

# Portals and Blocking Screws for Femoral and Tibial Nailing

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# Disclosures

- Consultant – Biomet, Cardinal Health
- Design – Biomet
- Research Fellow Support - Synthes

# RULES TO LIVE BY...

- DO WHAT YOU DO WELL
- BE CAREFULL - DO NOT WASTE VALUABLE REAL ESTATE
- DOUBLE CHECK AND TRIPLE CHECK ALLIGNMENT/STARTING POINT
- Varus/Valgus #1
- Flex/Ext #2
- Rotation /Length #3

# Antegrade Femur



# Free Drape...ie. No traction

- You need lots/more of help
- OK for simple diaphyseal fractures
- It is easy to drape yourself out in the buttock
- If you like, consider going lateral with a beanbag and no traction – allows full access.
- If you are struggling make a small incision

# PARALYSIS

- Just Do It
- In the young and muscular you will struggle without it.
- Segmental/axially unstable fx > 24 hrs old you likely will NOT restore length without it



# PIRIFORMIS VS. TROCH ENTRY

Which starting point is easier?

**Trochanteric Entry**

Which nail offers the most fixation options?

**Trochanteric Entry**

Which nail is more technically difficult to insert?

**Trochanteric Entry**

# 4TH GENERATION NAILS

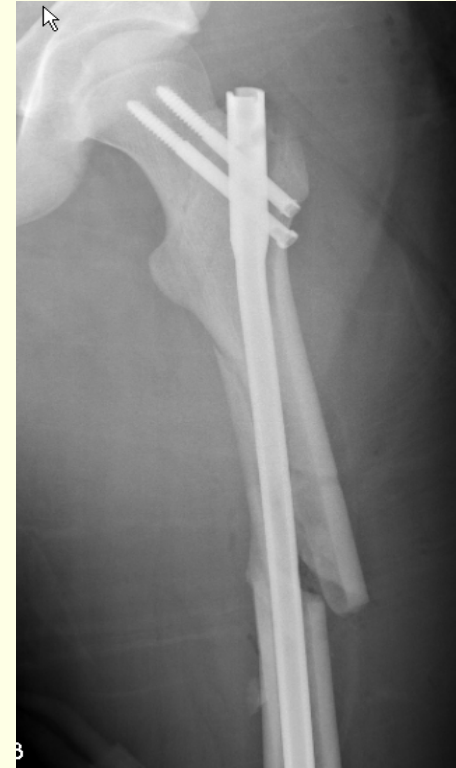
- Troch entry recon
- Not for IT Fx - collapse will not be reliable
- Size and technique do matter....
  - University of Utah biomechanical study
    - >11 nails are bad
    - Vertical jig orientation significantly decreases stress



**Pre-op**

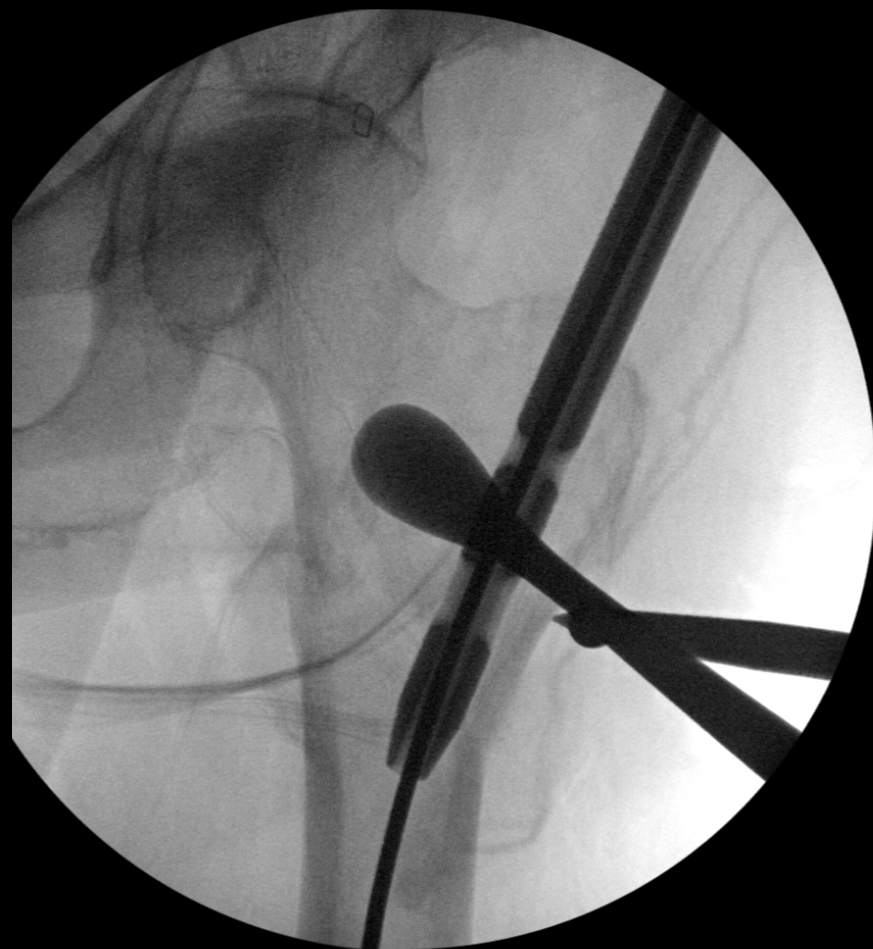
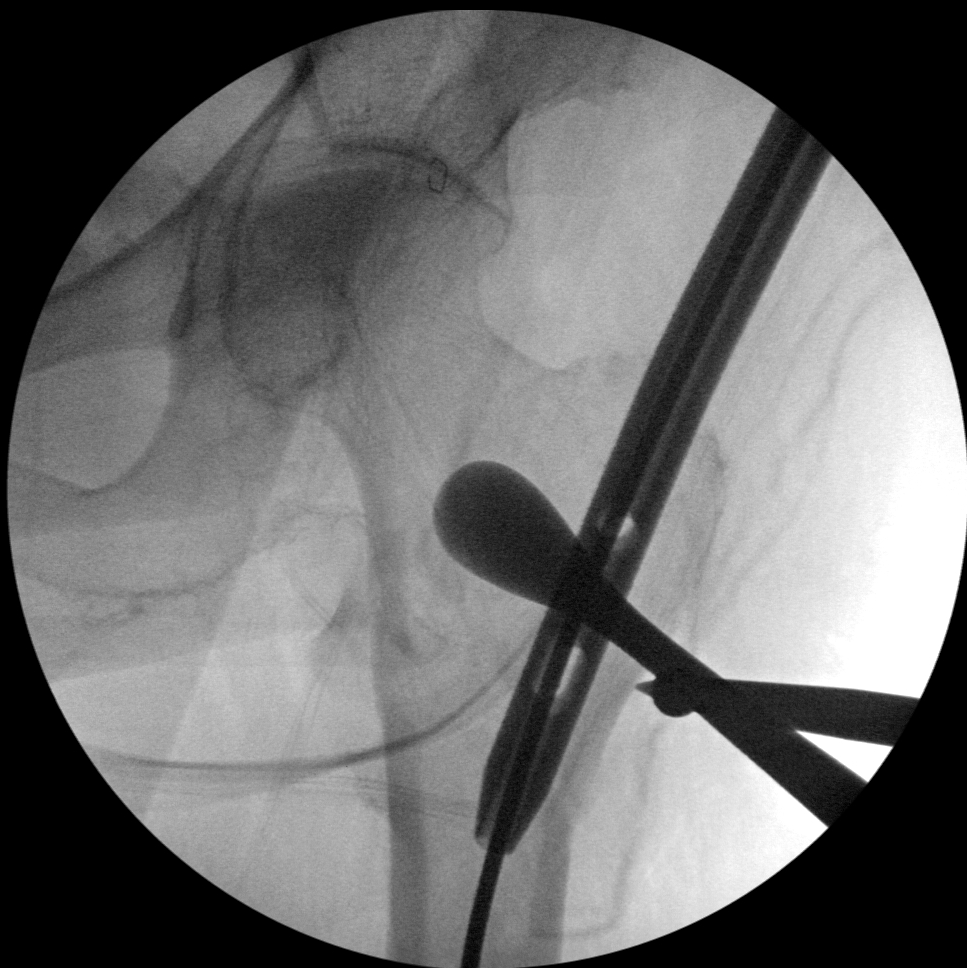


**Intra-op**



**Post-op**

**KEEP JIG VERTICALLY ORIENTED FOR FIRST 20 cm**  
**DO NOT GO BIGGER THAN 11mm Nail**  
**ALWAYS OVER REAM BY 2mm**





Which is more likely to displace an associated femoral neck fx?

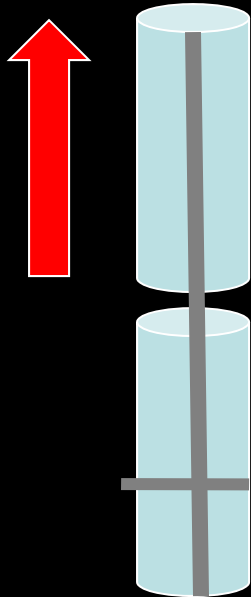
**PIRIFORMIS**

Which entry site is more likely to cause hip pain and abductor weakness?

