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Fractures of the Femoral Head: When to Fix versus Replace

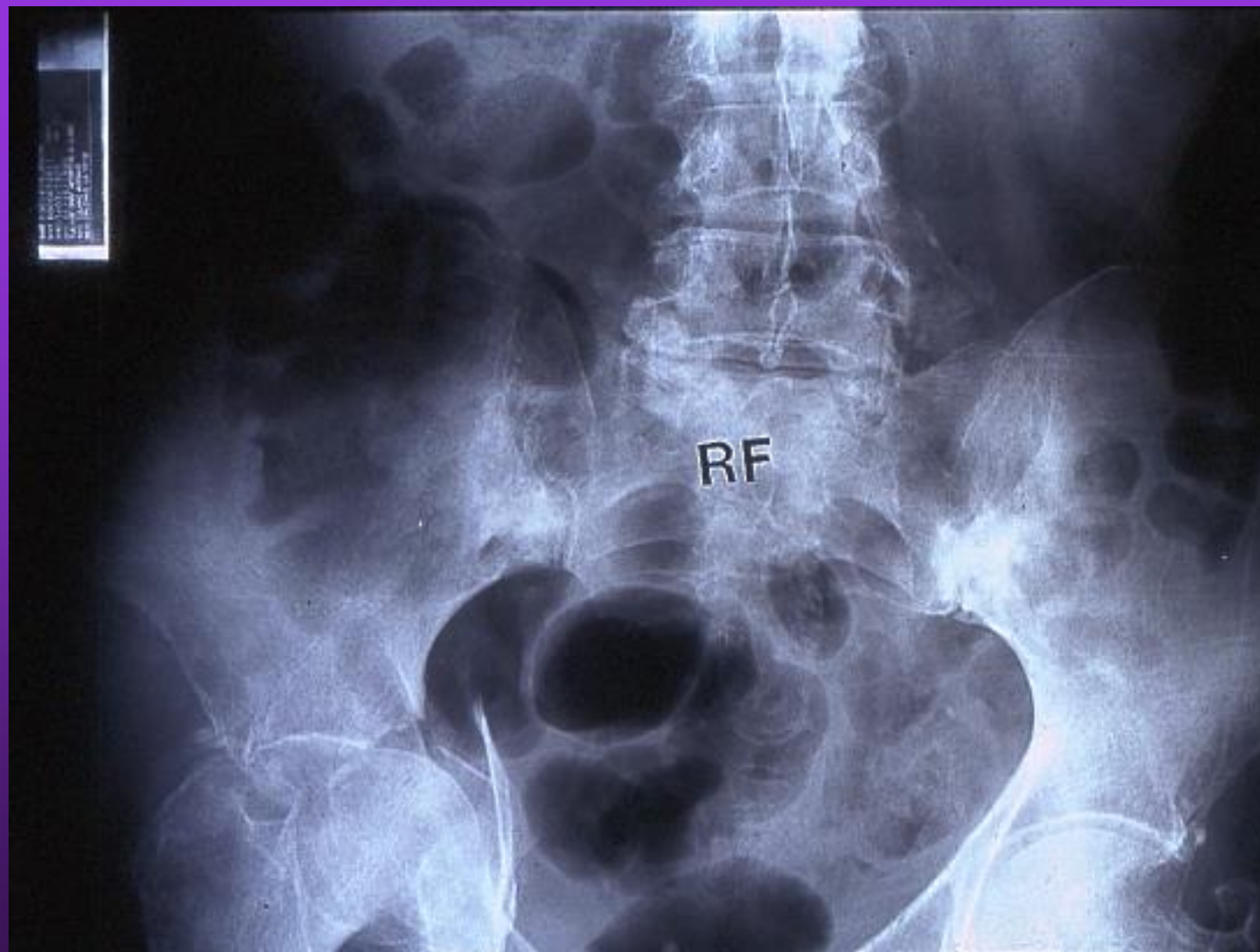


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Total Hip Arthroplasty

- Never in isolated femoral head fracture
- Associated with femoral neck fracture or lateral dome impaction (never seen one with medial dome impaction)

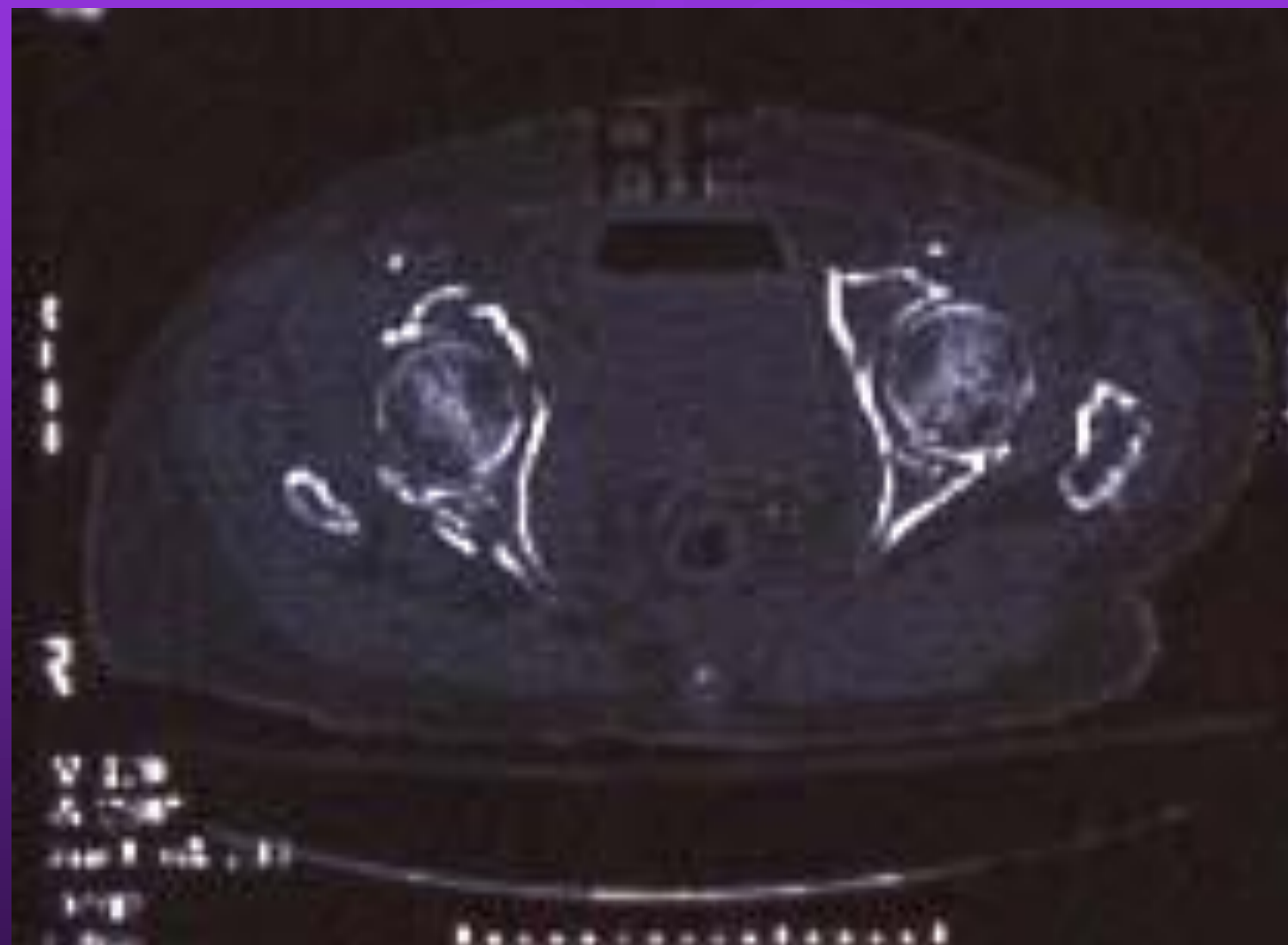












Anterior or Posterior Approach?

- Dependent on the type of fracture and what approach gives the easiest fixation (direction of the head migration)
- II and or IF – quadrilateral surface comminution
- KL – posterior wall

Posterior Approach

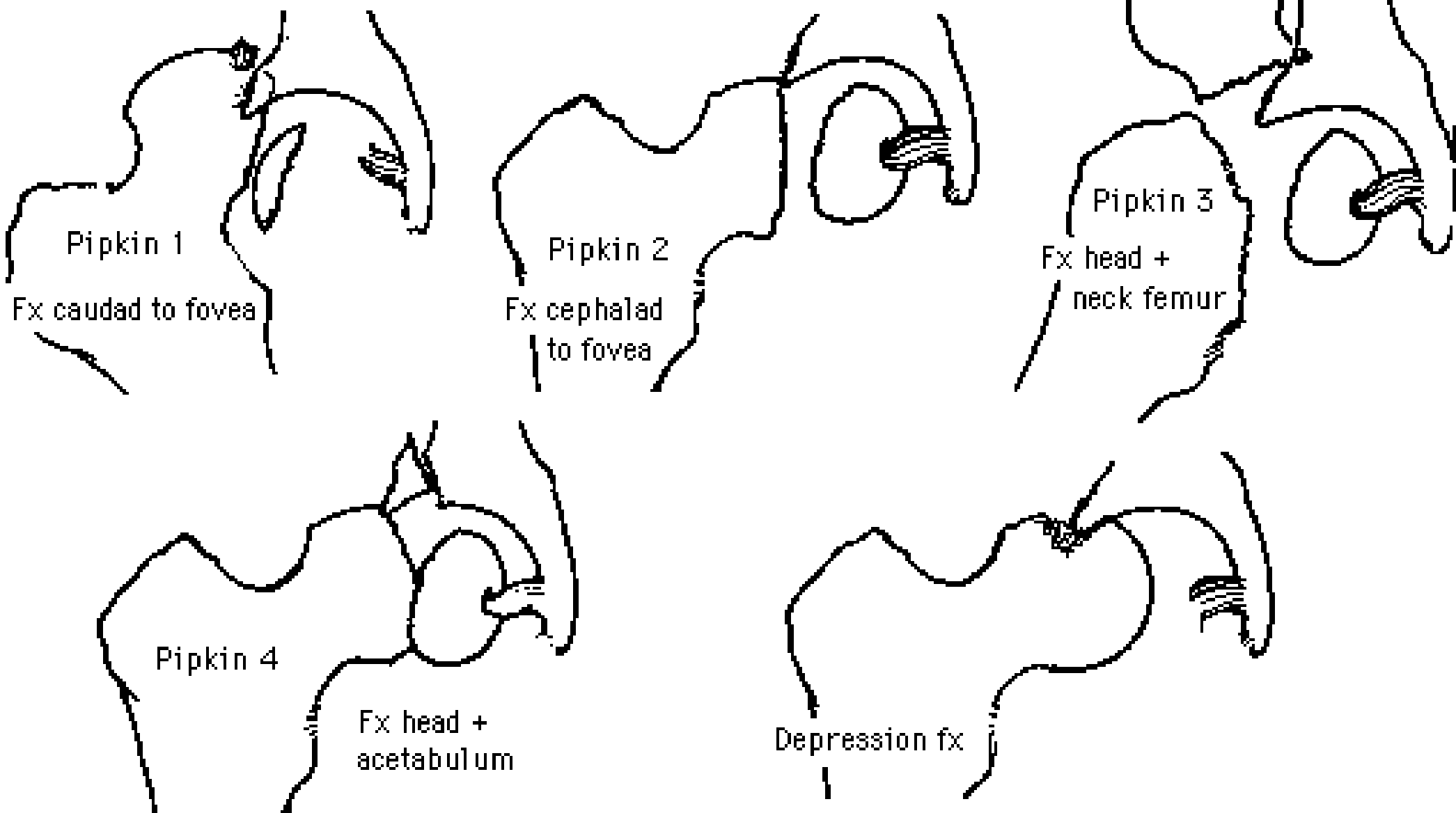
- KL for both fixation of acetabular fracture and THA (Femoral and dome impaction, OA) (Boraiah 2009)
- May do II to fix acetabular fracture but always KL for THA (?osteoporosis) (Herscovici 2010)





FEMORAL HEAD FXS

Pipkin, JBJS 39 A 1027, 1197 1957



MC

- 29 yo healthy male s/p MVC with posterior hip dislocation
- Pipkin 1-2 fracture

MC Injury Films



Treatment

- Pipkin 1- conservative (<2mm displaced after closed reduction posterior dislocation) vs excision (open vs scope Lansford 2012) vs orif
- Pipkin 2- conservative (<1mm) vs orif usually anterior
 - Always check femoral neck before reducing posterior hip dislocation

Treatment cont.

- Pipkin 3- conservative ($<1\text{mm}$) vs orif of femoral neck and head through anterior approach
- Pipkin 4- orif of acetabular fracture and femoral head with KL, trochanteric slide, and surgical dislocation (Solberg 2009 left OI intact)

Giannoudis Injury 2009

- 11.7% of posterior hip dislocations with femoral head fractures
- 84% due to MVA
- Timing of reduction <6hr (88% vs 42% G&E Hougaard 1986)

MC Post-reduction (note incongruent joint)



Pipkin 1 Studies

- Chakraborti 1975 – conservative Rx
- Epstein 1985 – open reduction internal fixation treatment of dislocation and femoral head
- Holms 2000- excise $<1/3$ nwb femoral head without clinical implication (cadavers)

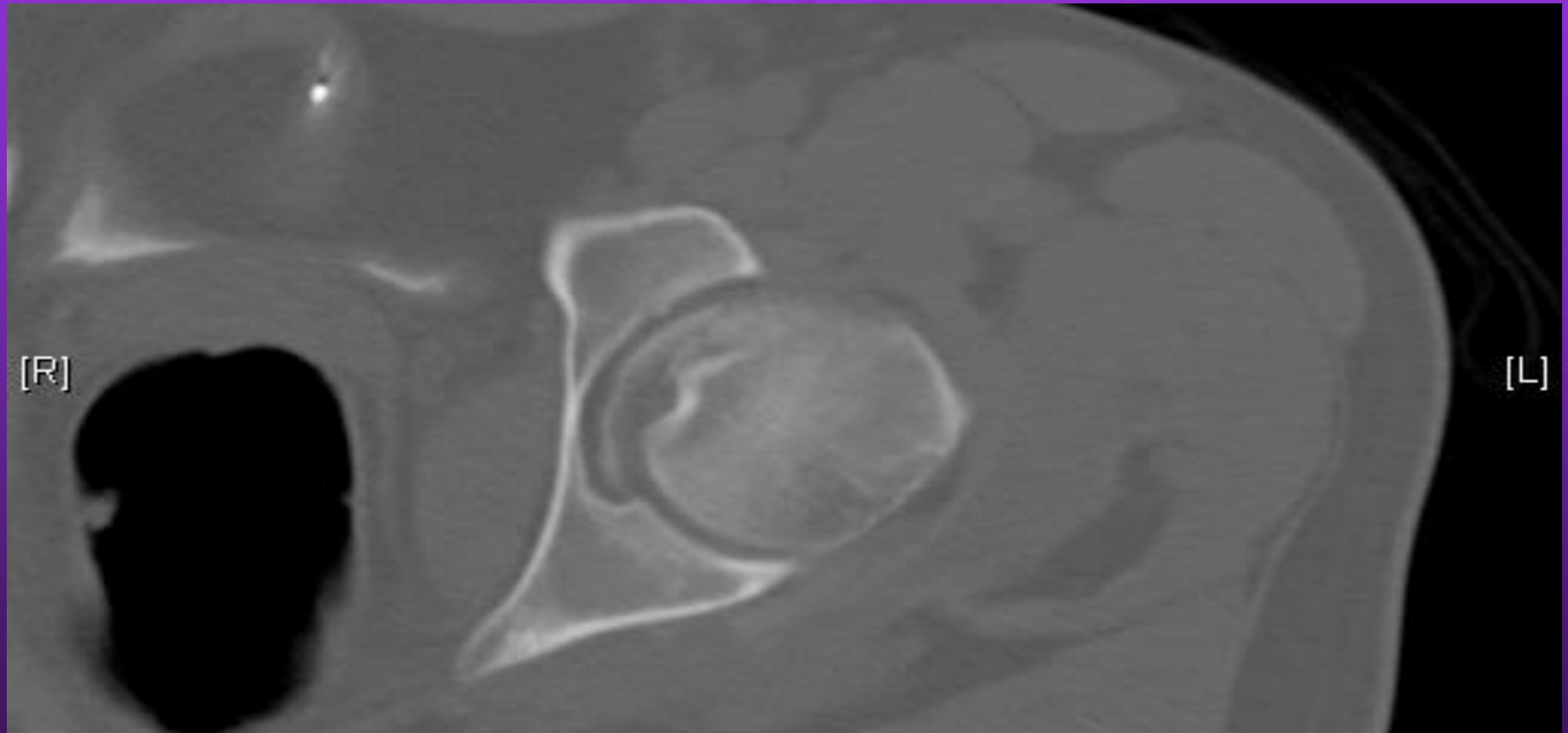
Chen et al Int Orthop 2011

- 16 patients Pipkin 1 conservative vs excision (1E, 3G, 2F, 2P vs 5E, 2G, 1F)
 - 2 AVN, 1 HO in cons.
 - 4 HO in Tx
 - <12 h for reduction (↑ in reduction for conservative rx)
 - Skeletal distraction 6 weeks, not randomized

