Orthopaedic Trauma Fundamentals

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Disclosures

- None for this talk

Welcome!

Who am I?

- Orthopaedic Trauma Surgeon from UAB
- From MN
- Med School/Residency Medical College of Wisconsin
- Tampa Orthopaedic Trauma Fellowship
- 5th year at UAB

What is Orthopaedic Trauma?

- Broken Bones, pelvis, acetabular trauma
- Periarticular fractures
- Nonunions
- Malunions
- Anything in between

- Fractures all day everyday!

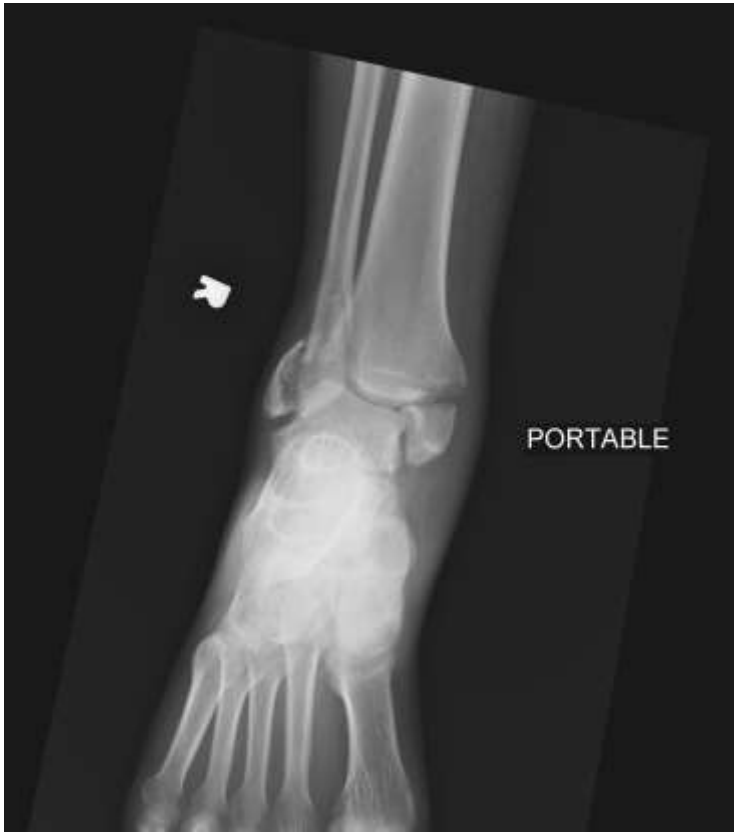
CME Objectives

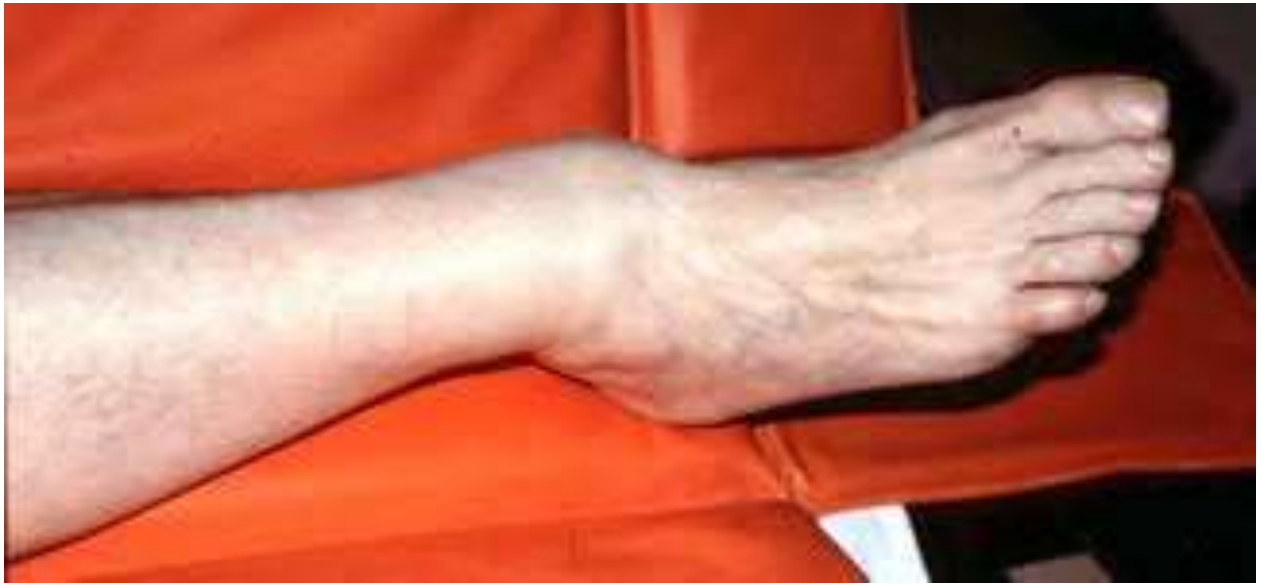
- Anatomy- areas of fracture and displacement
- Diagnosis- Characteristics and classification of fractures
- Treatment-modern treatment theory and techniques
- Assessment and Keys of treating traumatic joint injuries in an office setting
- Review ATLS Guidelines and Updates

Office Based Orthopaedic Trauma

Clinic Add-on slots

39 yo M
Right ankle pain after a misstep on a construction site.





Ankle Fractures 101

Anatomy of the Ankle Joint

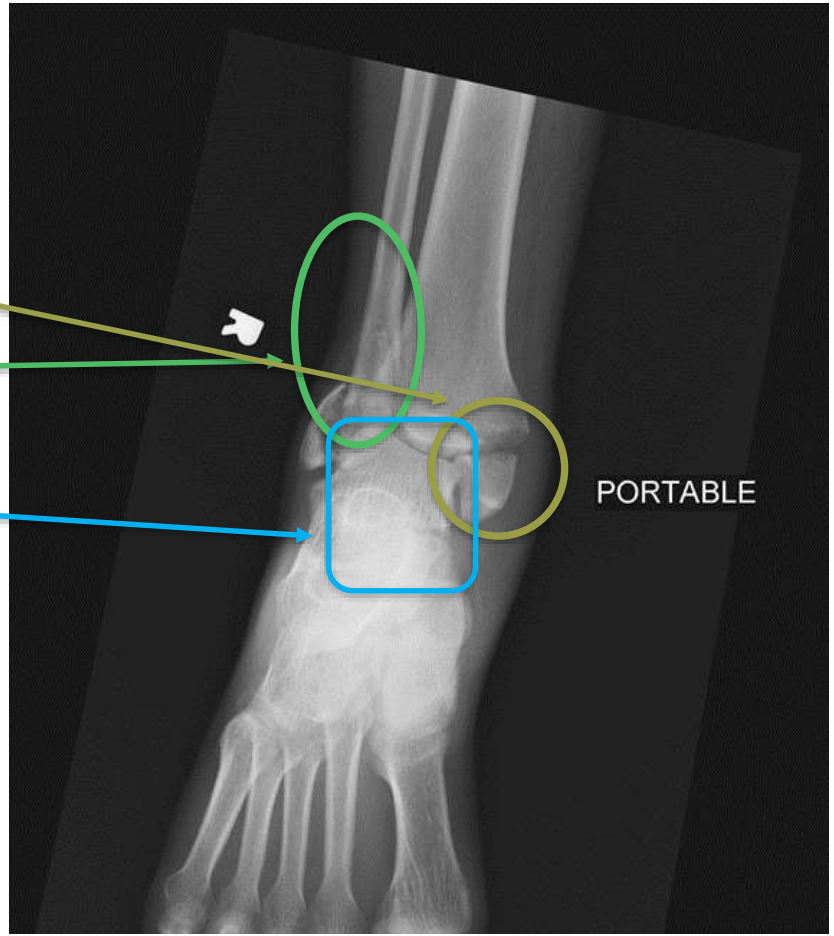
- Fibula= Lateral Malleolus
- Medial Tibia= Medial Malleolus
- Posterior Tibia= Posterior Malleolus
- Talus=Talus

Anatomy

Medial Malleolus

Lateral Malleolus

Talus



Goals of Treatment

- Anatomic Reduction!
- Joint Surface/Joint Reactive Forces
  - All about the Cartilage!

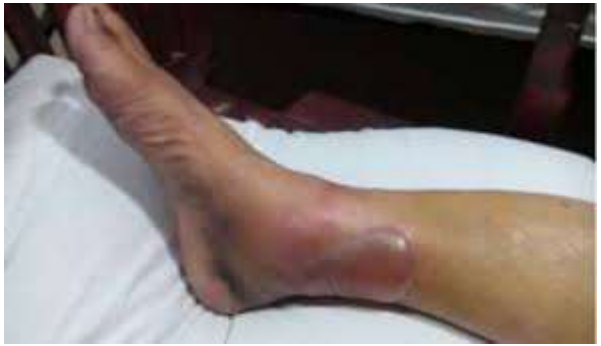
- Needs a Skin Check!
- Blisters??!! Normal?

Respect the Soft Tissue

Must respect the Soft Tissue envelope
-Allow fracture blisters to resolve, TRY NOT to UNROOF THEM!!

