

ACETABULAR FRACTURE CLASSIFICATION

SURGICAL ANATOMY

- ▶ OSSEOUS ANATOMY
- ▶ Ligamentous anatomy

COULMN CONCEPT

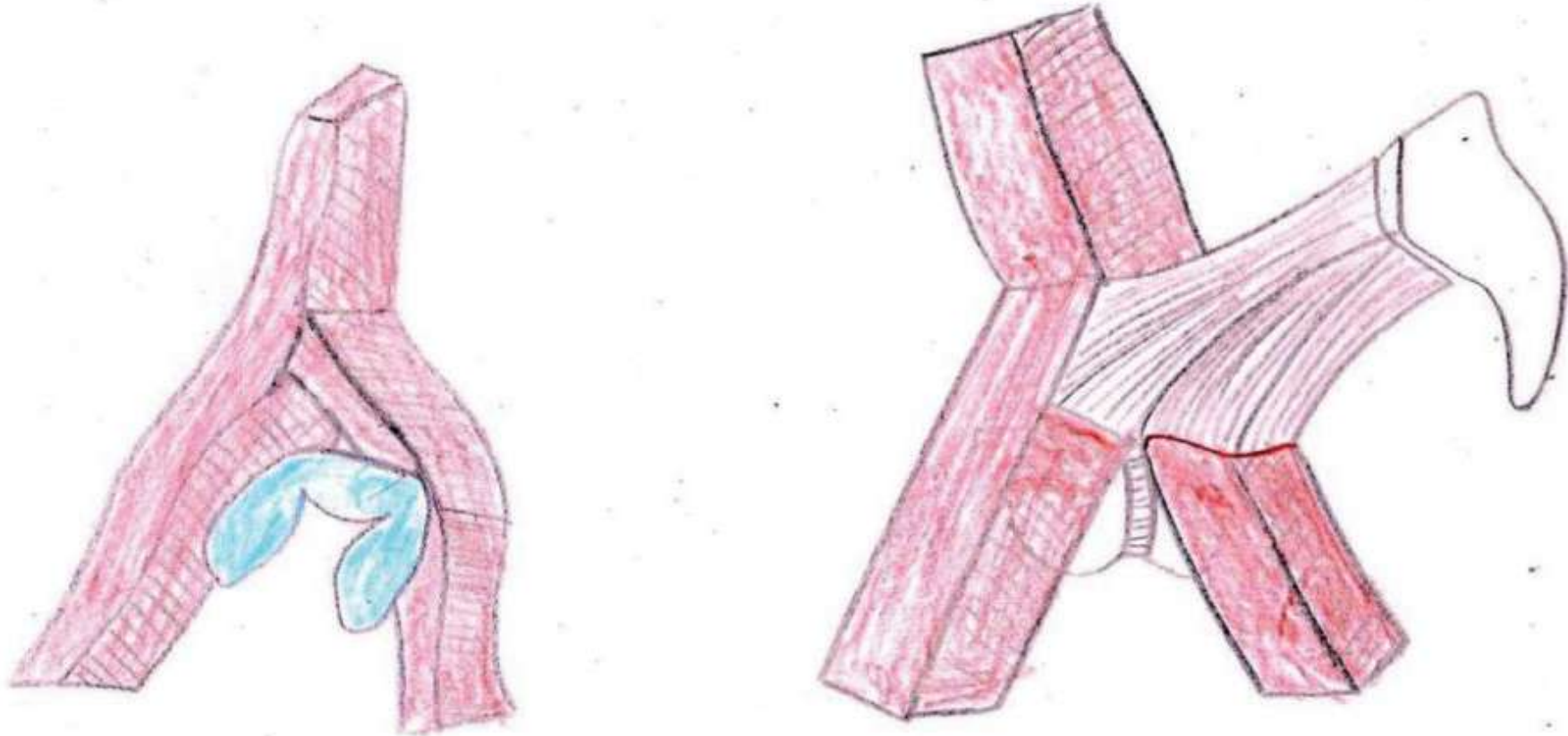


Figure 1.

Column concept of the acetabulum by Letournel and Judet.

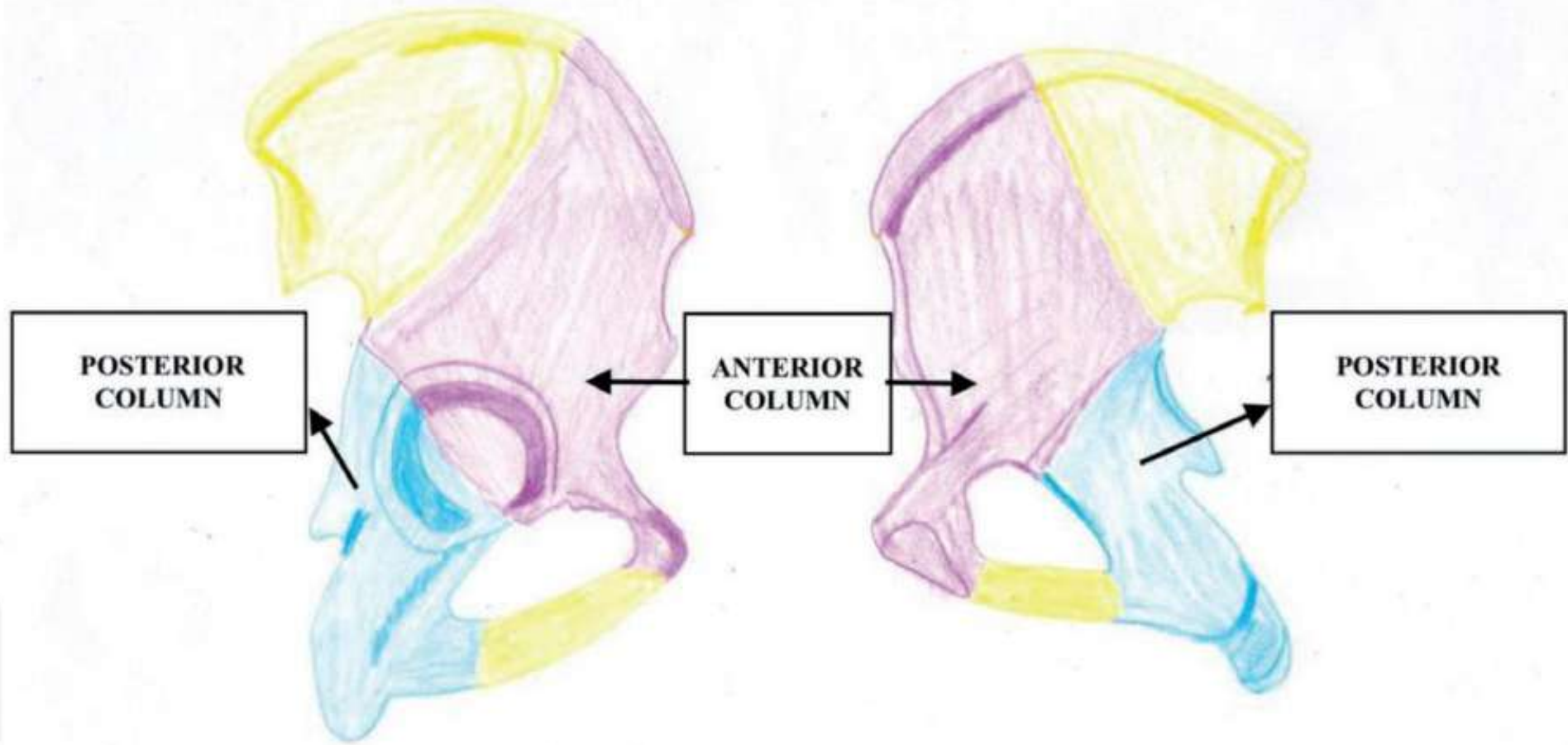


Figure 2.
Anterior column and posterior column.

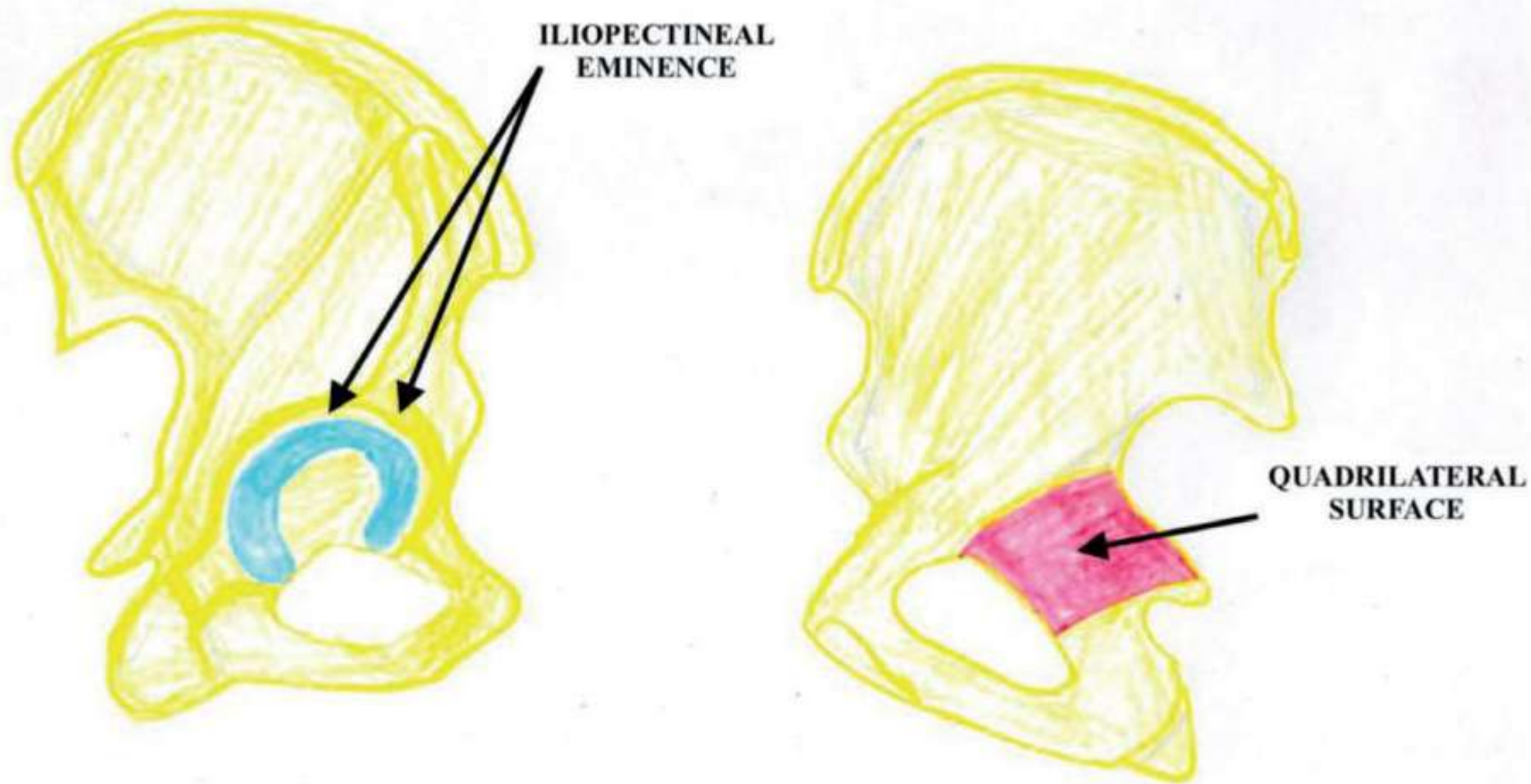


Figure 3.
Quadrilateral surface and iliopectineal eminence.

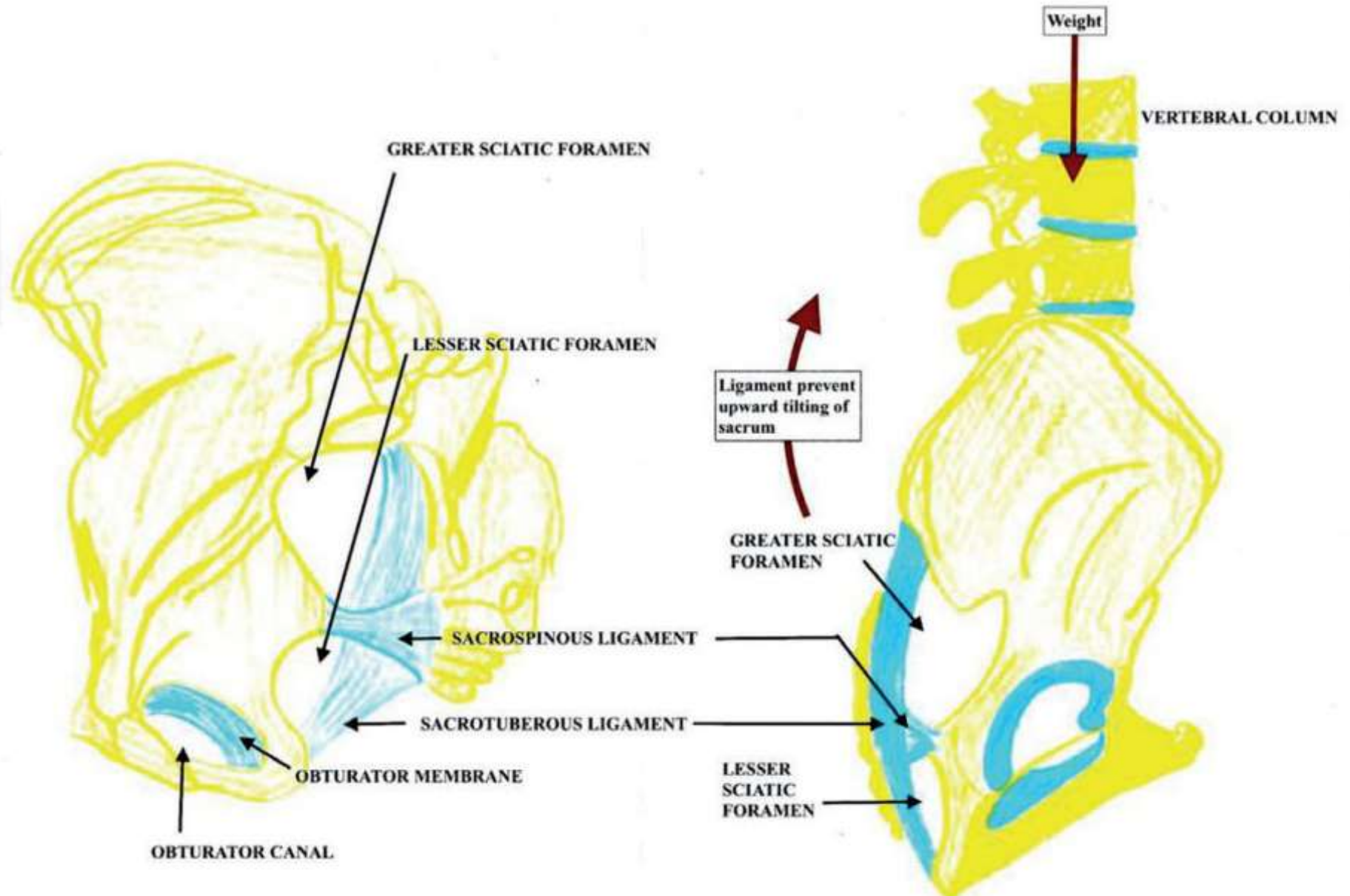
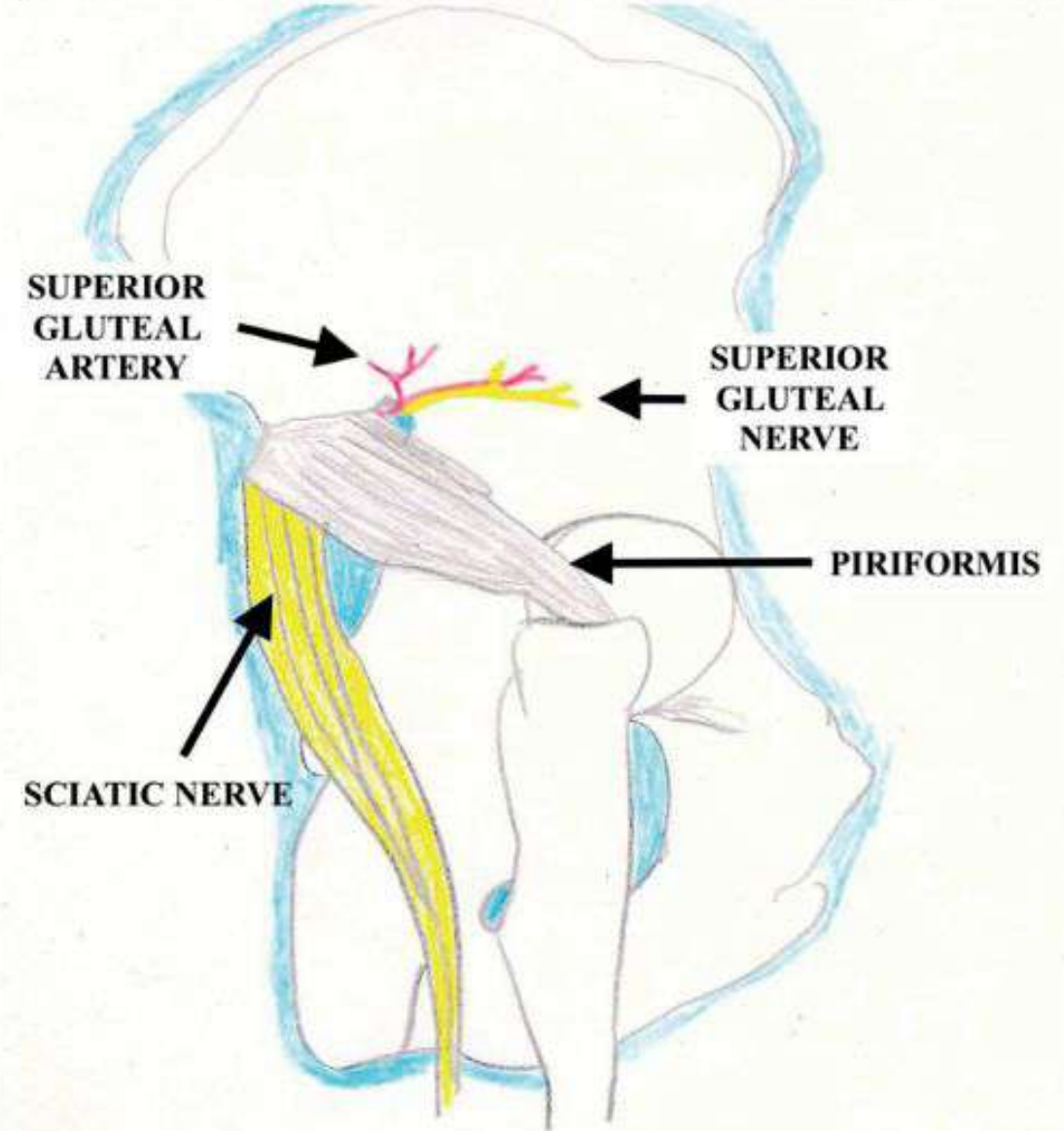


Figure 4

The sacrotuberous and sacrotuberous ligaments.

