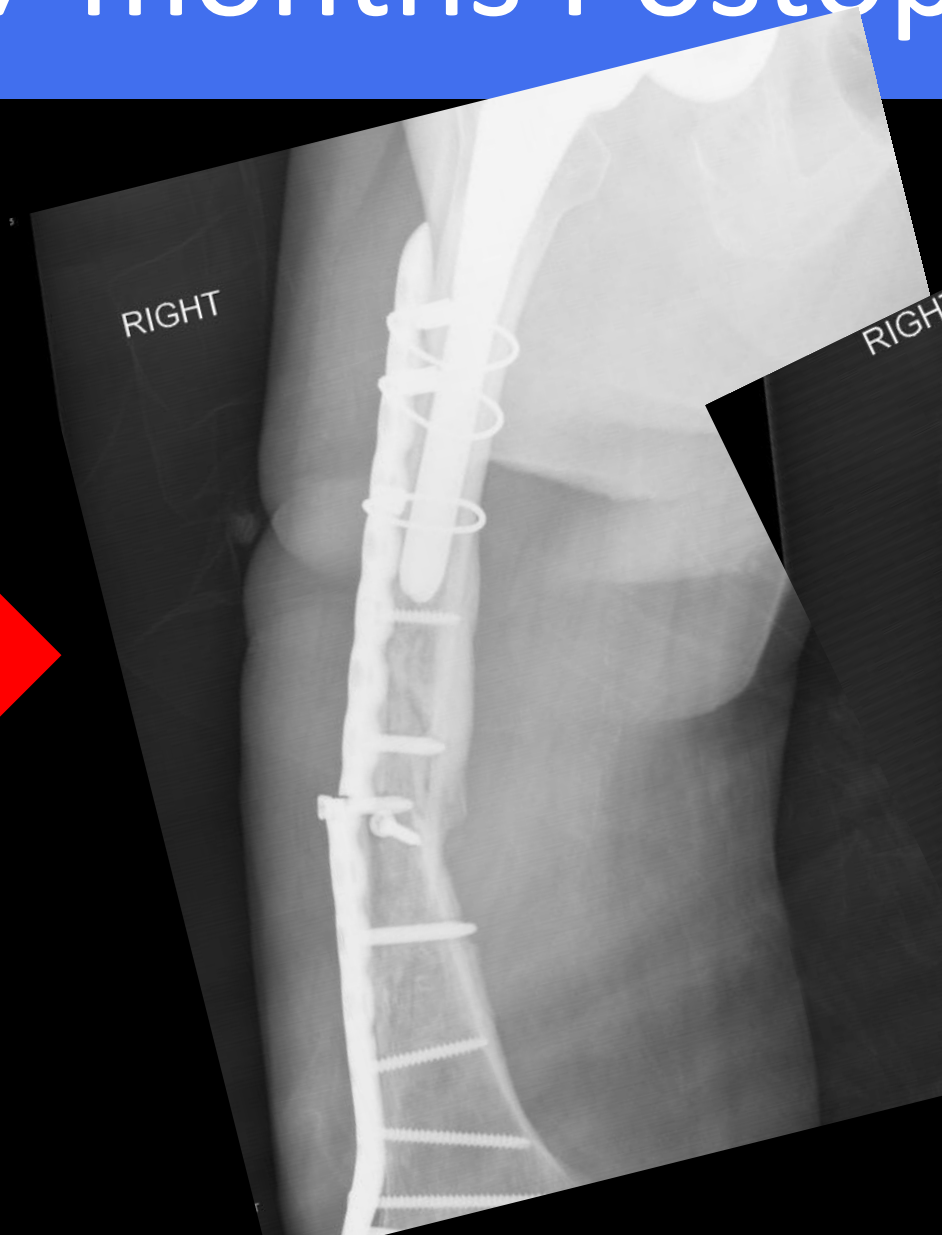


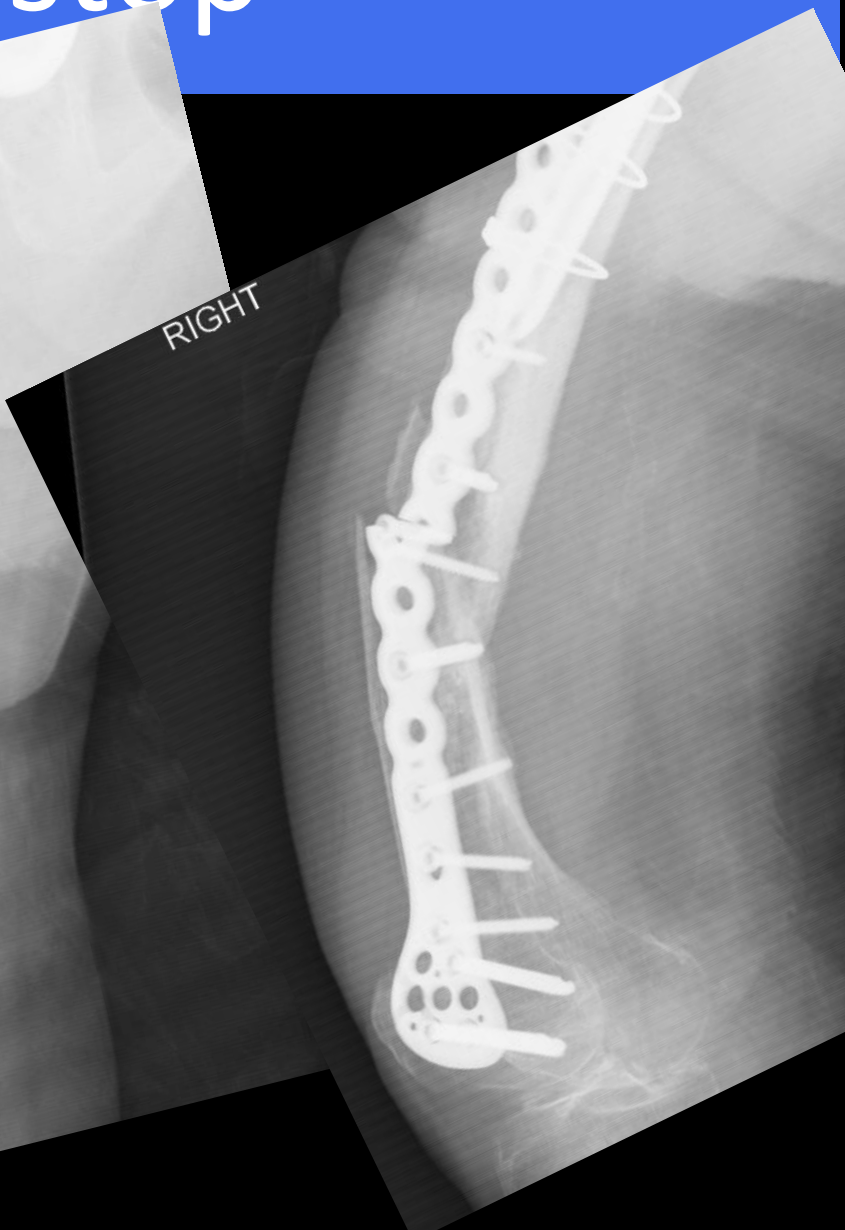


7 months Postop

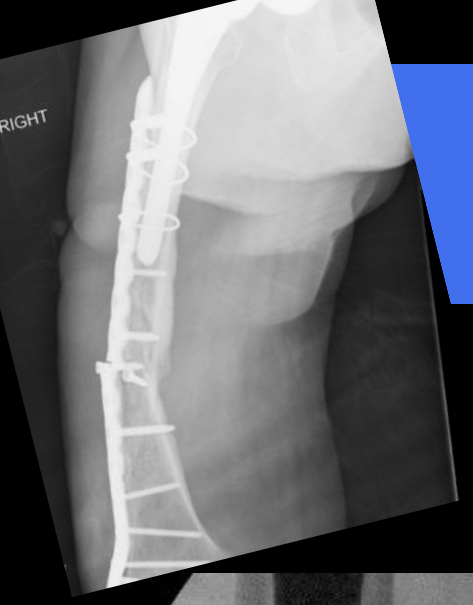


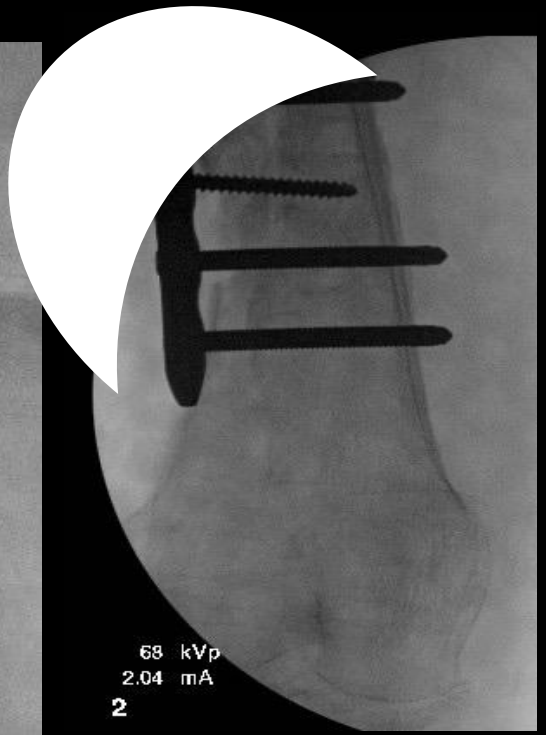






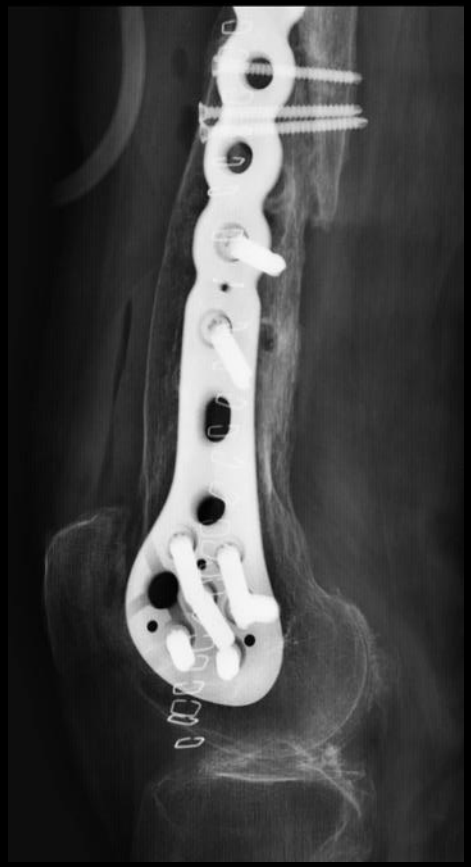
Revision



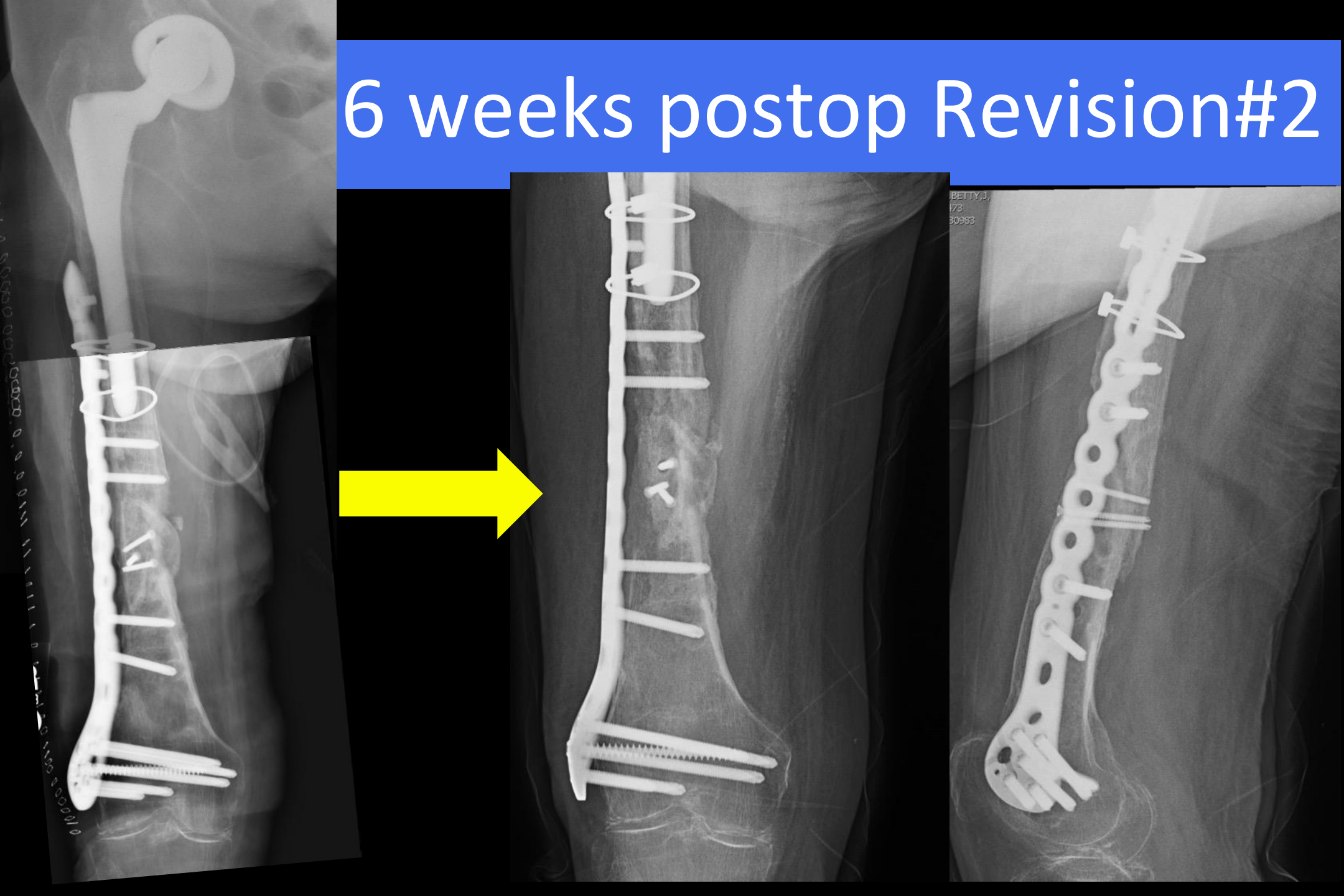


1 month postop Revision