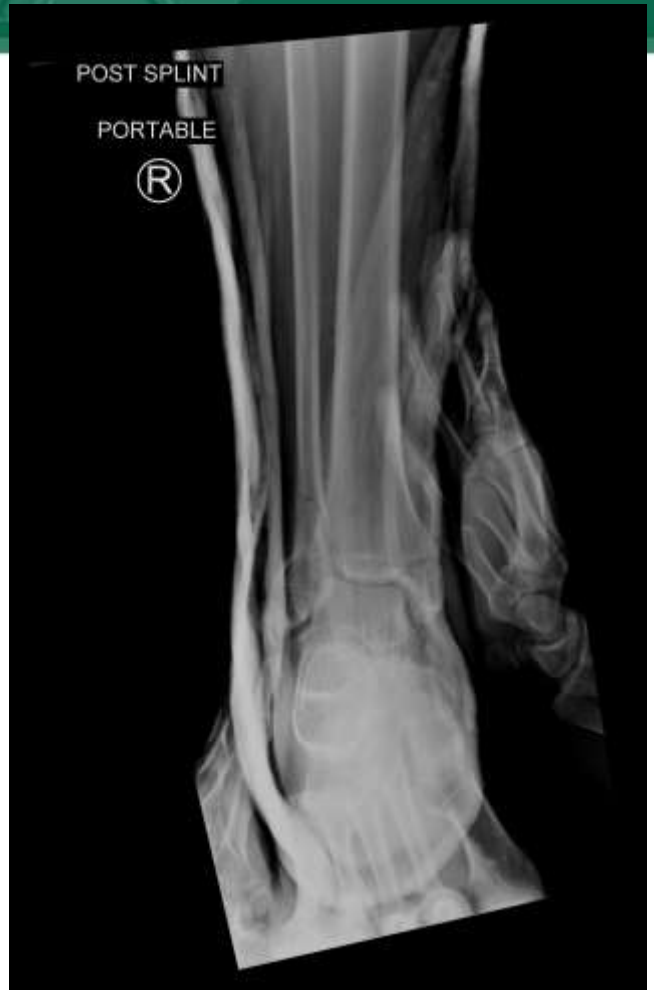
Strict elevation

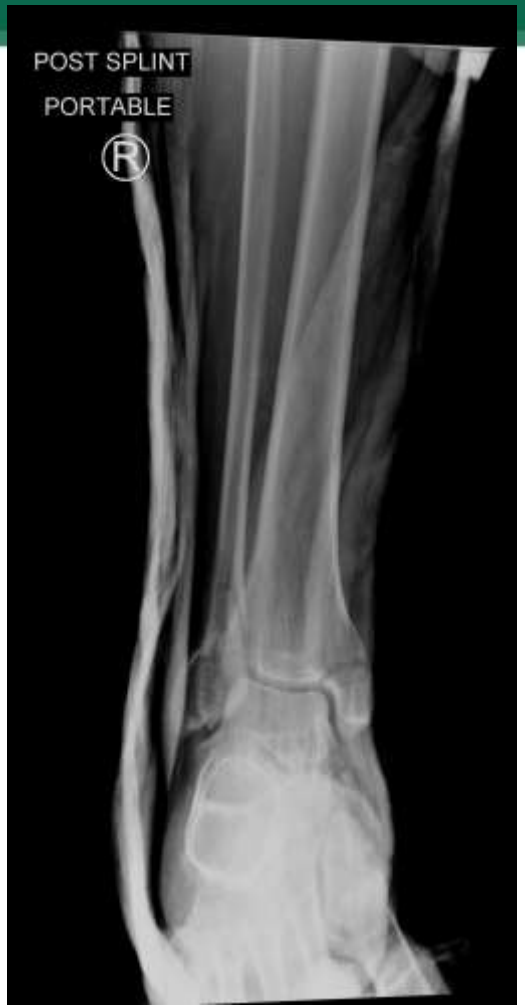
Reduction of ankle joint takes pressure off of the soft tissue



Reduction- Counter the forces!

- Ankle block- intraarticular, lidocaine + Marcaine, no EPINEPHRINE,
- Usually versed and or propofol done in the ER
- Well Padded, 7 layers of webril, bulky jones cotton
- Orthoglass or plaster, doesn't matter as long as well Molded!

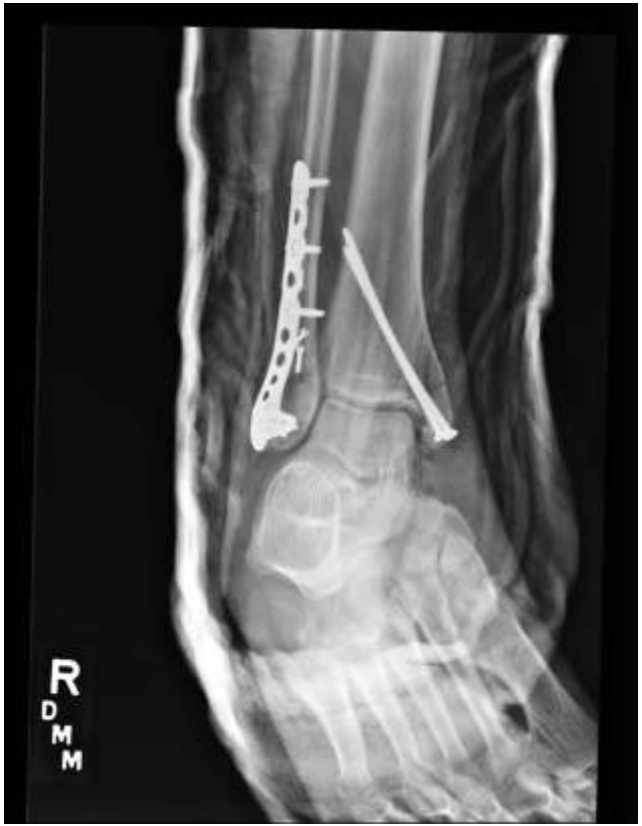




Surgical Timing

- The soft tissue will tell you when
- “Skin Wrinkling” Sign
- 0-10 days usual window

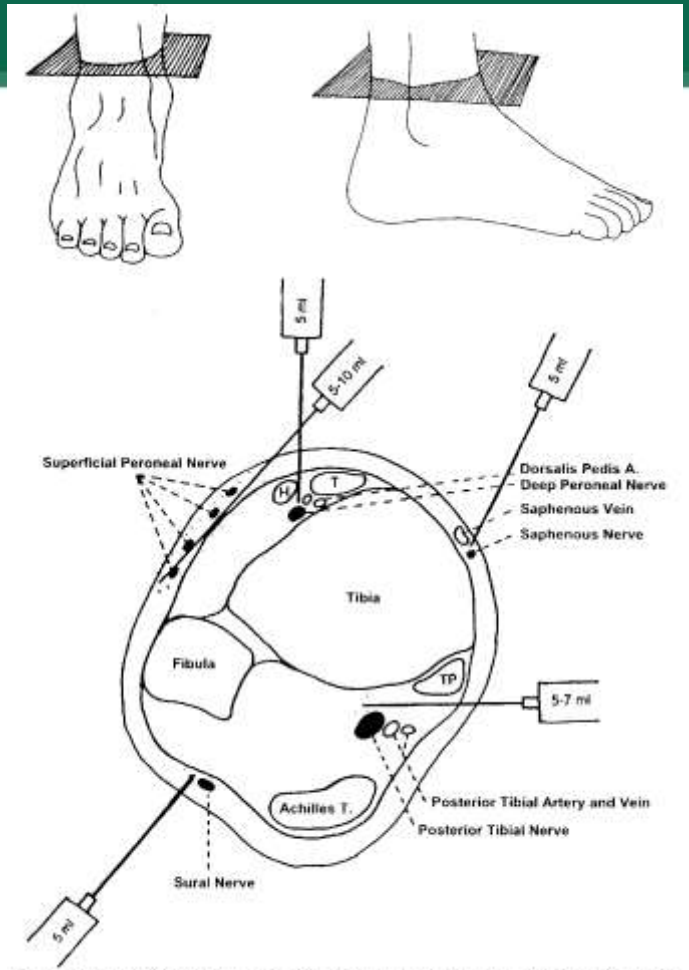
Post Operative



Pain Control

- Intraoperative Ankle Block, 0.5% Marcaine with Epinephrine
- iv Tylenol in OR if available
- Toradol iv in PACU
- Oral Toradol for 3 days q8h 10mg
- Strict “Toes above Nose” elevation for 2 weeks

Ankle Block



gram of the anesthetic technique. All punctures are performed at the supramalleolar level. The tourniquet is later placed at t

Narcotics

Narcotics

- Narcotics-> Post op Protocol
  - Oxycodone 5mg q4h, can take 10mg if needed for the first week
  - Then wean 5mg q4-6h second week
  - Then refill at first post op visit, 3,2,1 done by 6 weeks, discuss with patient
    - 5mg q8-10, 5mg q12h, 5mg qDay (as needed)

Post Operative Protocol

- Pending Soft Tissue and Host
  - Boot vs TAFO x 2 weeks.
  - Sutures out at 2-3 weeks
  - WBAT in Boot for the next 4 Weeks
  - DVT prophylaxis, 4 weeks chemoprophylaxis (enoxaparin)
  - At the 6 week visit, xr and transition to an ASO brace if tolerating Weight bearing

Questions Re ankle fx case?