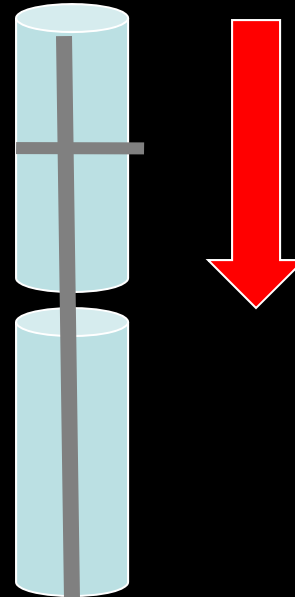
**PIRIFORMIS**

# GAPPAGE

- BACKSLAP vs. FORWARD SLAP



This is a pain



This is easy

Blocking screws...



ole

INSU,  
LAUMA,  
ENOLITH  
RIF LT TIBIA  
'032053  
ORWITZ  
'17508  
1/01/1976

U: 120.0  
University of Utah  
10/20/2006  
9:50:20 AM

31   
26 

72 kVp  
2.33 mA



Univers

IIA

VP  
A

150 AM

0

OEC

1 AM





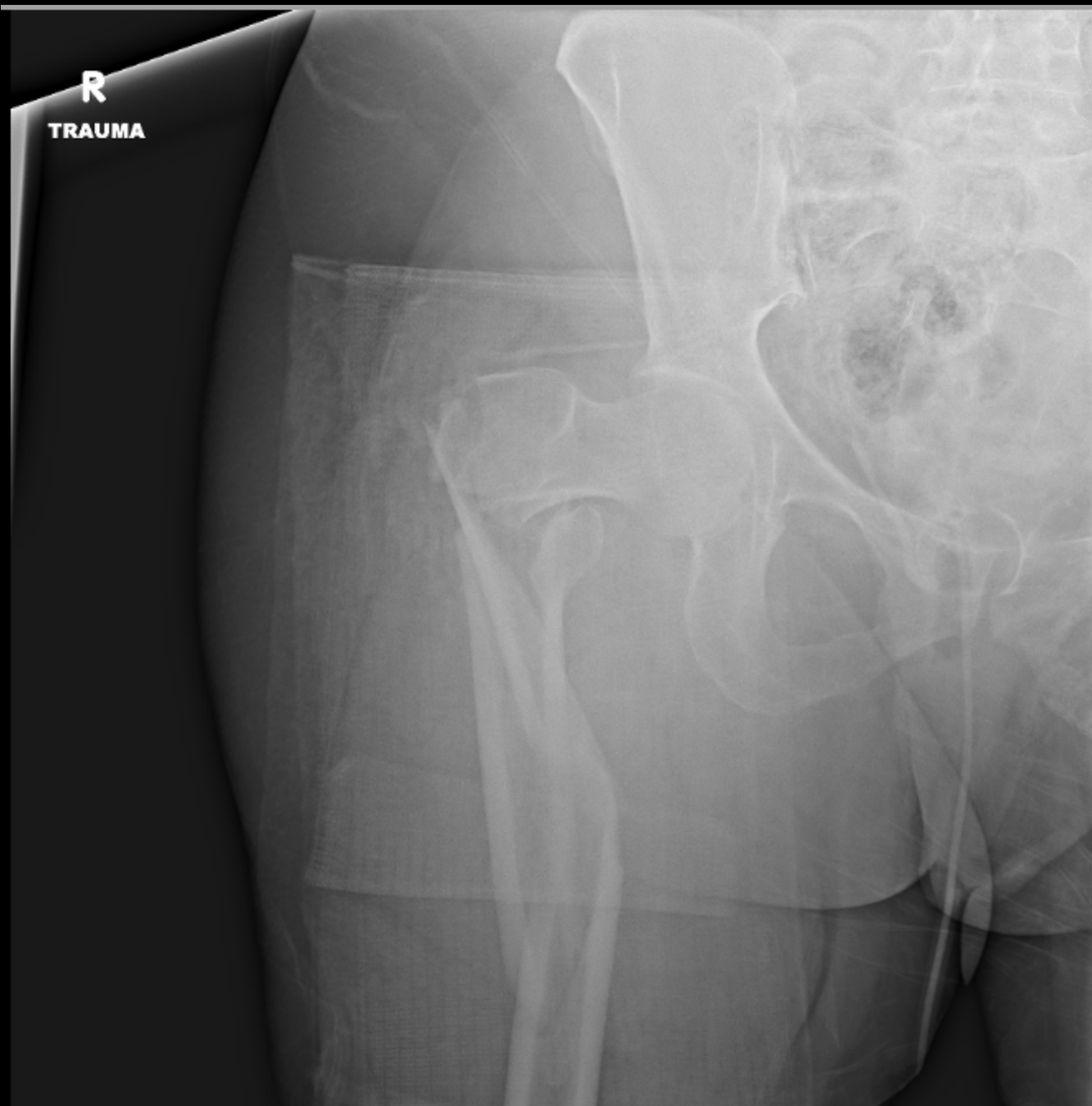








**R**  
**TRAUMA**



**R**  
**TRAUMA**



DERIVED/PRI



X-1  
Lat



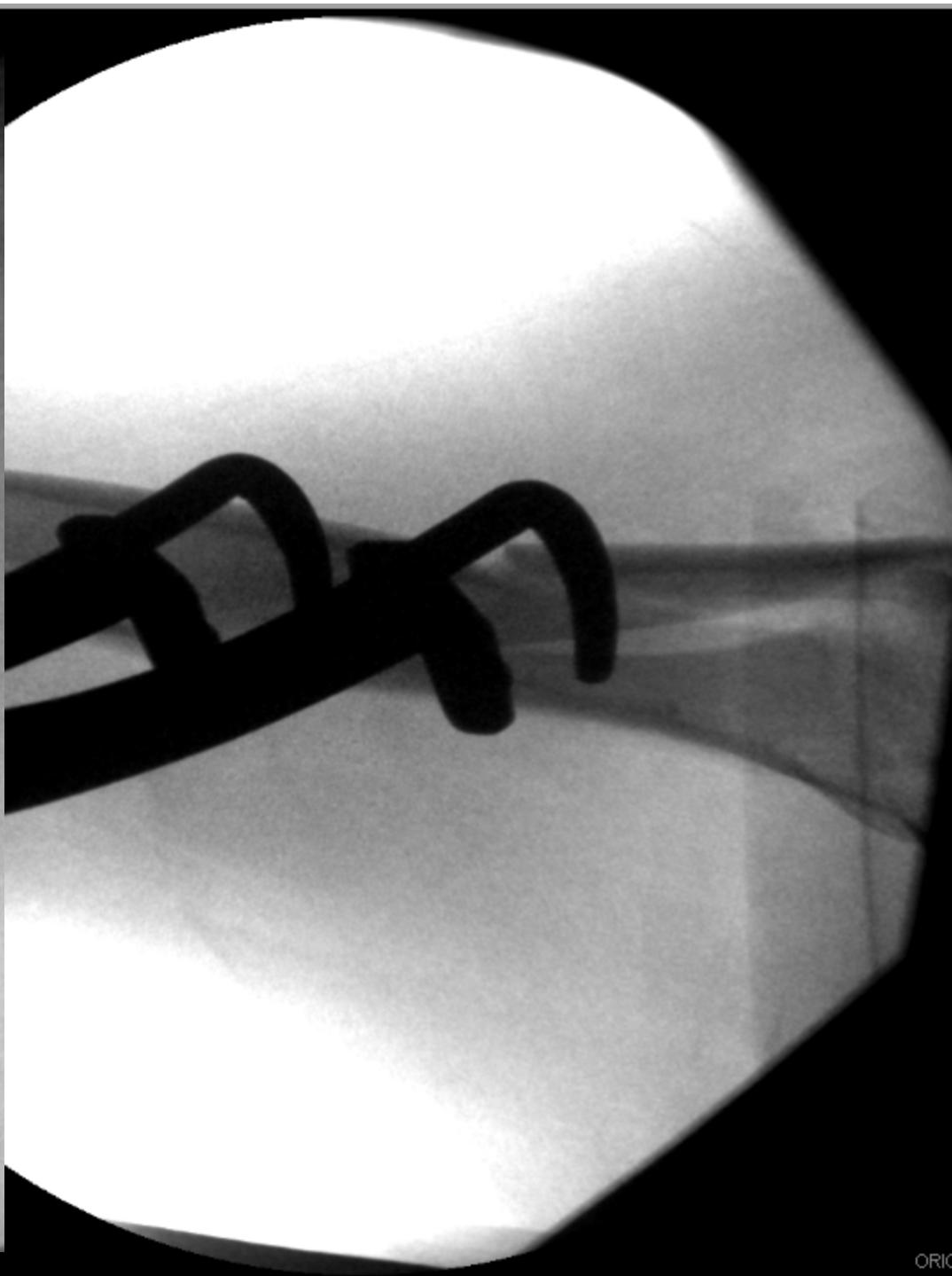




GHT



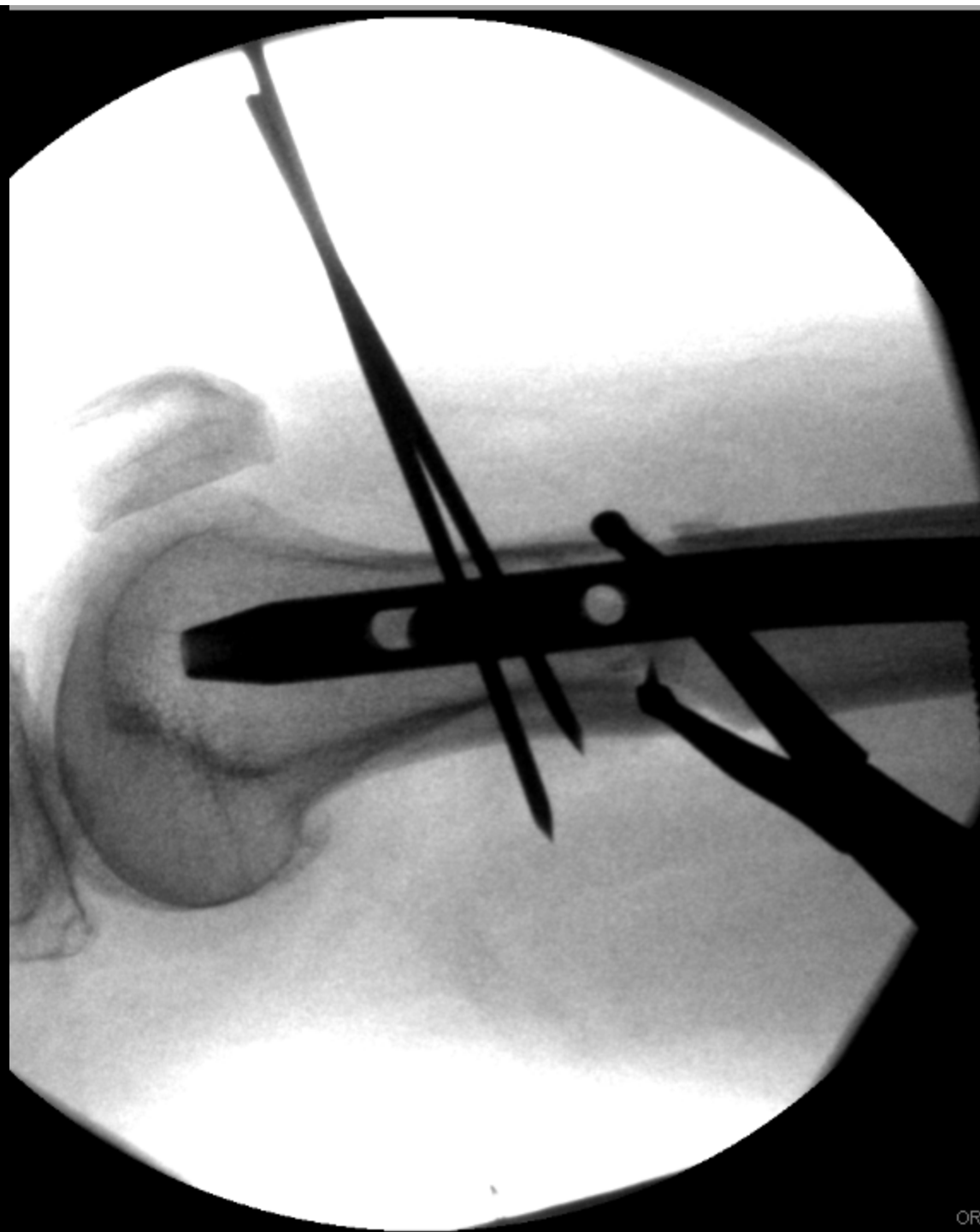
RIGHT





2/17/2012 11:19:47





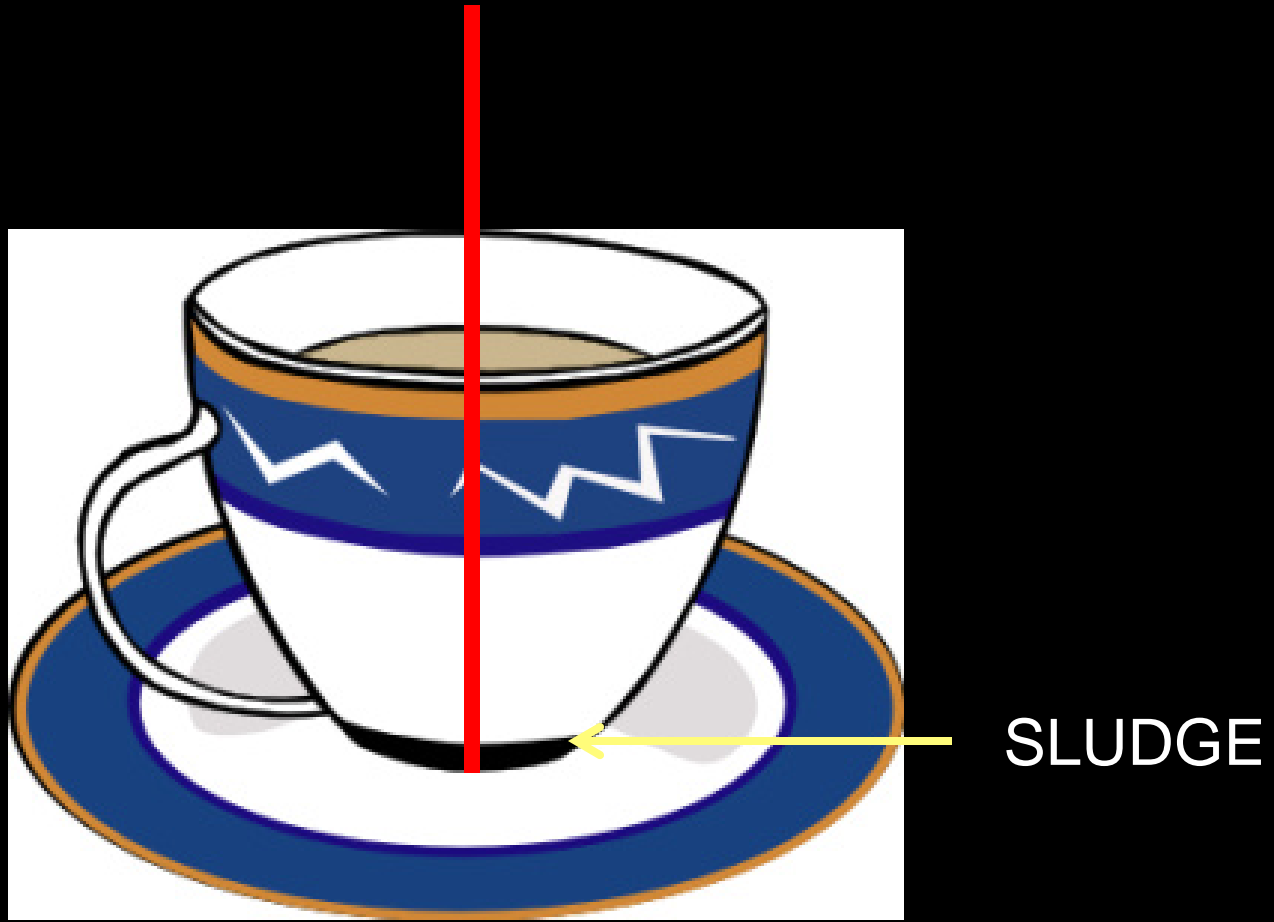


# SUMMARY

- Favor skeletal traction in the supine position
- Troch entry up to 11mm only
- Open and cheat as necessary
- Forward slap to diminish gaps
- Interlock as needed for stability, but don't burn salvage options
- Consider blocking screws if past the flare
- Check and recheck length and rotation – post op CT if necessary

# RETROGRADE FEMORAL AND TIBIAL NAILING

# The “teacup”



DISTAL  
FEMUR



PROXIMAL  
TIBIA

# Retrograde Nail

- Top 4 Issues-
  - Poor starting point = malalignment
  - Flexion malalignment because of access issues
  - TKA with predetermined starting point leading to malalignment
  - Insufficient distal stability



# Retrograde Solutions

- Cannulated entry with meticulous fluoro checks
- Provisional pin fixation with knee extended
- Fixed angle screw as distal interlock
- Augmentation with biologic cement
- No good answer for TKA ...except acceptance of the things we cannot change...

# TECHNIQUE

Its not what you do, but how  
you do it...