8 months post-index Sx

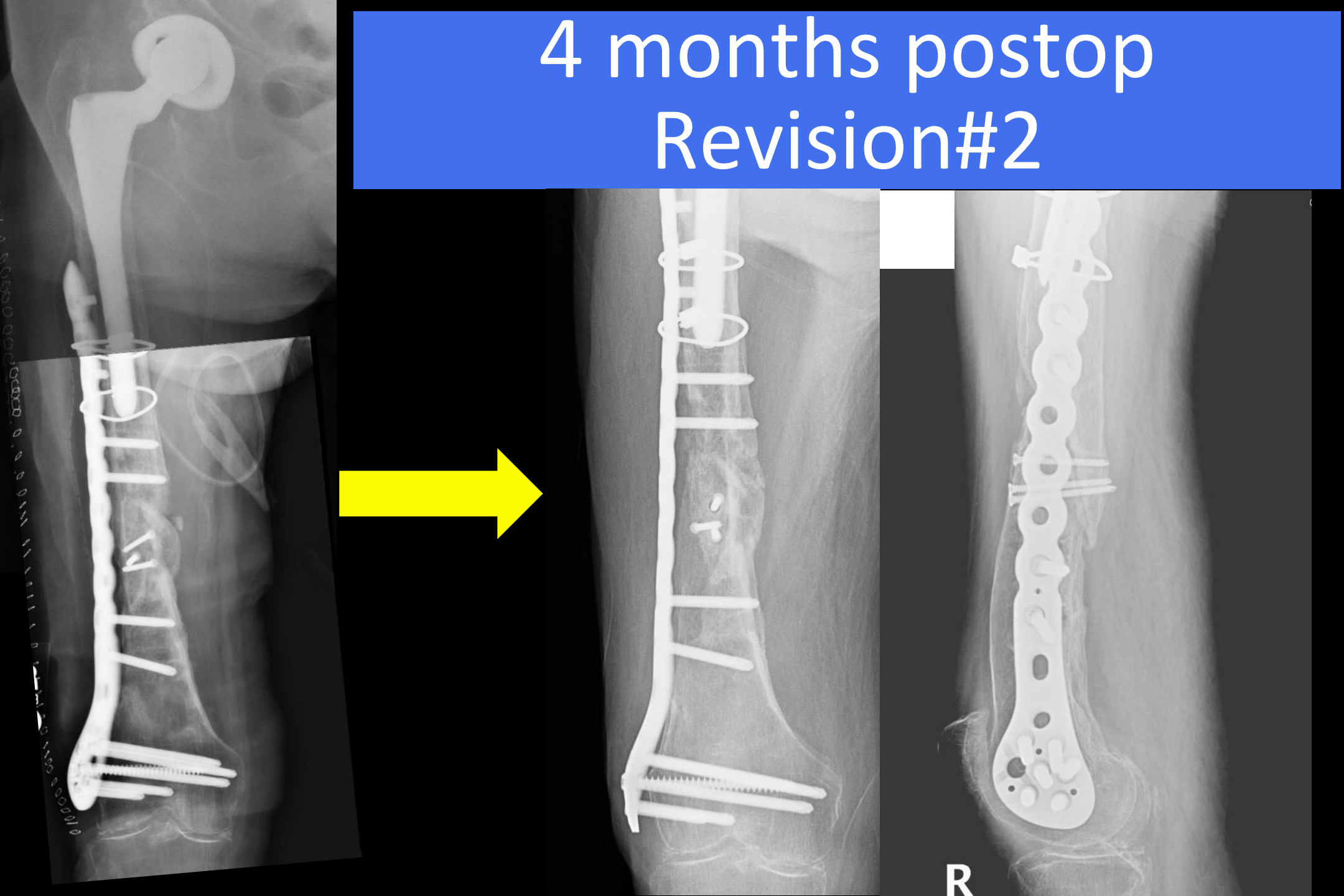
Revision #2



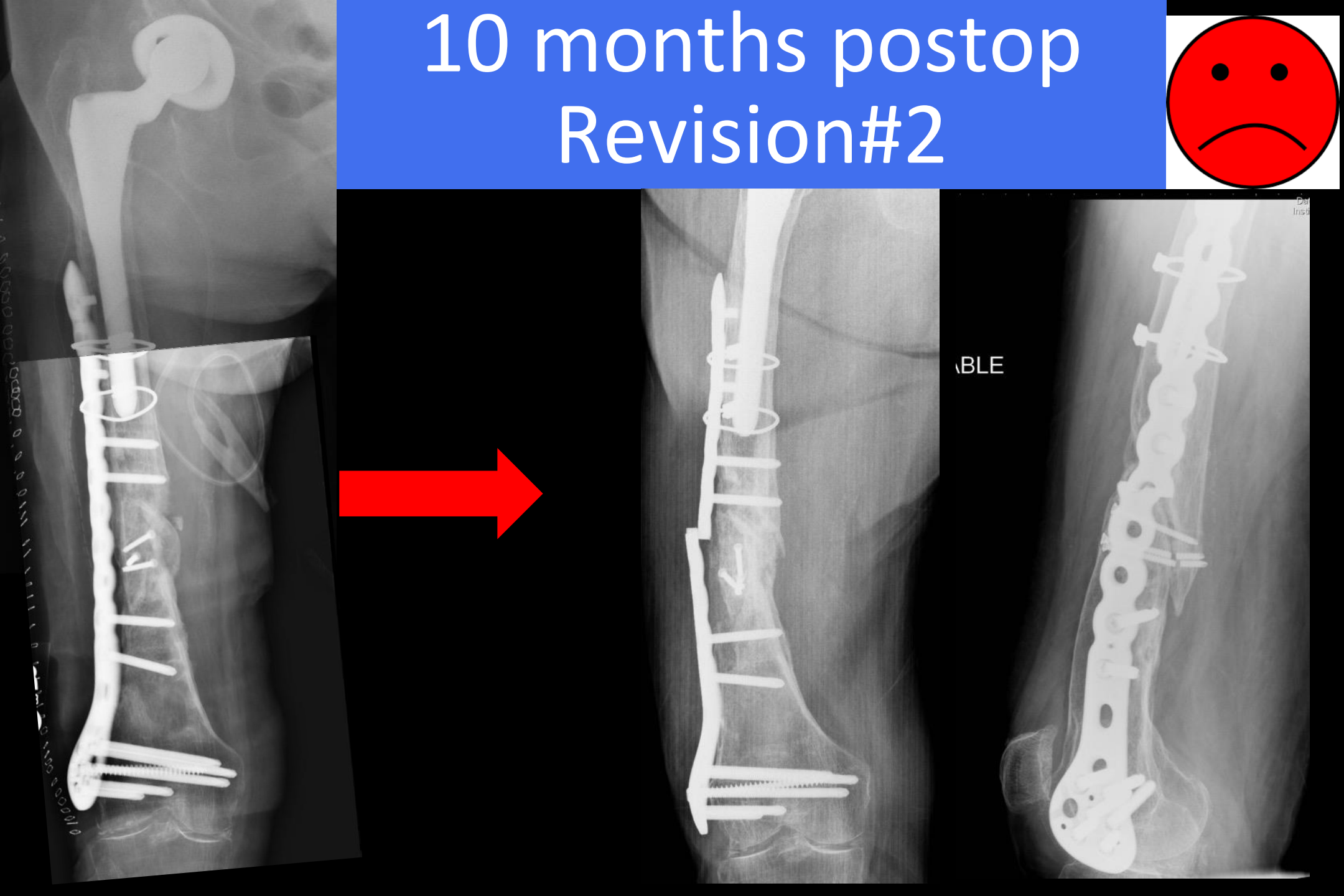
6 weeks postop Revision#2



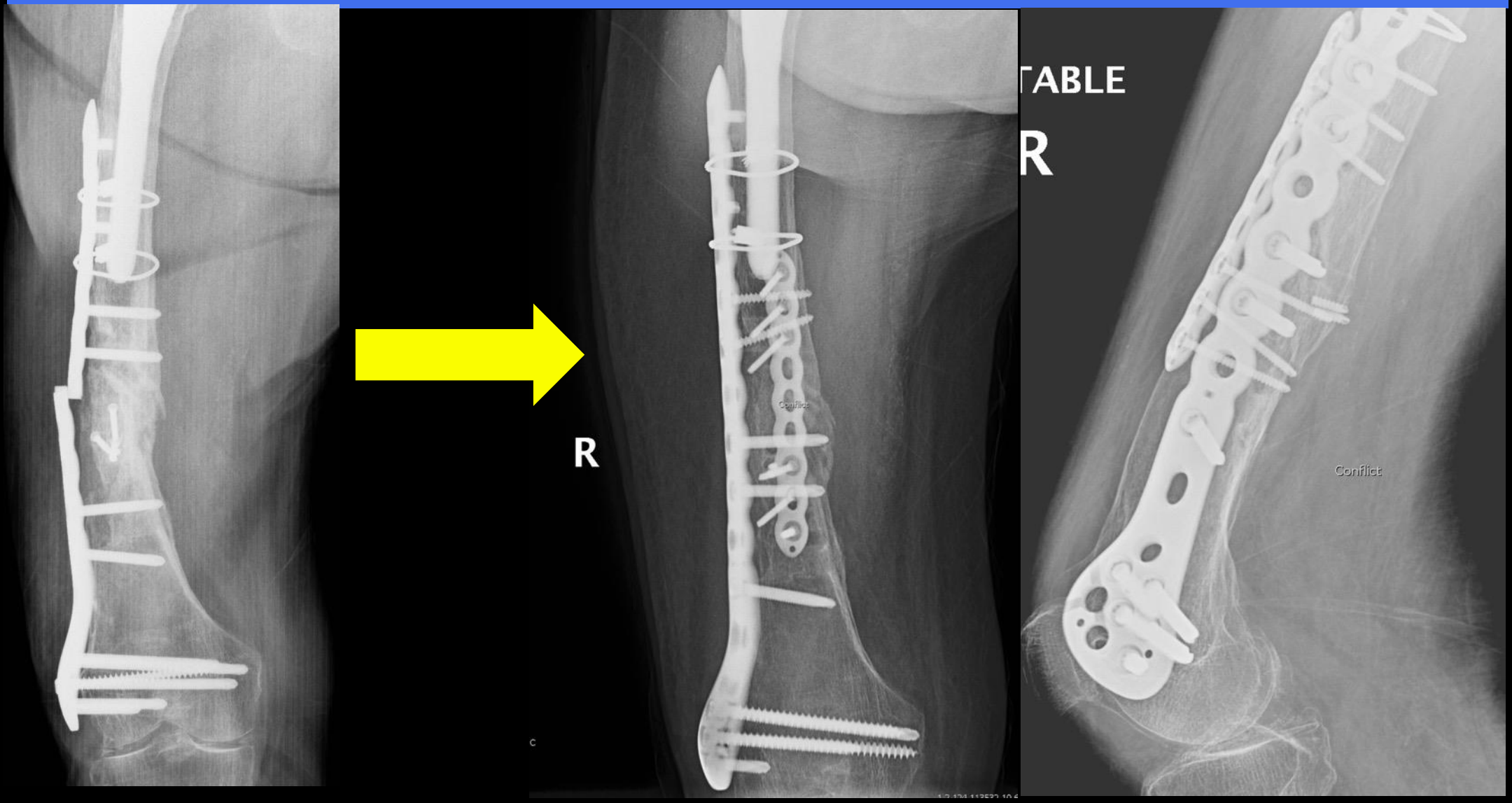
4 months postop
Revision#2



10 months postop
Revision#2



Revision #3: 24 months post-index



