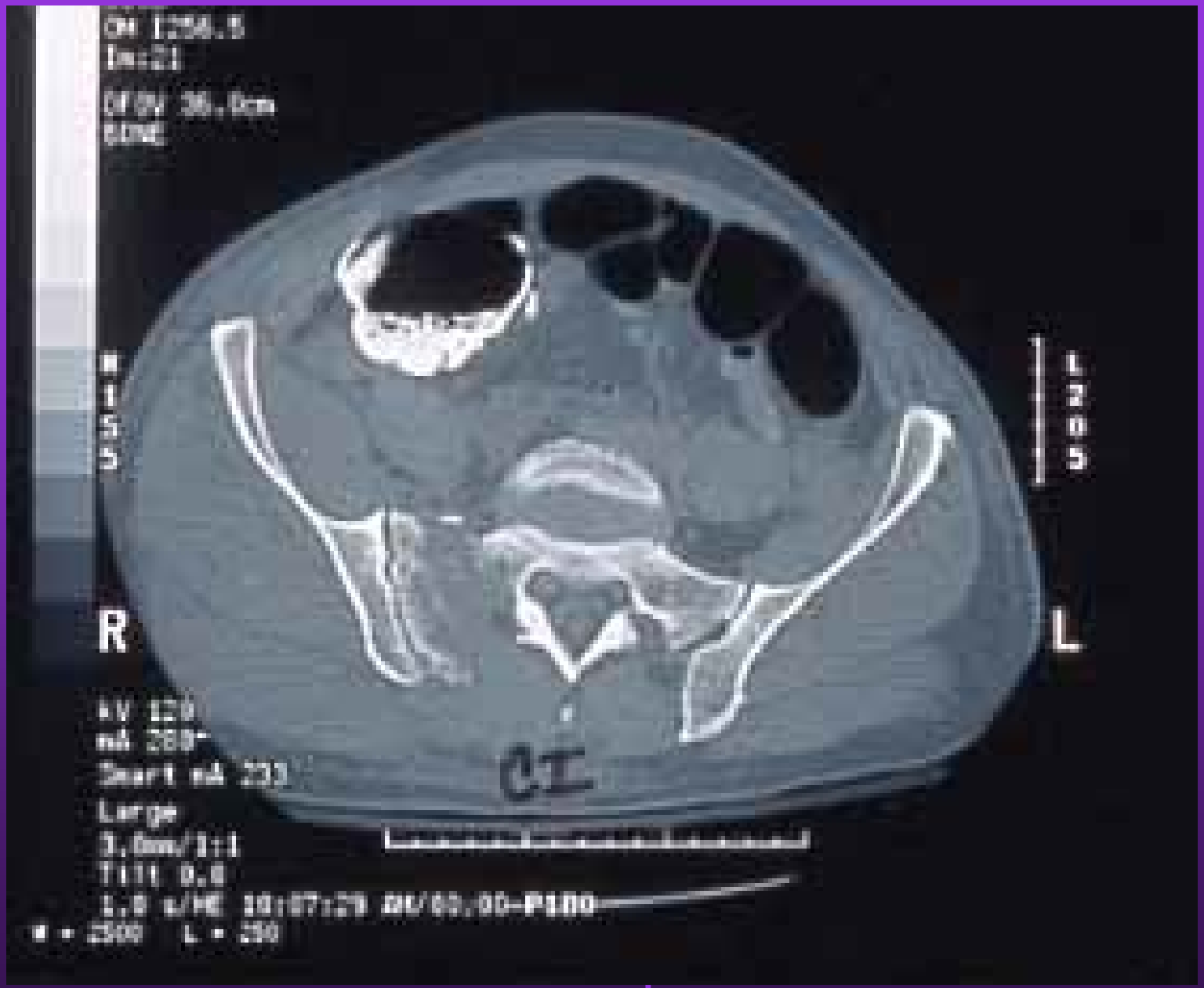
Kyle F. Dickson, M.D. M.B.A.

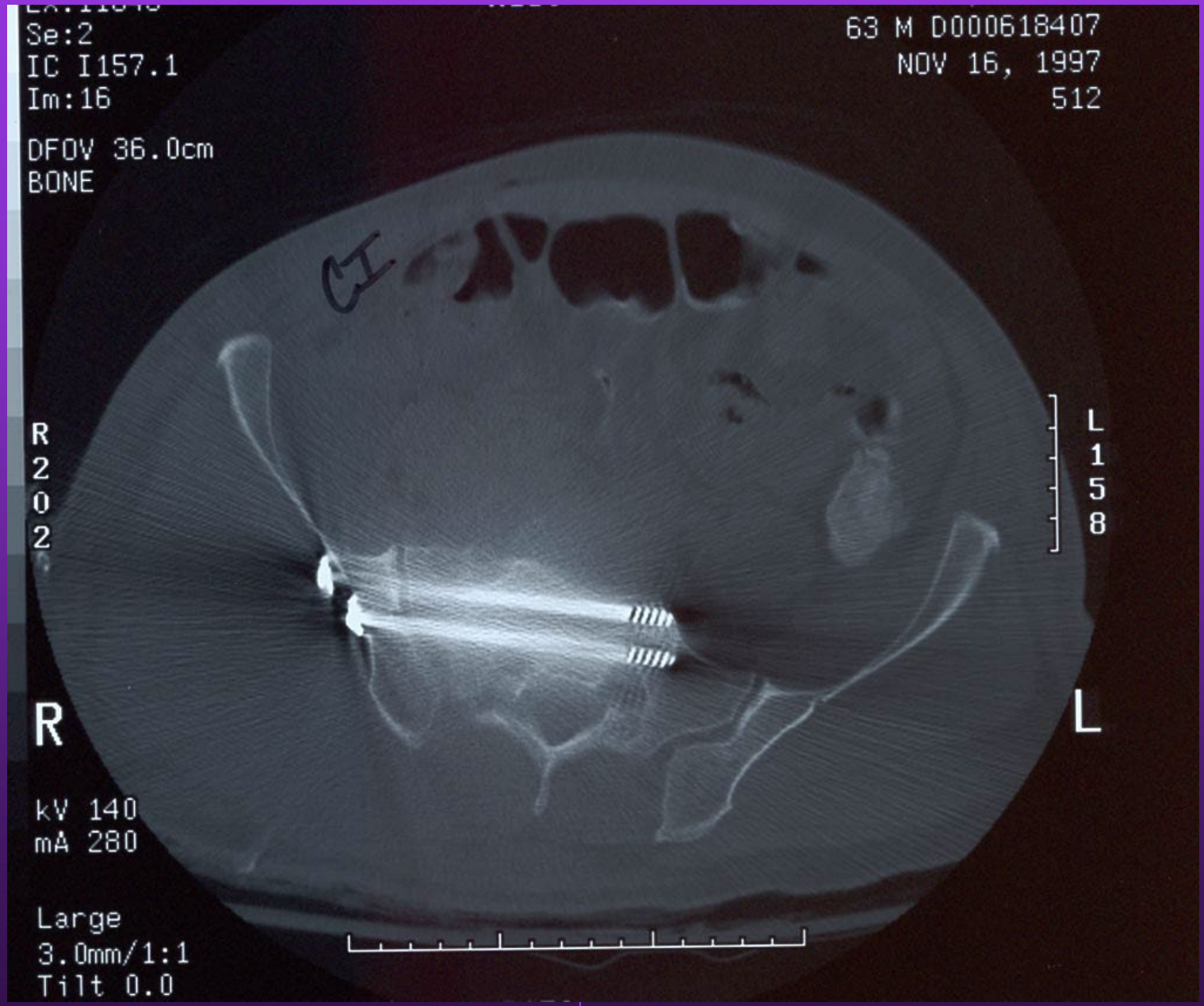
Professor Baylor College of Medicine
Southwest Orthopaedic Group, Houston, Texas
kyledickson99@gmail.com cell 713-208-4168
dr.kyledickson_md - facebook and instagram
acetabulumdoc.com - website

Pelvic Injuries- Marginal Indications

Kyle Dickson MD, MBA
Professor Baylor College of Medicine
Southwest Orthopaedic Group, Houston Texas

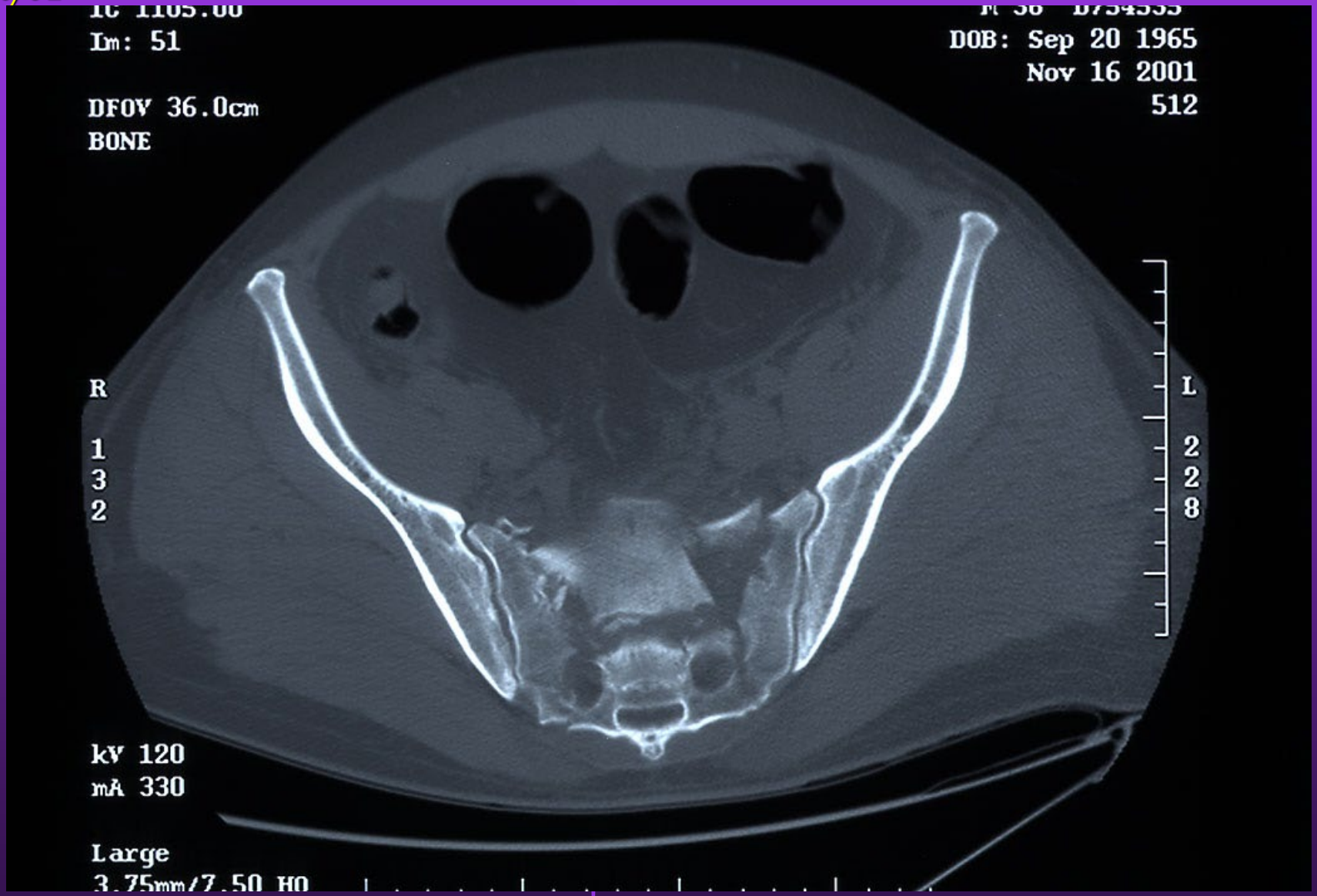

D. M.


R
L
CI

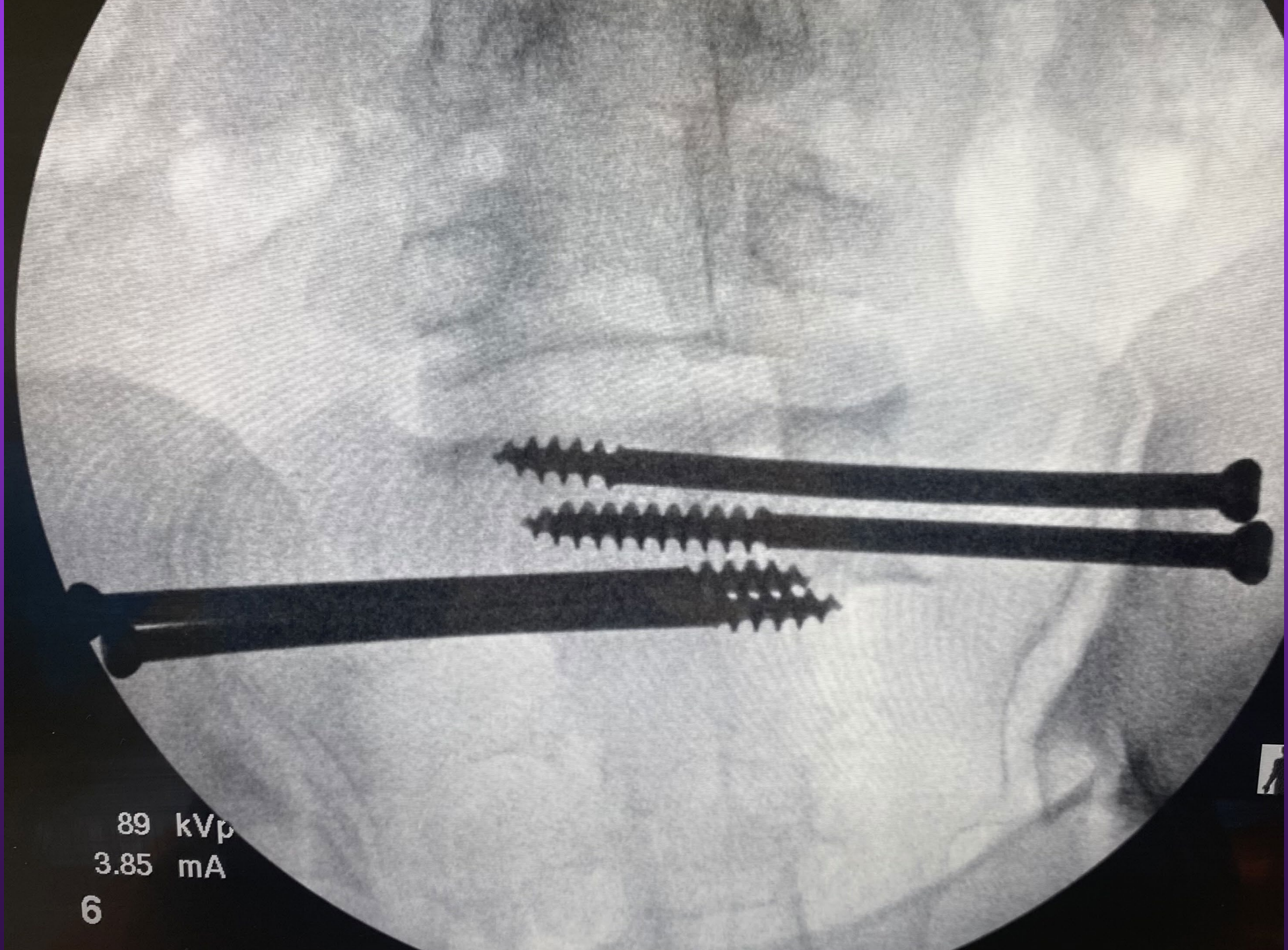

Se:2
IC I157.1
Im:16
DFOV 36.0cm
BONE
63 M D000618407
NOV 16, 1997
512
R
2
0
2
L
1
5
8
R
L
kV 140
mA 280
Large
3.0mm/1:1
Tilt 0.0


R
KH

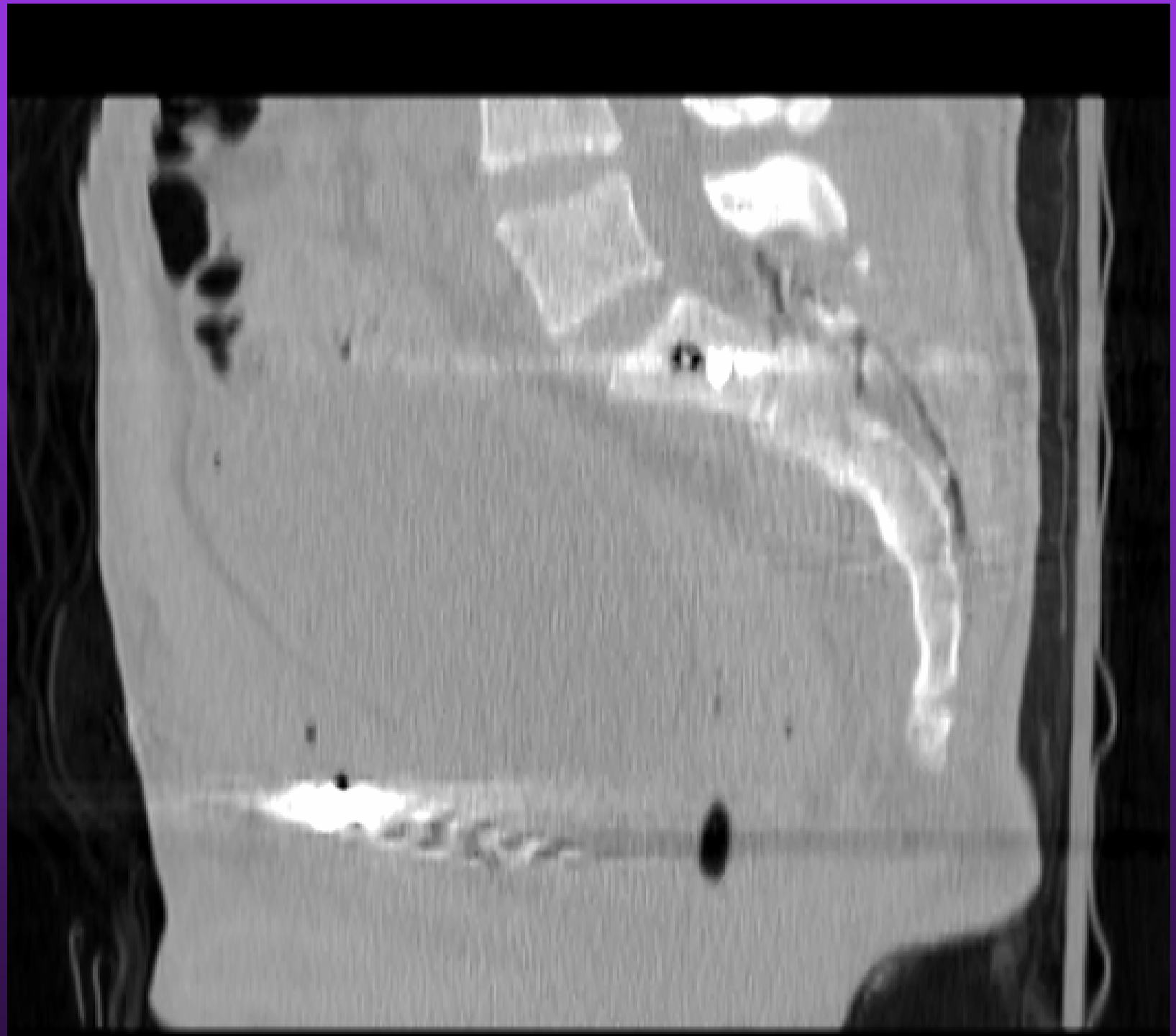
RL 11/16/01


Im: 51
DOB: Sep 20 1965
Nov 16 2001
512
DFOV 36.0cm
BONE
R
1
3
2
L
2
2
8
kV 120
mA 330
Large

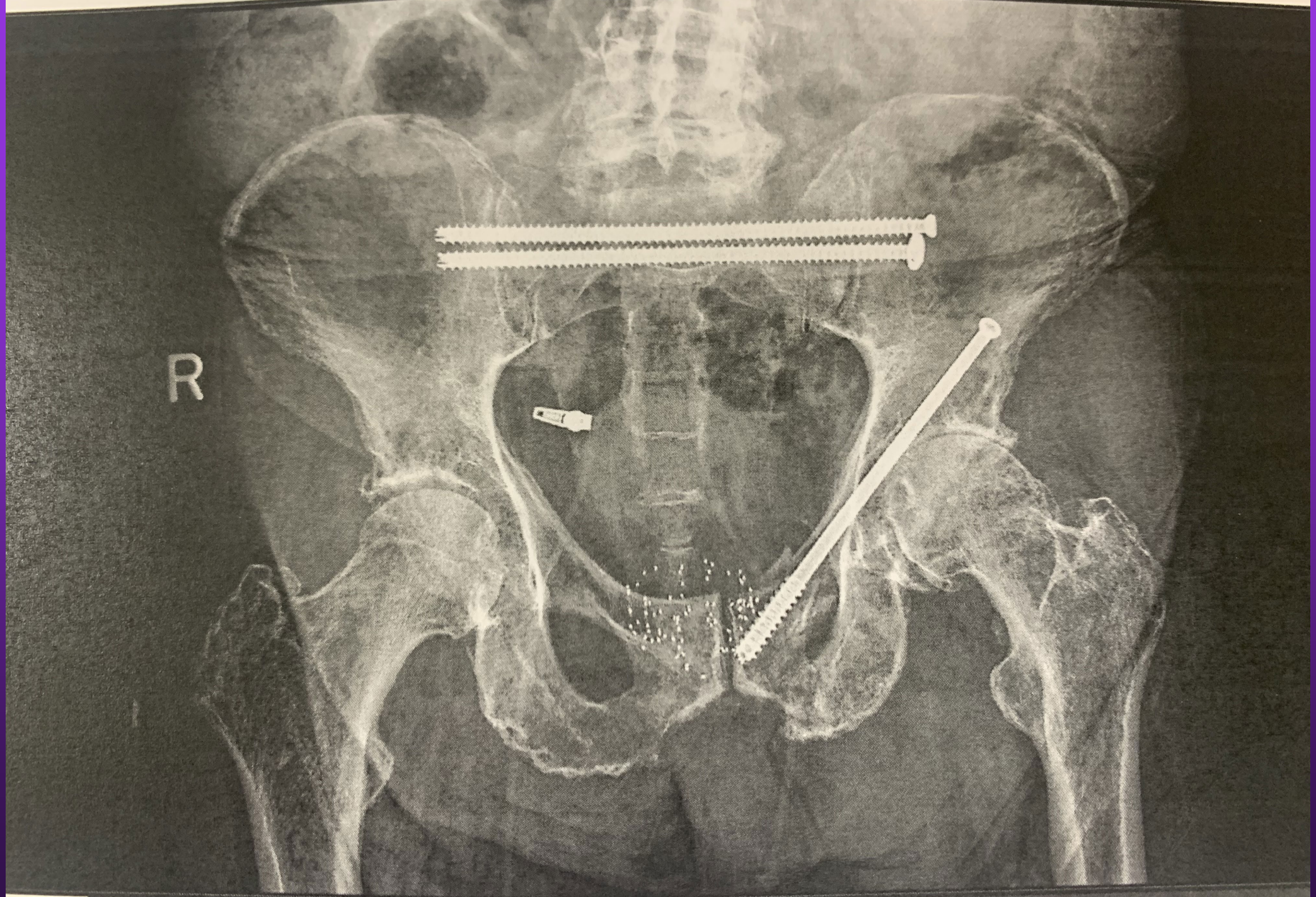

Date:2004.10.04
Time:18:42:05
Im.:000146
Se:000007
x 1.3
H
Inst:MEDICAL CEN OF LA at 1
Model:SOMATOM PLUS 4
Manuf:SIEMENS
Organ:PELVIS
PatPos:HFS
61
Ref Scan 3
Ref TP -1141.0
21
A
P
Scan:000003
SP:-1141.00
ST:3.00
TI:1000
kV:140.00
mAs:240
GT:0.00
CM:
21
Cmt:NONCONTRAST
PELVIS
SO:
CM:
Kernel:59 .10.AB91
Rows:512
W : 00894
C : 00173
F