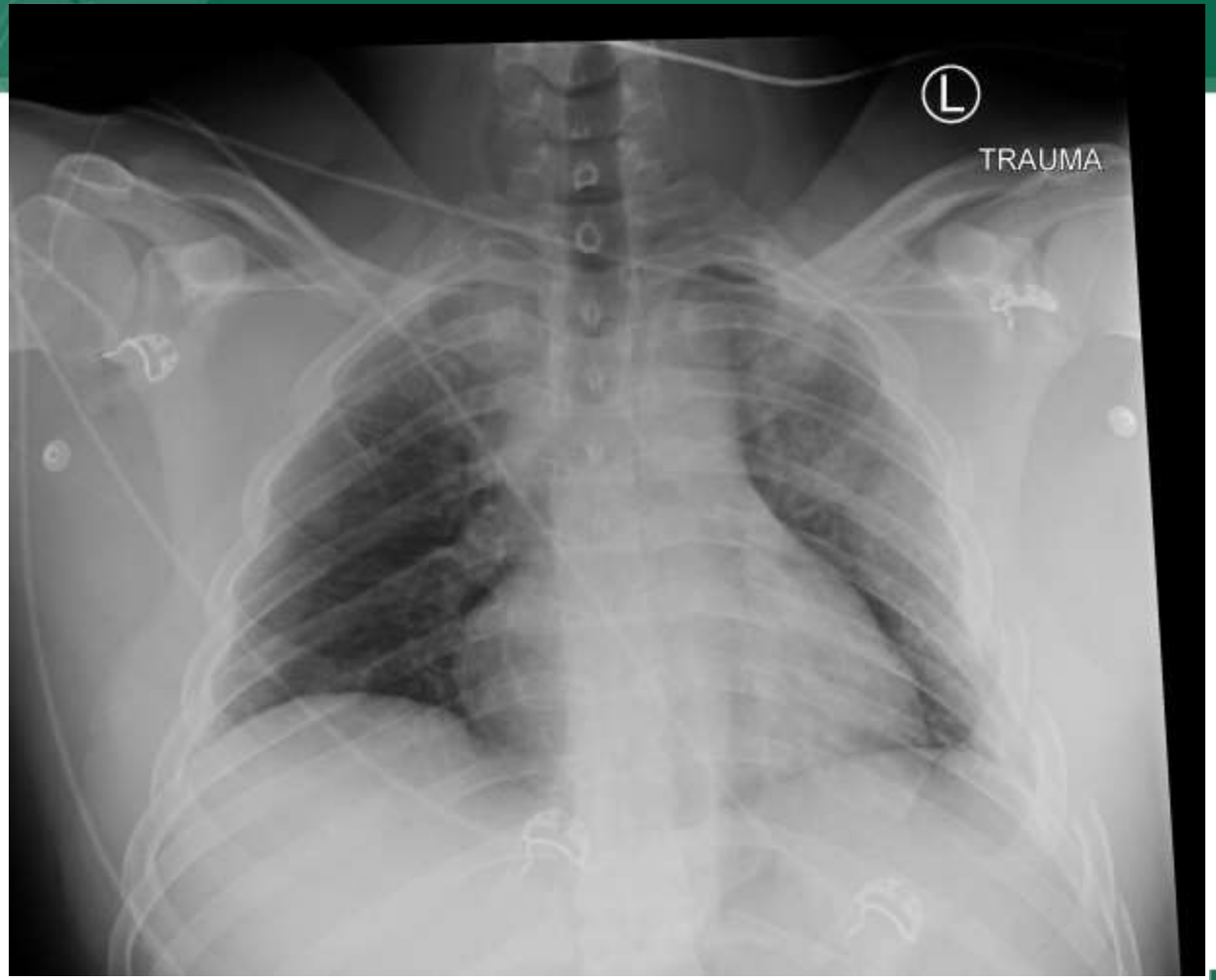
37 yo M MVC Level 1Trauma Alert

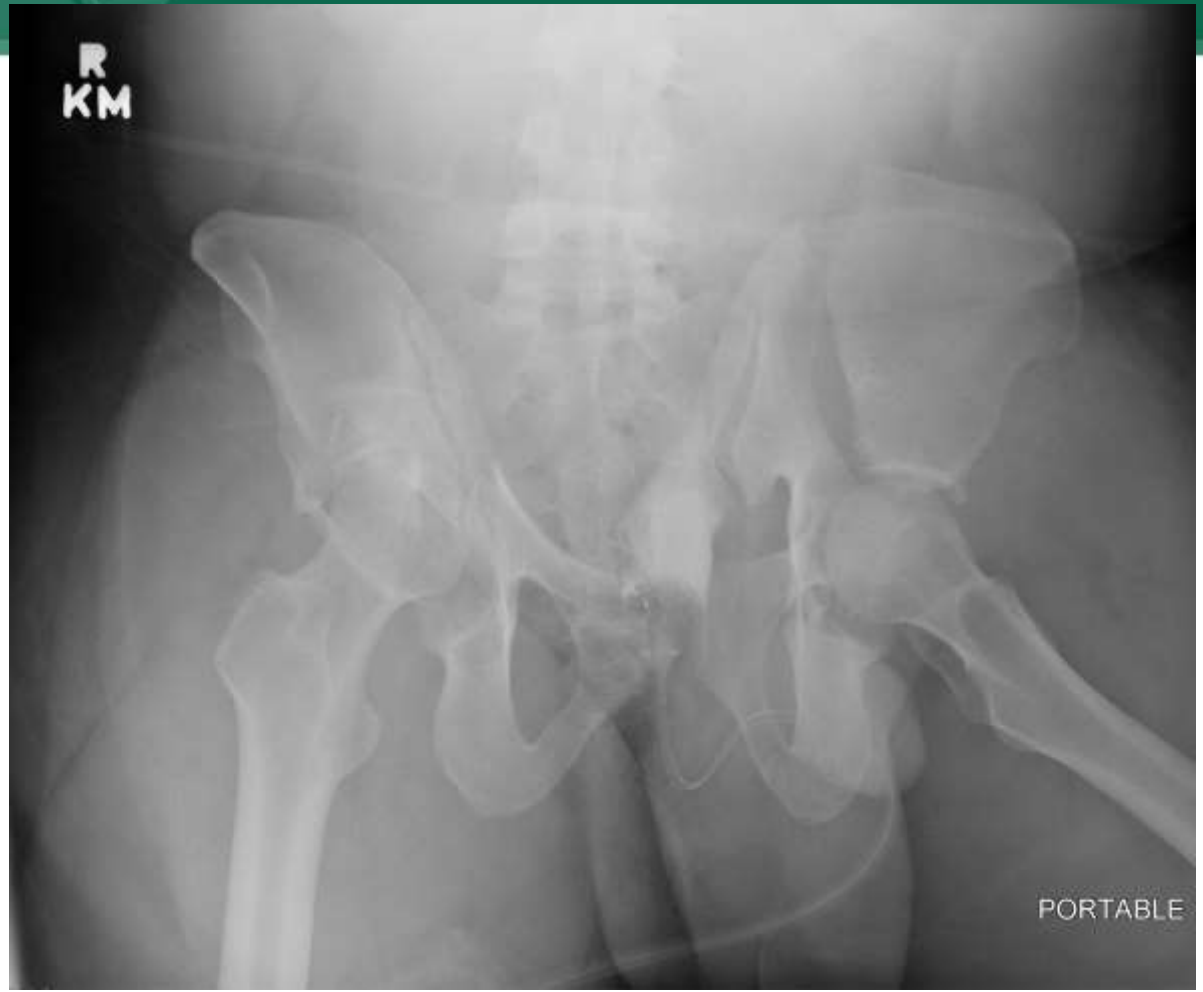
First things first.. ABCDE

- **A**irway- patent, protected?
- **B**reathing- Hemo/pneumothorax, breath sounds
- **C**irculation- Heart Sounds, Pulses in all 4 distal extremities
- **D**isability- Spinal Deformity, Moving Extremities
- **E**xposure- Head to Toe Skin Exam

Referred to as the **Primary Survey**

- **Secondary Survey**- Follows Primary, where a majority of fractures are identified.



