

Trunnionosis: What We Know in 2024

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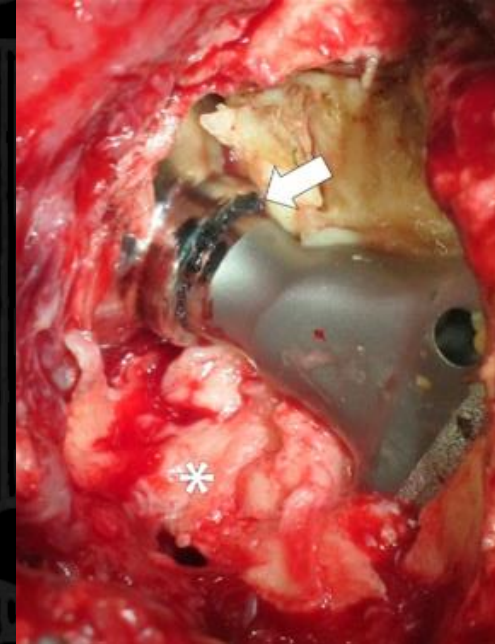


September 21, 2025



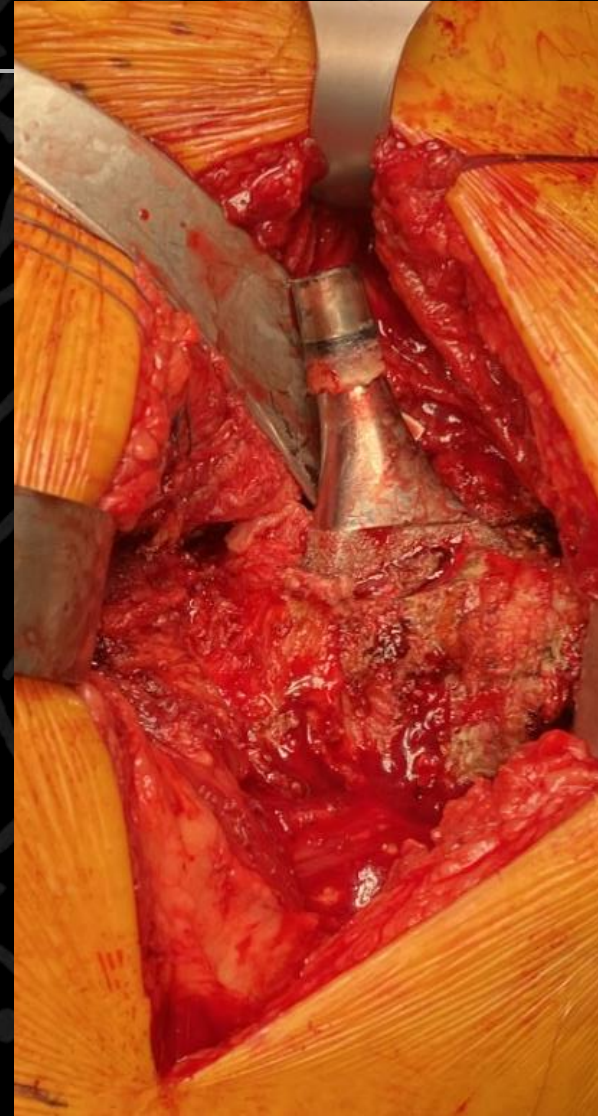
Definition- “Trunnionosis”

- Adverse Reaction to Metallic Debris (ARMD) at the morse taper of a Co/Cr head on PE bearing THA



OUTLINE

- **Epidemiology**
- **Diagnosis**
- **Risk Factors**
- **Treatment**
- **Outcomes**



Epidemiology

- **Increasing awareness over past decade**
 - Initially described in 1991
 - MOM phenomenon
- **Prevalence: <1-3% of total revision THA burden**
 - Wide regional variation
 - Underreported due to concomitant failure mechanisms
- **Time to clinical presentation & revision**
 - mean 3-7 yrs

Pathomechanics

- **MACC- mechanically assisted crevice corrosion**
 - Dissimilar metals
- **Loss of passivation layer-> oxidation of metal alloy**
 - Facilitated by mechanical stress/ motion