89 kVp
3.85 mA
6


Se:1
Im:322
T.HAYLEY
Study Date:11/6/2008
Study Time:12:33:08 PM
MRN:
C2144
W2756

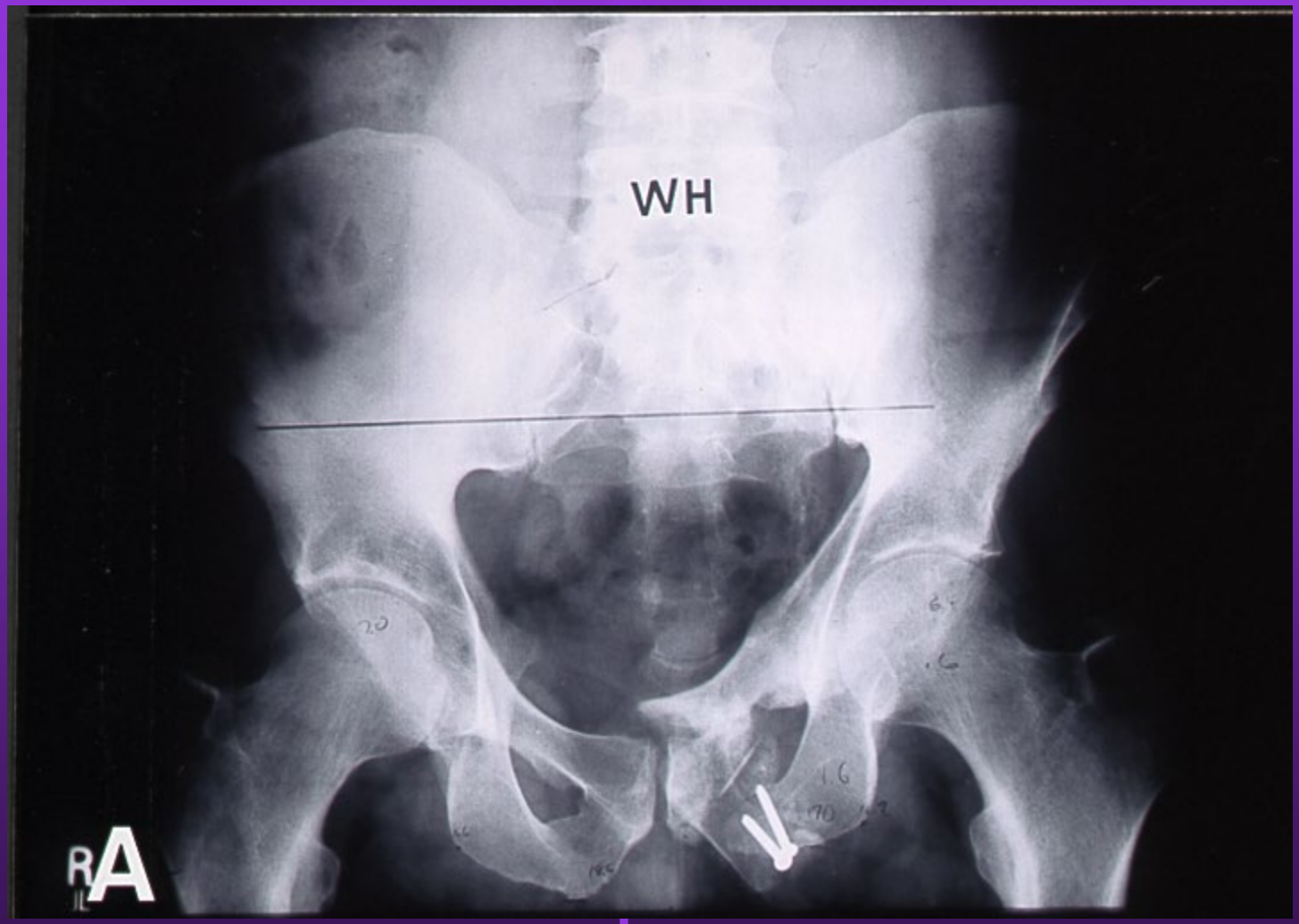


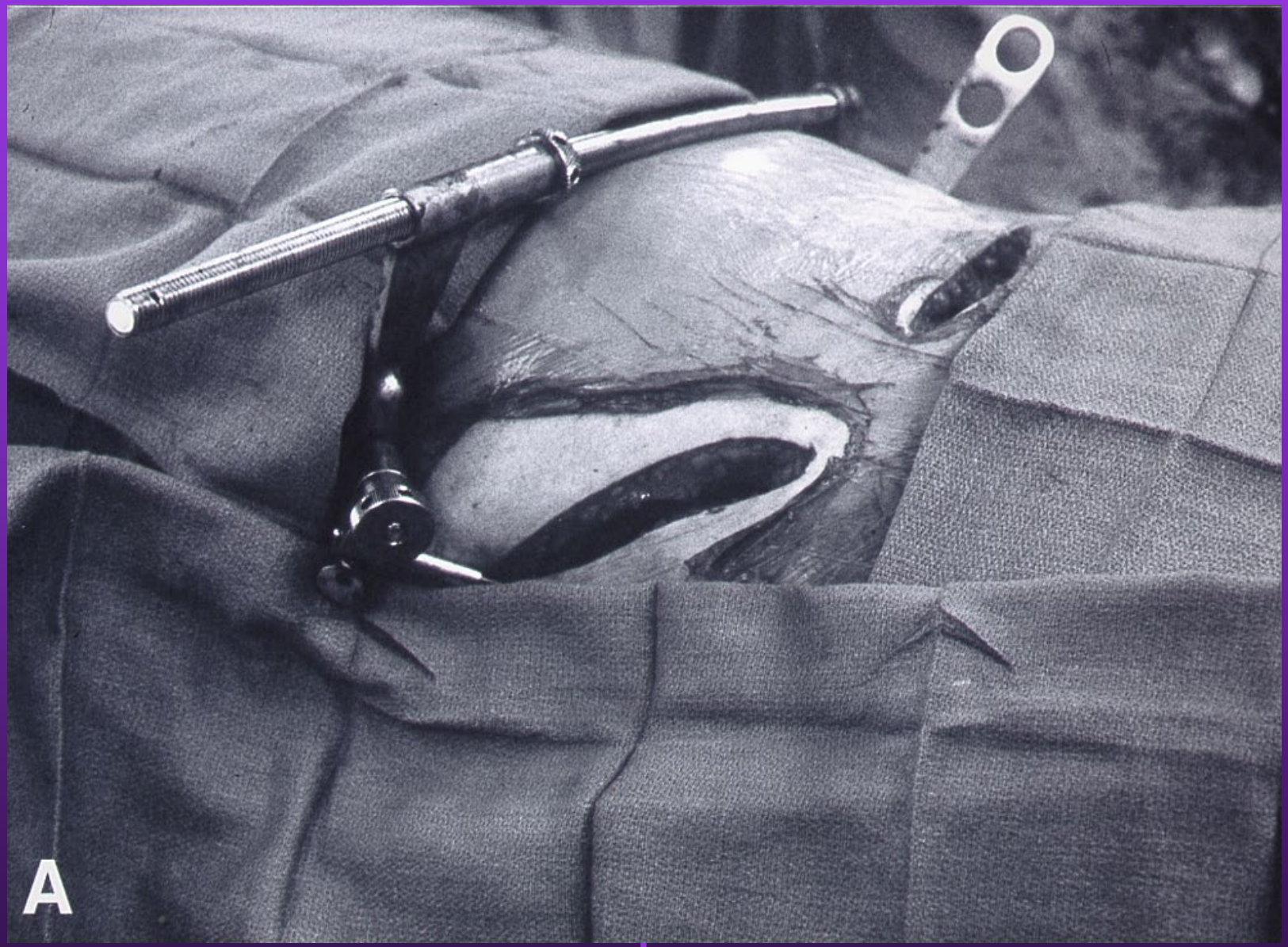

L

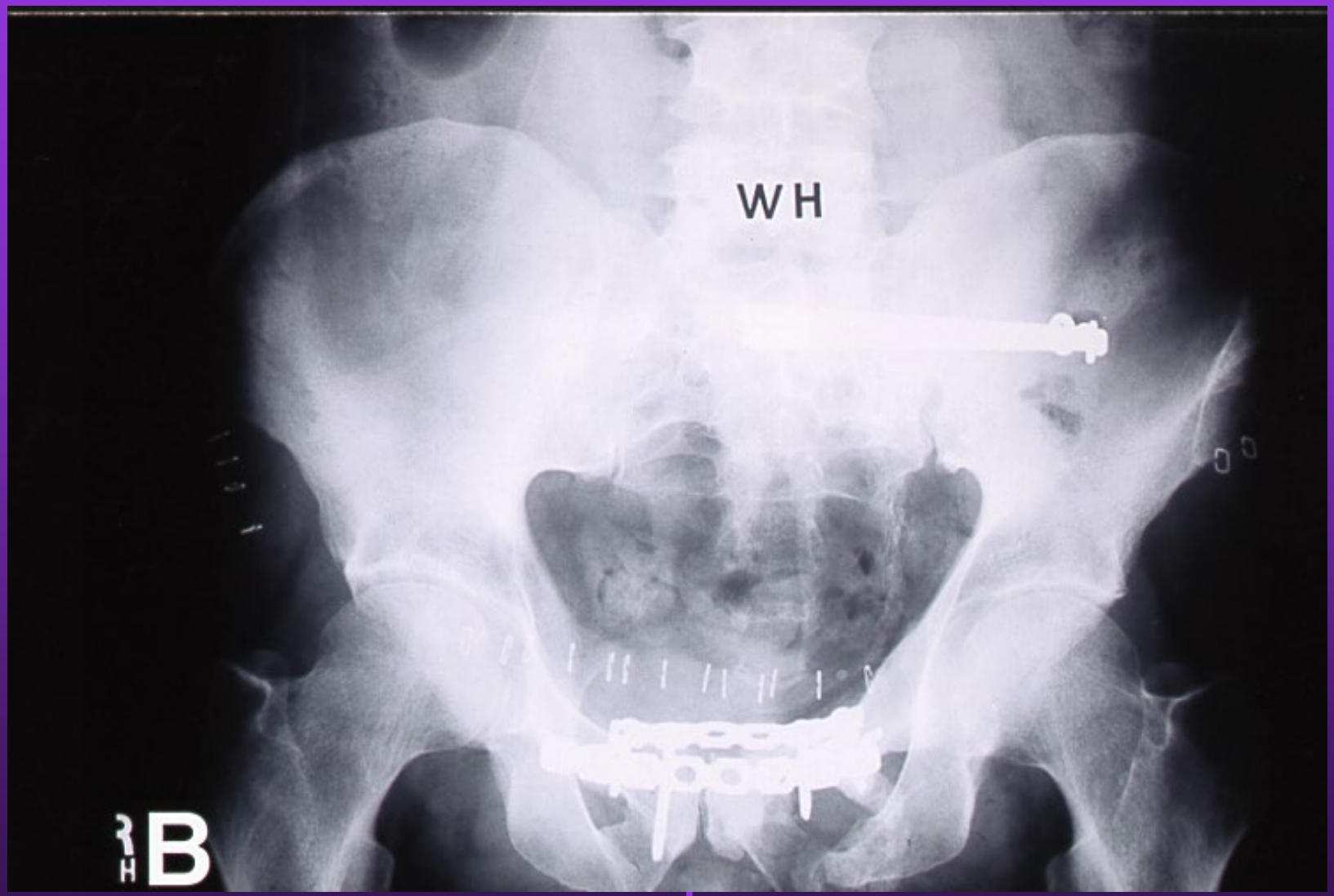

R

Indications

"too painful to mobilize and EUAF (with minimal 5-8lbs of manual compression) yields instability, we stabilize"