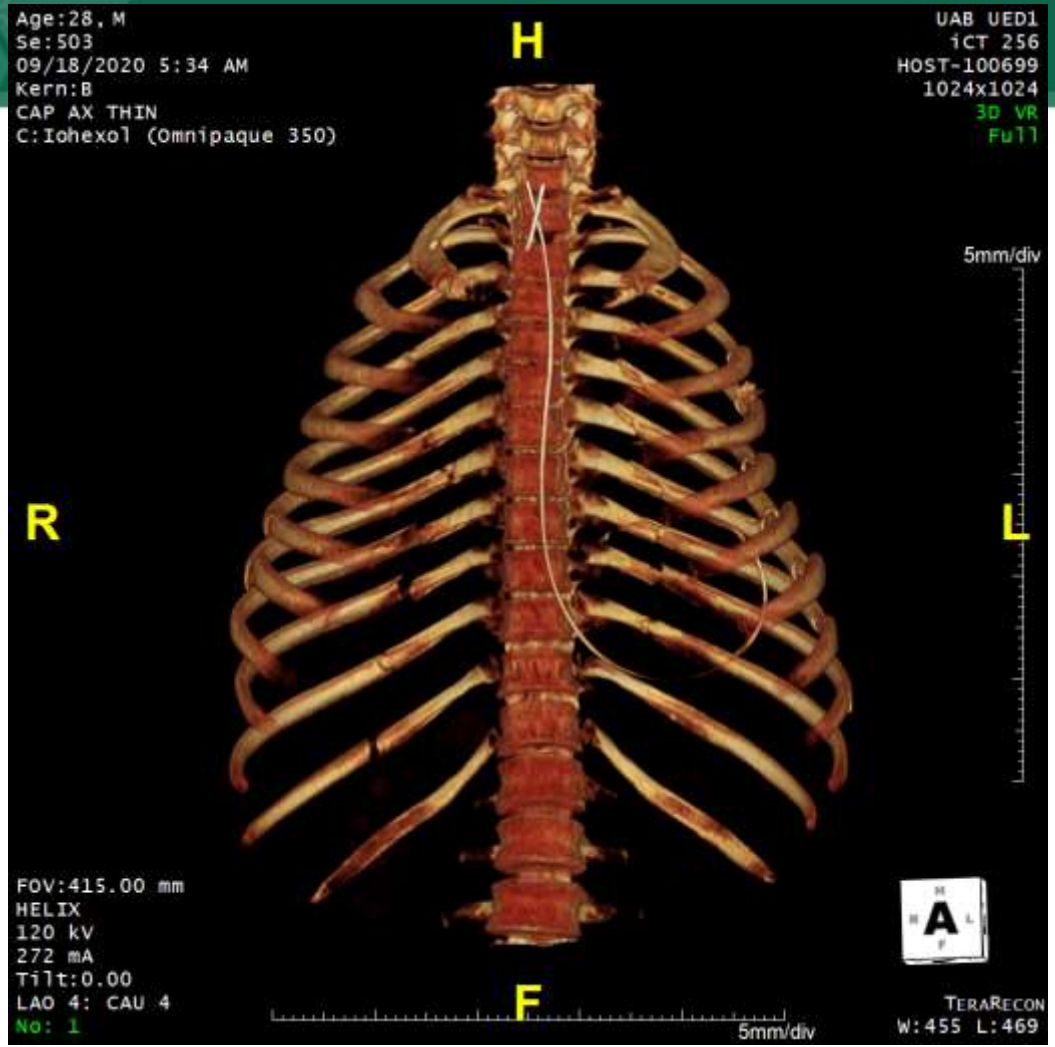


ATLS Resuscitation

- 2 Large bore iv's, 18 or 16, functional, preferably NOT in AC fossa
- **Recent Change:
- Used to be 2 L crystalloid and reassess
  - Can give a 500cc-1L bolus for intravascular support →
  - 1:1:1 PRBC:FFP:Platlets
- Why the Change?

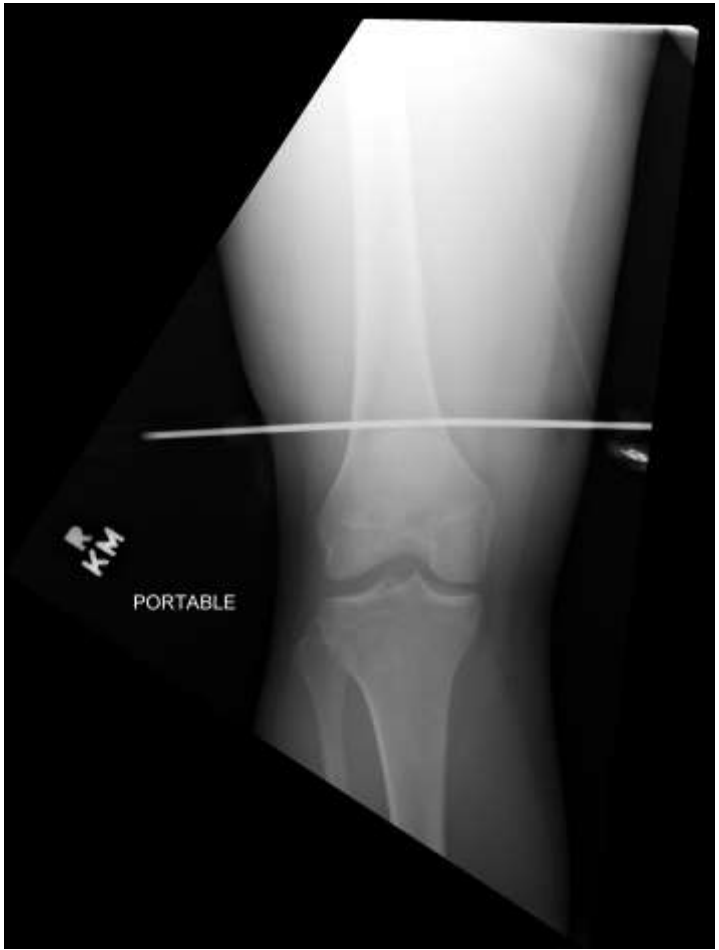
Goal of Resuscitative Therapy

- Goals Are:
  - STOP THE BLEED! Correct Consumptive Coagulopathies
    - Can Monitor Via TEG
  - End Organ Perfusion
- Measure of Success?
  - Urine Output
  - Base Deficit
  - Lactate
  - TEG



