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Acetabular Fractures: Which Ones Need Emergent Care?

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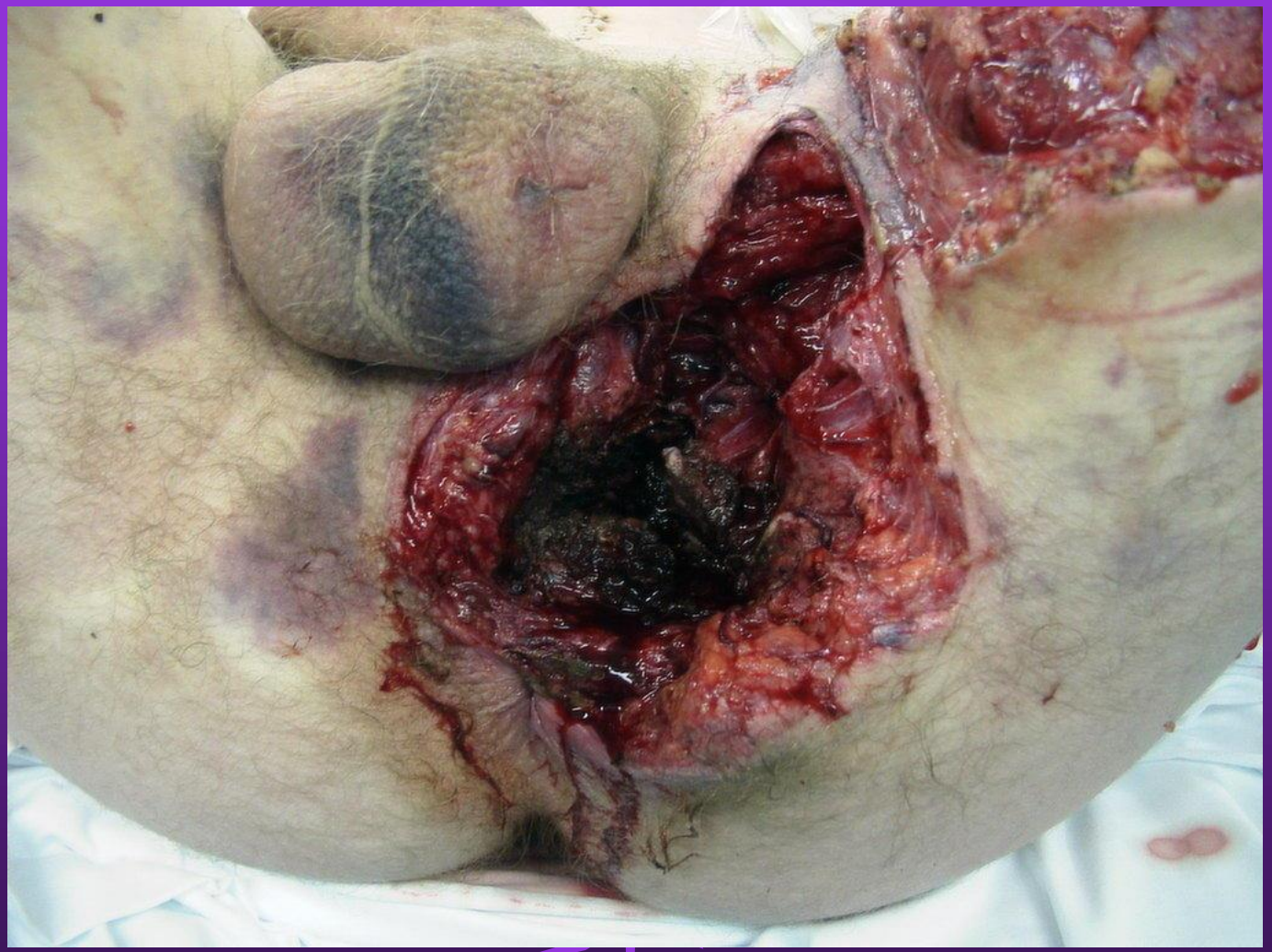
Emergency Management of Acetabular Fractures

- Open Fractures
- Progressive Neurologic Loss
- Femoral Head At Risk (Cartilage Damage)
- Femoral Head At Risk (AVN-Dislocation)



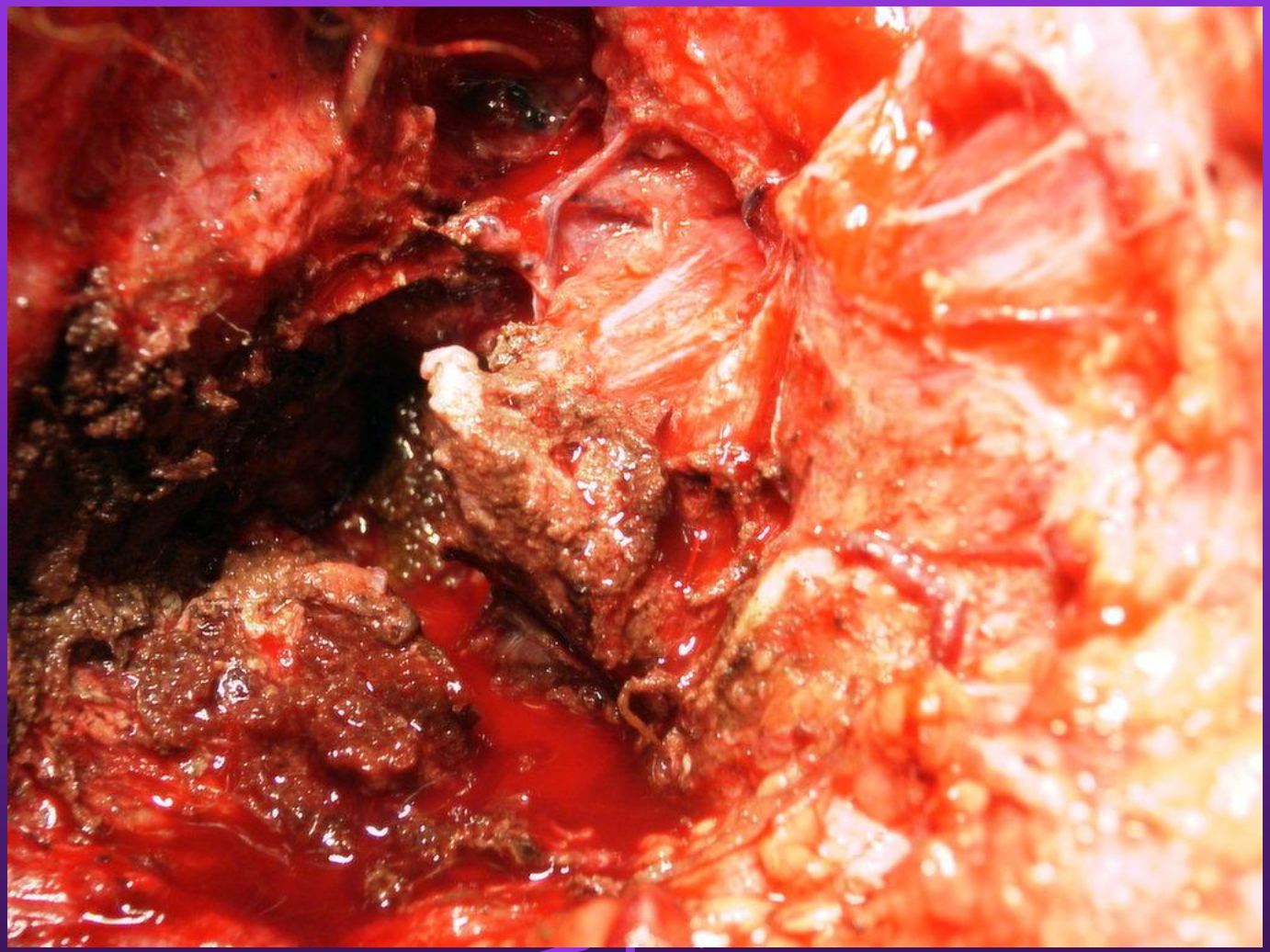
Cultures

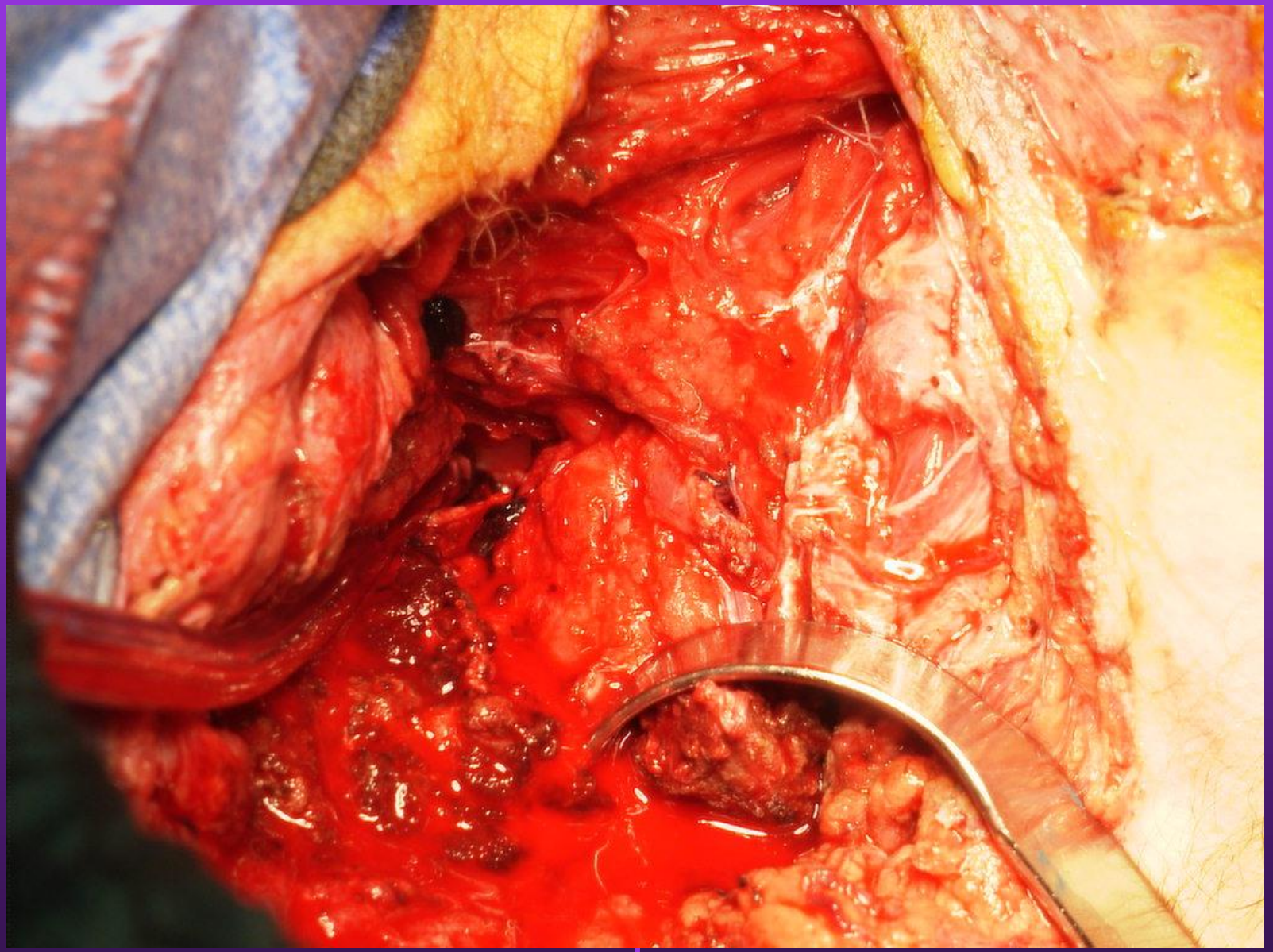
- GP & GN coverage (Vanco and cefepime)
- 58% Staph. aureus MRSA
- 75% coag negative Staph. (epidemidis MRSE)
- Resistant despite in vitro tests (aminoglycosides, macrolides, lincoamides, tetracycline, sulfonamides, quinolones)

Principles of Debridement

- Tumor surgery–wherever hematoma goes you go
- All devitalized tissue removed
  - includes skin, muscle, and bone
- Reprep and drape for fixation

Wound Irrigation





Antibiotic Beads

3 vials (1.2gr) of tobramycin and 3 vials (1gr) vancomycin per bag of cement (2 liquids) cover with Mastisol & Ioband

Negative Pressure Wound Therapy

- VAC Devise (KCI Inc)
  - After I&D
  - Infected wound after I&D
  - Dead Space
  - Over STSG
  - Exposed tendon, bone, joint

  - Webb, JAAOS 2002

Negative Pressure Wound Therapy (Wound Vac)

- Increased blood flow
- Quicker granulation
- Close inside to outside

Elek 1957

- Inoculation of medical students with or without suture with Staph
- 10000 CFU less with suture to cause an infection

Lessons Learned from LEAP Study

- No one does really well
- Scoring systems do not predict outcome
- Psycho-social issues play important role in long term outcomesAbsent plantar sensation not an indication for amputation
- Avoid complications regardless of treatment path

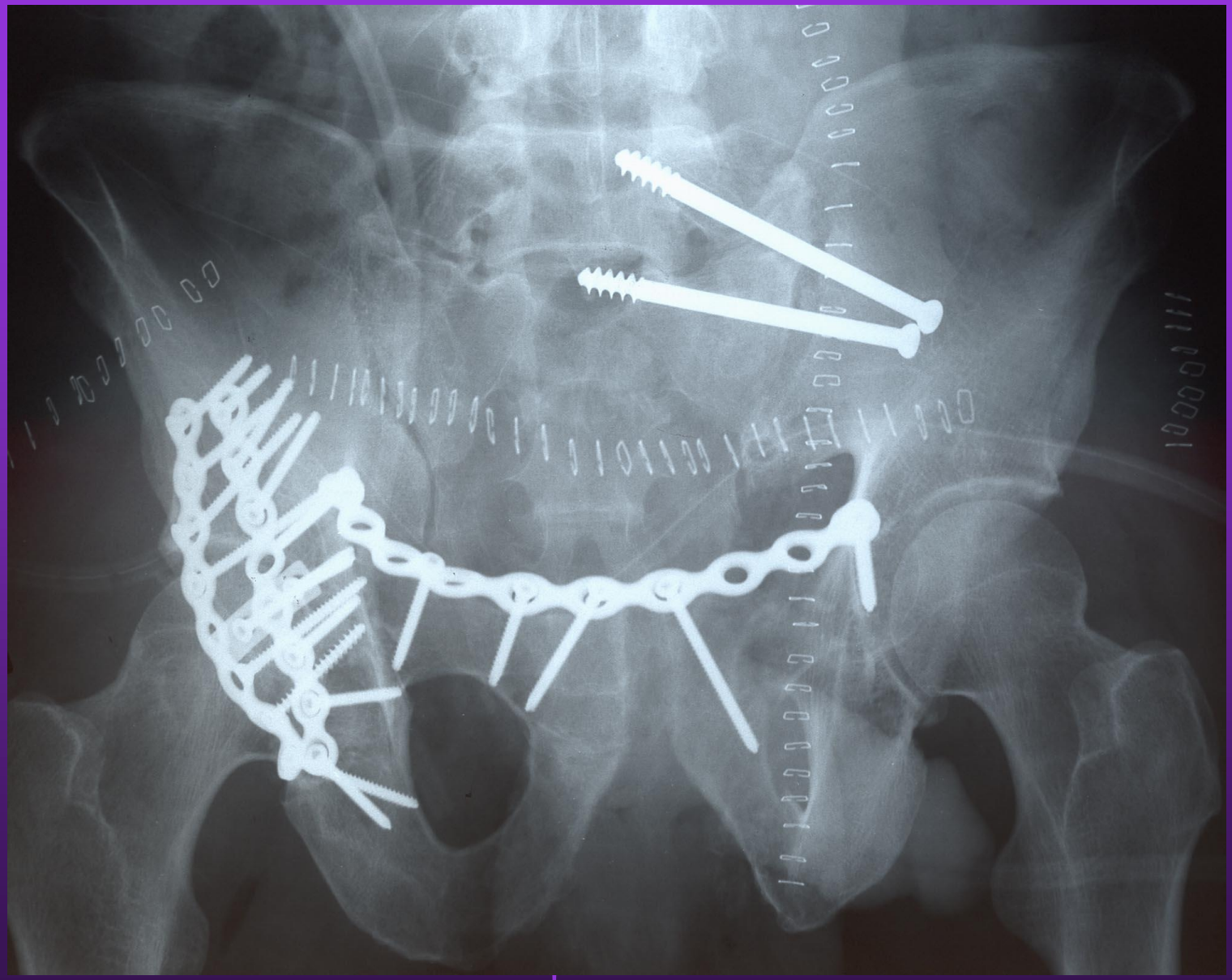
Time to Definitive Treatment Influences Incidence of Infection After Open Lower-extremity Trauma