2 yr post revision #3

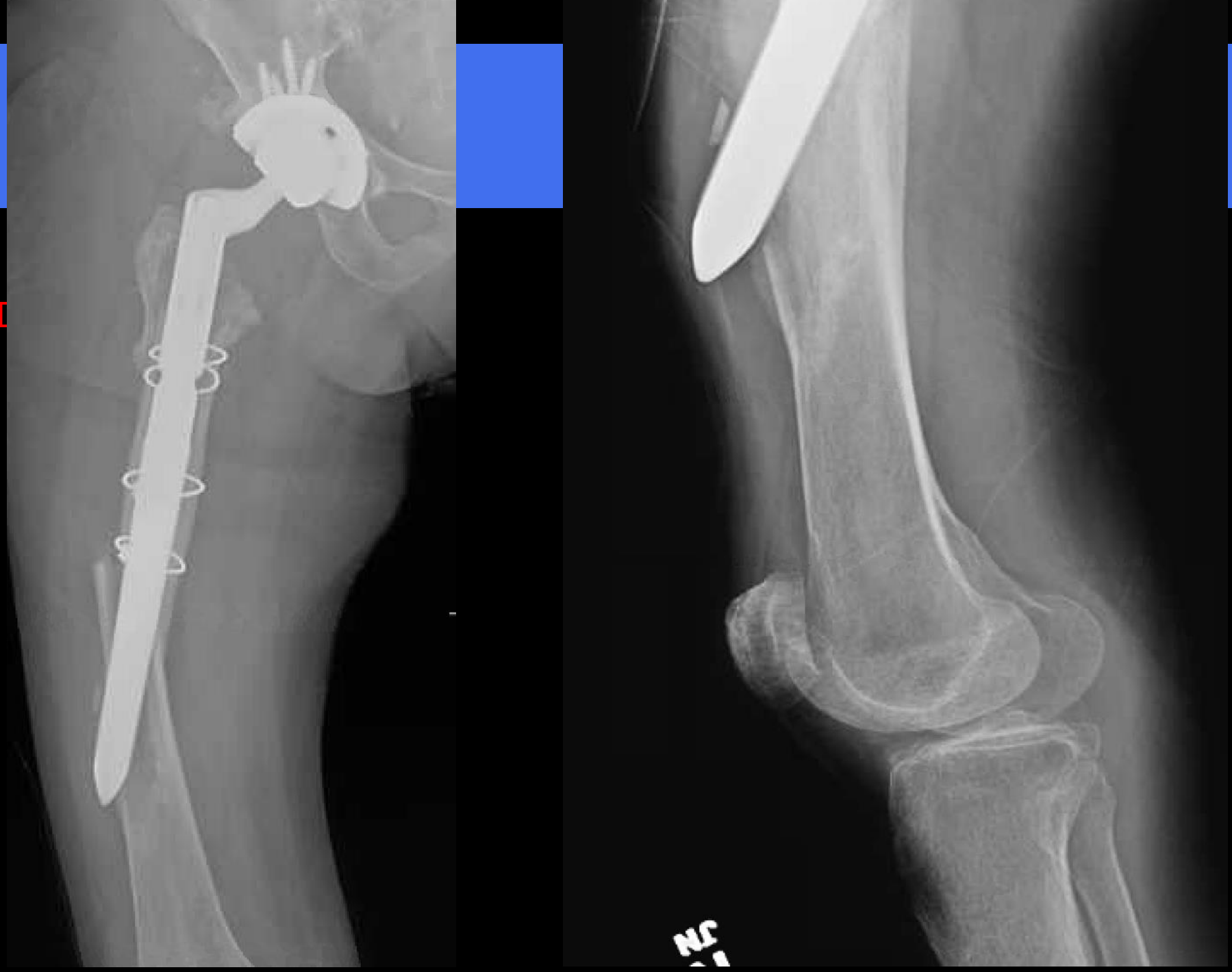
Secondary Fixation

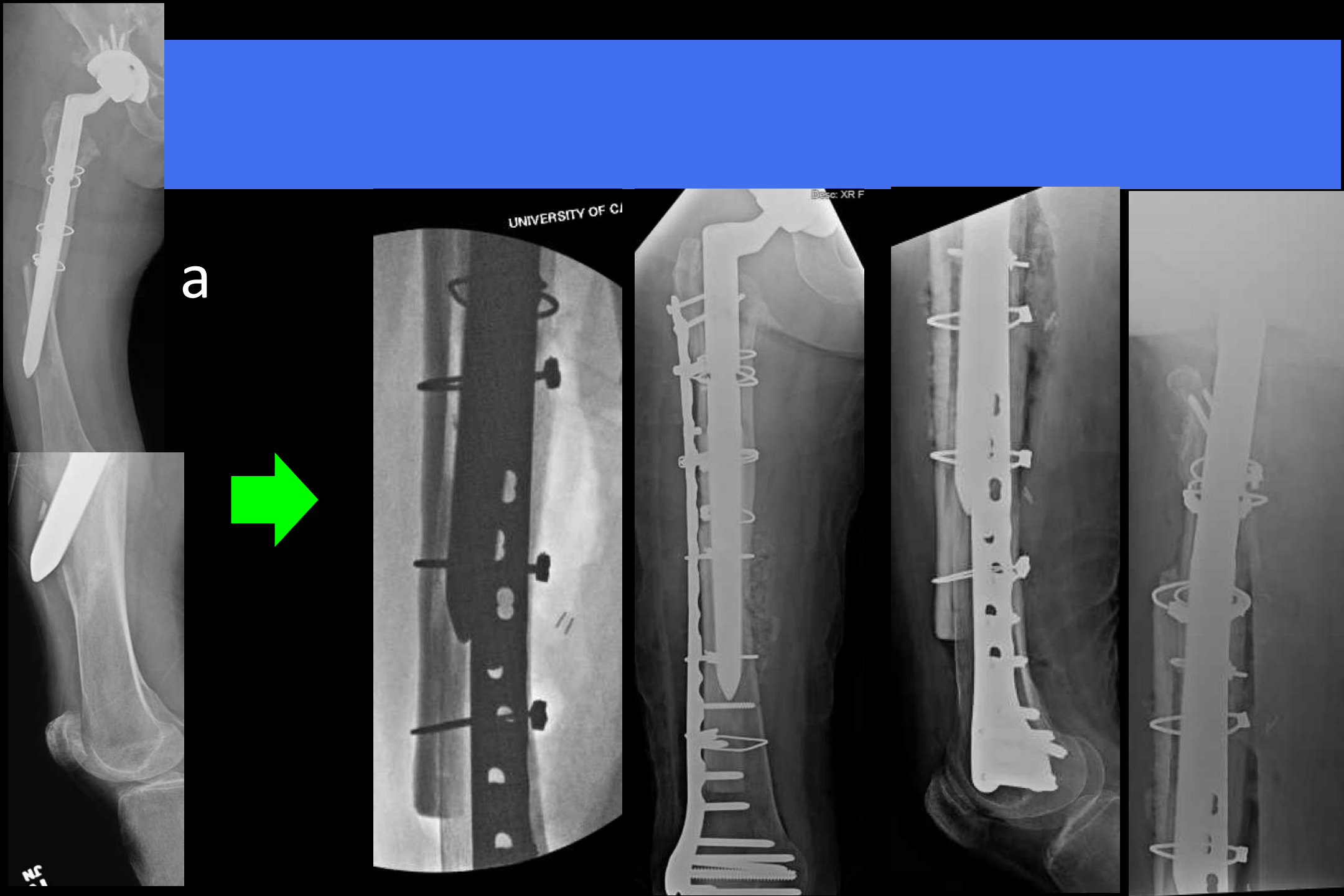
- Allograft Strut
- Plate

Secondary Fixation: Strut vs Plate

- ***STRUT:***
  - Increase bone stock
  - Add to stability of fixation +
  - Technically *harder*
- ***PLATE:***