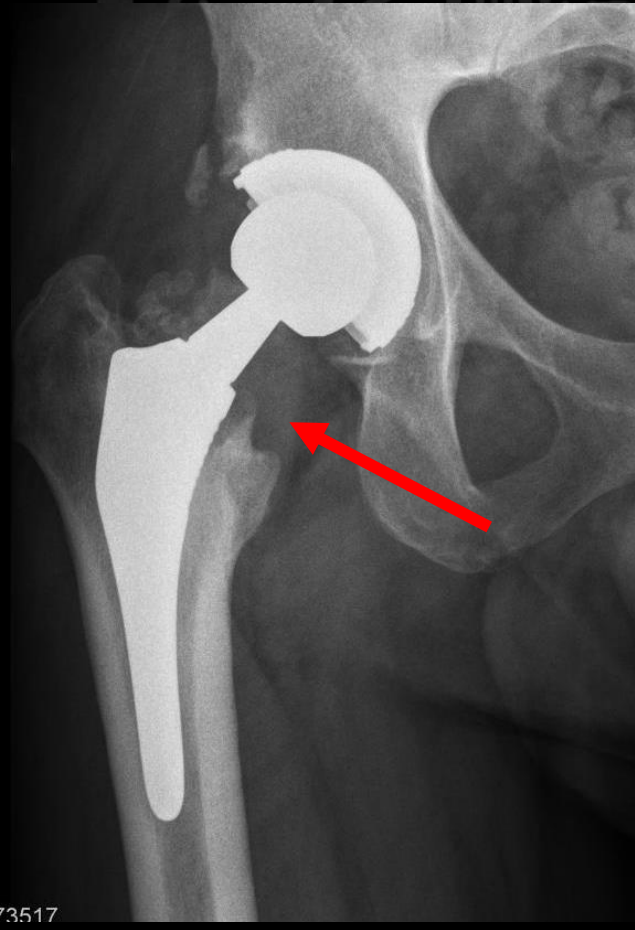


Diagnosis- Clinical History/ PE

- **Variable spectrum**
 - **History**
 - Asymptomatic
 - Painful THA
 - Recurrent instability
 - **Physical exam**
 - Normal
 - + provocative tests
 - Abductor weakness

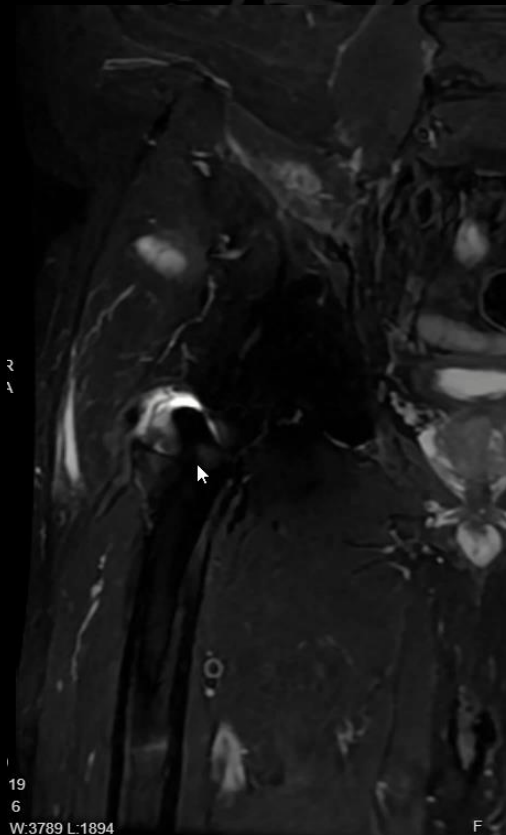
Diagnosis- Imaging

XRAYS



Diagnosis- Imaging

MARS MRI



Diagnosis- Labs

■ Serum Co/Cr

- >1 mcg/L
- 2:1-5:1 ratio Co/Cr

■ ESR/ CRP

- May be elevated in absence of infection

■ Aspiration

- Manual cell count
- Lymphocyte dominant
- Synovial Co/Cr (>1-300x serum levels)

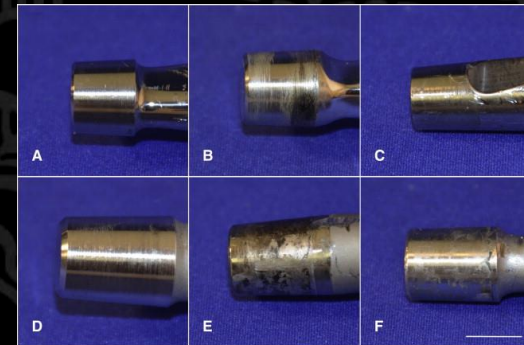
Risk Factors- Patient

- **BMI**
- **Activity (?)**



Risk Factors- Implant

- Femoral head composition (**CoCr**)
- Femoral head size ($\geq 36\text{mm}$)
- Femoral offset (**high**)
- Taper geometry (**shorter and smaller**)
- Certain implants