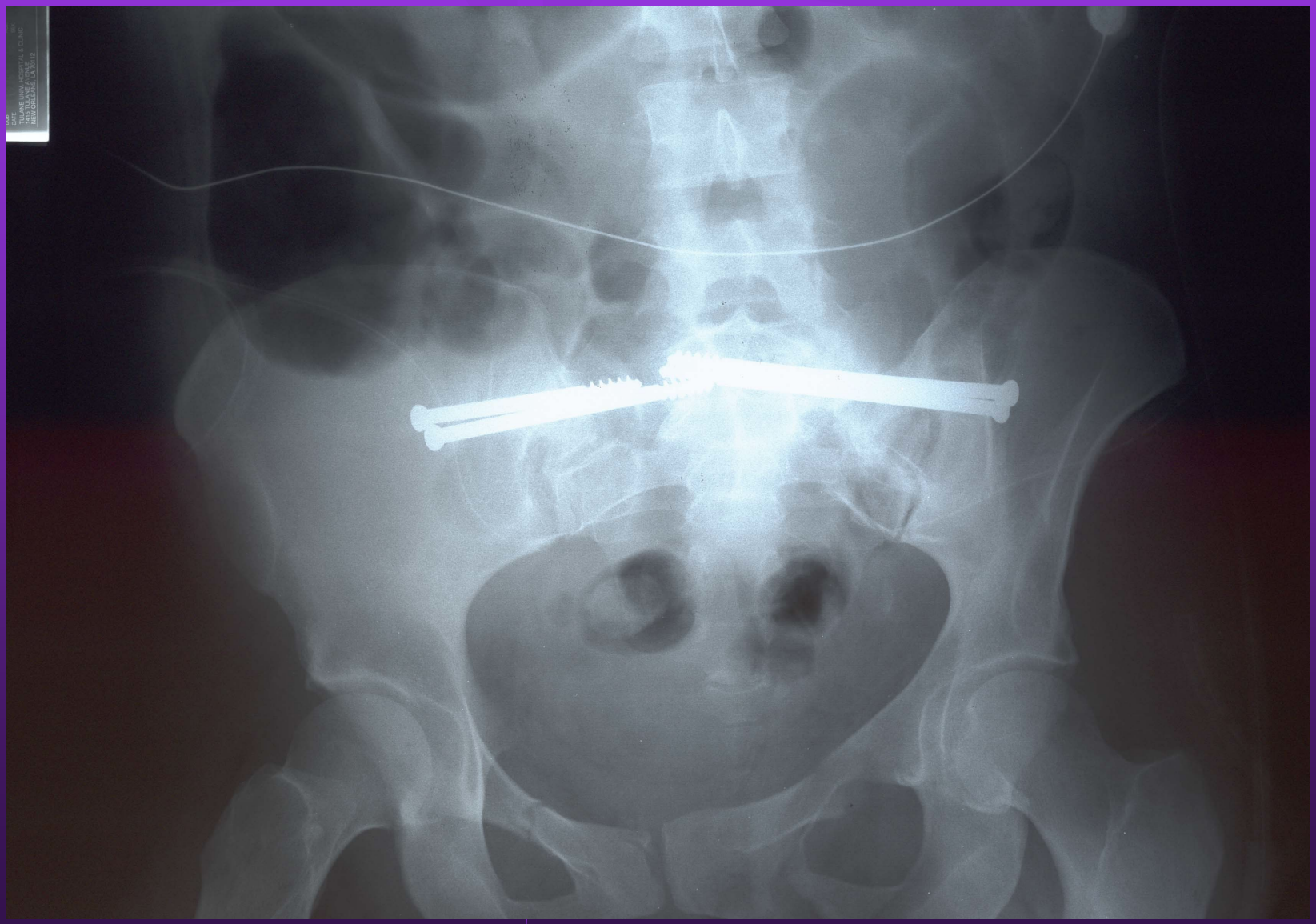

WH
RA


A

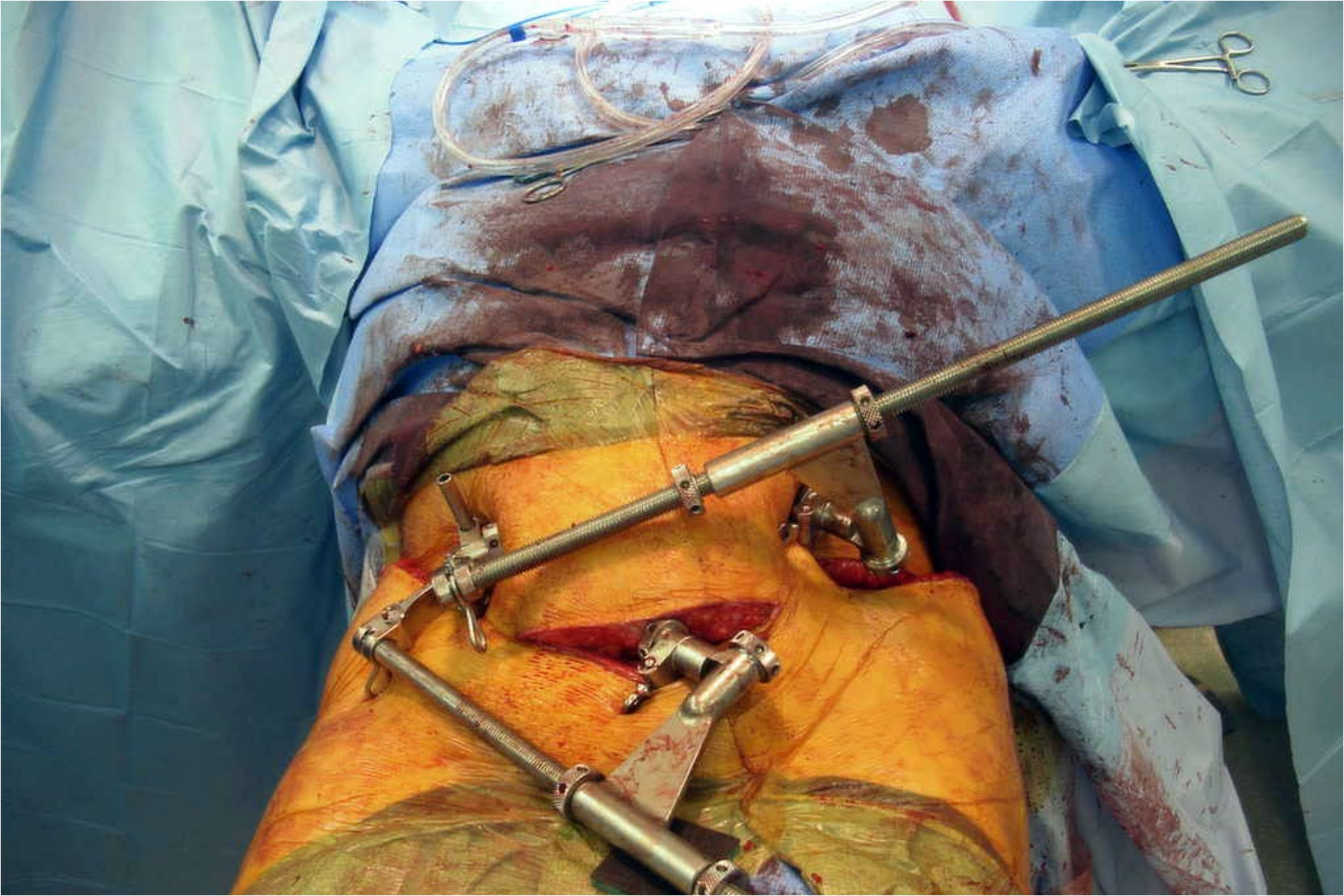

WH
RH
B

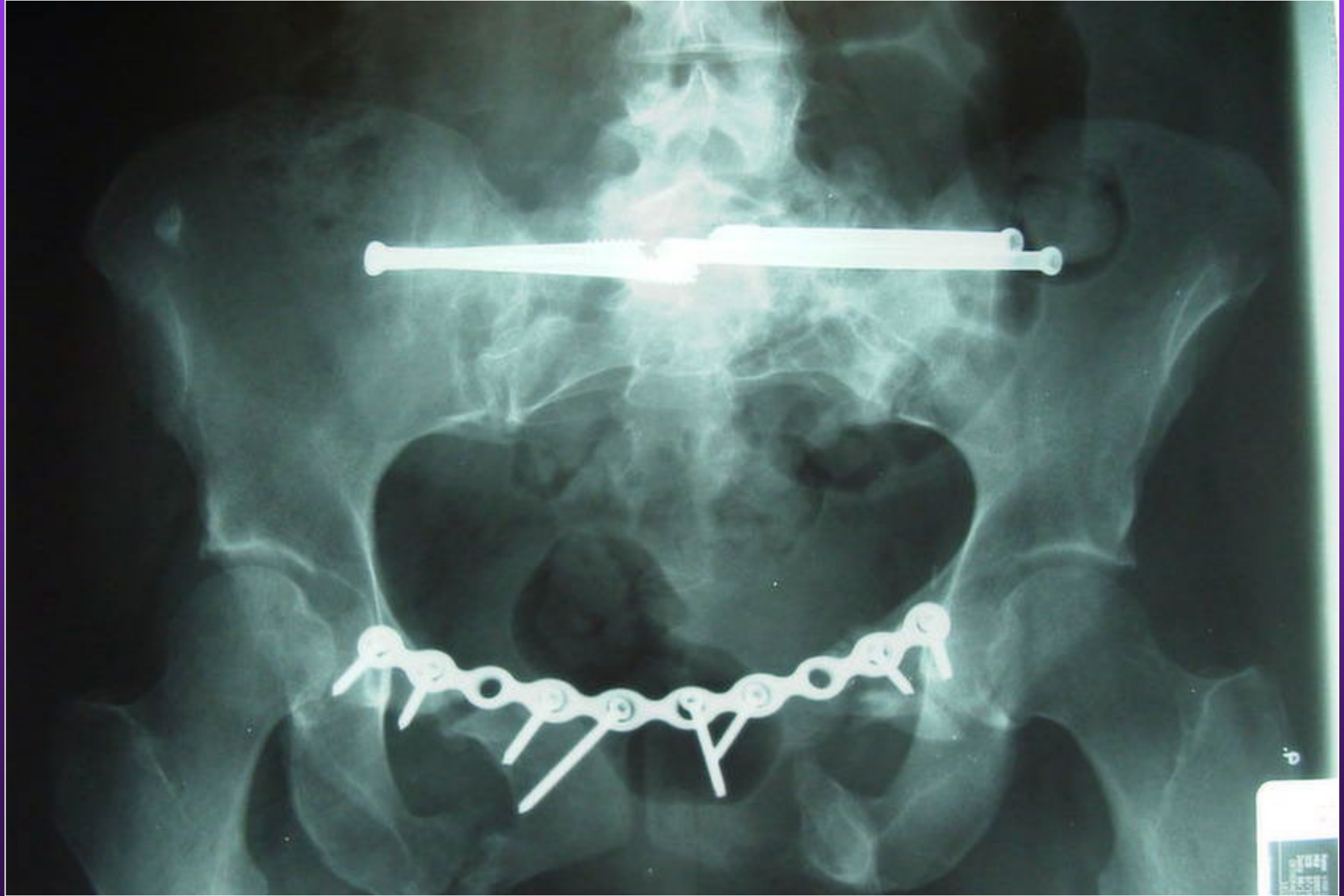
GV-11-11-02

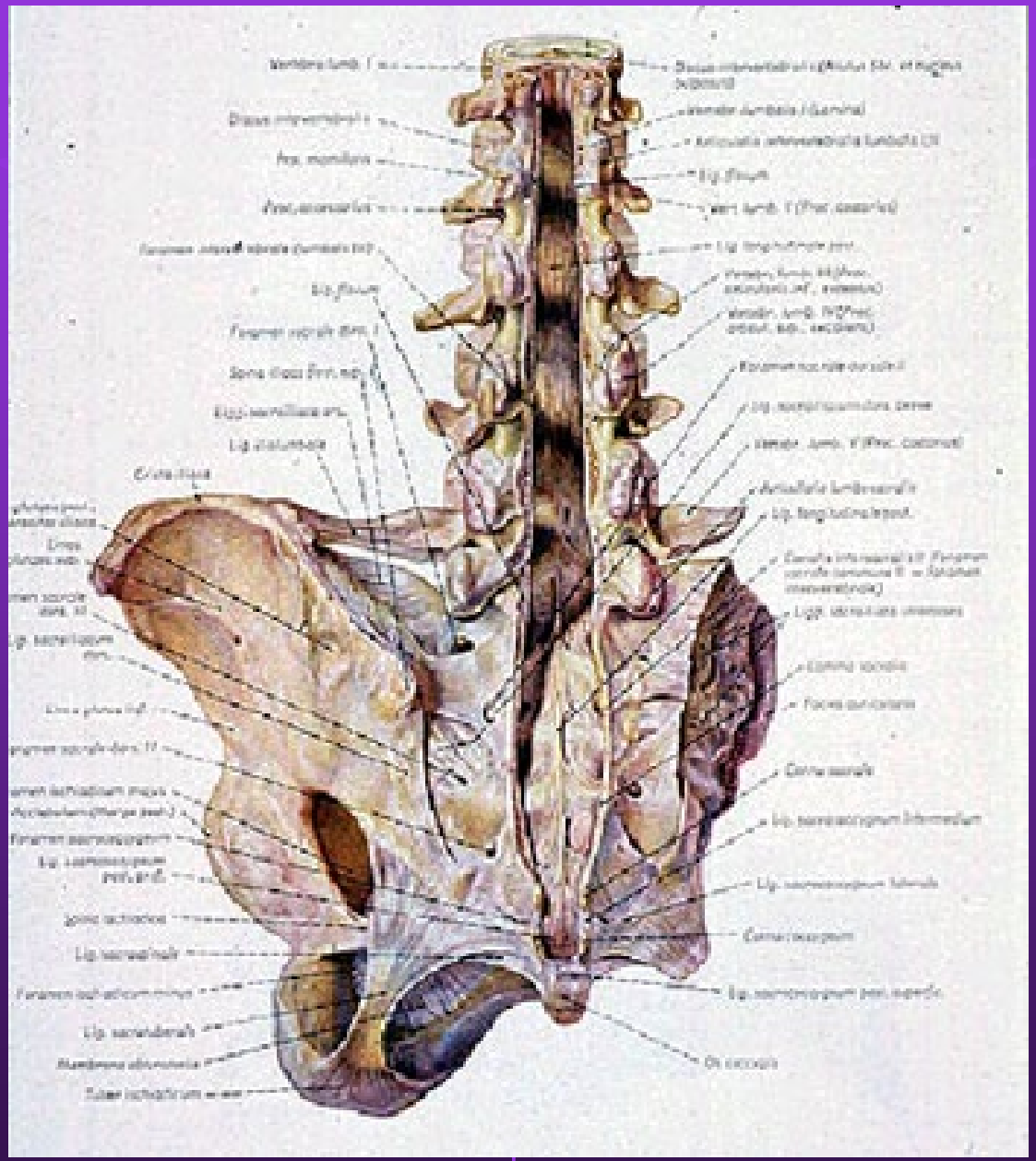
GV-11-21-02



GV-1-15-04

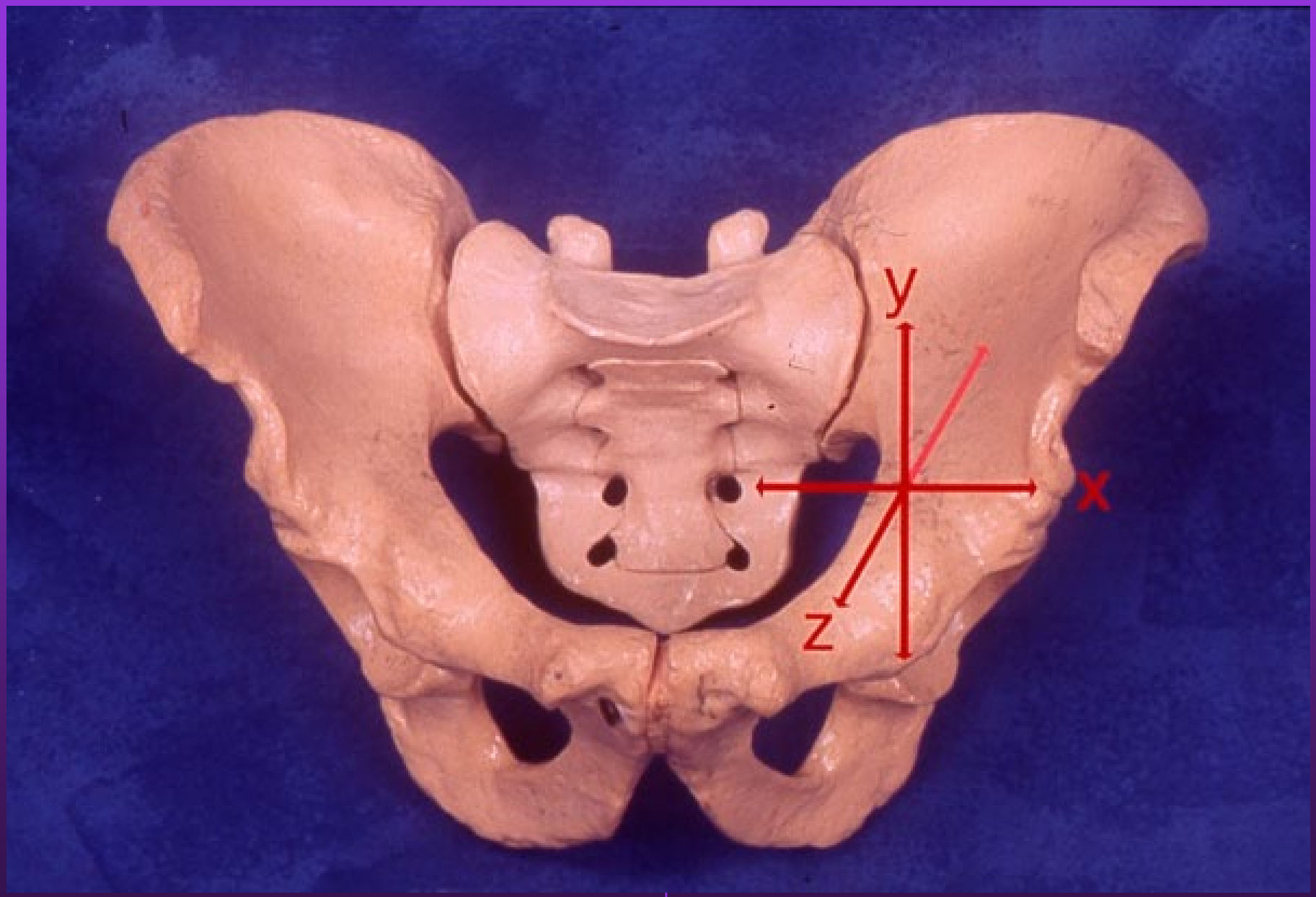





Vertebra lumb. I
Discus intervertebralis
Proc. mamillaris
Proc. accessorius
Lig. flavum
Foramen vertebrale
Spina iliaca post. sup.
Lig. sacroiliacum ant.
Lig. iliolumbale
Crista iliaca
Linea glutea
Spina iliaca post. inf.
Lig. sacrotuberale
Foramen ischiadicum majus
Lig. sacrospinale
Spina ischiadica
Lig. sacrale laterale
Foramen sacrale dorsale I
Lig. sacroiliacum dorsale
Lig. sacrotuberale
Os coxae
Vertebra lumb. I (Arcus vert., Lamina)
Articulatio intervertebralis lumbalis (I)
Lig. flavum
Vert. lumb. I (Proc. costalis)
Lig. longitudinale ant.
Vertebra lumb. III (Proc. costalis inf., foramen)
Vertebra lumb. IV (Proc. costalis inf., sulcus, excisura)
Foramen sacrale dorsale I
Lig. sacroiliacum dorsale
Vertebra lumb. V (Proc. costalis)
Articulatio lumbosacralis
Lig. longitudinale post.
Canalis intervertebralis (Foramen vertebrae lumbalis III = Spatium intervertebrale)
Ligg. iliolumbalia, anteriora
Canalis sacralis
Facies auricularis
Cornua sacralia
Lig. sacrococcygeum intermedium
Lig. sacrococcygeum laterale
Canalis coccygeus
Lig. sacrococcygeum ant. superficiale
Os coxae


Interosseous
sacroiliac ligaments
Posterior
superior
iliac
spine

Determine Stability & Deformity


y
x
z

Translational Deformities

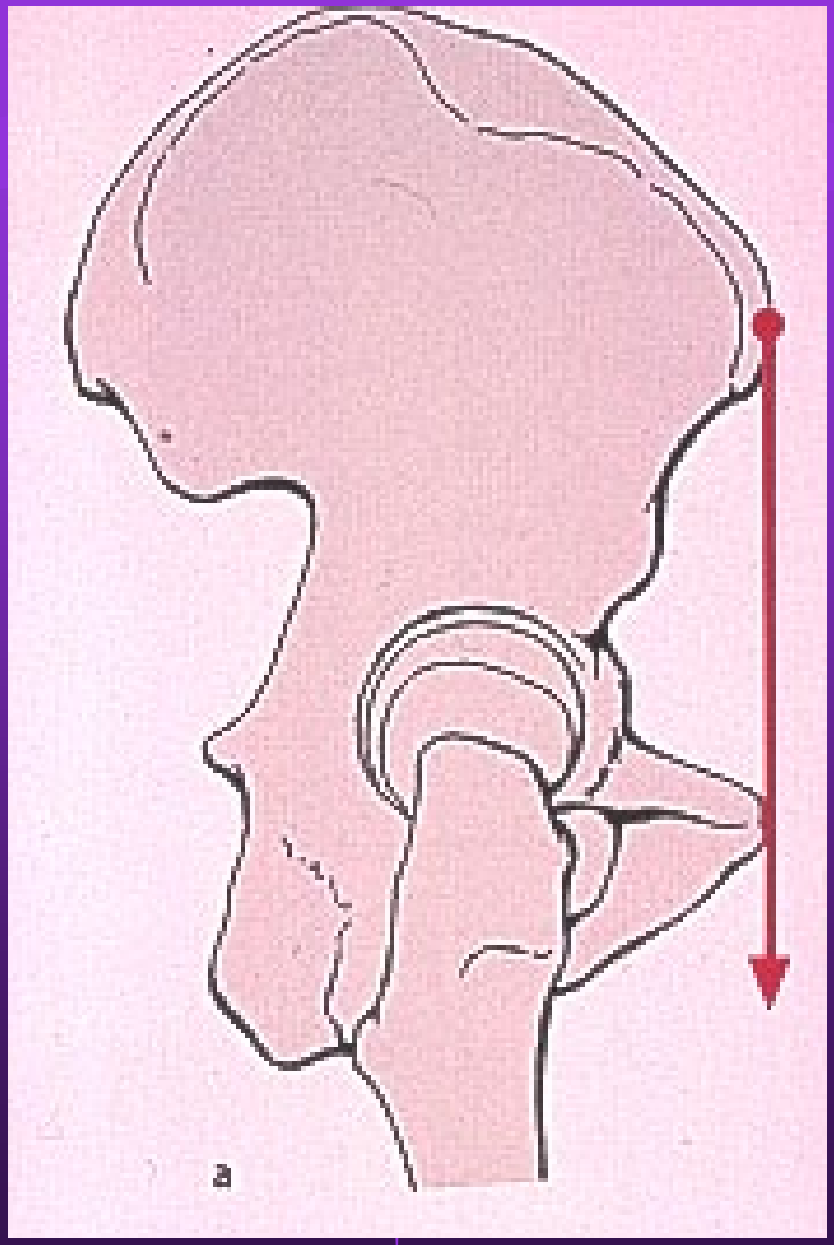
- X axis – Diastasis or impaction
- Y axis – Caudad or cephalad displacement
- Z axis – Anterior or posterior displacement

Rotational Deformities

- X axis – Flexion or extension
- Y axis – Internal rotation or external rotation
- Z axis – Abduction or adduction

Physical Exam

- Symmetrical palpable ASIS, iliac wing, and symphysis
- ASIS compression test
- Iliac wing compression test


a

Radiographic Evaluation

- Anteroposterior view (AP)
- Inlet view (40° caudad)
- Outlet view (40 ° cephalad)
- CT

Good Quality Radiographs are Essential

CT Scan

- Better defines posterior injury
- Amount of displacement versus impaction
- Rotation of fragments
- Amount of comminution
- Assess neural foramina

CT Scan

- Better defines posterior injury
- Amount of displacement versus impaction
- Rotation of fragments
- Amount of comminution
- Assess neural foramina

Radiographic Signs of Instability

- Sacroiliac displacement of 5 mm in any plane
- Posterior fracture gap (rather than impaction)
- Avulsion of fifth lumbar transverse process, lateral border of sacrum (sacrotuberous ligament), or ischial spine (sacrospinous ligament)

Operative Indications

- Hemodynamic Instability (bp<90 binder, sheet, exfix)
- Open pelvic injury
- Progressive neurologic deterioration
- Avulsions >1cm

Indications cont.

- Lateral compression injury with >1cm of leg length discrepancy, >15° IR, or impingement of the rectum, bladder, or vaginal vault
- Open book >1cm with symptoms (2.5cm)

Indications cont.

- Unstable posterior ring radiographically (with a posterior fracture gap or widening of the SI joint 5mm) and clinically. Rami > 1.5cm of displacement

Nonoperative Management

- Anterior ring injury with non or minimally displaced posterior injury

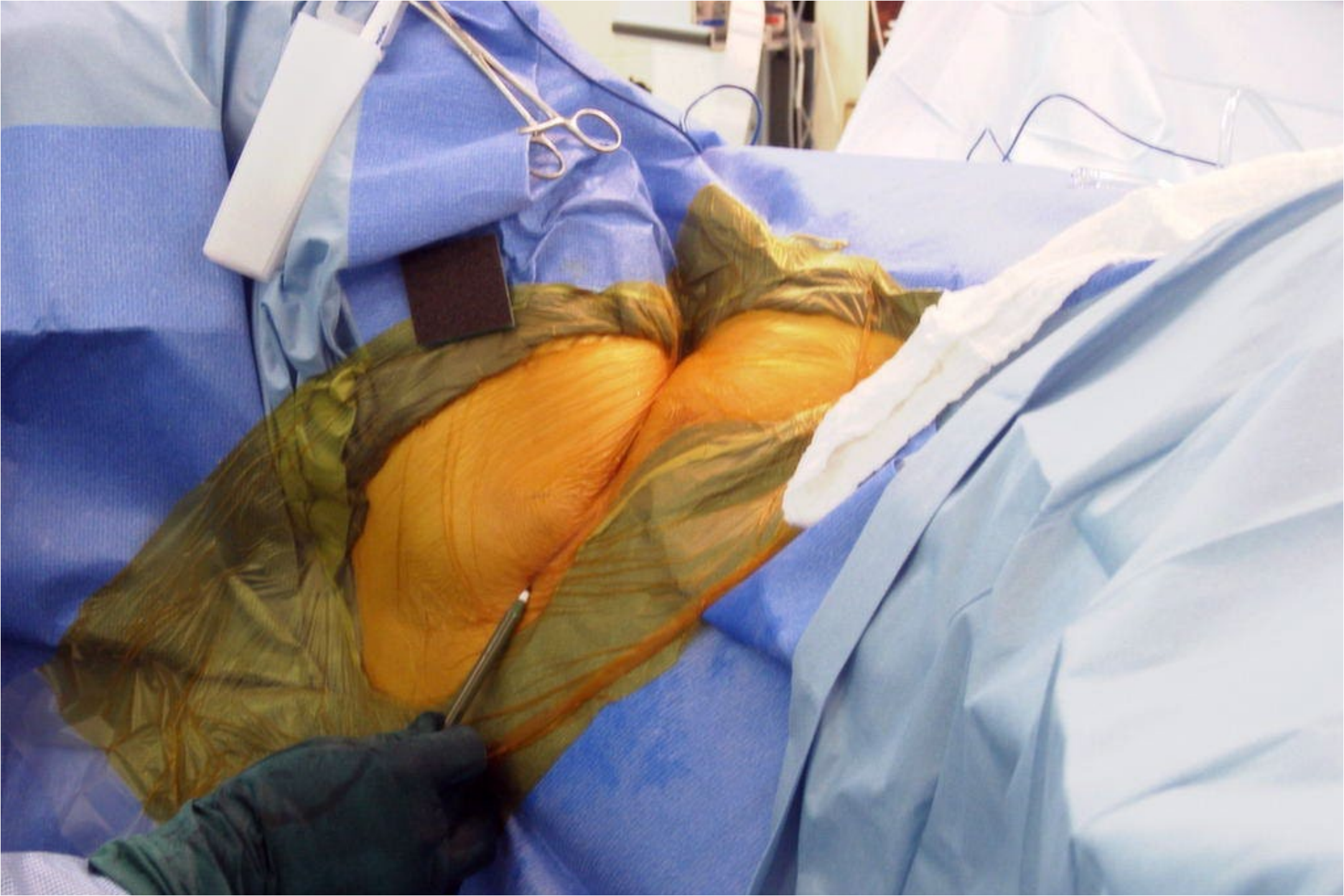
Techniques

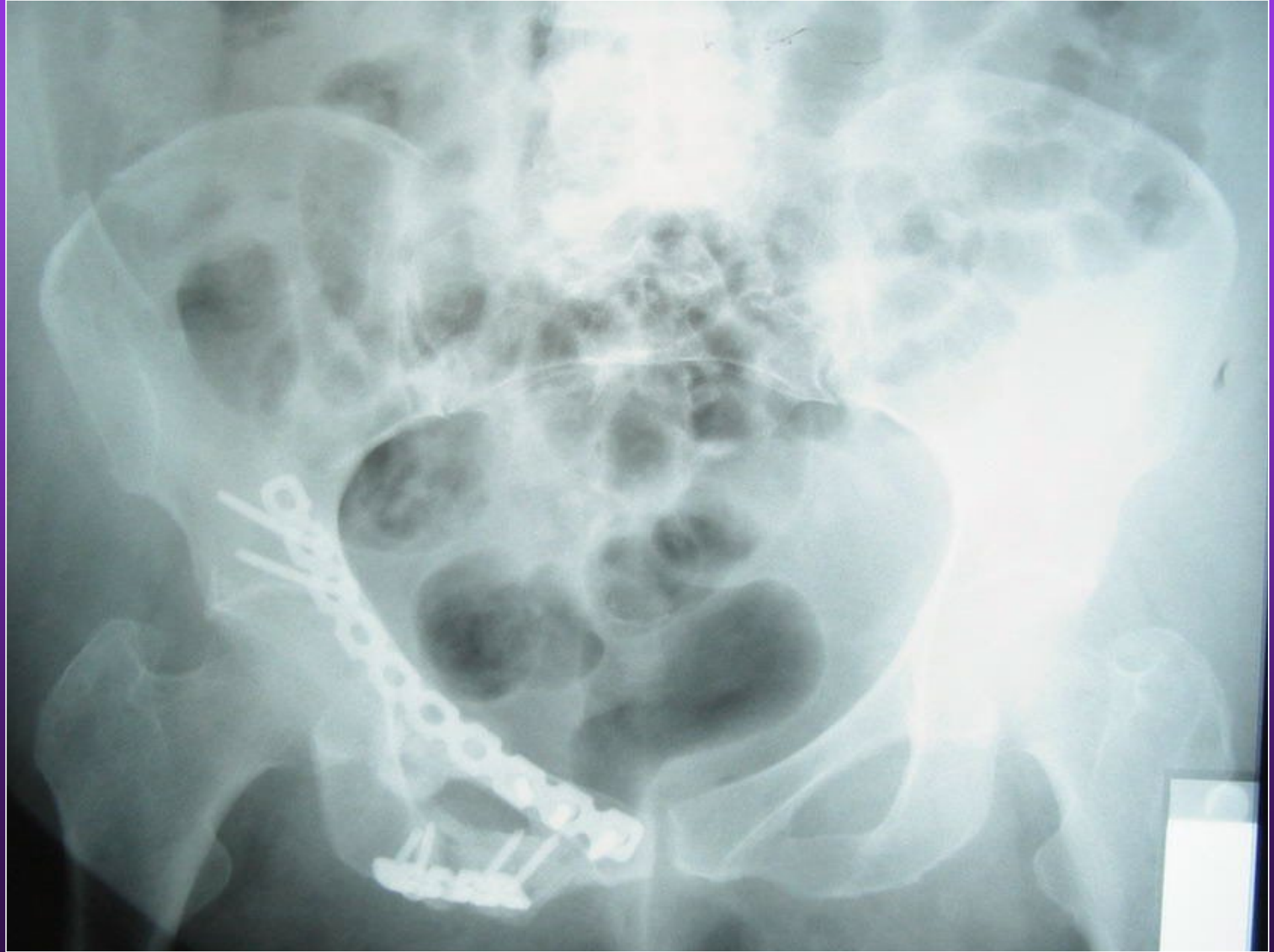
- Pubic Ramus Fractures
  - –ORIF if distracted over 1.5 cm
  - –Or significantly rotated to impinge on vaginal vault, bladder, or rectum (‘tilt fracture’)

Techniques

- Pubic Ramus Fractures
  - –Rarely repaired in Bucholz type II fractures
    - Matta series-over 84 percent treated nonoperatively, even in unstable injuries treated posteriorly (Bucholz III or Tile C)