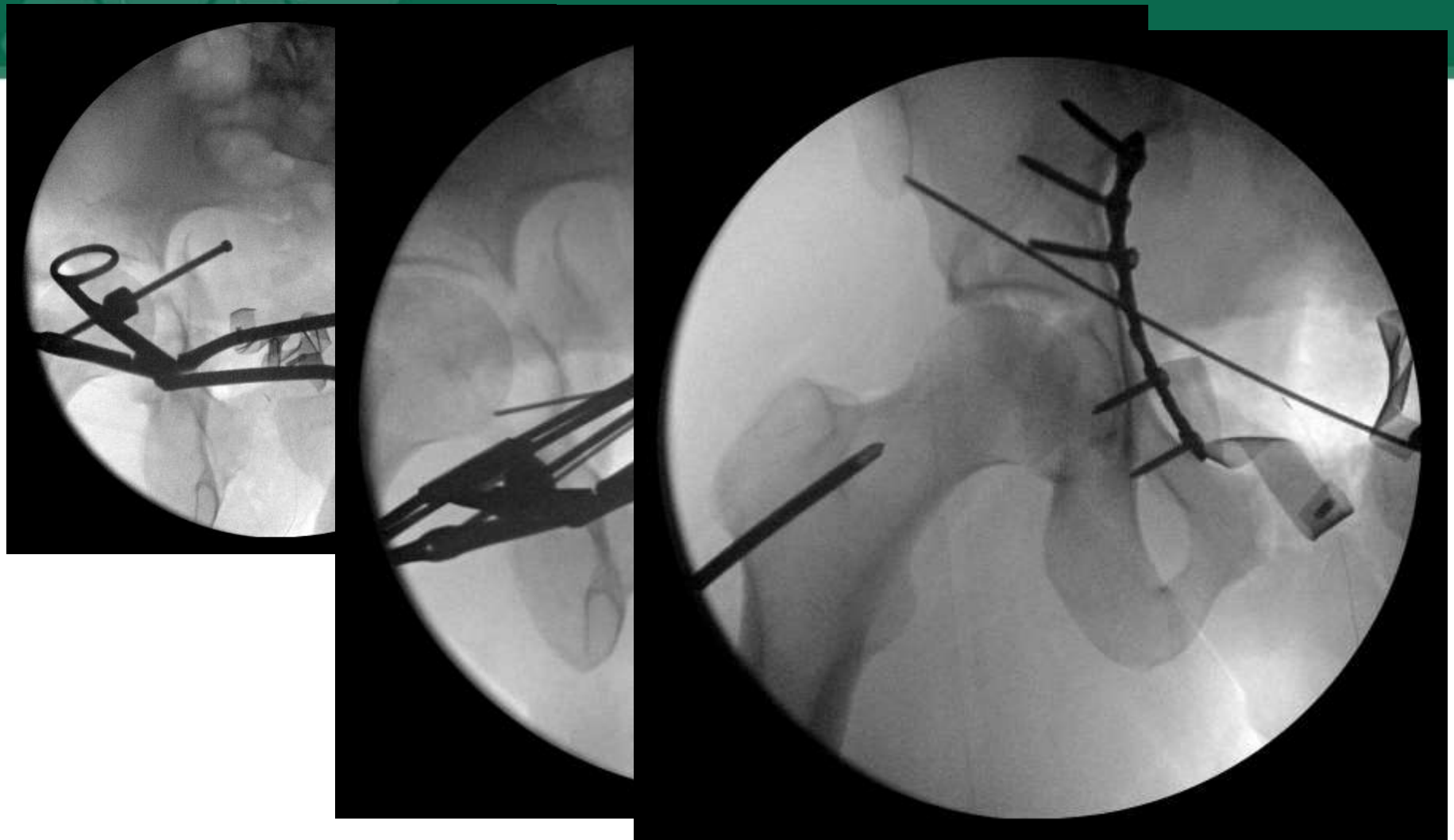
Temporary Stabilization

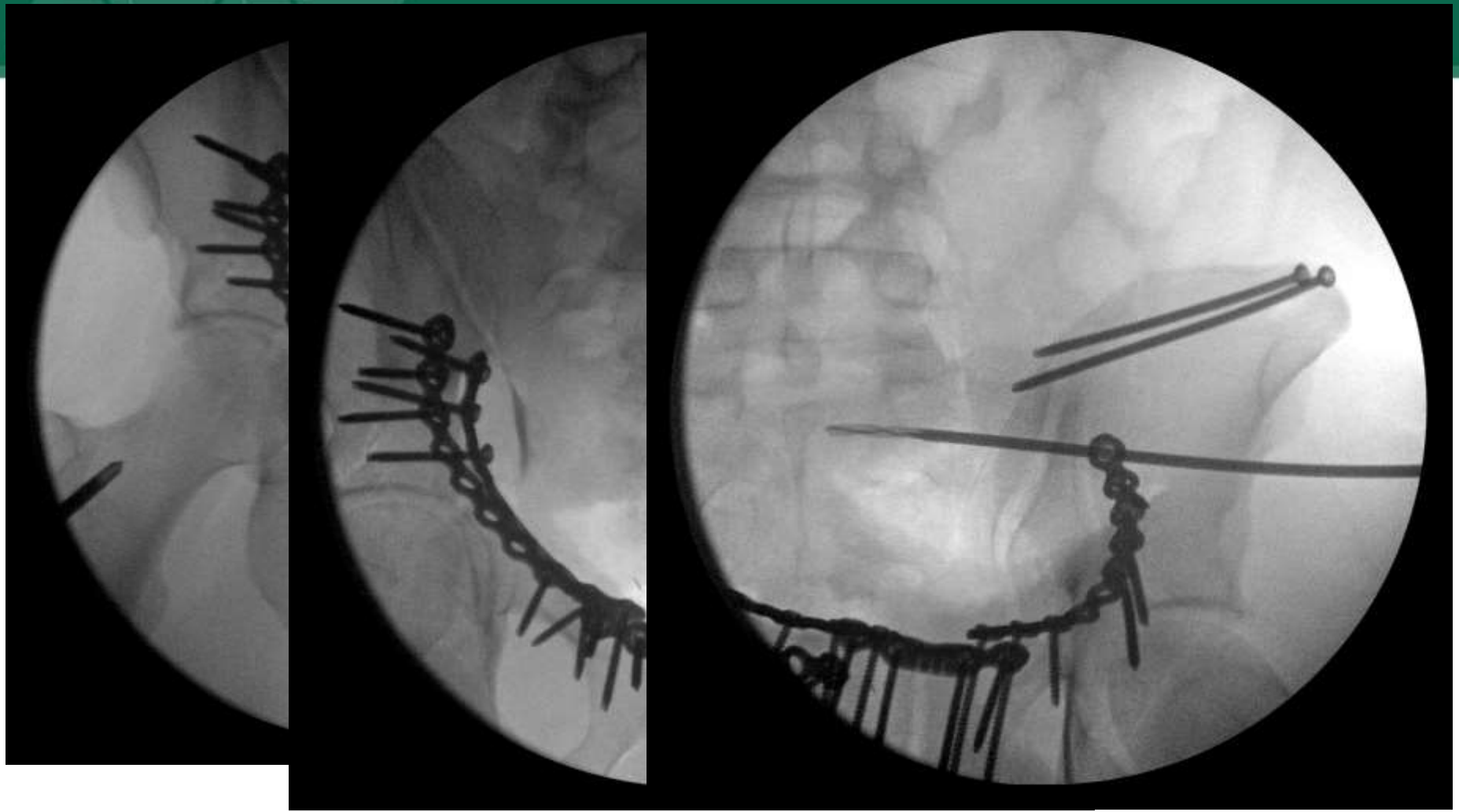
- Skeletal Traction

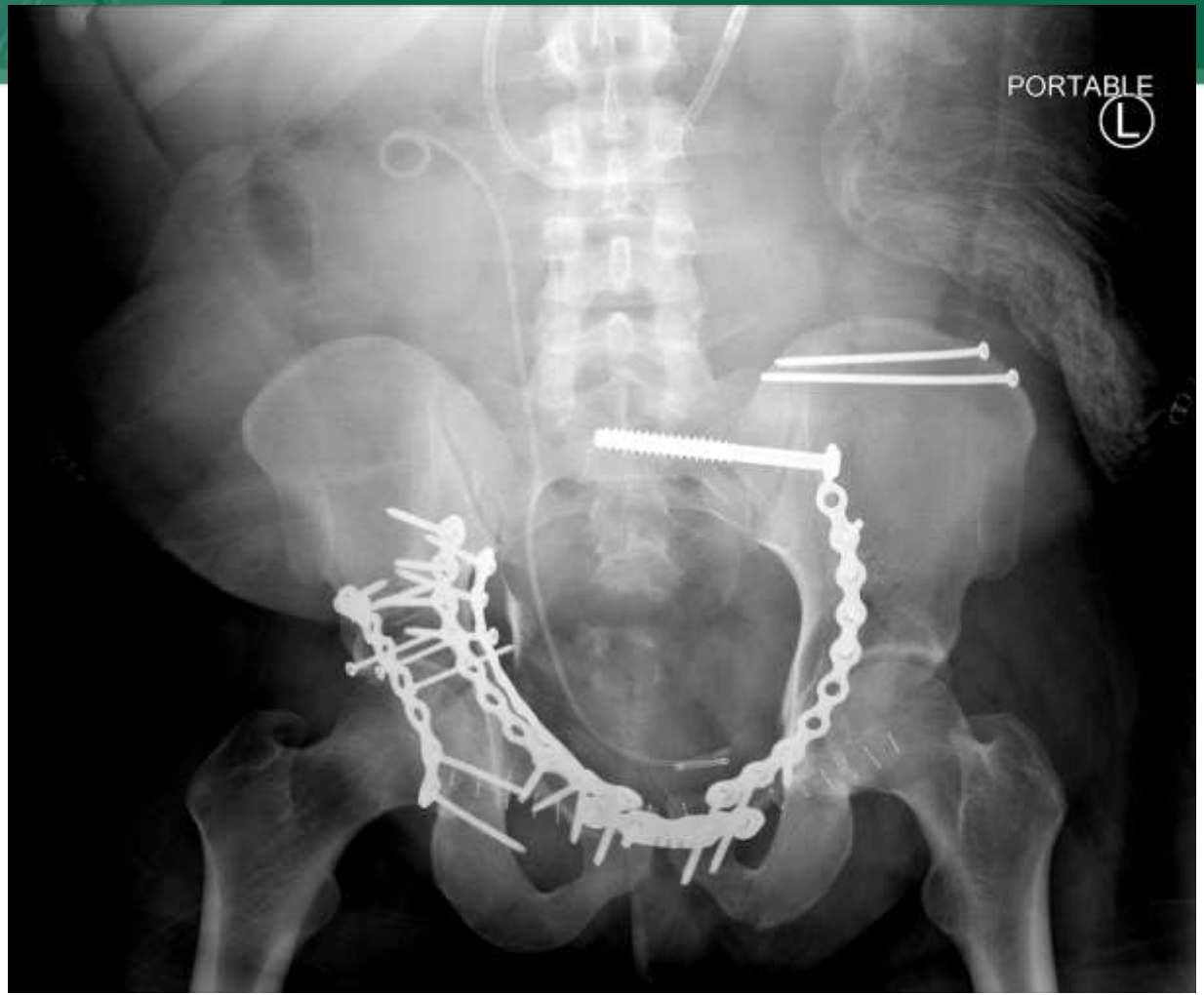


Timing to Definitive Fixation

- Once Adequately resuscitated and can tolerate a fairly significant fluid shift.
  - Estimated Blood Loss 2,000cc







Intraop

- 3,600cc Blood Loss
- Blood volume for this patient, ~5,500cc
- Large Fluid Shifts
- 7 units PRBCs, 4 FFP, Platelets

Post Op

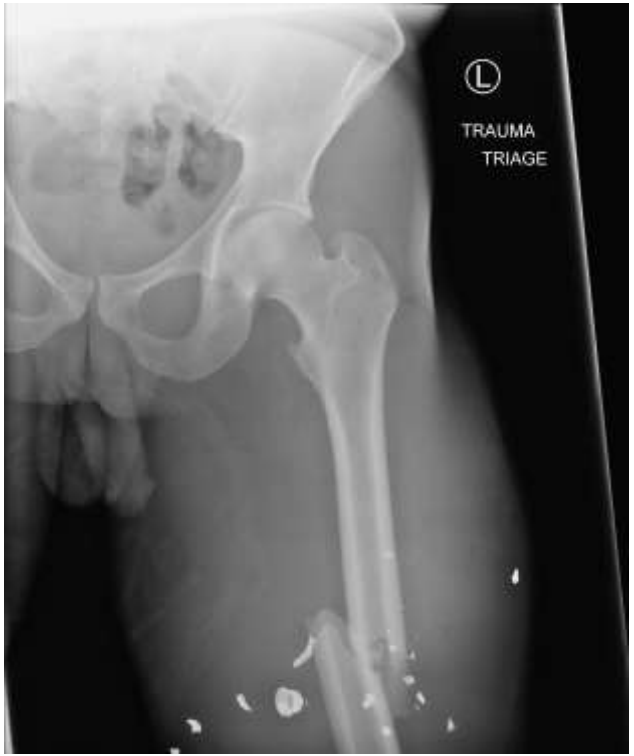
- V/Q Mismatch
  - ECMOx2 weeks
  - Recovers in CICU/TBICU

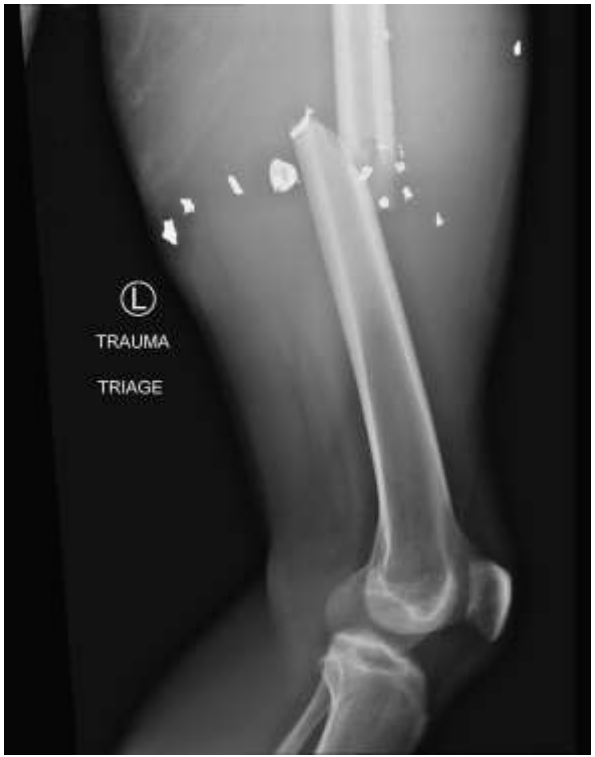
- Non-Weight Bearing for 12 weeks
- Enoxoparin for 6 weeks
- Depend on Physical Therapists and Case Managers for Placement

Questions?