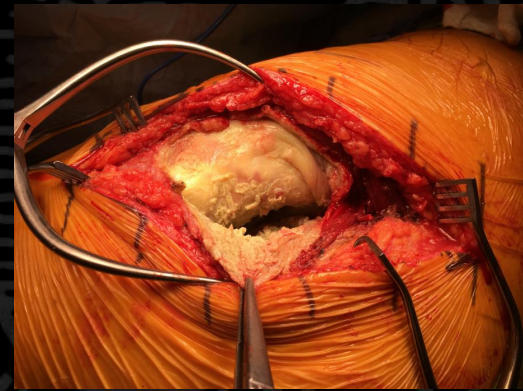
Risk Factors- Surgeon

- **Technique of cleaning/drying taper**
- **Appropriate in line impaction force**



Surgical Treatment

- Revision head/ liner exchange
- Debridement of pseudotumor
- Revision of acetabular component
- Revision of femoral stem



Outcomes

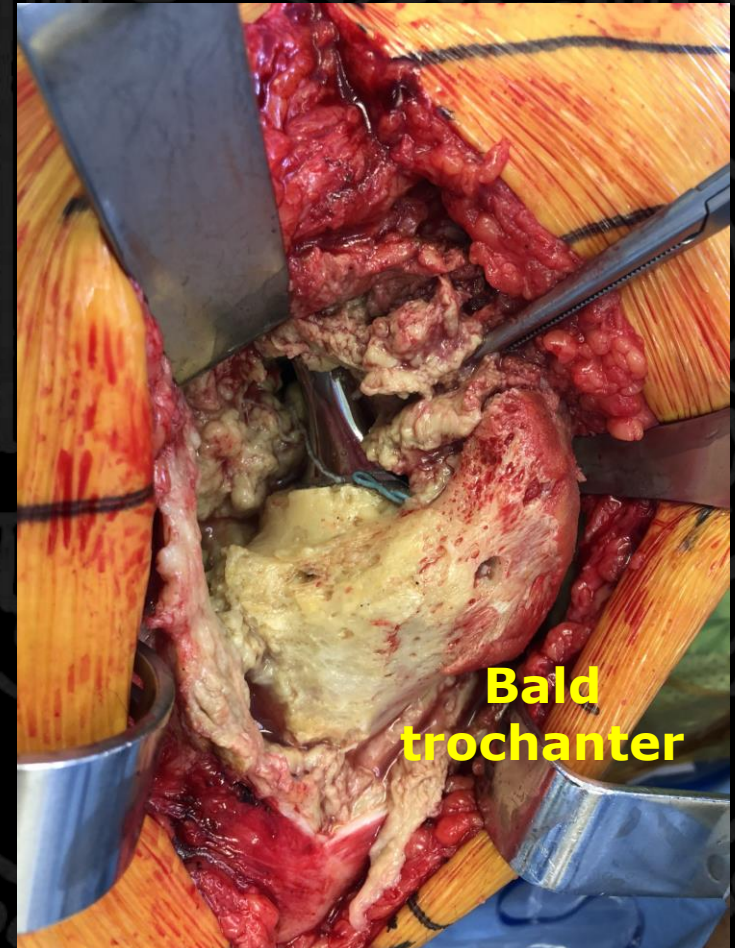
Clinical Outcomes and Risk Factors for Re-Revision Due to Trunnion Corrosion in Primary Metal-on-Polyethylene Total Hip Arthroplasty

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Michael E. Neufeld, MSc, MD, Lisa C. Howard, MHSc, MD, Bassam A. Masri, MD,
Nelson V. Greidanus, MPH, MD, Donald S. Garbuz, MHSc, MD



■ HIP
Revision for adverse local tissue reaction following metal-on-polyethylene total hip arthroplasty is associated with a high risk of early major complications

- High rate of re-revision surgery
 - Approximately 25% ~ 2yrs
- Failure mechanisms:
 - PJI and instability
- 24% rate of dissatisfaction
- Risk factors for re-revision
 - Not revising cup
 - Time from primary to revision



Dual Mobility- Corrosion

- Theoretical risk given dissimilar metals @ modular jxn

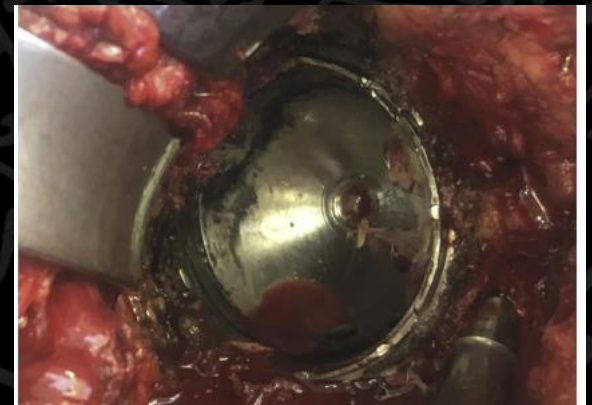
- Exacerbated by mal-seating of liner



- Case reports/series

- Systematic review (N=248pt)