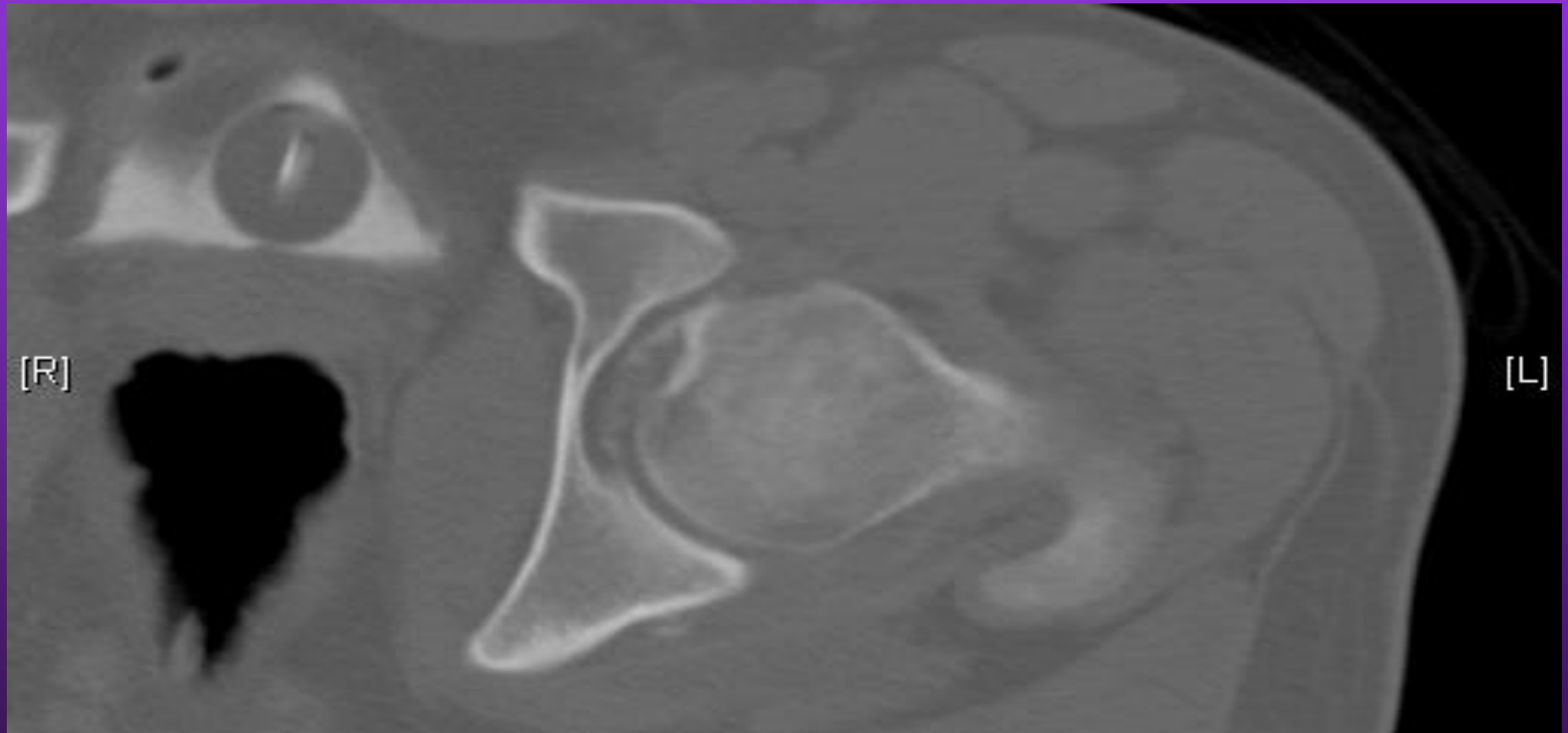
Anterior vs Posterior

- Fracture is usually anterior
- Check CT
 - Swiontkowski 1992

MC CT



MC CT



MC OR

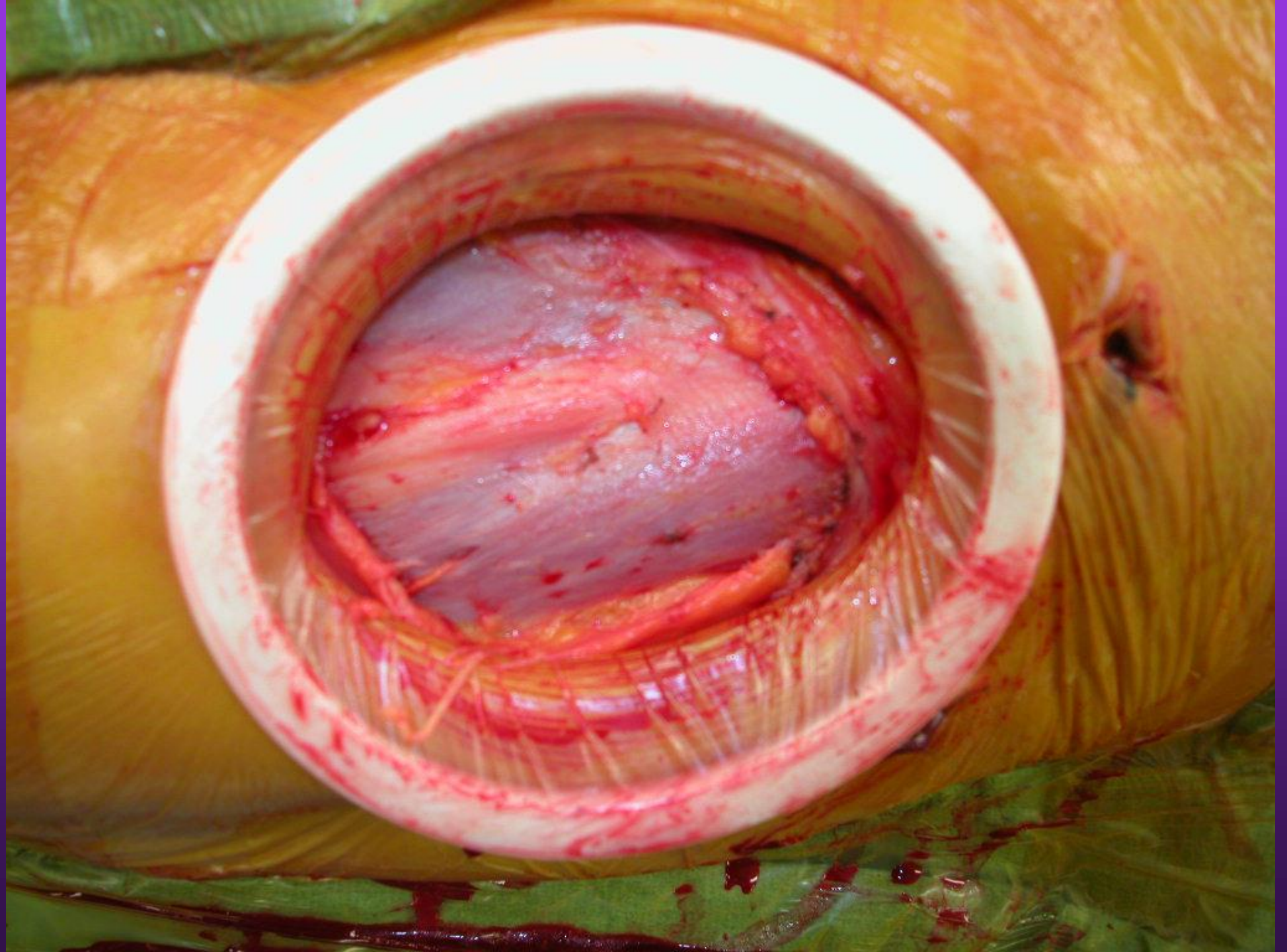
- ORIF through Smith-Peterson approach and surgical dislocation (initially done by a trauma fellowship trained surgeon and was unable to dislocate the hip)
- Fixation with 3.0 cannulated screws



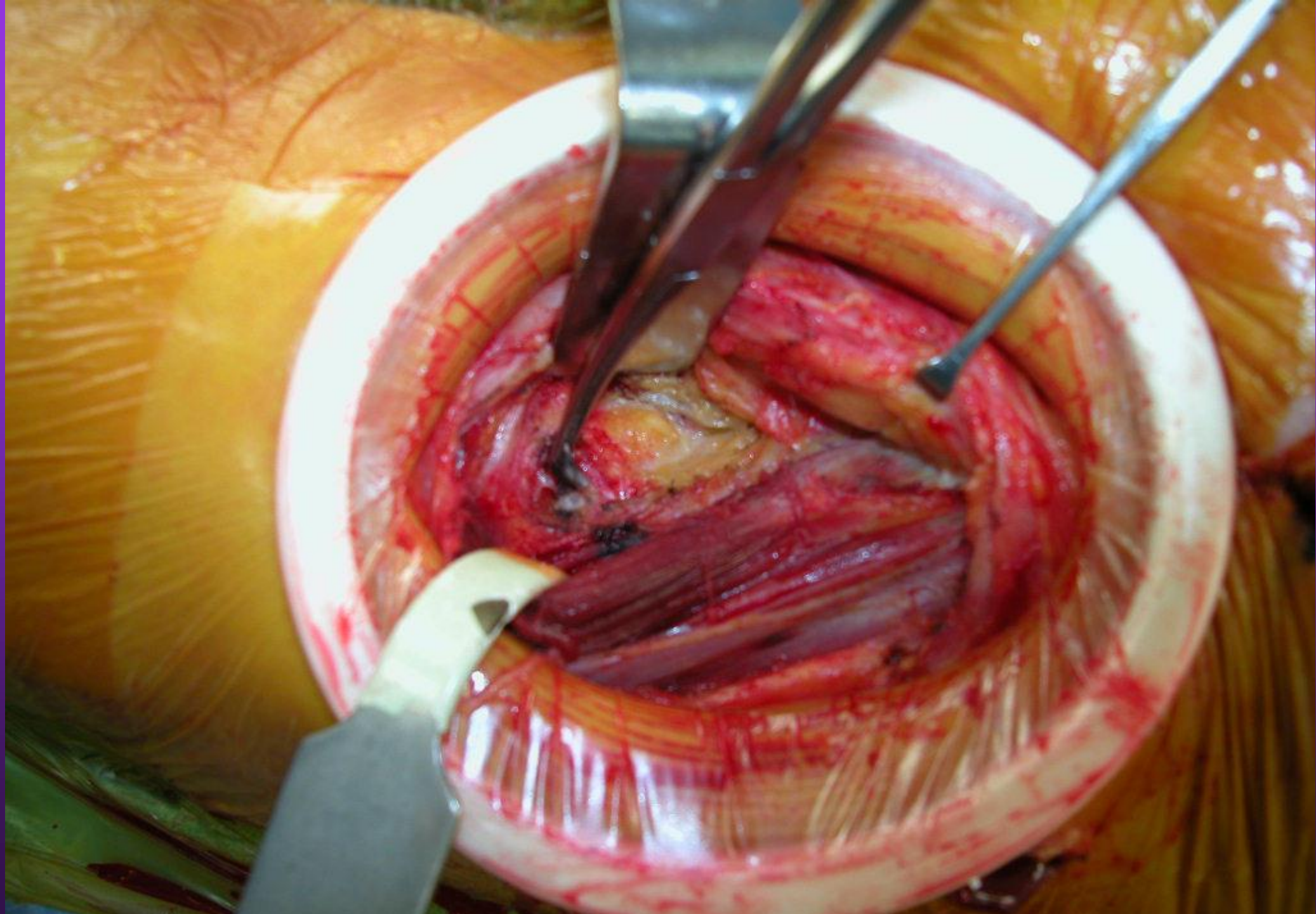
Dr. Kregor
slides

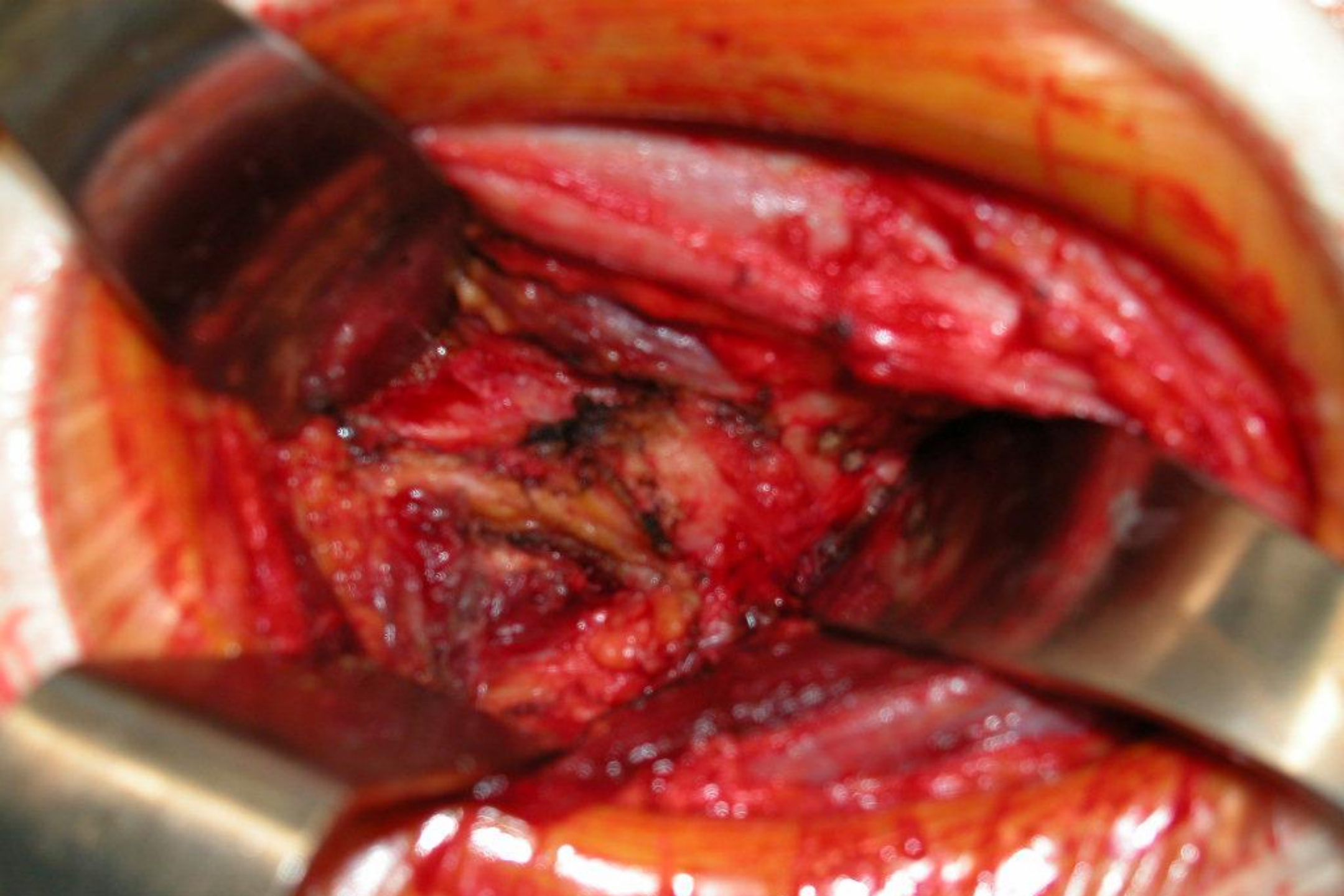
Case #1

Line of 10 cm skin incision.