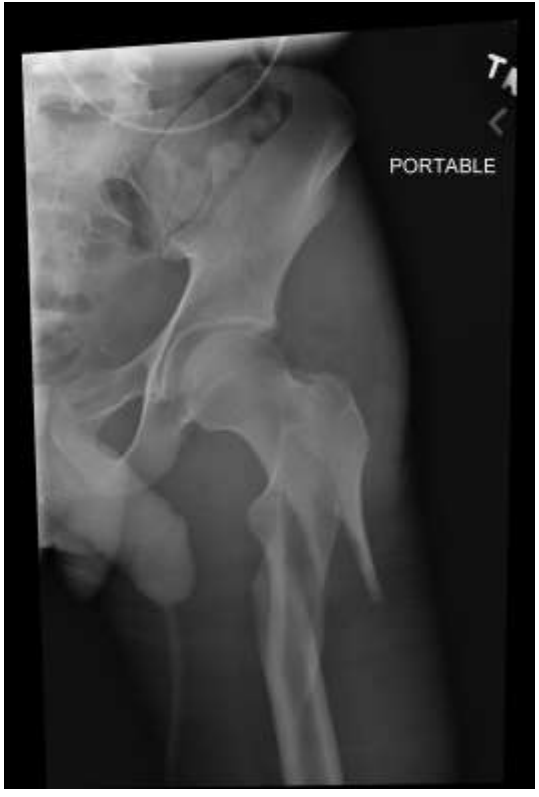
- Resuscitation

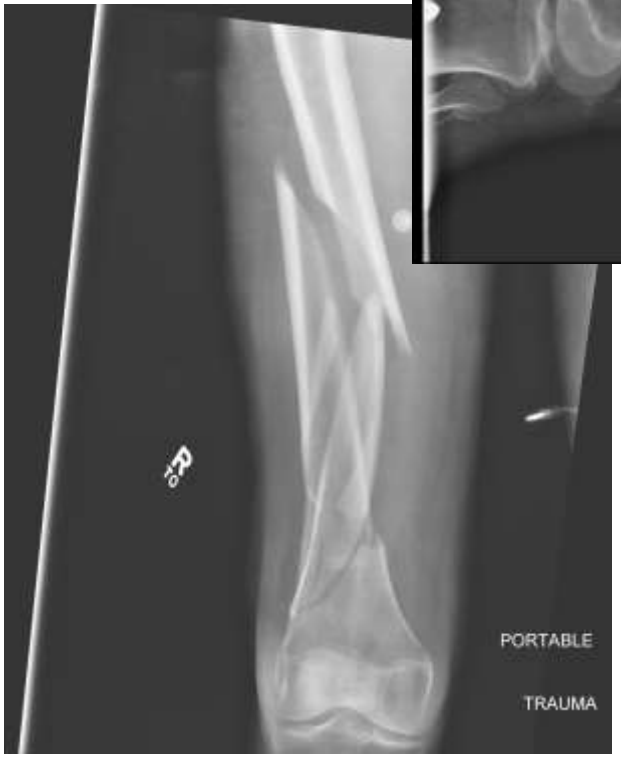
Case #3- 22 yo M GSW to abd and LLE

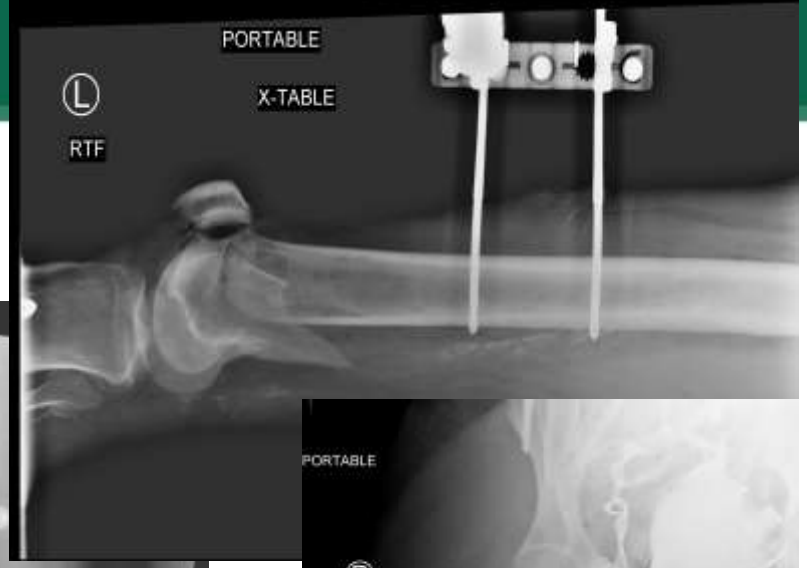


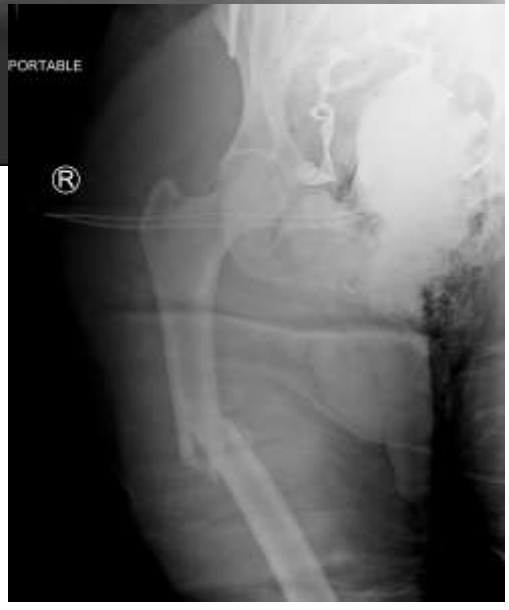


Femur Fractures









Talk the Talk…

- Fracture patterns:
  - Transverse
  - Compression
  - Spiral
  - Oblique
  - Avulsion

“Talk the Talk”

- Locations:
  - Medial
  - Lateral
  - Proximal
  - Mid
  - Distal

- Locations:
  - Epiphysis
  - Metaphysis
  - Diaphysis

“Talk the Talk”

Fracture=Broken

Open=Compound

- Bone through the skin
- 3 grades- I, II, IIIa,b,c

Closed- no skin breakage

Fracture-Dislocation!

Lets put ‘em together…

- (Orientation) (Fragmentation) of the (Side) (Location) of the (bone).
  - Orientation
    - Transverse
    - Oblique
    - Spiral

Fragmentation
- Comminuted
- Segmental

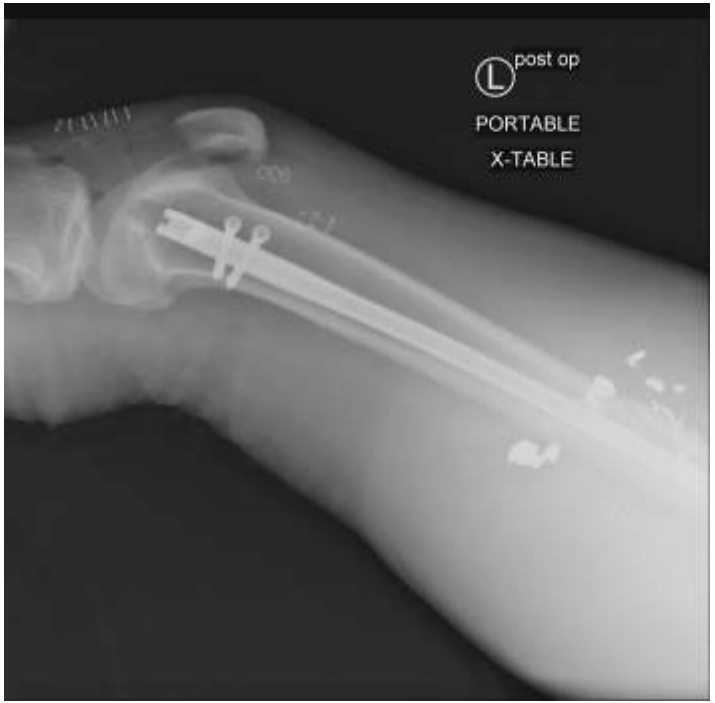
Side
- Medial
- Lateral
- Dorsal
- Volar
- Anterior
- Posterior

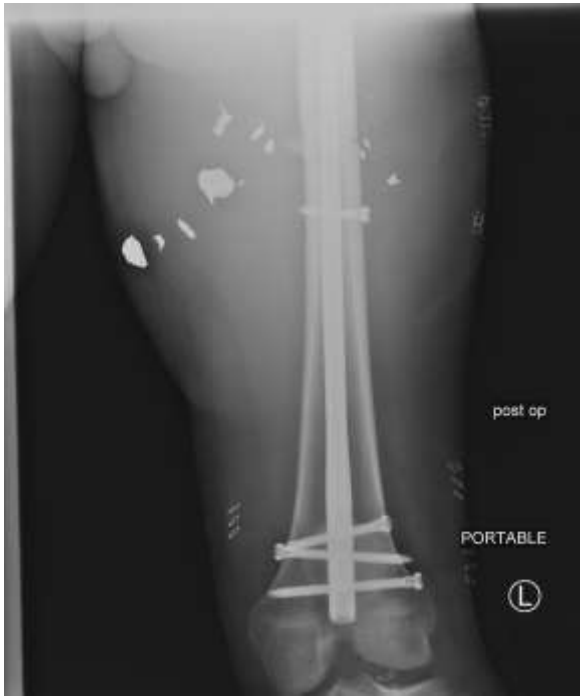
Location
- Proximal third
- Mid-Shaft
- Distal third
- Metaphyseal
- Diaphyseal

All Together…

- AP and Lateral radiograph demonstrating a short oblique mid-shaft (or isthmic) femur fracture.