Superior gluteal artery, vein and nerve traverse above piriformis and Sciatic nerve exits the pelvis below piriformis.



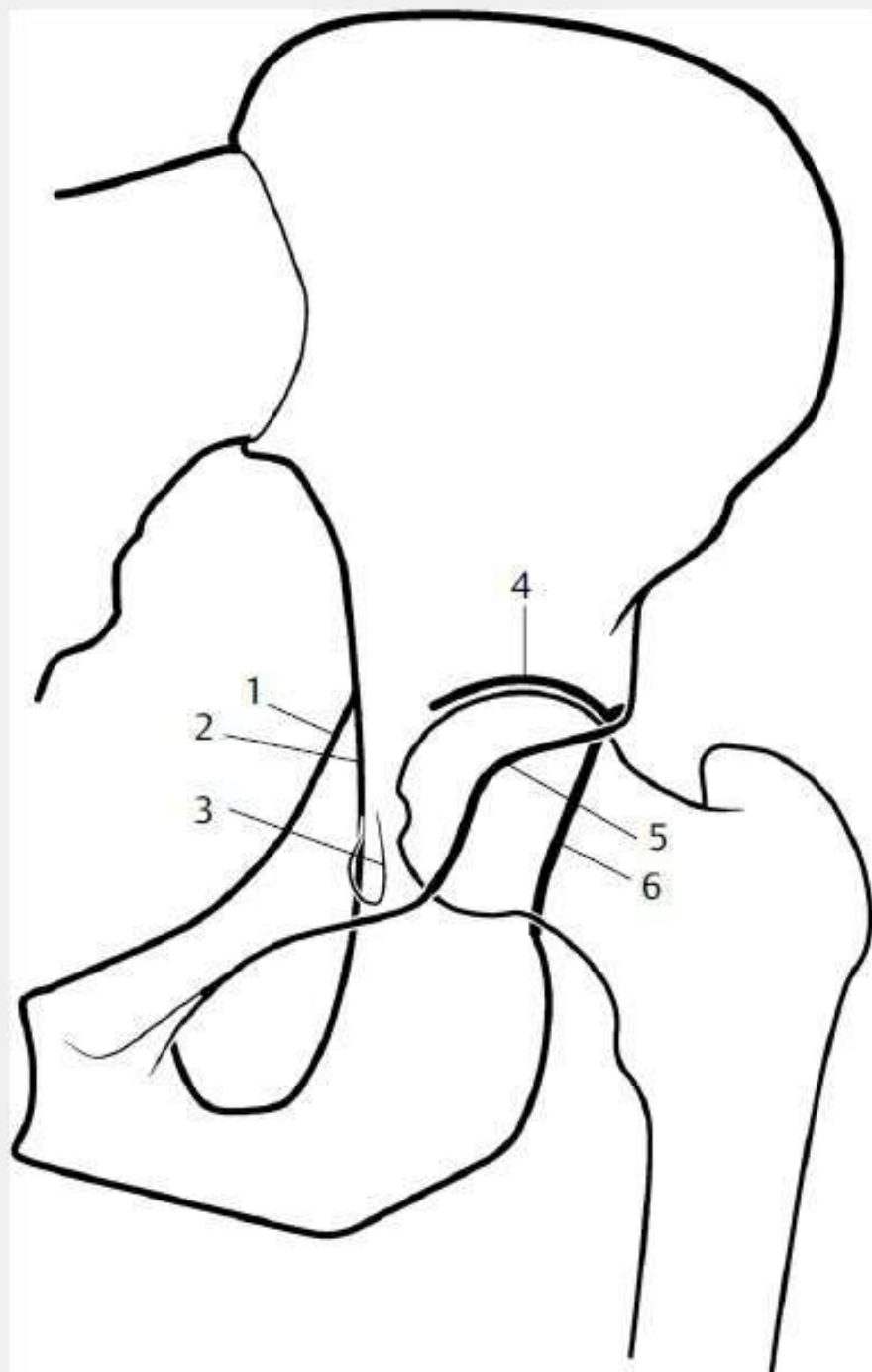
- ▶ The Greater Sciatic Foramen: contains the piriformis muscle, superior glutei nerves, sciatic nerve, ischial vessels, and internal pudendal vessels and nerve.

- ▶ The Lesser Sciatic Foramen: contains the obturator internus muscle and internal pudendal vessels. These structures exit the pelvis via greater sciatic foramen and after crossing over the sacrospinous ligament re-enters the pelvis via lesser sciatic foramen

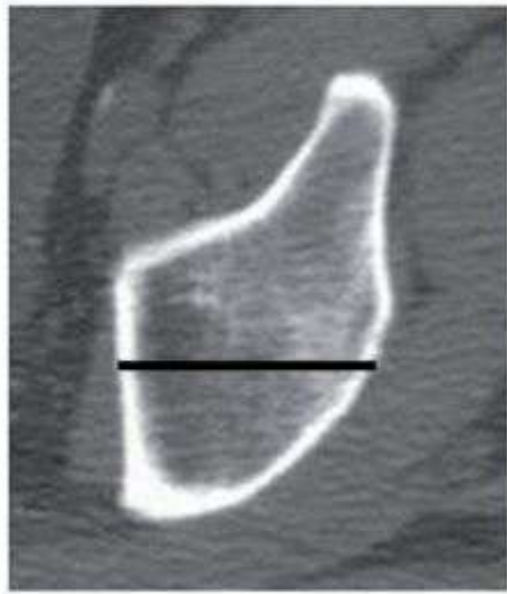
Ligaments anatomy

- ▶ The iliosacral joint is a fibrocartilaginous joint that acts as a dual wedge in axial and antero-posterior directions
- ▶ The posterior sacroiliac ligament consists of The superficial part going from the posterior iliac crest and posterior iliac spines to the posterior tubercles of the sacrum made up of several fascicles.
- ▶ The deep portion or interosseous ligament, which is the strongest ligament in the human body.

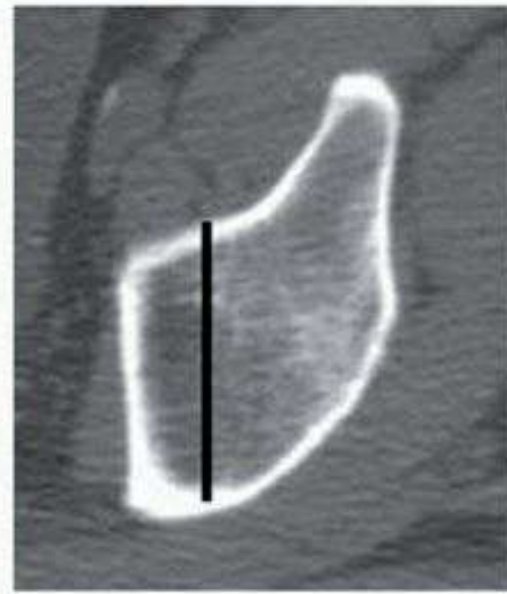
- ▶ The anterior-most border of the iliac bone begins with the anterosuperior iliac spine (ASIS), which gives origin to:
- ▶ Fascia Lata
- ▶ Sartorius
- ▶ Inguinal ligament



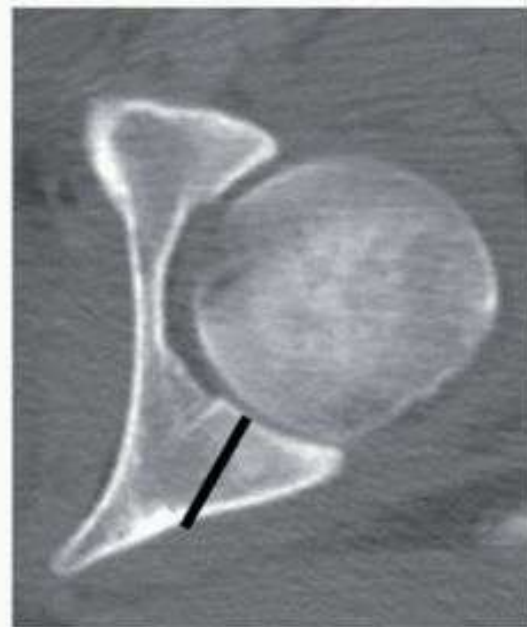
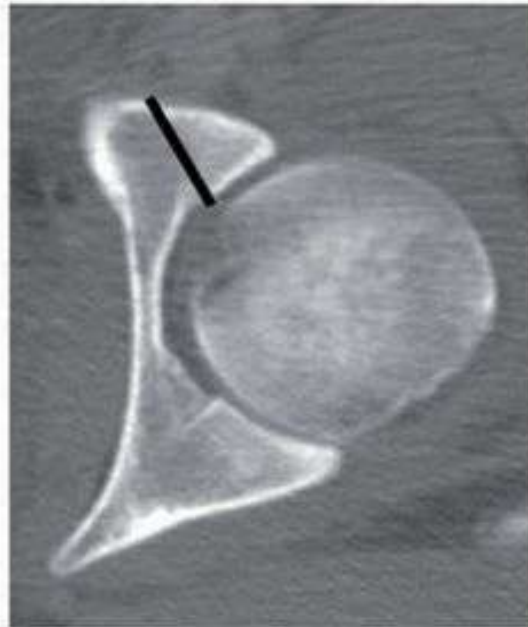
This figure shows the six ligaments of the capsule listed in the text box. Note that the

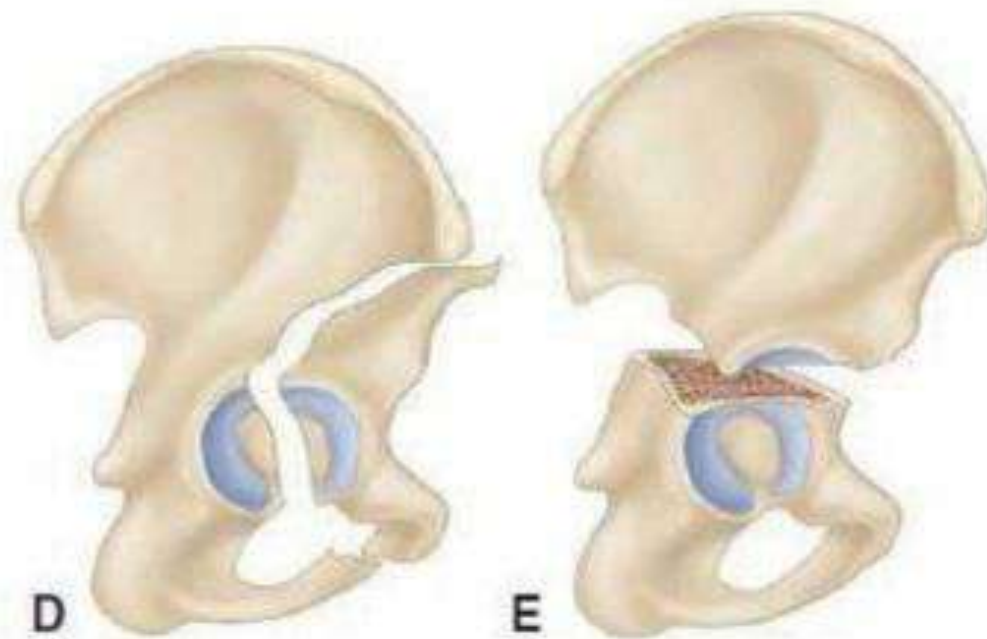
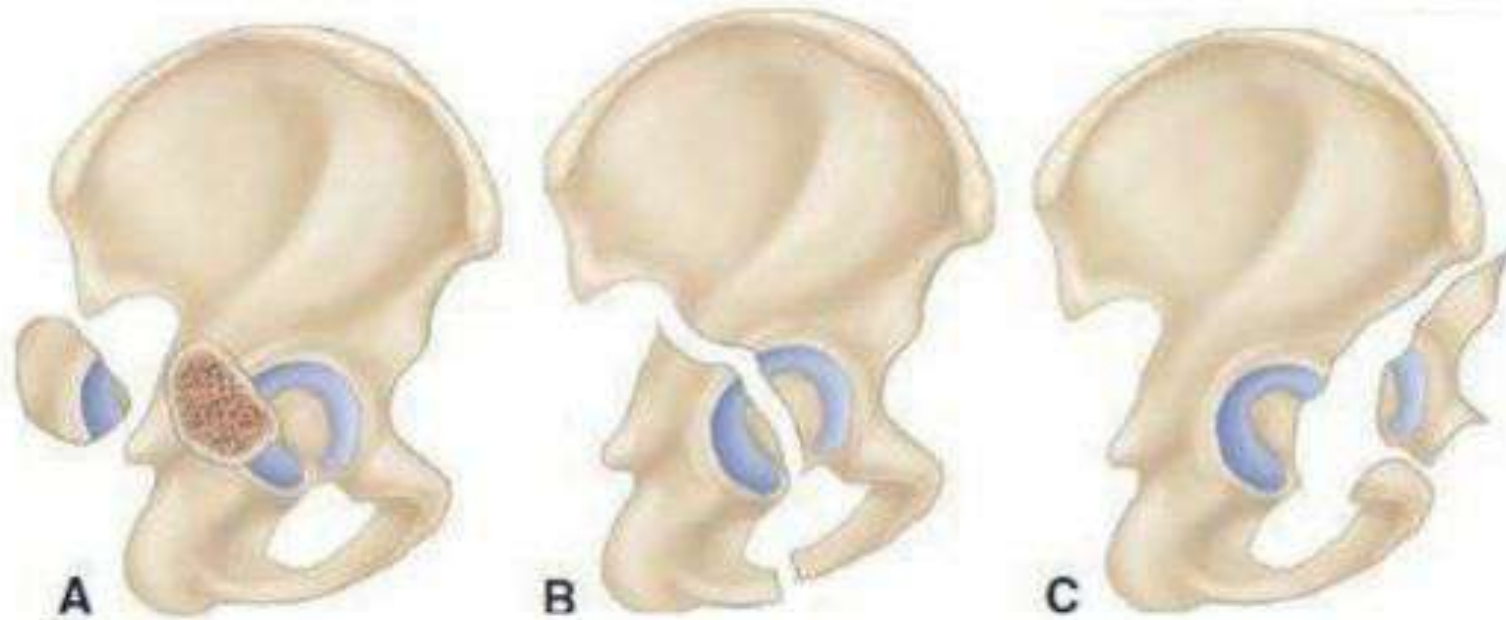