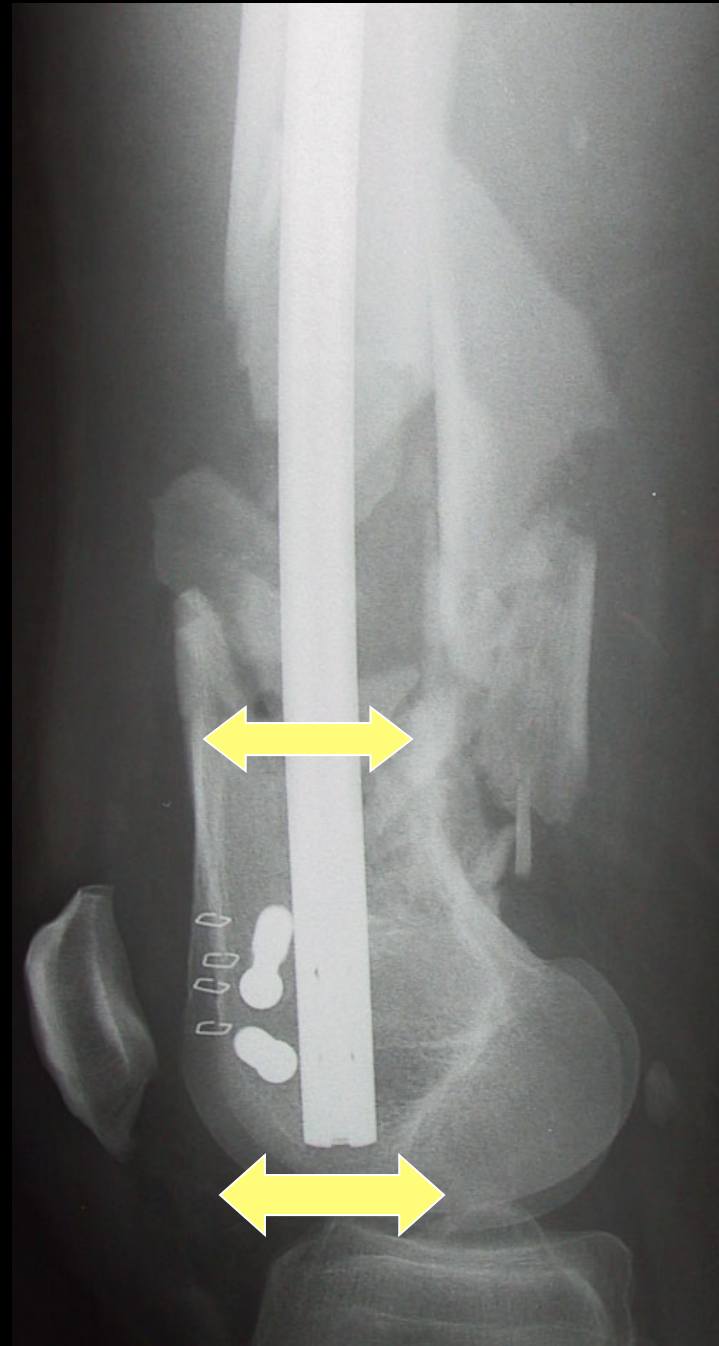
# Free Drape...by definition

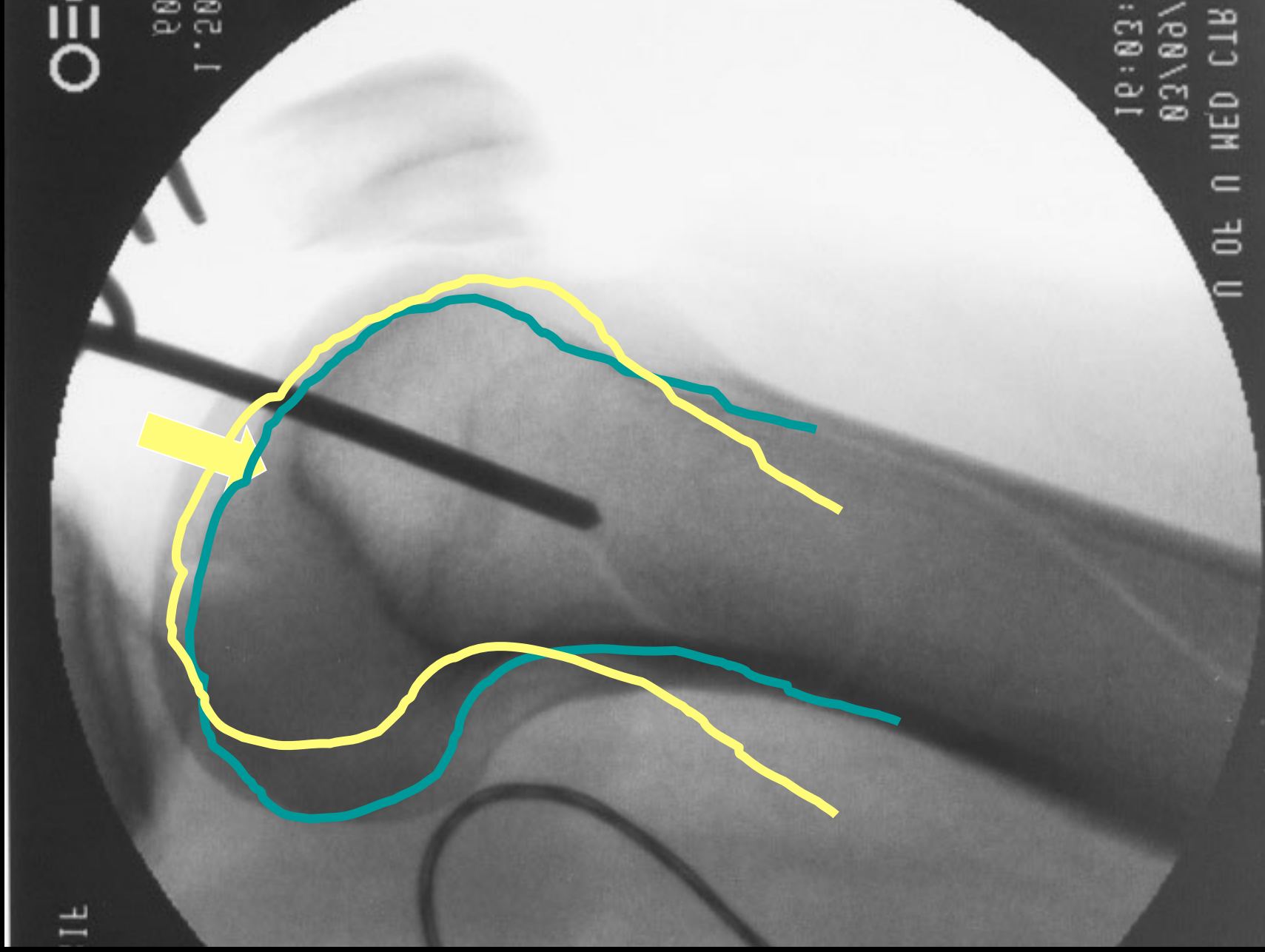
- You may need lots/more of help esp in comminuted/segmental fx
- It is easy to drape yourself out in the buttock – that is bad if they have a missed femoral neck
- If you are struggling make a small incision at the fx– extremely helpful for judging rotation

# RETROGRADE TECHNIQUE

- Reduction Reduction Reduction
- REDUCTION
- Starting Point – easier with arthrotomy....loss of reduction
- Reaming
- Irrigate the joint- easier with arthrotomy
- I drain the joint
- Periprosthetic - know your knee, and be willing to accept those things you cannot change