Final Films



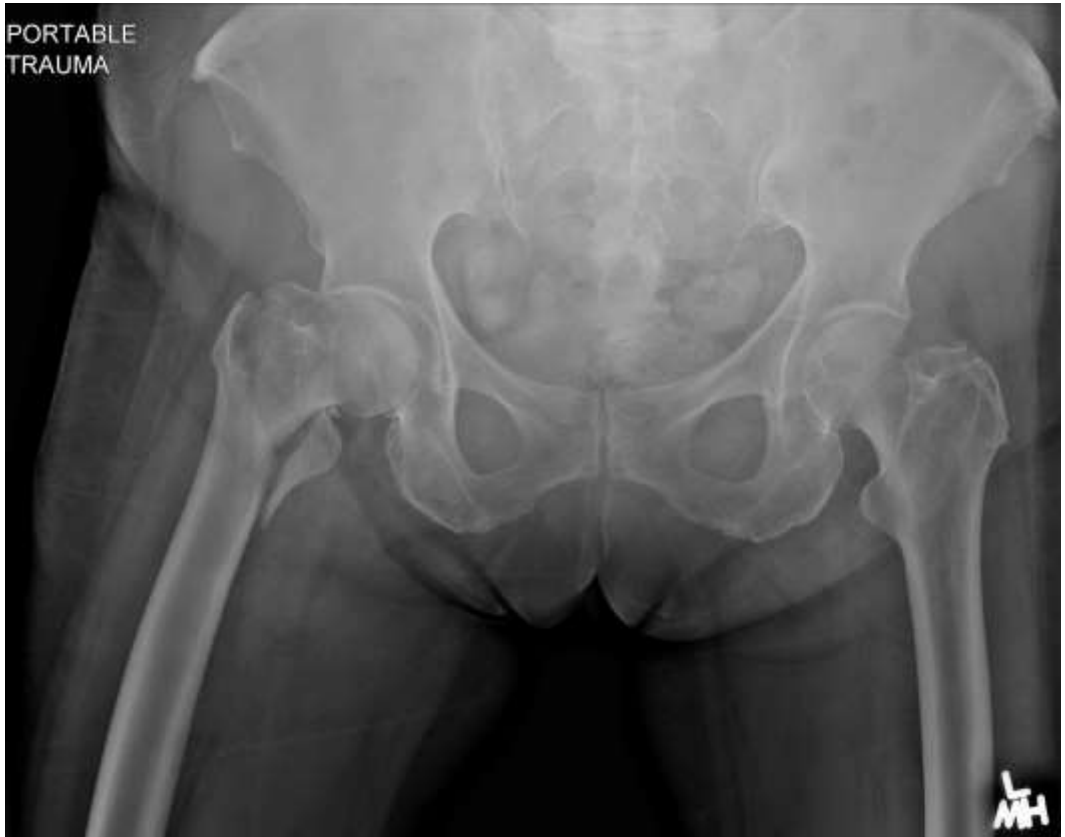


Questions?

“Hip Fractures”

- What does that mean?
- Intertrochanteric Fracture
- Femoral Neck Fracture

86 yo F Fall from standing



Laying in bed short and externally rotated

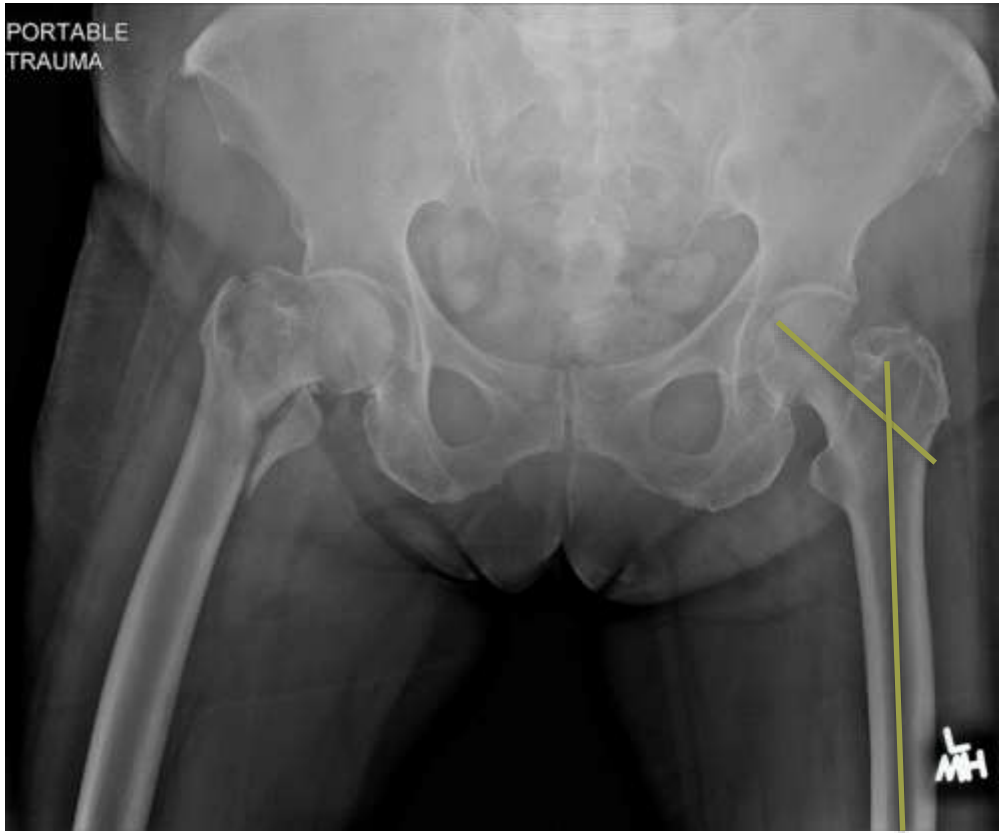
Intertrochanteric Femur Treatment Options

- ORIF
- IMN
- Replacement/Arthroplasty

Intertrochanteric Femur Fractures

- Stable vs Unstable patterns.
  - Lateral wall fracture/comminution
  - Posteriormedial comminution
  - Reverse Oblique pattern

What to look for?



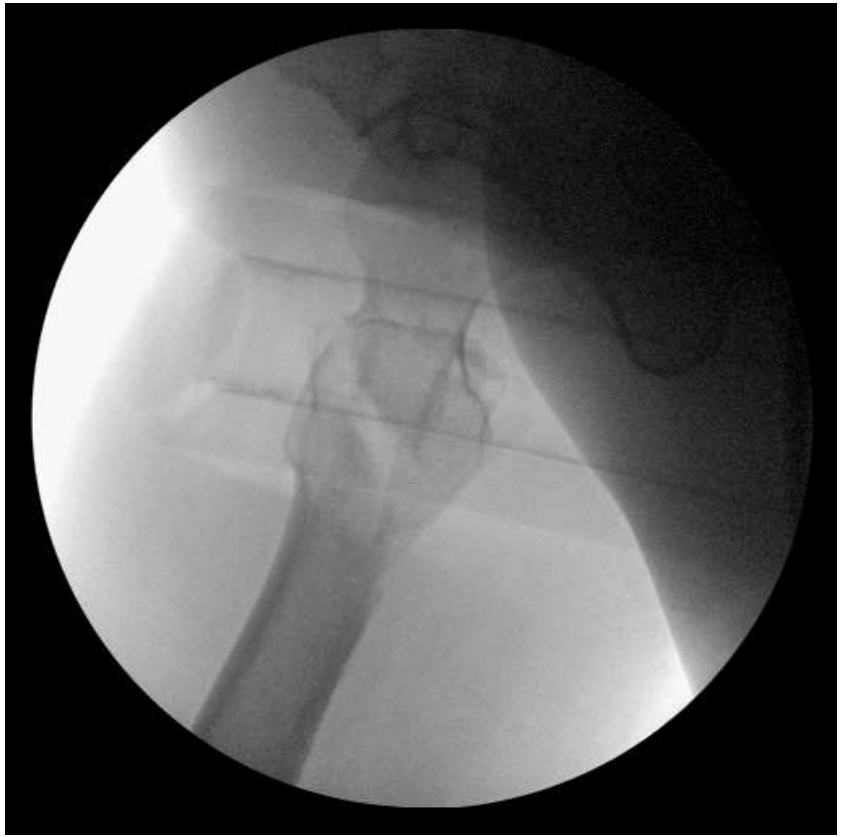
Neck-Shaft Angle

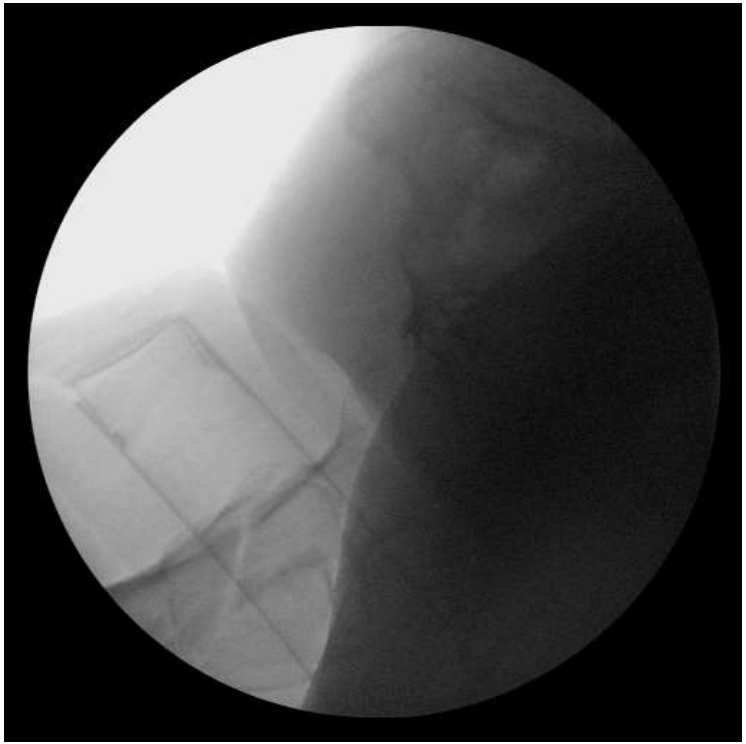
Normal?