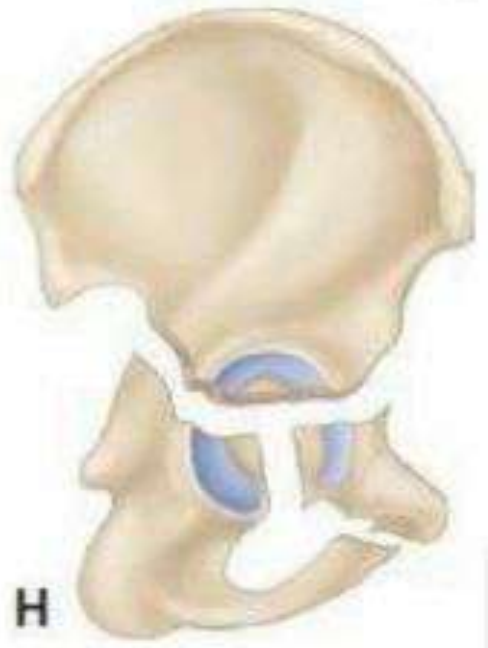
A



B

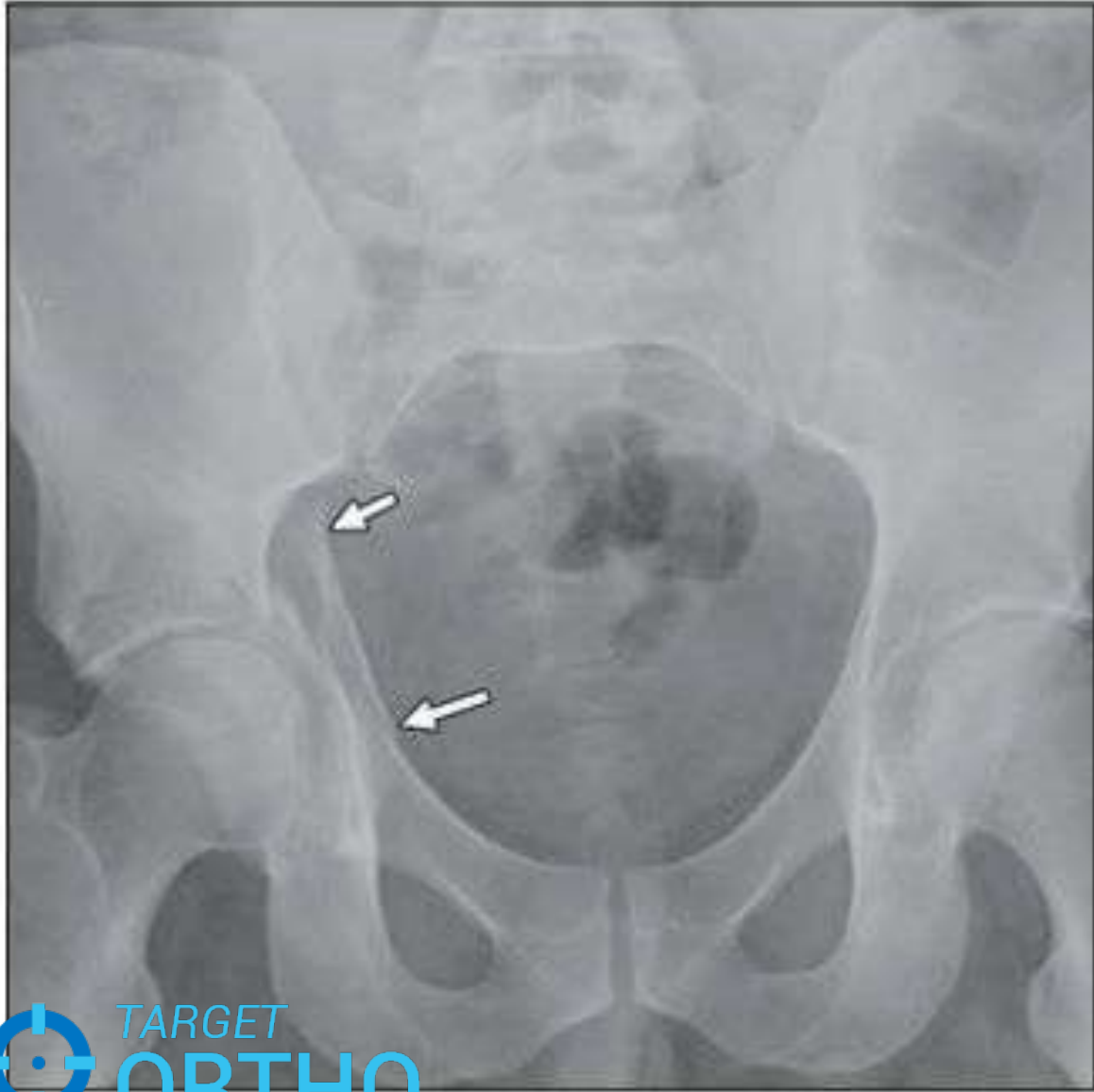


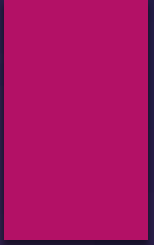




RADIOLOGICAL SIGNS

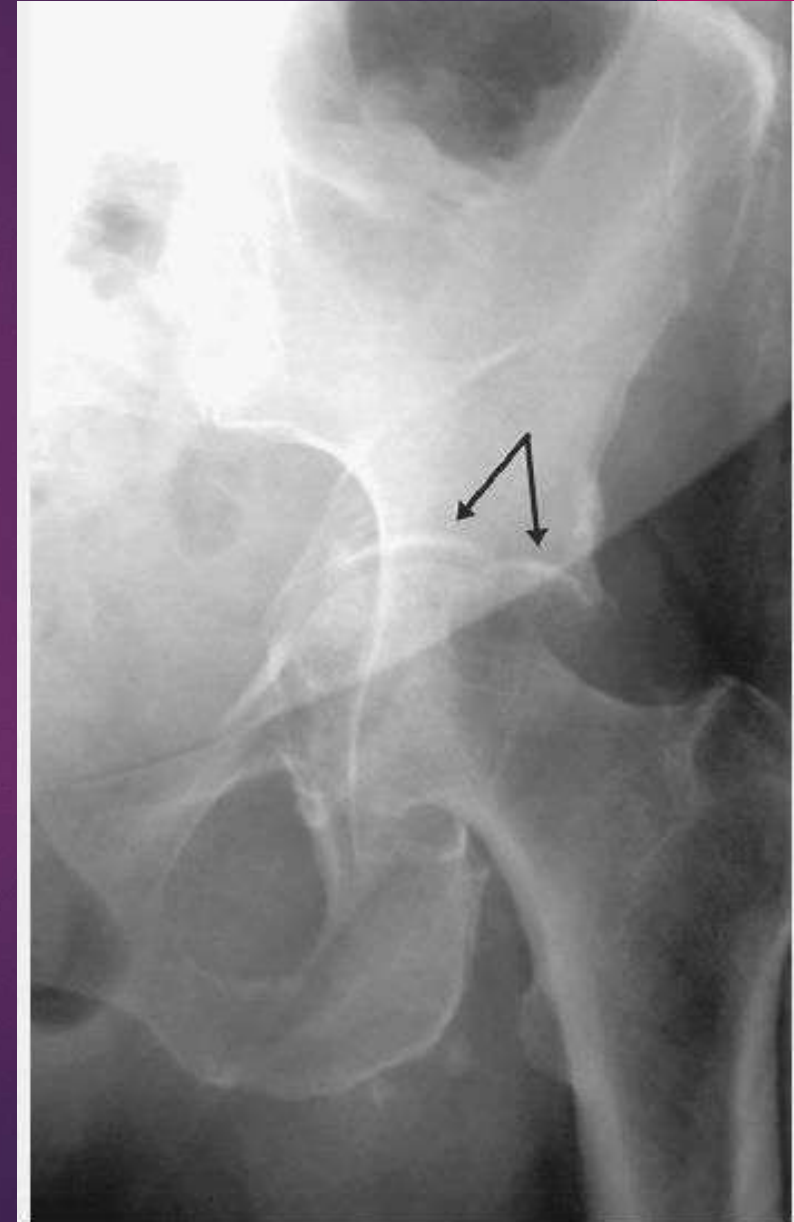
- ▶ DOUBLE BEAK
- ▶ SPUR SIGN
- ▶ SEAGULL SIGN





Sea gull sign

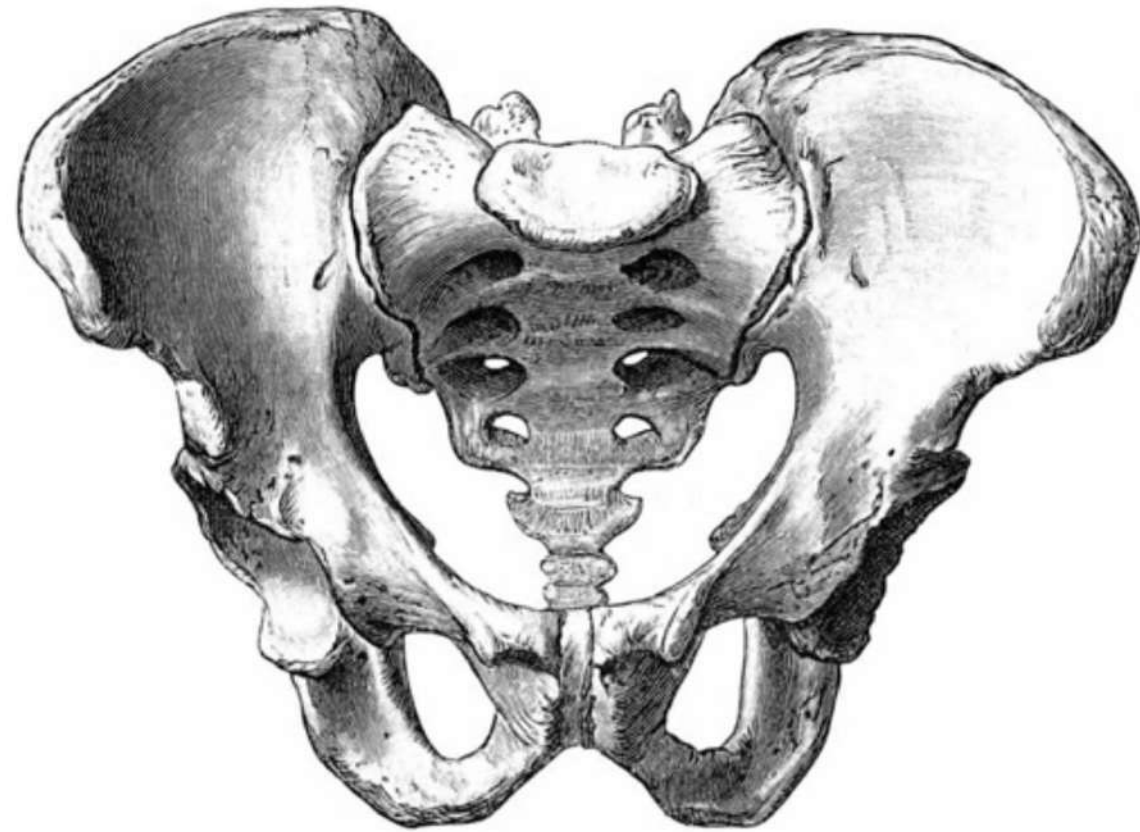
- ▶ Represents impaction of superomedial roof
- ▶ Seen on oblique iliac view
- ▶ Pathognomonic for posterior wall fractures.



Learning Objectives

- Understand upper sacral segment anatomy
 - Recognize variability
- Appreciate osseous fixation pathways
- Realize importance of preoperative planning
- Safely and reproducibly place iliosacral screws

Pelvis



Spectrum of Anatomy

“Normal”



“Dysmorphic”



Spectrum of Anatomy

“Normal”

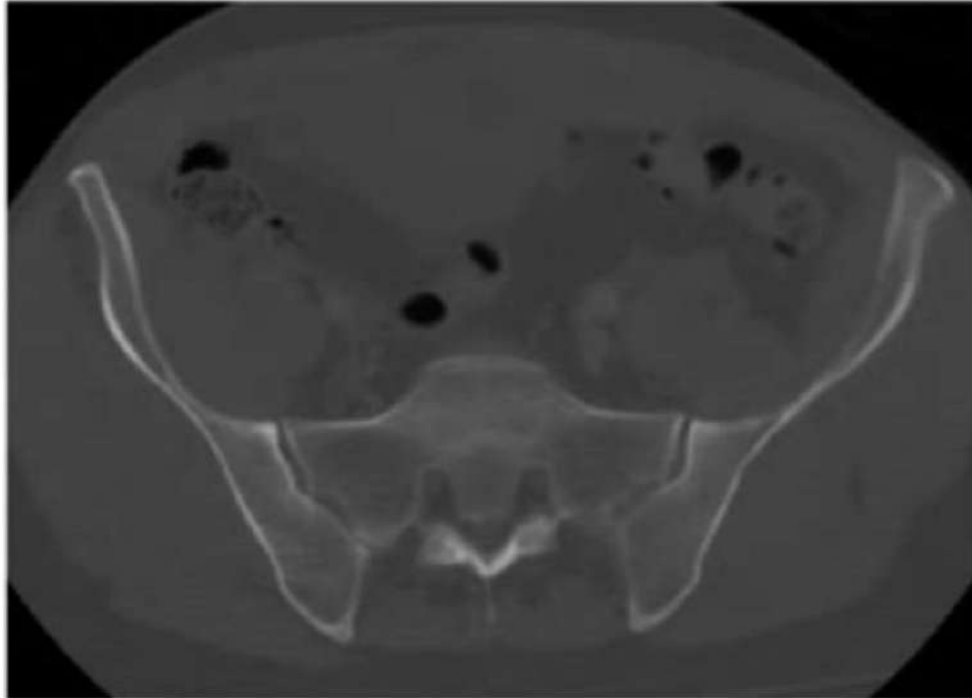


“Dysmorphic”



Spectrum of Anatomy

“Normal”

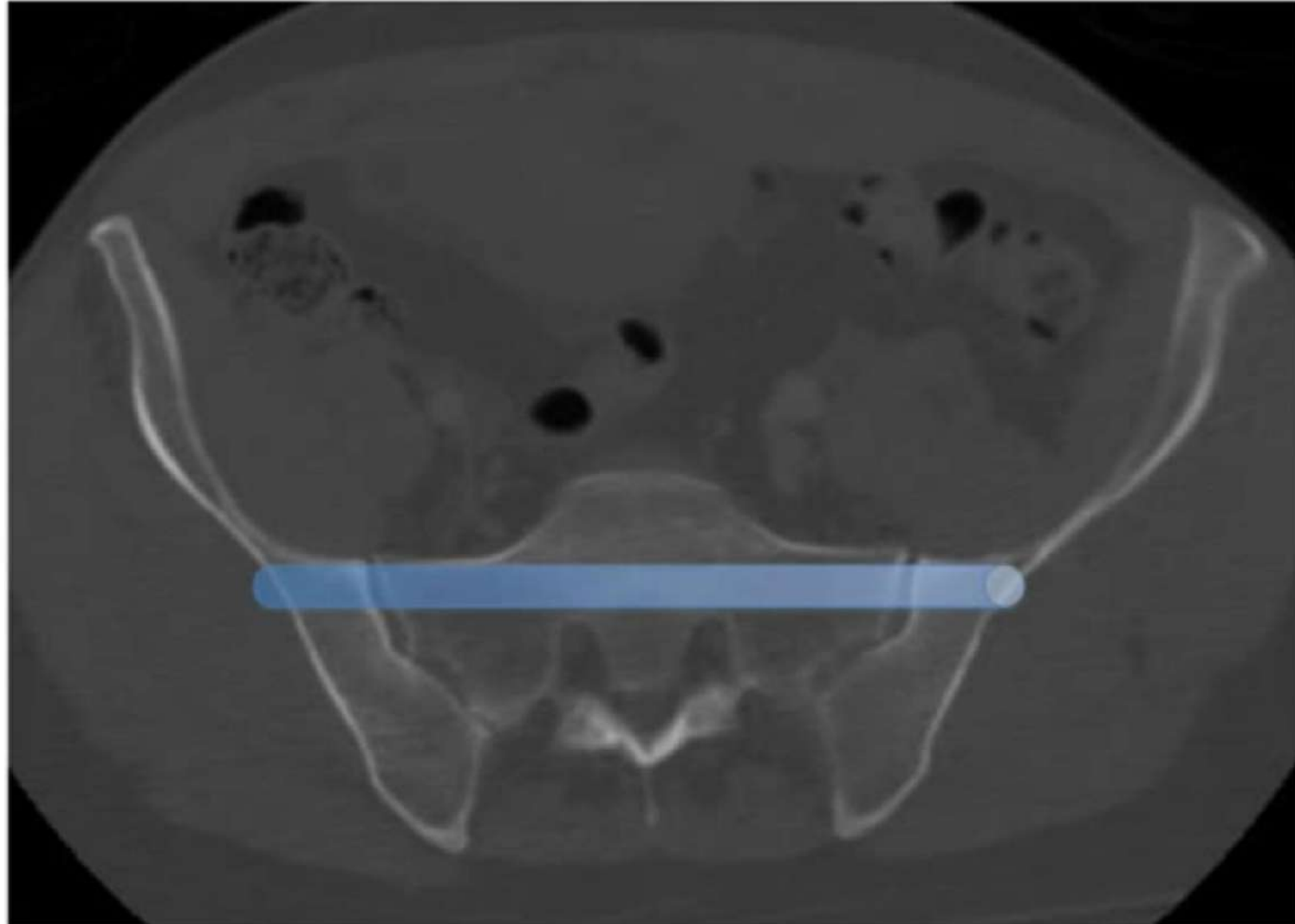


“Dysmorphic”