R
174
kV 120
mA 265
Large
2.500mm/3.75 0.75:1

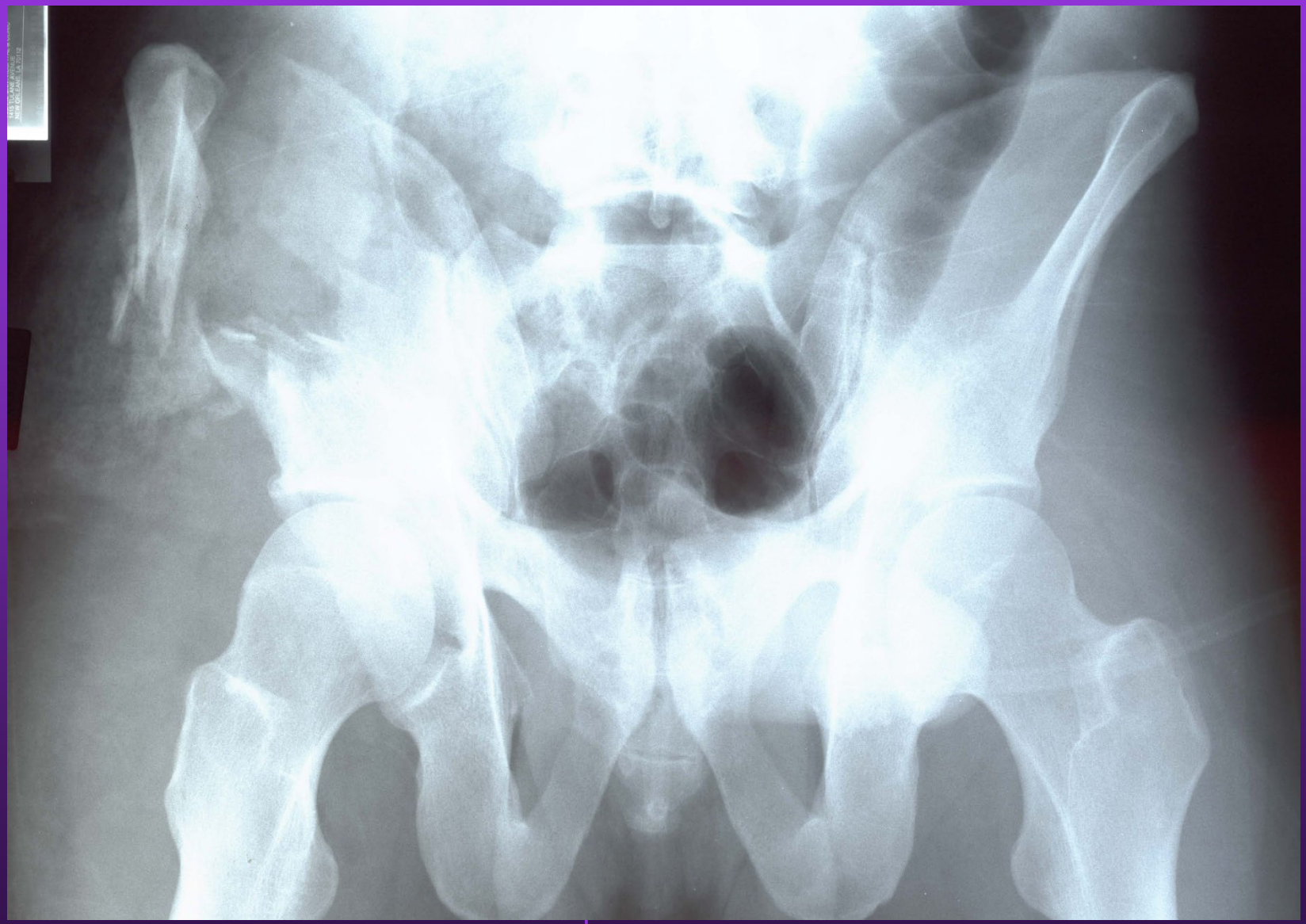




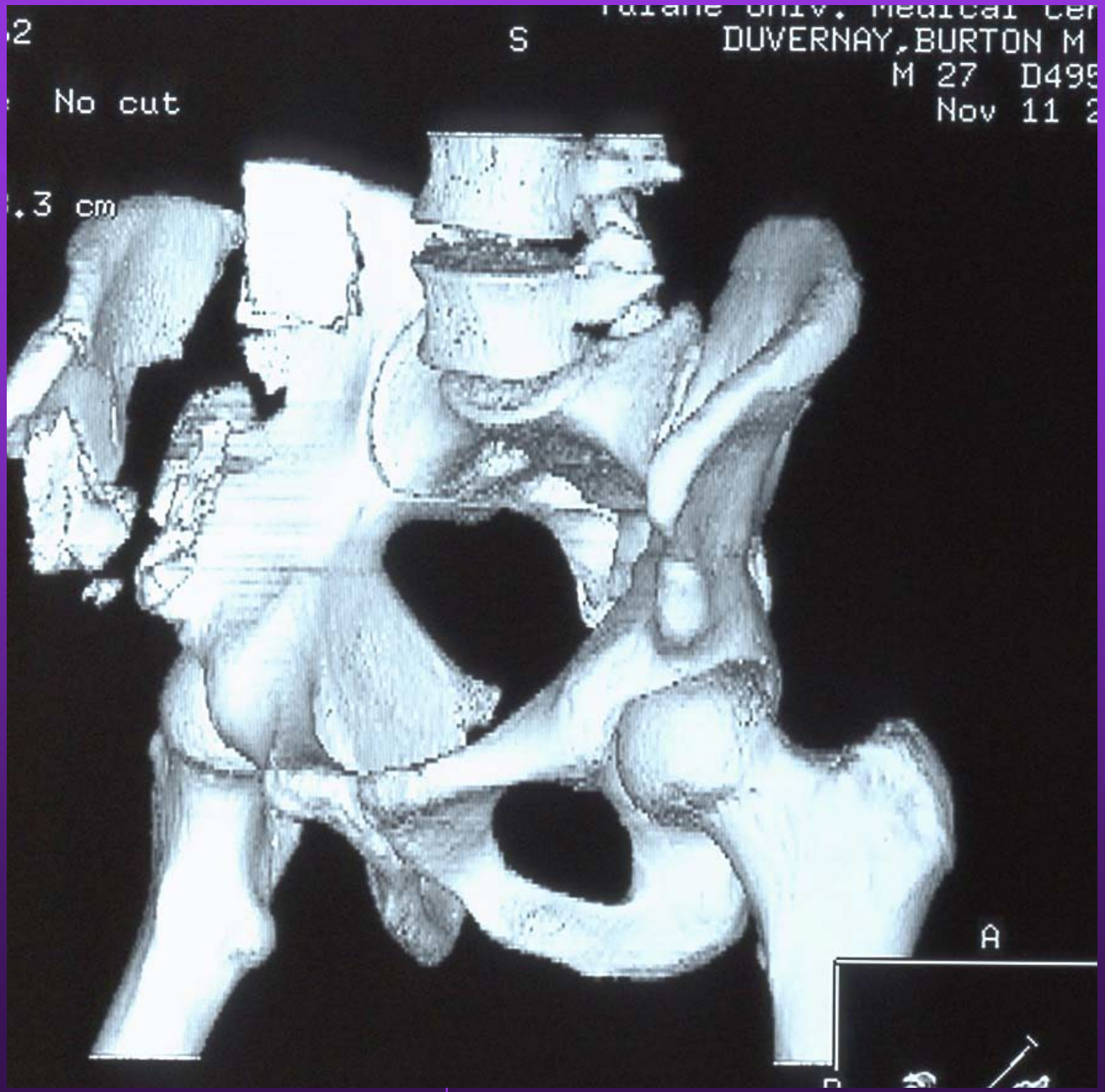
A Fractures – Ring Intact

- A-1 – Fracture of innominate bone; avulsion
- A-2 – Fracture of innominate bone; direct blow
- A-3 – Transverse fracture of sacrum and coccyx

BD-11-11-02



BD-11-11-02

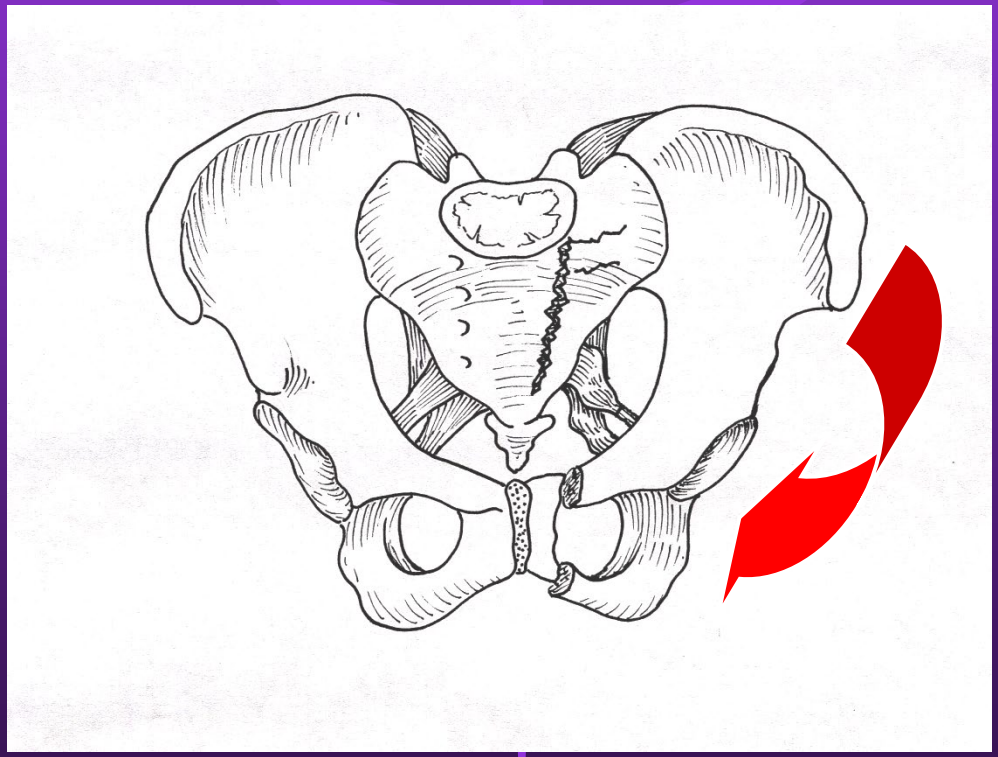


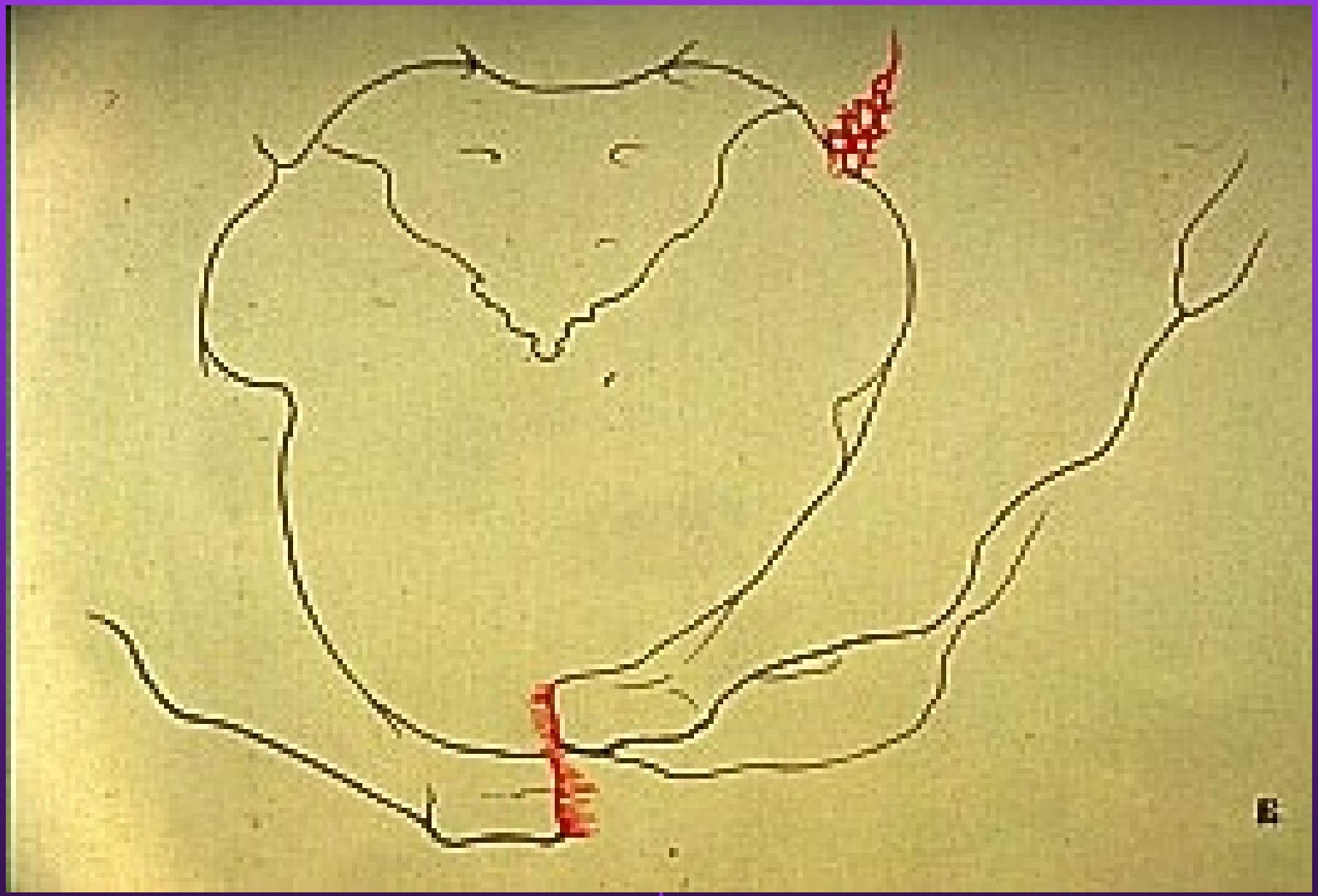
Lateral Compression

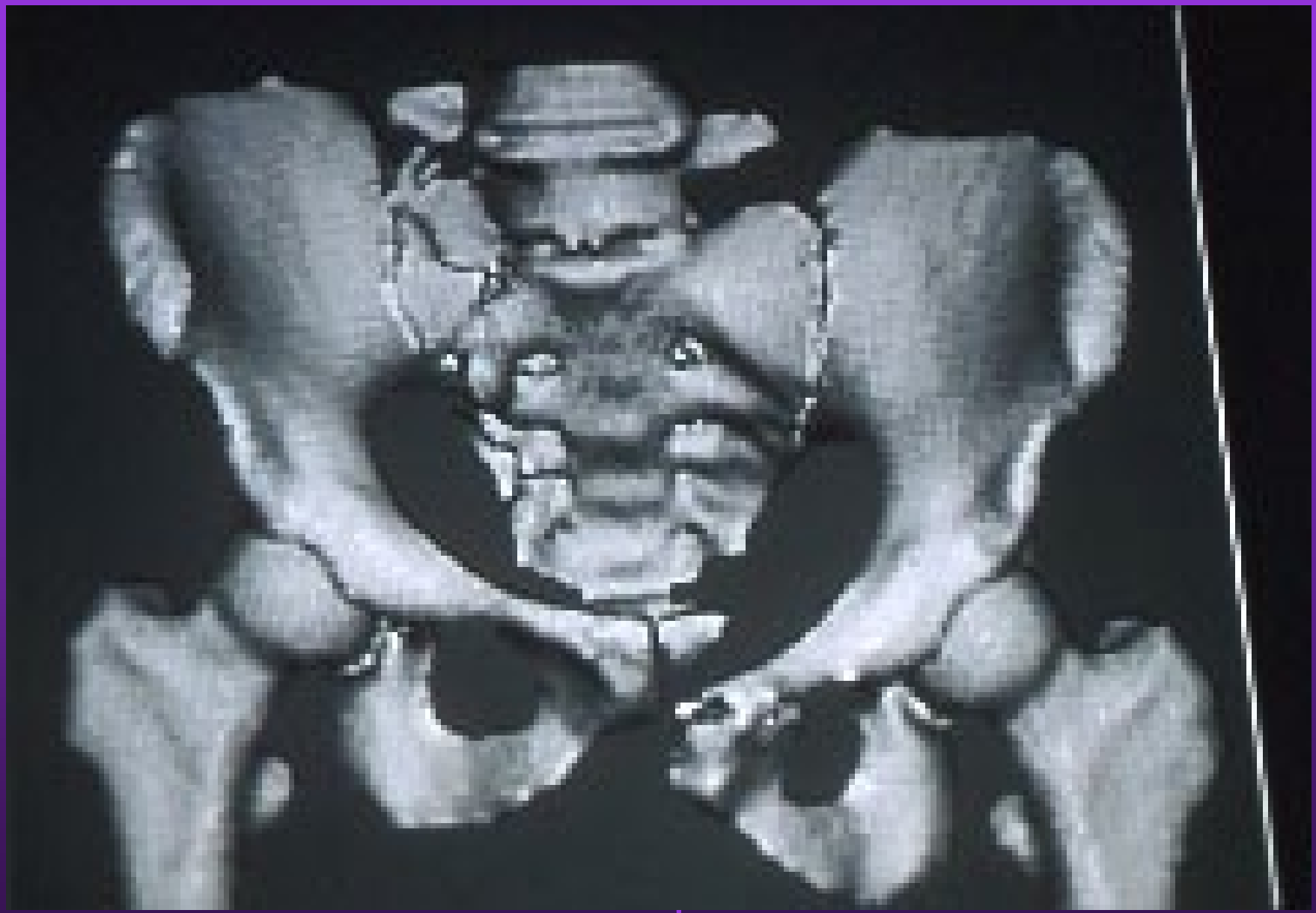
- LC-1 – Ant. superior inf. rami or symphysis and compression of sacrum same side
- LC-2 - LC-1 – anteriorly and posteriorly crescent fracture near anterior border at SI joint → Ileum rotated internally