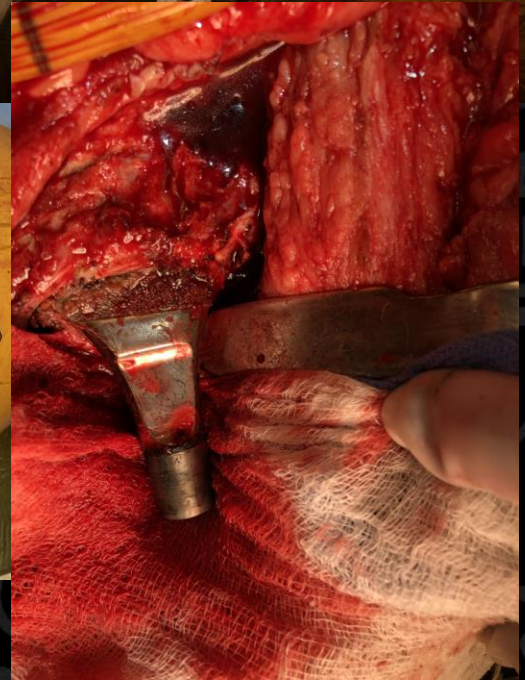
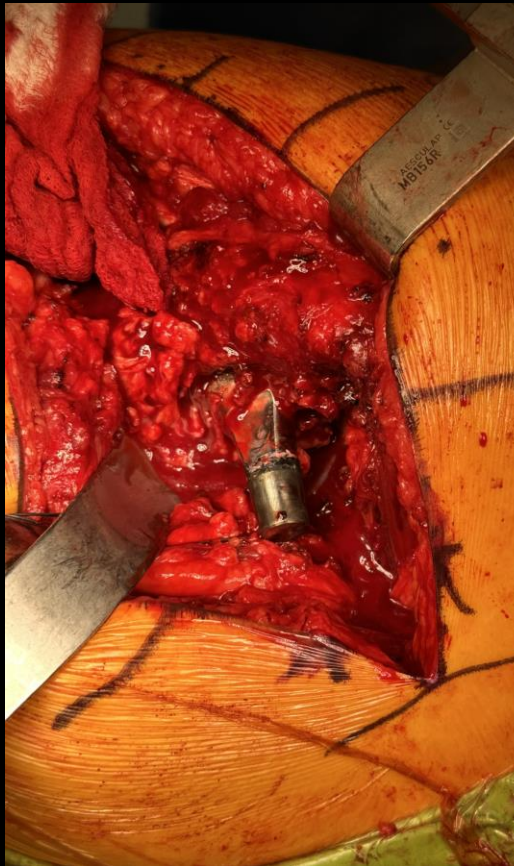
- 5% had elevated Co (>1 mcg/L)
- 1.6% had elevated Cr (>1.6 mcg/L)