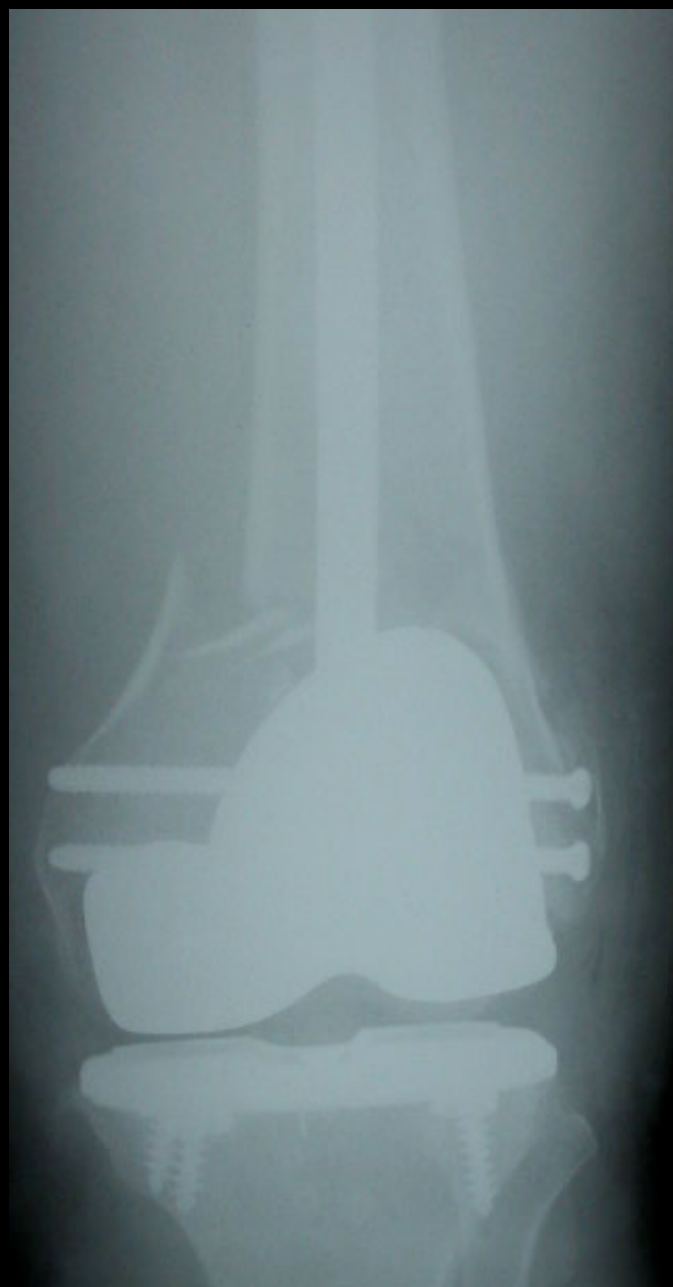


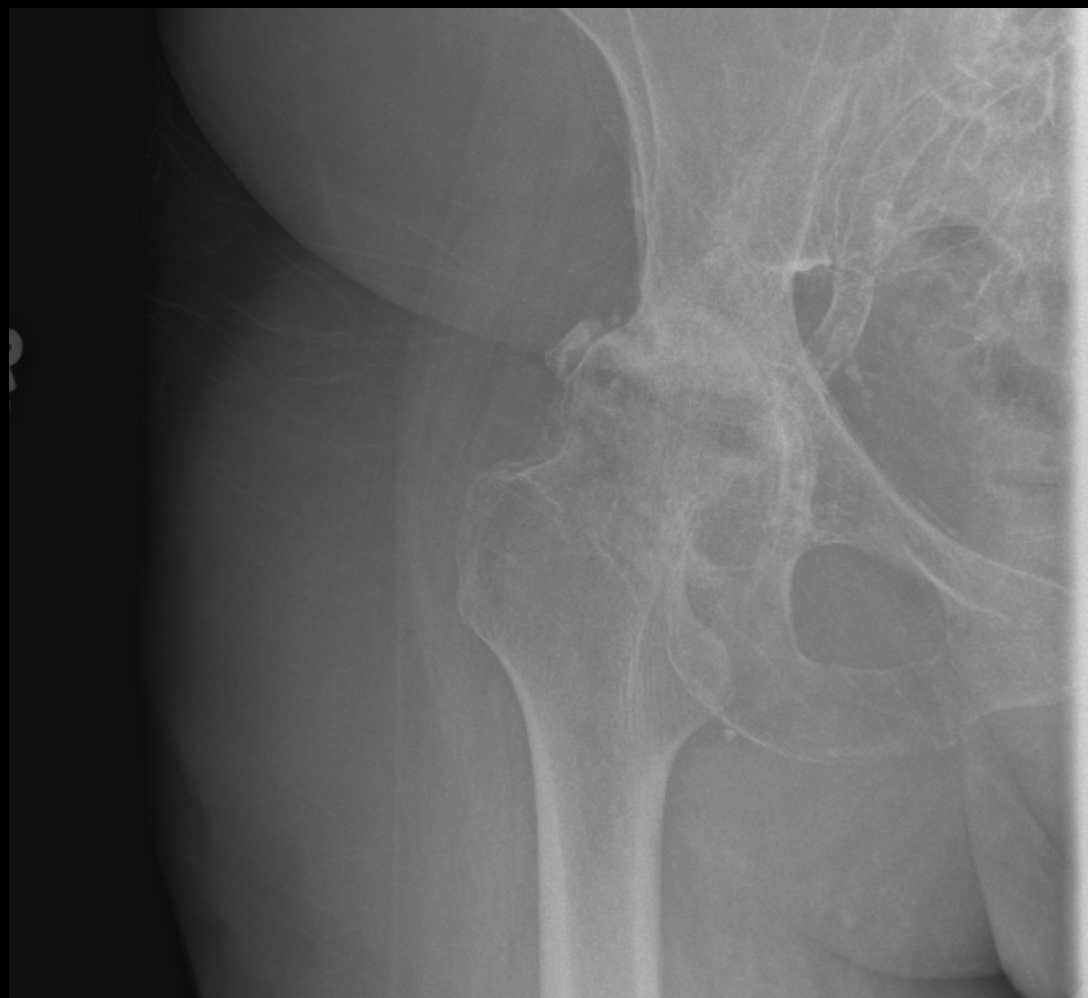


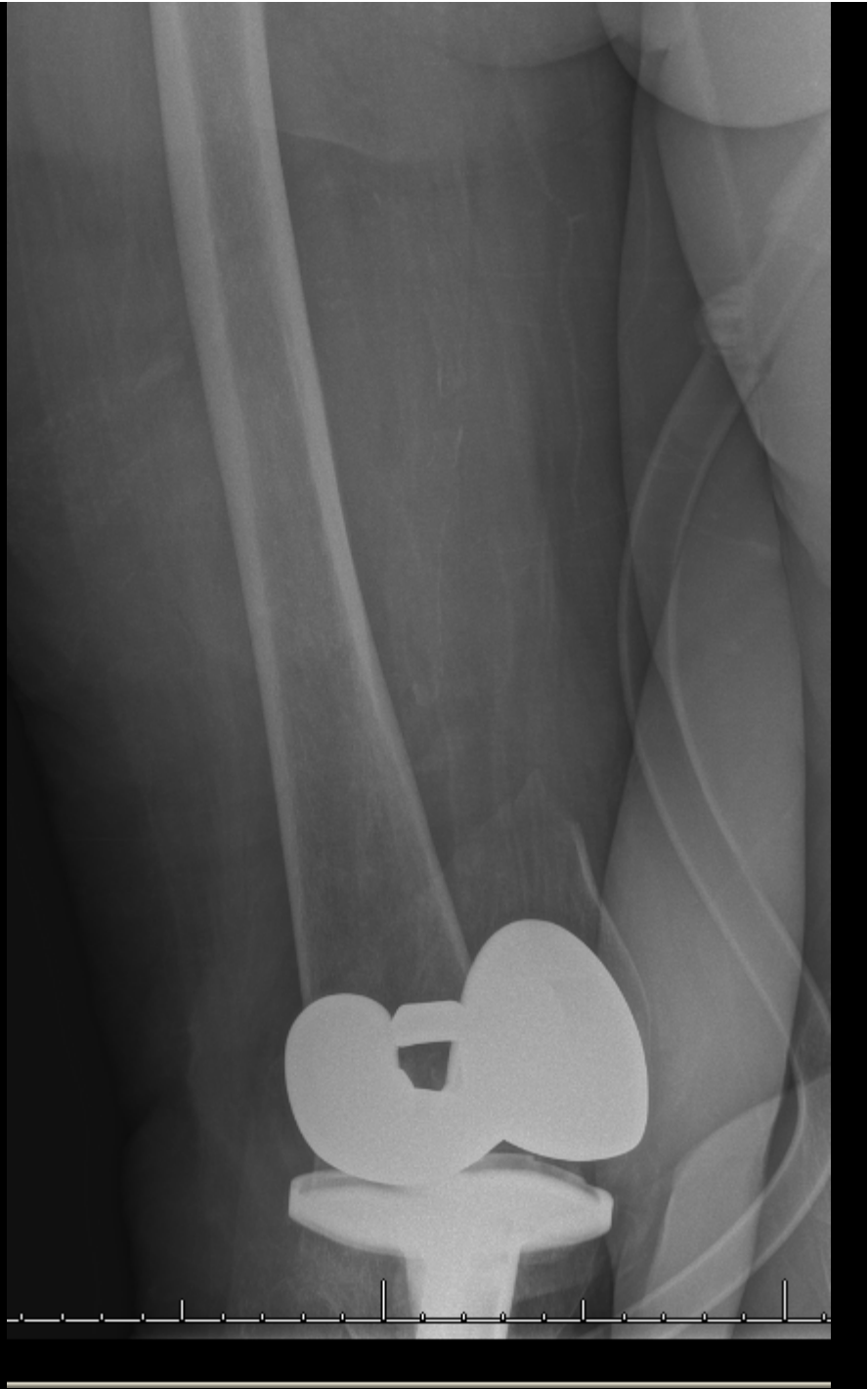


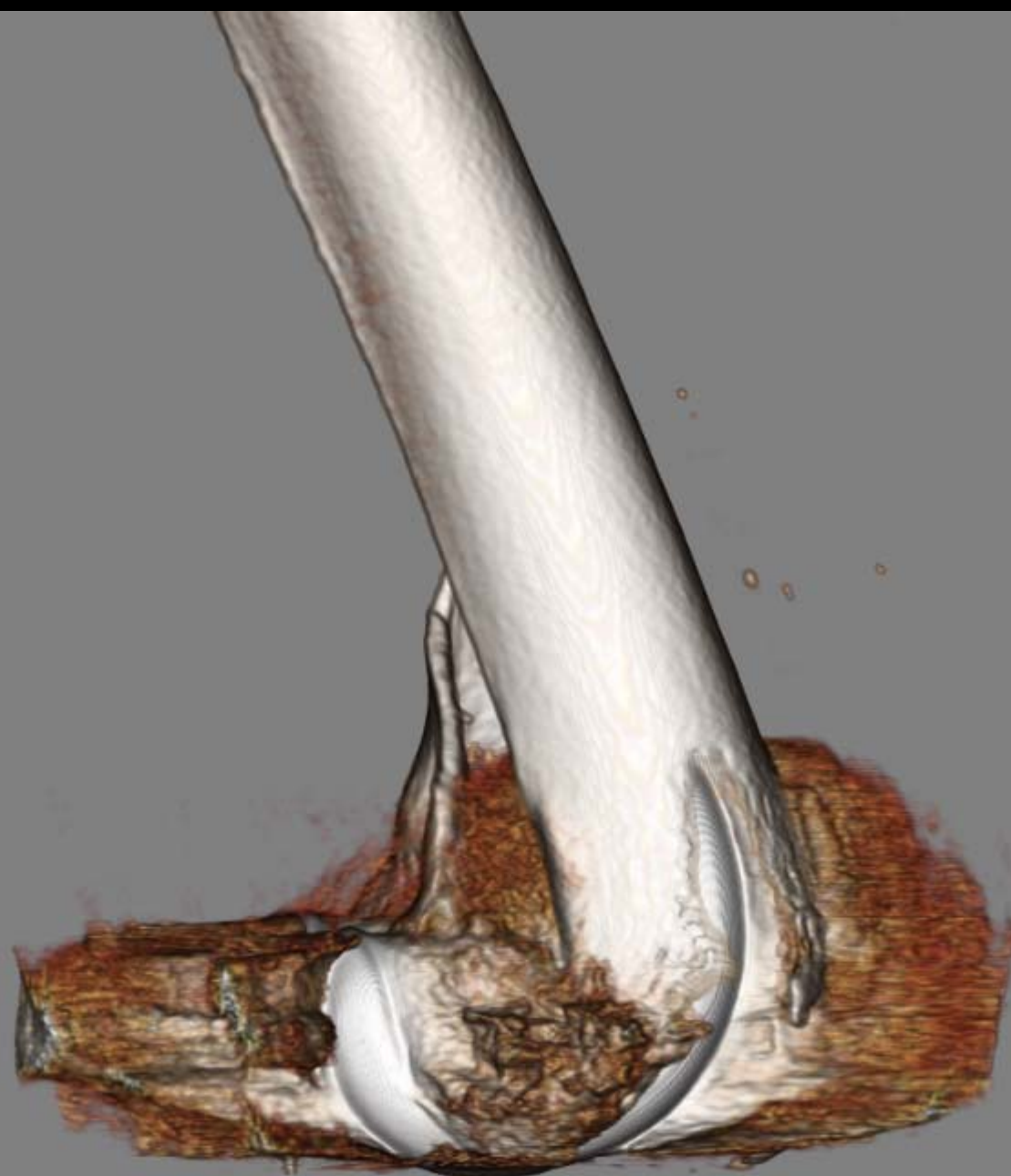








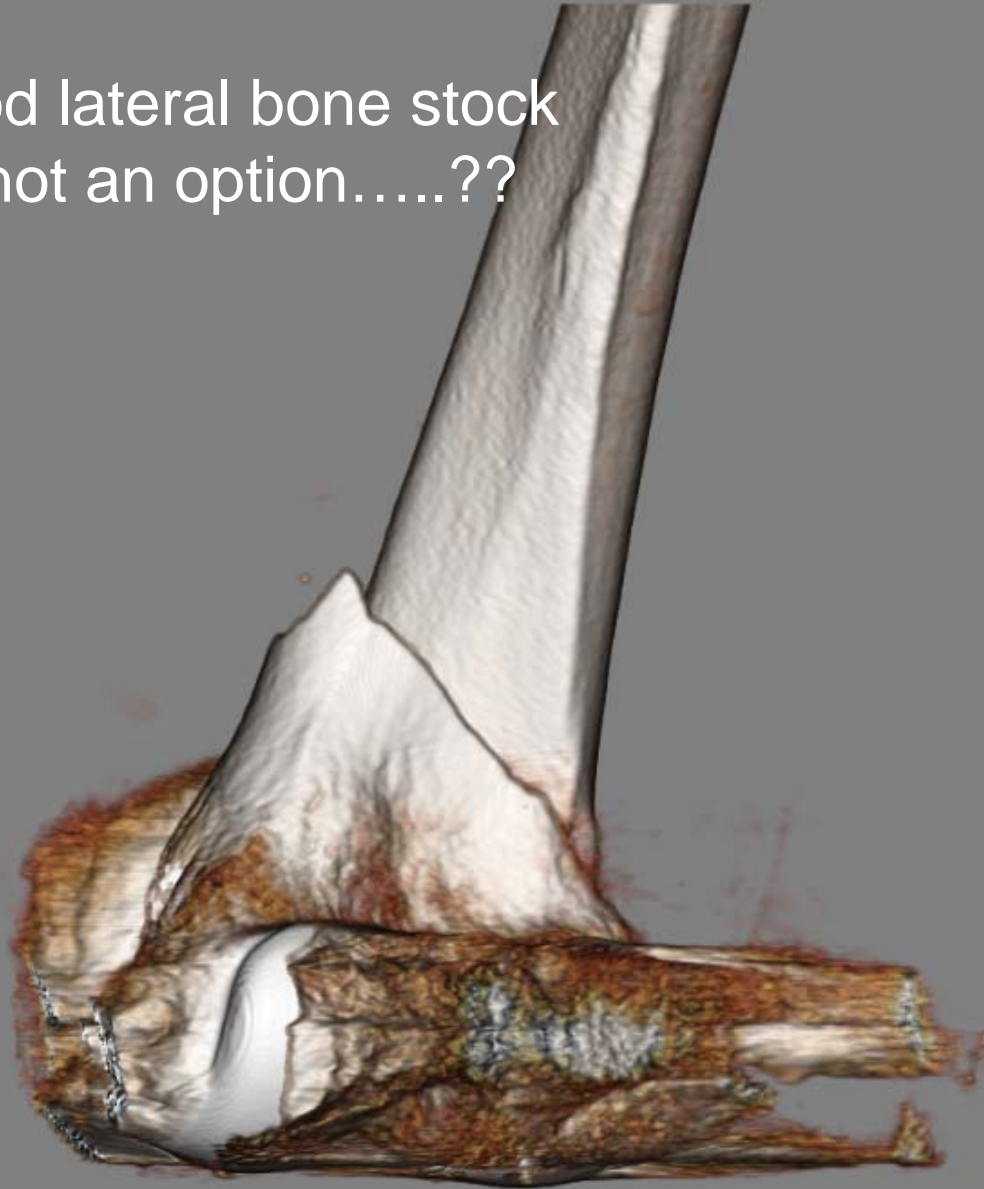




H

No good lateral bone stock  
RIMN not an option.....??

5mm



H

H

Modern Retrograde Intramedullary Nails Versus  
Periarticular Locked Plates for Supracondylar **Femur**  
**Fractures** After Total Knee Arthroplasty.

Meneghini RM, Keyes BJ, Reddy KK, Maar DC.  
J Arthroplasty. 2014 Jan 28

29 nails, 66 plates

Plates 19% nonunion

Nails 9% nonunion

Locked plating of periprosthetic femur fractures above total knee arthroplasty.