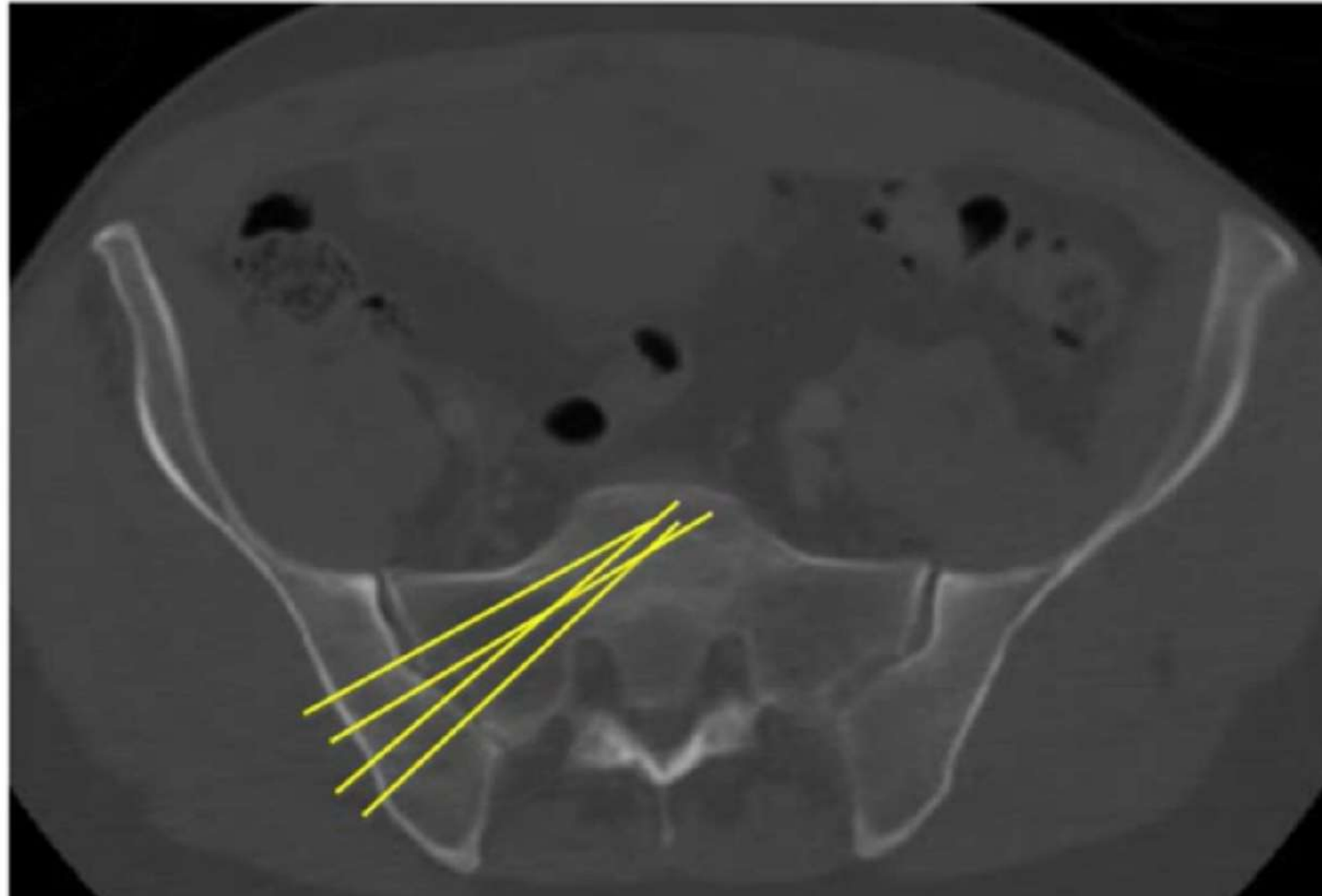
Osseous Fixation Pathways

“Normal”



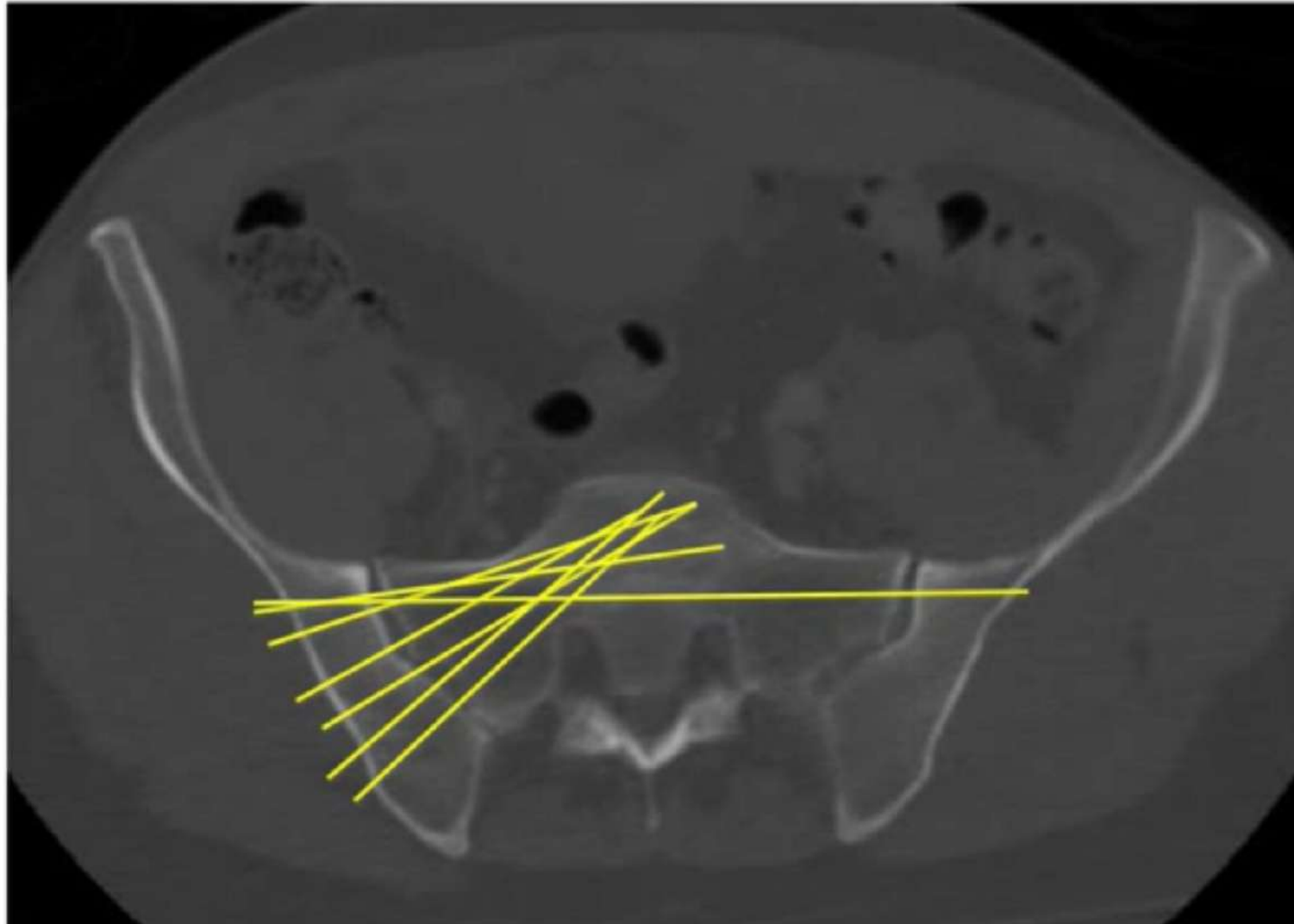
Osseous Fixation Pathways

“Normal”



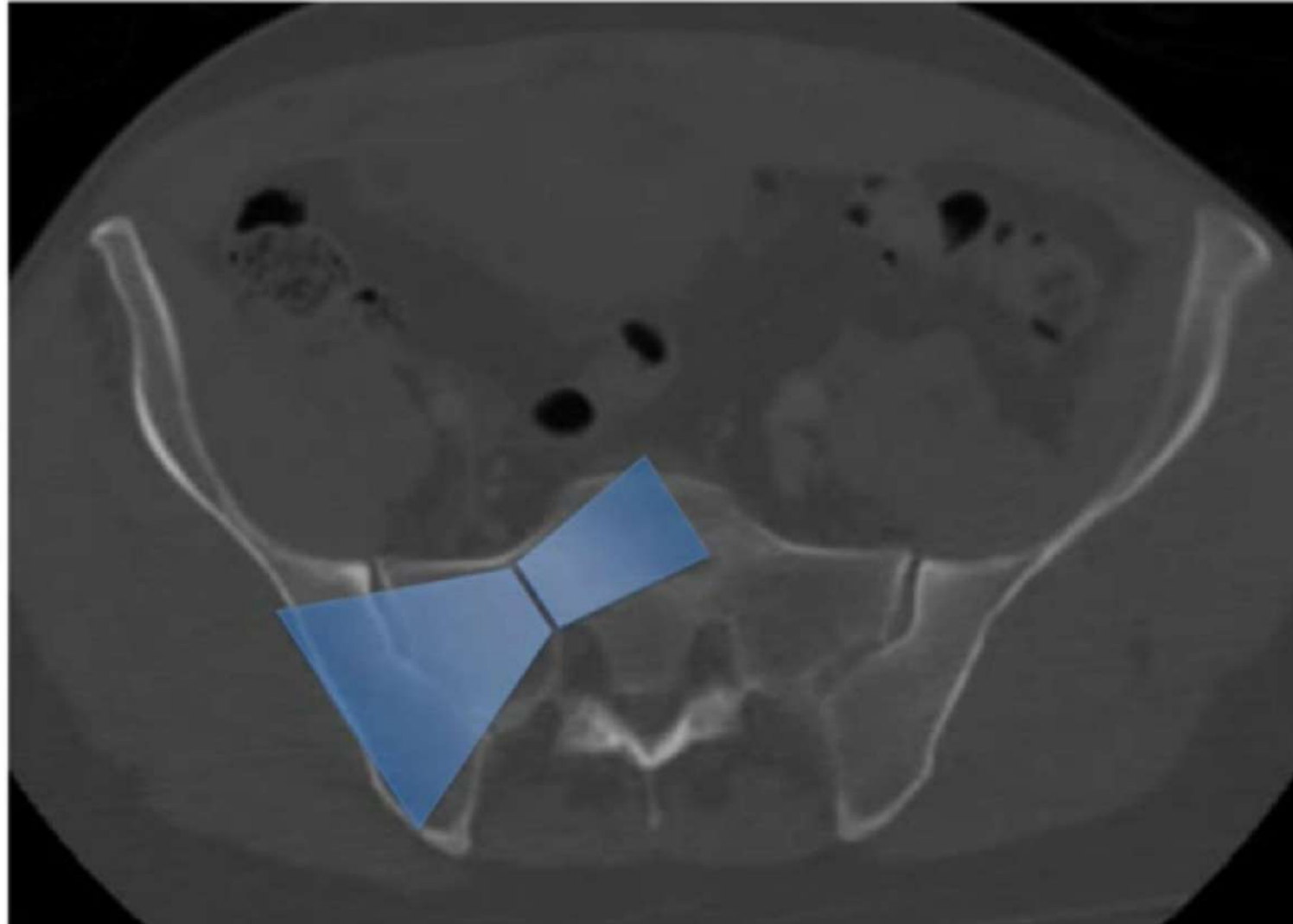
Osseous Fixation Pathways

“Normal”



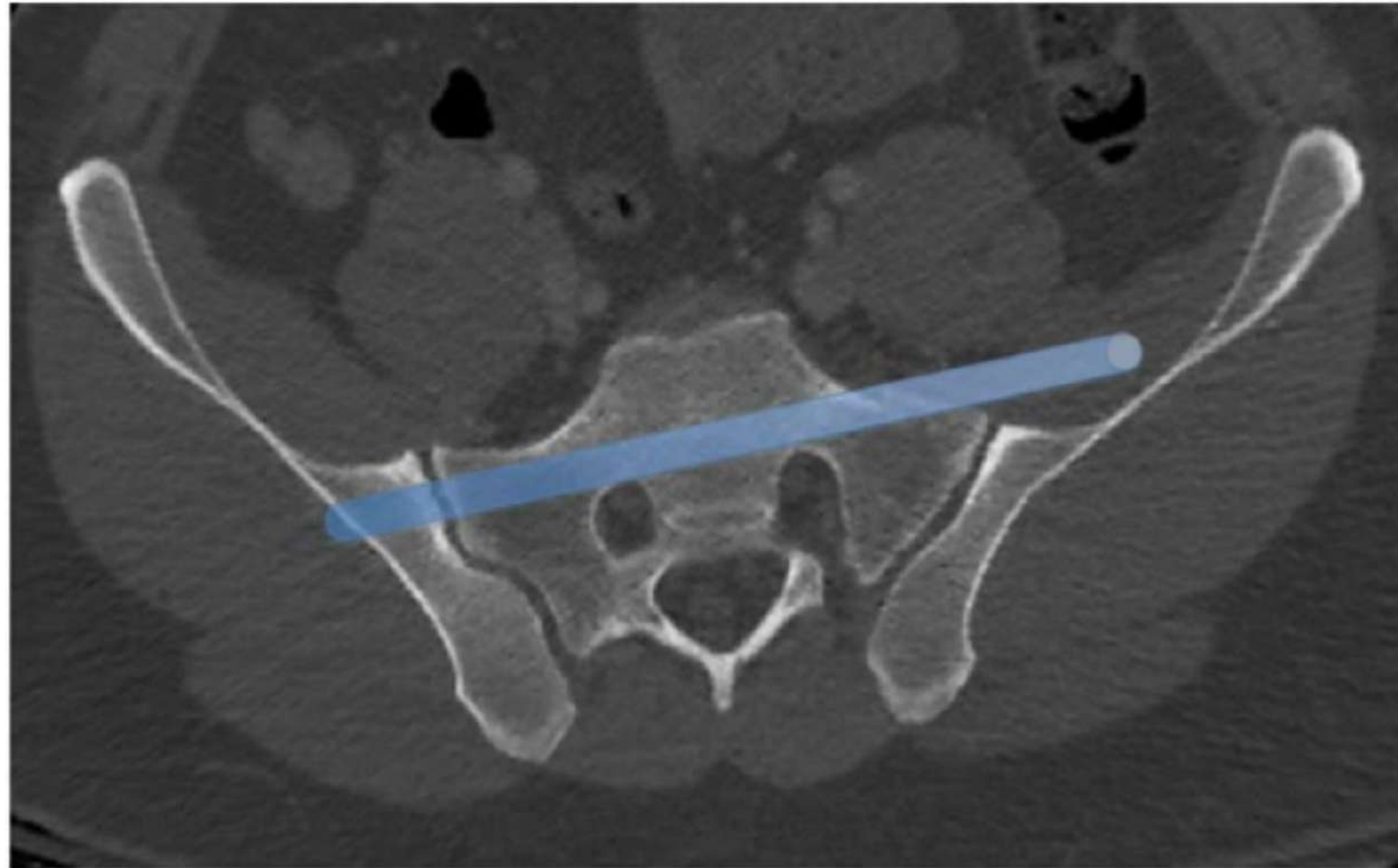
Osseous Fixation Pathways

“Normal”



Osseous Fixation Pathways

“Dysmorphic”