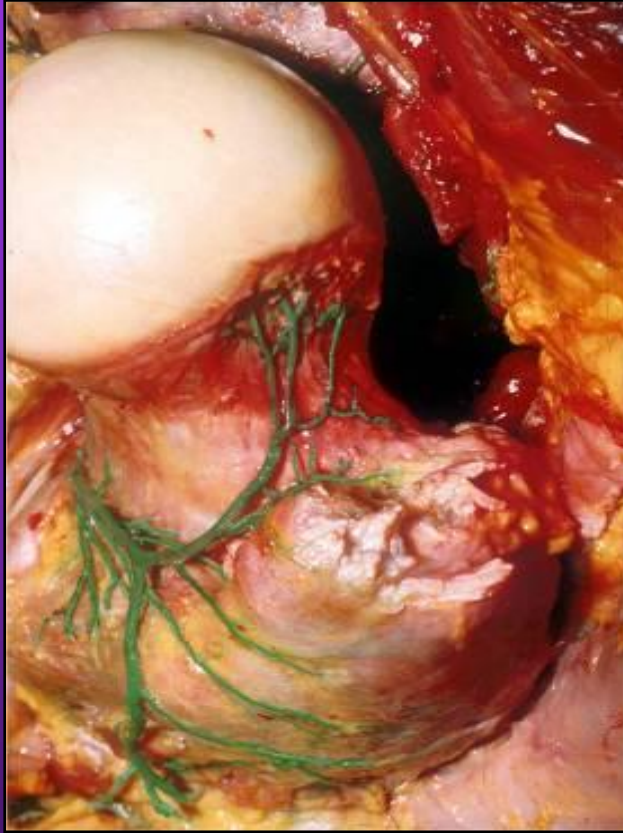








Terminal subsynovial (retinacular) vessels



Superior
type

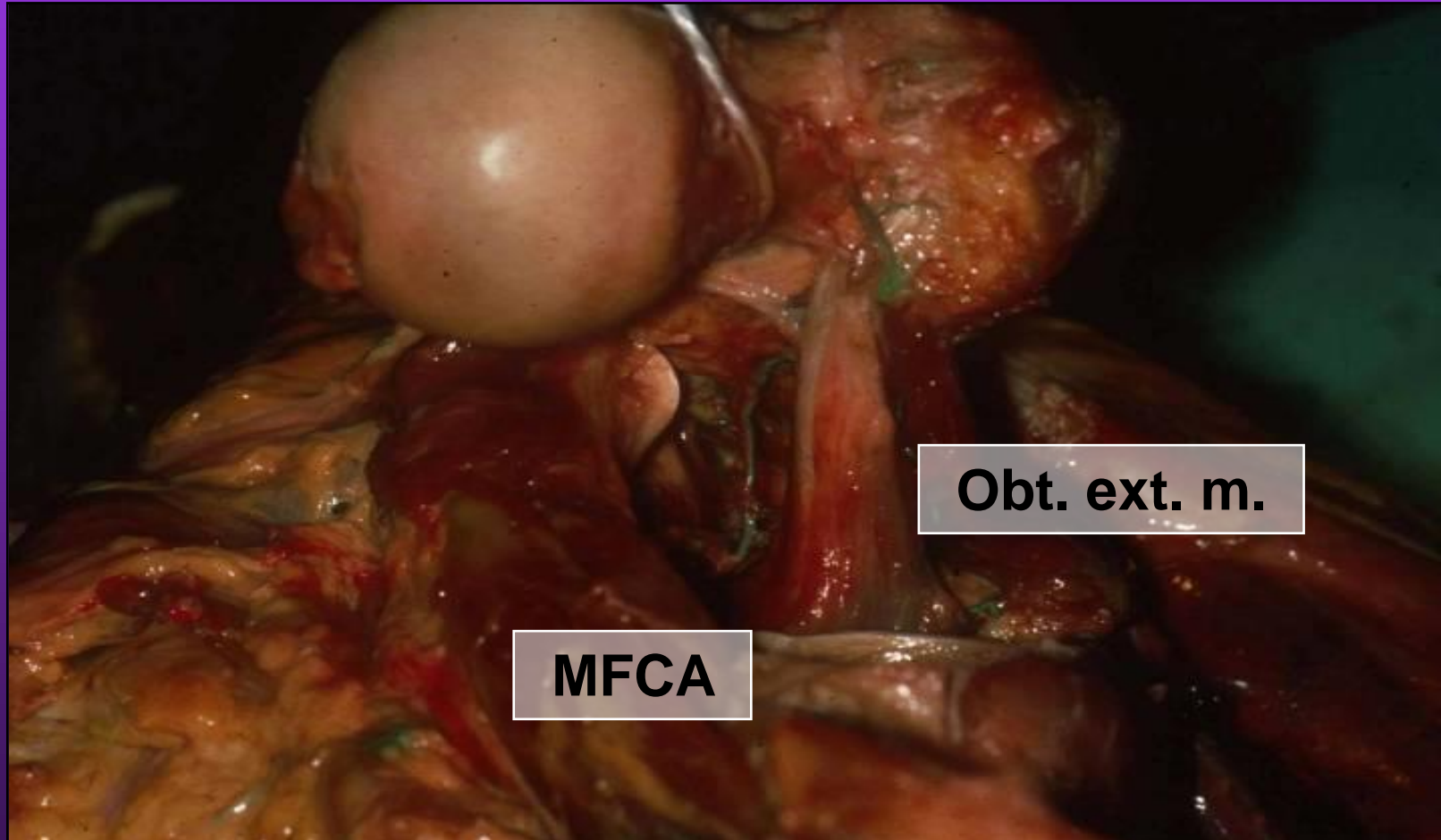


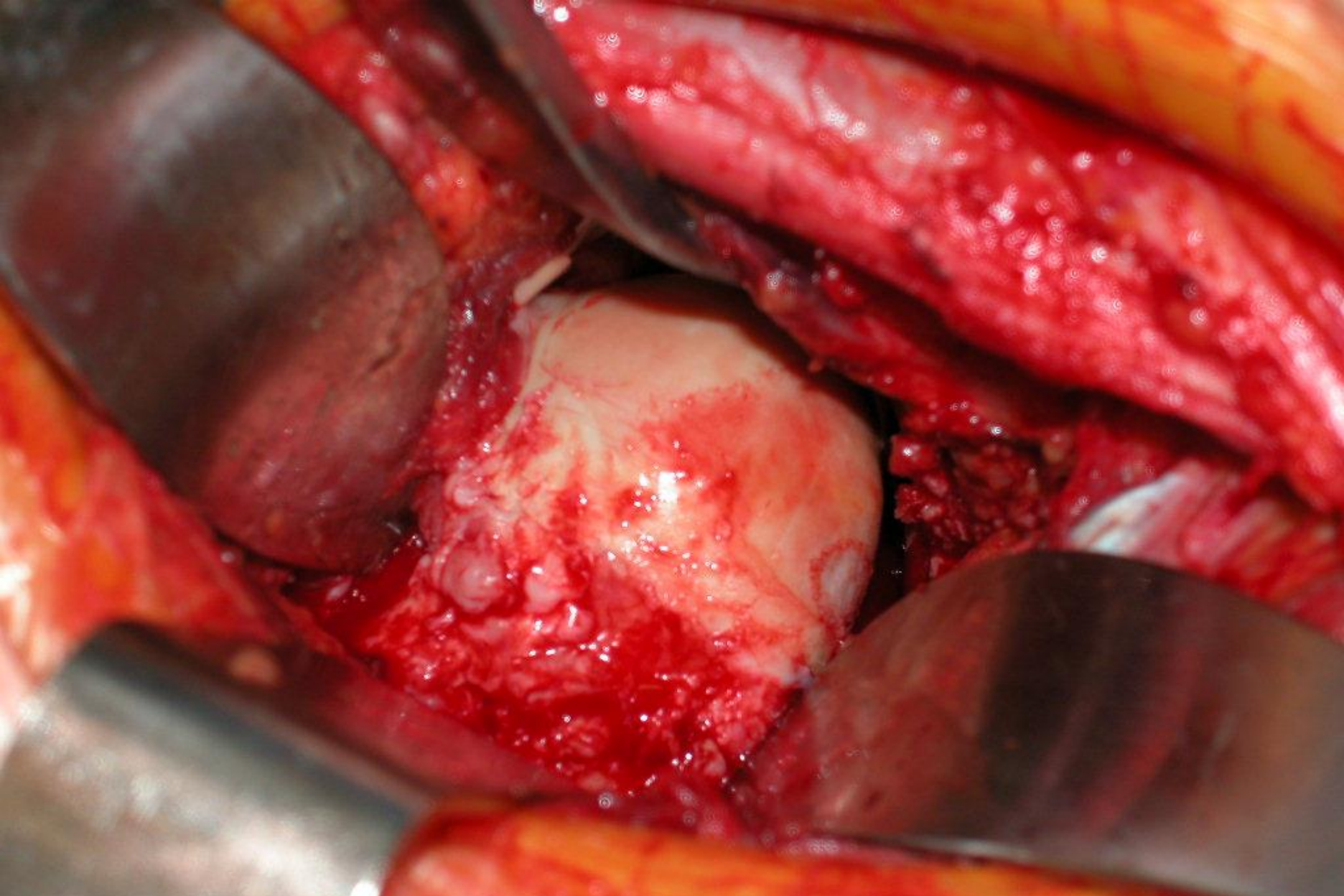
Mixed



Post. neck
free of vessels

Obt. ext. m. protects MFCA





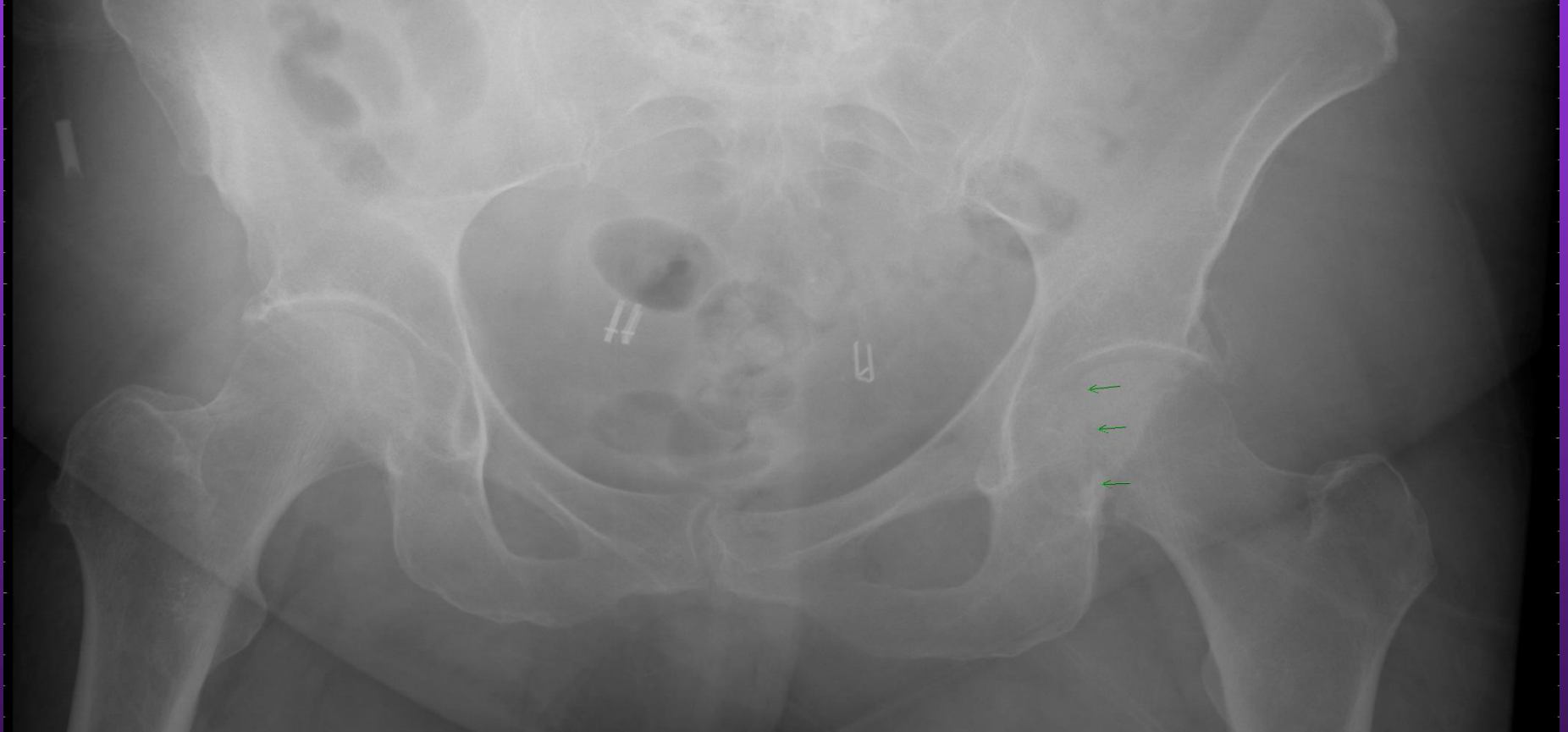
EL

- 56 yo female s/p MVA, unrestrained passenger
- h/o osteoporosis, hypothyroid, depression, OSA, breast cancer
- Posterior hip dislocation with Pipkin 2 fracture

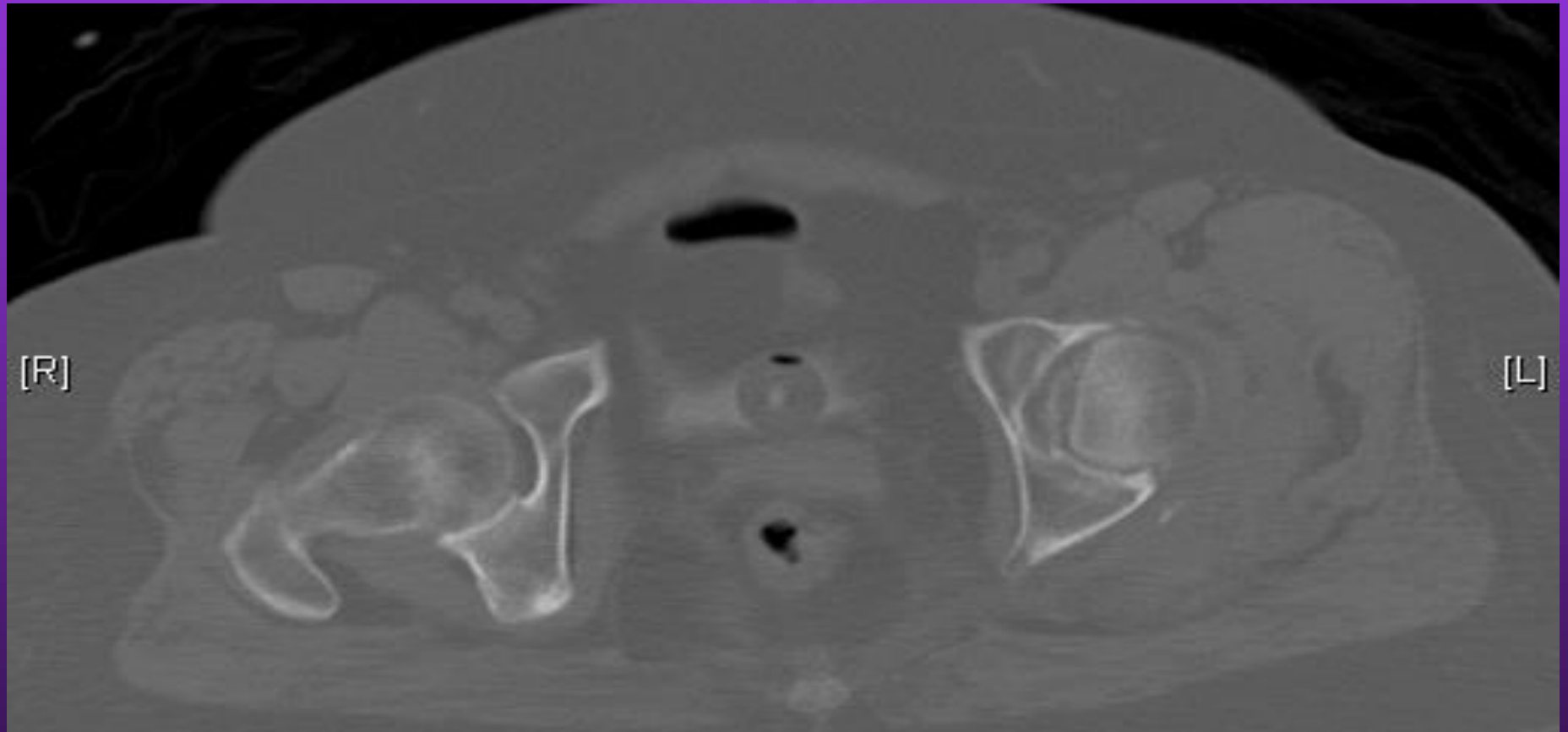
Injury Films



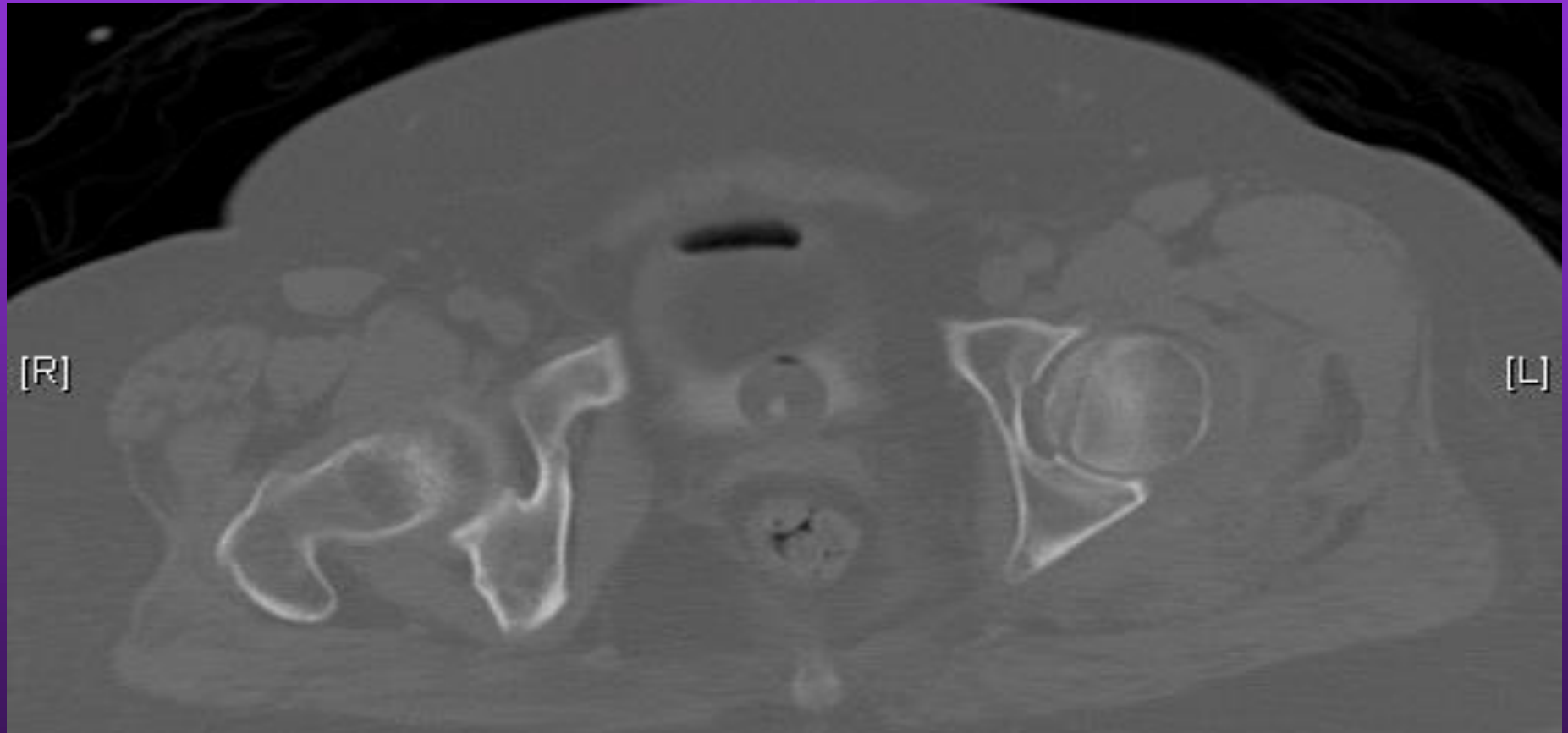
Post-Reduction



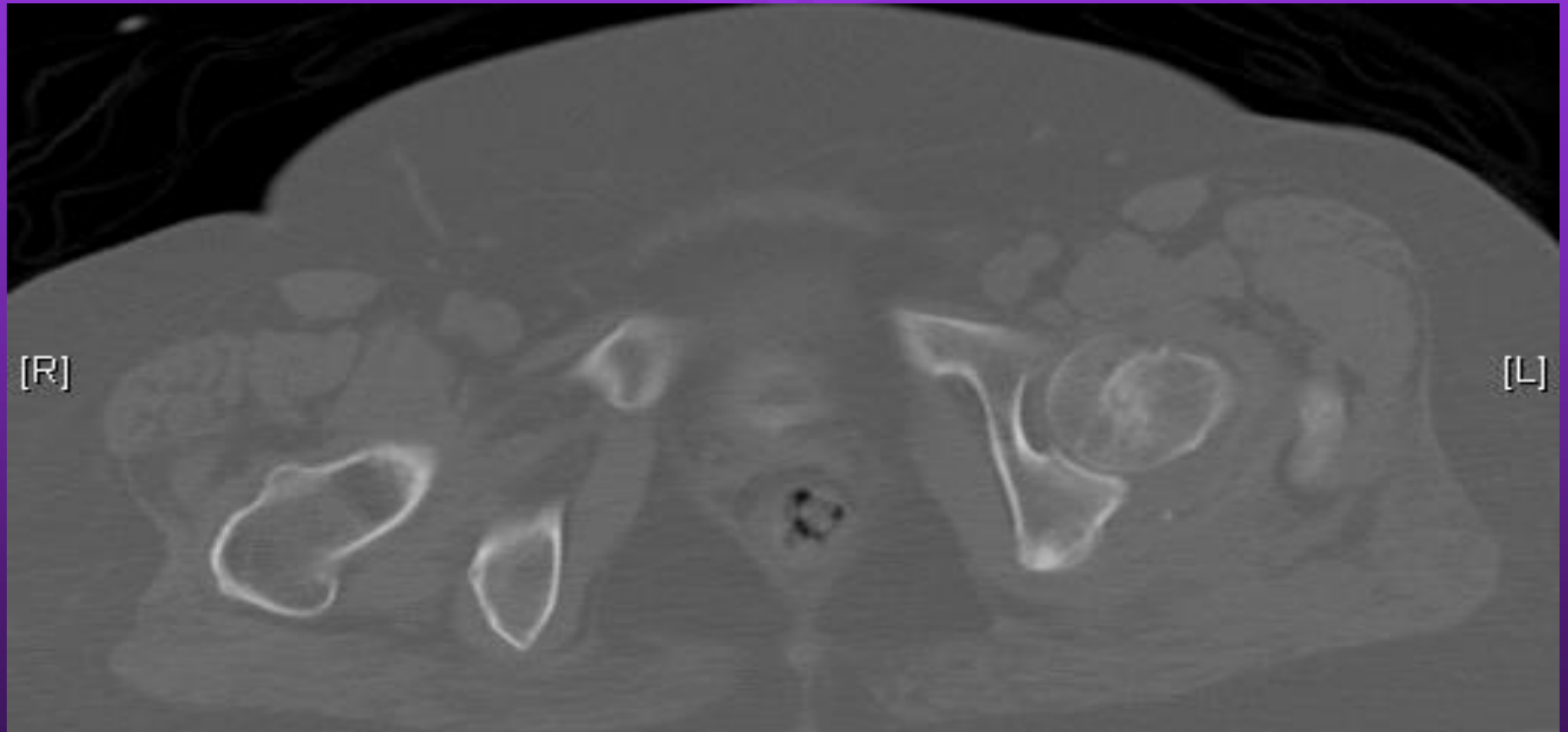
CT



CT



CT



CT



OR

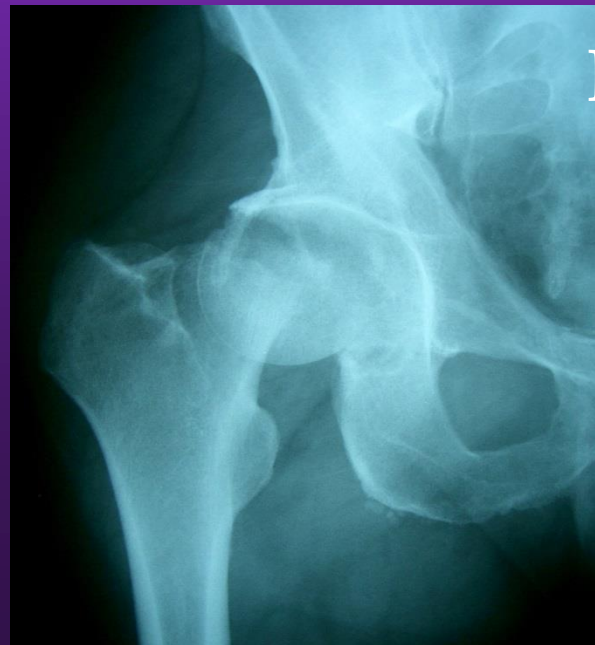
- ORIF through Smith-Peterson approach
- 3.0 cannulated screws