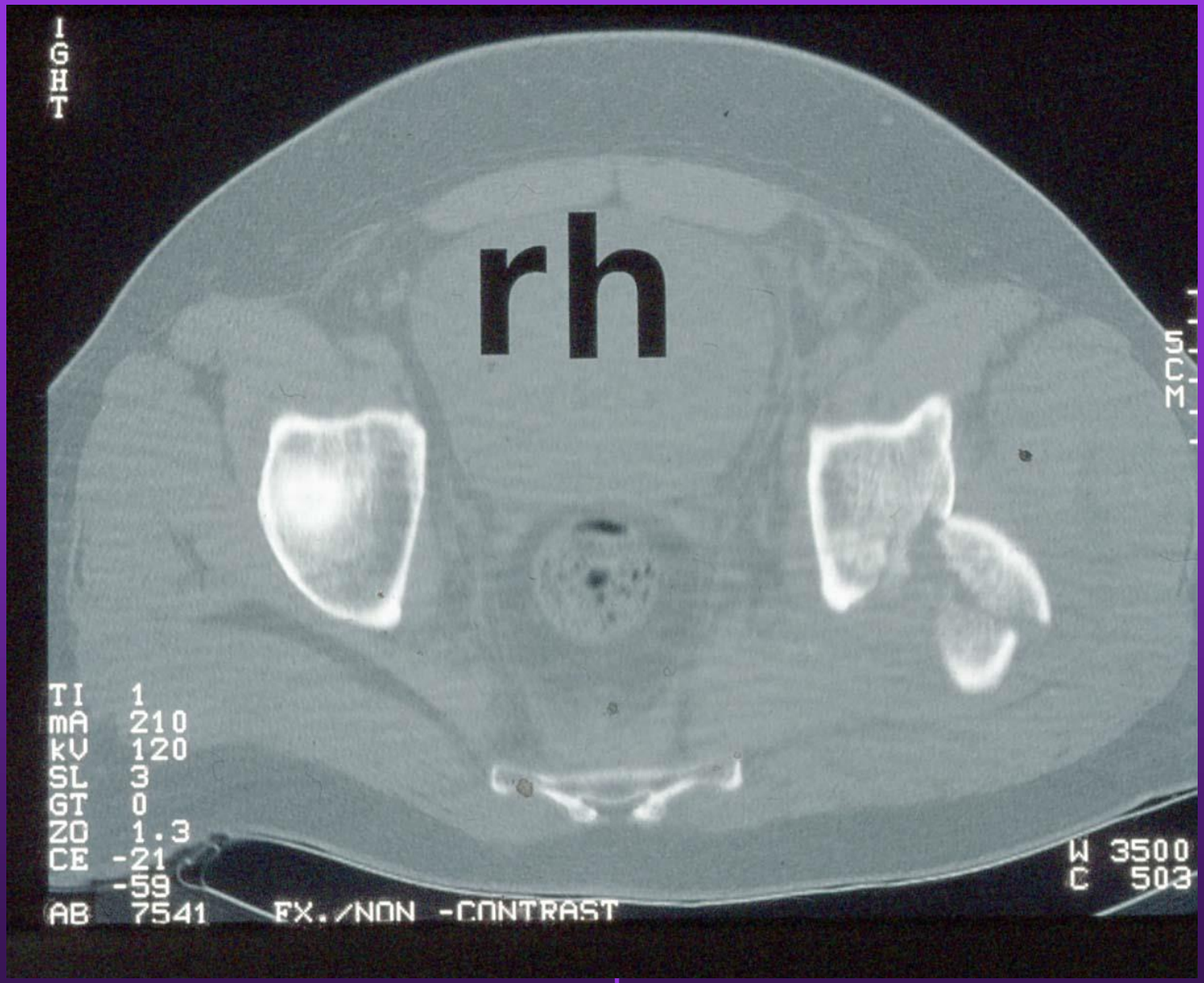
- **Pollak et al (LEAP Study Group) OTA Paper 2003**
- Retrospective multicenter of 315 patients (40% transferred from other hospitals)
- Overall infection rate 27%
- Mean time to debridement 11.4 h
- Not significant predictors of infection:
  - time to debridement, time to coverage
- Time to admission to trauma center was significant:
  - <6 h infection rate 22%
  - >6 h infection rate 39%

4 Stage Reconstruction

- Anterior – release of L SI joint, symphysis, ant column R
- Posterior – L SI joint release, reduction, and fixation
- EIF – Release of posterior column and ORIF of “T” PW
- Anterior – ORIF of symphysis

JA

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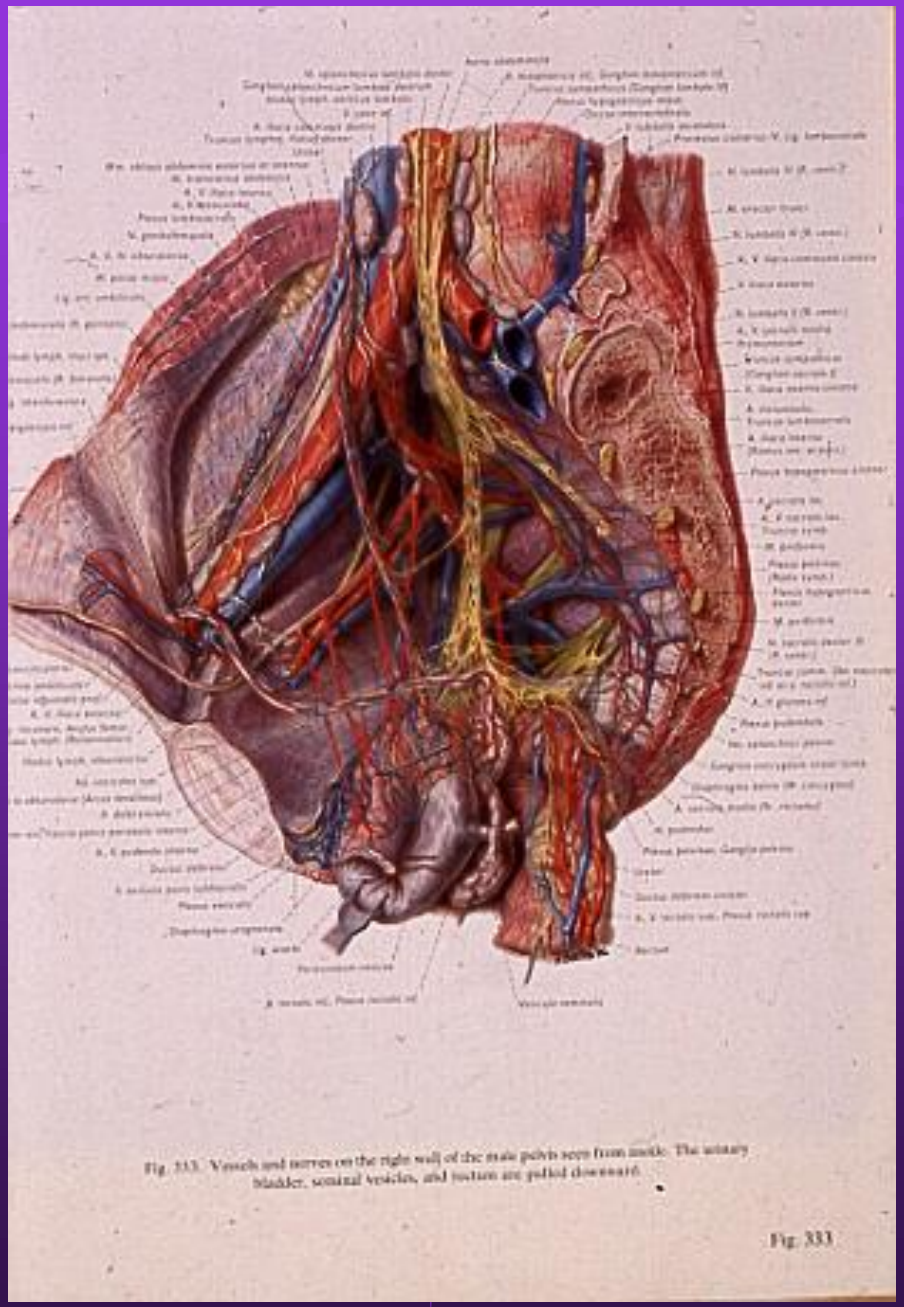
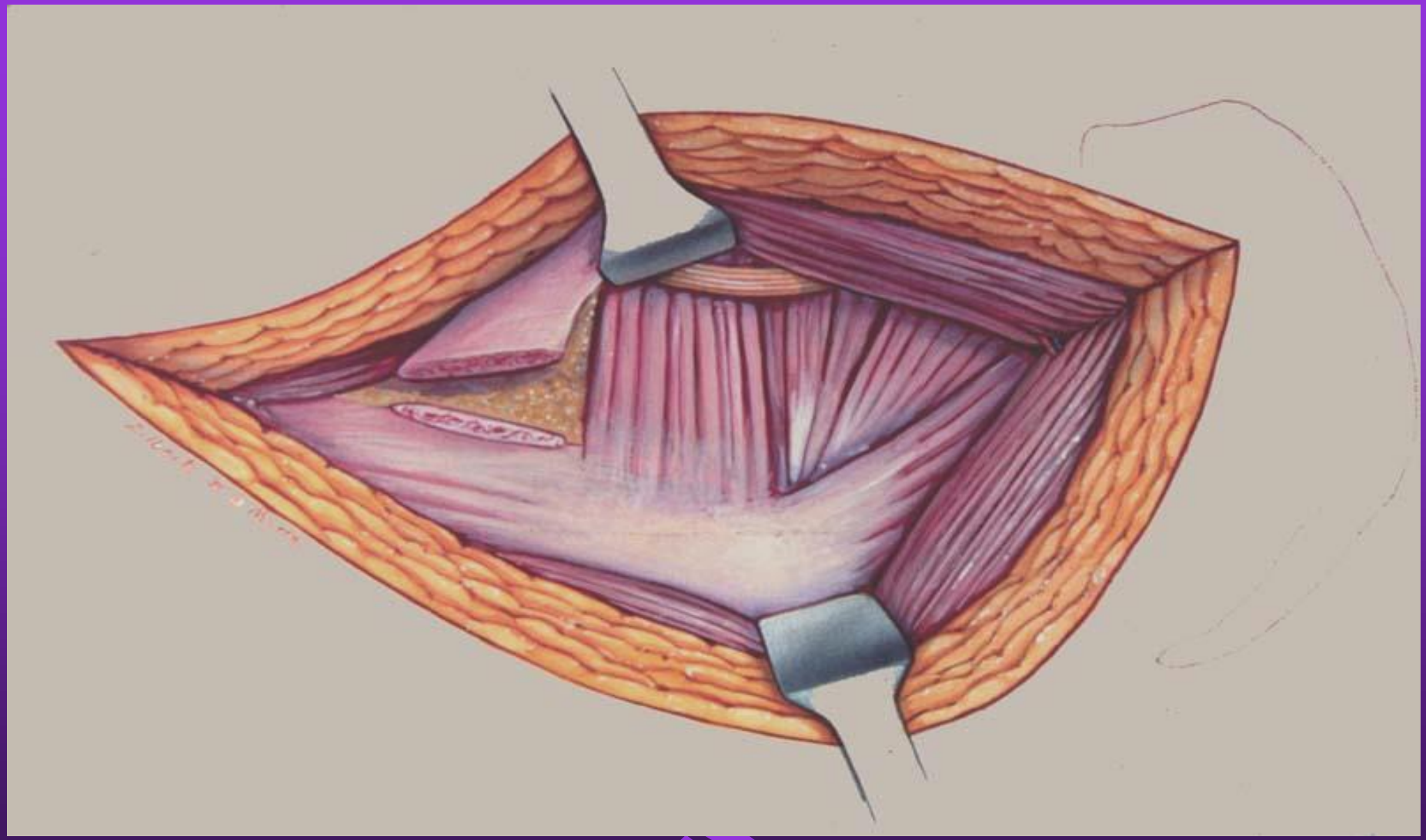
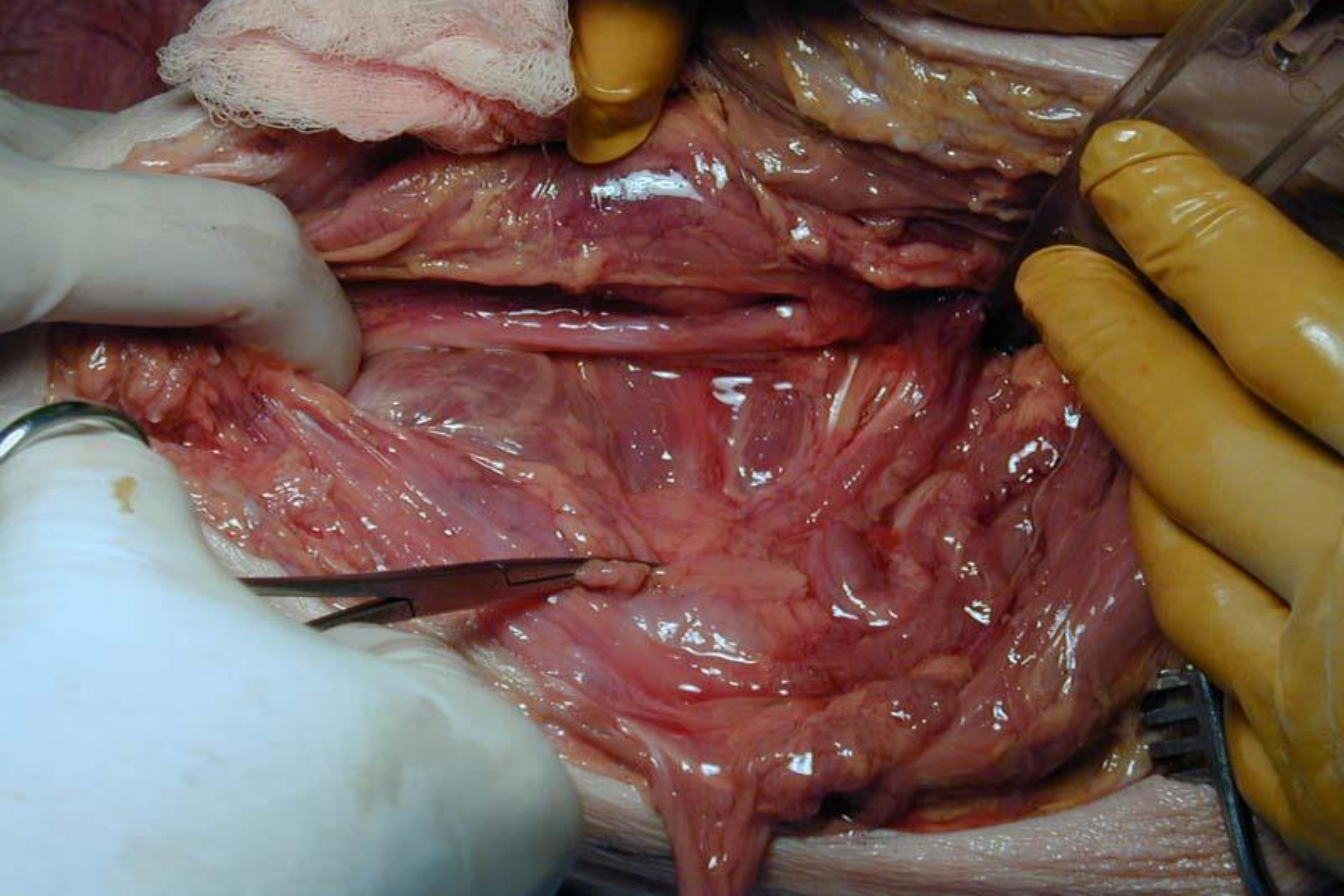
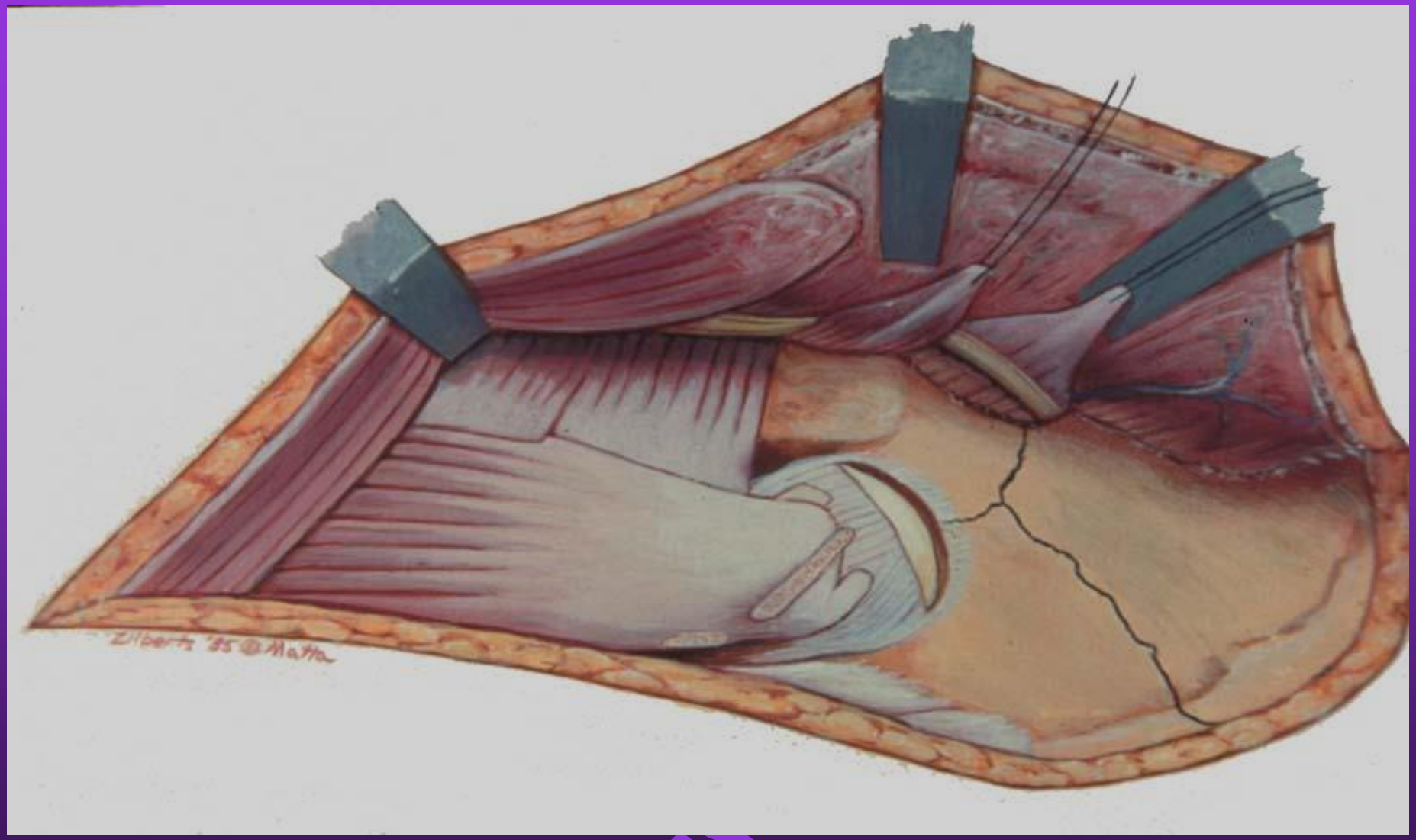