Lateral Compression

LC I: Sacral compression

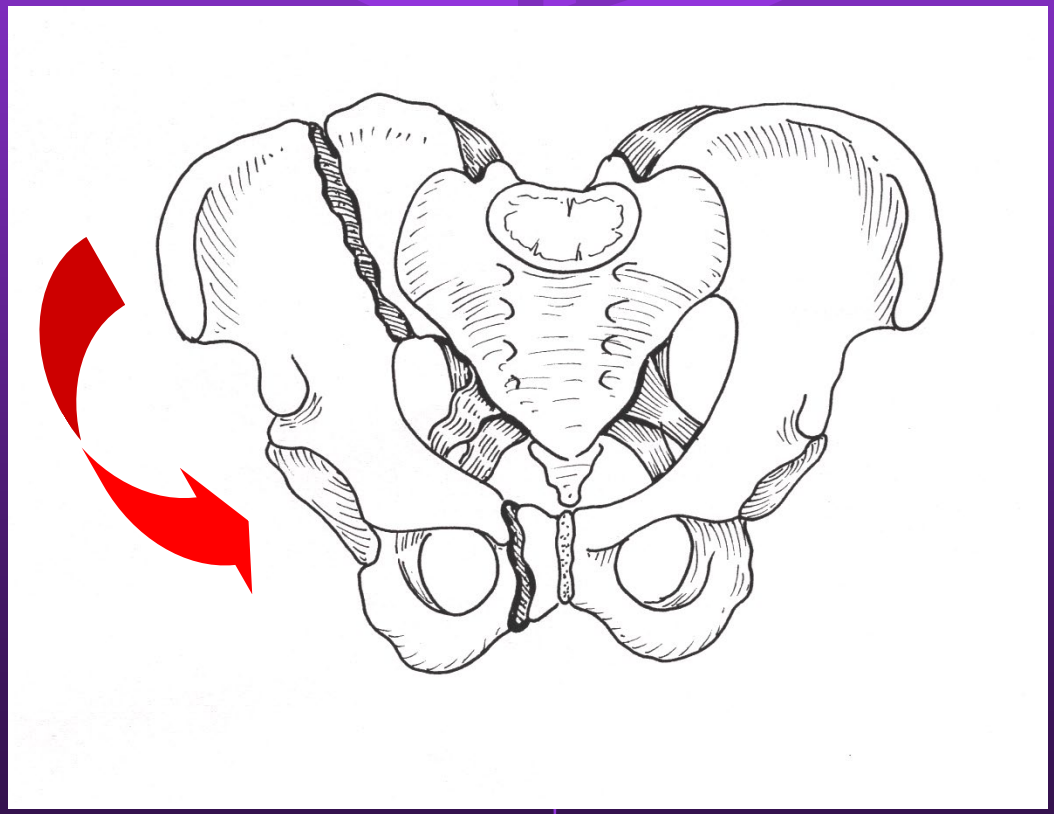


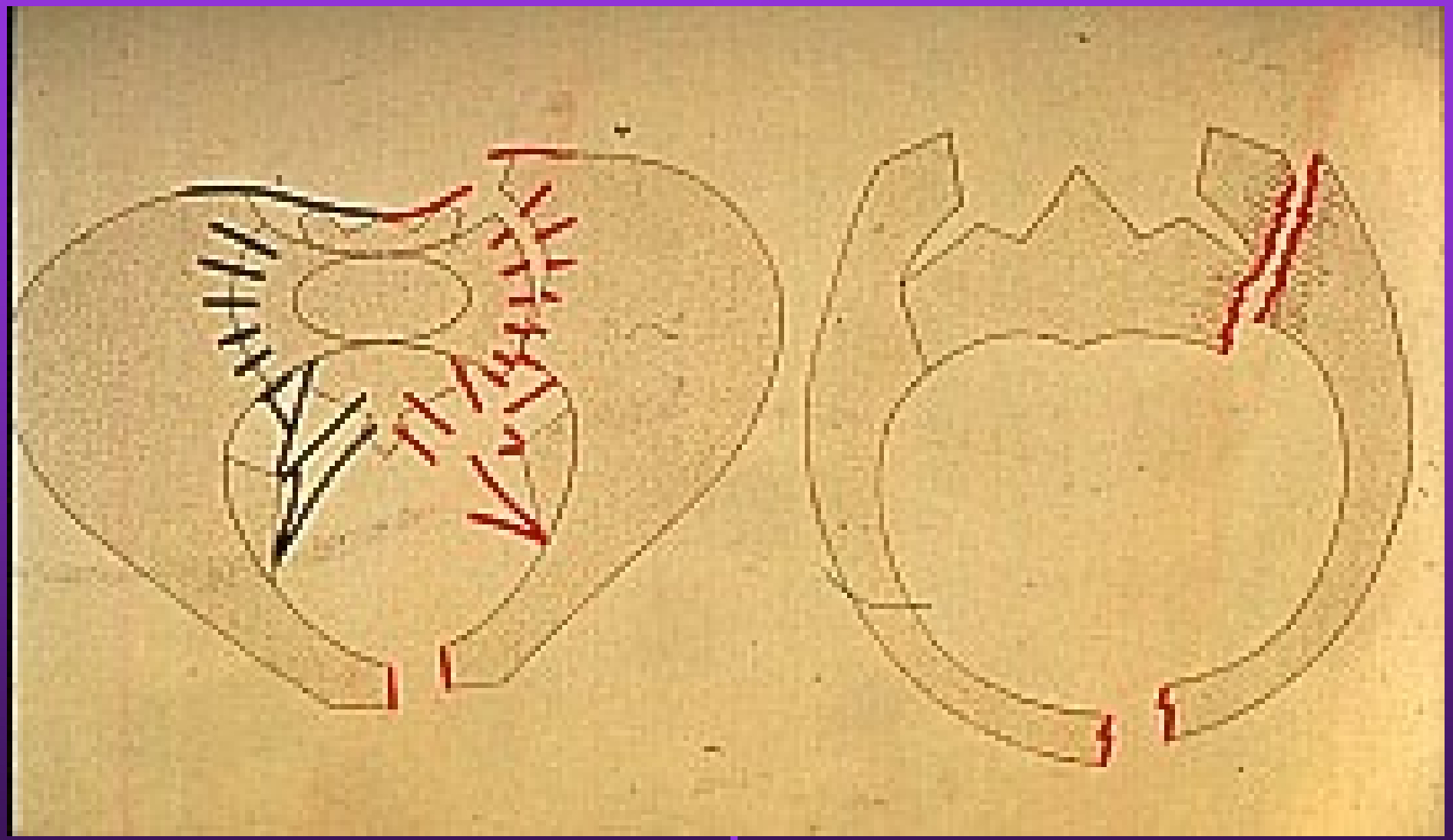

E



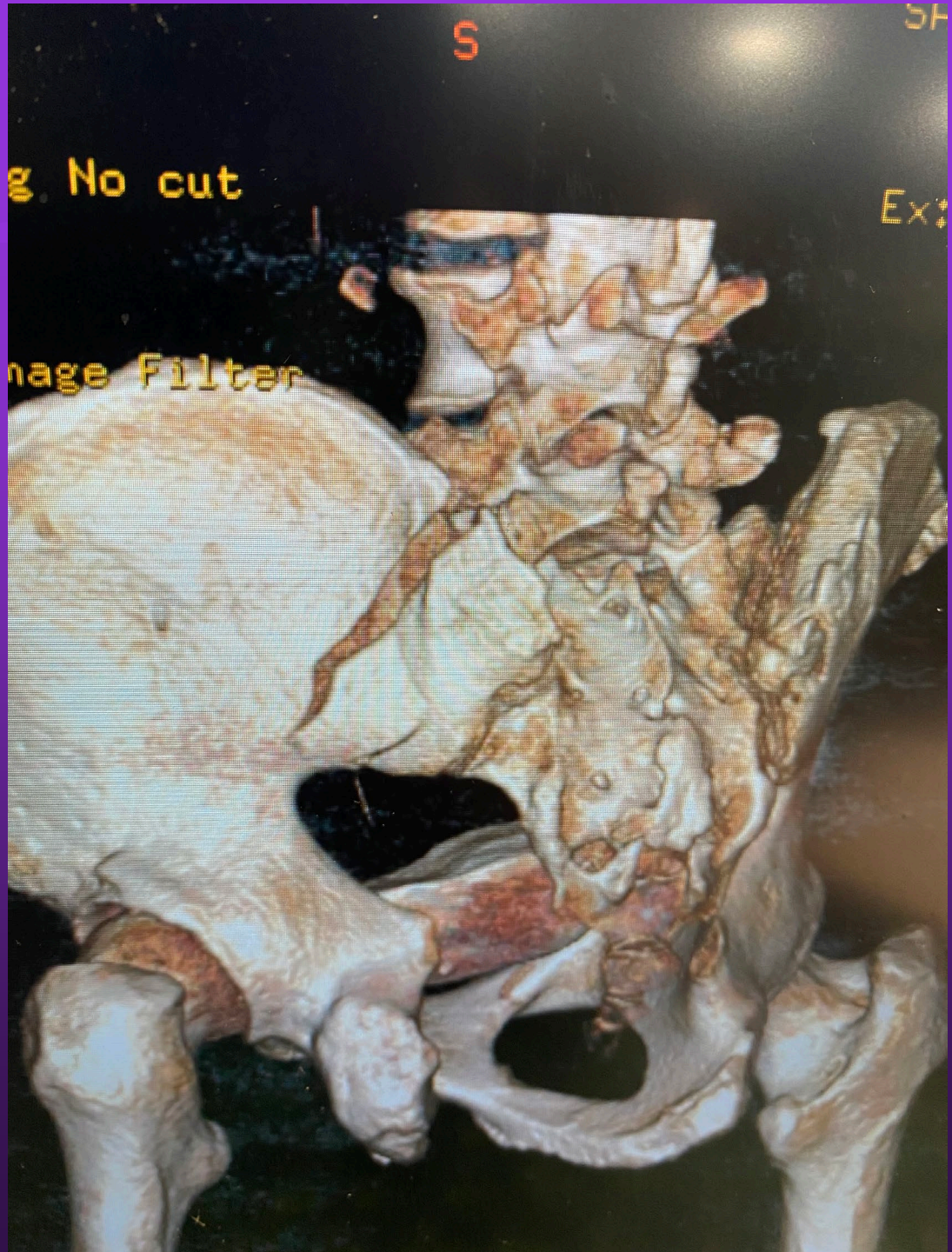
Lateral Compression

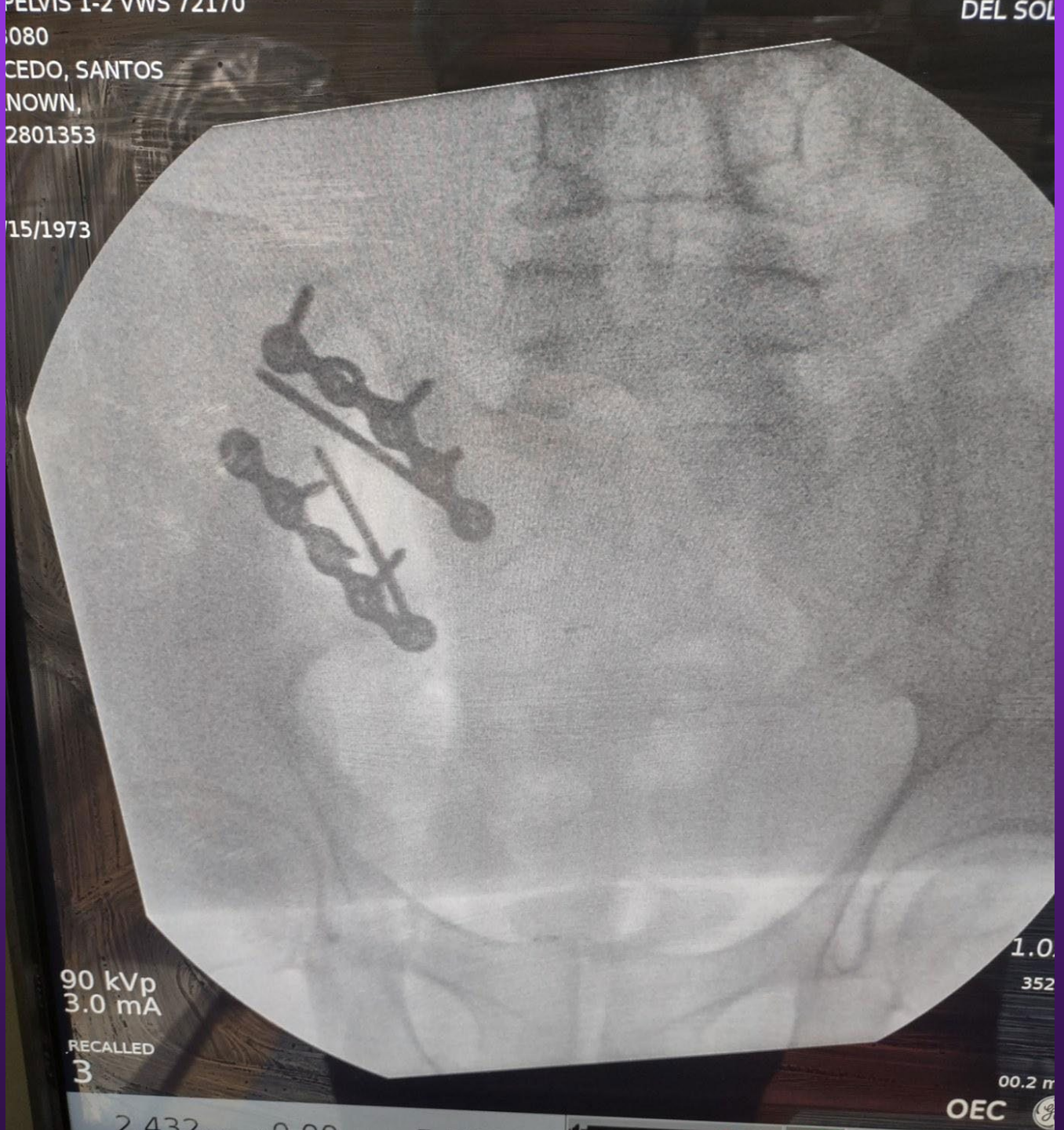
LC II: Iliac wing fracture






KM
8-15-94

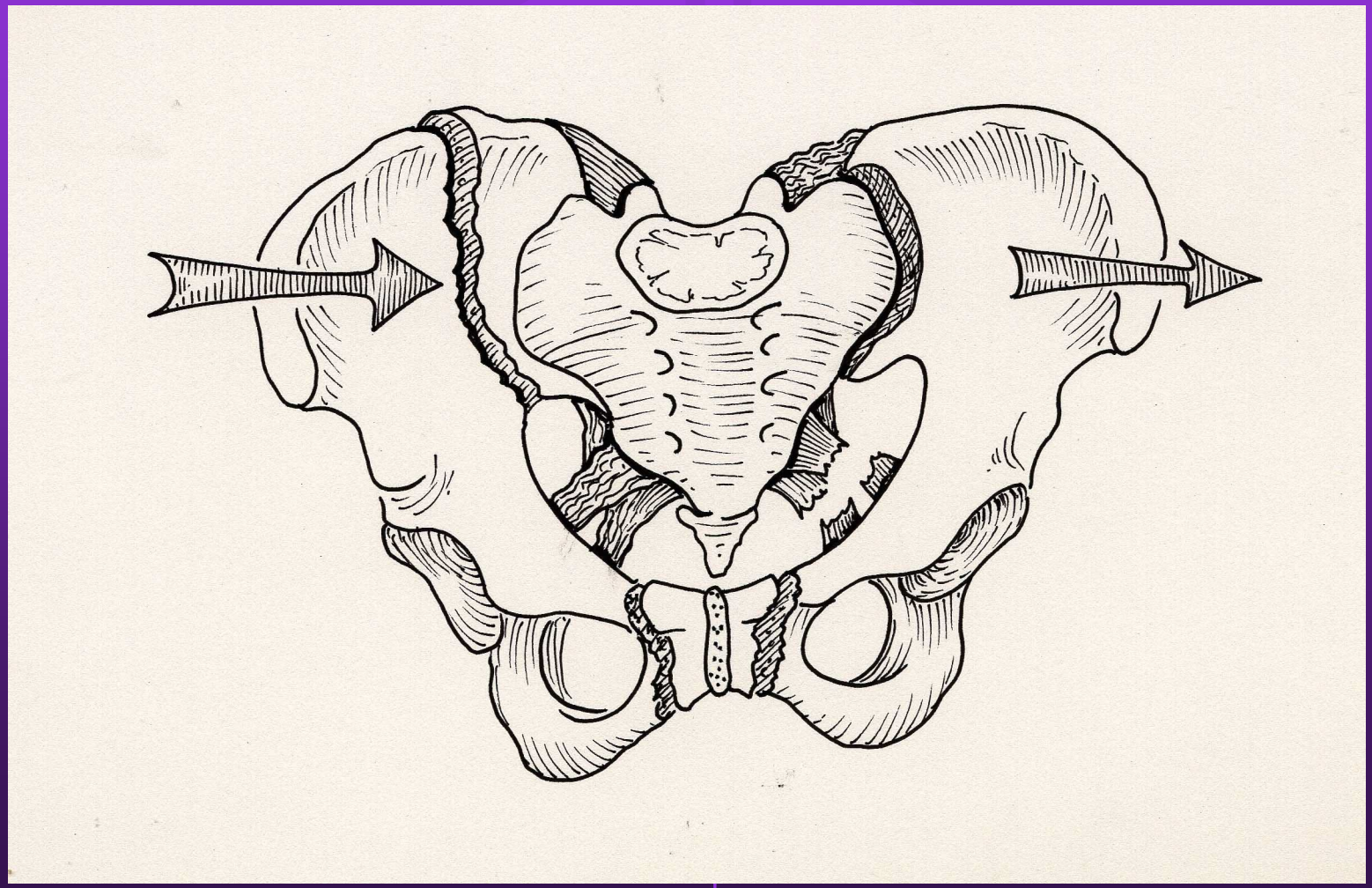

S
g No cut
nage Filter


PELVIS 1-2 VWS 72170
3080
CEDO, SANTOS
NOWN,
2801353
/15/1973
DEL SOL
90 kVp
3.0 mA
RECALLED
3
OEC

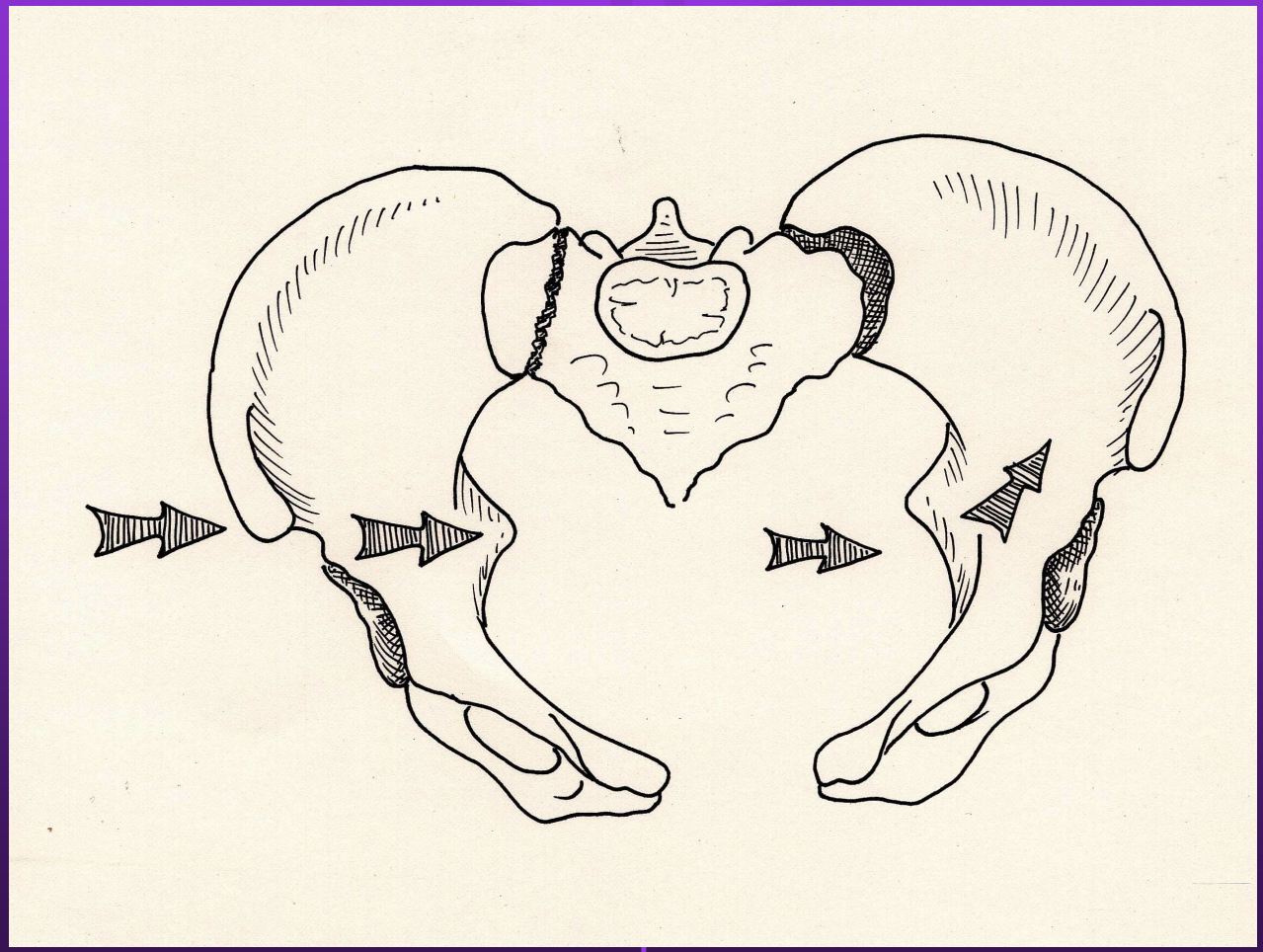
LC (cont.)

- LC-3 – Windswept pelvis – LCI or II on one side of the pelvis and open book (APC) on contralateral side (roll over mechanism by IR on LC side and ER on contralateral side)

LC III: "Windswept pelvis"

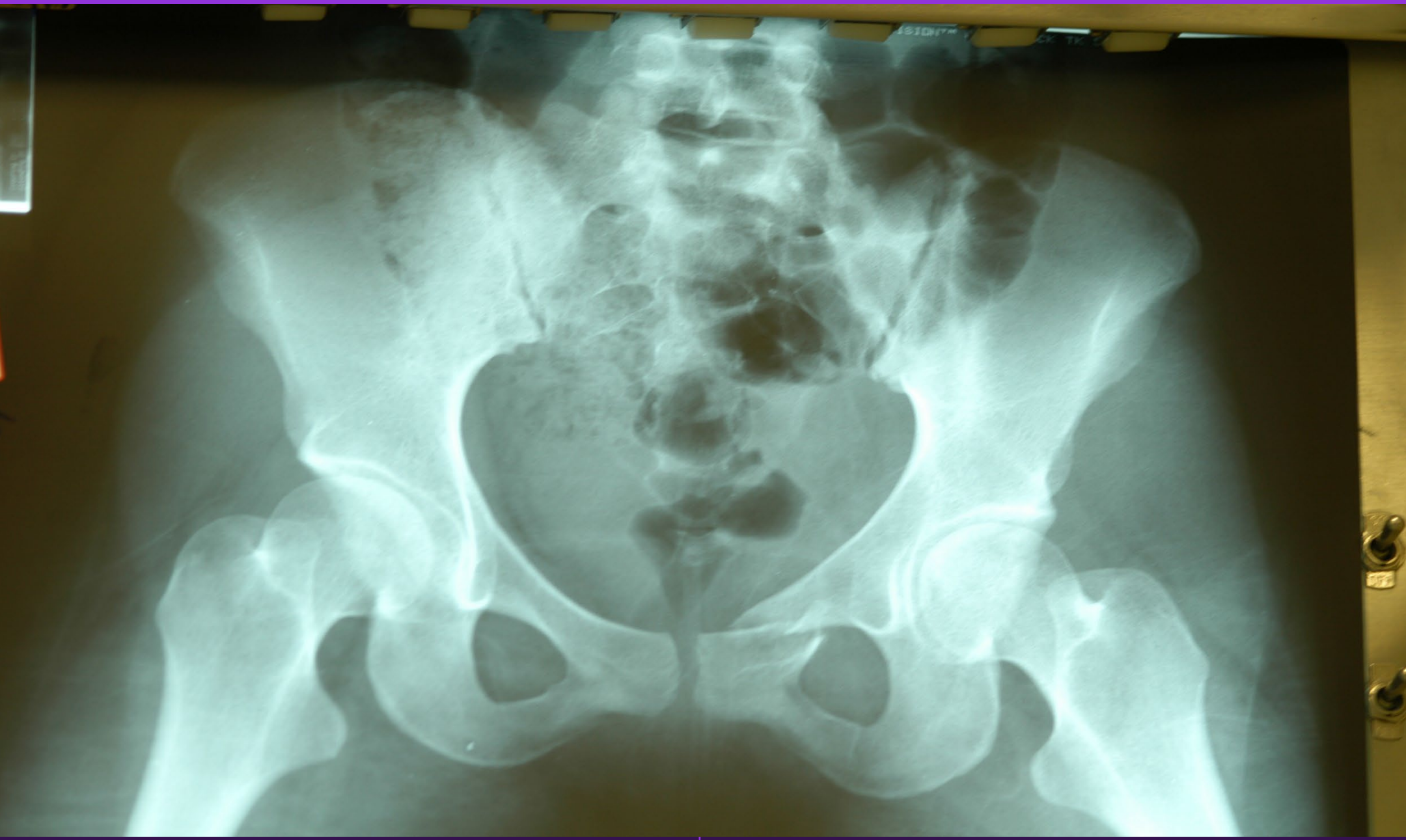


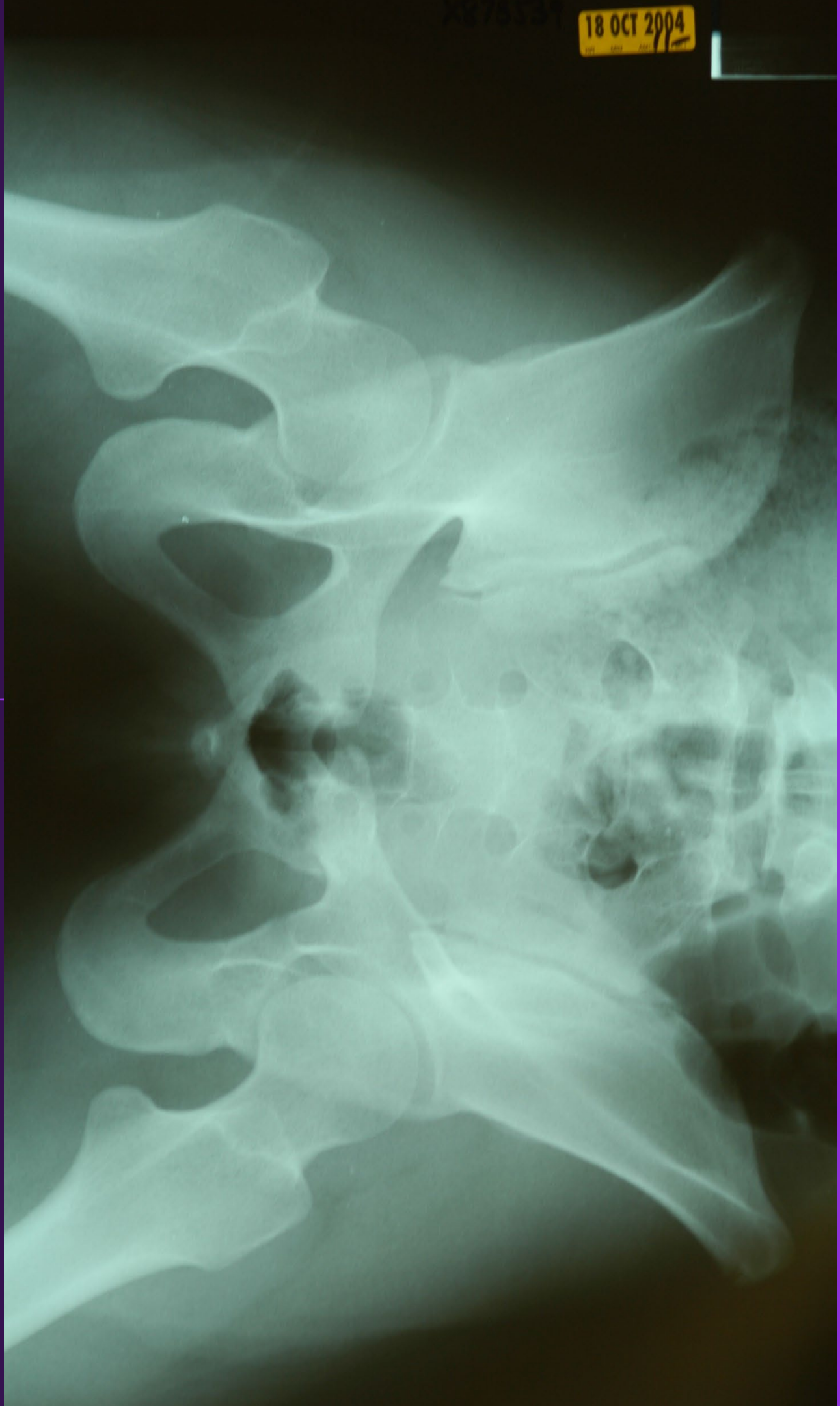
LC III



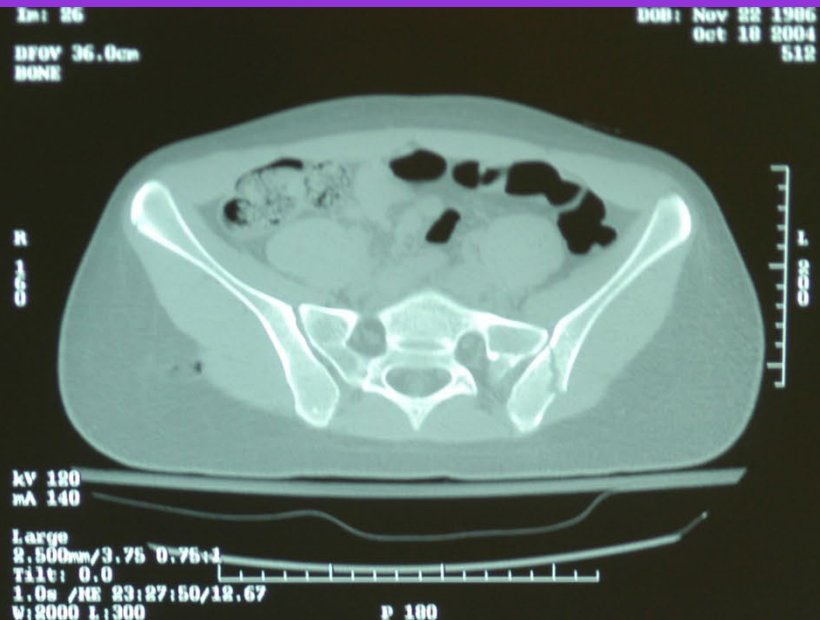
GV-11-11-02

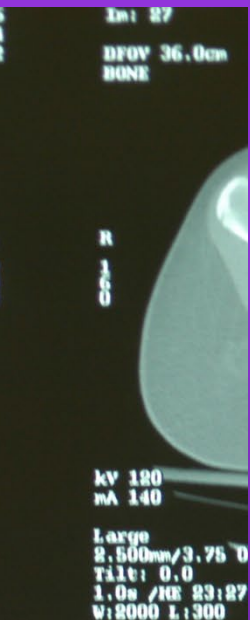
Anterior ring injury with partial posterior ring injury (i.e. open book lateral compression > 20° rotation or > 1 cm LLD)