Post-Op

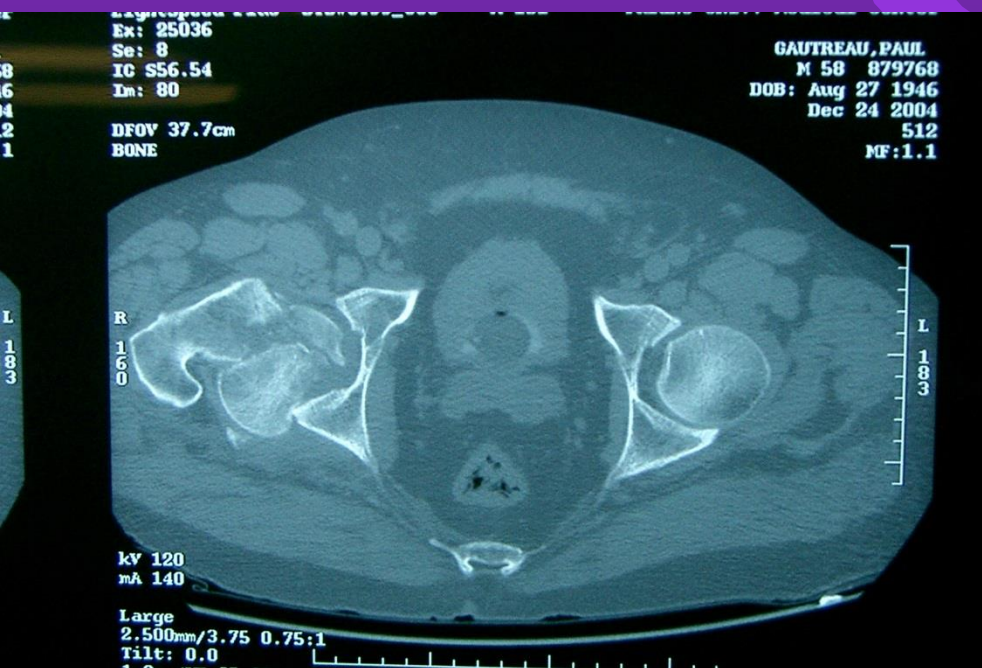
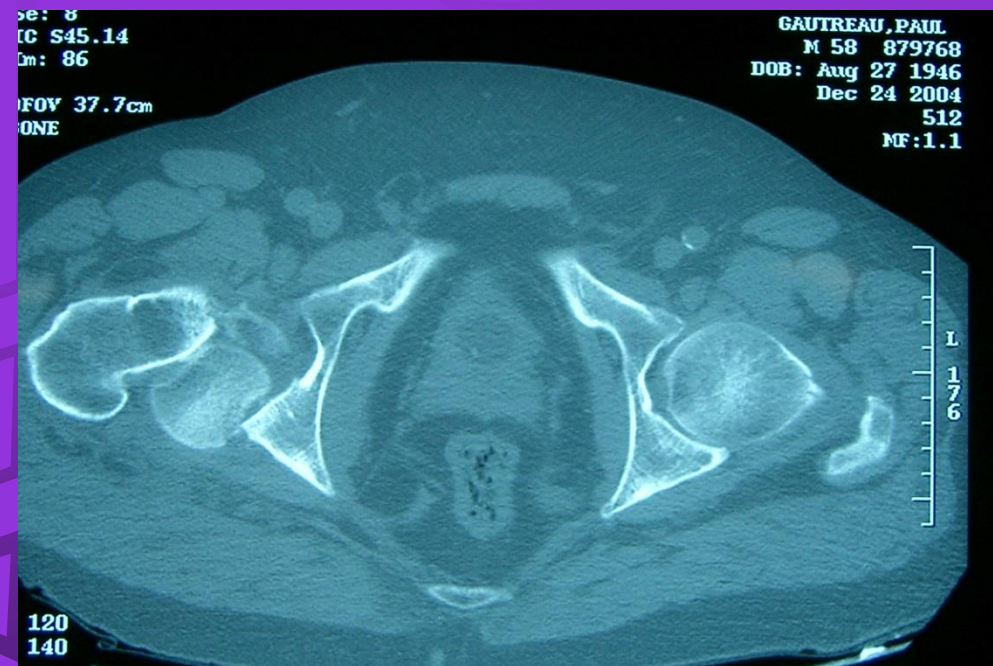


Post-Op





Pipkin 3

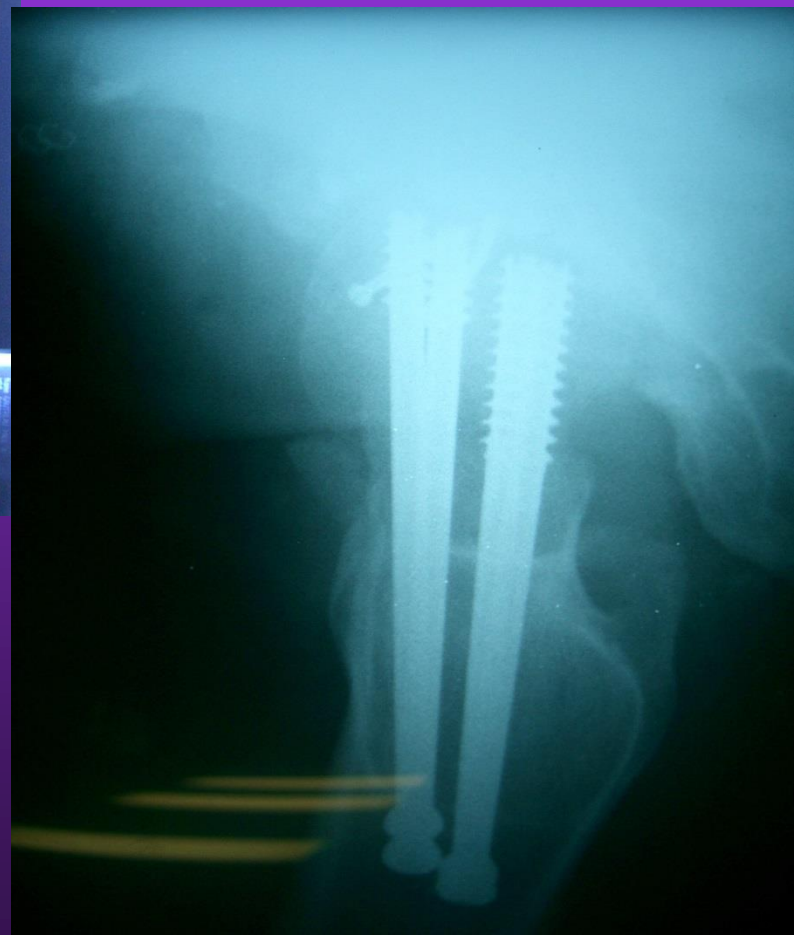


Head first then neck (careful with blood supply)



100 kVp
3.50 mA
45

25
3
OEC

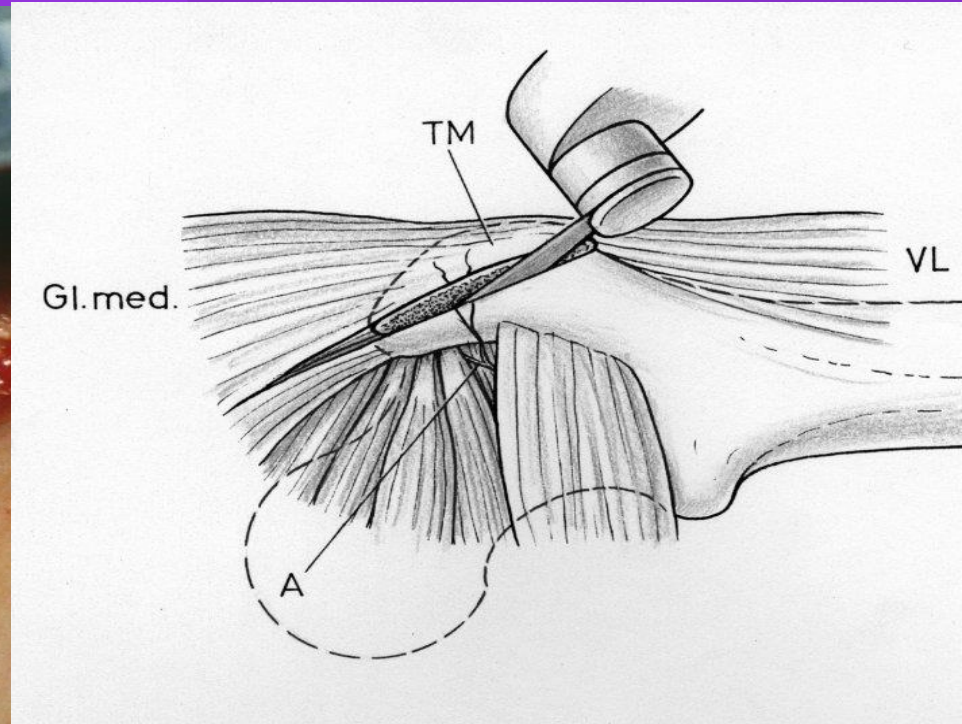
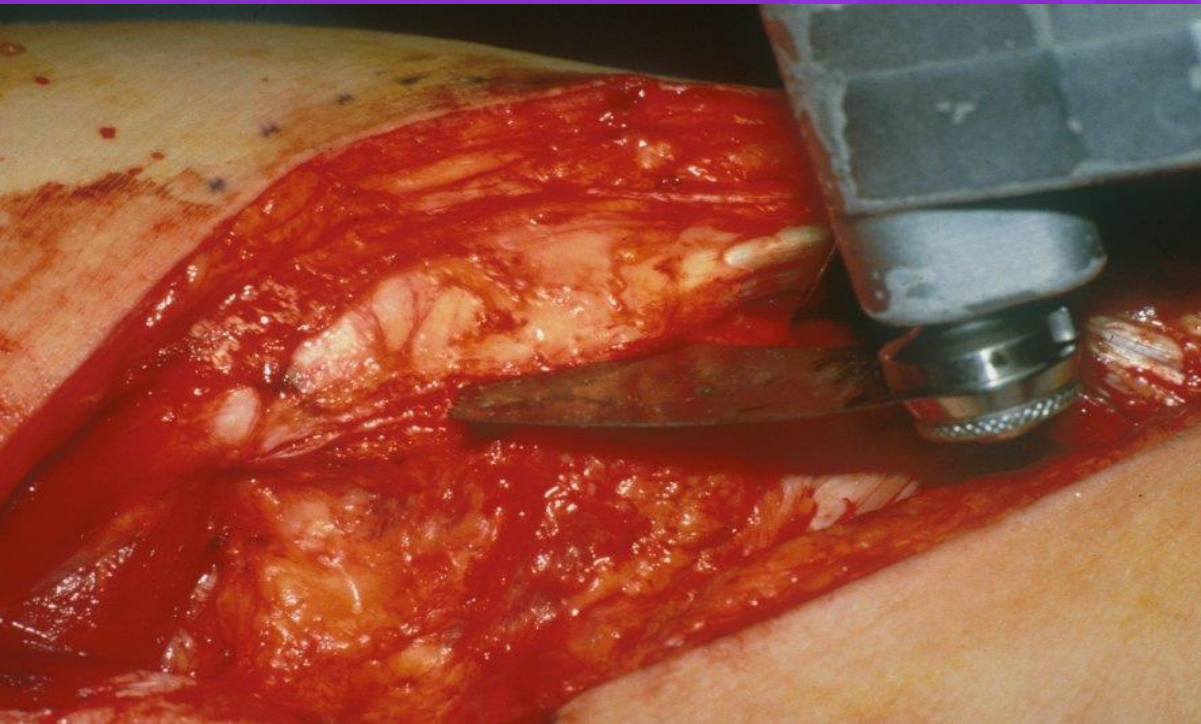


Ex

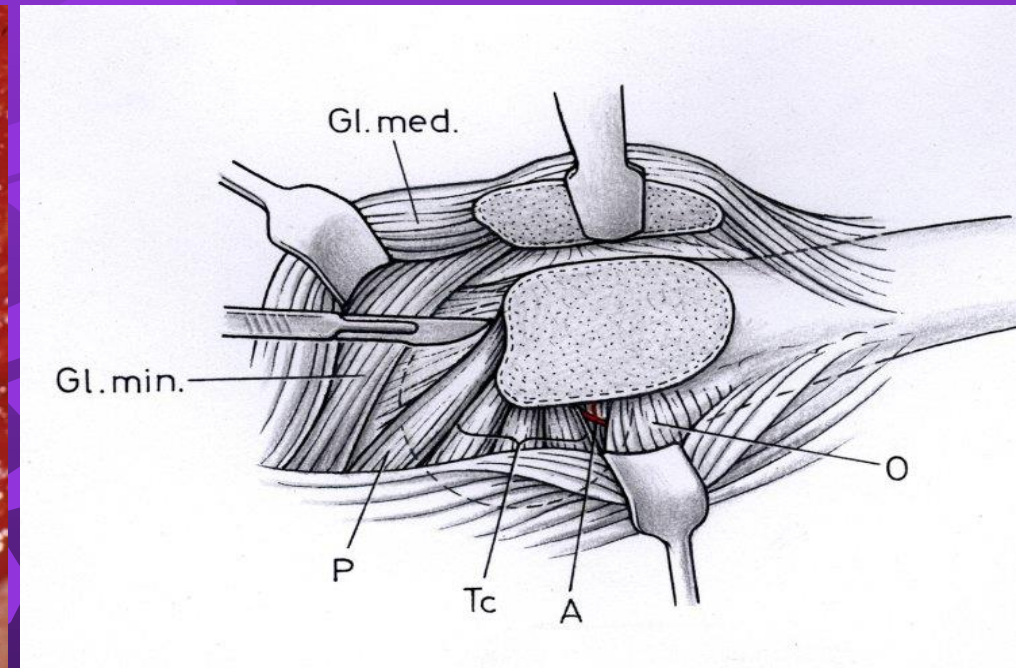
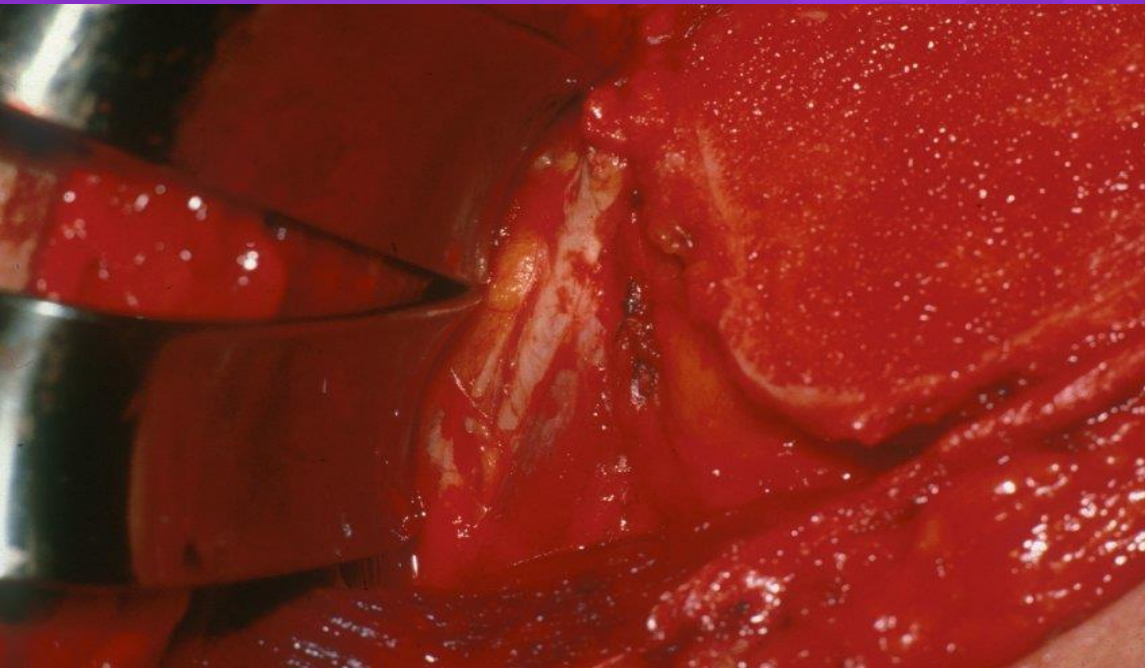
Pipkin 4 Surgical Dislocations

- KL in lateral decubitus with a trochanteric slide (instead of a flip)
- Pipkin fracture with a posterior wall
- Some use it in Tr to see the reduction