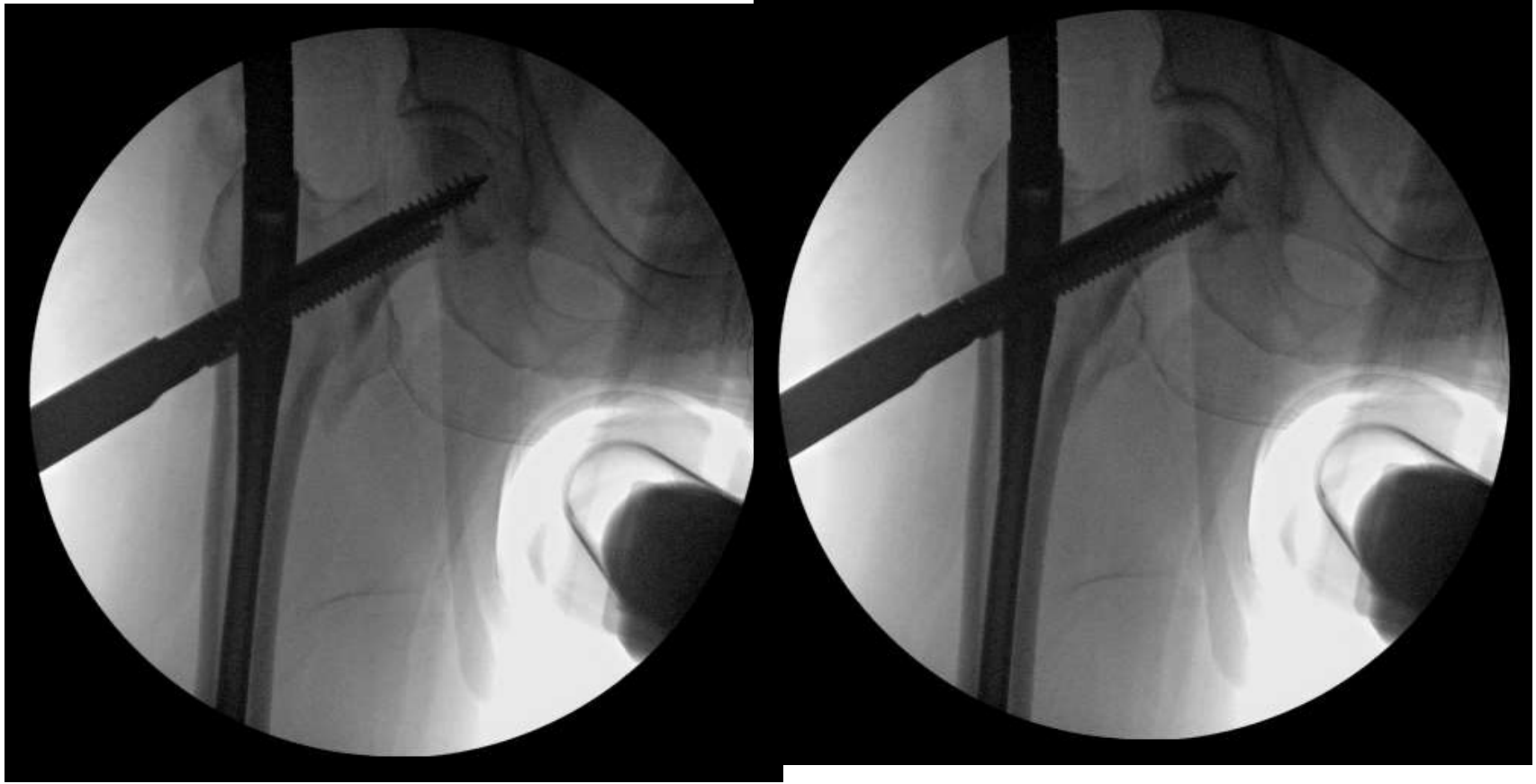
Implant Options?
125, 127, 130,
135

Setup

- Supine radiolucent table
- Free Leg vs Traction Top for the Jackson Flat Top
- My preference is traction top:
  - Can do with no extra hands
  - Usual reduction is 8-12 internal reduction, no more than 15 degrees or something else is probably wrong.
  - Check lateral, shaft tends to sag
    - Tricks- elevate with elevator/retractor/crutch, make incision inline with guidewire for lag bolt

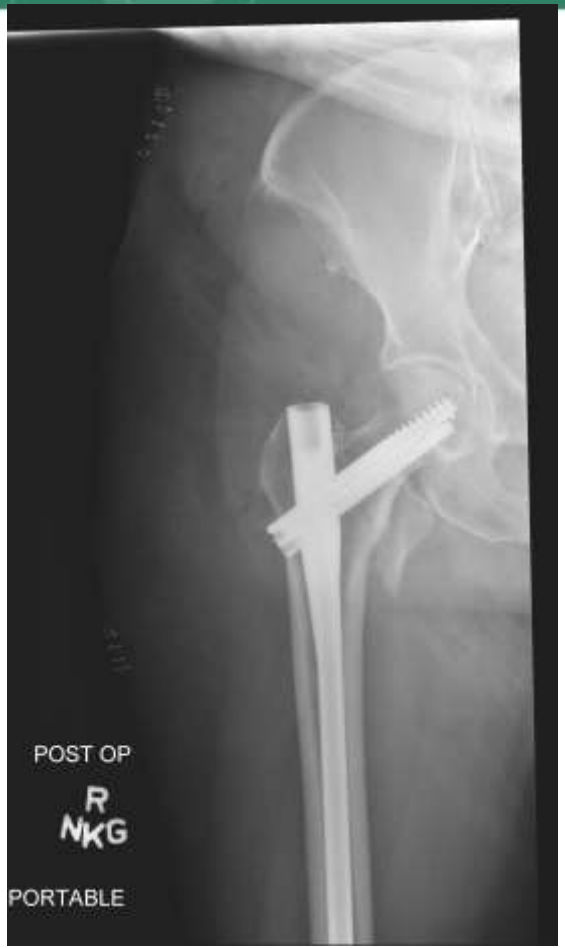


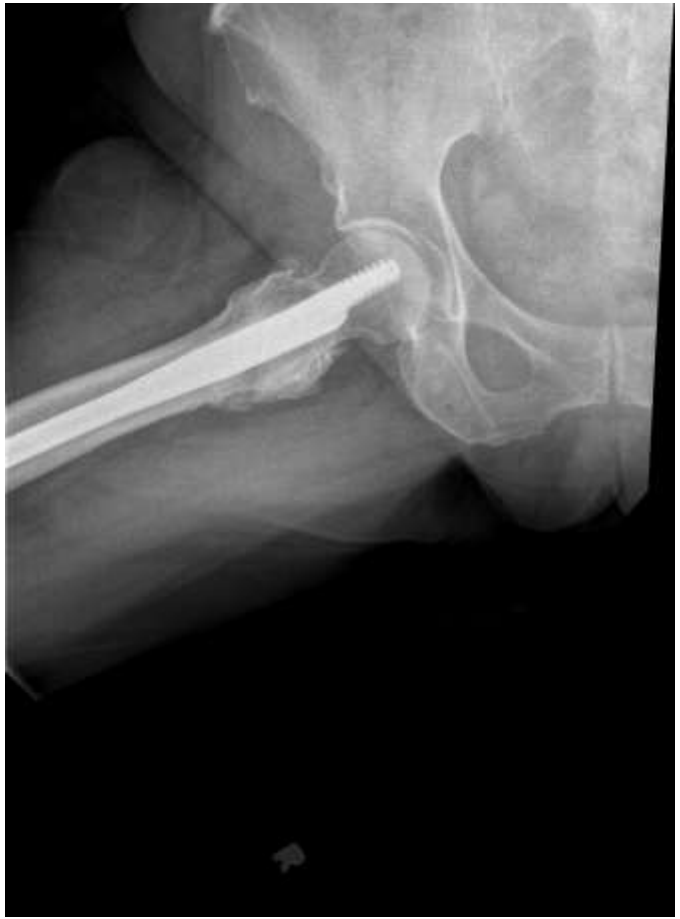




Mantras

- Thou shalt not “Varus”
- Thou shalt ALWAYS compress





Pain Control- Elderly

- Avoid Narcotics
- Local Around Incisions, 0.5% with Epinephrine
- iv Tylenol

Post op Protocol

- Goal- Mobillity
- Patient SHOULD be Weight Bearing as Tolerated Post op
- Elderly decondition rapidly
- Acute disorientation

Questions?

Thank you!

Jon Quade

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