- Femoral head composition trended toward ↑ ion levels

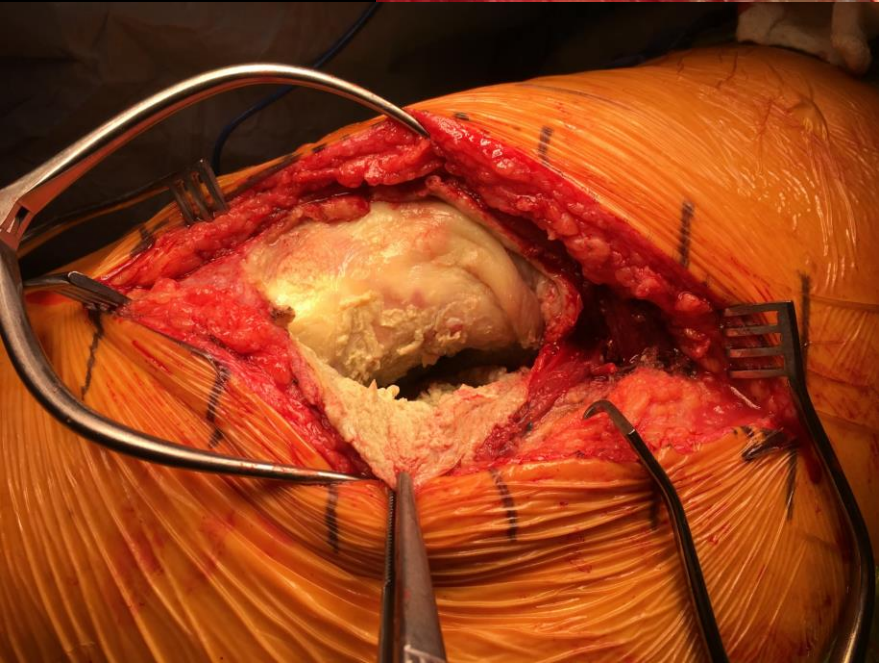
Summary

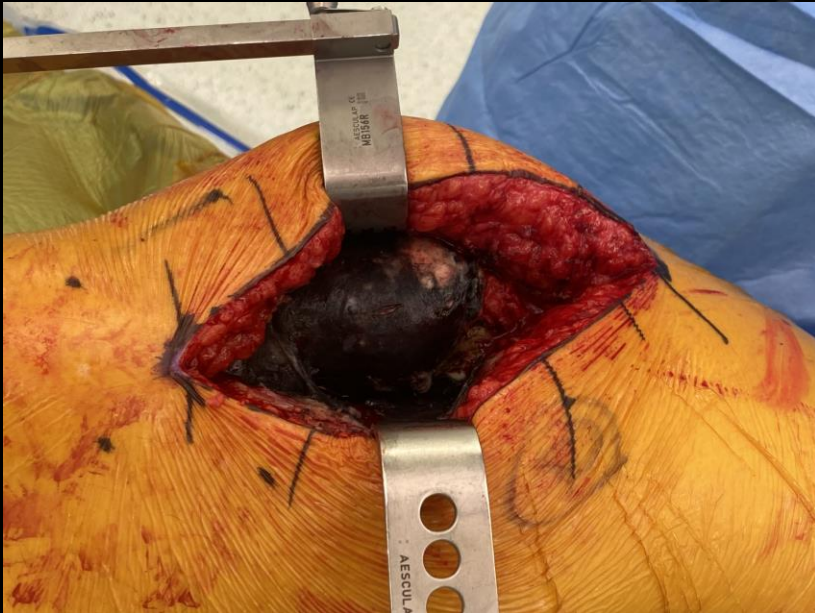
- **Diagnosis of trunnionosis requires a healthy index of suspicion**
- **Labs, aspiration, and imaging remain the mainstay of diagnosis**
- **Surgery may seem straightforward, but the outcomes are anything but**
- **Our responsibility: counsel patients, meticulous surgical technique, and judicious use of dual mobility**





UNIVERSITY OF







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Case 5

- 74M L recurrent hip mass & limp
- '15 L THA (DA), 4/16 mass excision
- PE: preserved ROM, +trendelenberg gait/ sign, swelling anterolateral thigh

LABS:
12/7/16:
Chromium = 1.6
Cobalt = 10.2

10/13/2016:
ESR = 22 (20 is high end of normal)
CRP = 7.2 (9 is the high end of normal)



- Diagnosis
- Further workup?

Case 5

- **Surgical Plan?**
- **Instruments/
Implants?**



Case 5

- 3/2017- revision head/liner ceramic on HXLPE, 40+7 Biolox head
- Gross damage to abductor from ARMD



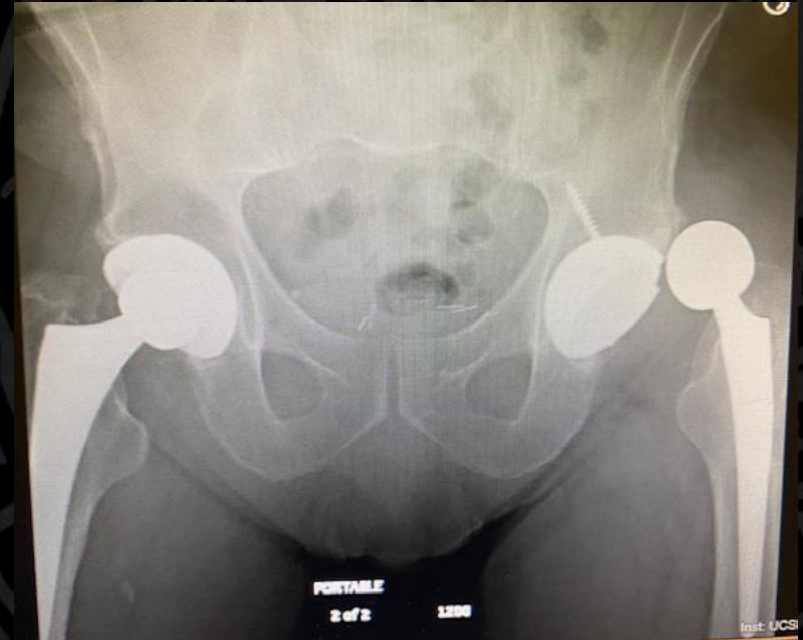
Case 5

- Multiple dislocations requiring CR
- Now what?