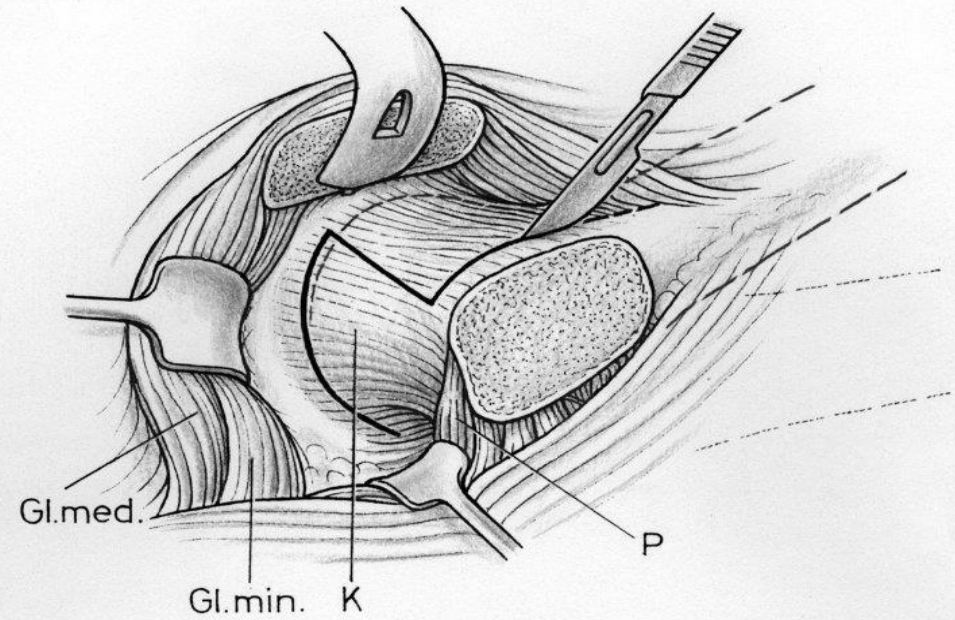
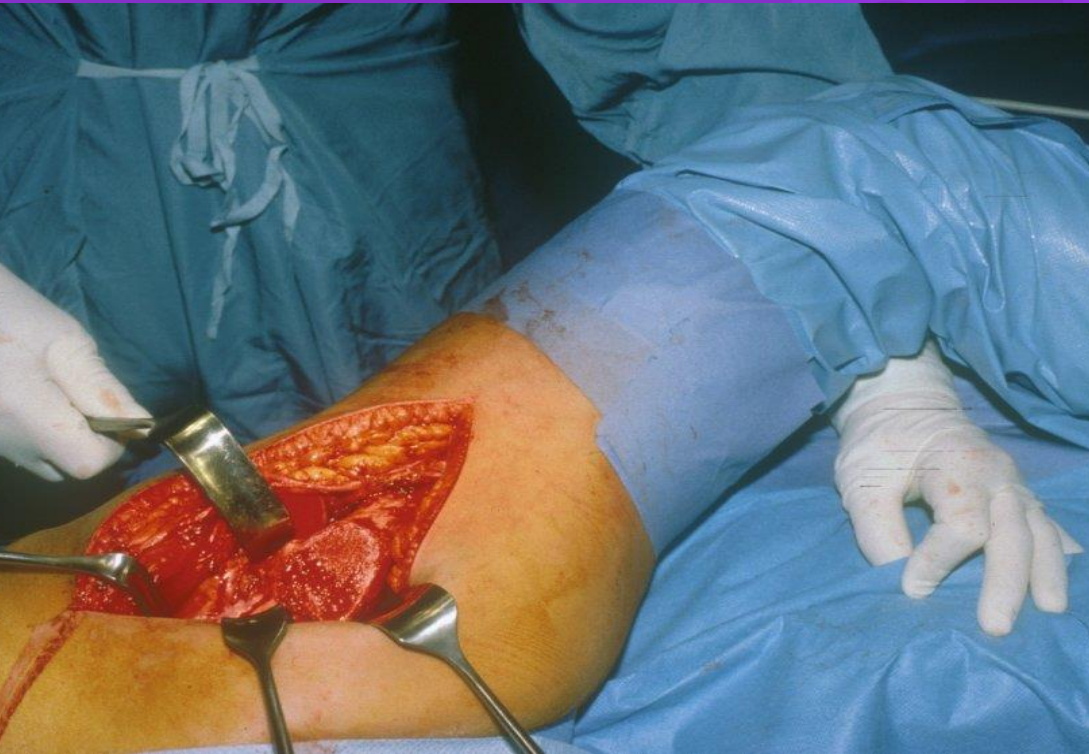
osteotomy of greater trochanter

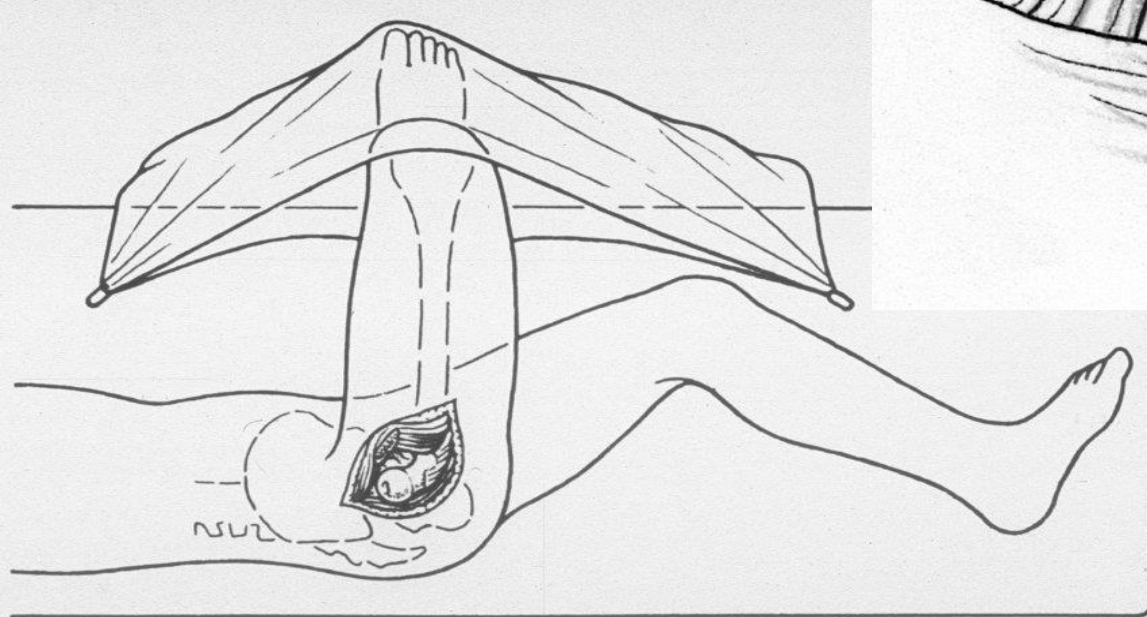
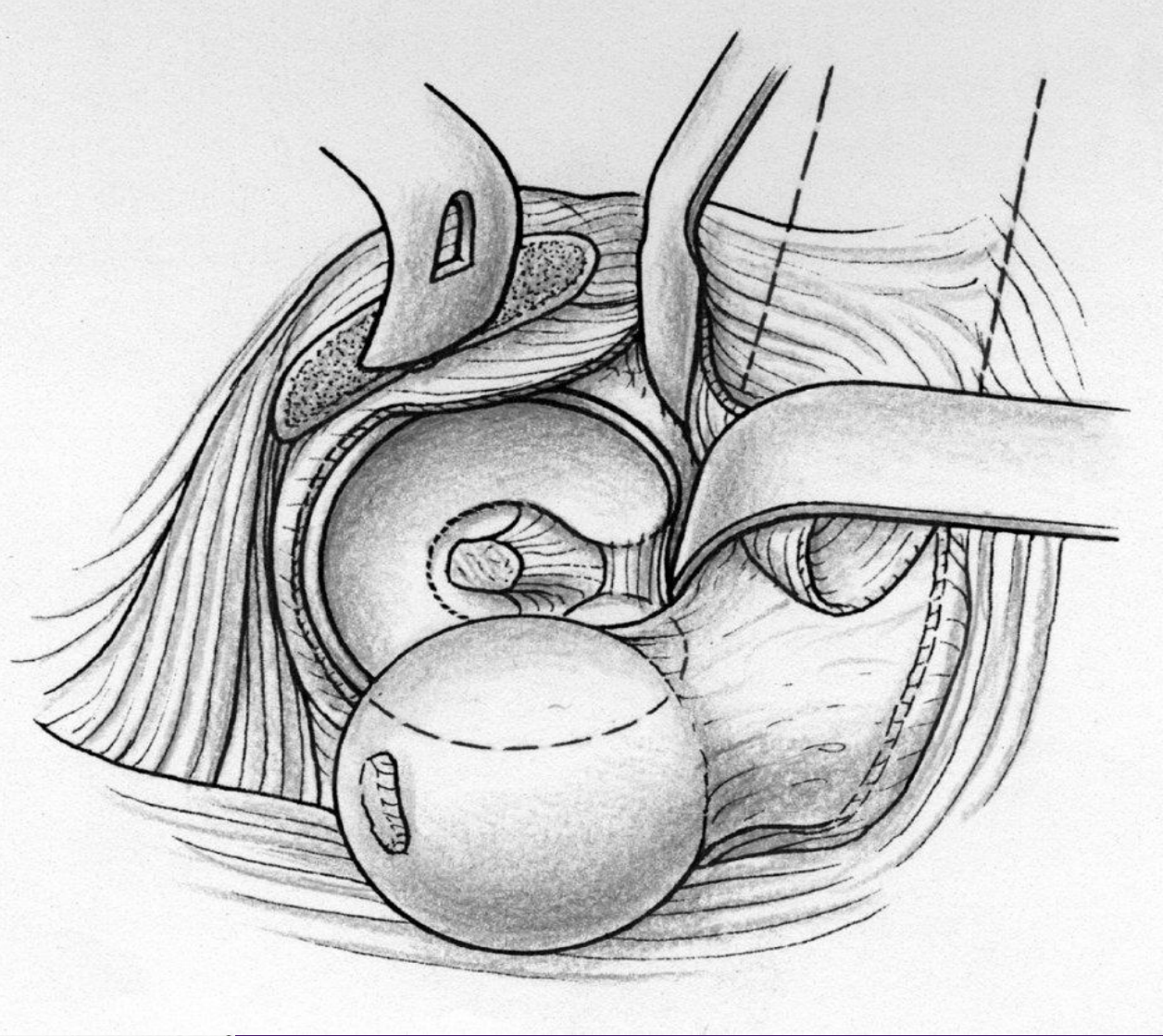


piriformis muscle

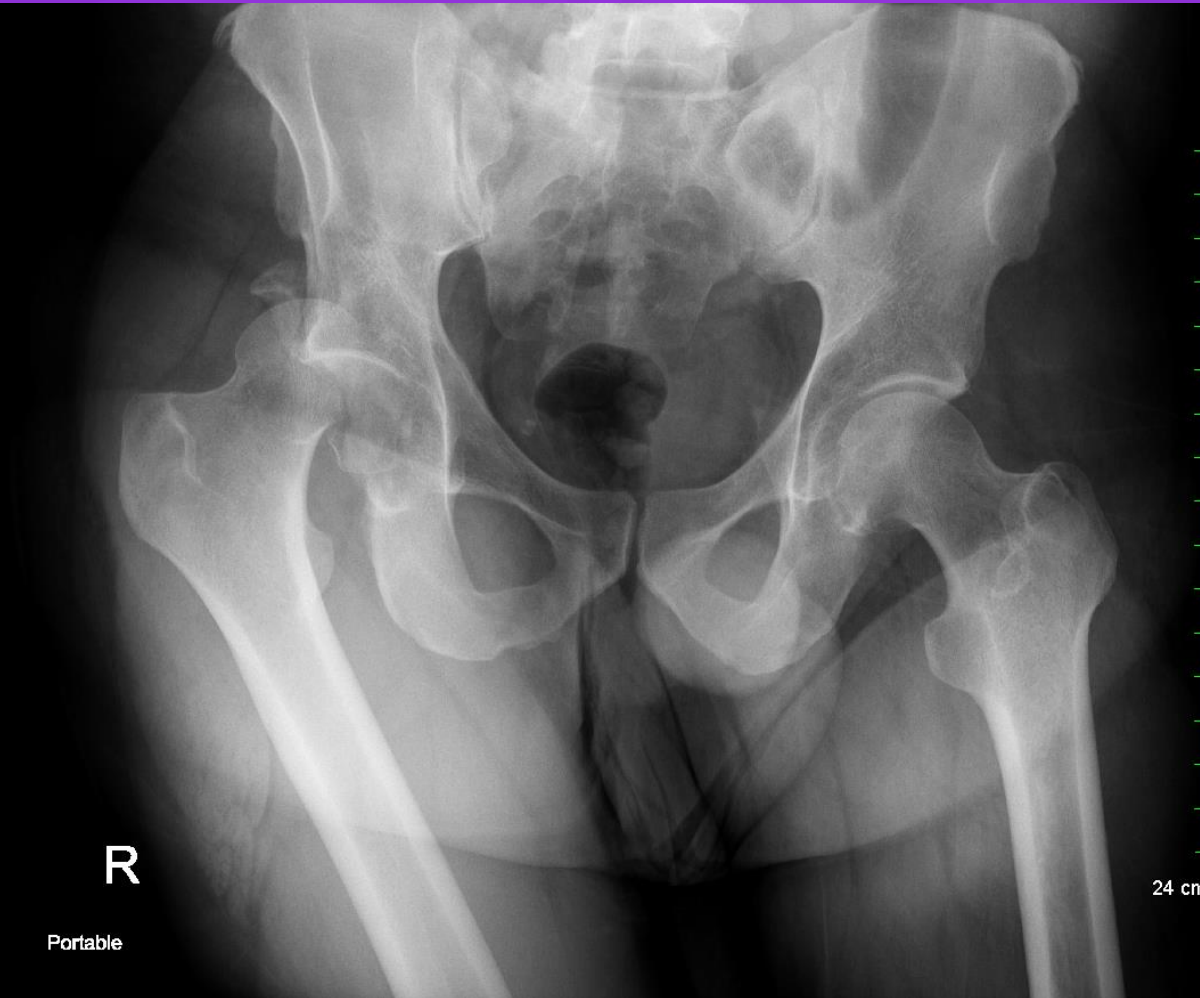


capsulotomy

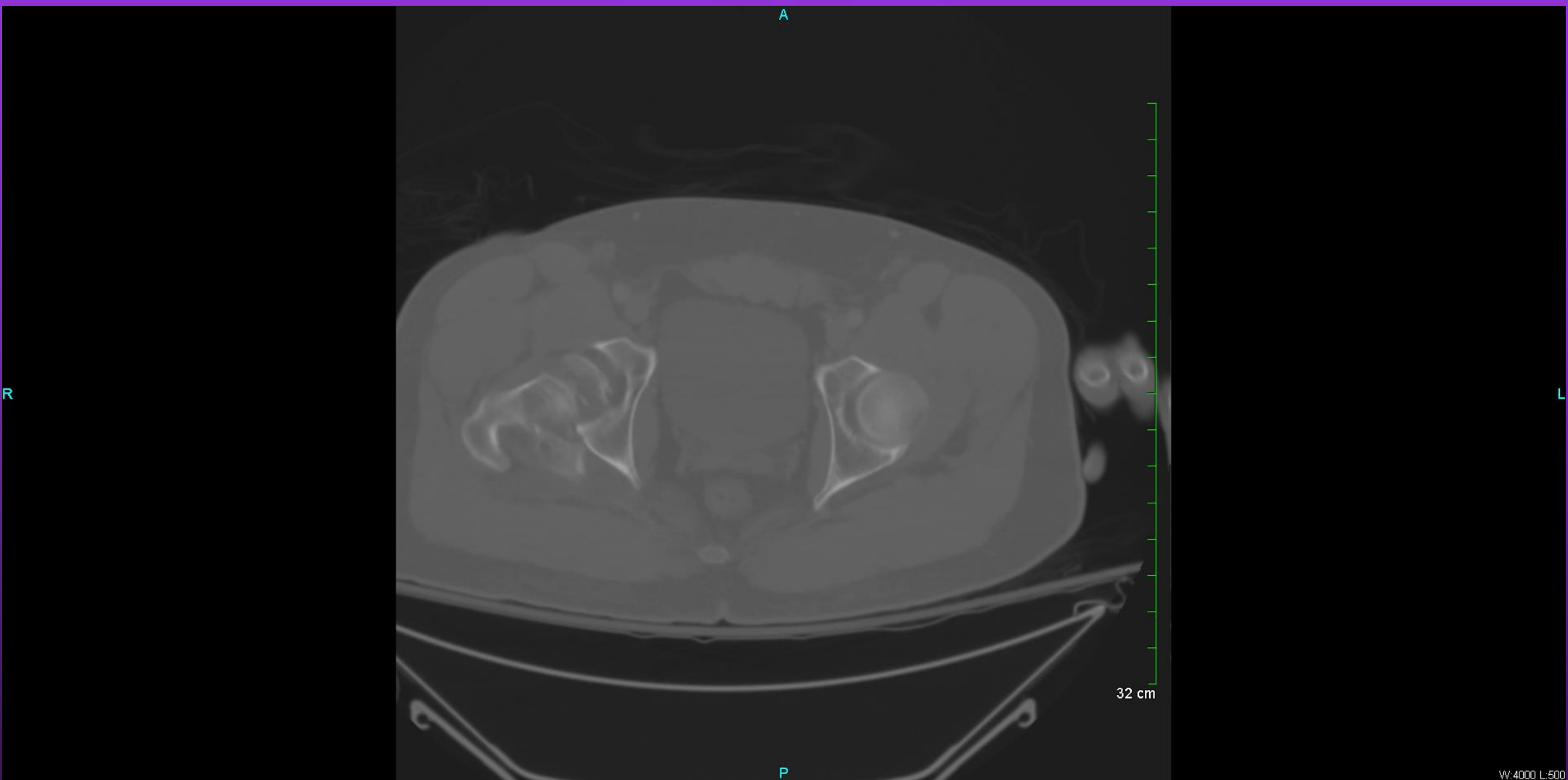




41yo MVA RS







2/5/18 FH, FN, PW



< 4-4 (ALL) >

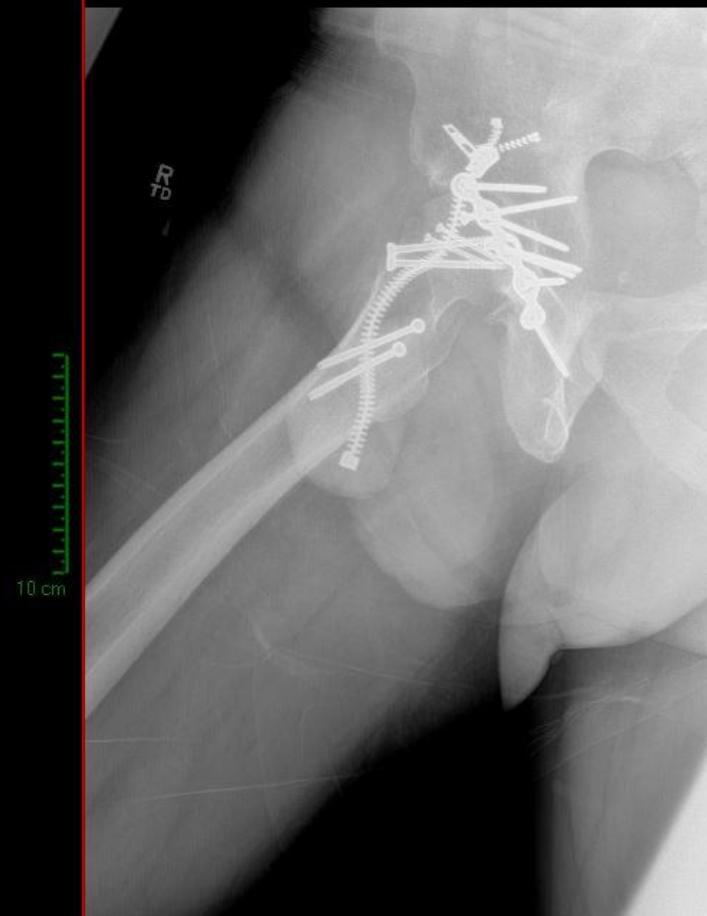
>3 months



< 5-5 (ALL) >



< 6-6 (ALL) >



RelXRay Exp: 1007
[Icons]