Fig. 333. Vessels and nerves on the right wall of the male pelvis seen from inside. The urinary bladder, seminal vesicles, and rectum are pulled downward.

Fig. 333



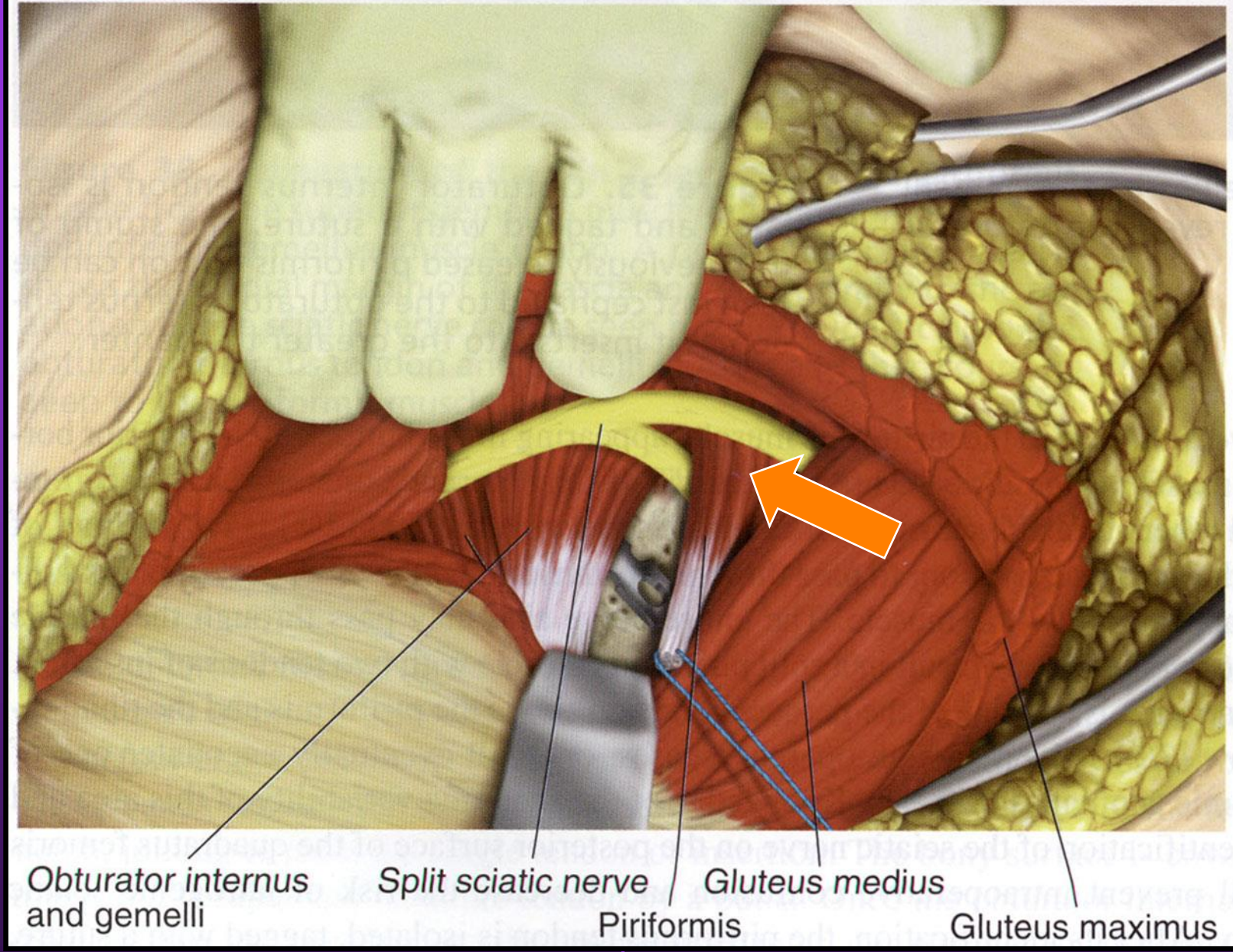


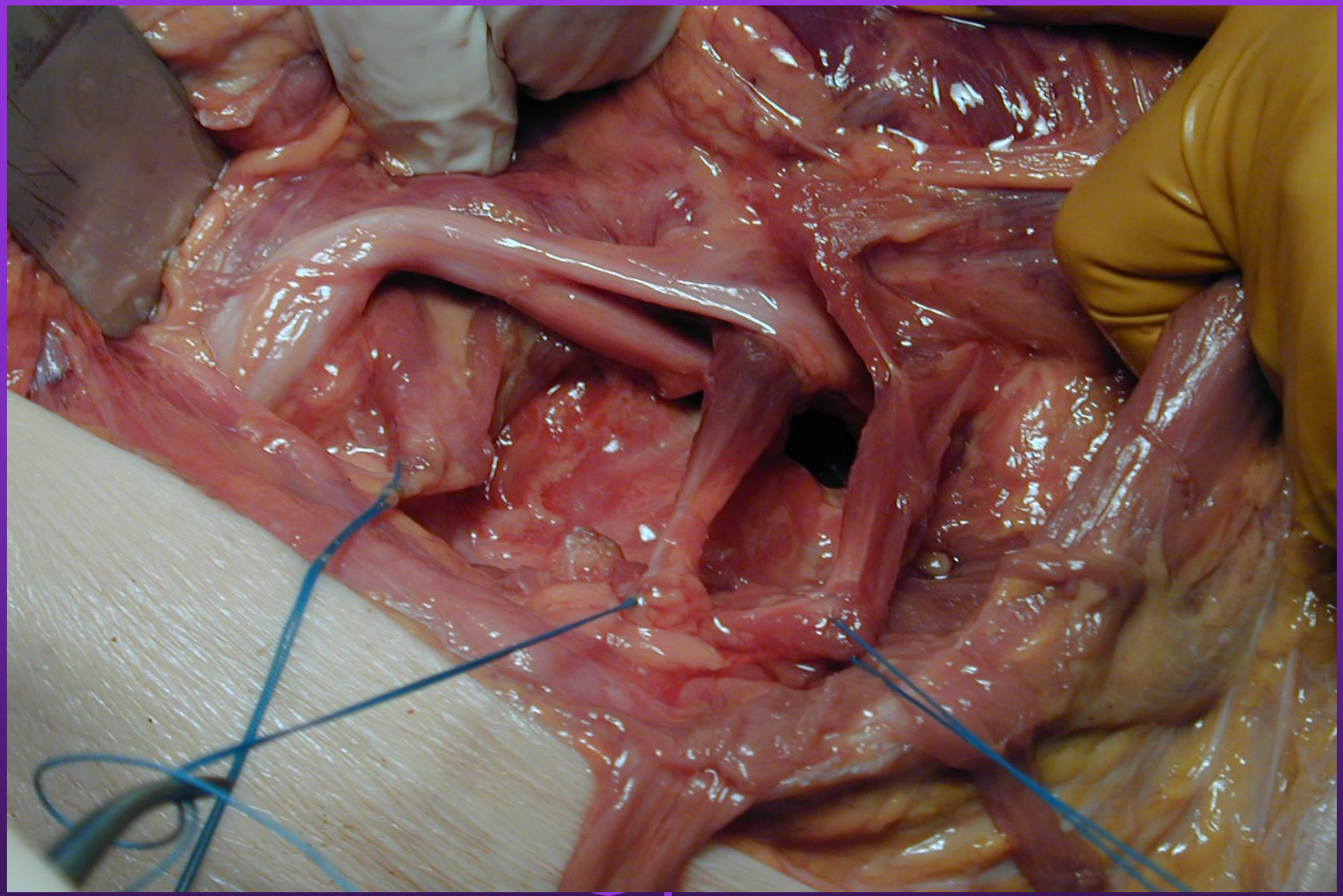


Sciatic Nerve Anatomy

- 84%: Anterior to Piriformis
- 12%: Peroneal Division through Piriformis
- 3%: Peroneal Division Posterior to Piriformis / Tibial Division anterior to Piriformis
- 1%: Entire Nerve through Piriformis

Hollinshead, WH 1982


Obturator internus
and gemelli
Split sciatic nerve
Piriformis
Gluteus medius
Gluteus maximus




Memorial Hermann TMC
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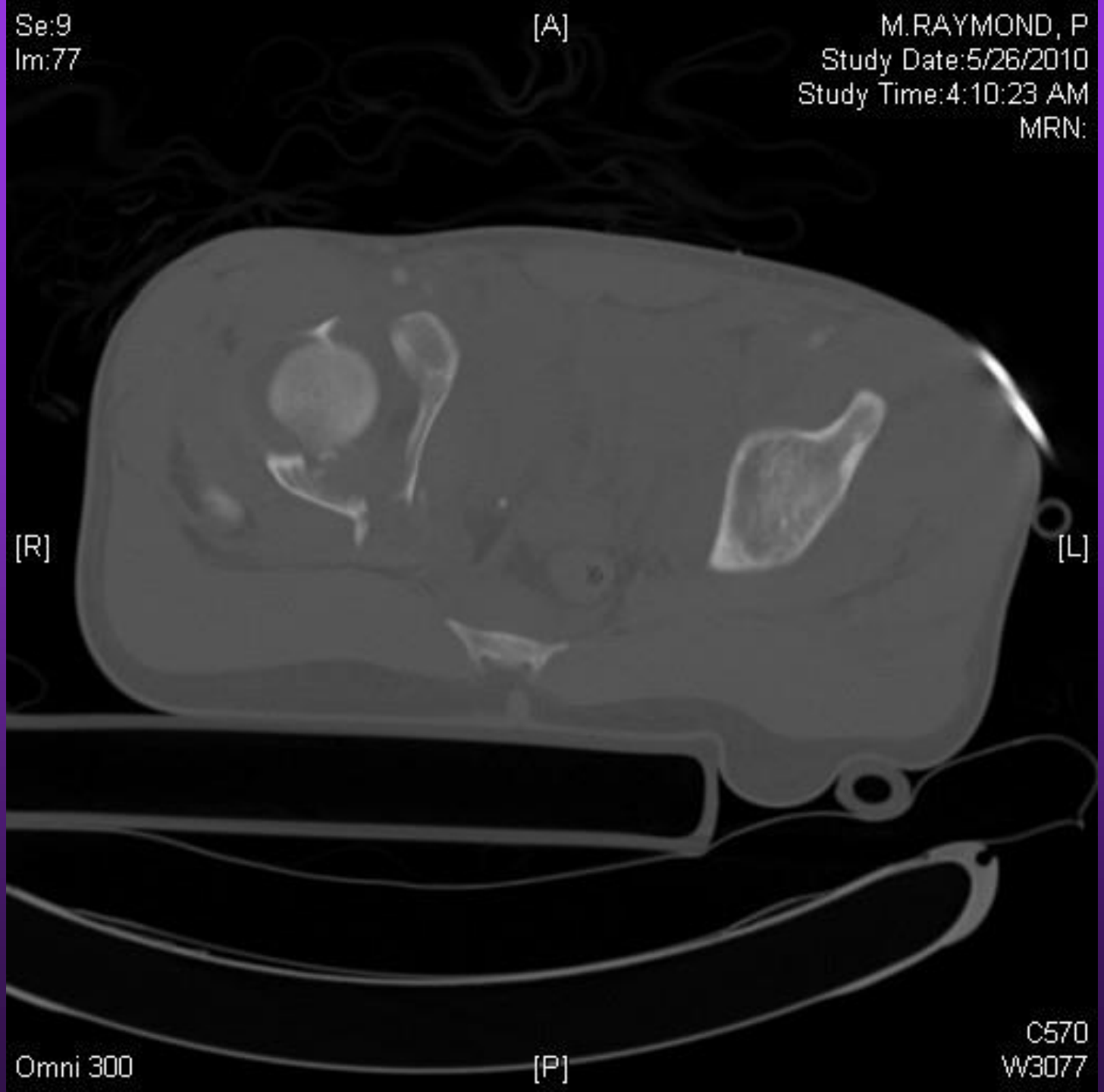
TRAUMA 2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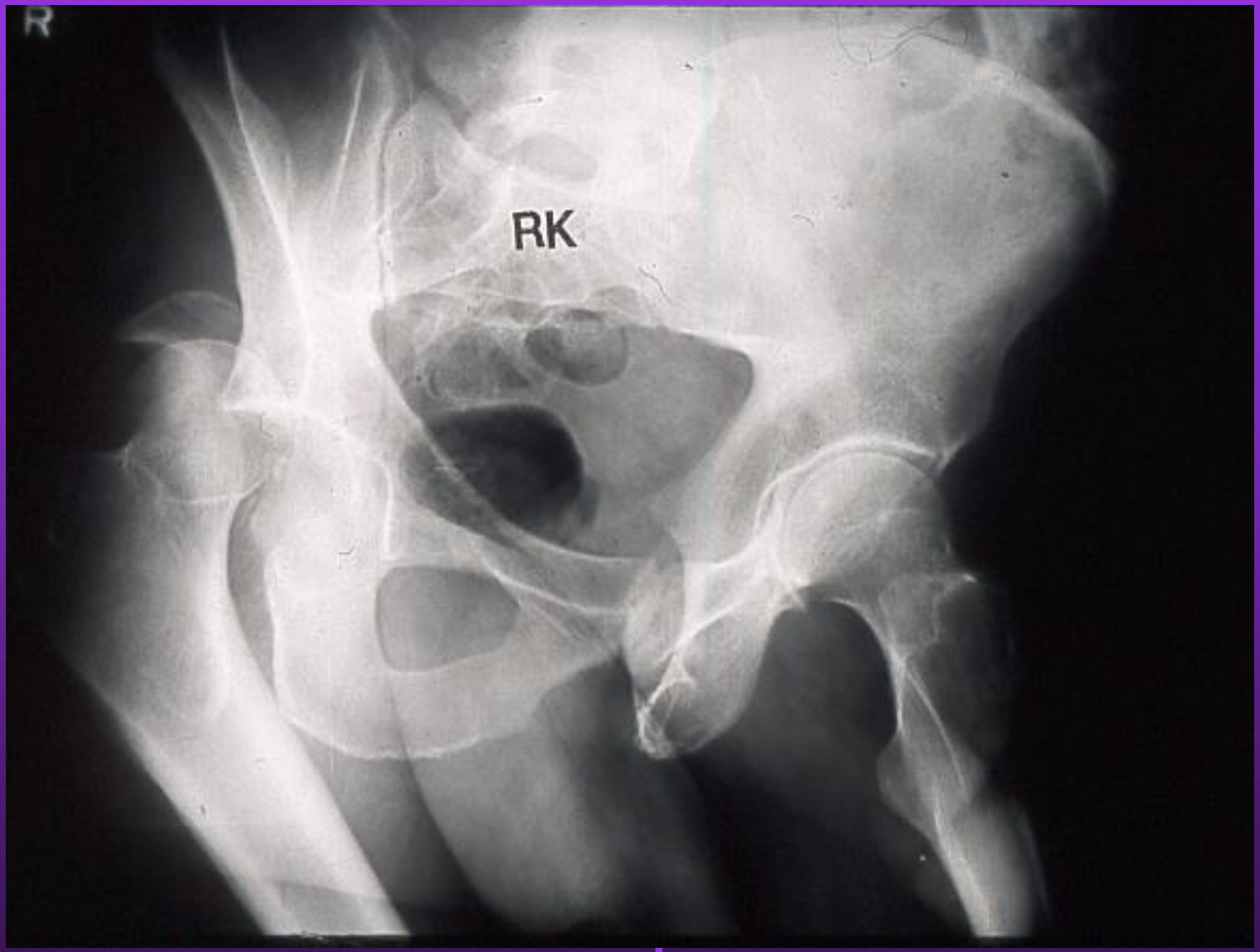
R
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Macroscopic Injury of Femoral Head - Letournel