Hou Z, Bowen TR, Irgit K, Strohecker K, Matzko ME, Widmaier J, Smith WR.  
J Orthop Trauma. 2012

52 patients, 34 plates/18 nails

PLATES – 9% nonunion, 9% malunion, 6% infection

NAILS – 6% nonunion, 11% malunion, 6% infection



Interlocks from the medial side???



Vp  
1A



TLEY  
RY

GEISINGER MEDICAL

4  
1

073

R

70 kVp





# SUMMARY

- Starting point is critical
- Reduction is critical, esp in more distal fractures
- Open and cheat as necessary
- Interlock as needed for stability, but don't burn salvage options
- Consider blocking screws if past the flare
- Check and recheck length and rotation – post op CT if necessary

# Proximal Tibia Extra-articular Fractures

# First Decision

- Do I want to plate it or nail it ?
  - Plating MAY BE easier
  - Nailing MAY be more biologic, probably easier on the soft tissues

# I want to plate it....but how??

- Likely lateral locked plate
- **STRONGLY** consider perc medial augmentation if there is medial comminution



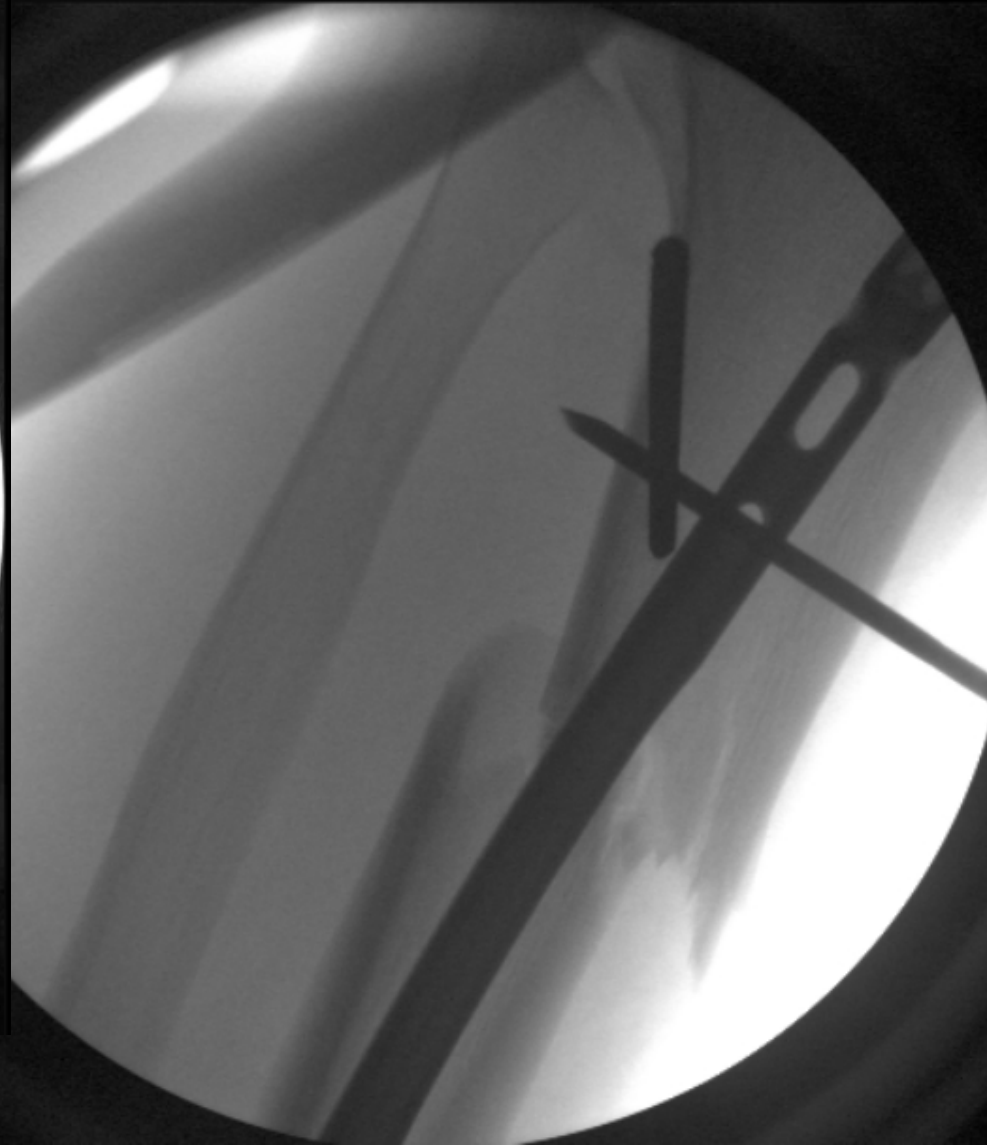
# Nailing Proximal Third/Quarter Tibia Fractures

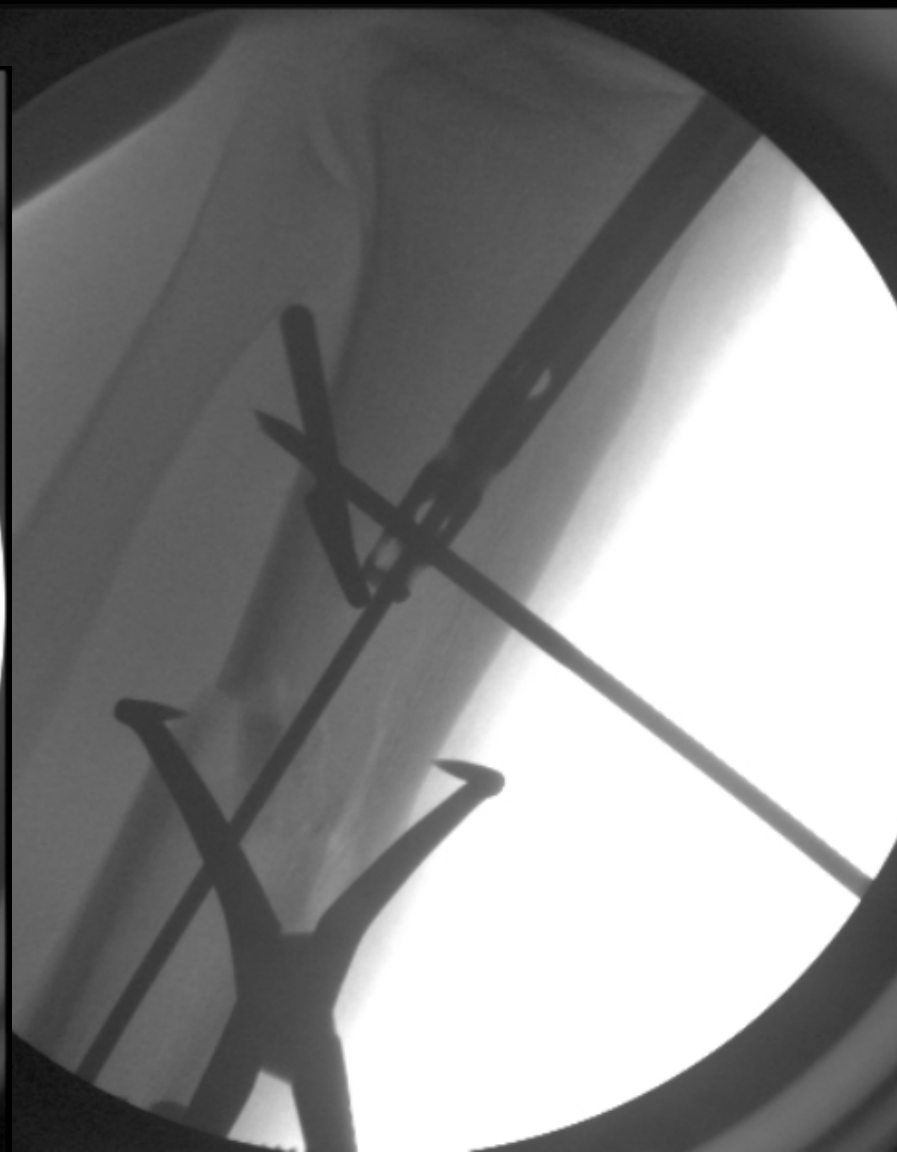
- Lateral Starting point... ???
- Reduction, reduction, reduction
- Multiple proximal interlocks
- Blocking screws if necessary
- Cheat – clamps, unicortical plates, femoral distractor....