C 3793
W 15428

RelXRay Exp: 1768
[Icons]

C 6353
W 16206

RelXRay Exp: 1638
[Icons]

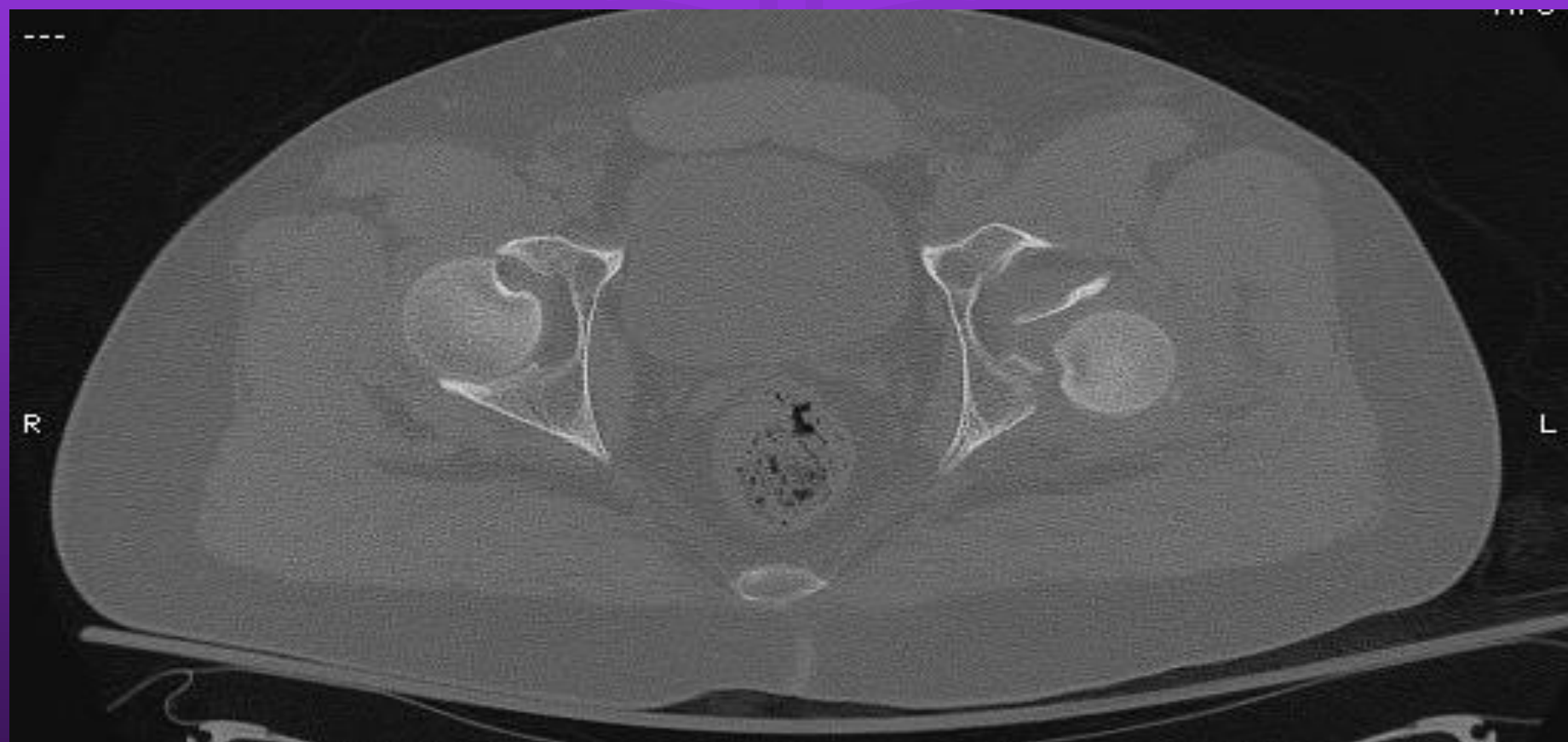
FM

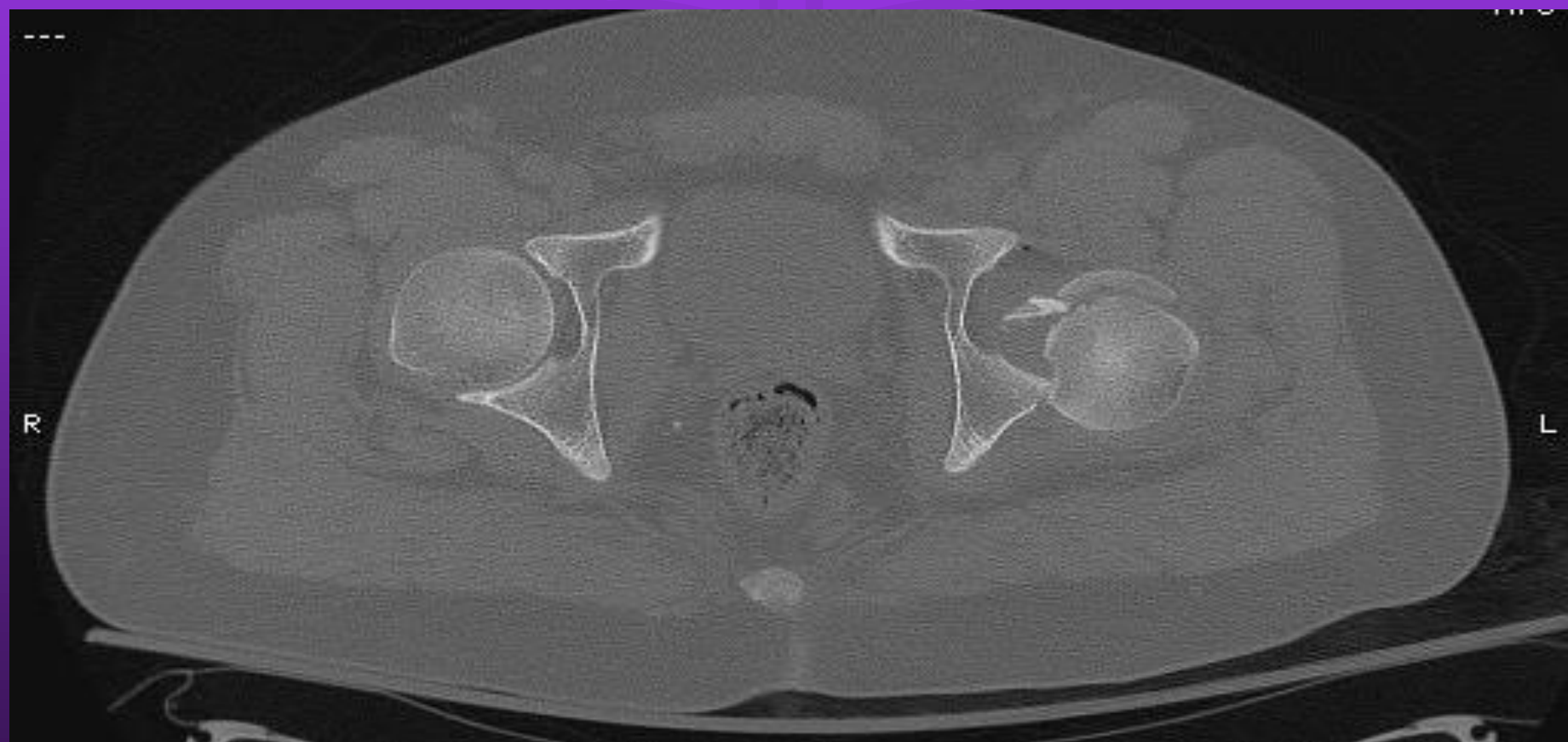
- 38 yo intoxicated pedestrian struck by motor vehicle
- Sustained Pipkin 4 fracture dislocation of hip with posterior wall fracture and irreducible dislocation

SUPINE

**SR5
76@80
0413**

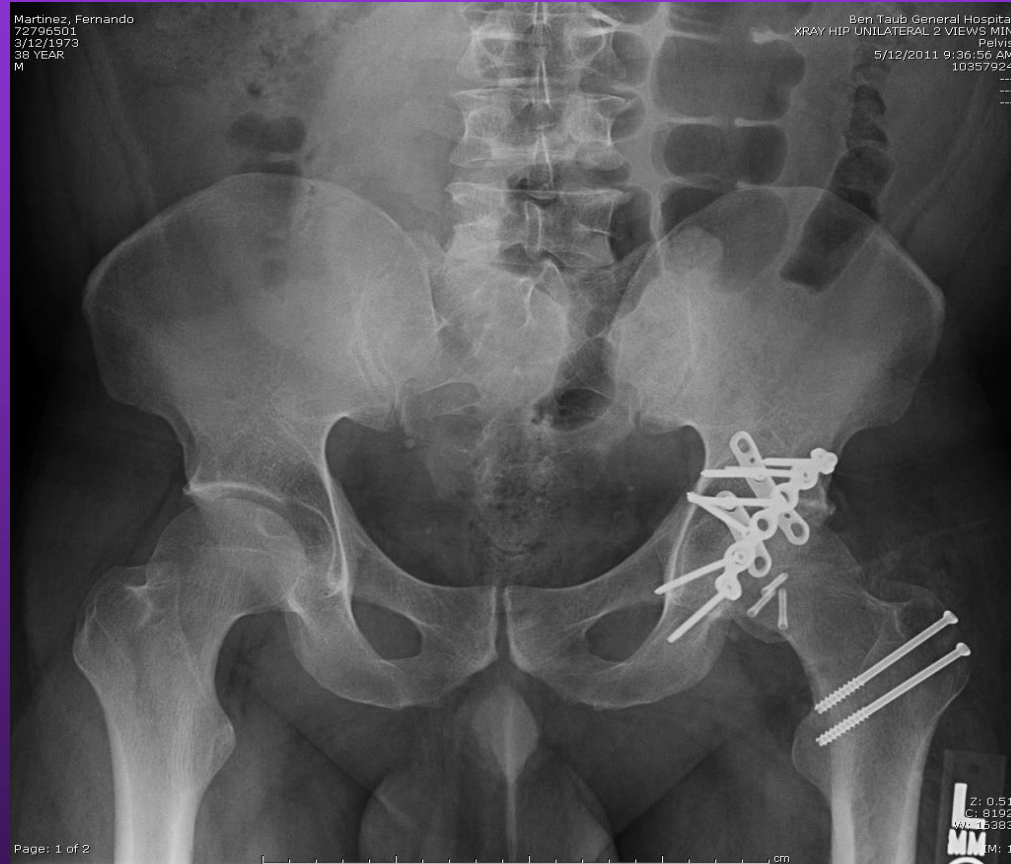






OR

- Trochanteric osteotomy with surgical hip dislocation
- Femoral head fracture repaired with 3 Acutrak screws
- Marked comminution and chondral injury to posterior wall articular surface
- Posterior wall fixed with 2 hook plates and 6 hole pelvic recon plate



Post-Op Course

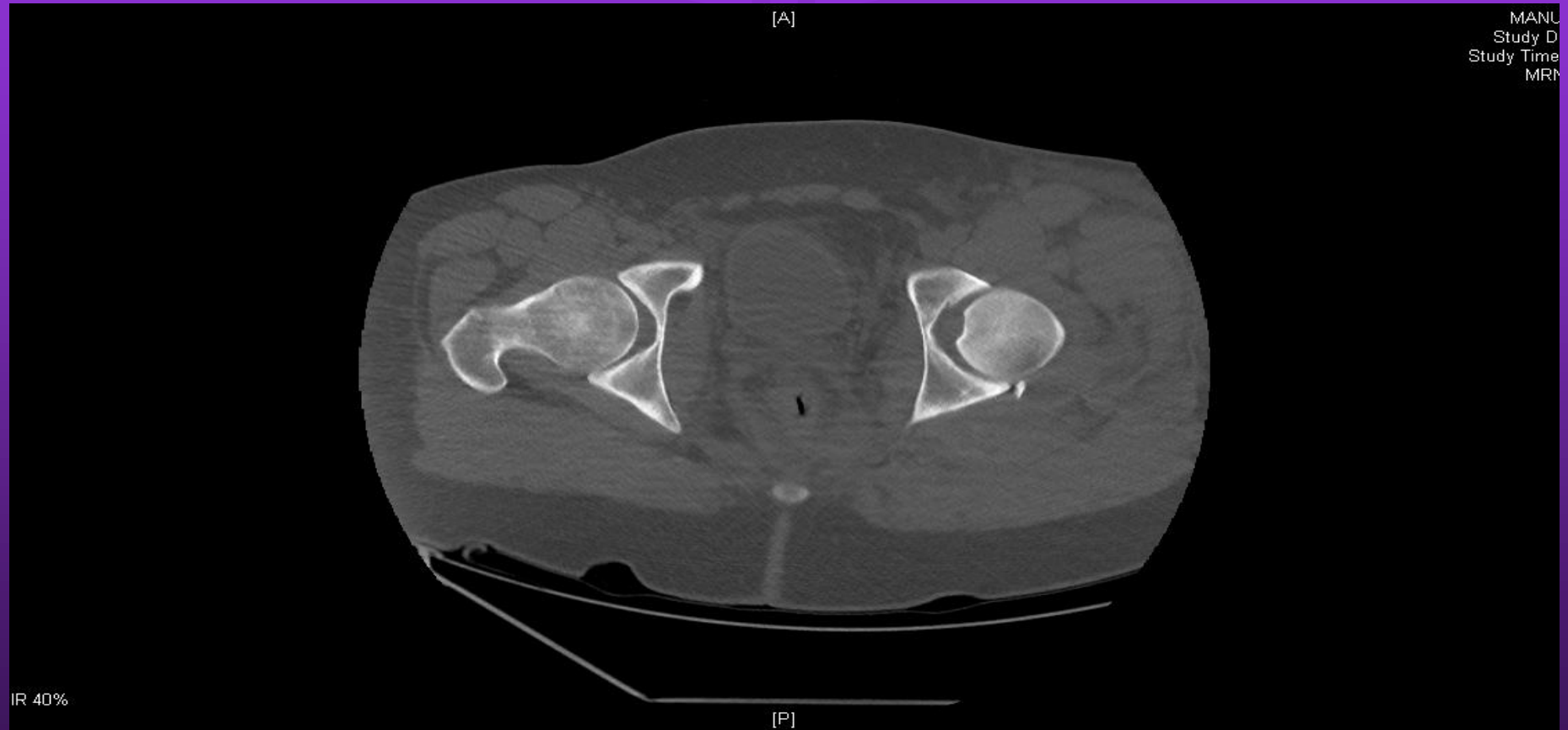
- TDWB 3 months
- Seen at 5 months follow up with no significant pain or limitations
- Stable HO seen



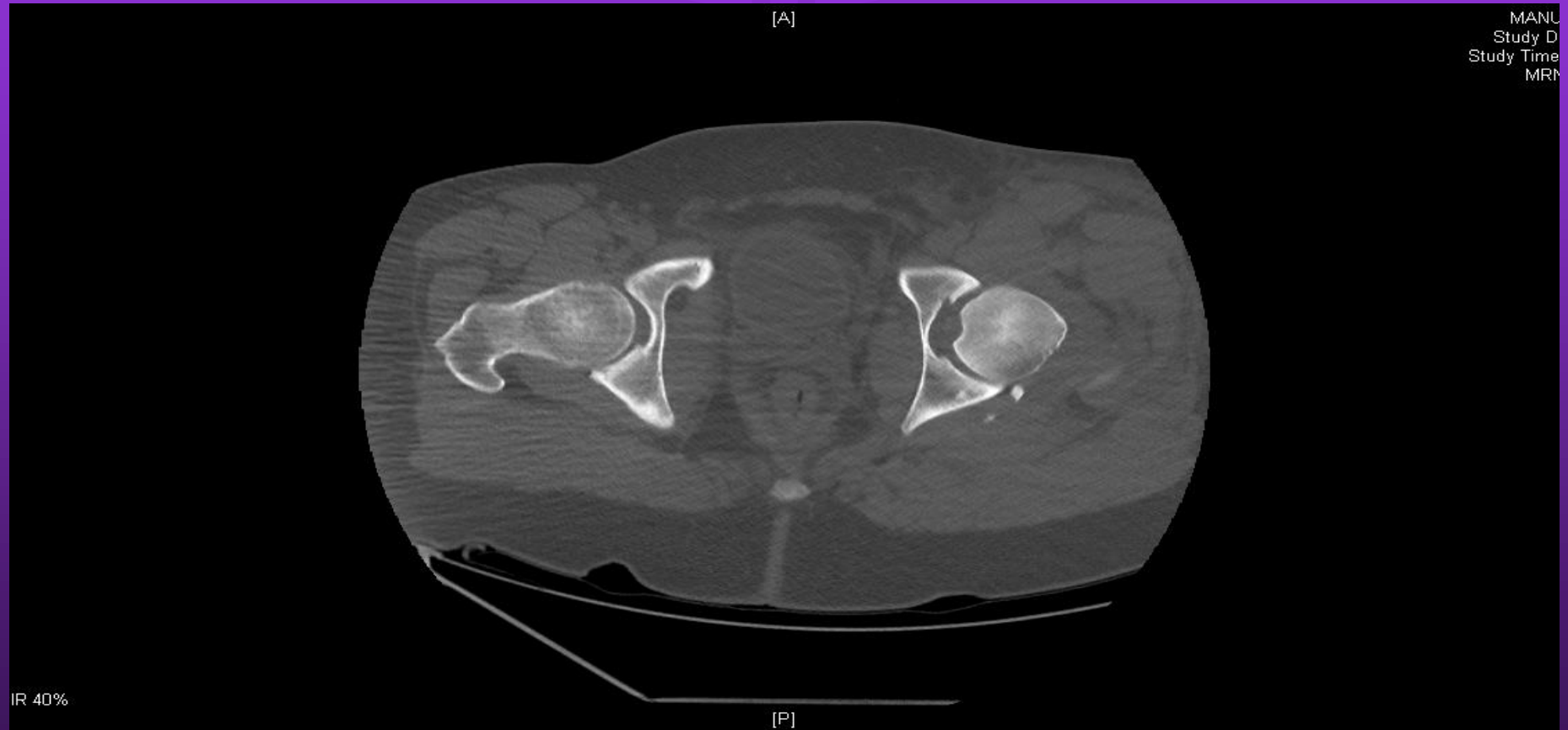
BM

- 21 yo healthy male, s/p MVA (passenger)
- Posterior hip dislocation, closed reduced at outside hospital and transferred
- Left femoral head fracture with posterior wall fracture