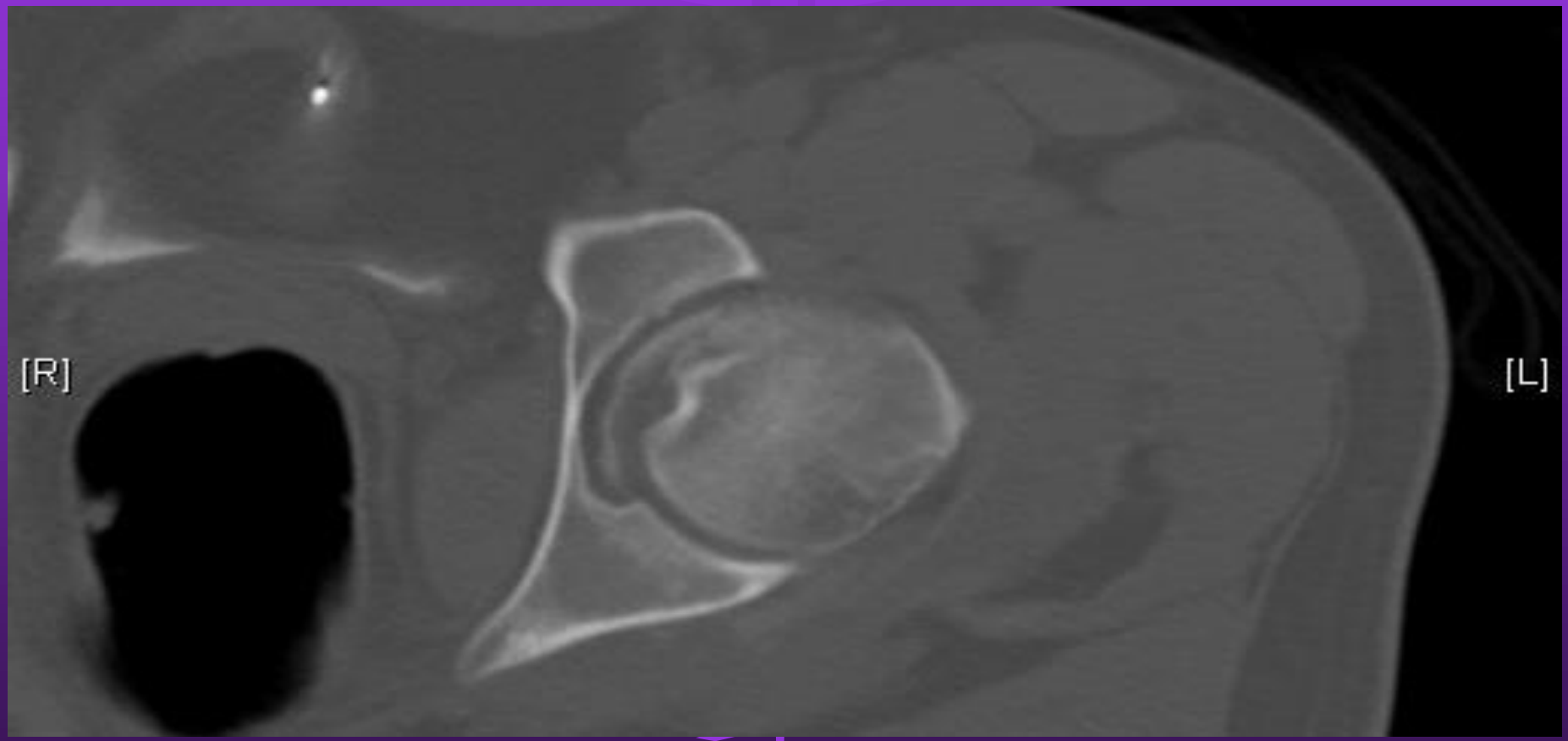
- 1.9%(18pts) Pipkin 1(4) may bleed – excision
- 2.12%(20pts) Pipkin 2(4) mainly BC depression between .5-1.5 cm
- 2.66%(25pts) friction between FH on unreduced Tr fx
- 5.1%(48pts) not seen radiographically


BW

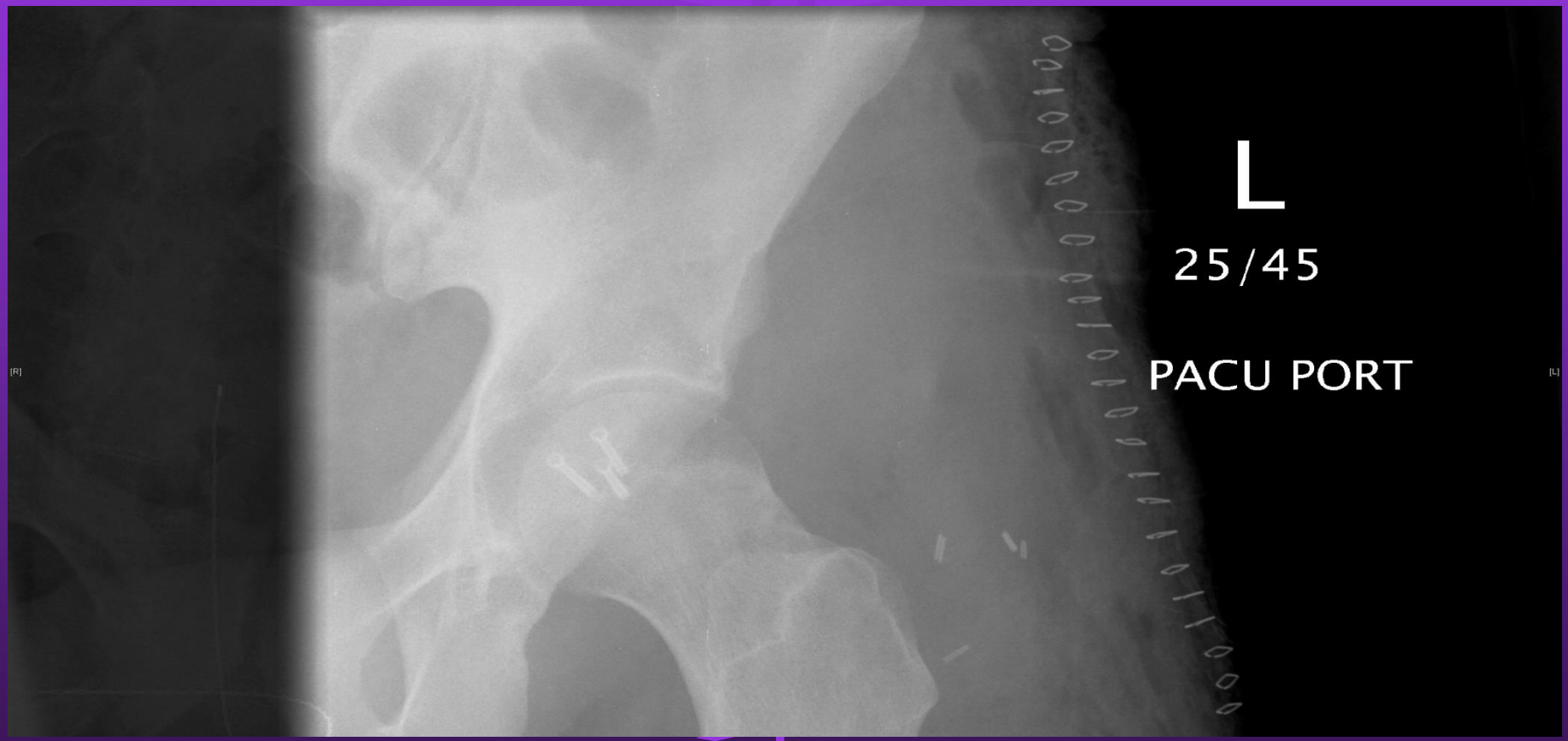
MC Injury Films

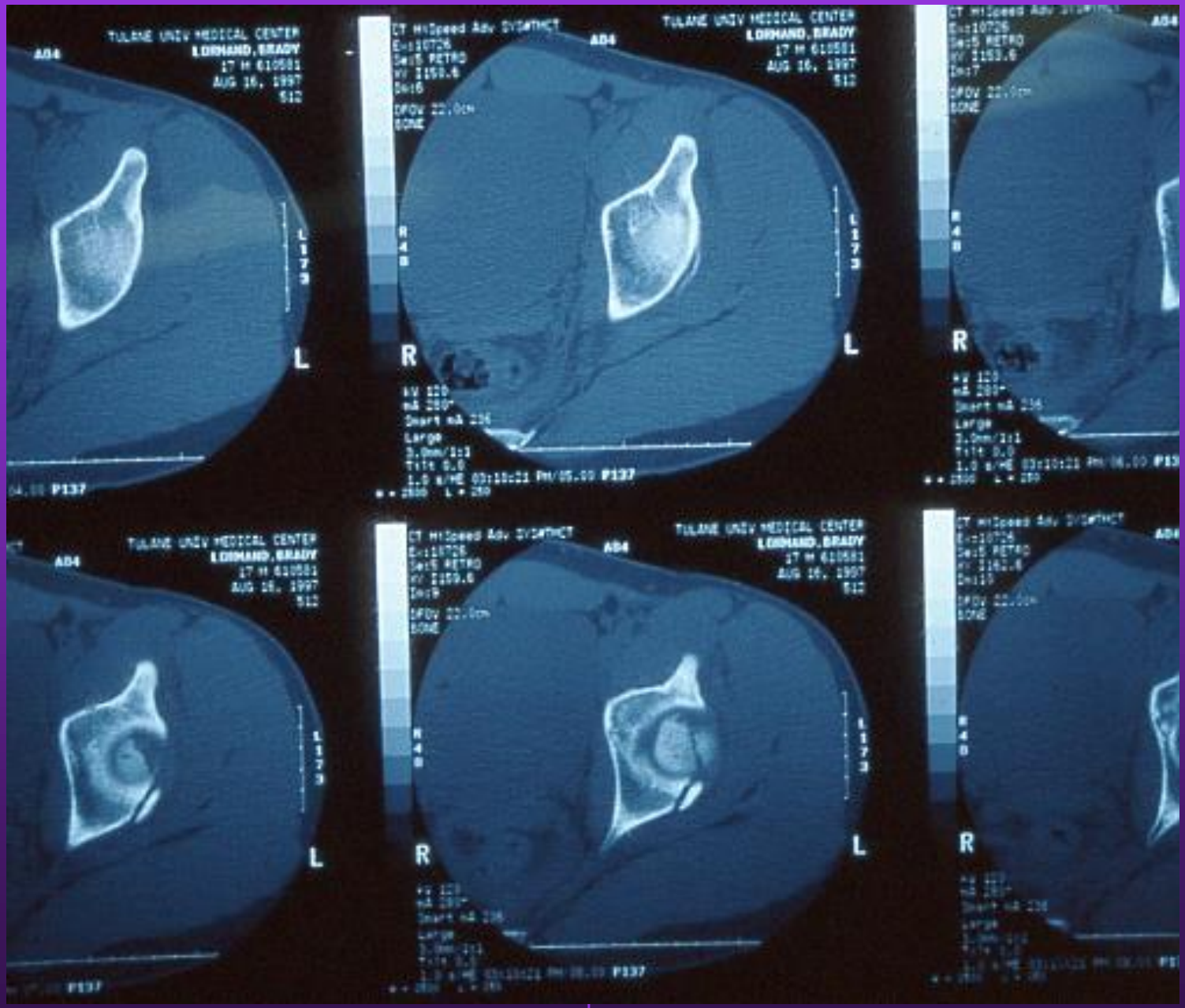
MC Post-reduction (note incongruent joint)