Case 5

- Surgical plan
- Instruments/implants?



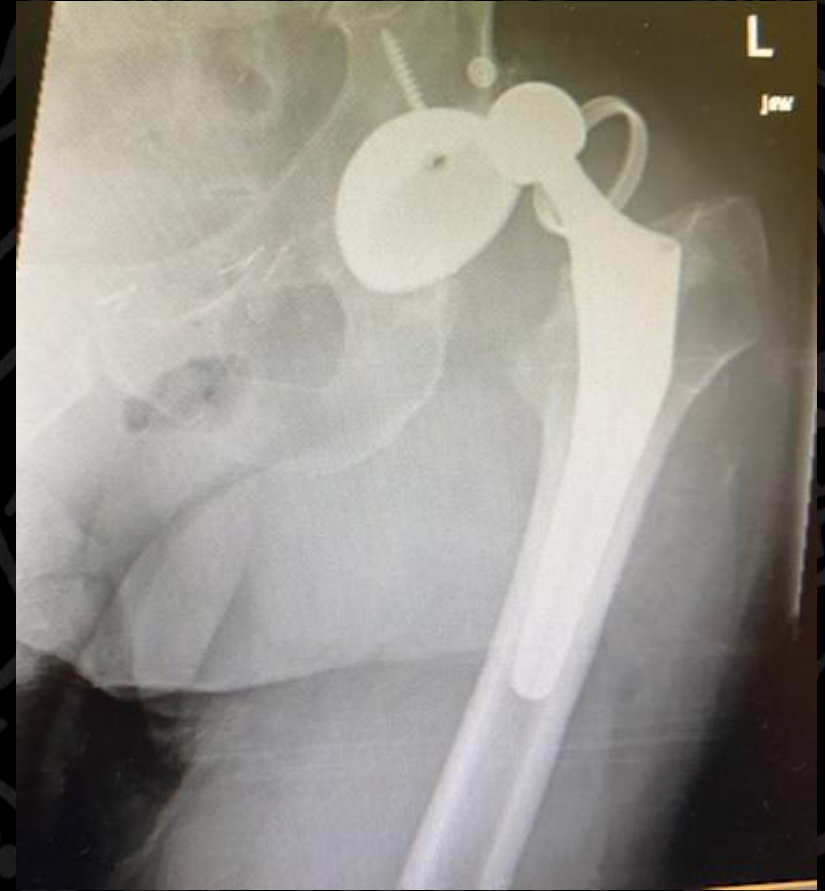
Case 5

- 1/2018 revision to constrained liner
- Zimmer trilogy constrained, 32+7 biolox head



Case 5

- Does well for 2 years, then redislocated trying to clip nails
- Now what?



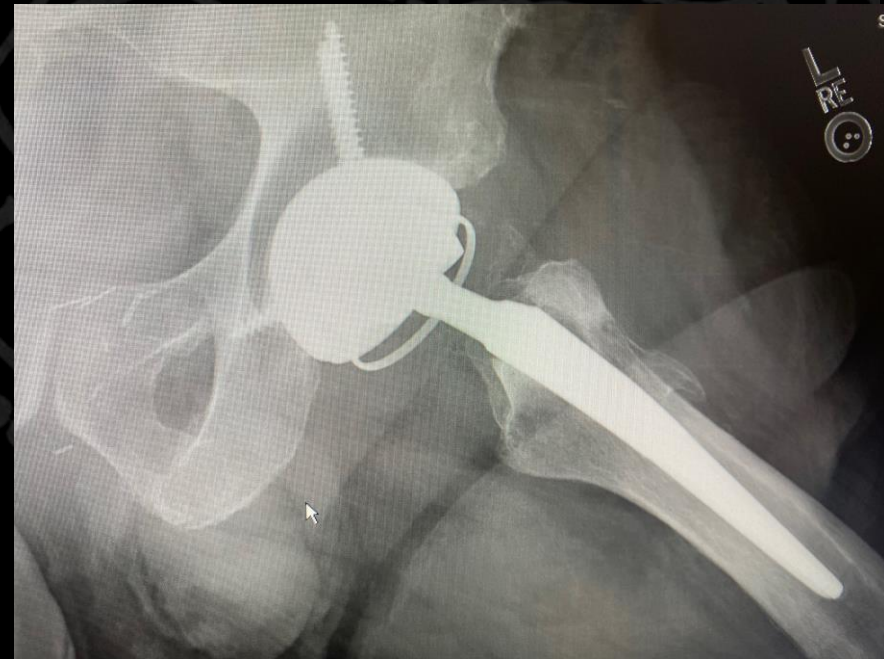
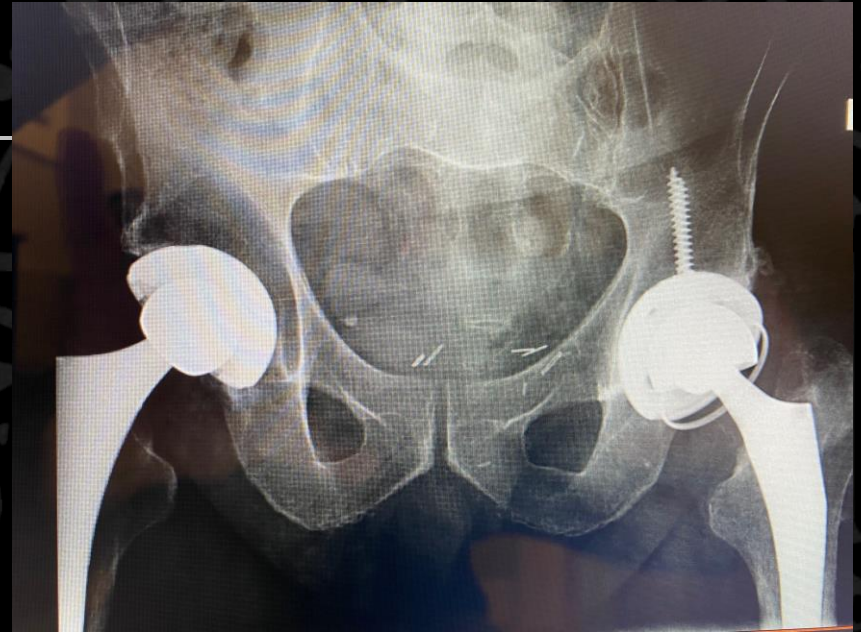
Case 5