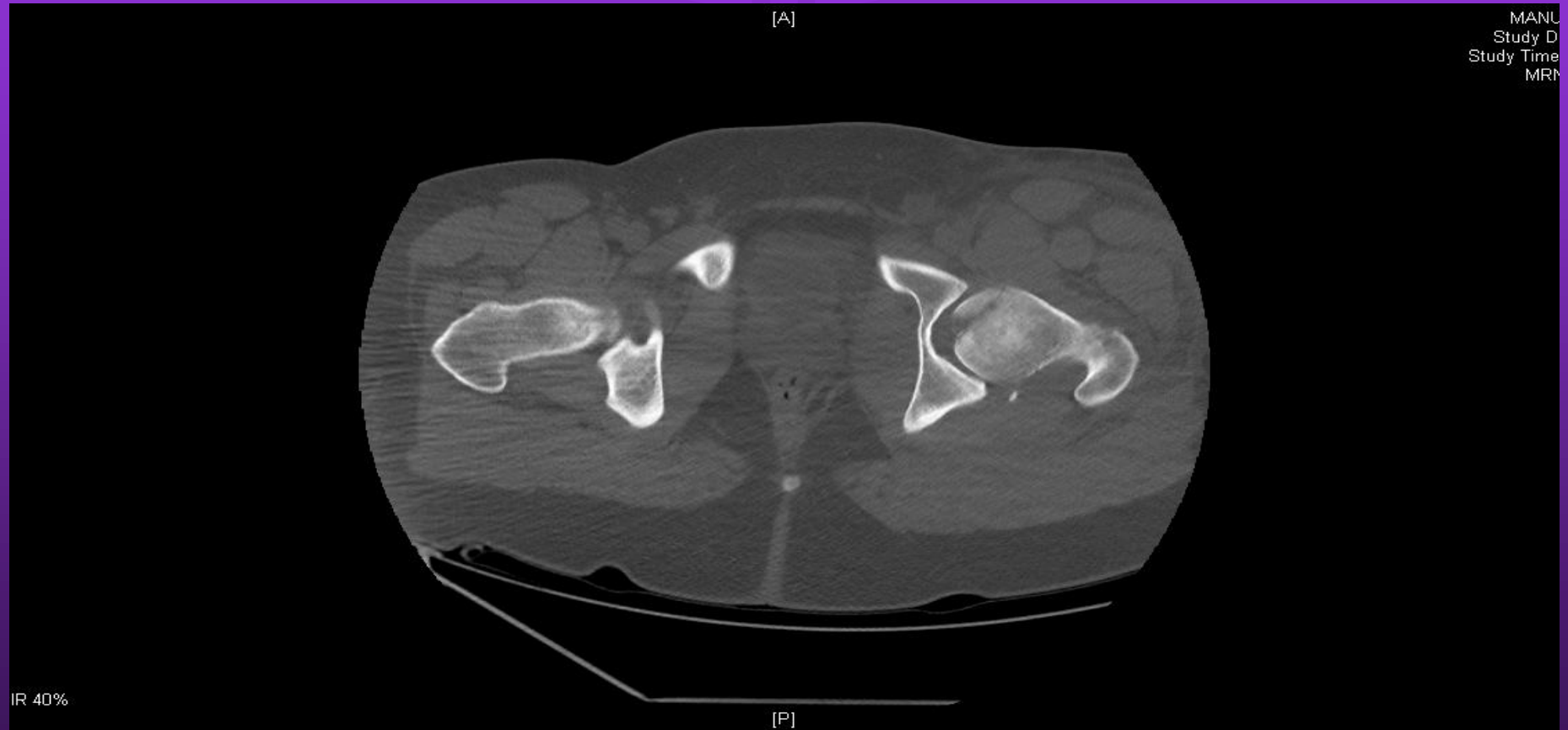
Post-Reduction CT



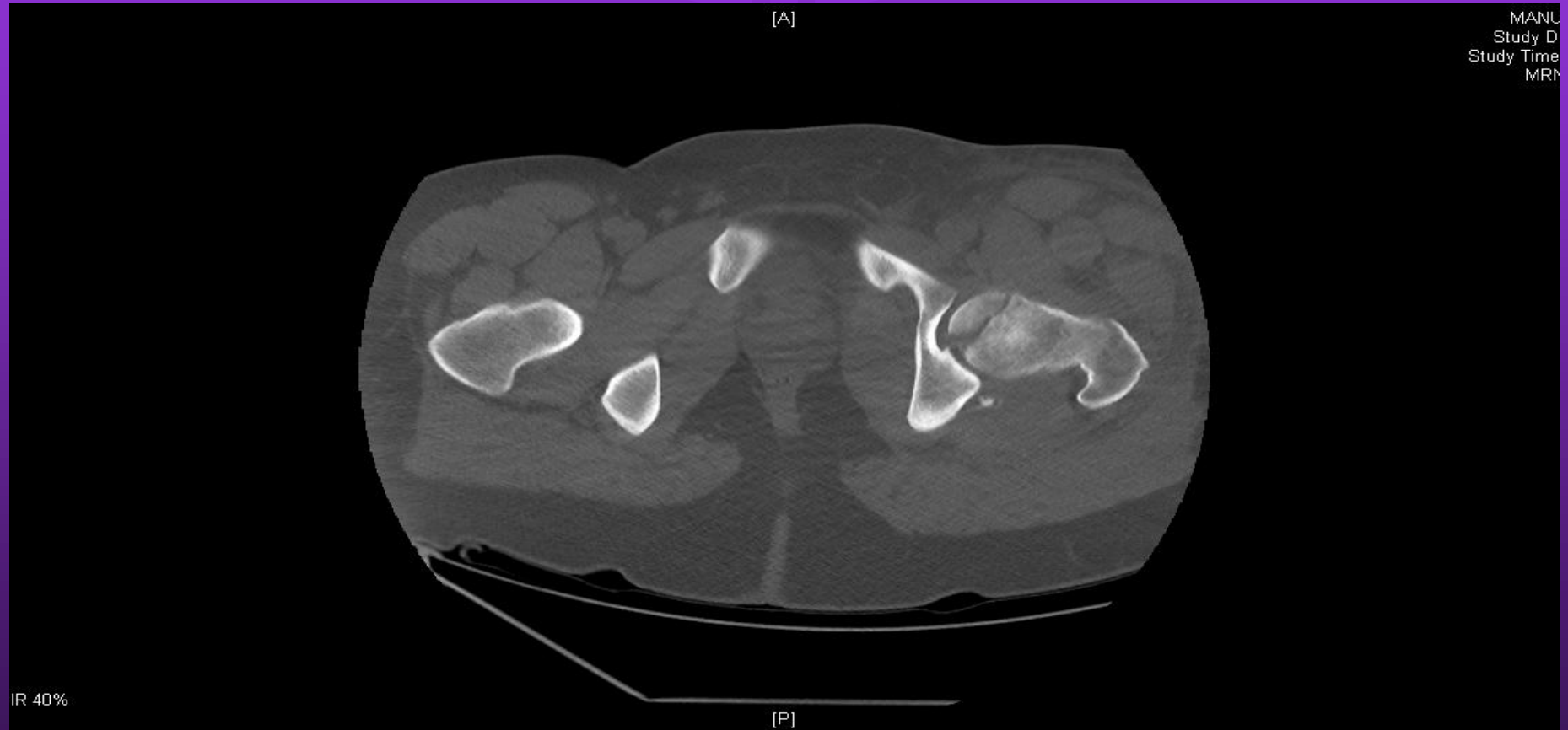
Post-Reduction CT



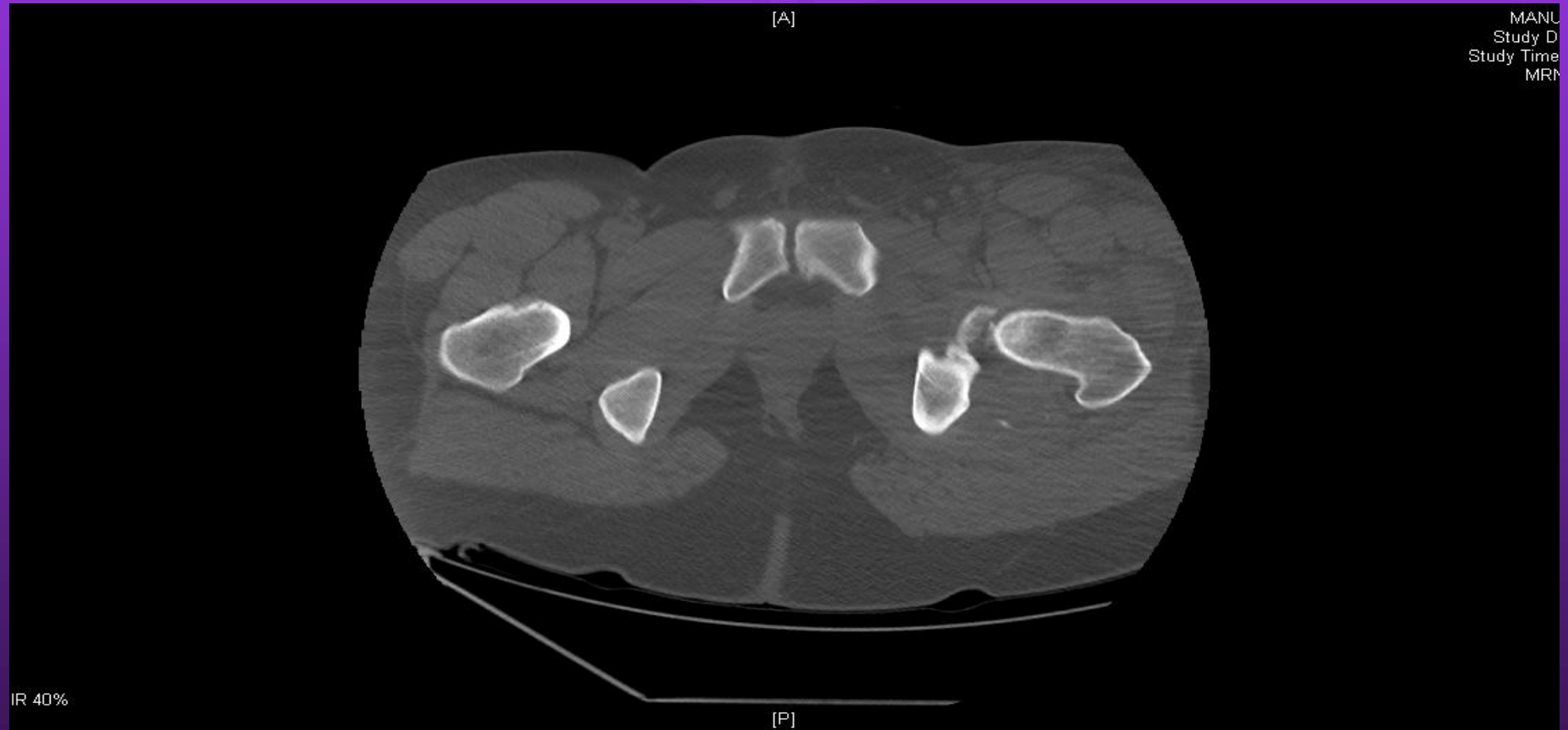
Post-Reduction CT



Post-Reduction CT



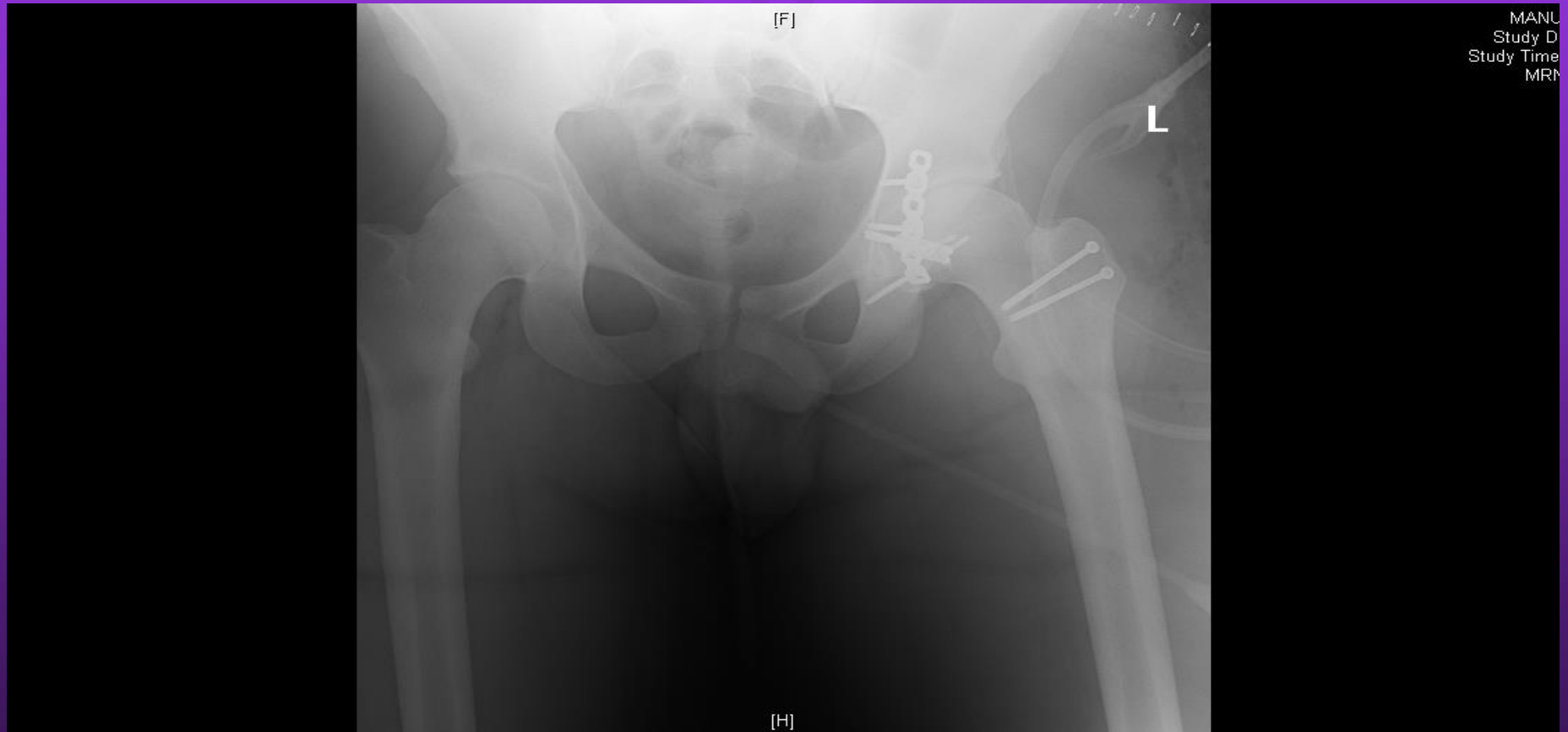
Post-Reduction CT



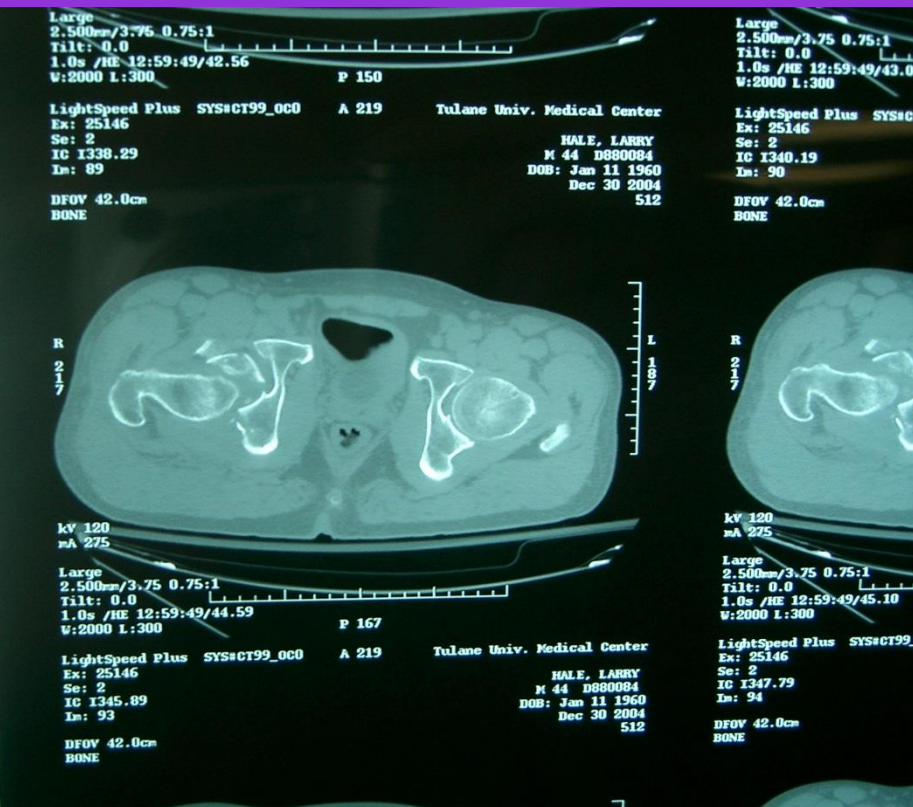
OR

- Kocher-Langenbeck approach with greater trochanteric osteotomy and surgical dislocation
- Fixation with 3.0 cannulated screws followed by fixation of posterior wall with spring plate and 5-hole recon plate