  - -Add to stability to fixation **+++**
  - Technically *easier*

Allograft Strut

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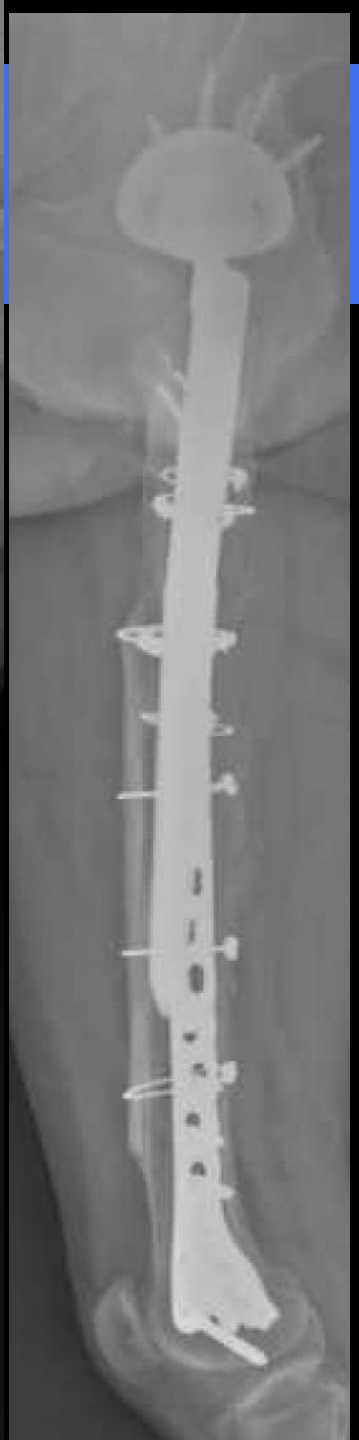
UNIVERSITY OF CI
Desc: XR F

1 yr f/u

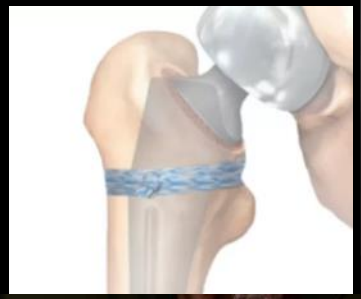


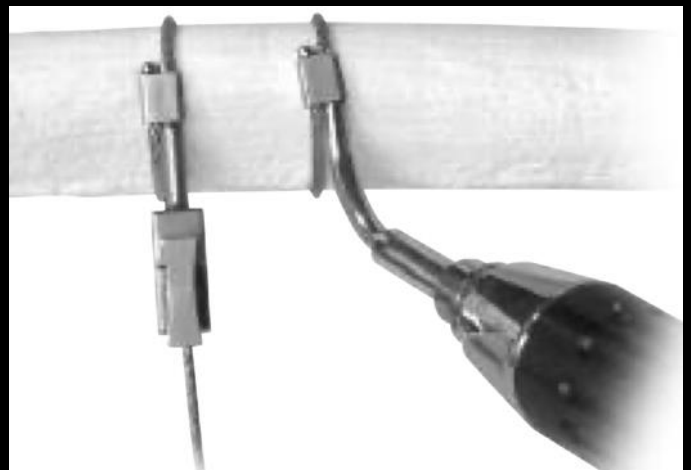
When to use STRUT?