MC CT



MC Post-Op

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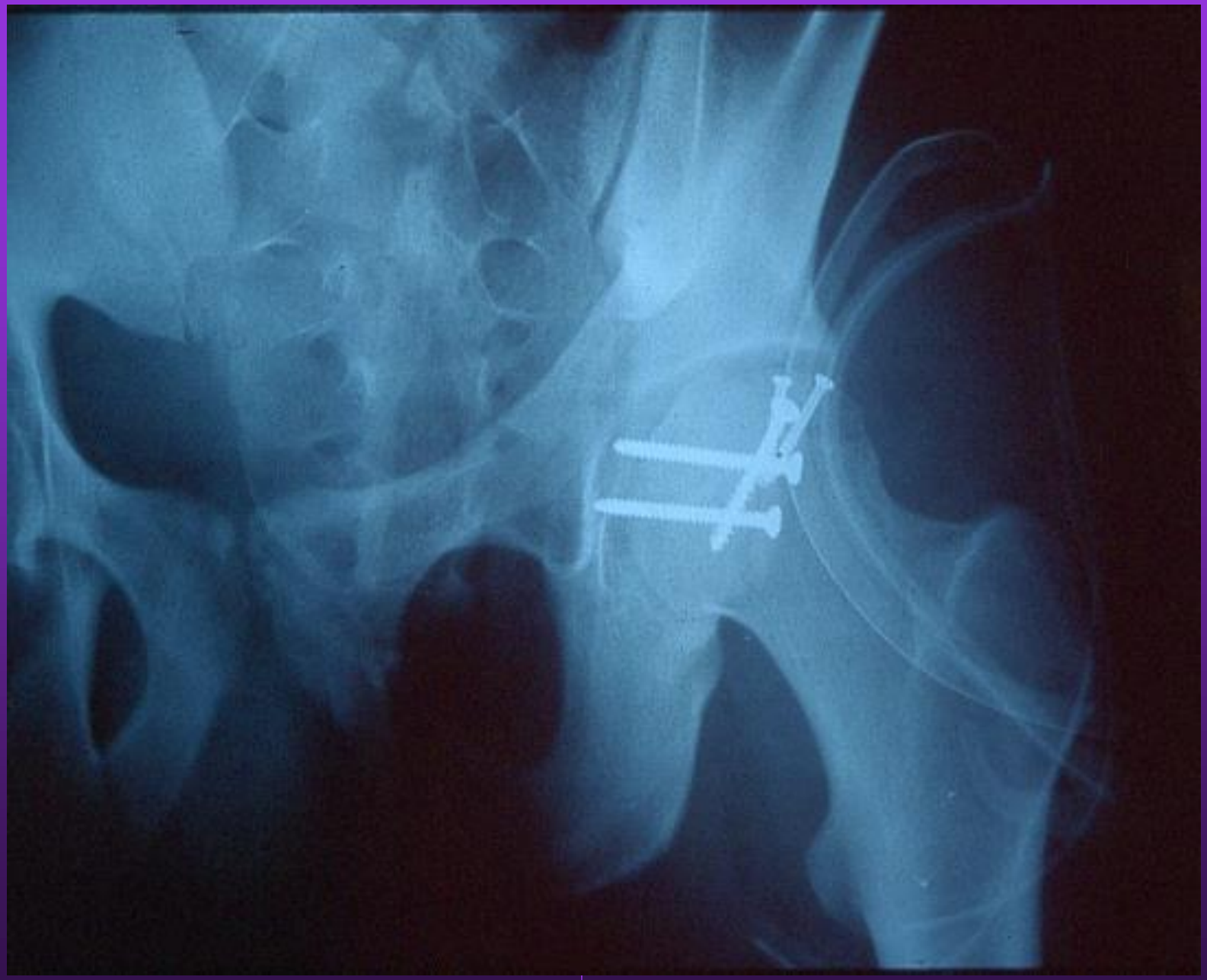
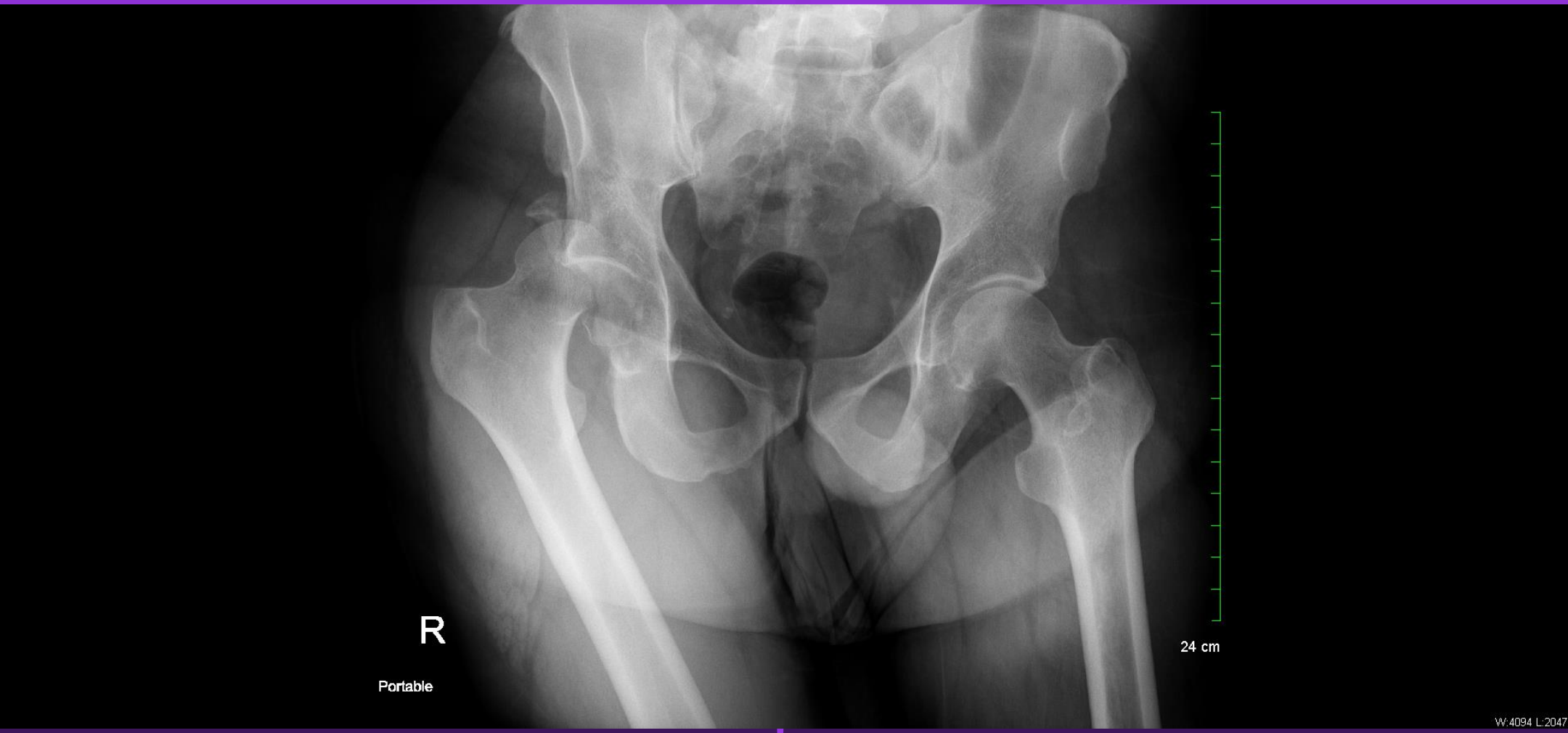
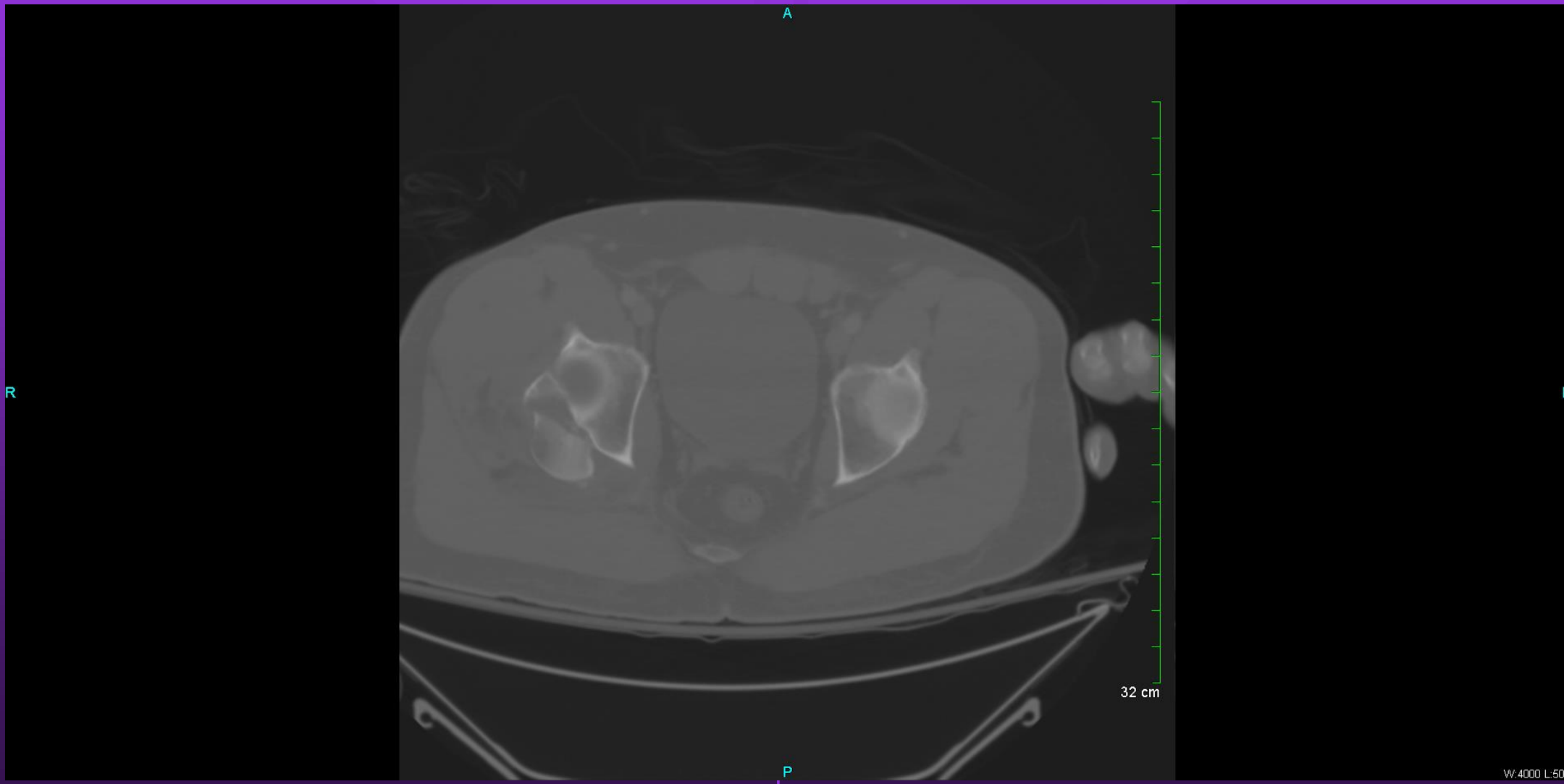
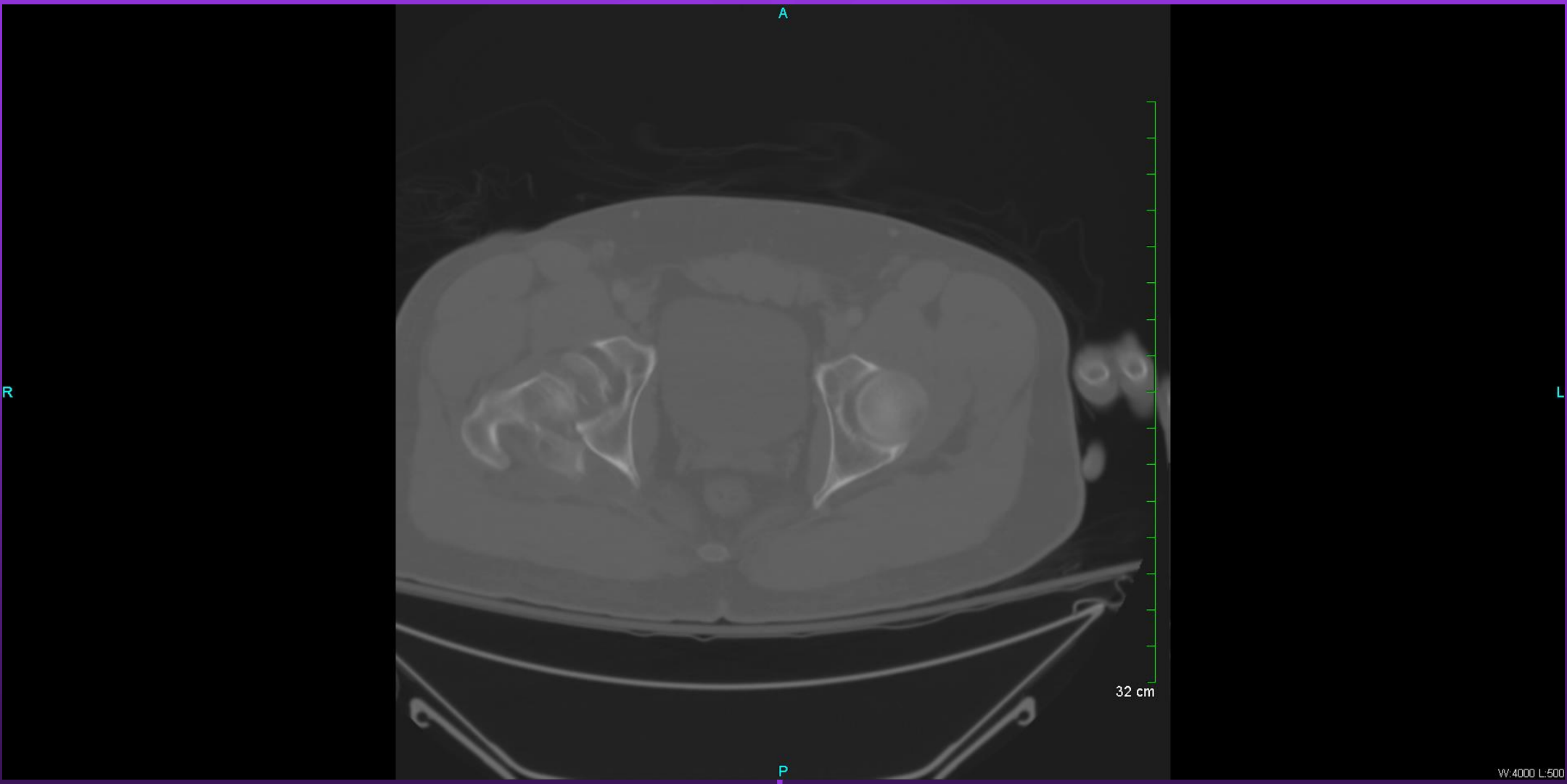


41yo MVA RS




A
R
32 cm
P
W:4000 L:50


A
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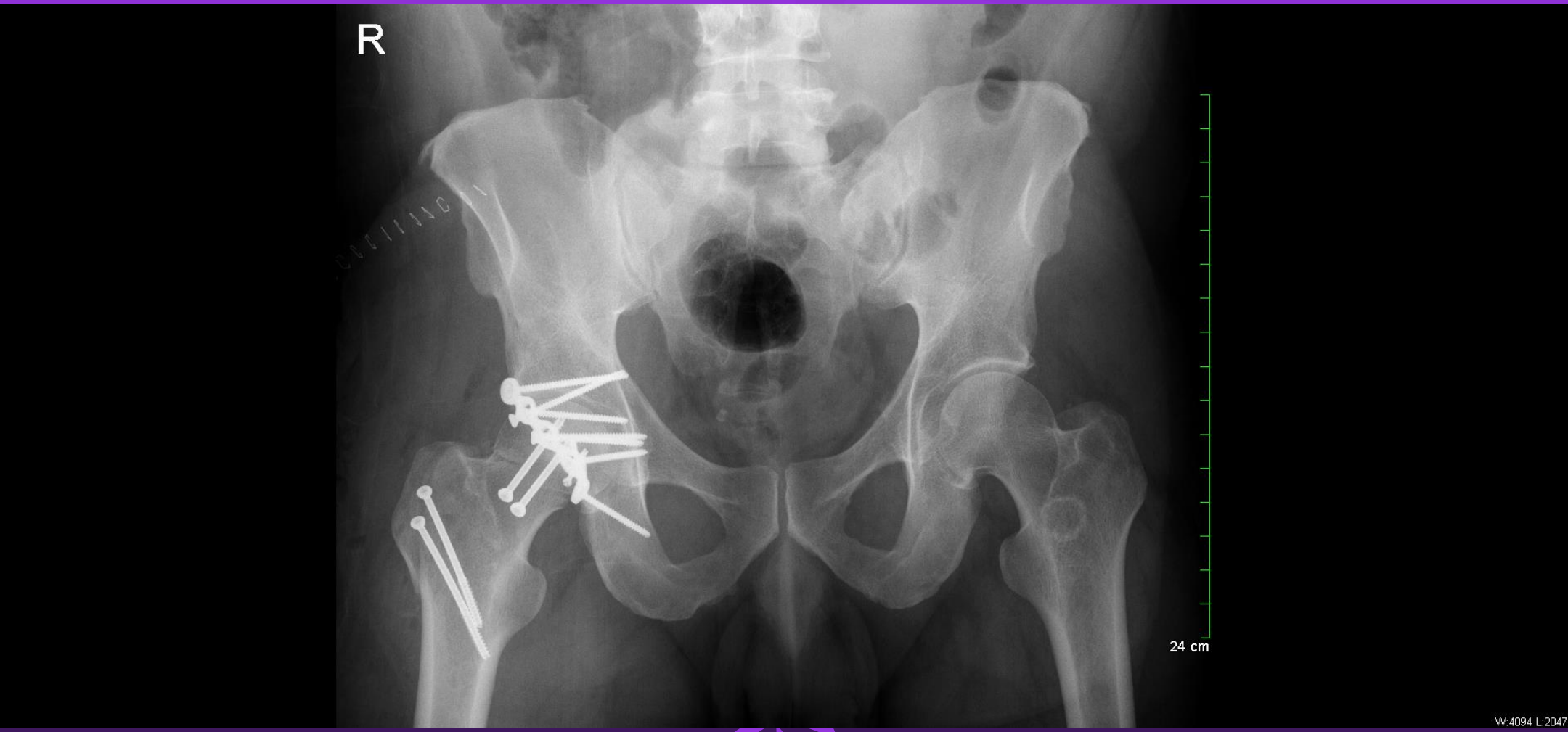
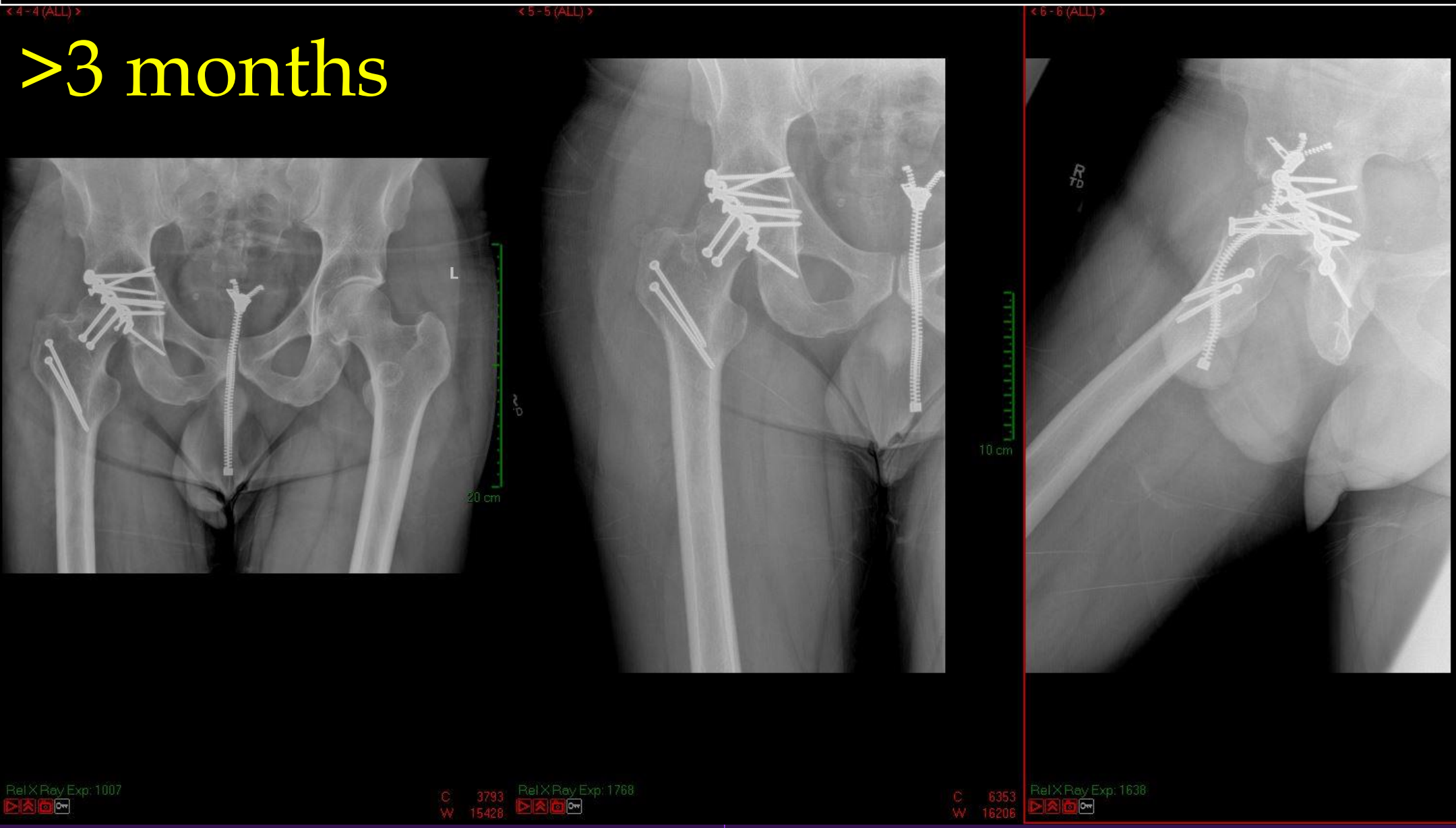
32 cm
W:4000 L:500