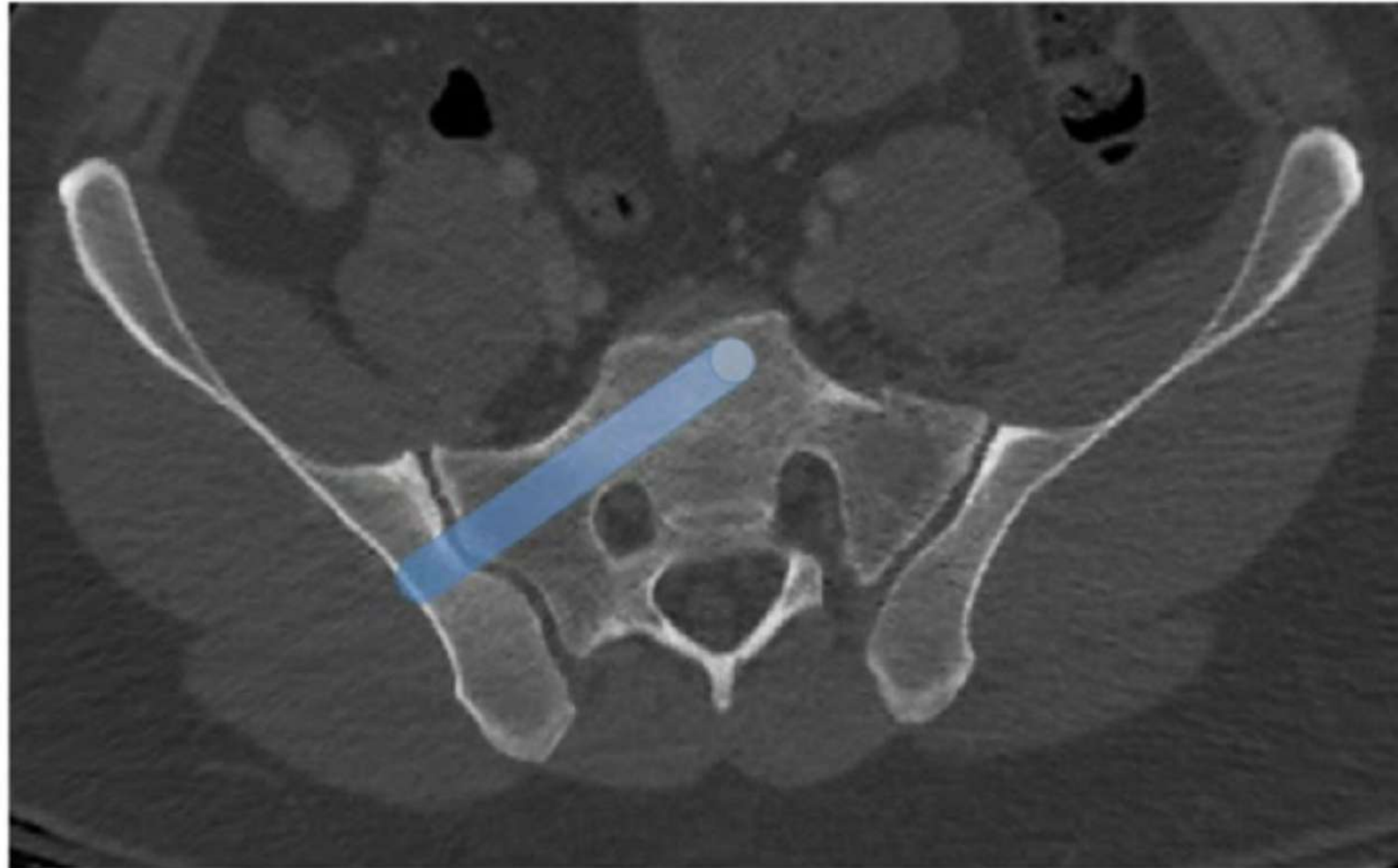
Osseous Fixation Pathways

“Dysmorphic”



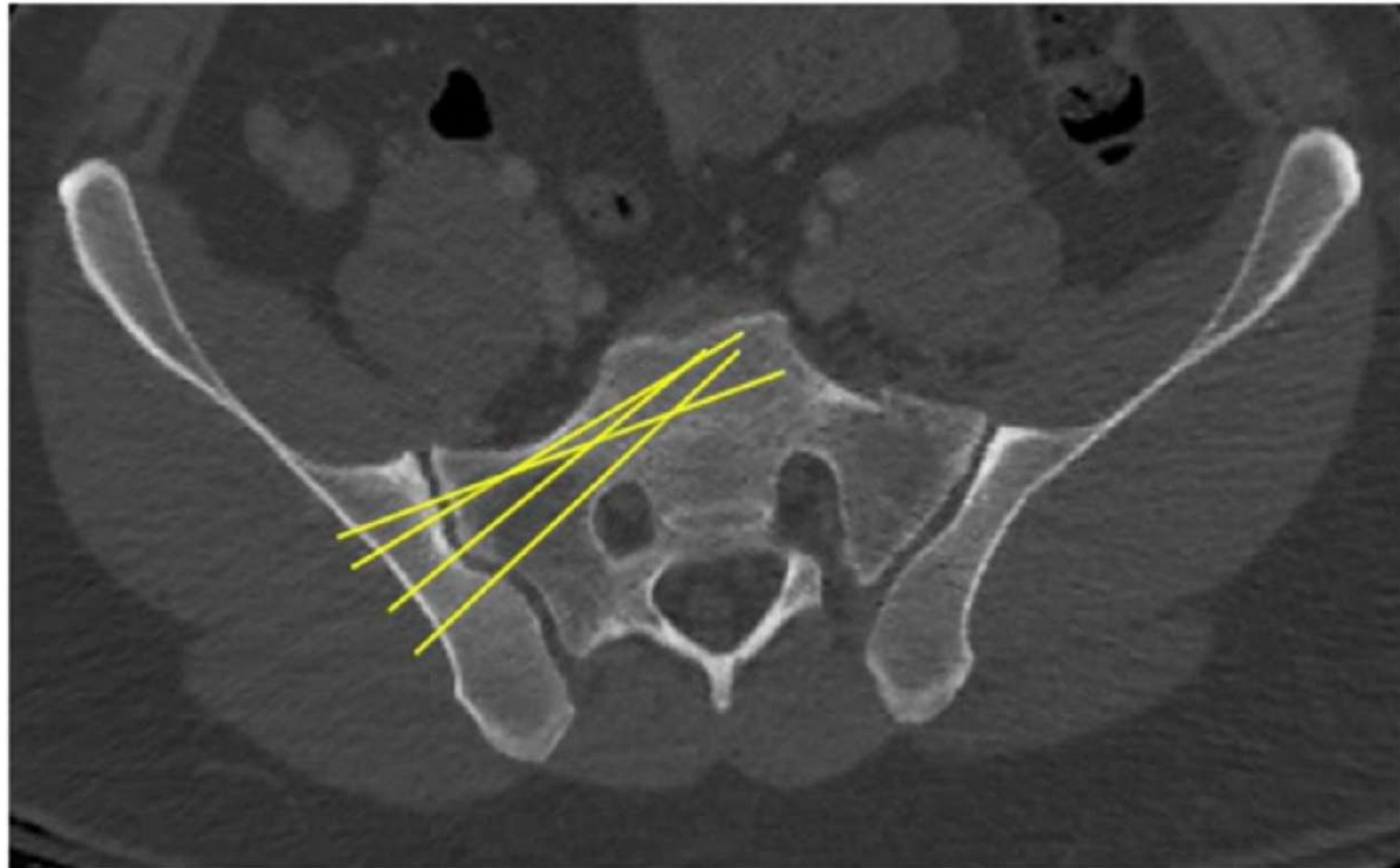
Osseous Fixation Pathways

“Dysmorphic”



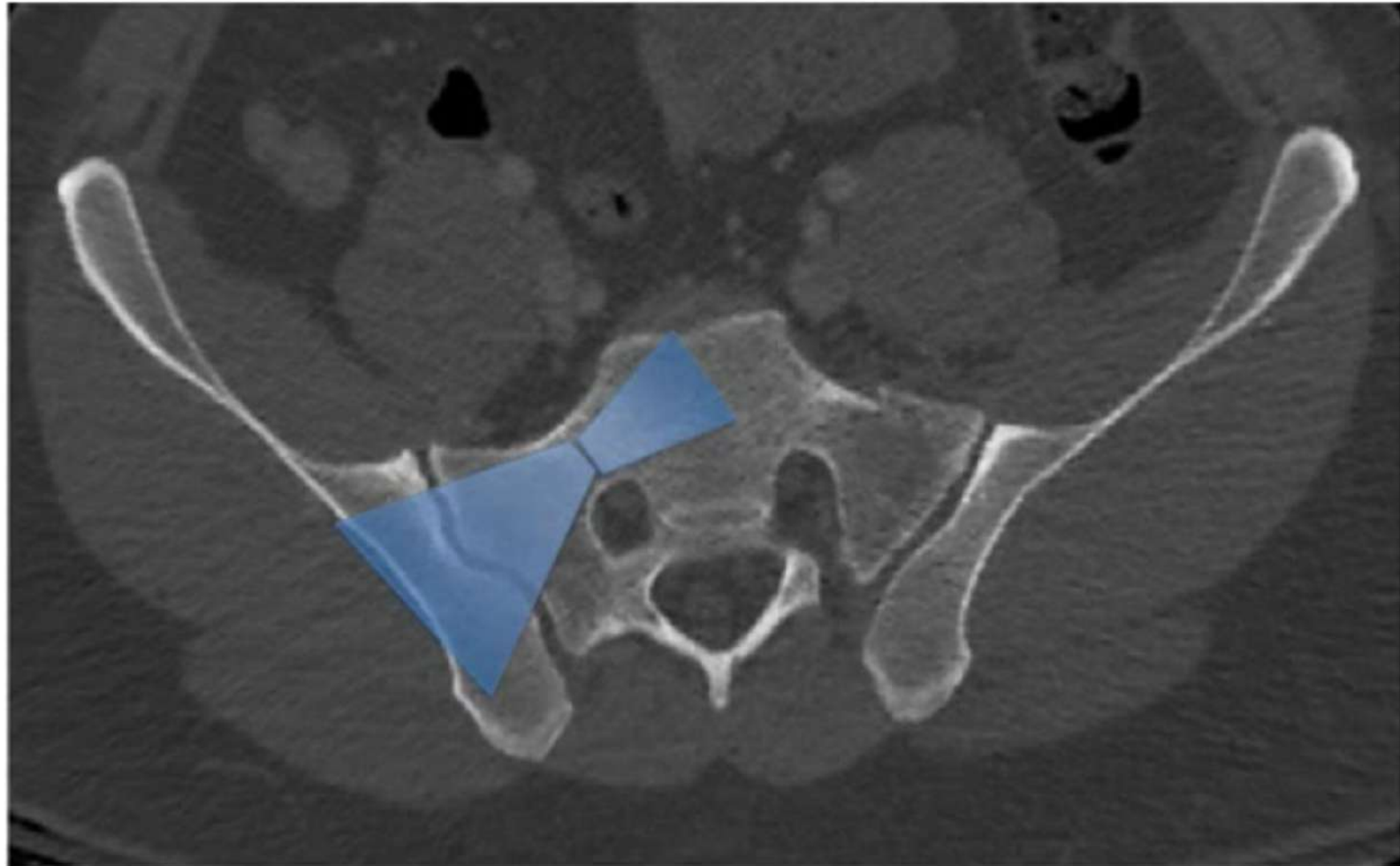
Osseous Fixation Pathways

“Dysmorphic”



Osseous Fixation Pathways

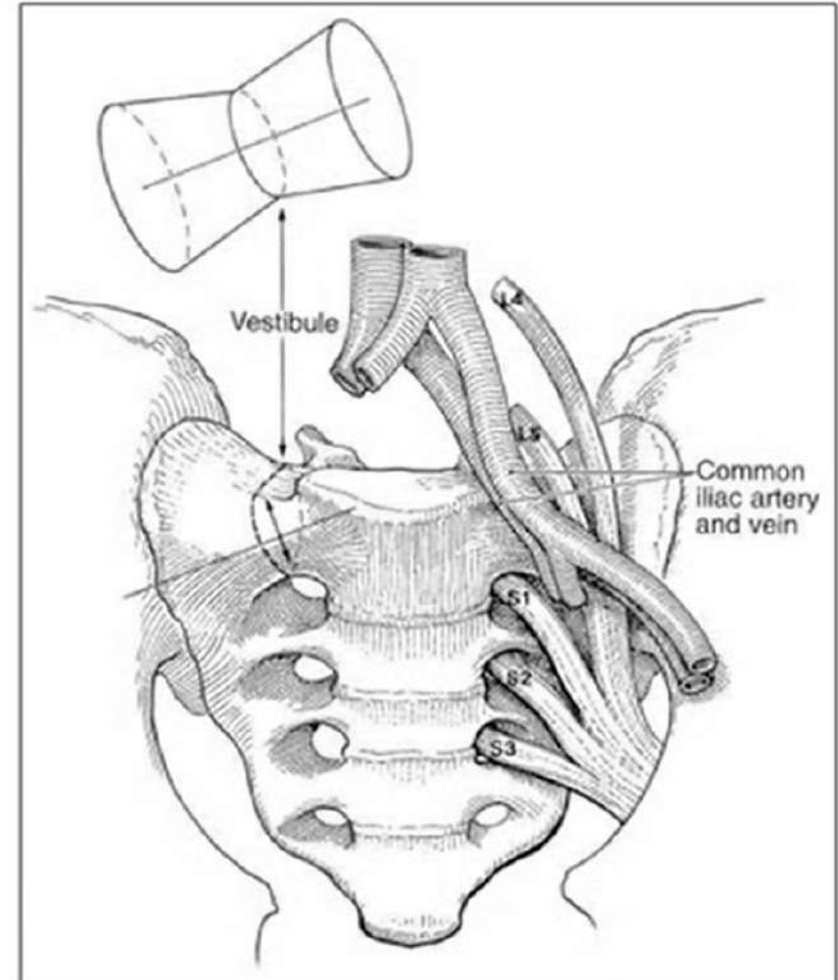
“Dysmorphic”



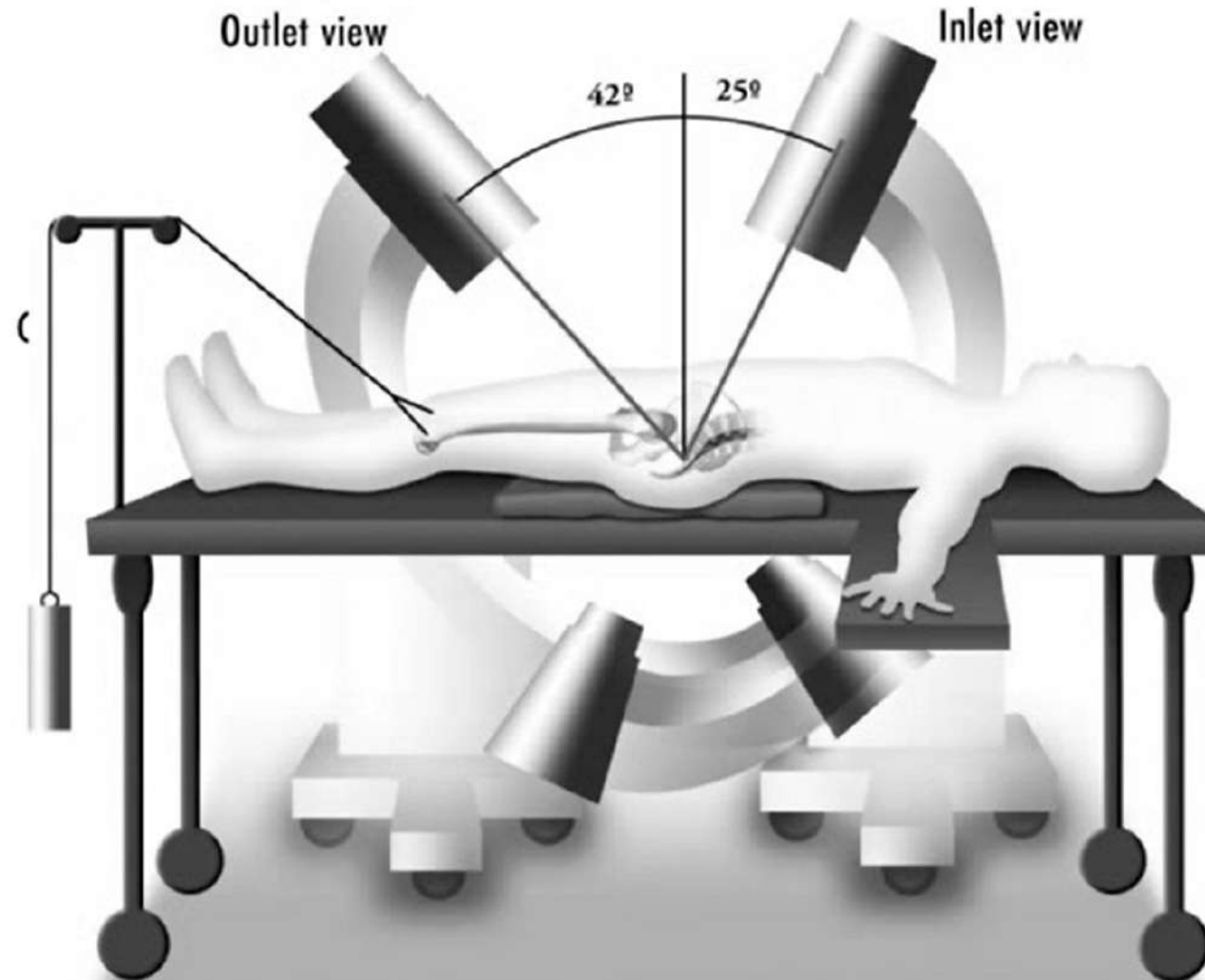
Consistent Extraosseous Anatomy

Staying Within the Vestibule

- L5 Nerve Root
 - Lateral ala
 - “High and anterior”
- S1 Nerve Root
 - Central ala
 - “Low and posterior”
- Common Iliac Vessels
 - Medial Ala
 - “High and Anterior”