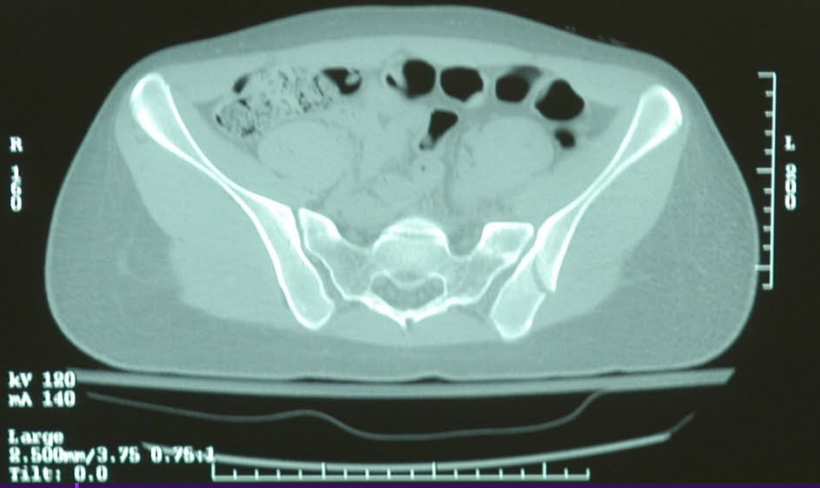

18 OCT 2004

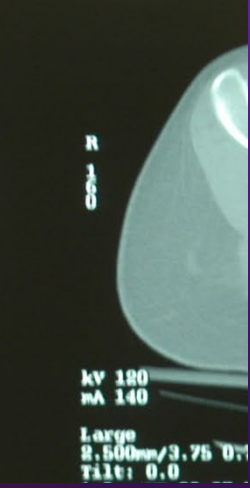

Im: 25
DOB: Nov 22 1906
Oct 18 2004
512
DFOV 36.0cm
DONE
R
L
kV 120
mA 140
Large
2.500mm/3.75 0.75+1
Tilt: 0.0
1.0s /HE 23:27:50/12.16
W:2000 L:300
P 180
LightSpeed Plus SYS#CT99_OCO
A 180
Tulane Univ. Medical Center
Ex: 23602
Se: 2
IC I180.60
Im: 29
CORMIER,DEAVON
F 17 873427
DOB: Nov 22 1906
Oct 18 2004
512
DFOV 36.0cm
DONE

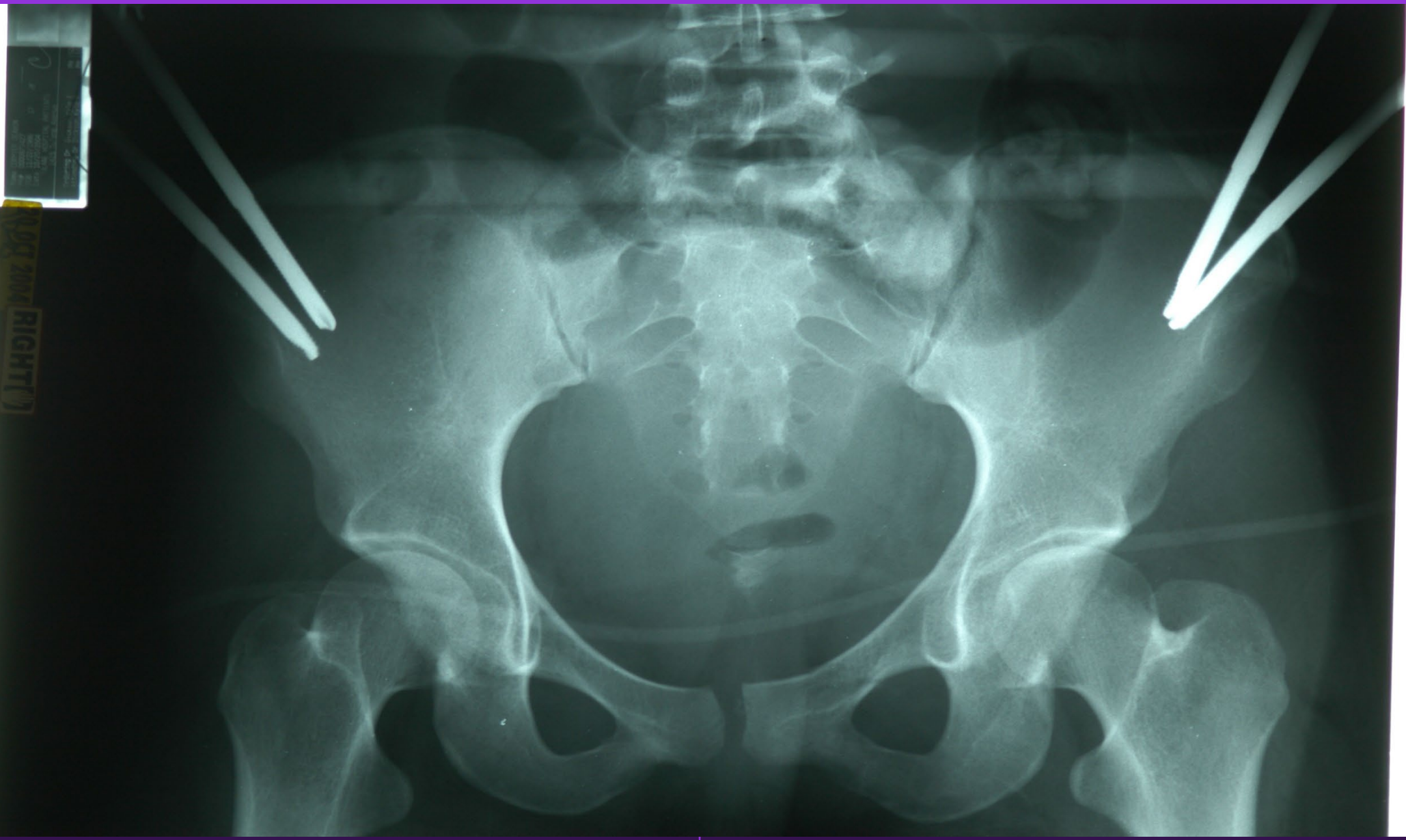

Im: 26
DOB: Nov 22 1906
Oct 18 2004
512
DFOV 36.0cm
DONE
R
L
kV 120
mA 140
Large
2.500mm/3.75 0.75+1
Tilt: 0.0
1.0s /HE 23:27:50/12.67
W:2000 L:300
P 180
LightSpeed Plus SYS#CT99_OCO
A 180
Tulane Univ. Medical Center
Ex: 23602
Se: 2
IC I182.59
Im: 30
CORMIER,DEAVON
F 17 873427
DOB: Nov 22 1906
Oct 18 2004
512
DFOV 36.0cm
DONE

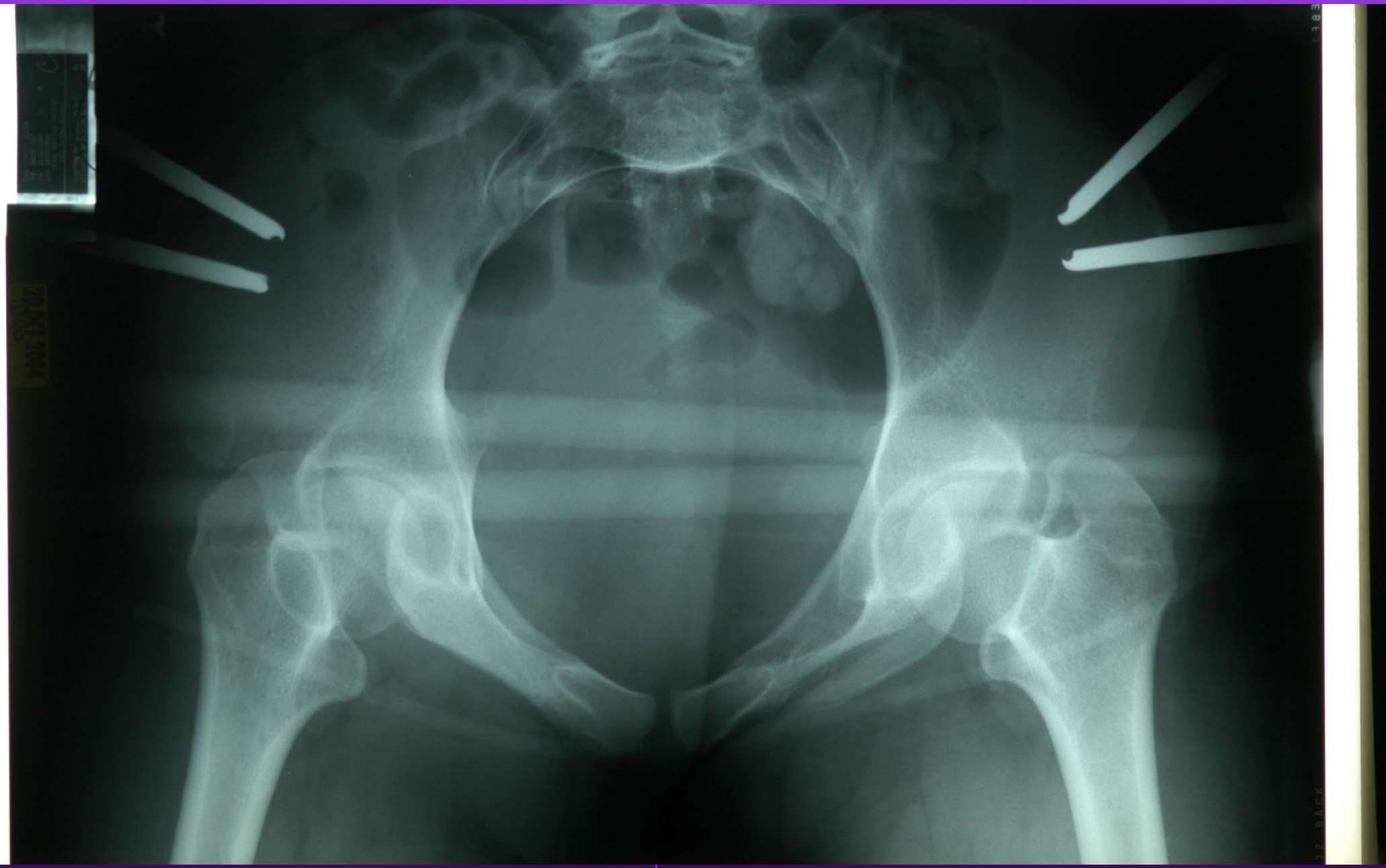

Im: 27
DFOV 36.0cm
DONE
R
L
kV 120
mA 140
Large
Tilt: 0.0
W:2000 L:300
LightSpeed Plu
Ex: 23602
Se: 2
IC I184.49
Im: 31
DFOV 36.0cm
DONE

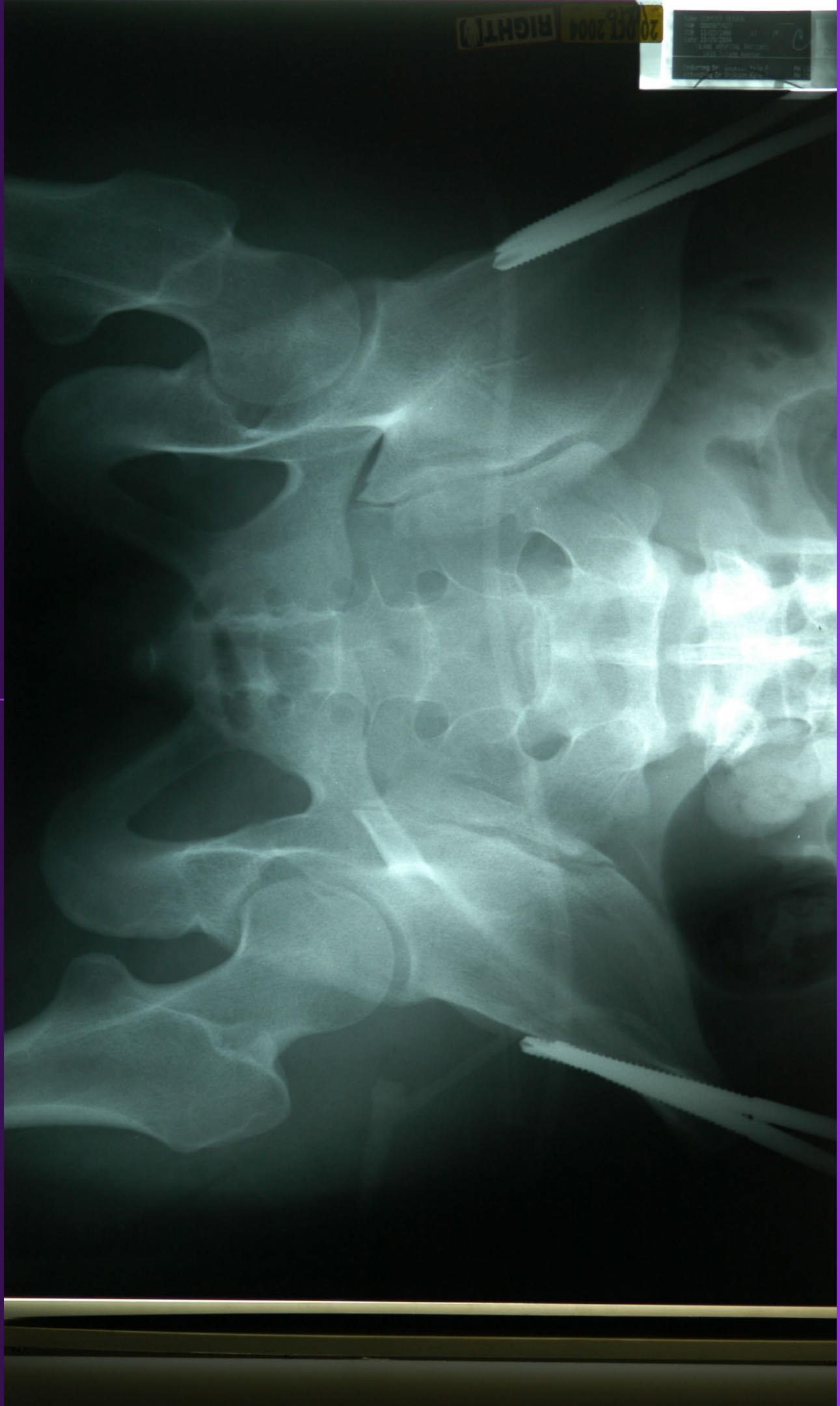

R
L
kV 120
mA 140
Large
2.500mm/3.75 0.75+1
Tilt: 0.0


R
L
kV 120
mA 140
Large
2.500mm/3.75 0.75+1
Tilt: 0.0


R
kV 120
mA 140
Large
Tilt: 0.0


RIGHT



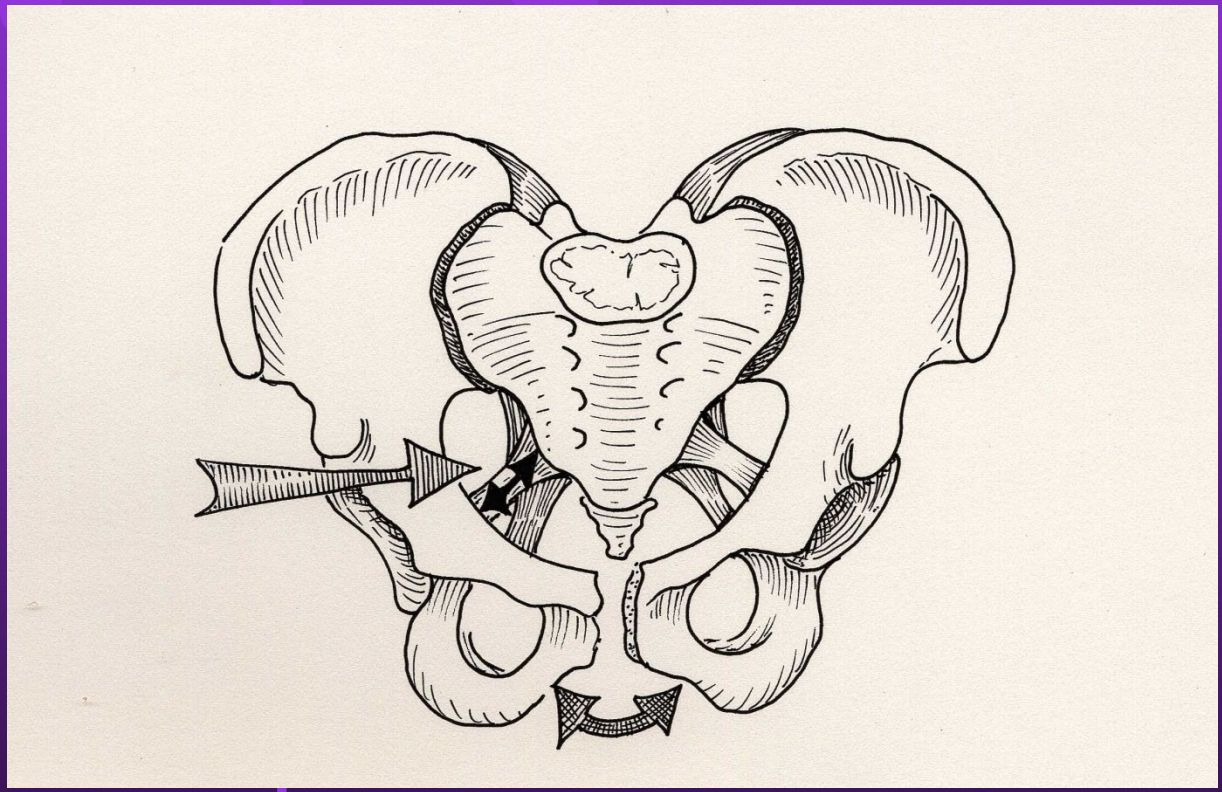

RIGHT

Nonoperative Management

- Ant. Ring only injuries – WBAT
- Minimally displaced posterior injury TDWB x 8 wks ambulation training

AP I

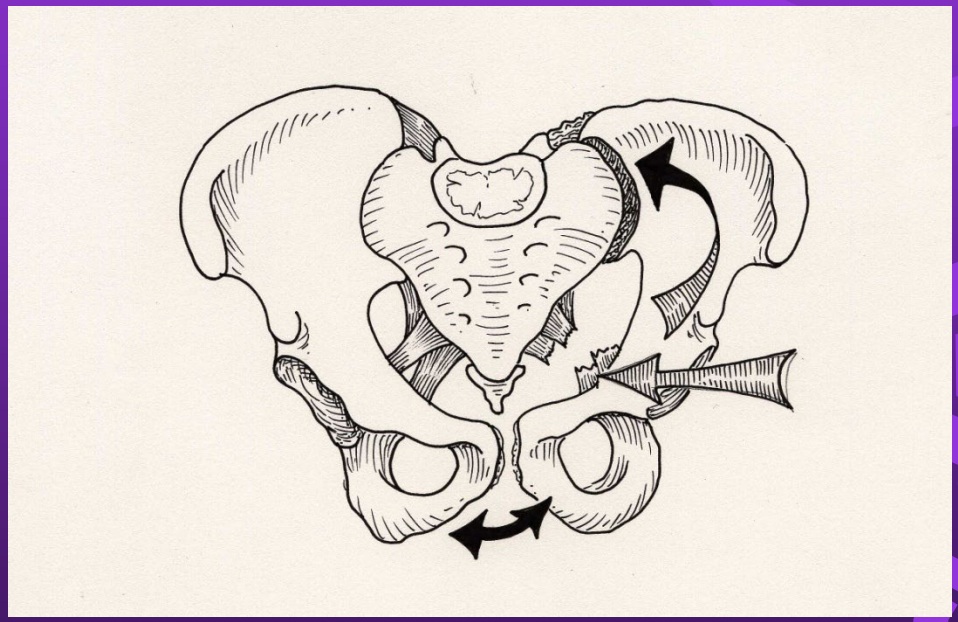
- *Note that the ligaments are stretched, and not torn*



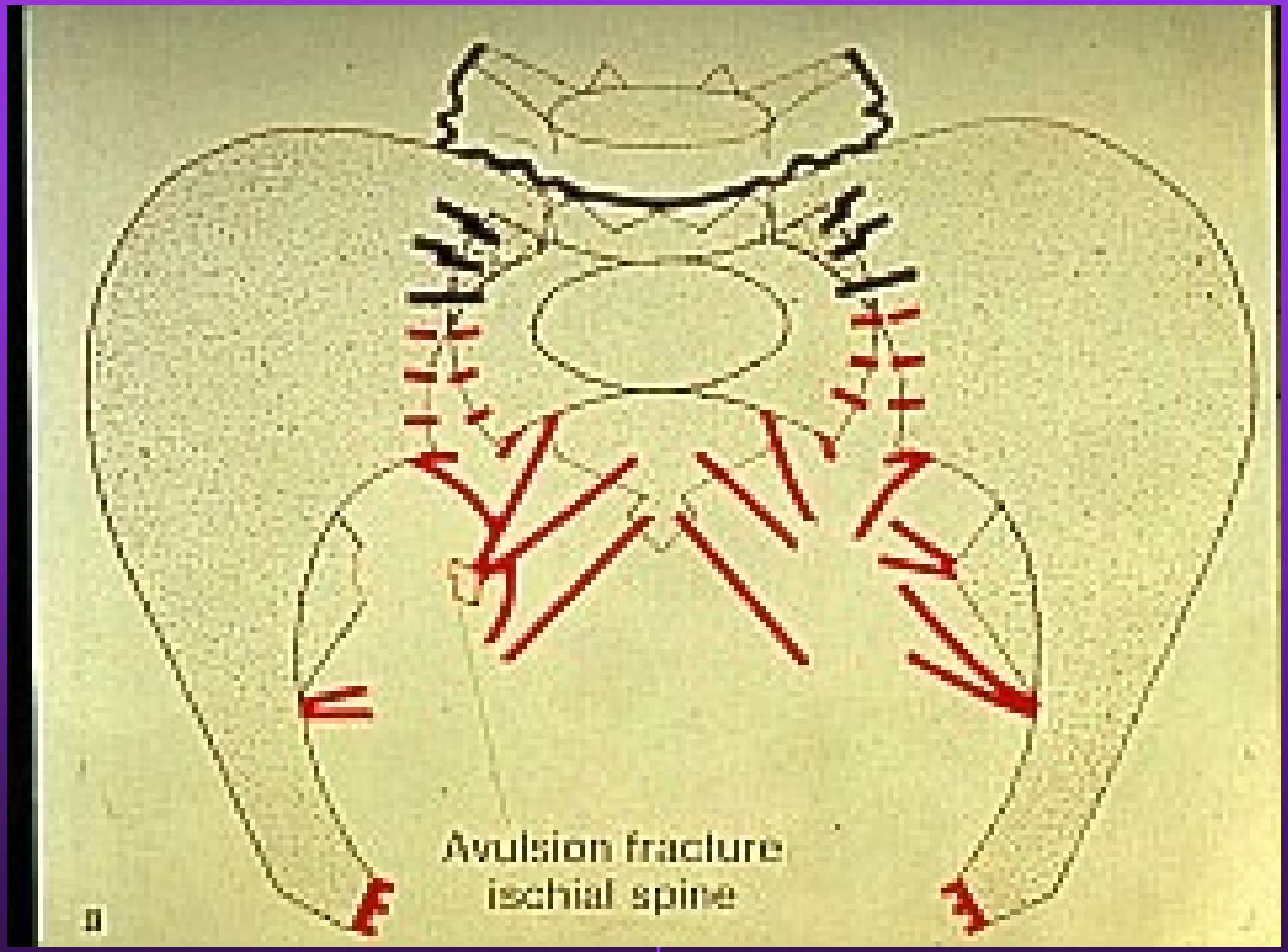
Anteroposterior (cont.)