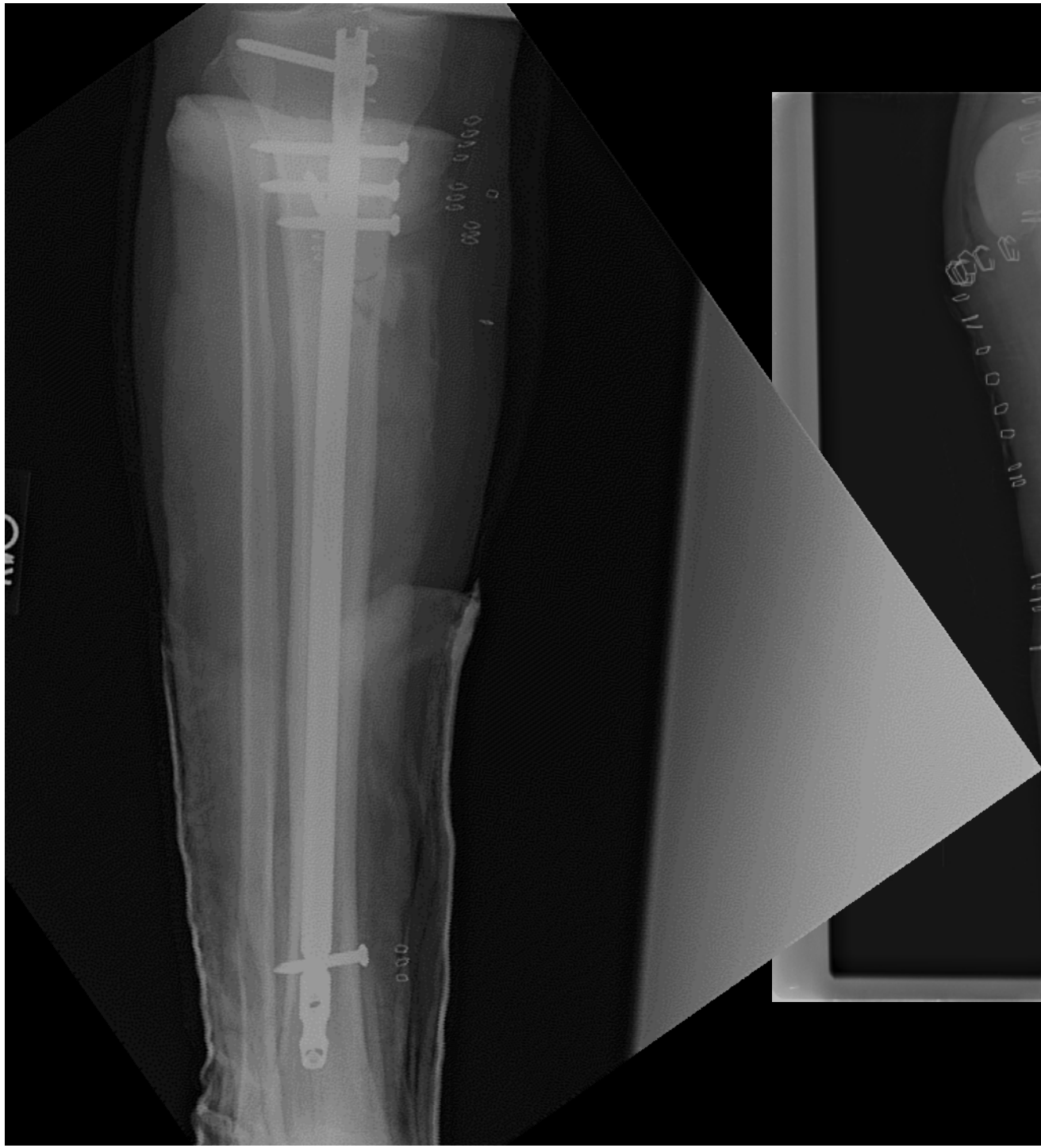
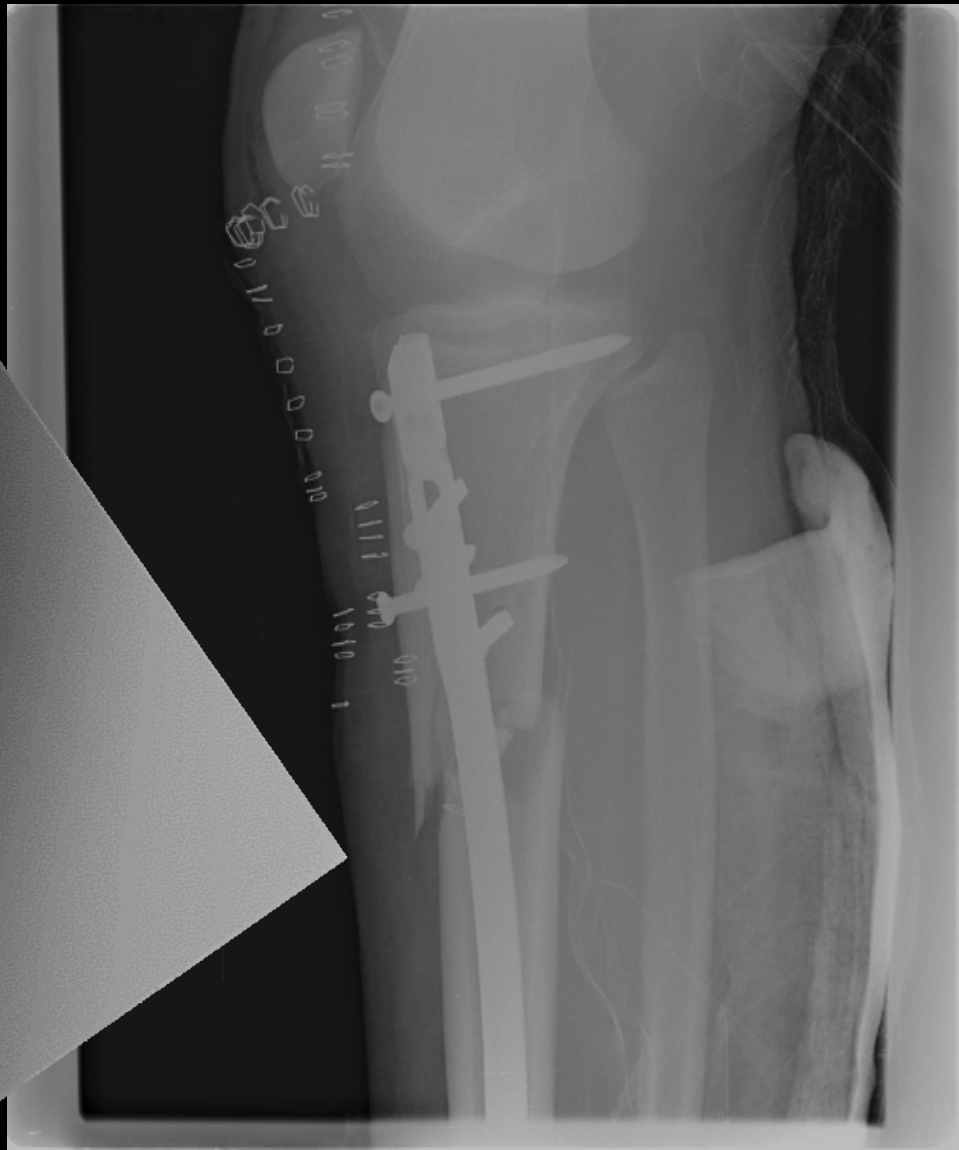












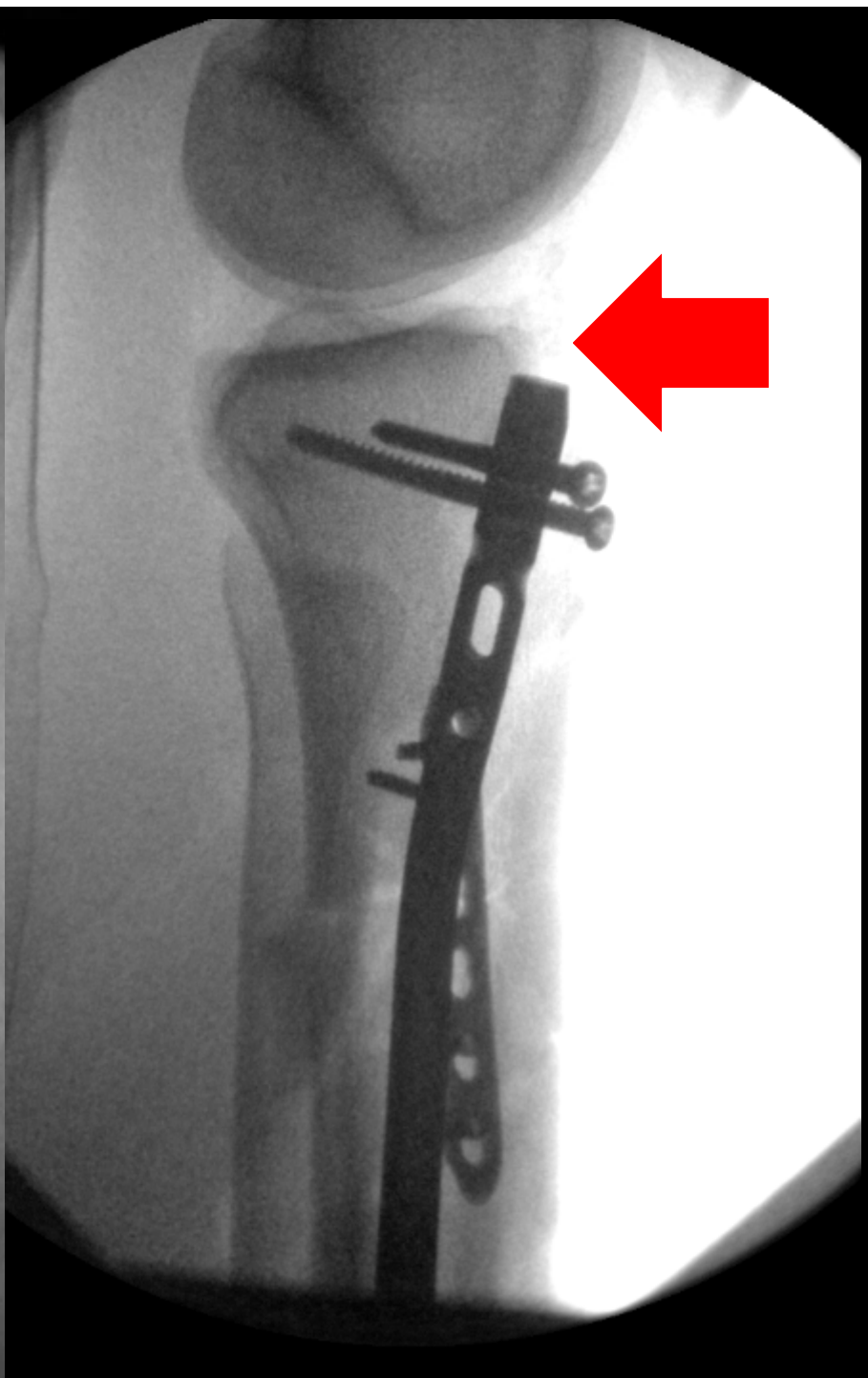
# SUPRA -PATELLAR NAILING

- Different incision from originally described extended nailing - Tornetta
- Intrarticular by definition – through the fat pad
- May be issues with getting the correct starting point