Intraoperative Fluoroscopy



Preoperative Planning

Inlet View



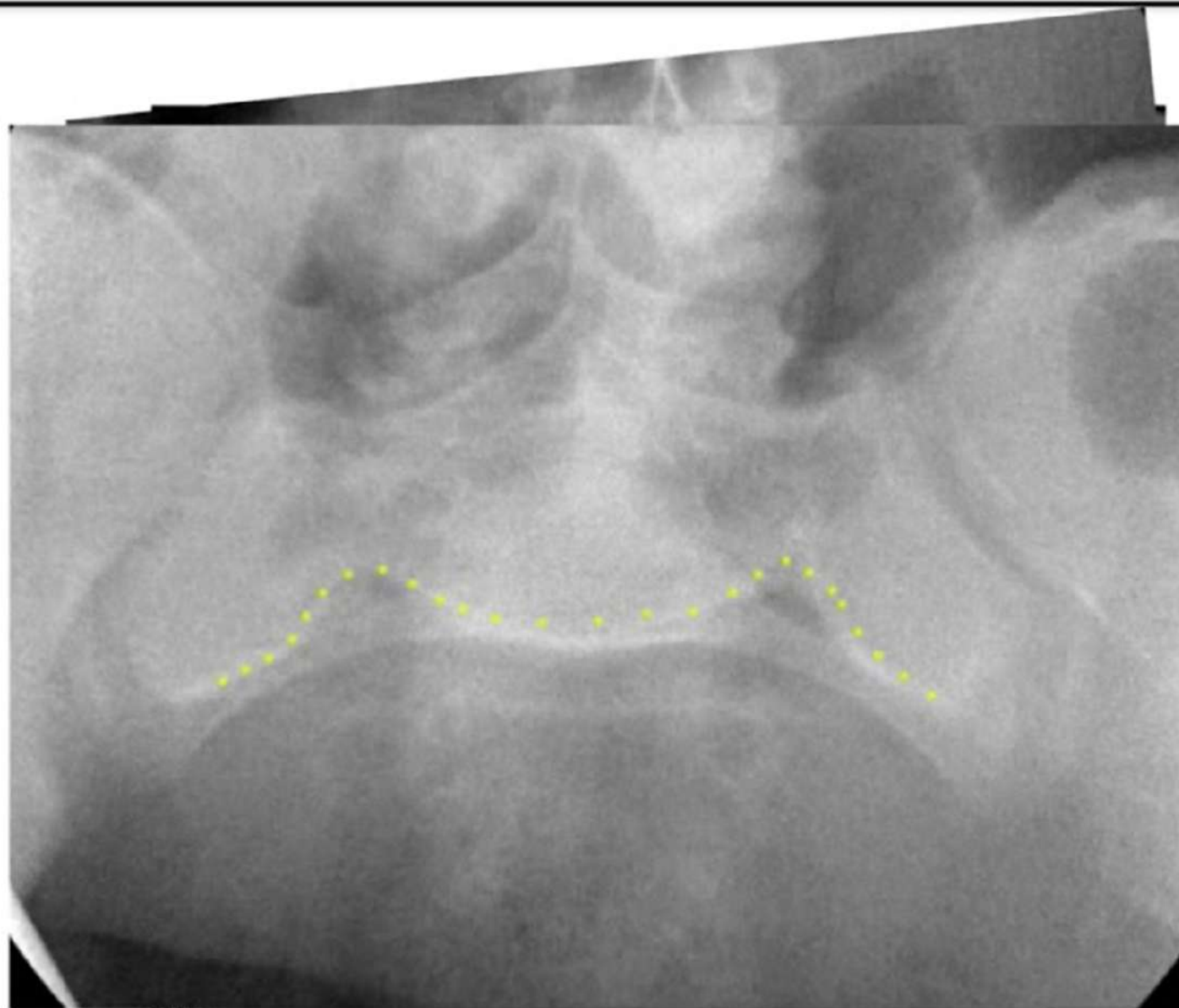
Preoperative Planning

Inlet View



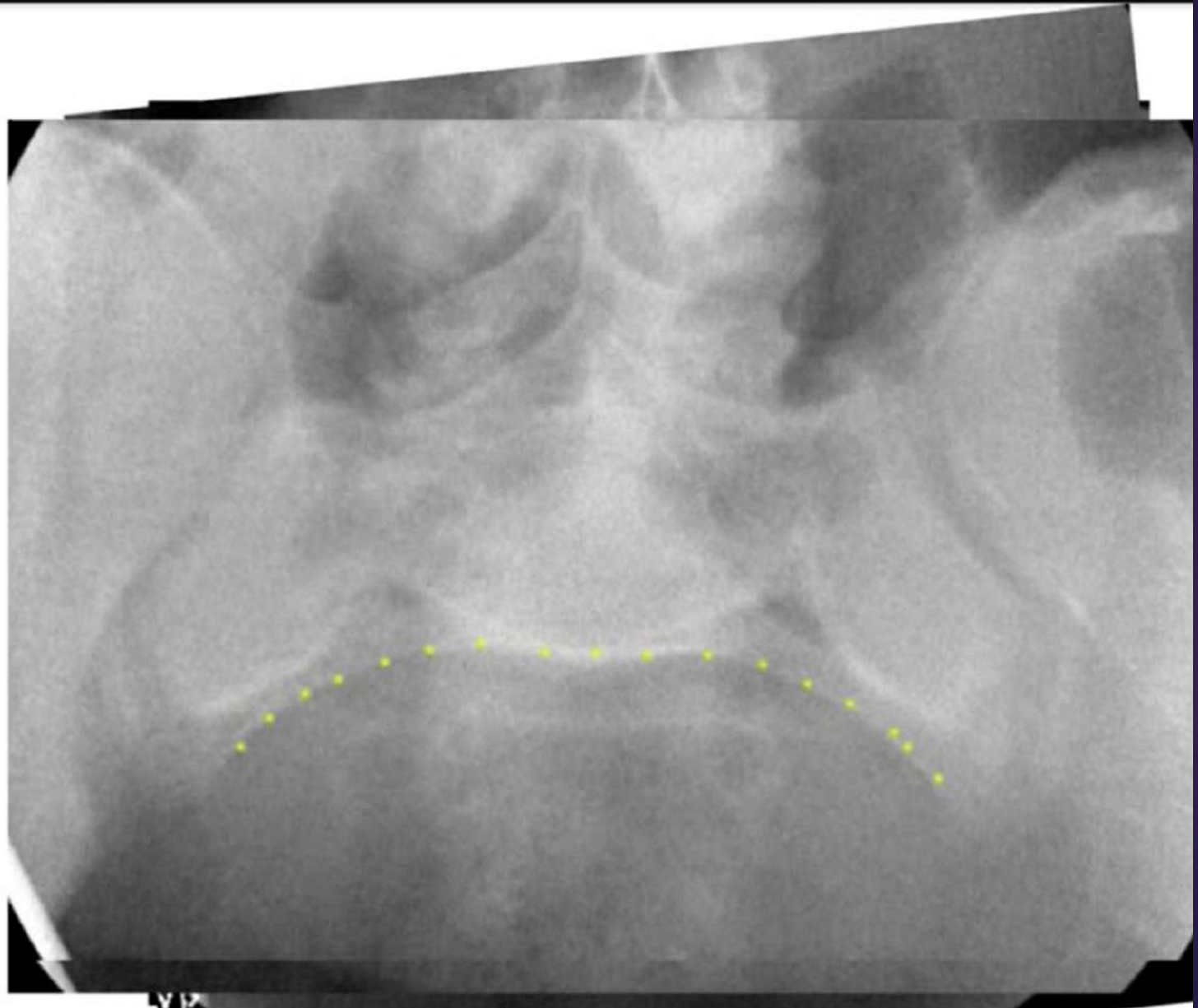
Preoperative Planning

Inlet View



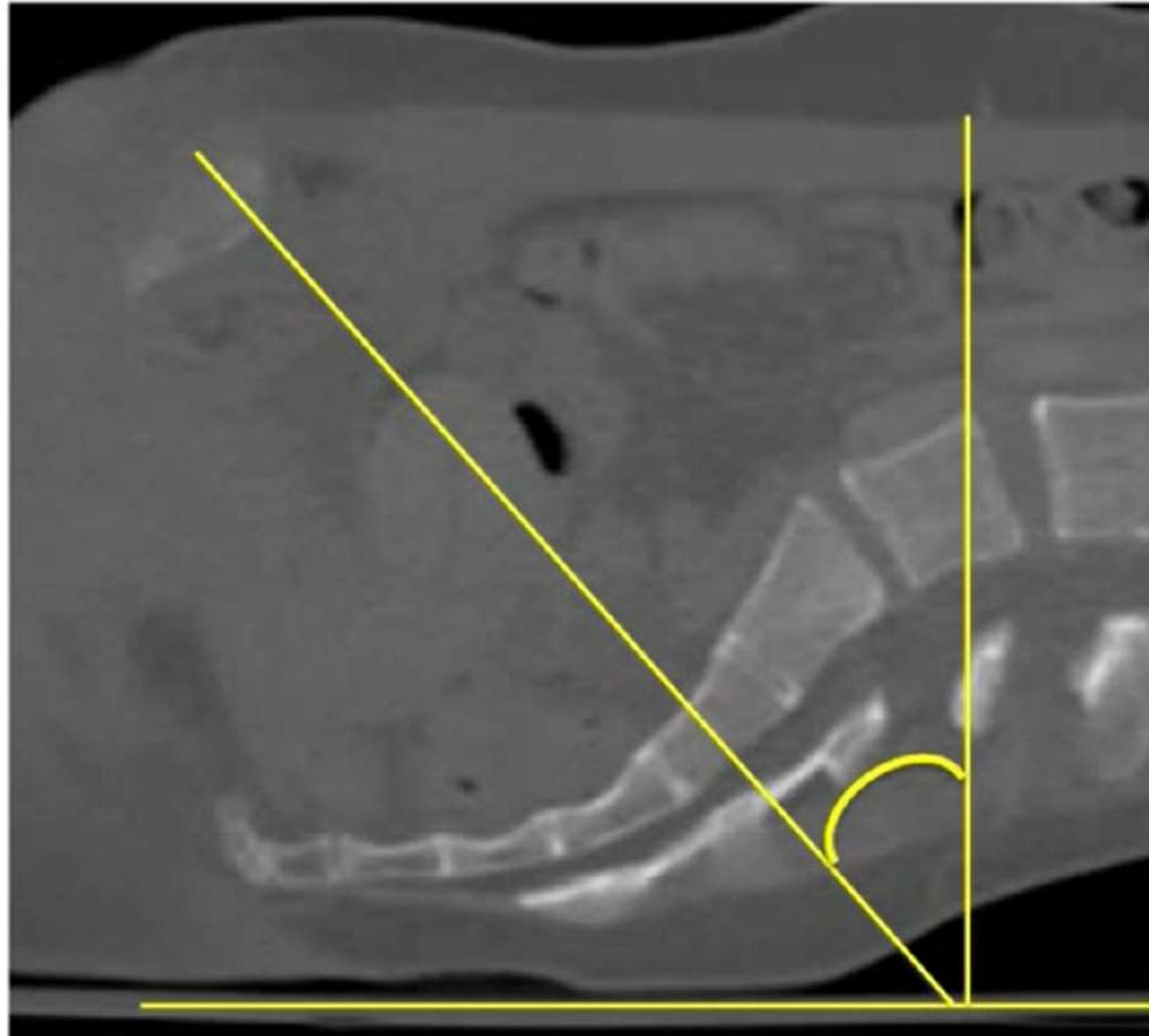
Preoperative Planning

Inlet View



Preoperative Planning

Outlet View



Preoperative Planning

AP Rollover View



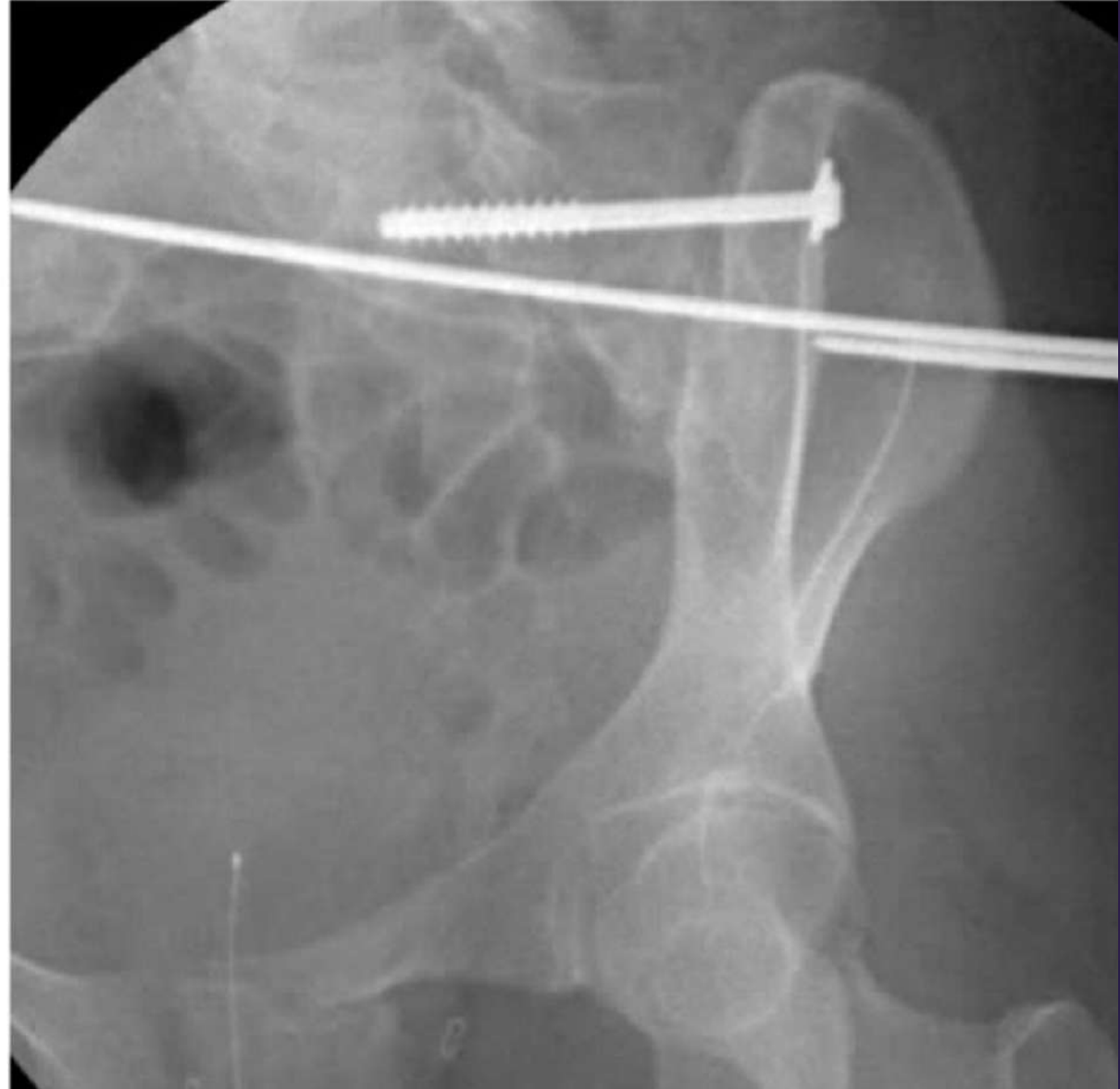
Preoperative Planning