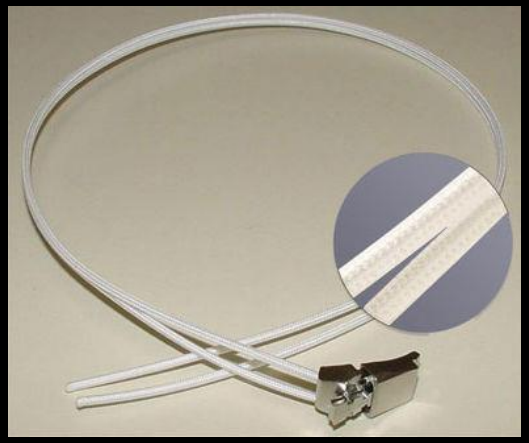
- Bone DEFECT / Bone loss
- OSTEOPOROTIC bone w very thin cortices
- As a secondary implant, NOT isolated!!!!

CABLES

- At least 2 cables around the stem
- Metallic > Synthetic > Suture
- Better around the whole fixation (plates or plate+strut)







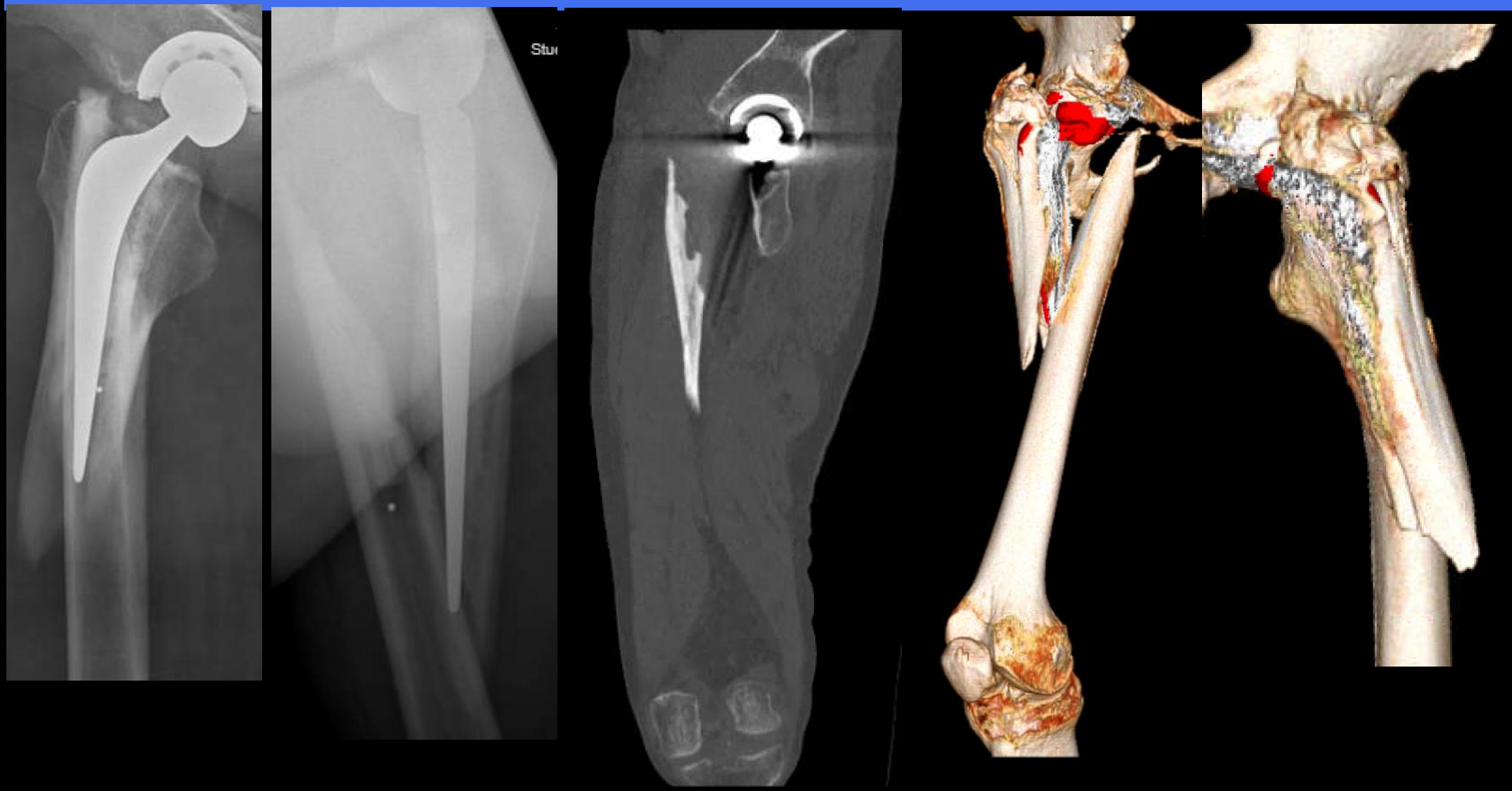
Fixation: How Long?