2/5/18 FH, FN, PW



>3 months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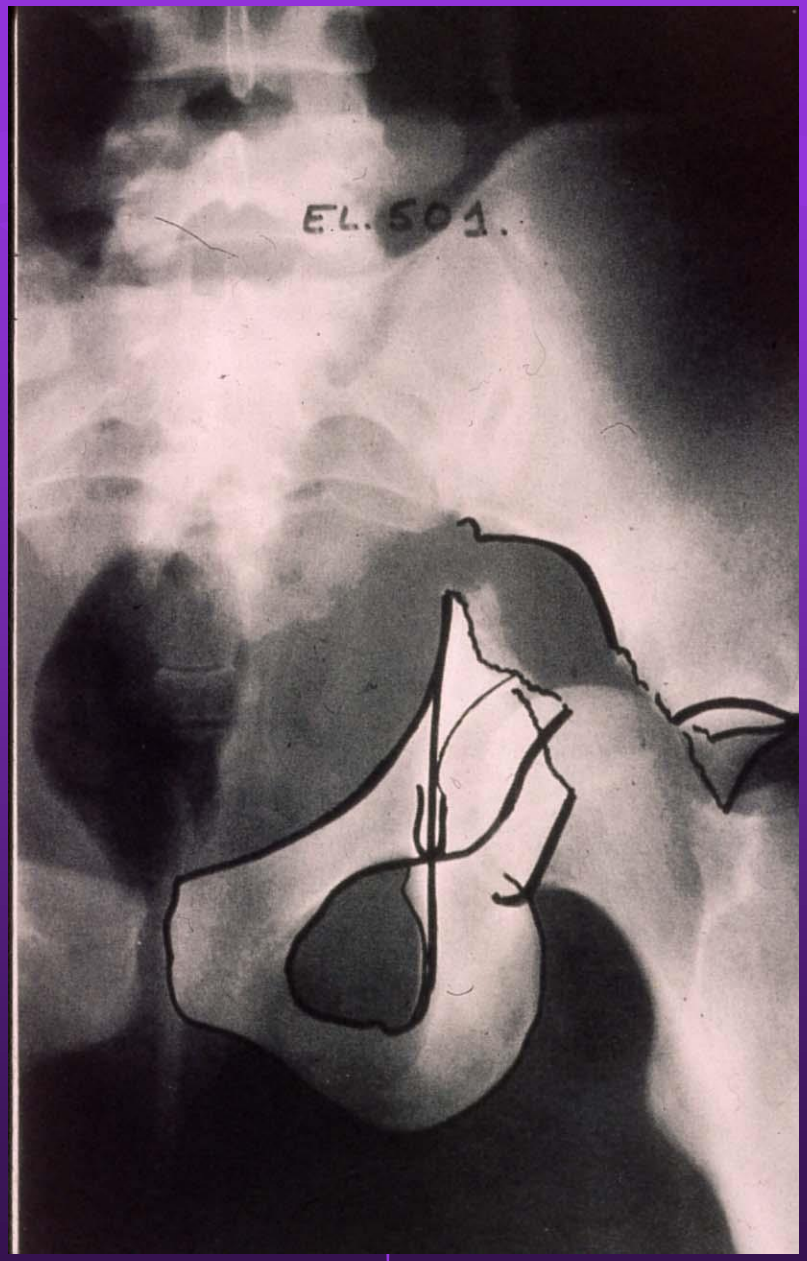
L
20 cm
10 cm
Rel X Ray Exp: 1007
C 3793
W 15428
Rel X Ray Exp: 1768
C 6353
W 16206
Rel X Ray Exp: 1638

AP, and both 45° obliques



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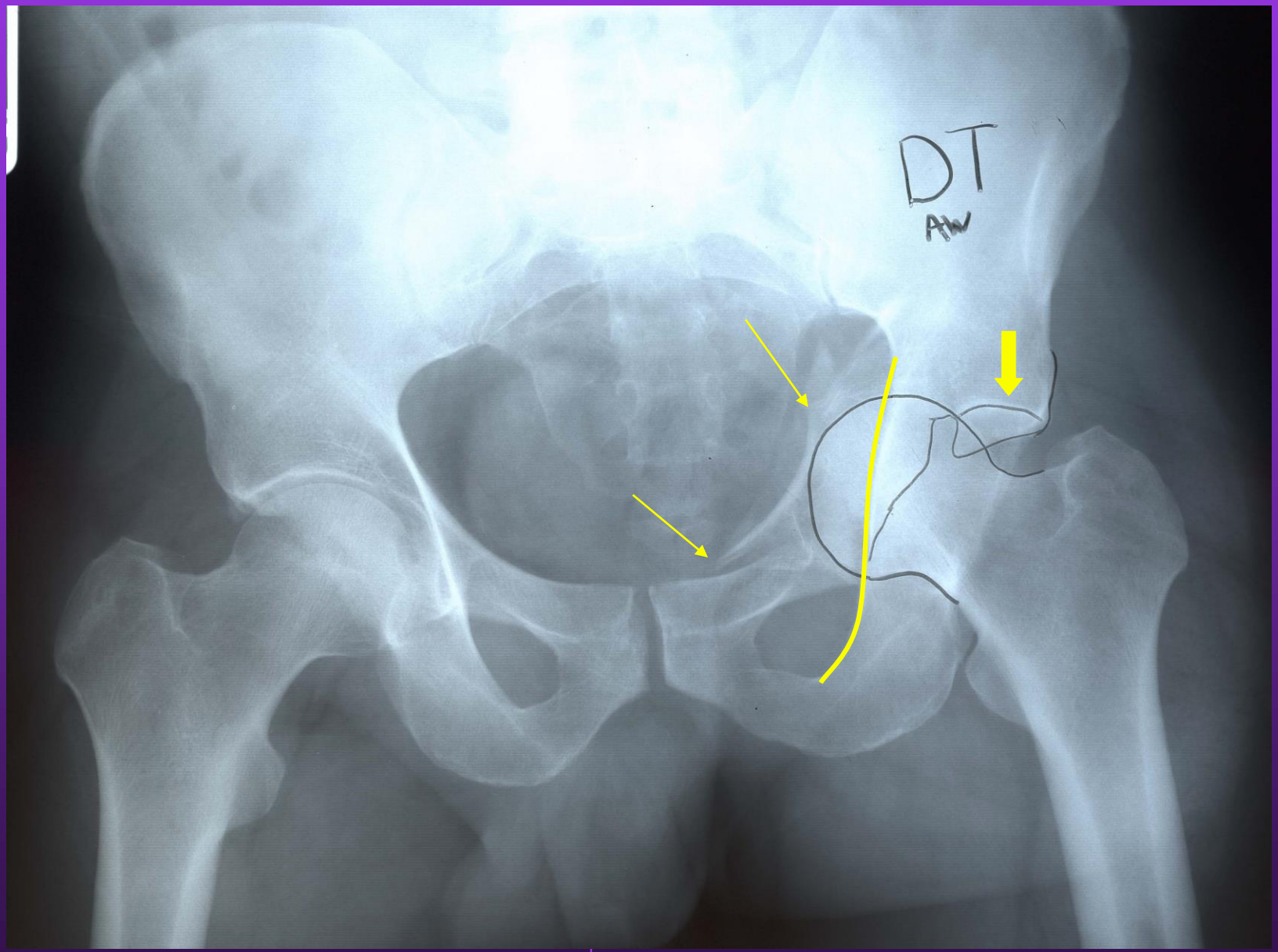