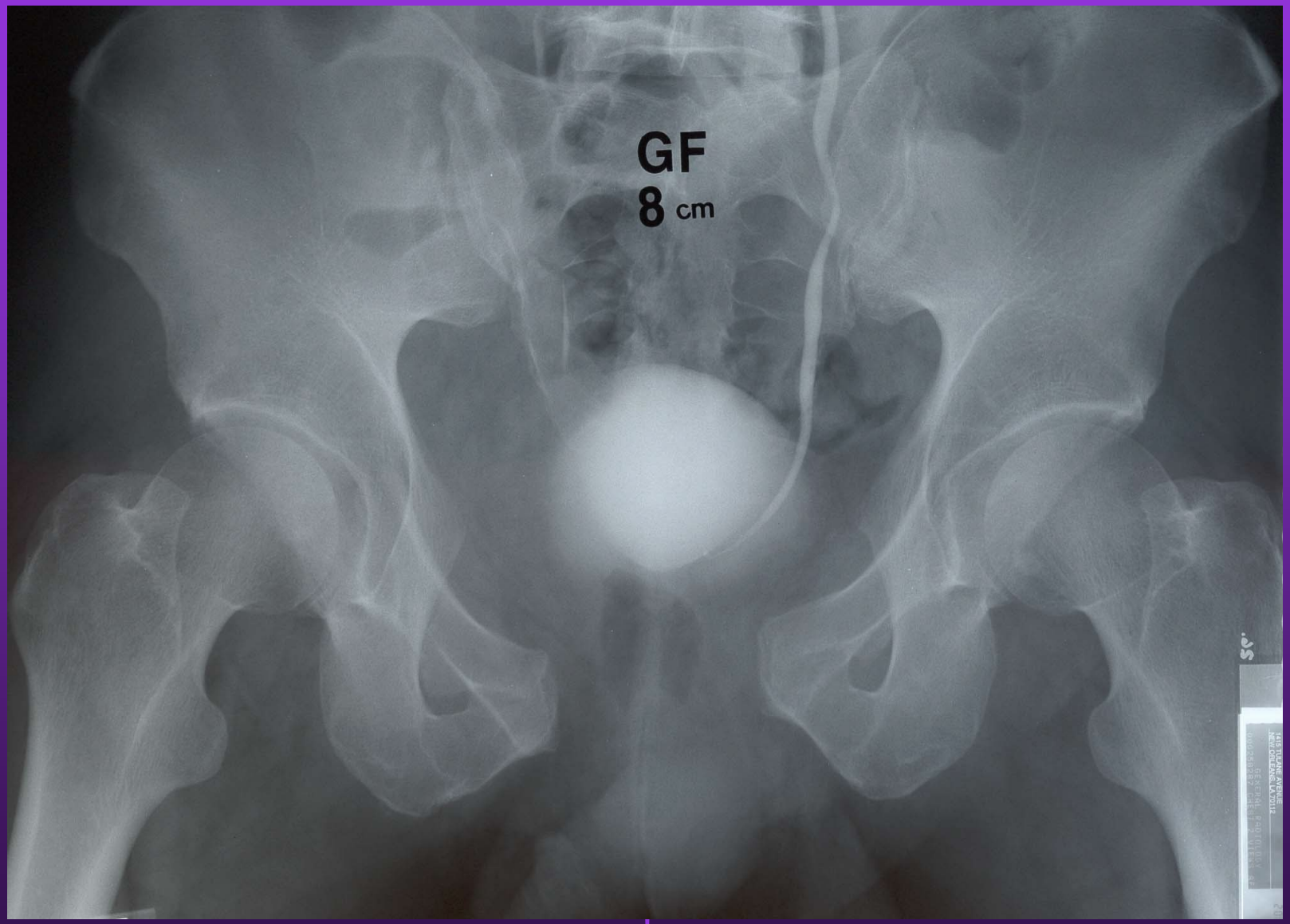
- APC-2 – Sacrotuberous, sacrospinous, and anterior SI joint ligaments disrupted (post SI ligaments intact)
- APC-3 – Complete SI joint disruption (usually not vertically displaced)

AP II

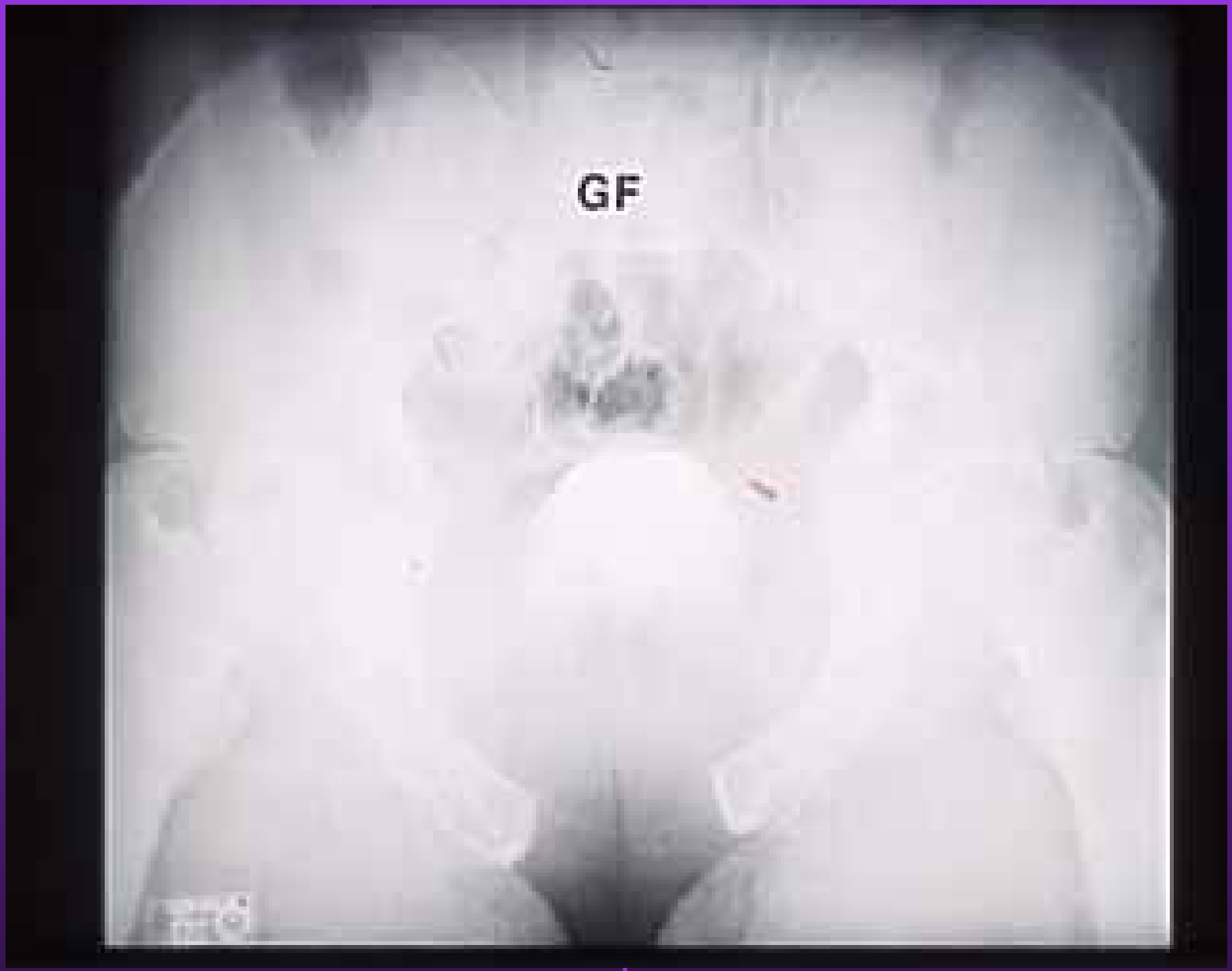


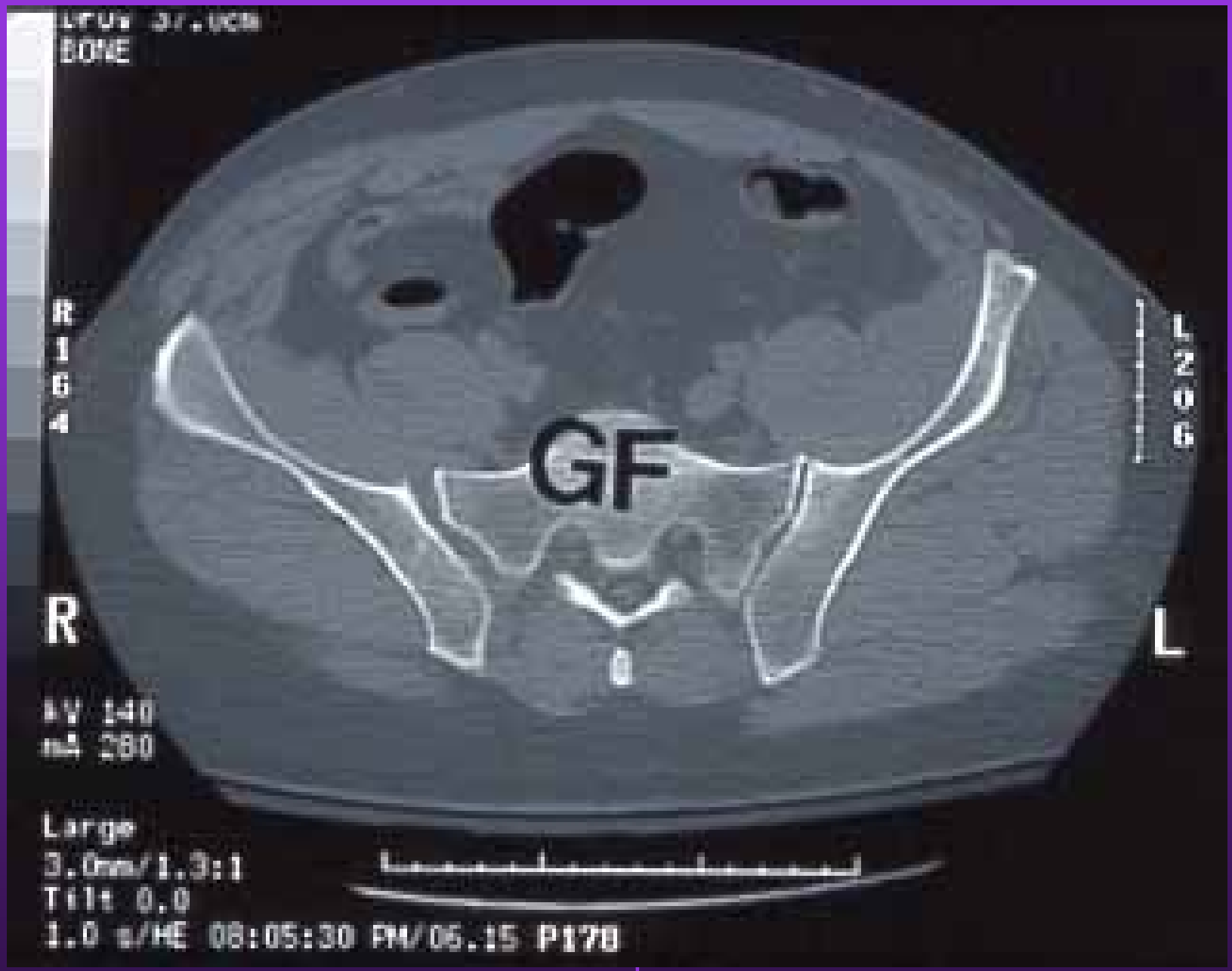
- *Note: pelvic floor ligaments are violated, as well as anterior SI ligaments*