- Bone quality
- Fracture pattern

- Better to span the whole Femur

65 yo

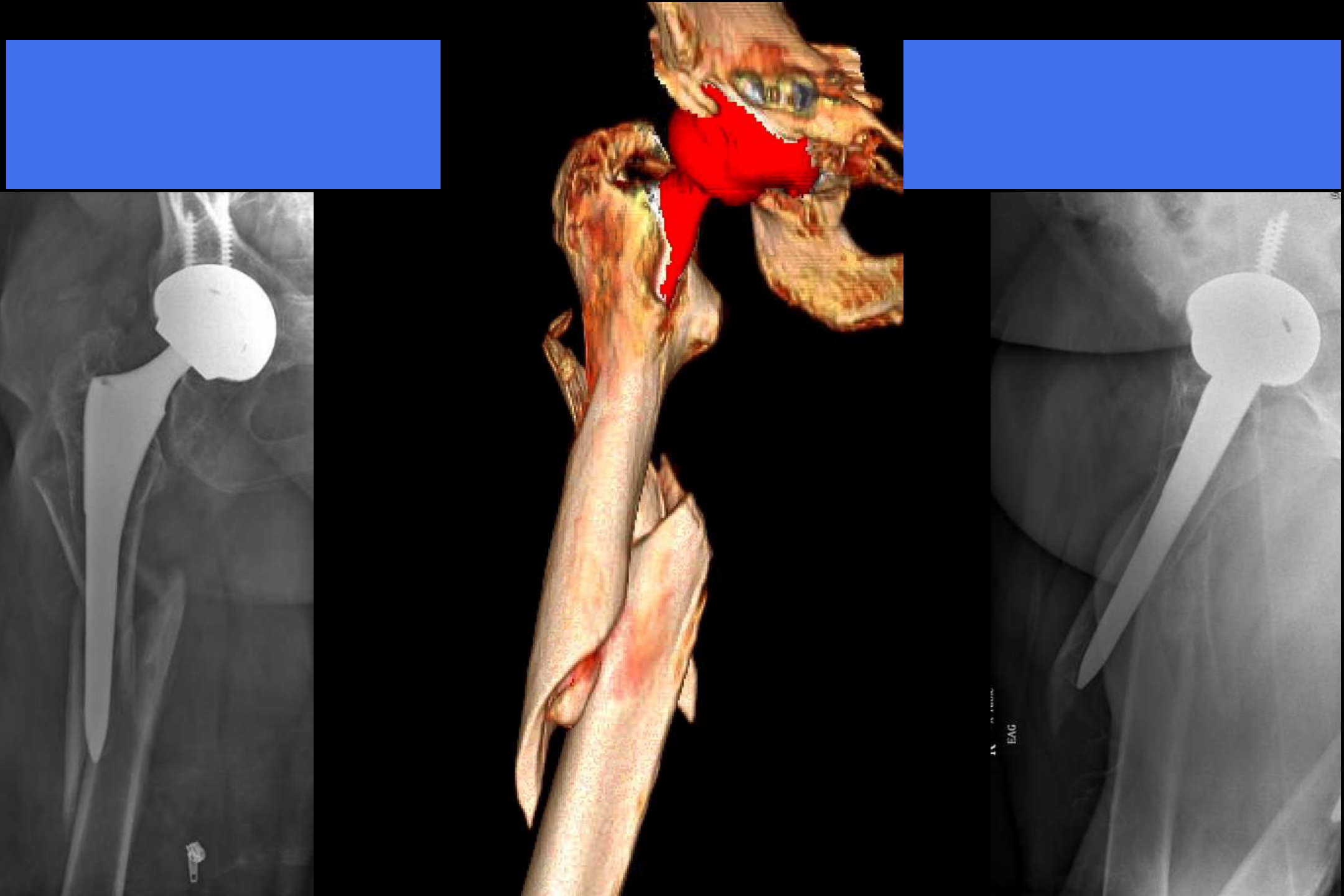
65 yo, cemented THA



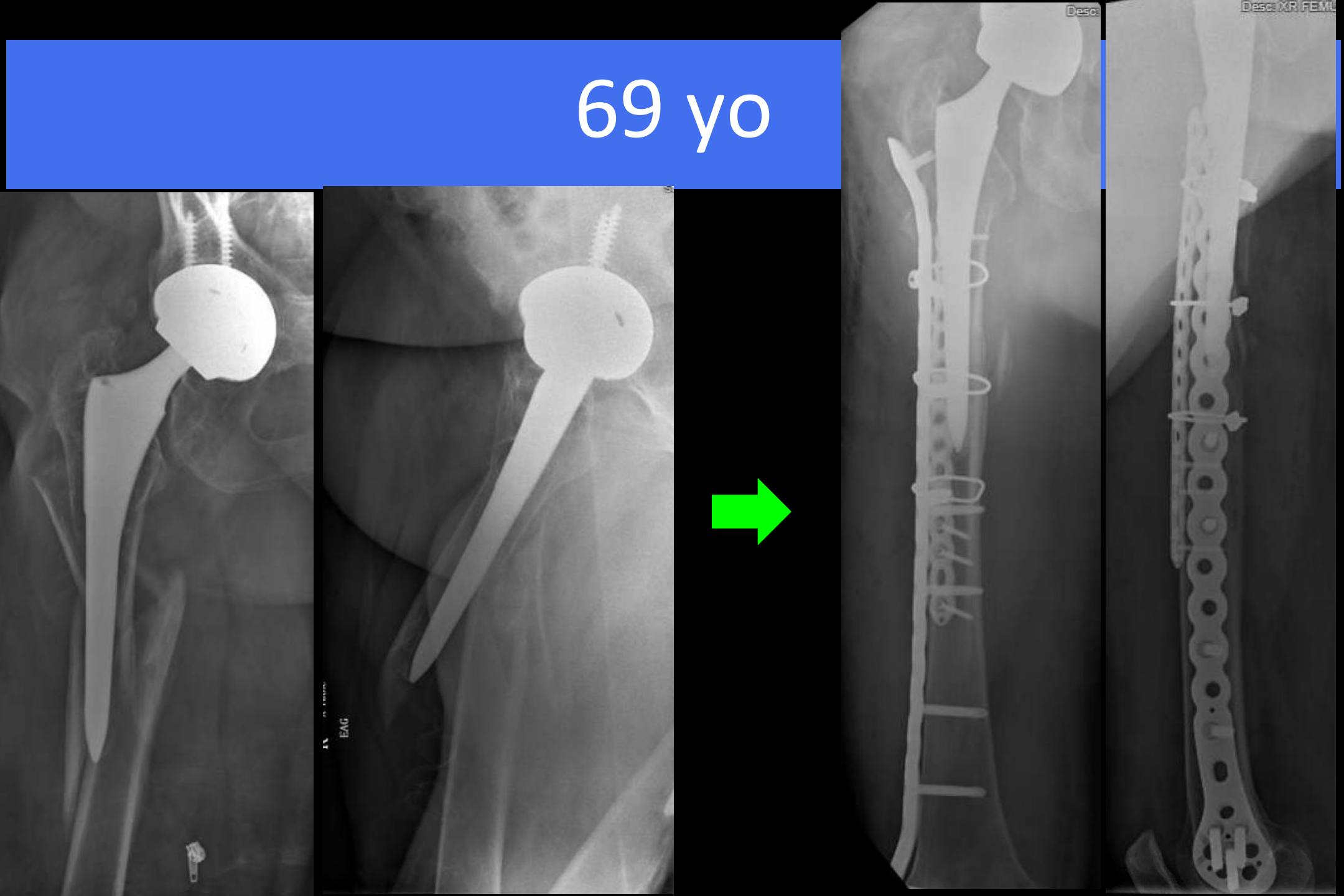
65 yo, cemented THA

69 yo

69 yo



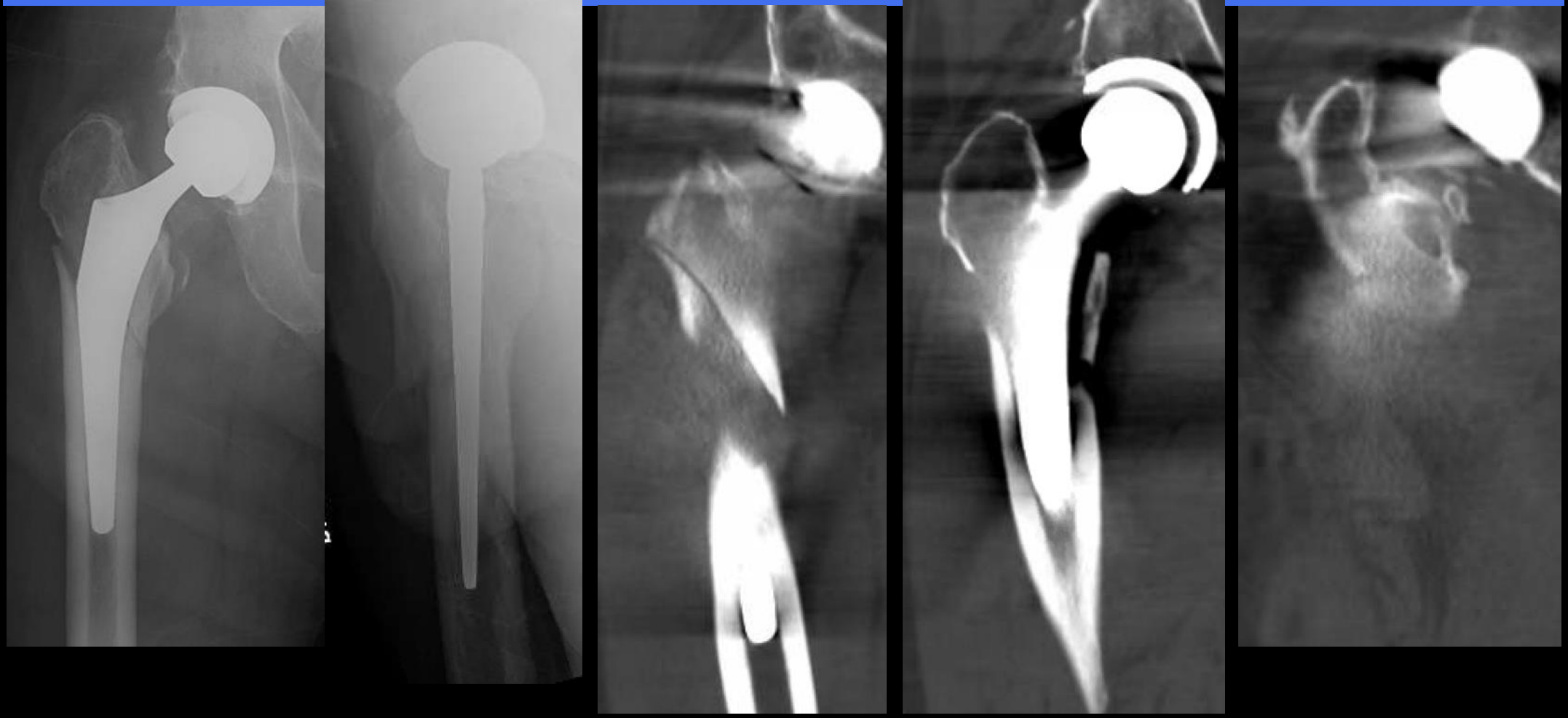
69 yo



69 yo, 1yr f/u

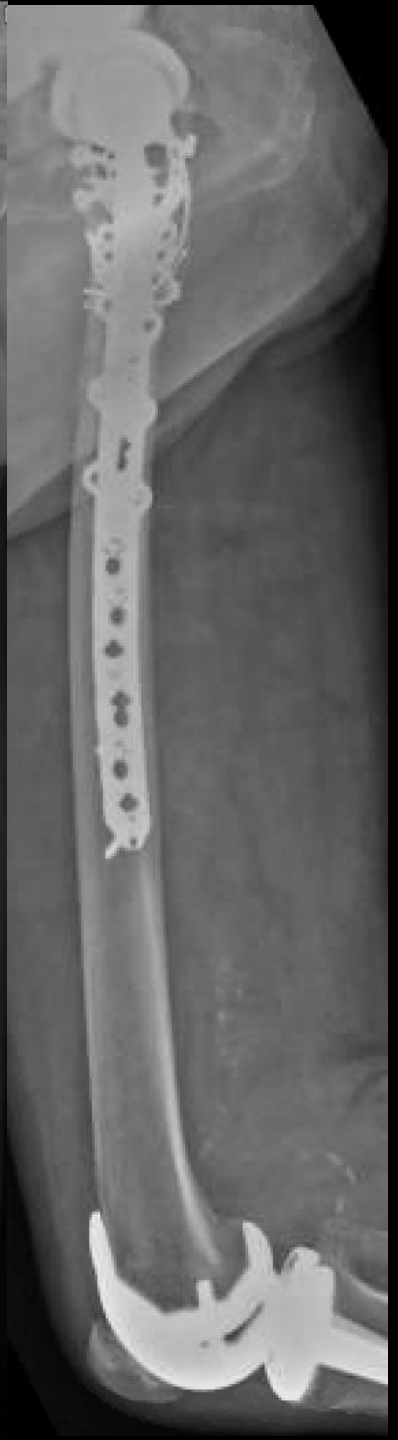
83yo

83 yo