- Surgical plan?
- Instruments/
Implants?



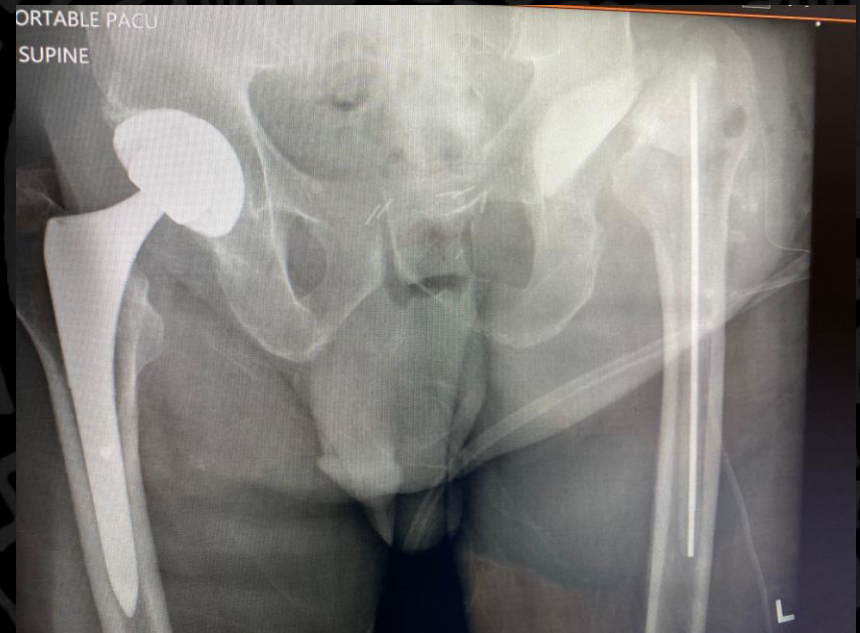
Case 5

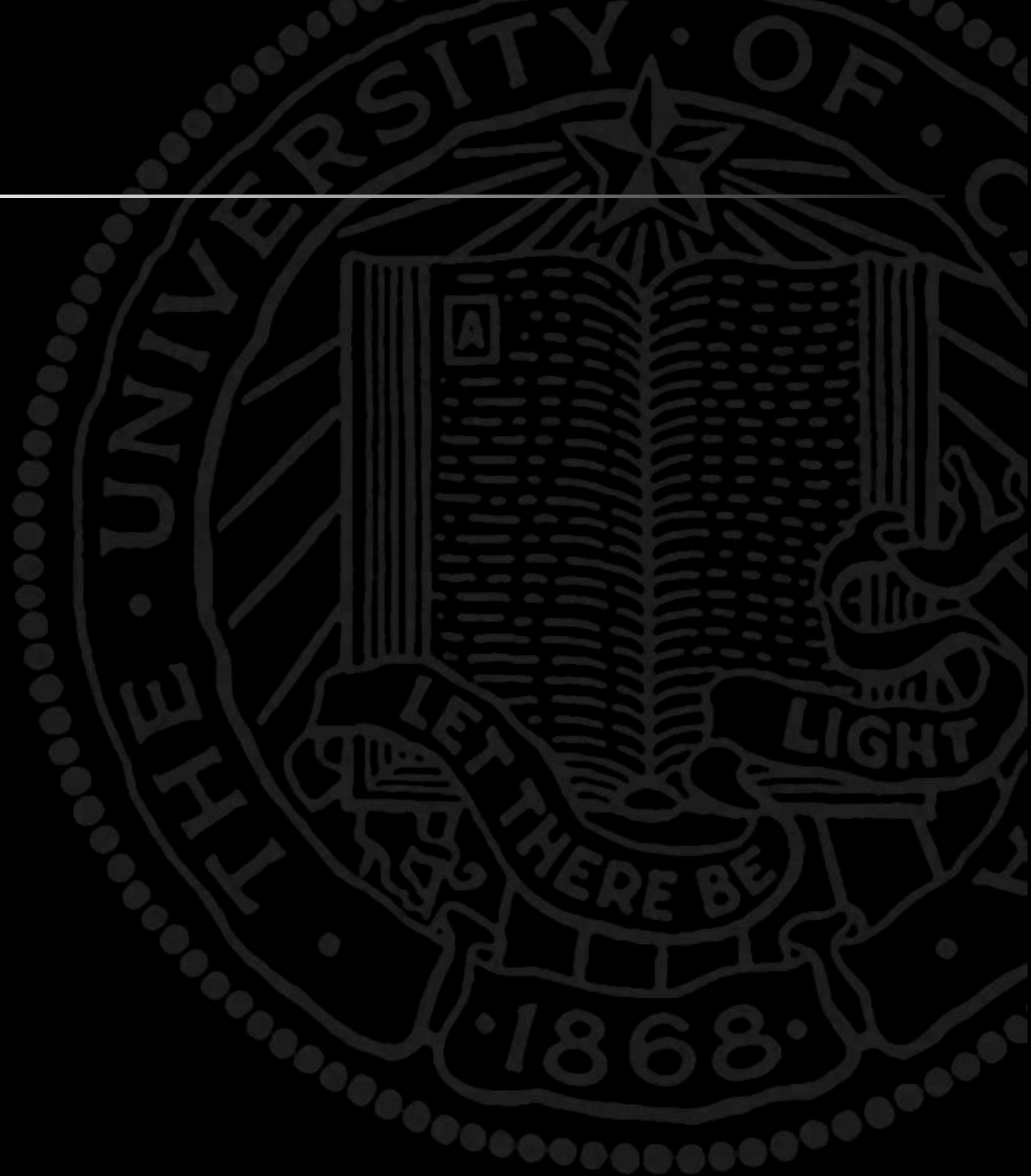
- Revision acetabulum, Stryker Tritanium, constrained liner