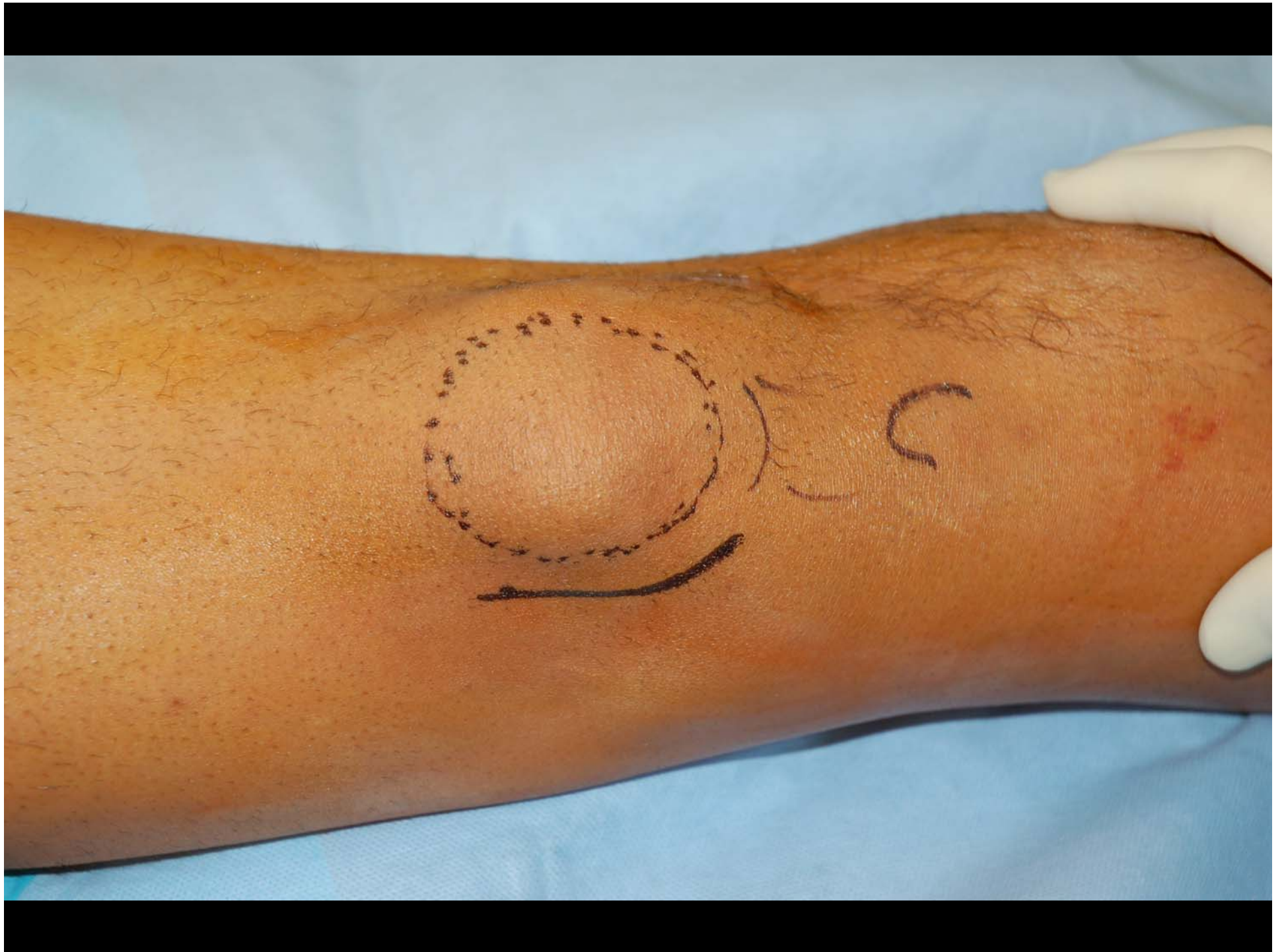
# Extended Tibial Nailing

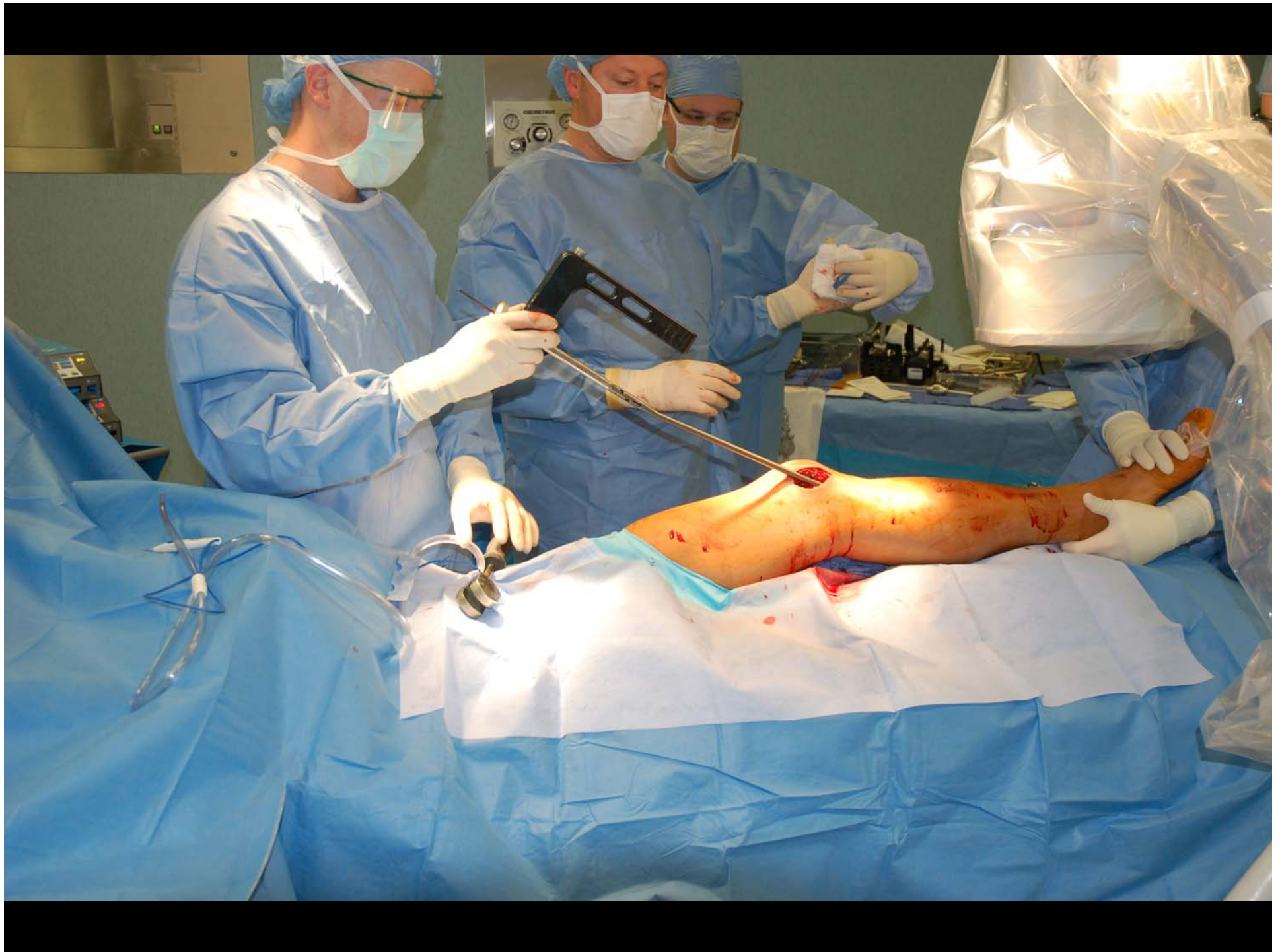
Horwitz DS, Kubiak EN  
November 2010 JOT







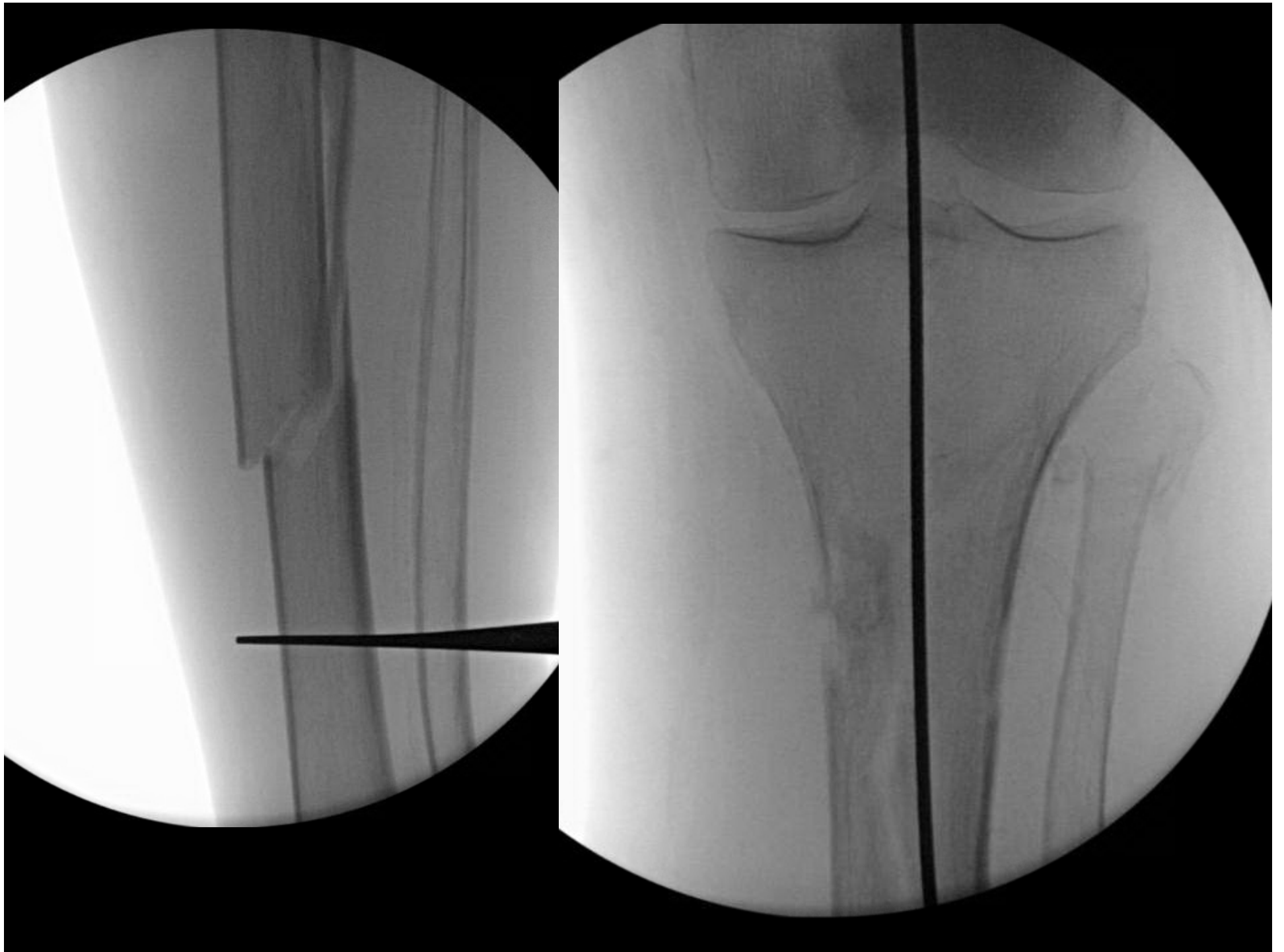




















# SUMMARY

- Plates and nails both work
- Technique is paramount
- Extended Nailing works
- You must have an acceptable reduction before you start interlocks.
- If you begin to lose reduction early then revise...do not hope/pray

THANK YOU