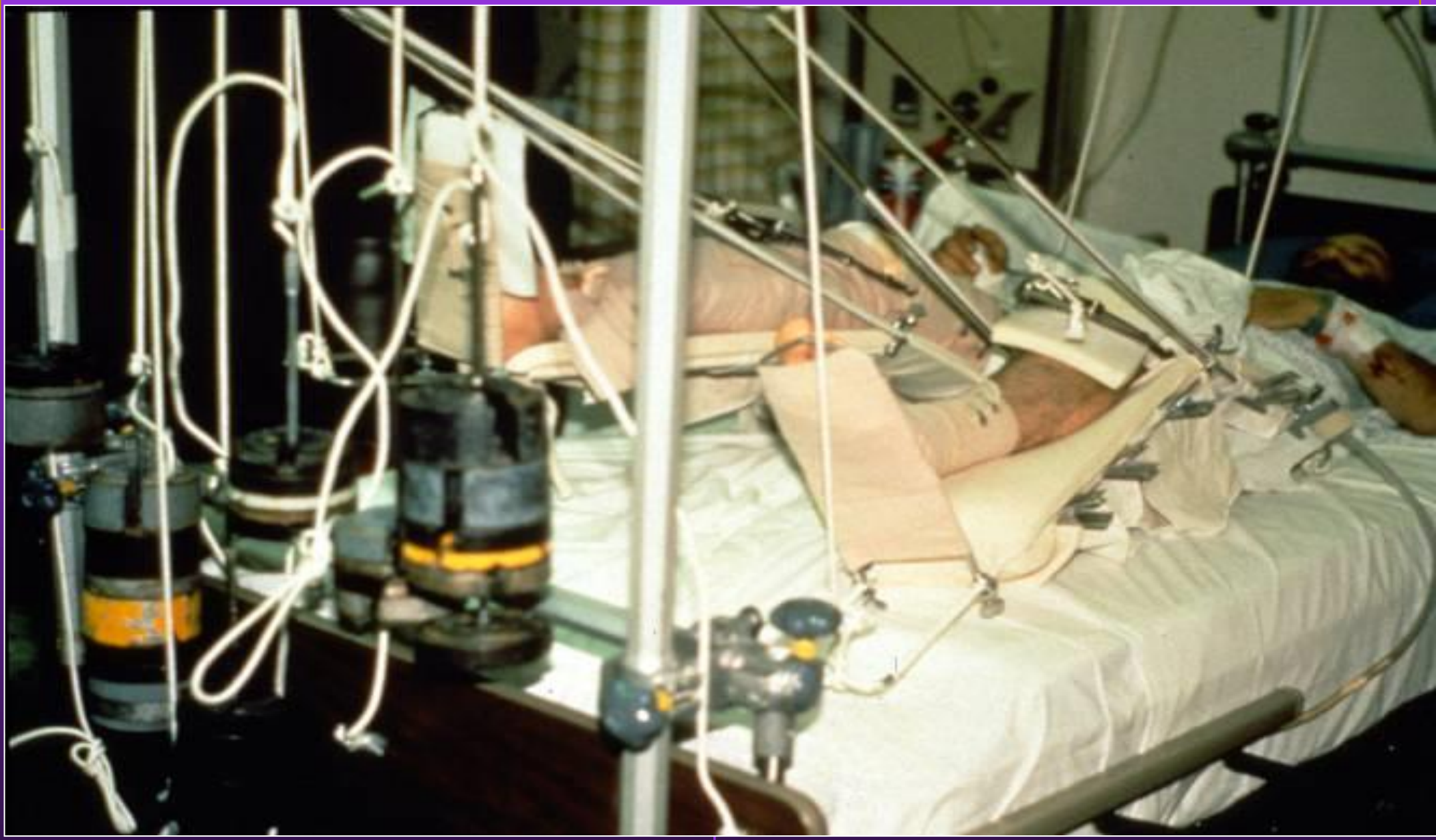

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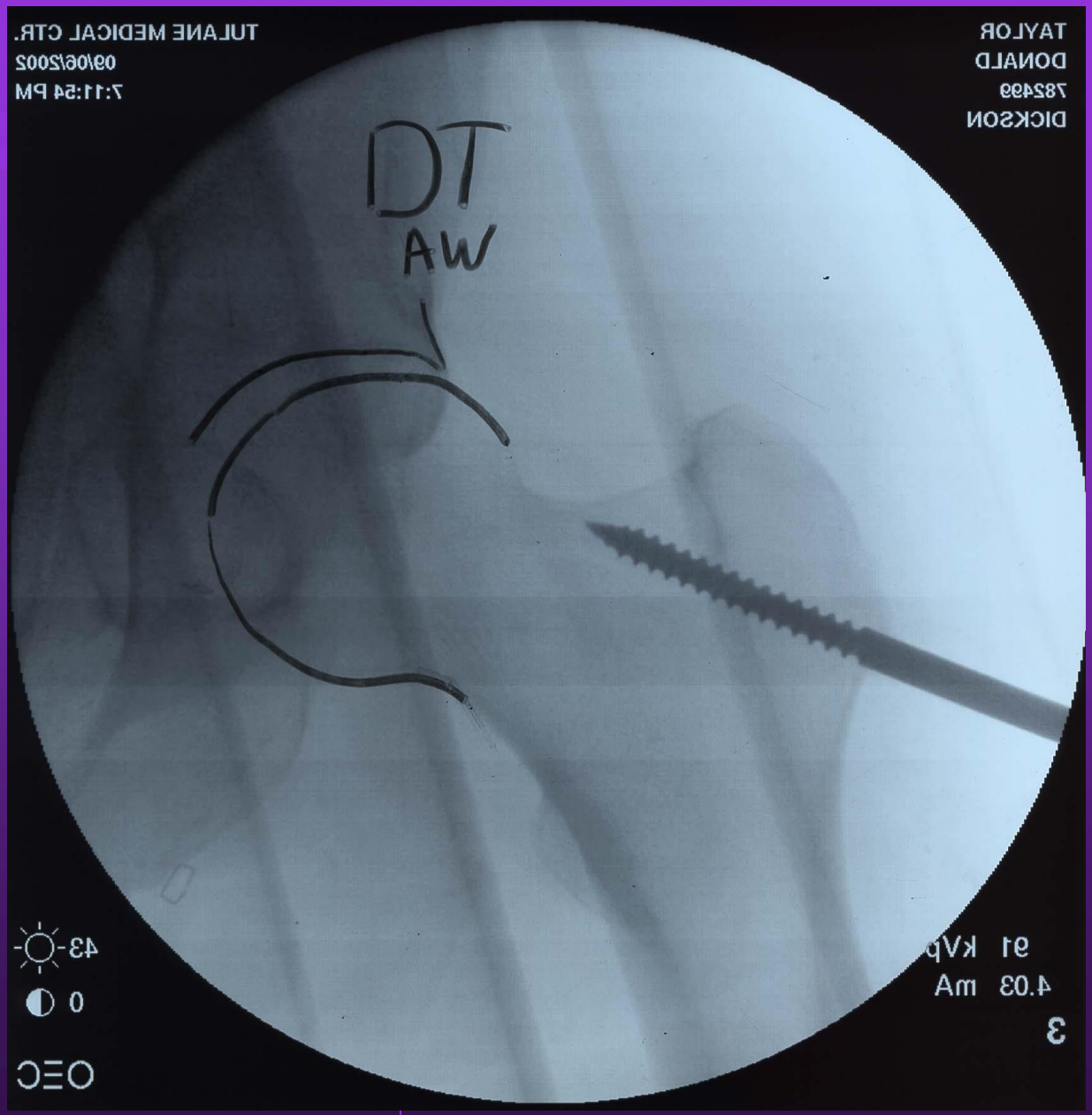
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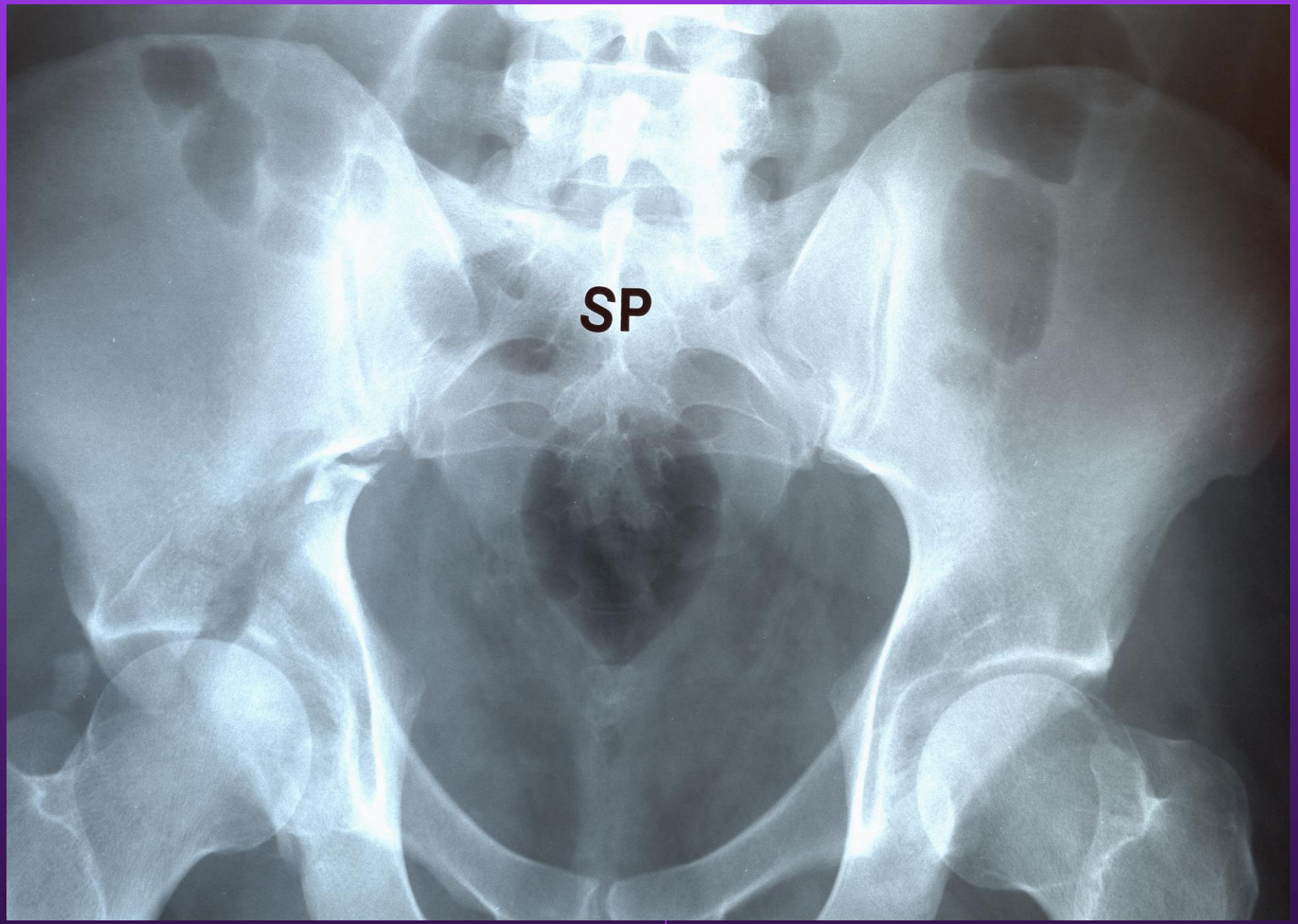
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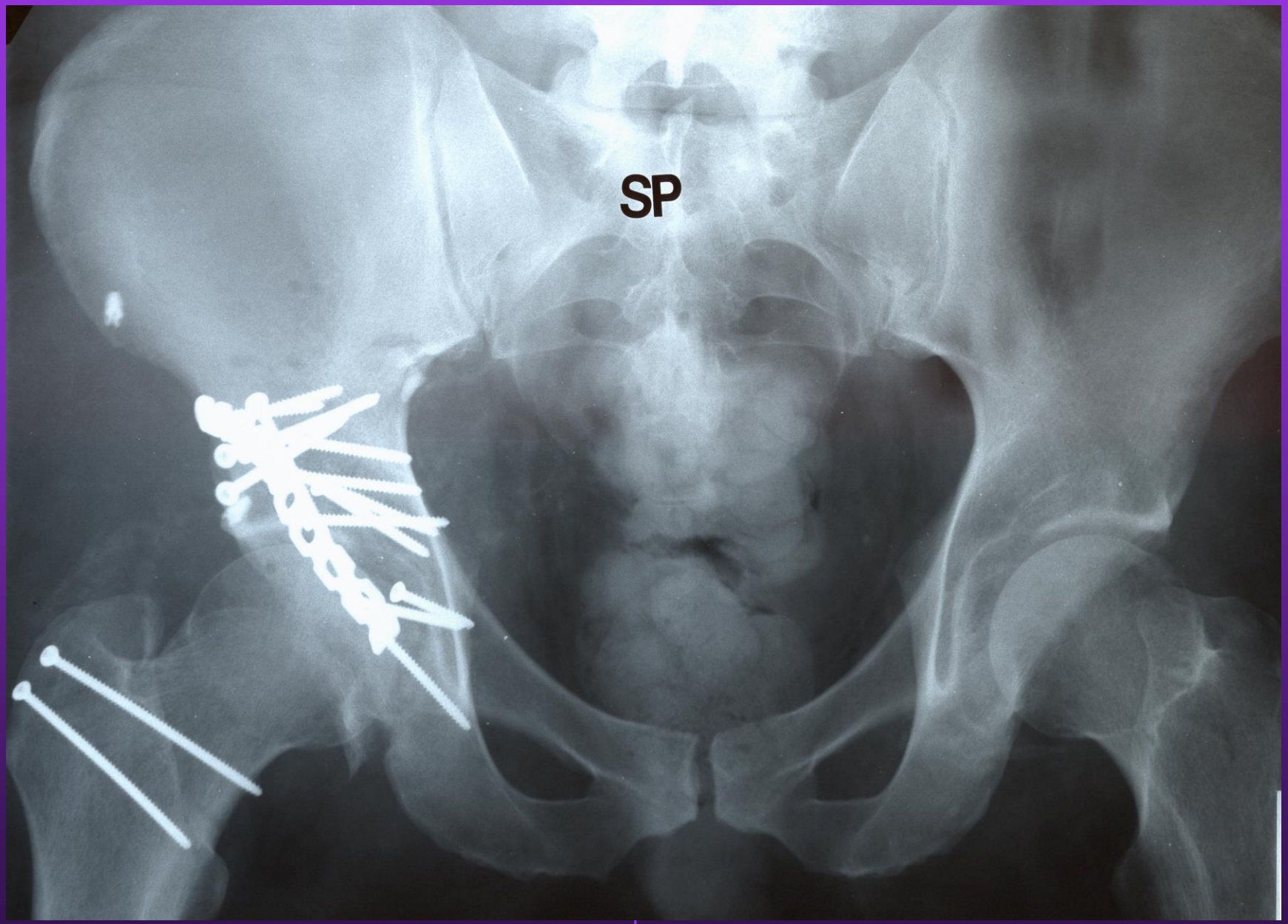
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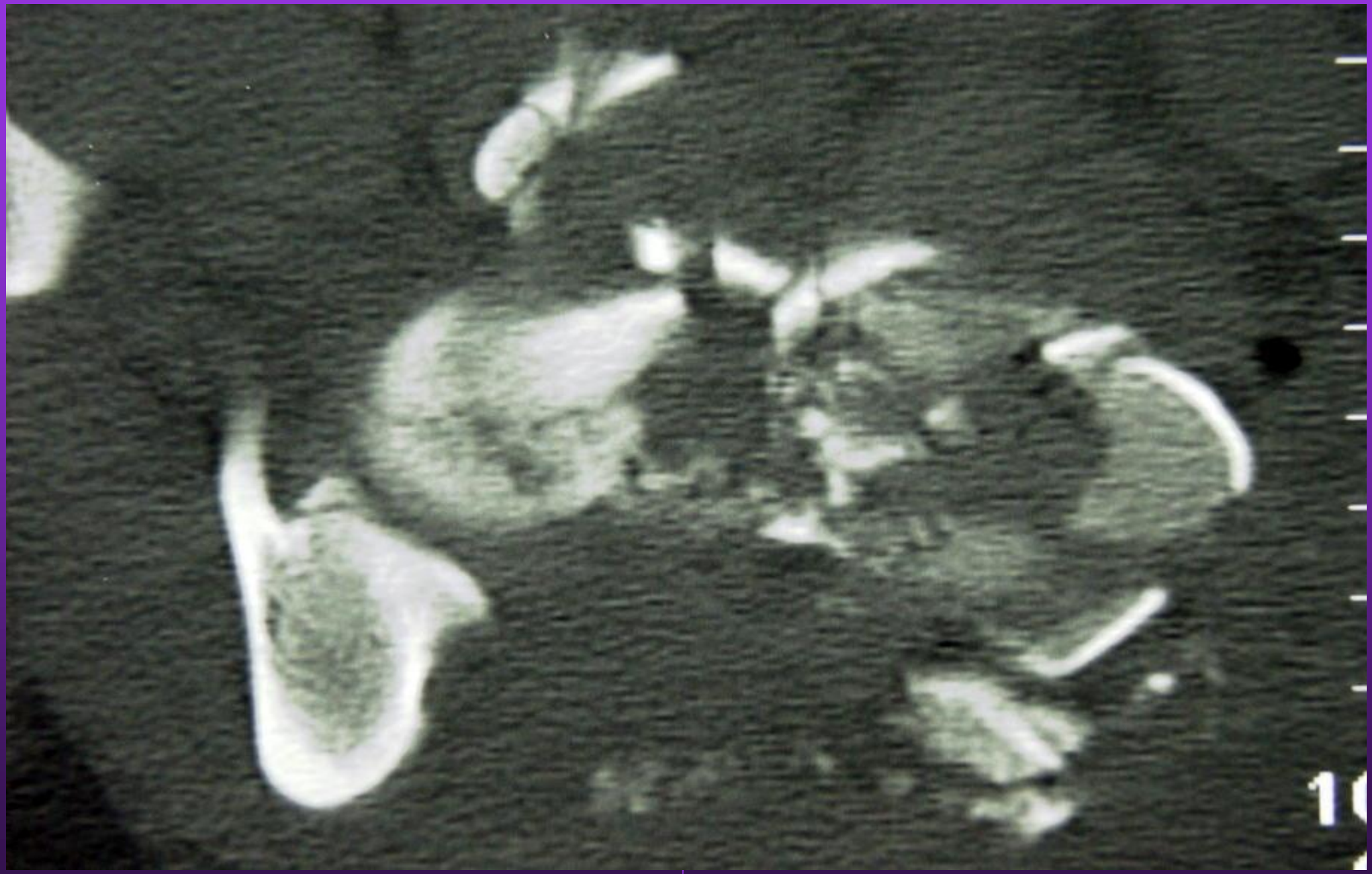
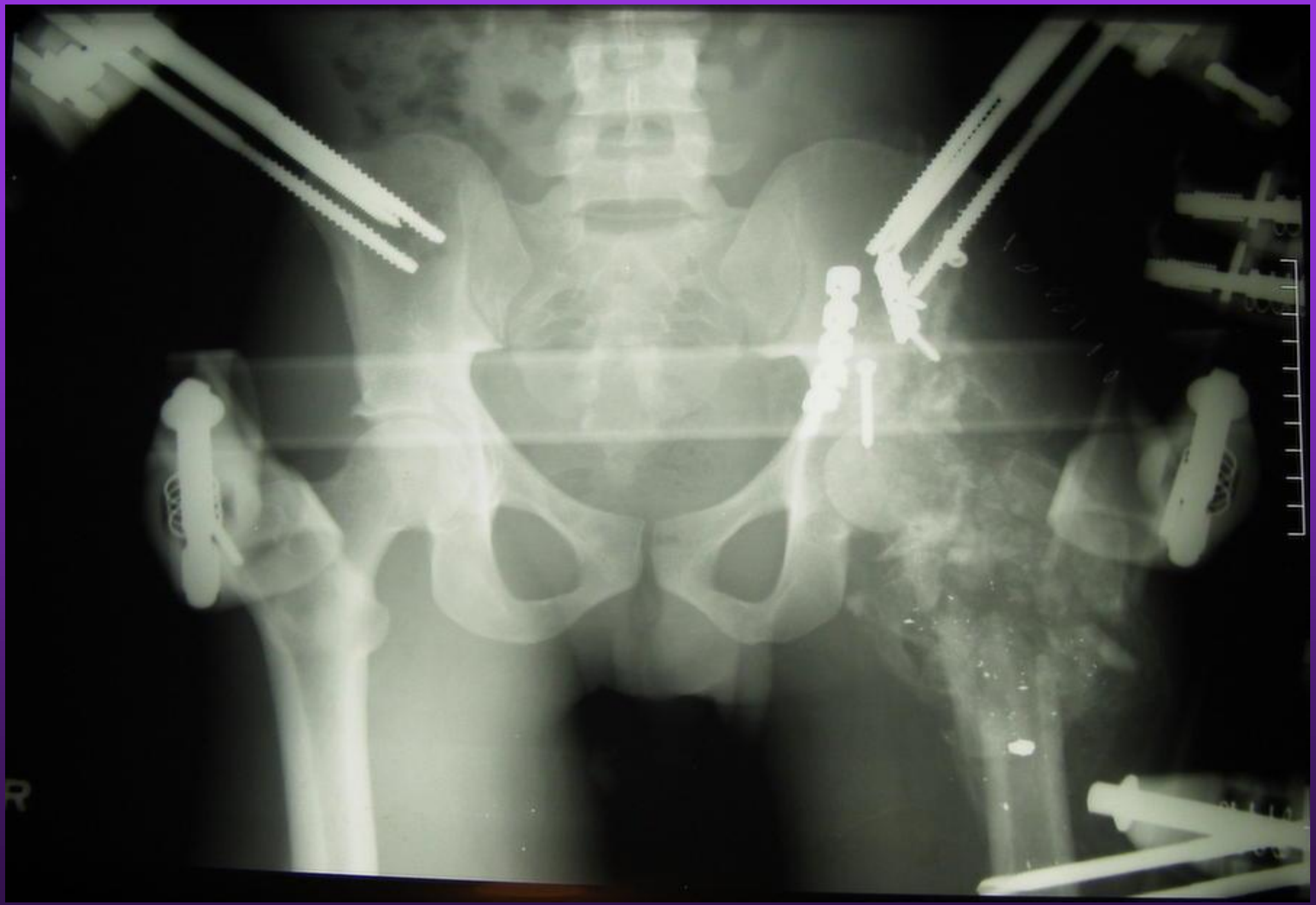
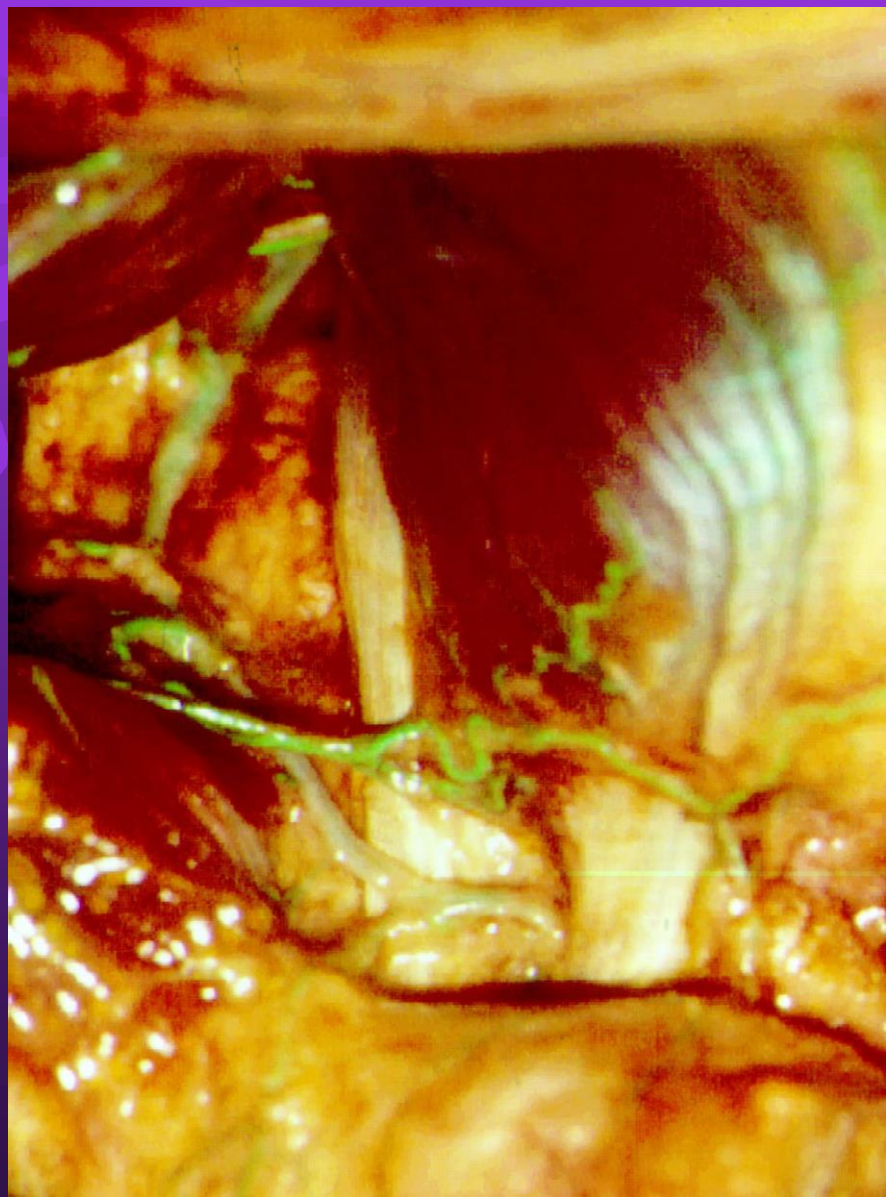