AP Rollover View



Preoperative Planning

AP Rollover View



Lateral View



06:48

Miller and Routt. JAAOS 2012

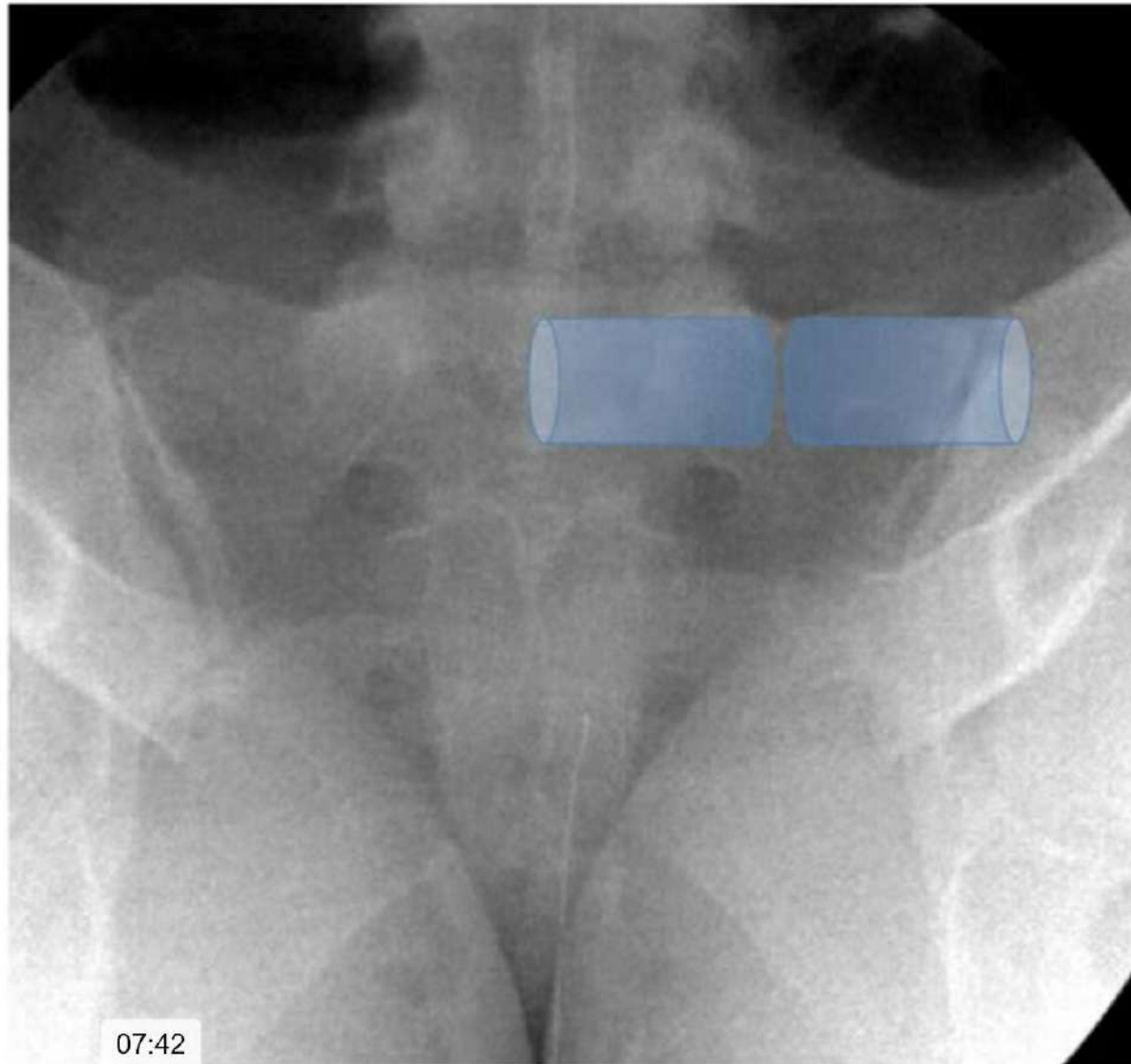
Reduction is Mandatory



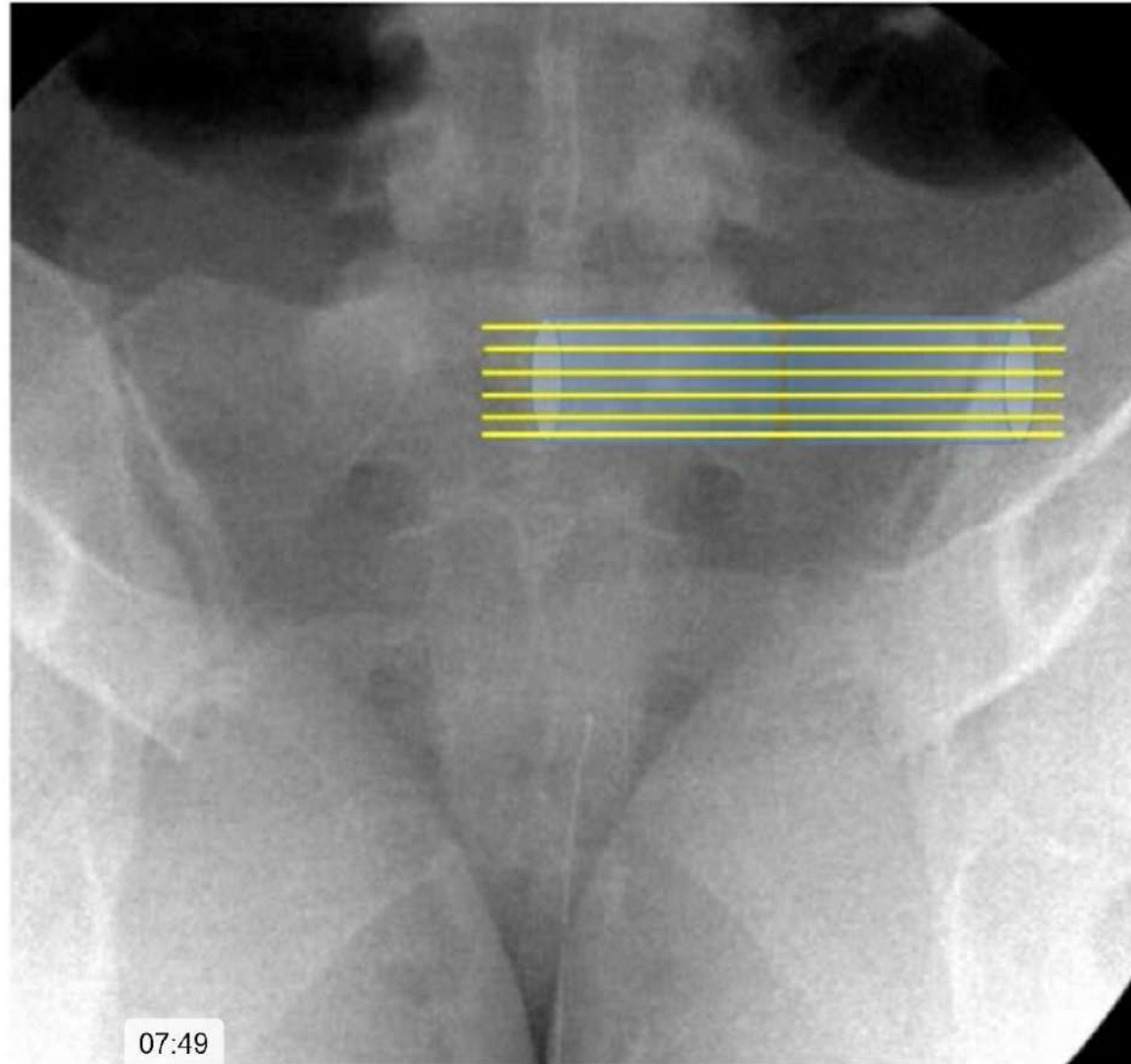
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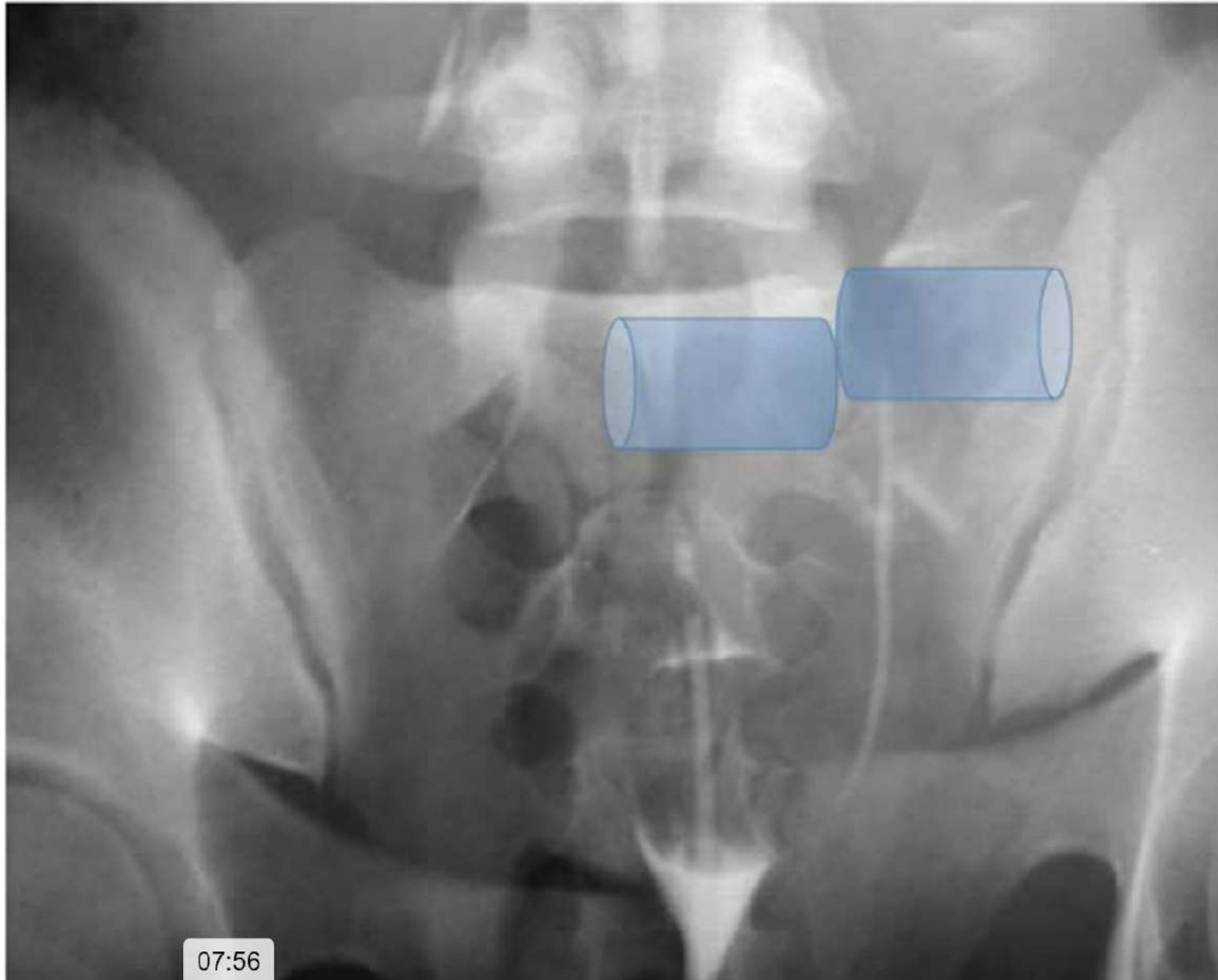
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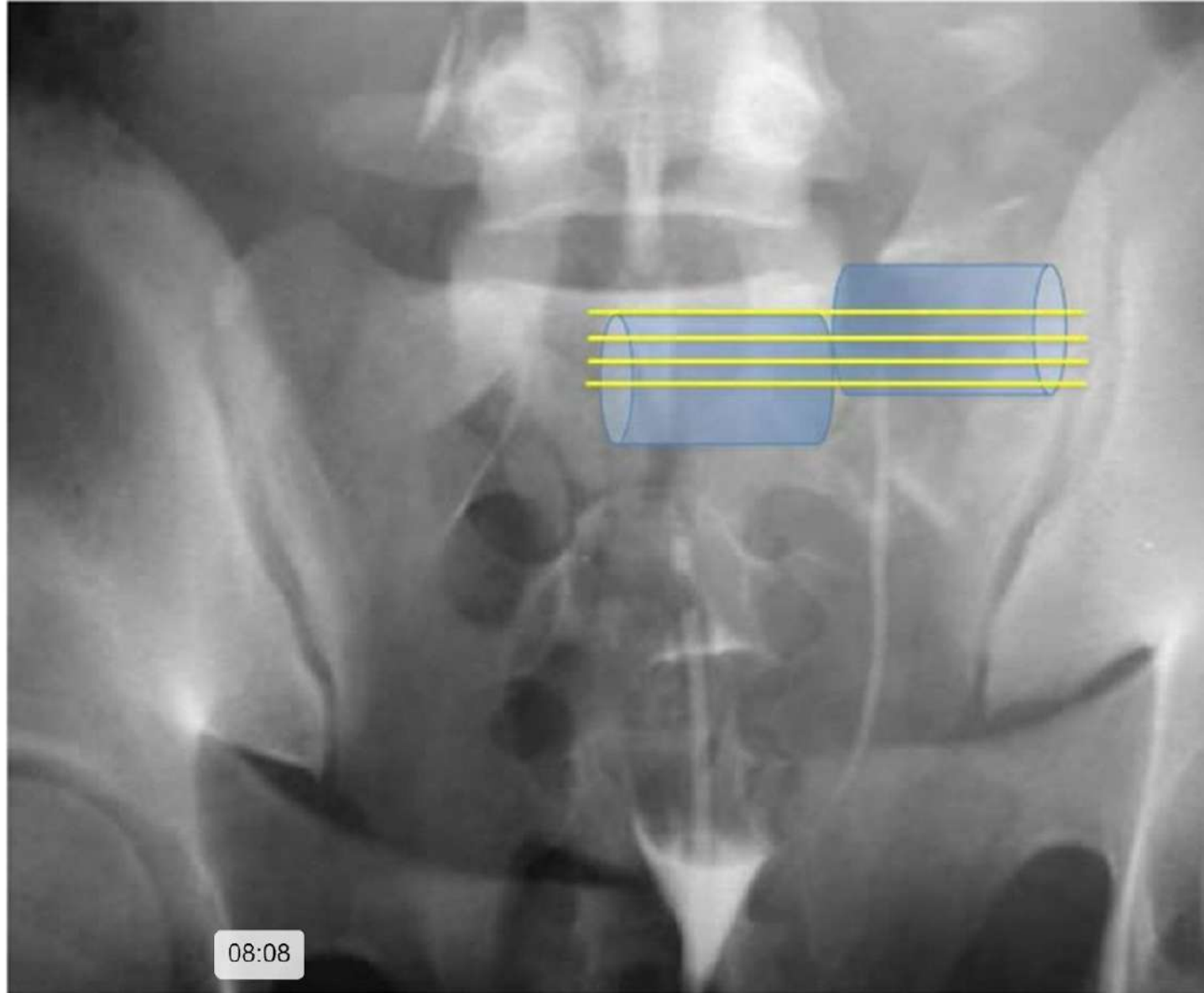
Reduction is Mandatory