83 yo

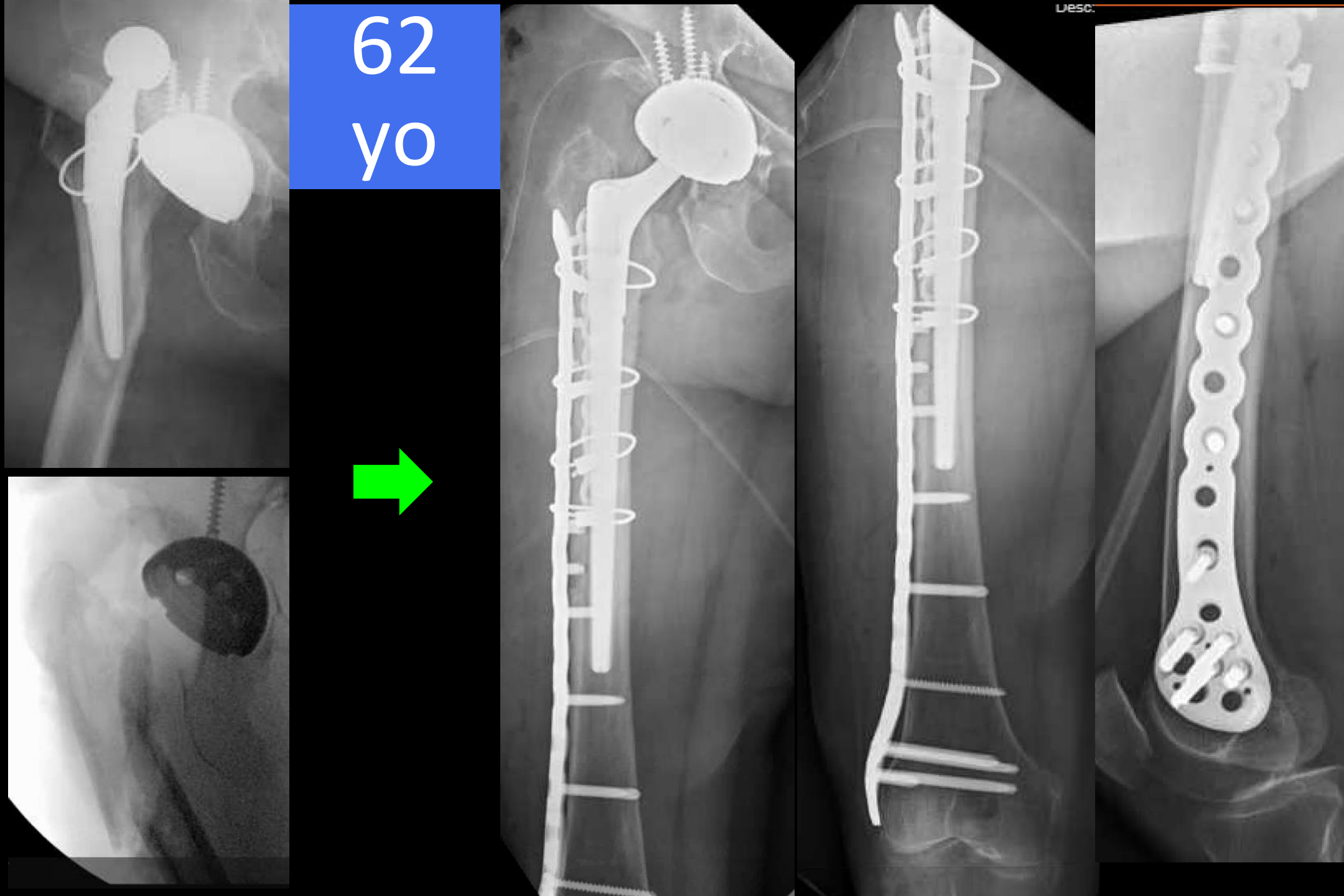
83 yo



62 yo

62 yo

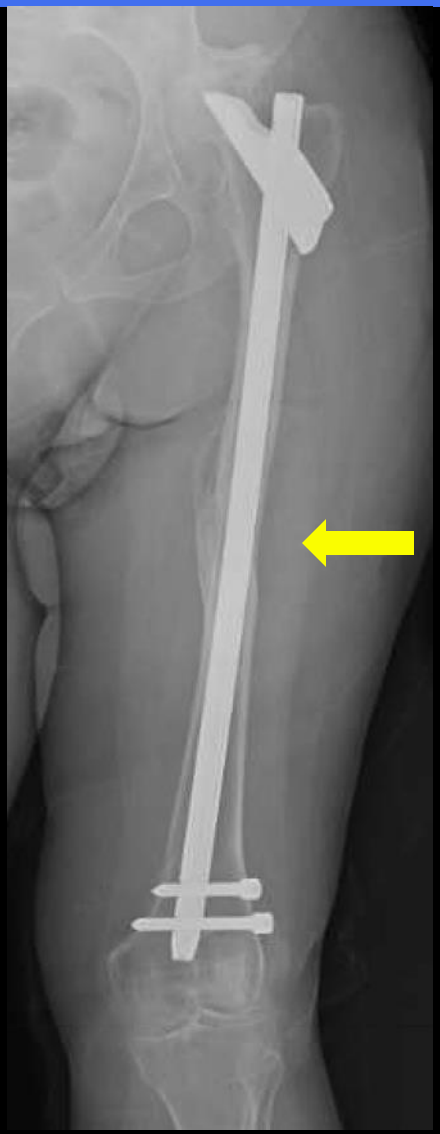
62 yo

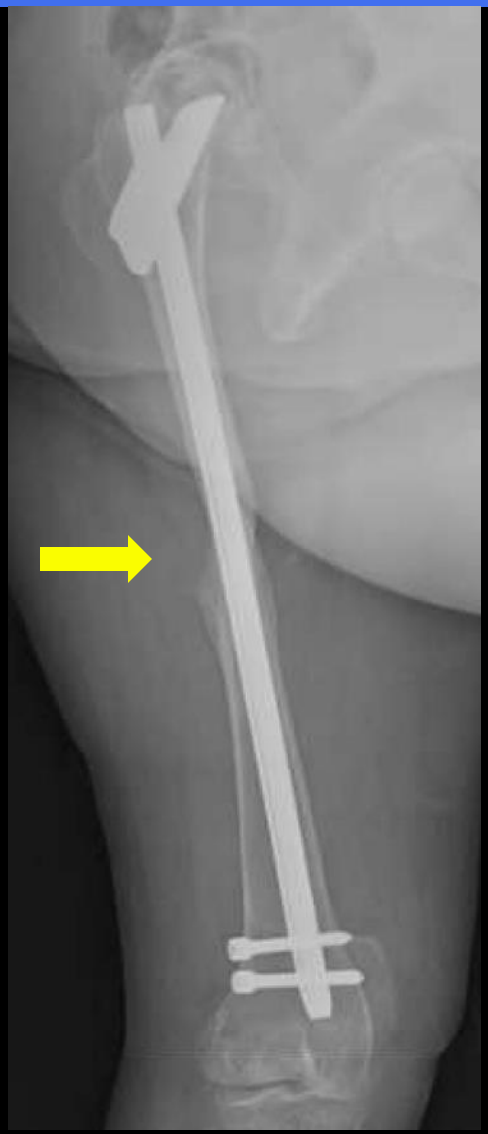

62
yo

62 yo, 6 months f/u

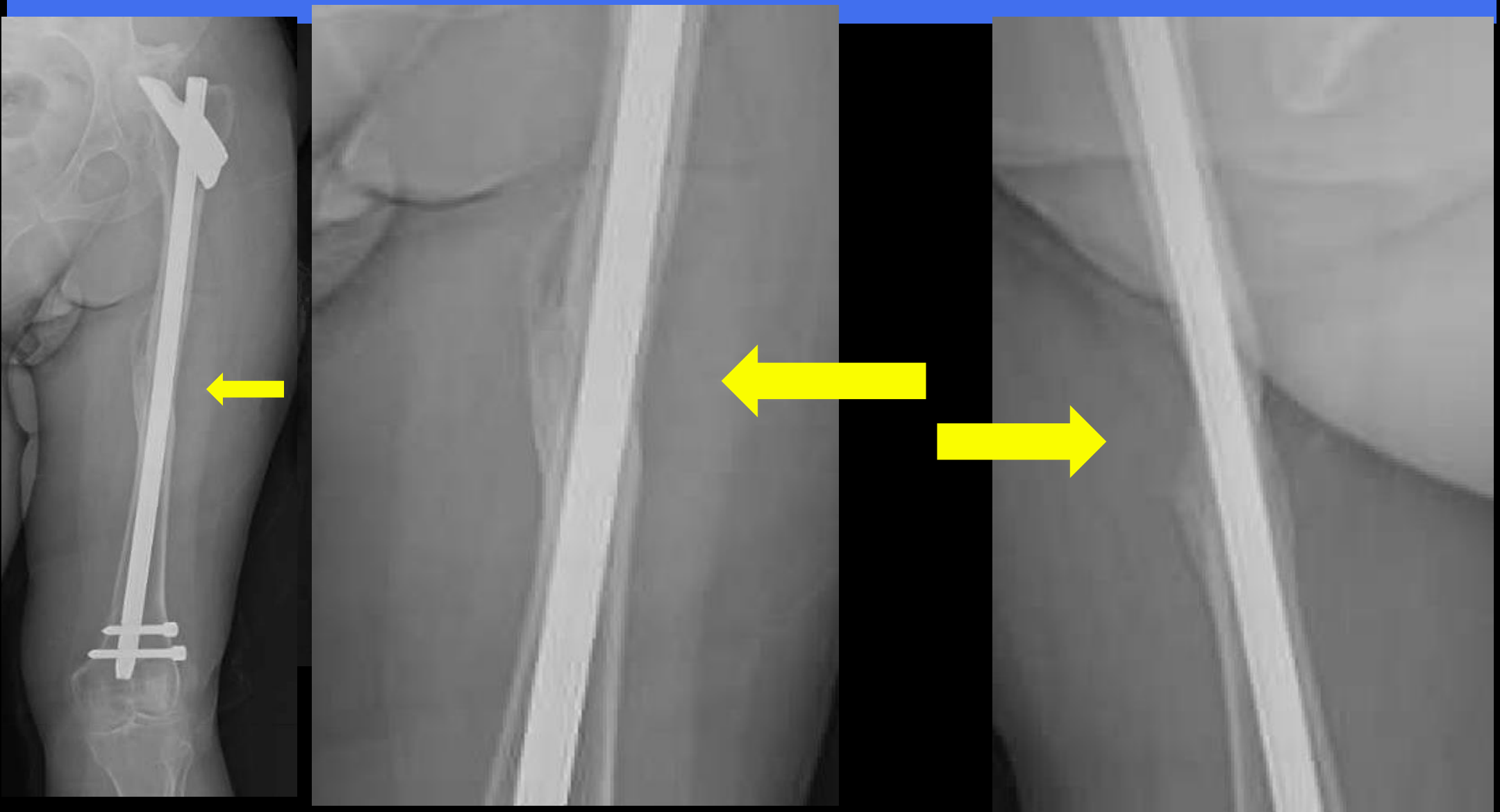
57 yo

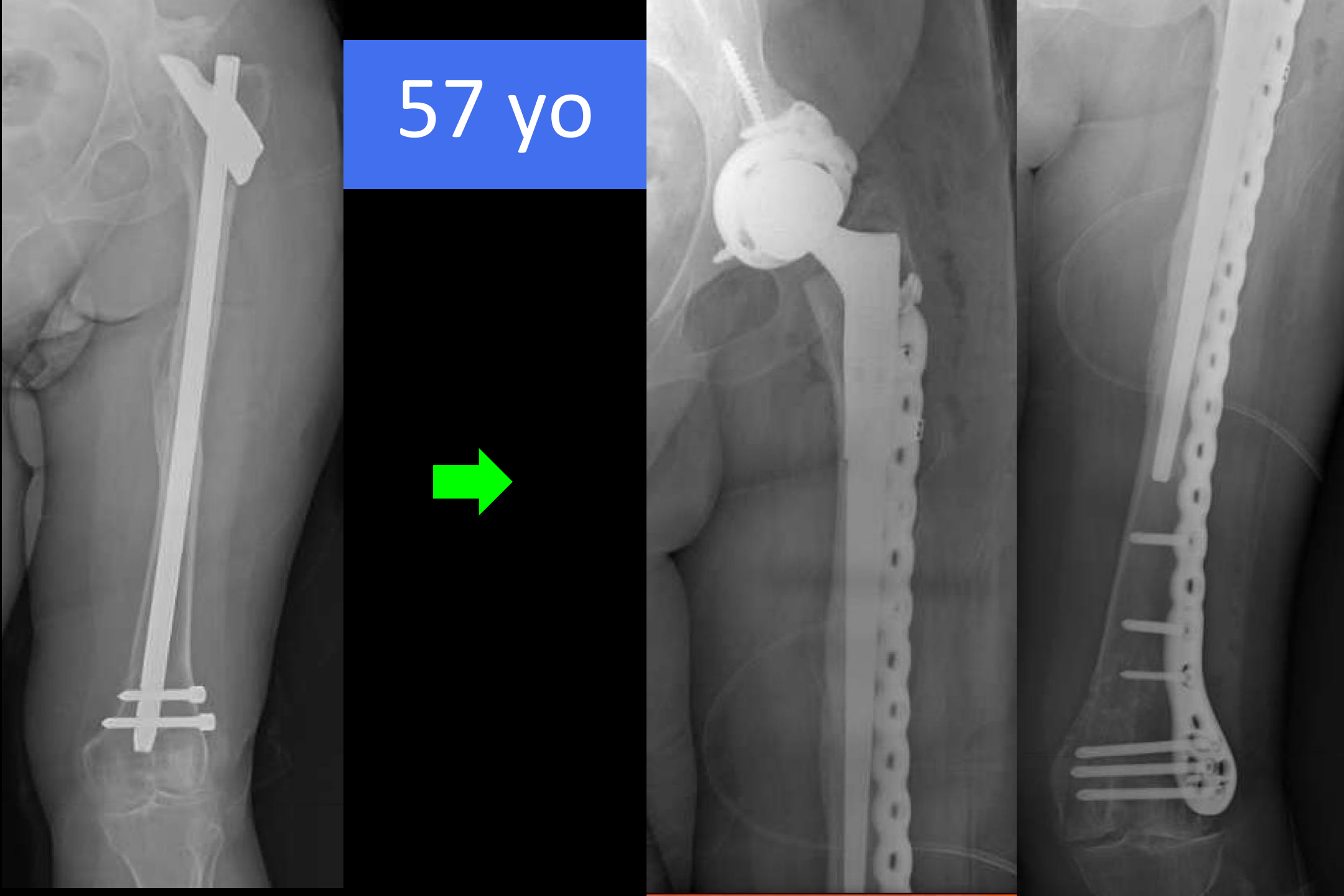
57 yo

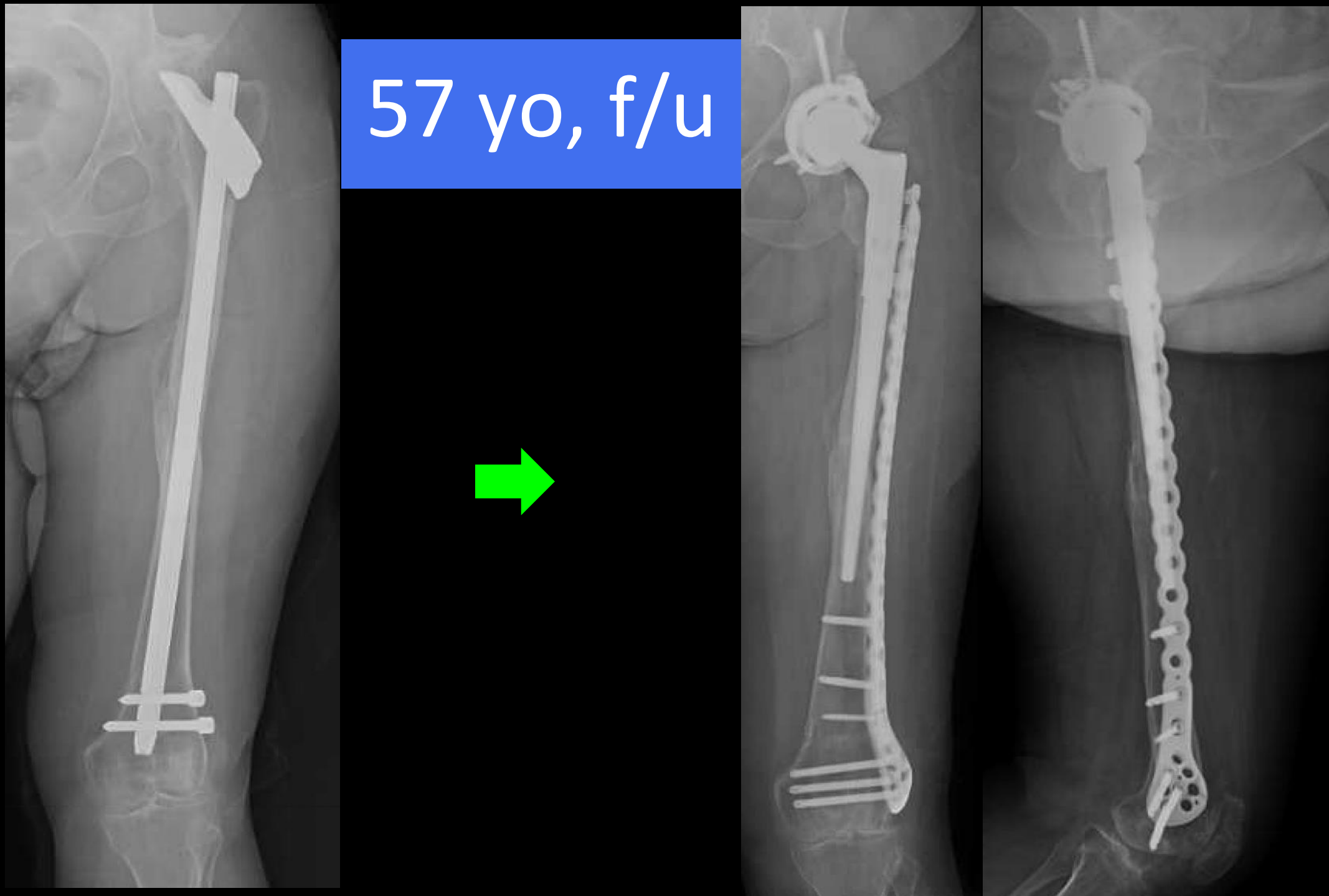




57 yo




57 yo


57 yo, f/u

Take Home Messages

- Around Stem: UNICORTICAL LOCKING SCREWS ***AND*** CABLES +/- bicortical/transcortical screws
- REDUCE it well and BUILD it strong
- Consider 2 implants unless strong Bone
- SPAN the whole bone

THANK YOU

Utku.Kandemir@ucsf.edu

Orthopaedic Trauma Institute
UCSF + SAN FRANCISCO GENERAL HOSPITAL