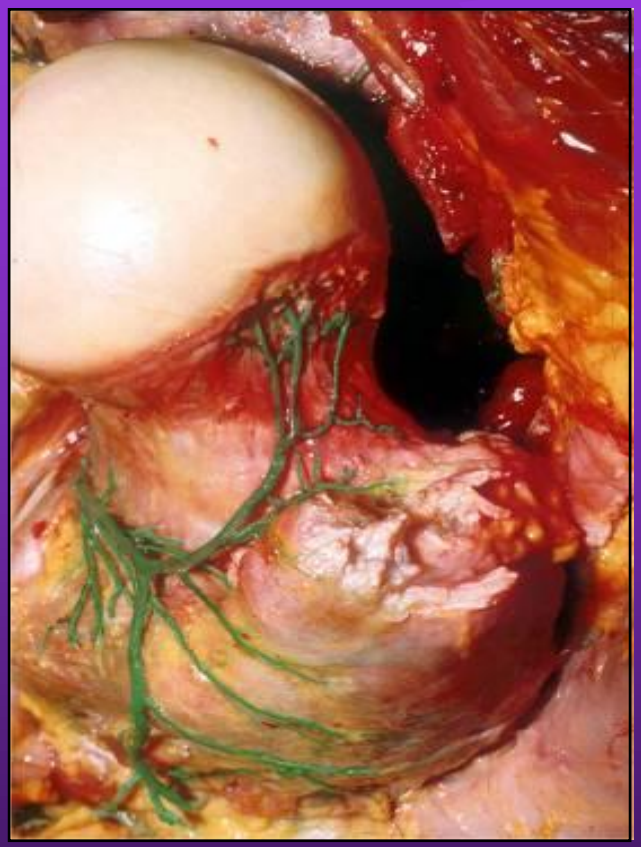


Femoral Head Blood Supply

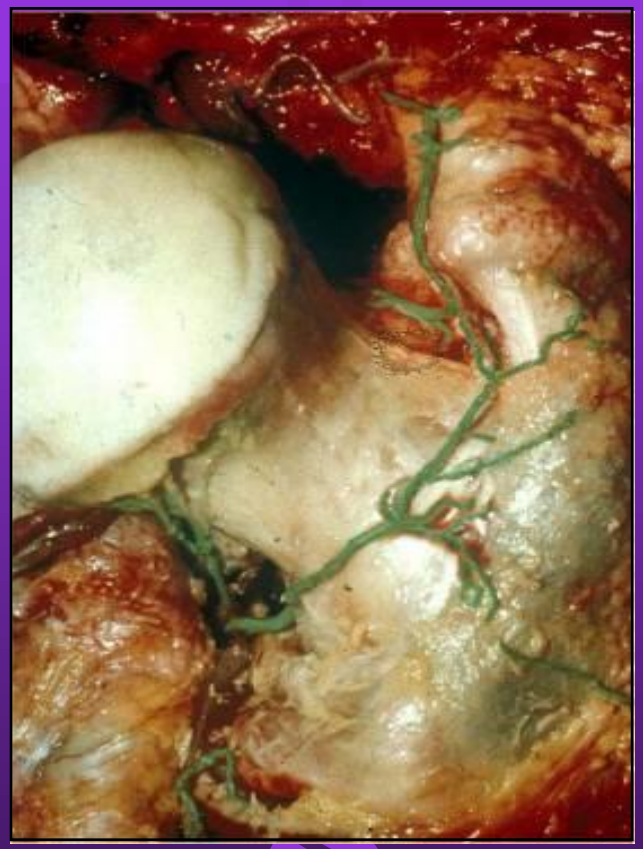
- Deep Branch of Medial Femoral Circumflex
- May be injured by:
  - Detaching quadratus from femur
  - Reflecting obturator internus or piriformis too close to trochanter



Terminal subsynovial (retinacular) vessels



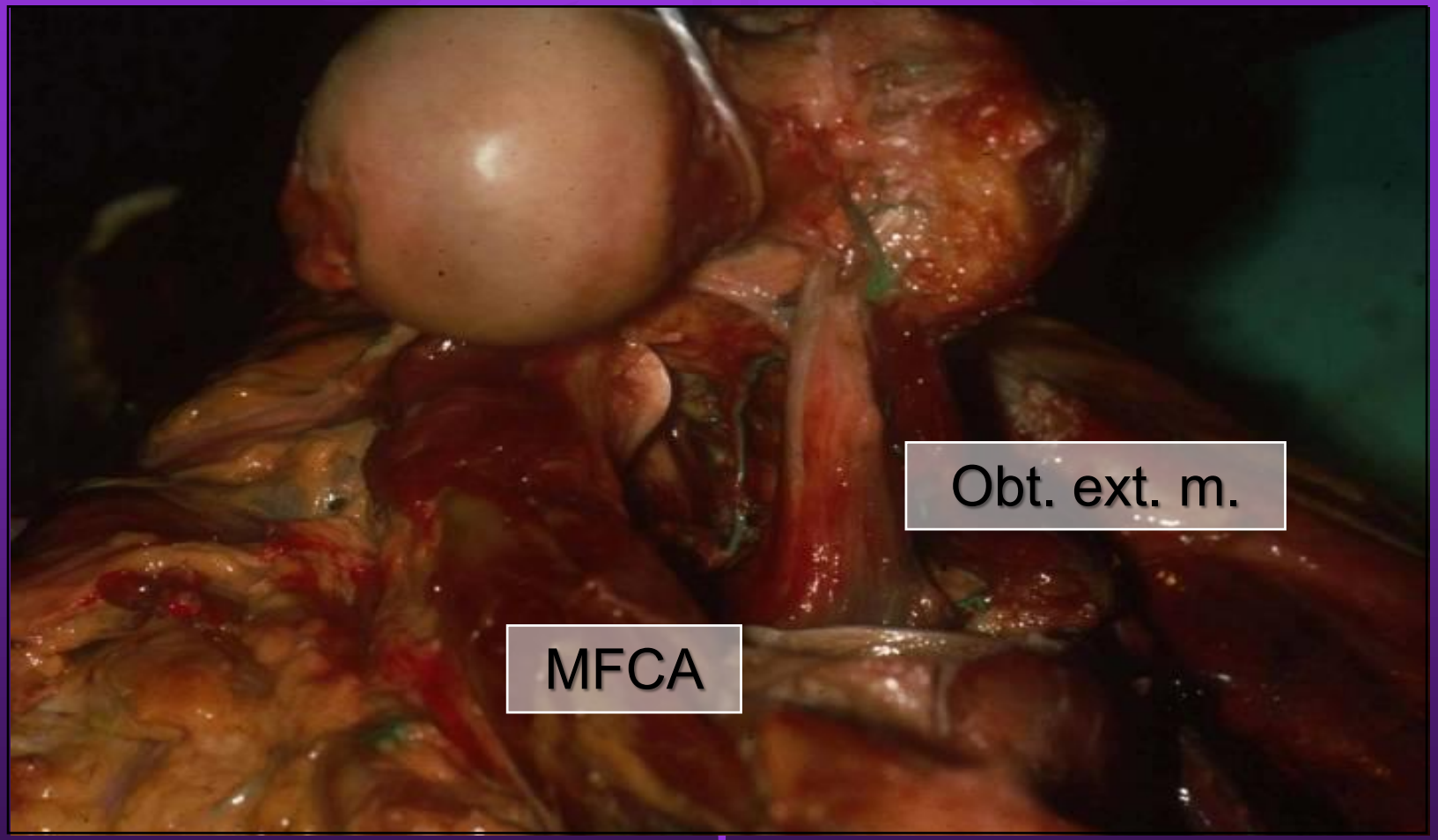
Superior type



Mixed

Post. neck free of vessels

Obt. ext. m. protects MFCA



Gautier et al., *JBJS*, **82-B:**679, 2000.

AVN after fracture dislocation of acetabulum

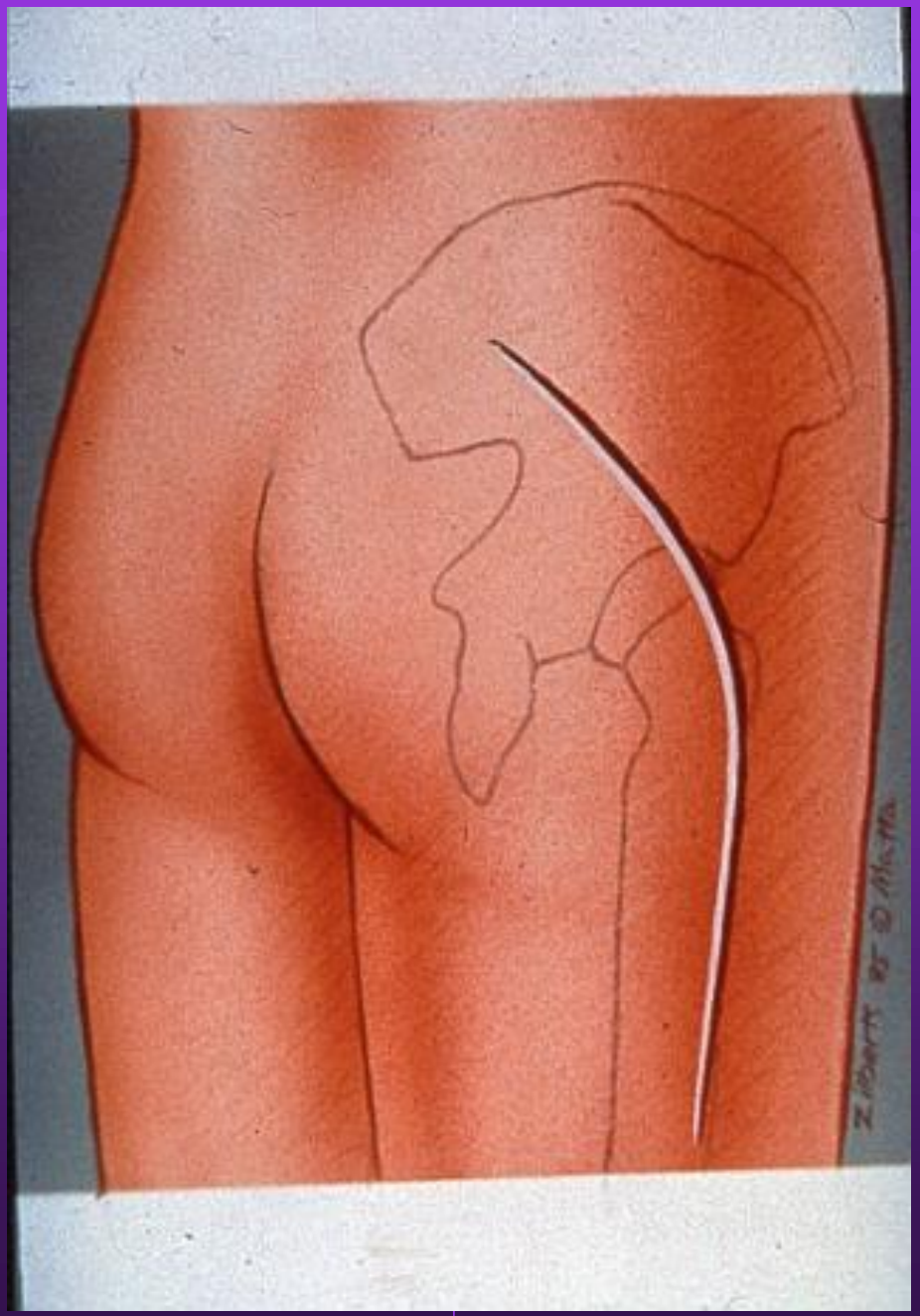
- 5-40% with up to 3 to 4x increase with lack of relocation for > 6 hrs (50%)
- Developes 2 to 24 months (13-15 months) with early reduction of dislocation 10% versus if >24 hrs up to 20%(mixed with isolated hip dislocations)

Anterior or Posterior Approach?

- Anterior- Smith-Peterson for posterior dislocations and anterior head fractures
- Posterior- Kocher Langenbeck approach with greater trochanter slide and surgical dislocation for femoral head fracture and certain acetabular fractures

Case #1

Line of 10 cm skin incision.



Limitations: Kocher-Langenbeck

- Superior Acetabular Region
- Anterior Column
- Fractures High in Greater Sciatic Notch

Prone Position

- Aids in Reduction of Ischiopubic Segment
- Facilitates Palpation of Quadrilateral Surface
- Allows Clamp Placement through Greater Sciatic Notch
- Easier Prep and Drape


Over 1,000 acetabulum with > 300 without a table

Lateral KL

- Need to see posterior wall and anterior head ie orif PW and orif FH
- Greater Trochanteric osteotomy with surgical dislocation

Letournel

- "We suspect (AVN) less frequent (with acetabulum fractures due to) smaller incidence of avascular and it is possible to perform a late reduction of a dislocation without this likelihood" pg. 324 (4.1%)
- "(AVN) is a diagnosis much to often … to explain post-operative complication …of a malreduced fx"

Summary

- Open Fractures
- Progressive Neurologic Loss
- Femoral Head At Risk (Cartilage Damage)
- Femoral Head At Risk (AVN-Dislocation)

The Pelvis is a Place to Work
Not a Place to Play