Reduction is Mandatory



Reduction is Mandatory



Patient Positioning

- Supine
- Lumbosacral bump
 - Two blankets in midline
- Prep low and posterior



Start Site

Inlet



Outlet



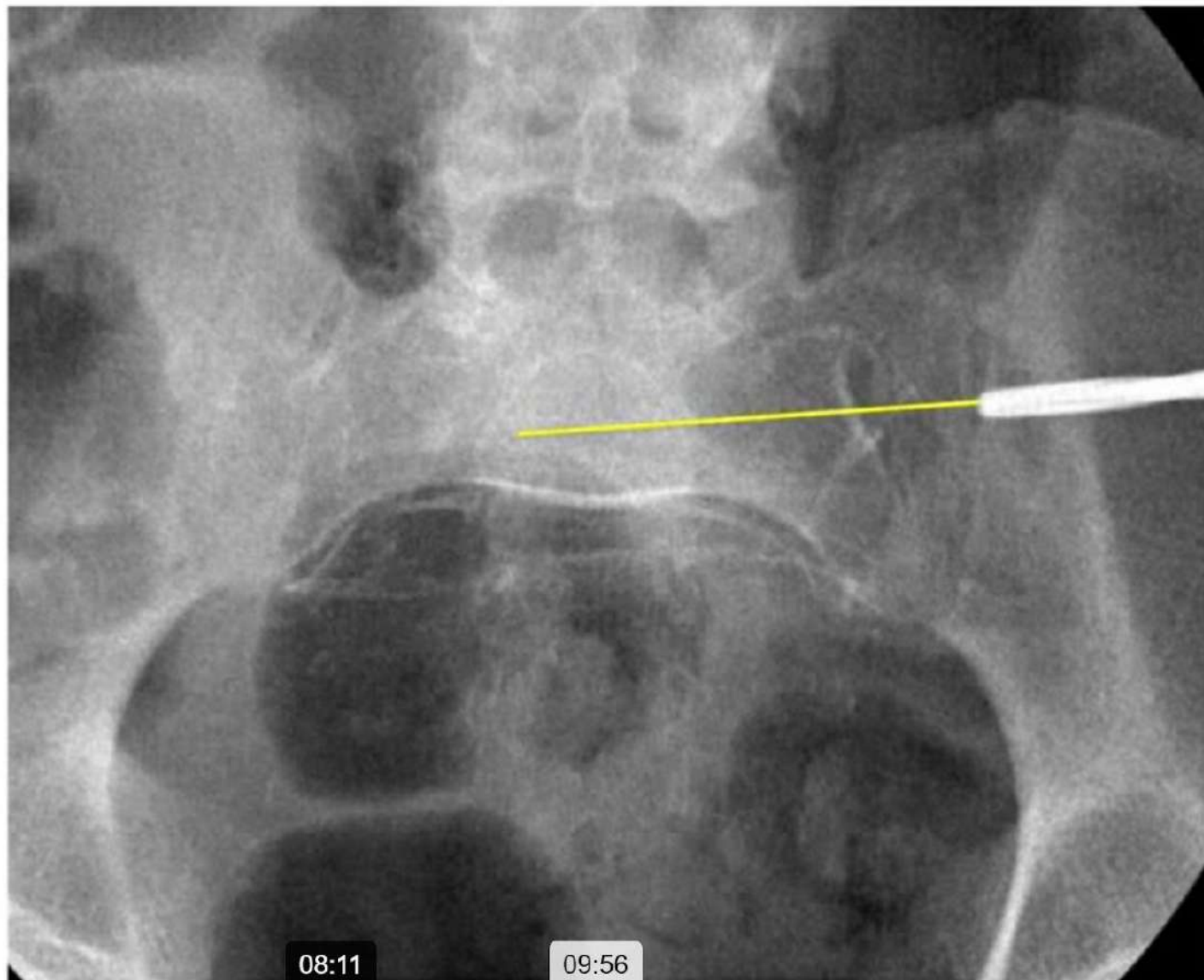
Drill Insertion and Orientation



08:11

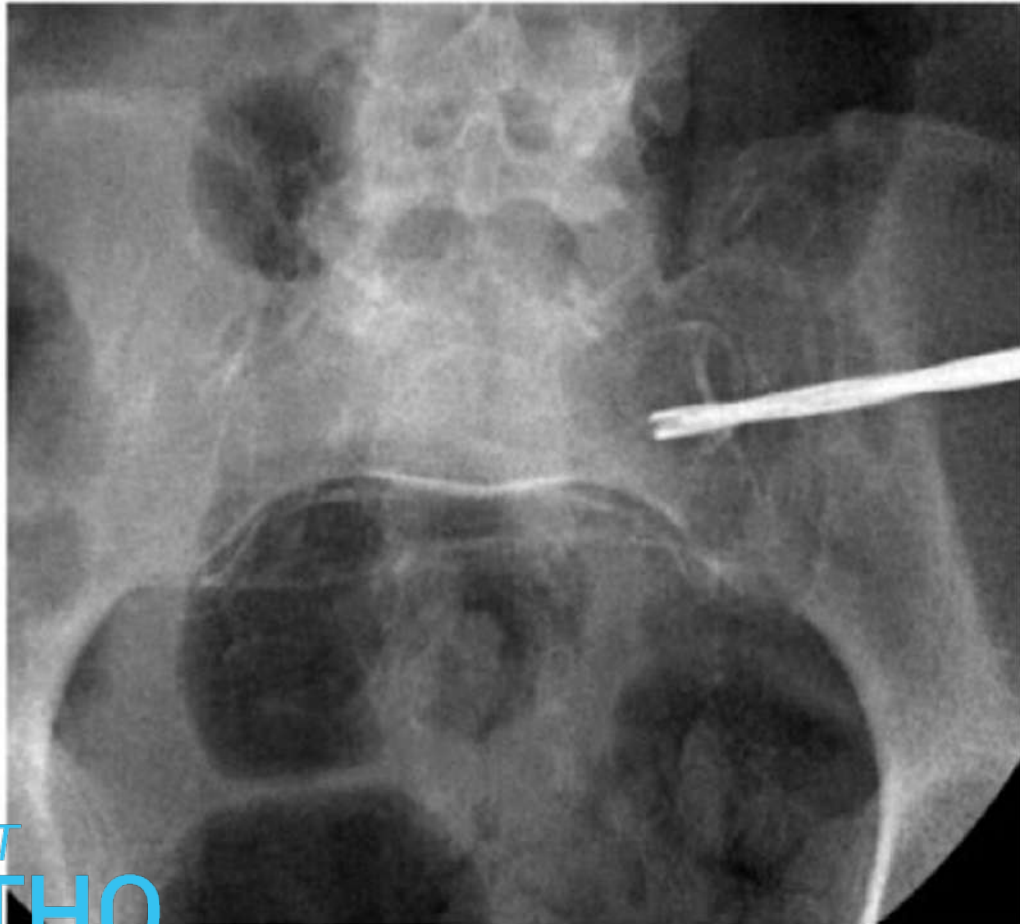
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Drill Insertion and Orientation



Drill Advancement

Inlet



Outlet



Verify on Lateral View



Advance Into Sacral Body

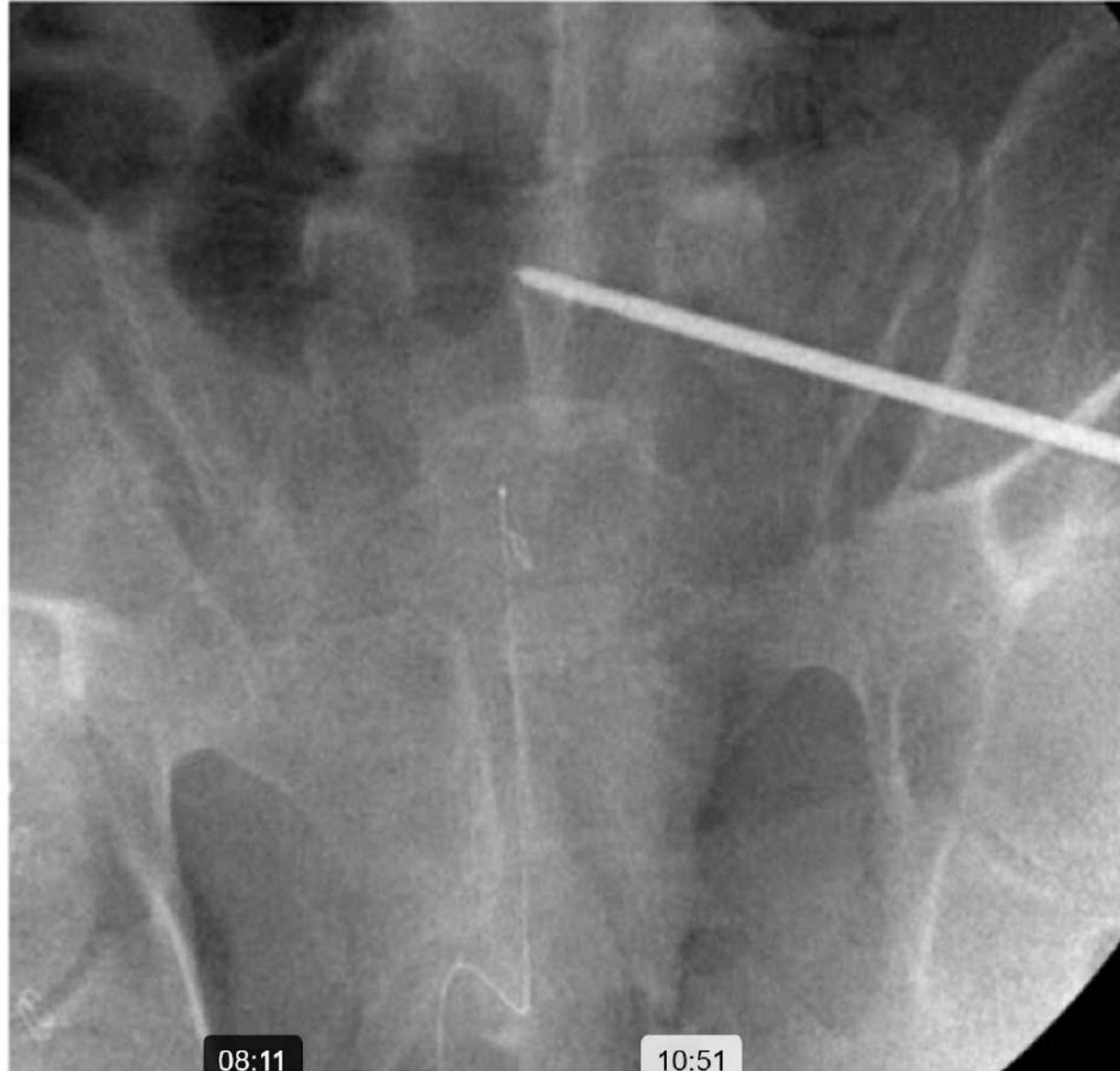
Inlet



Outlet



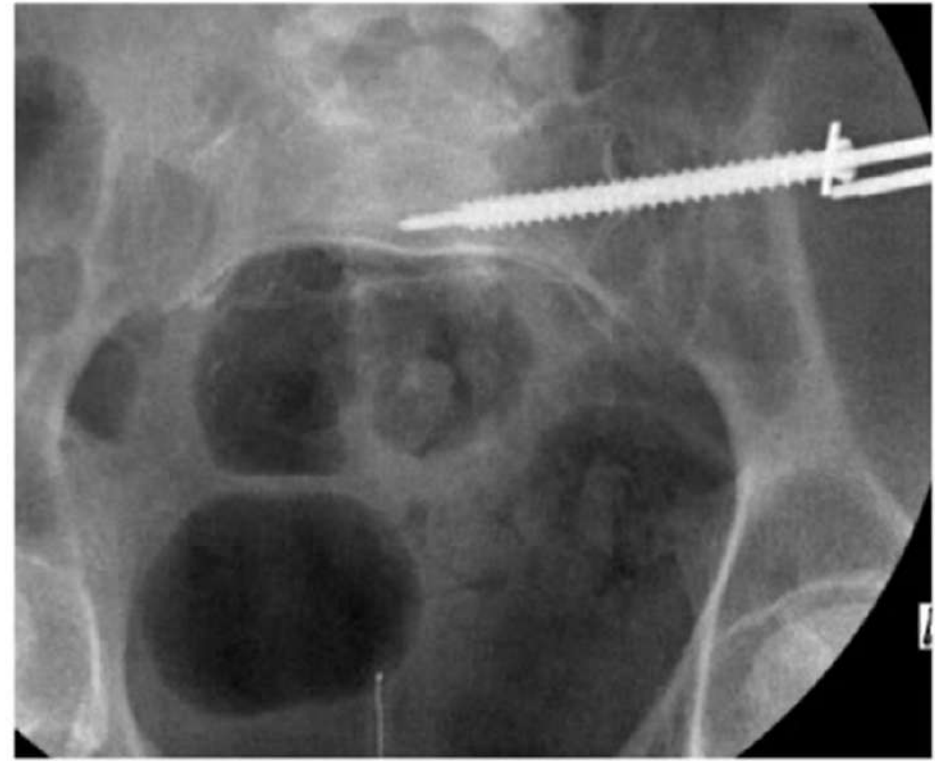
Evaluate Drill Path



Measure Depth

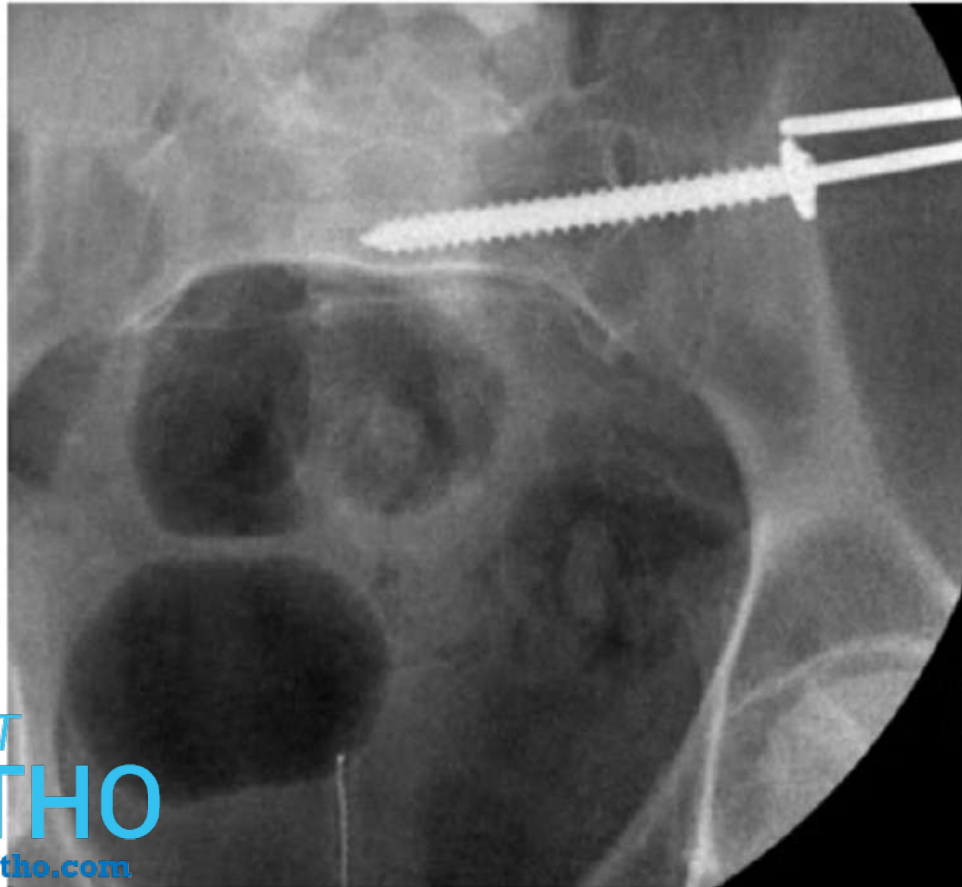


Screw Insertion

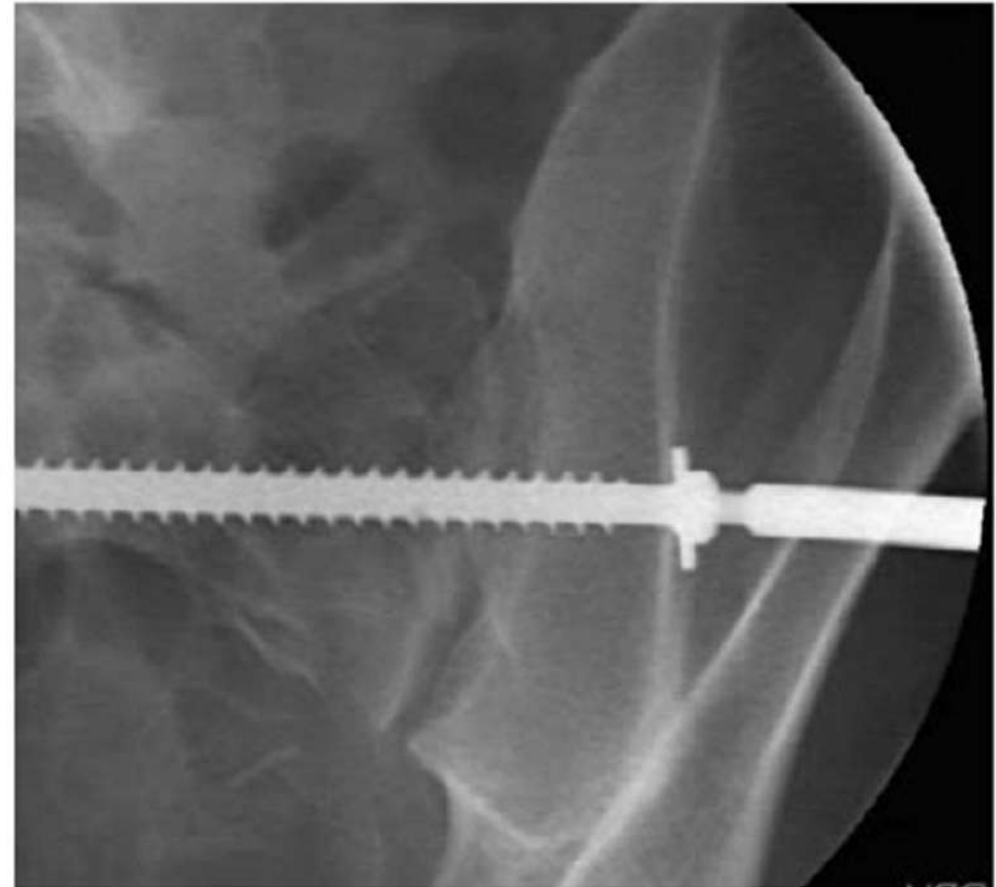


Verify No Screw Intrusion

Inlet



AP Rollover



Conclusion

- Knowledge of anatomy is paramount
- Understand posterior ring variability
- Preoperative planning vital
- Reduction mandatory
- Execute screw placement safely and reproducibly