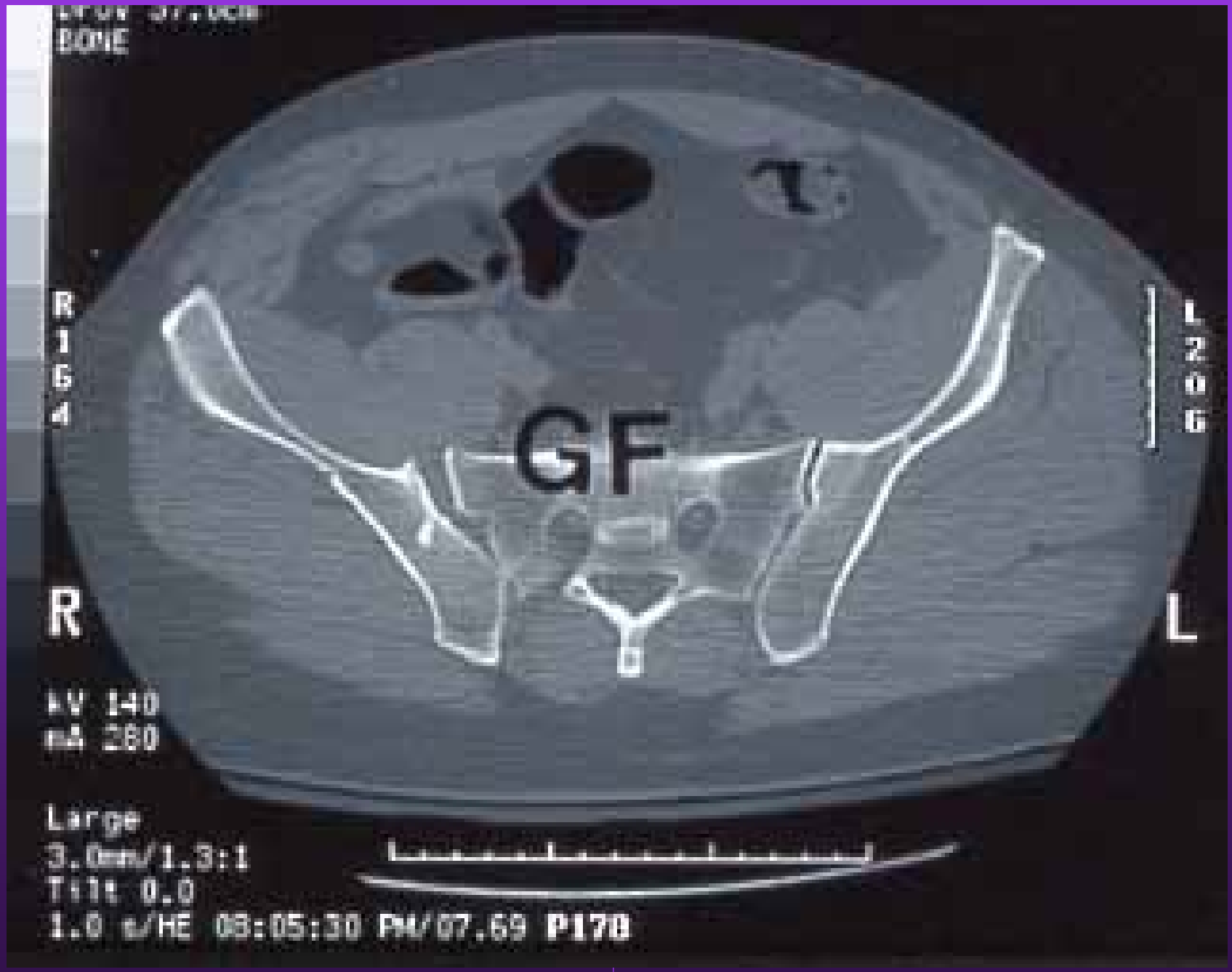

Avulsion fracture
ischial spine


GF
8 cm

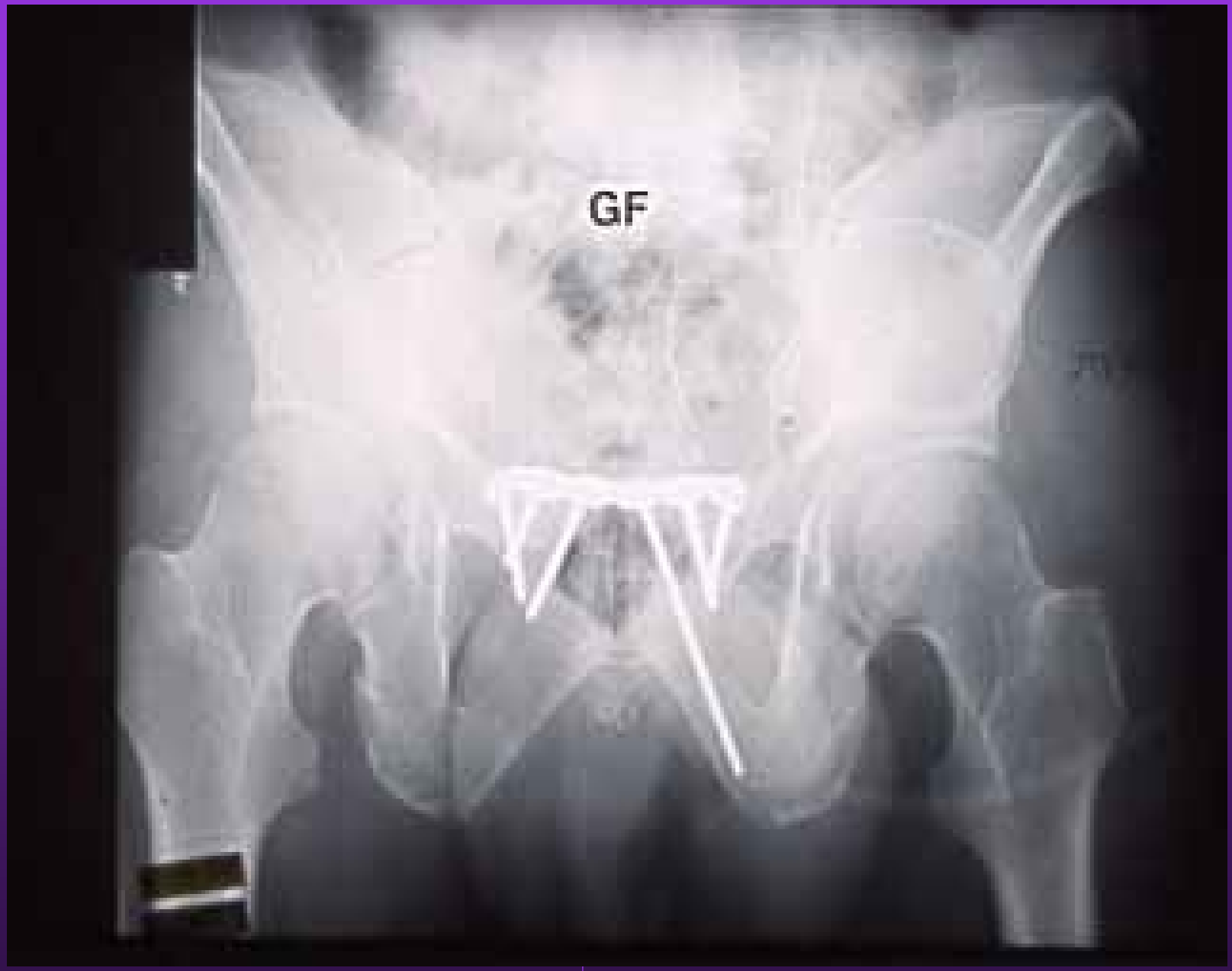

GF

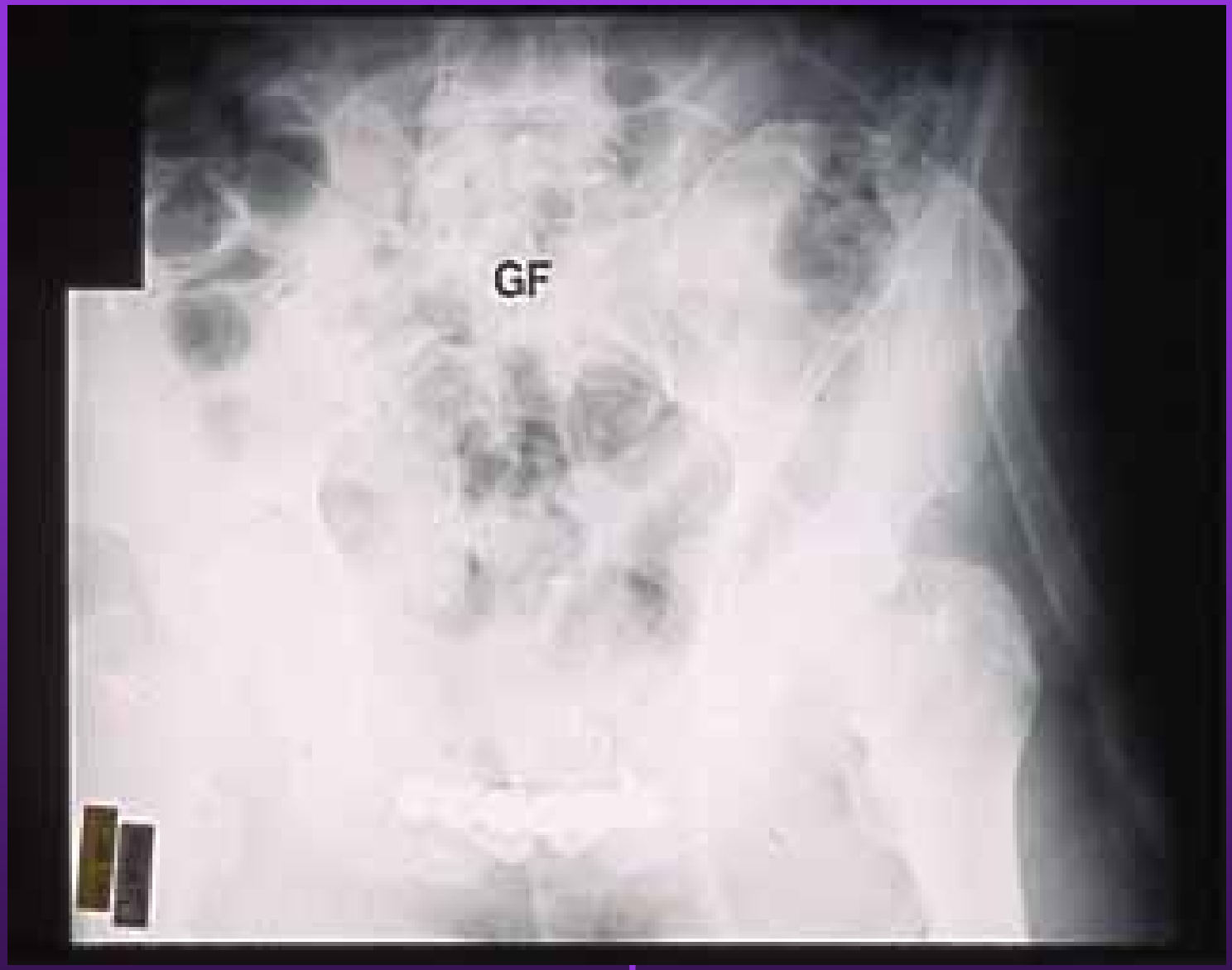

GF

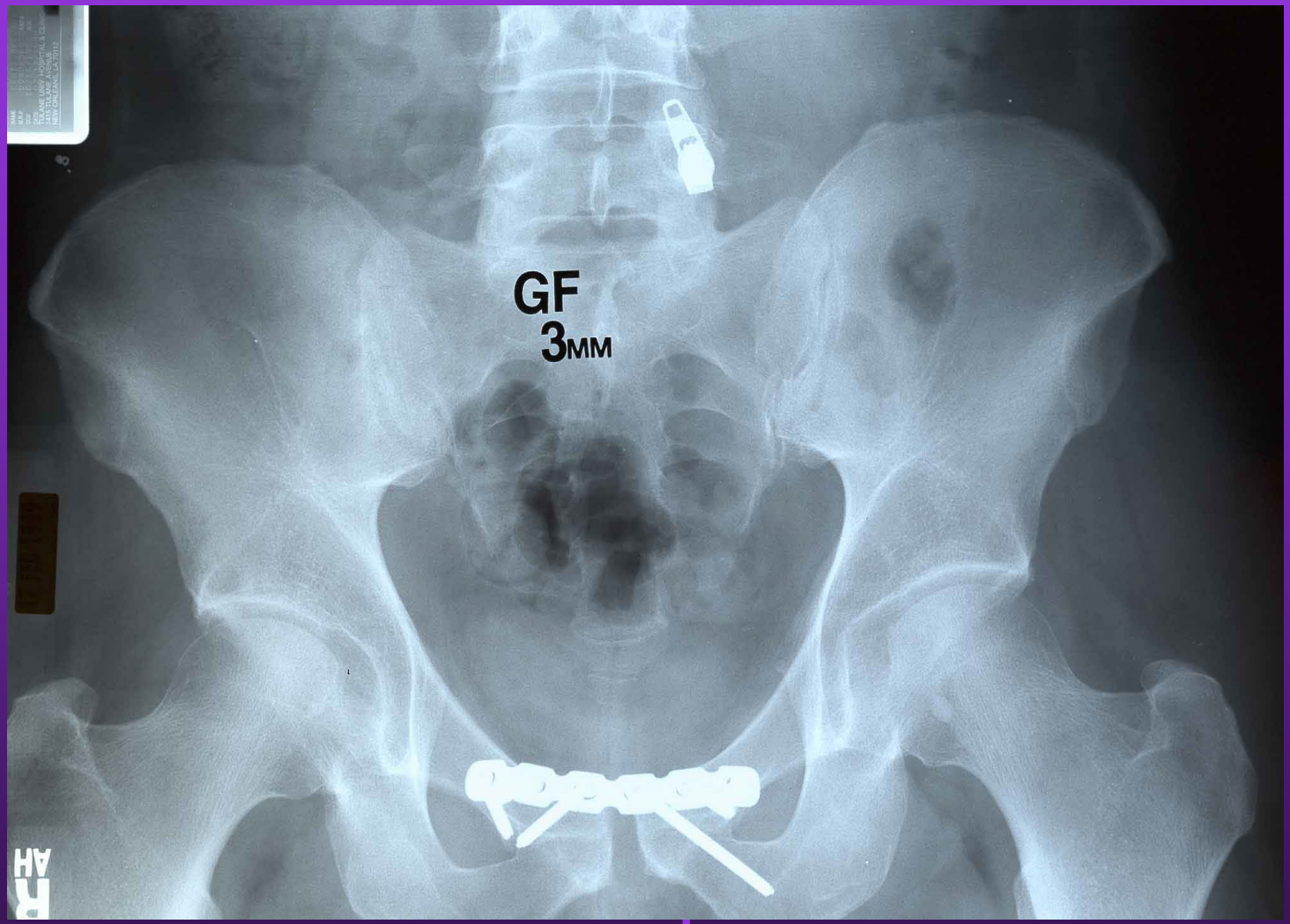

BONE
R
164
GF
L206
R
L
kV 140
mA 280
Large
3.0mm/1.3:1
Tilt 0.0
1.0 s/HE 08:05:30 PM/05.15 P170

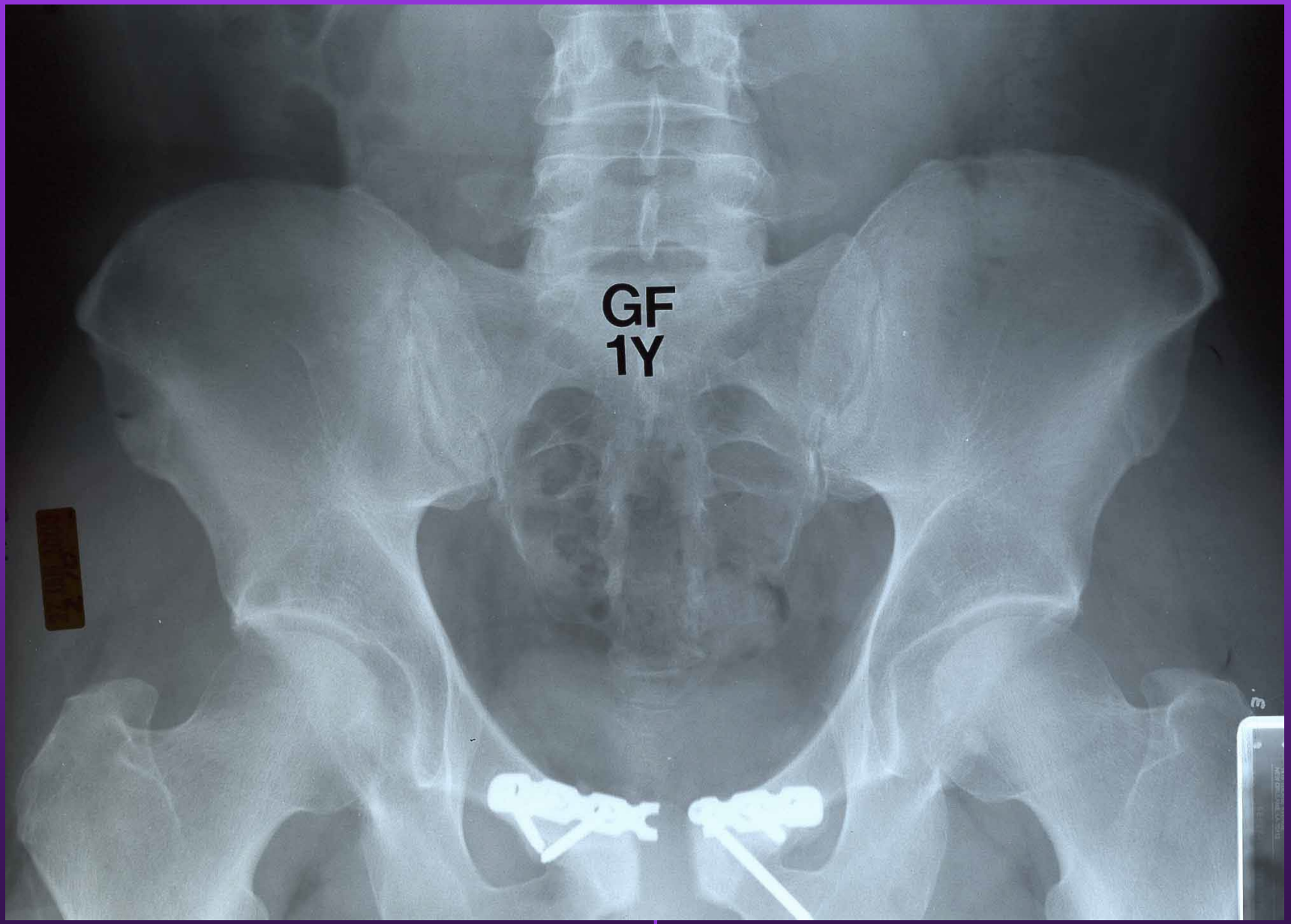

BONE
R 164
GF
R
L
kV 140
mA 280
Large
3.0mm/1.3:1
Tilt 0.0
1.0 s/HE 08:05:30 PM/07.69 P170


GF

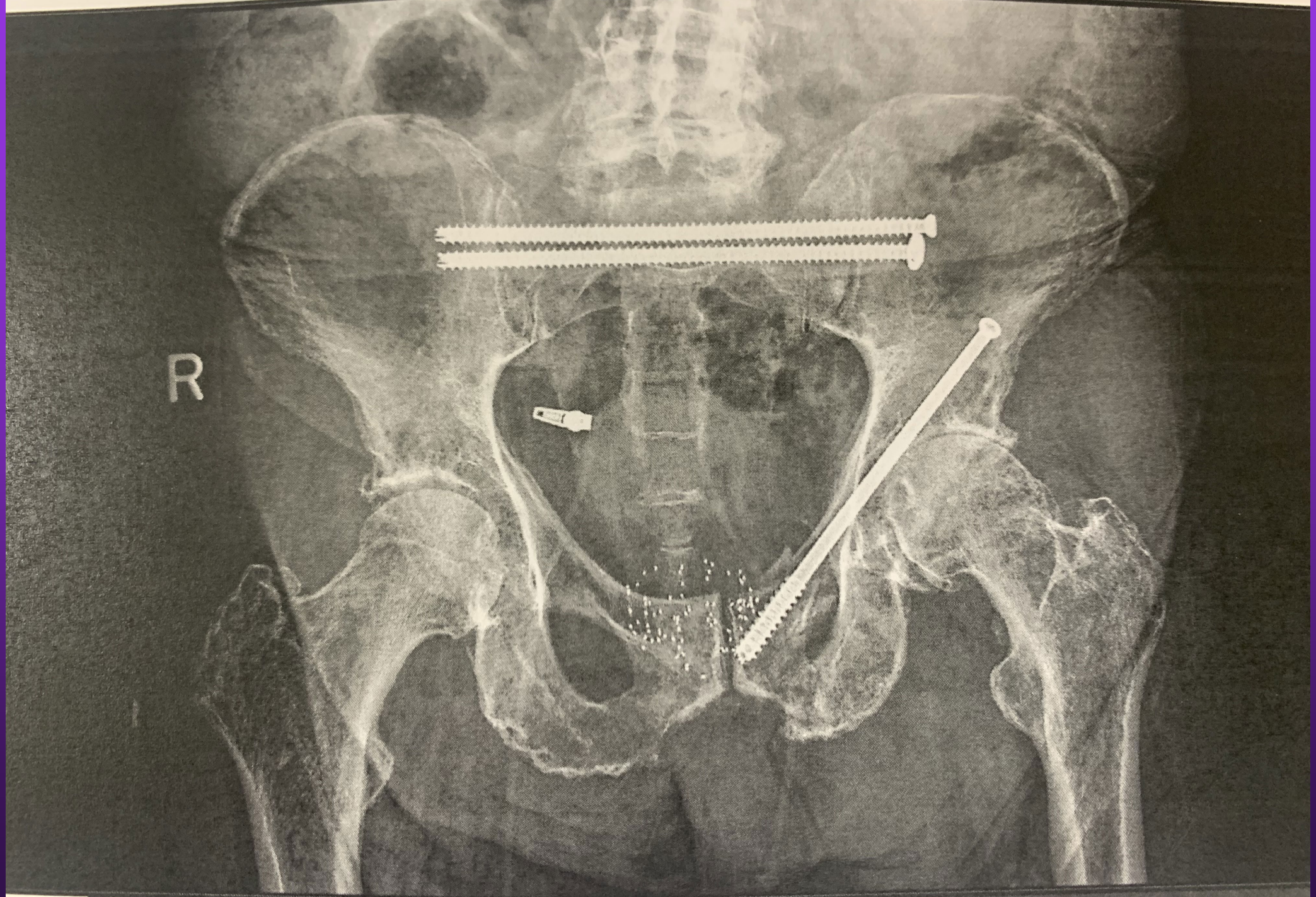

GF


GF

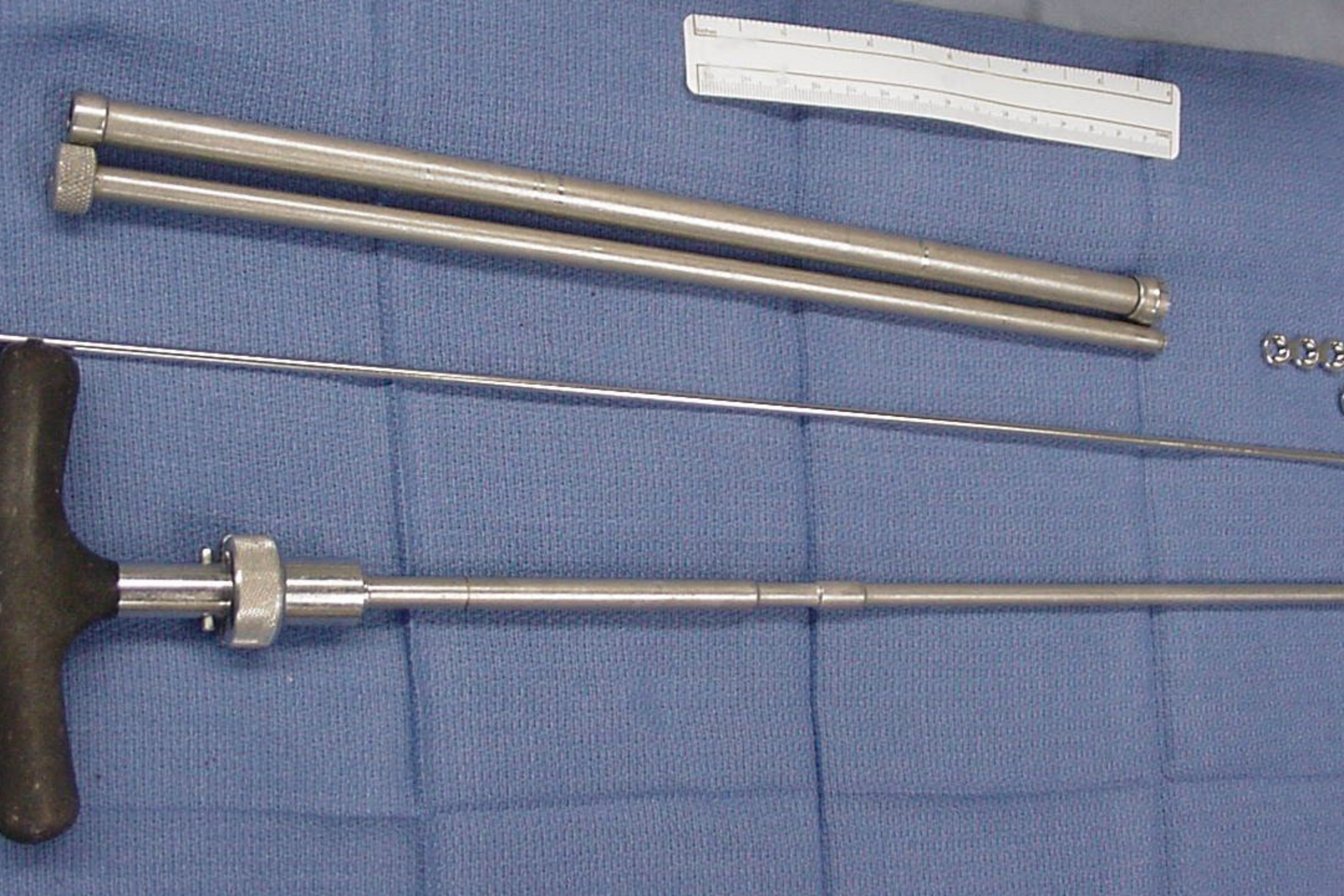

GF
3MM

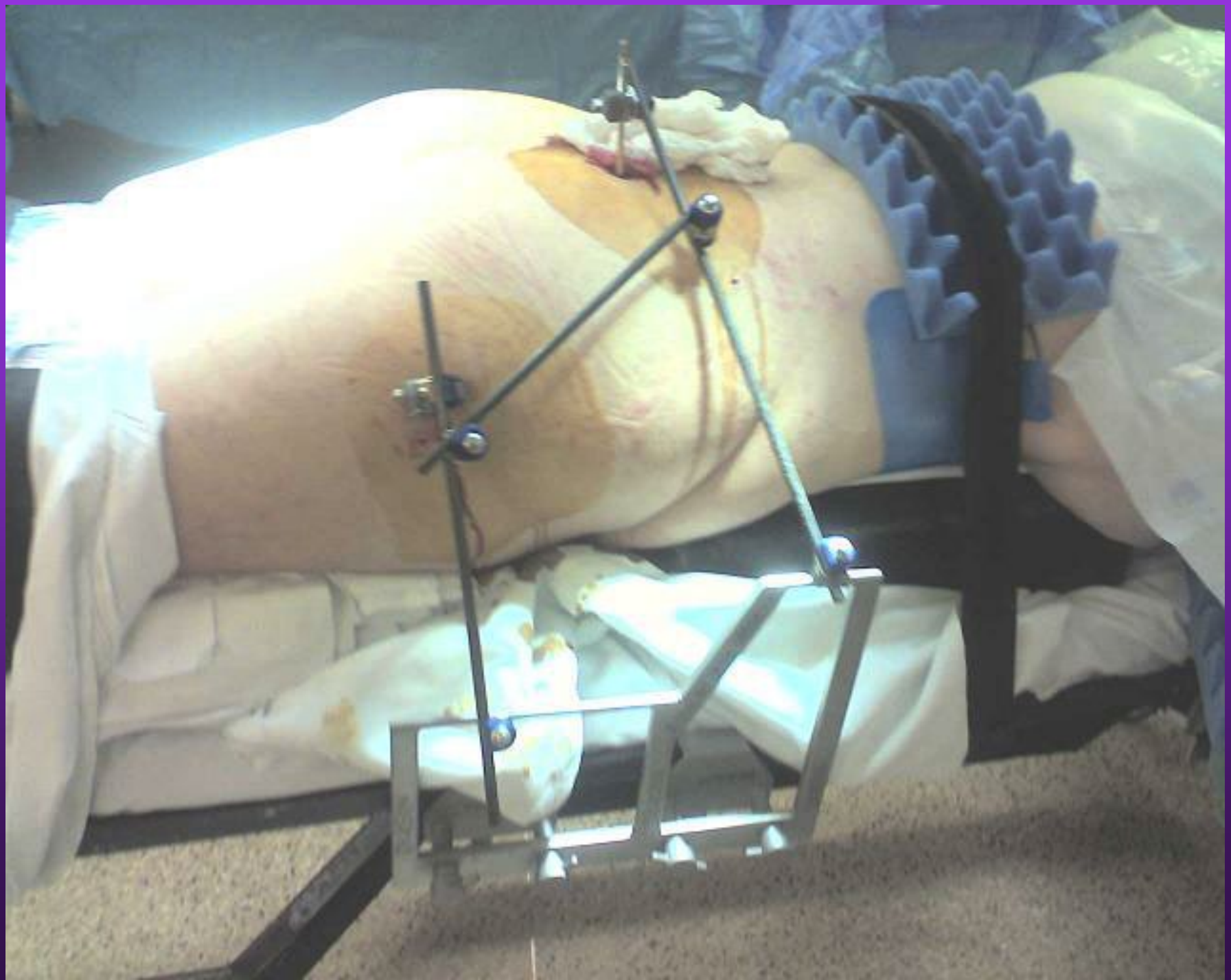

GF
1Y


INJURY PREVENTION TEAM
Charity Hospital

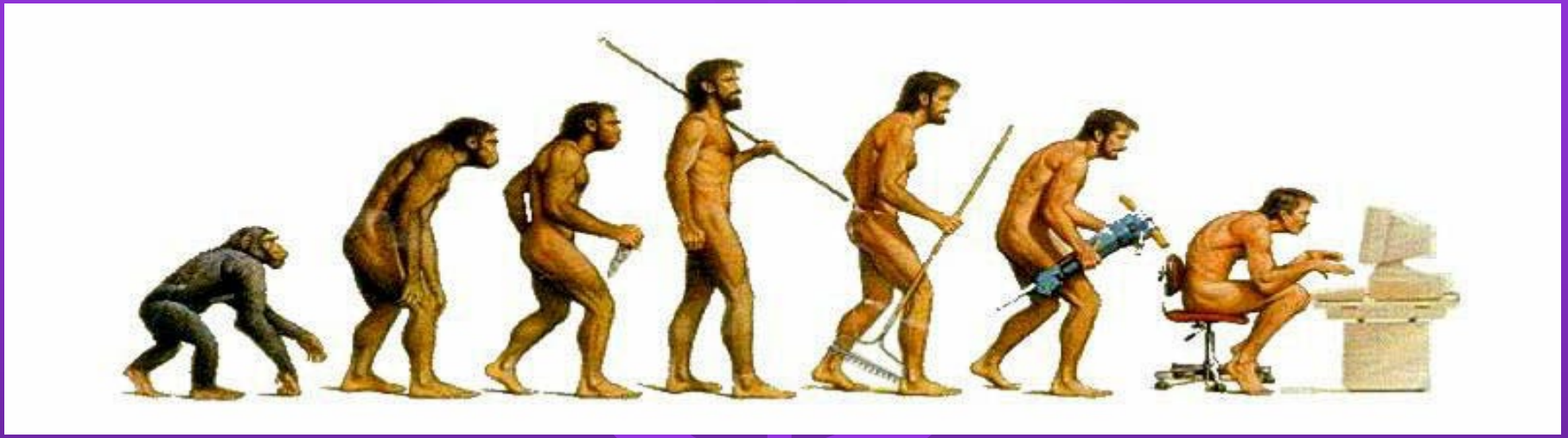

R

Percutaneous
L.F.B. (Louisiana Fat Boy)

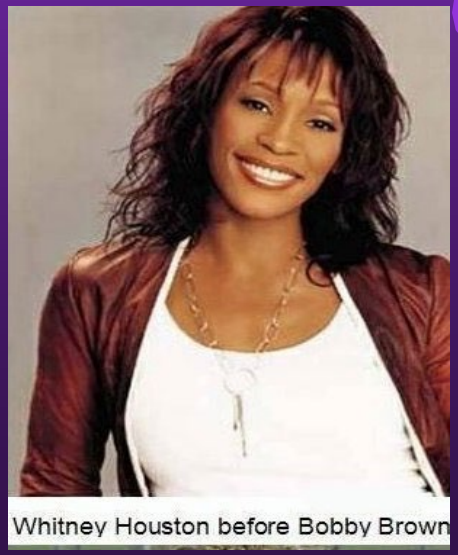




Evolution



Or something completely different?



Whitney Houston before Bobby Brown

You be the judge!

Just because you can doesn't mean you should

Experience is not doing a better job, It is doing a better job quicker

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