Post-Op

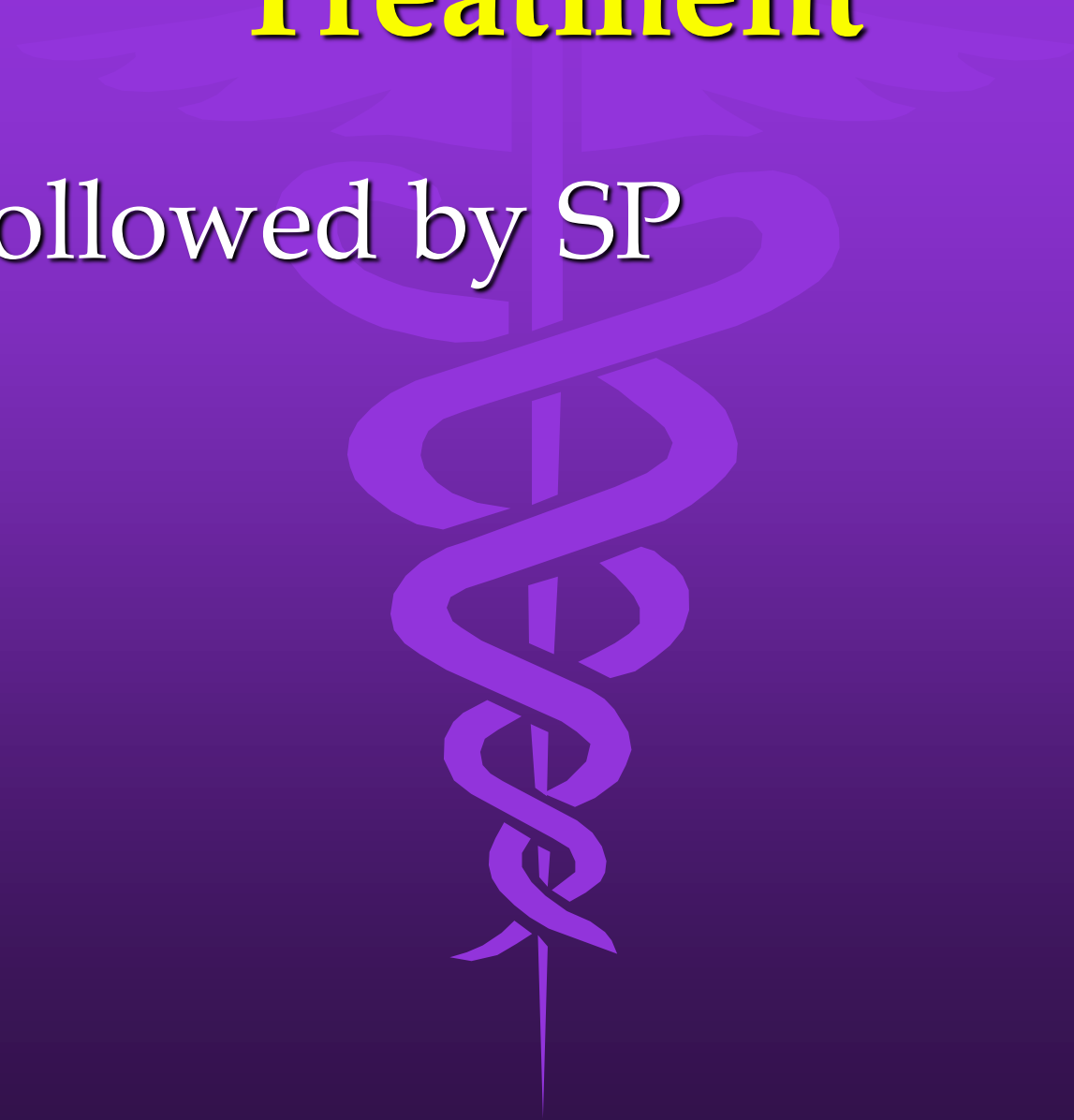


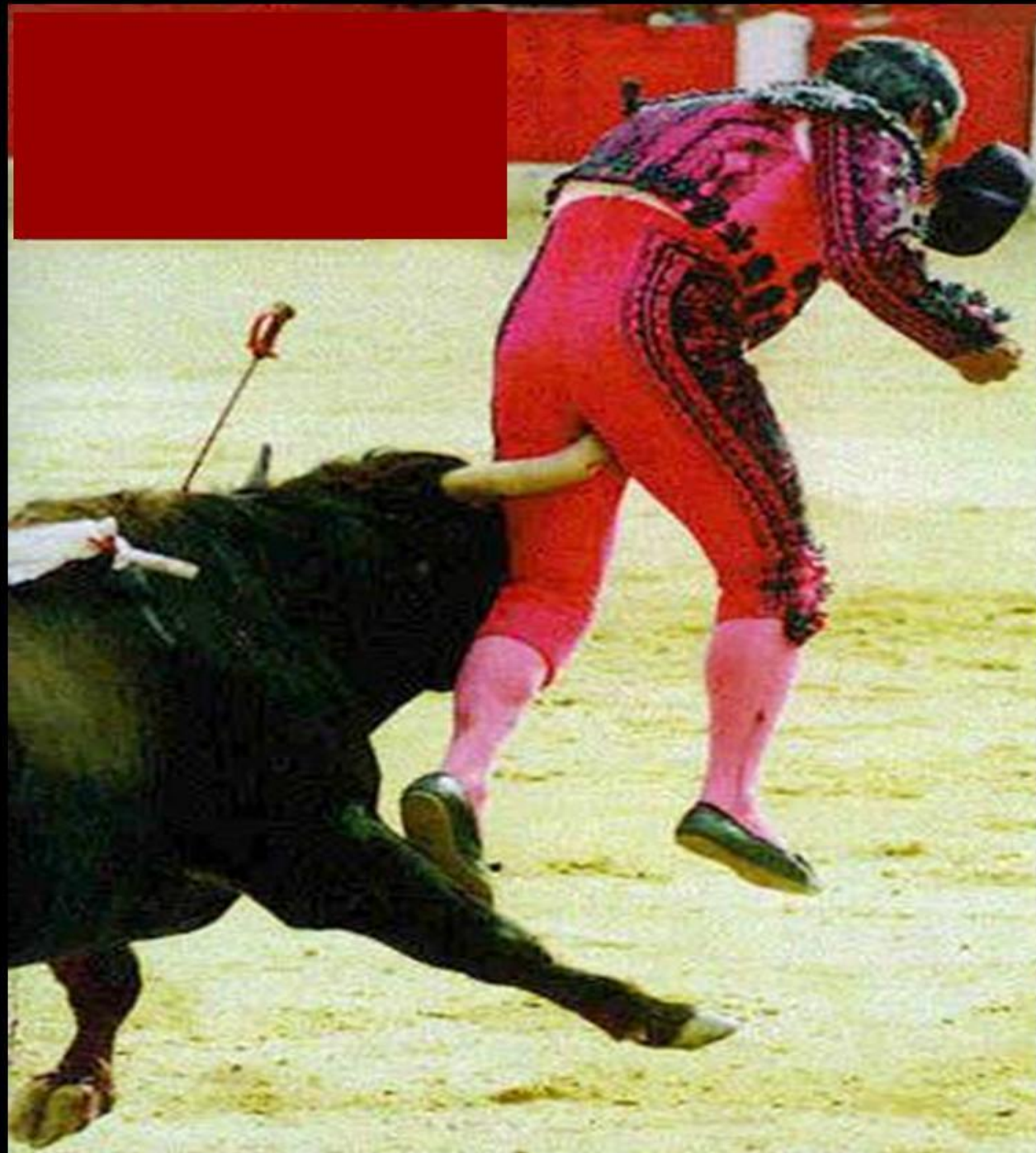


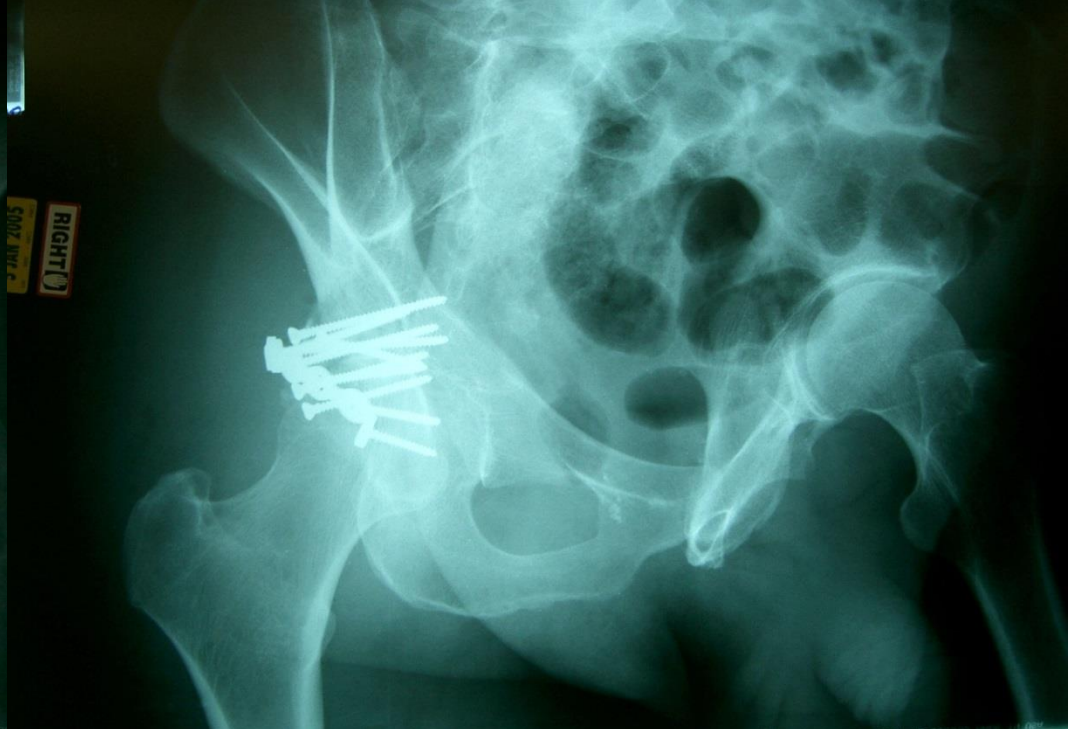
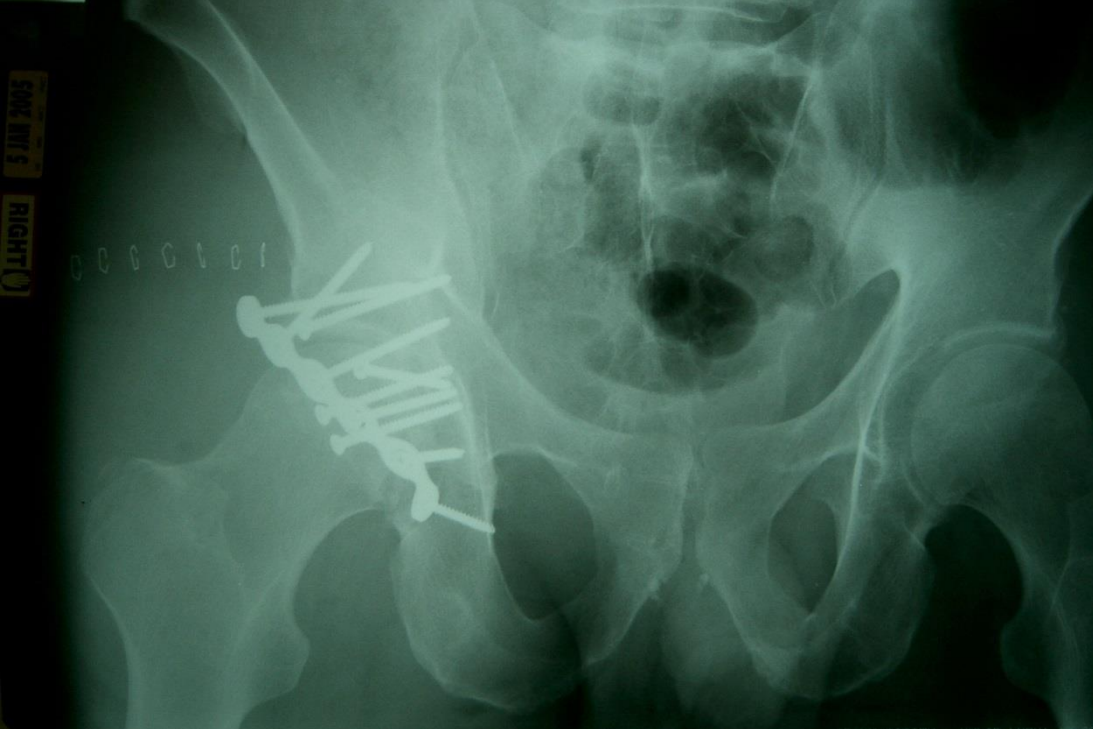


Treatment

- KL followed by SP

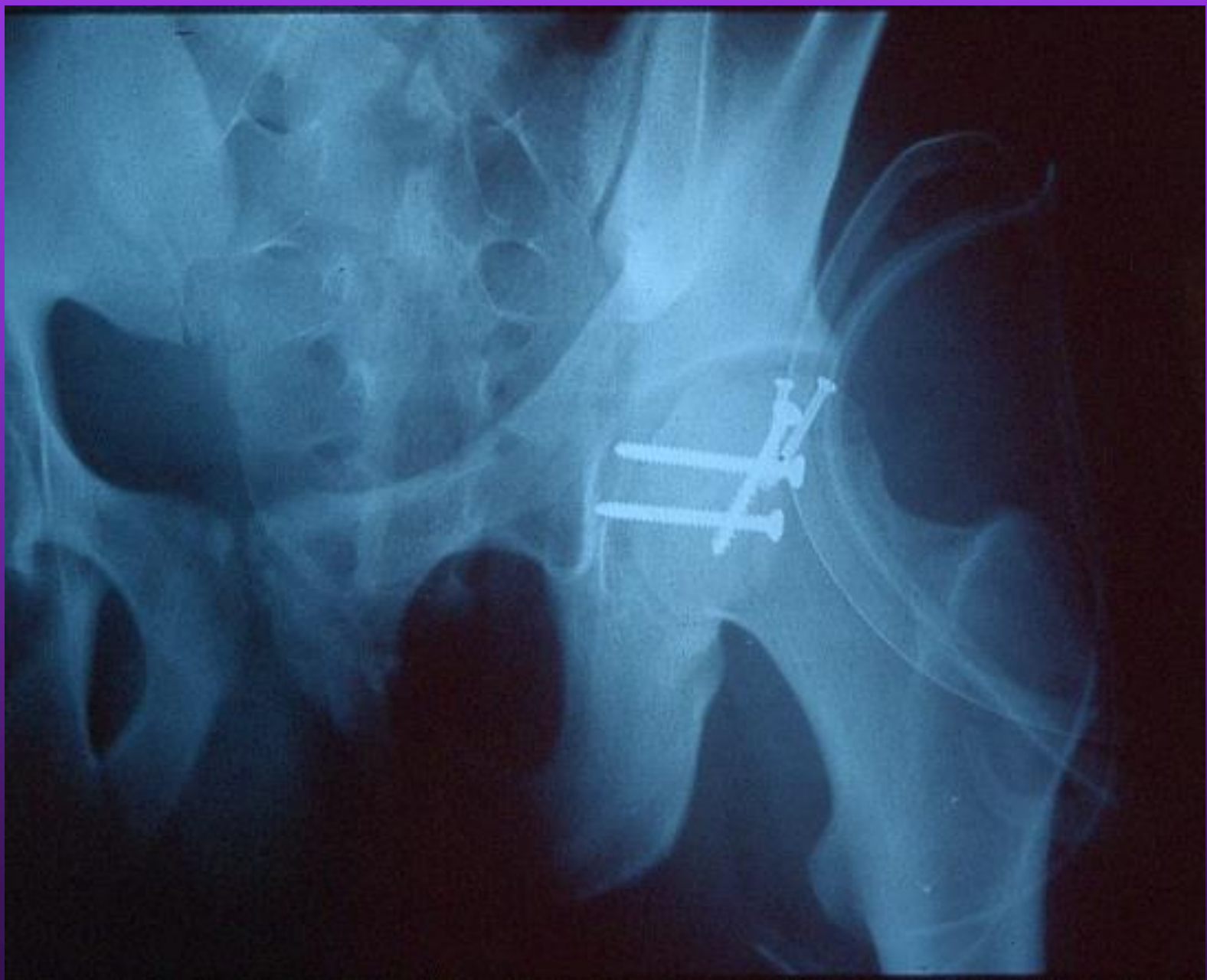








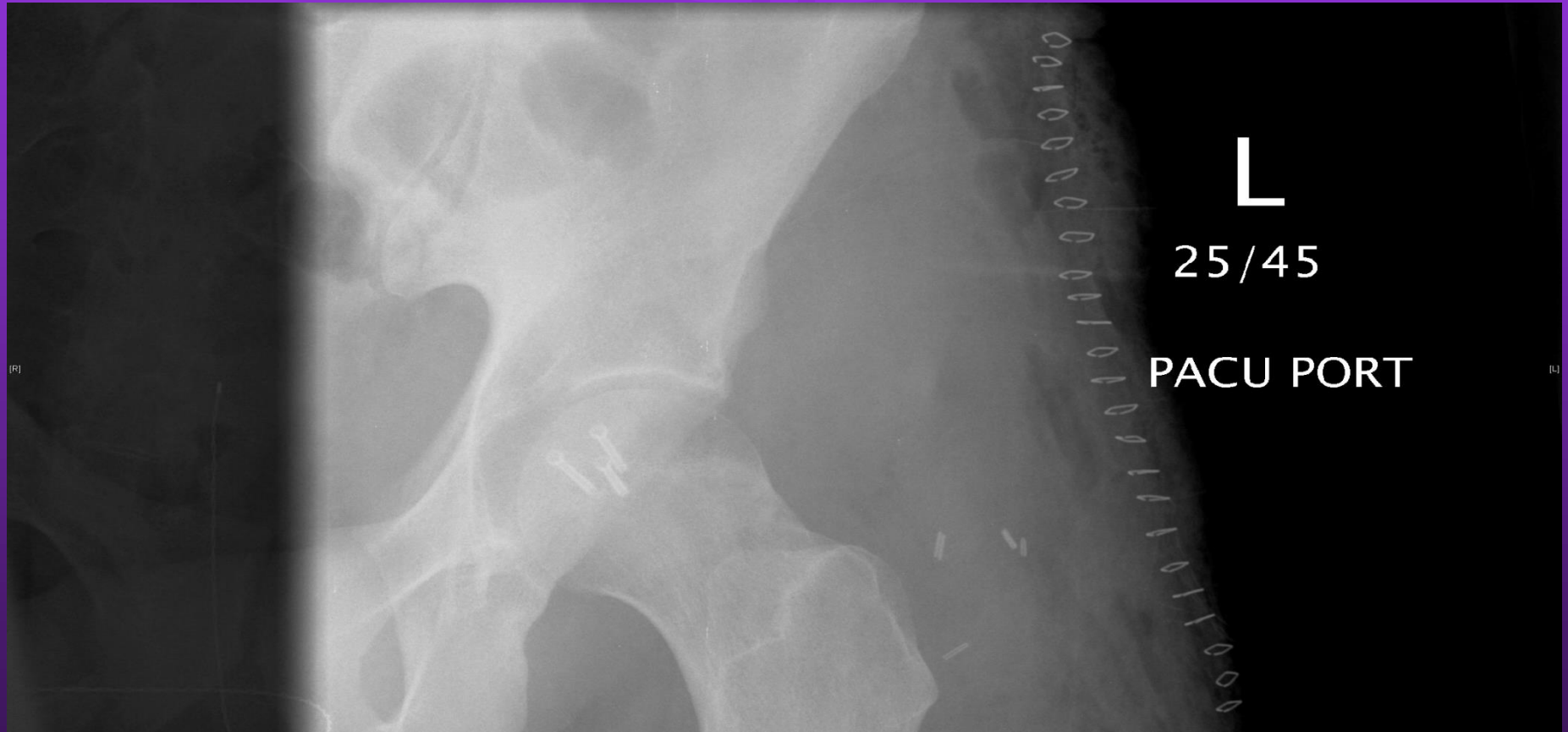




MC Post-Op



MC Post-Op



Treatment

- Pipkin 1- conservative ($<2\text{mm}$ displaced after closed reduction posterior dislocation, $>2\text{mm}$ excise)
- Pipkin 2- conservative ($<1\text{mm}$) most orif usually anterior
 - Always check femoral neck before reducing posterior hip dislocation

Treatment cont.

- Pipkin 3- conservative ($<1\text{mm}$) most orif of femoral neck and head through anterior approach
- Pipkin 4- orif of acetabular fracture and femoral head with KL, trochanteric slide, and surgical dislocation