Case 5

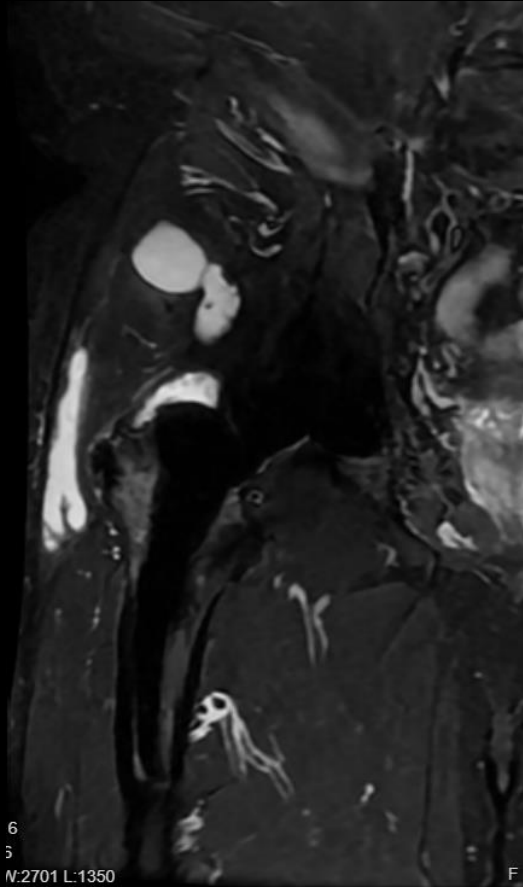
- Unfortunately, where we're at...
- Recurrent player at Dept wide M&M











MR HIP WITHOUT CONTRAST, RIGHT (S)

