

Acetabular Fractures



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Nothing to disclose

Objectives

Anatomy:

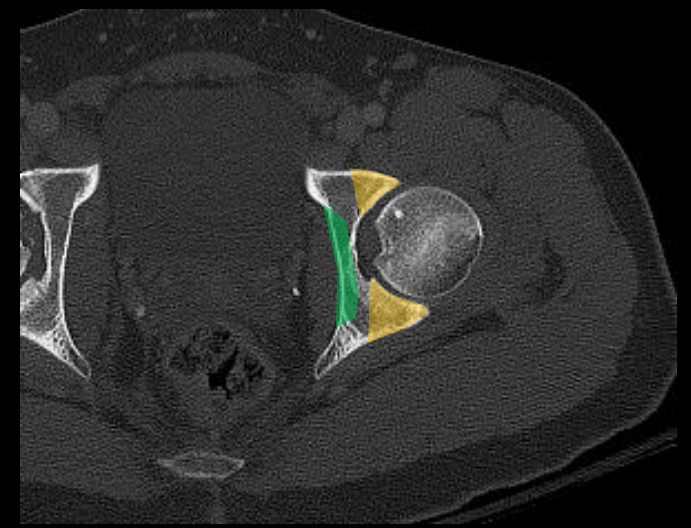
- Where are the **anterior** and **posterior** columns?
- What is the difference between a **column** and a **wall**?

Imaging:

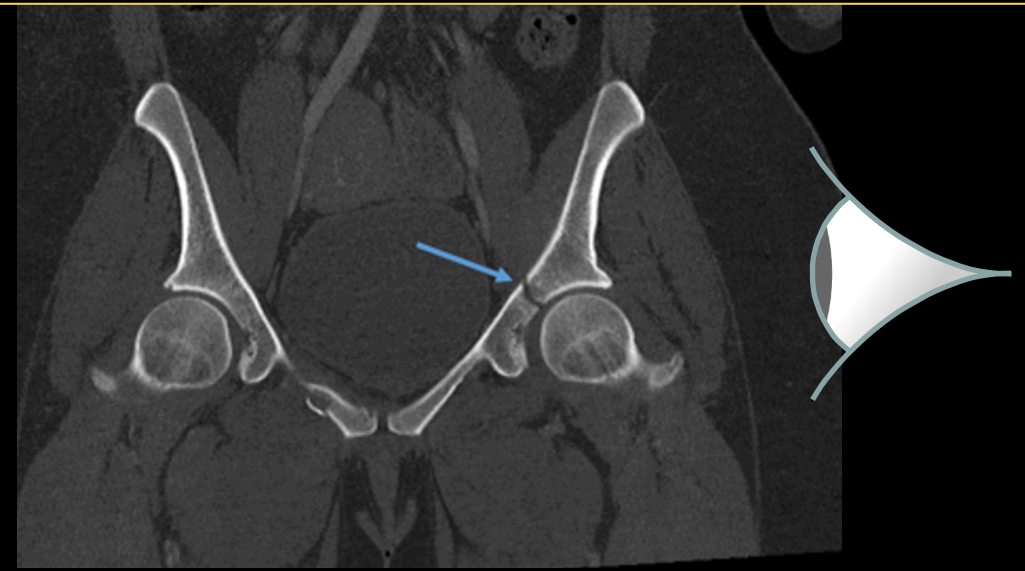
- Overview of Judet-Letournel system
- The **only 4 things** you need to know about Judet-Letournel
- Using **routine CT images** for classifying fractures



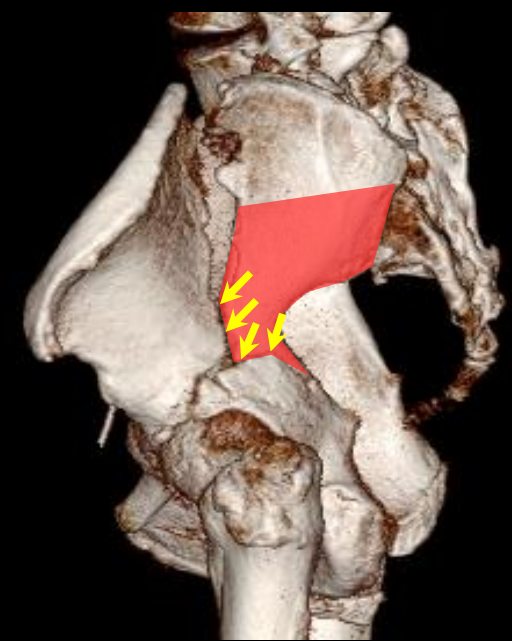
Wall



Column

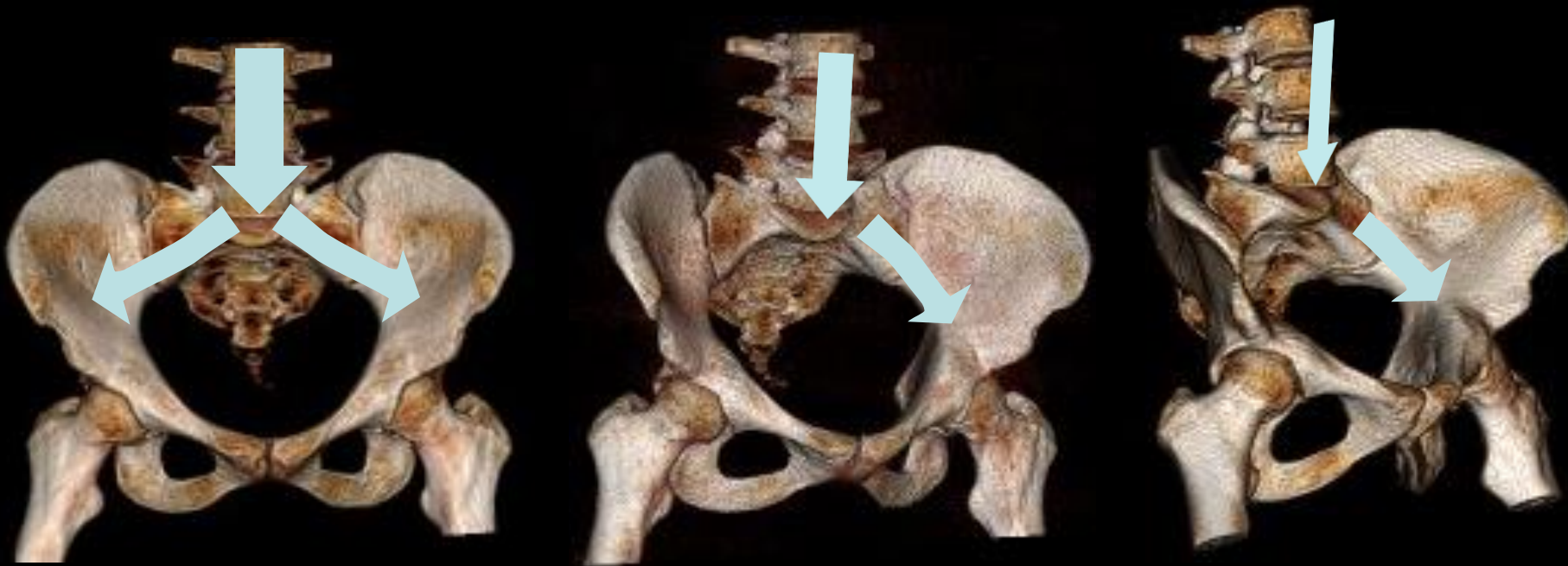


Transverse



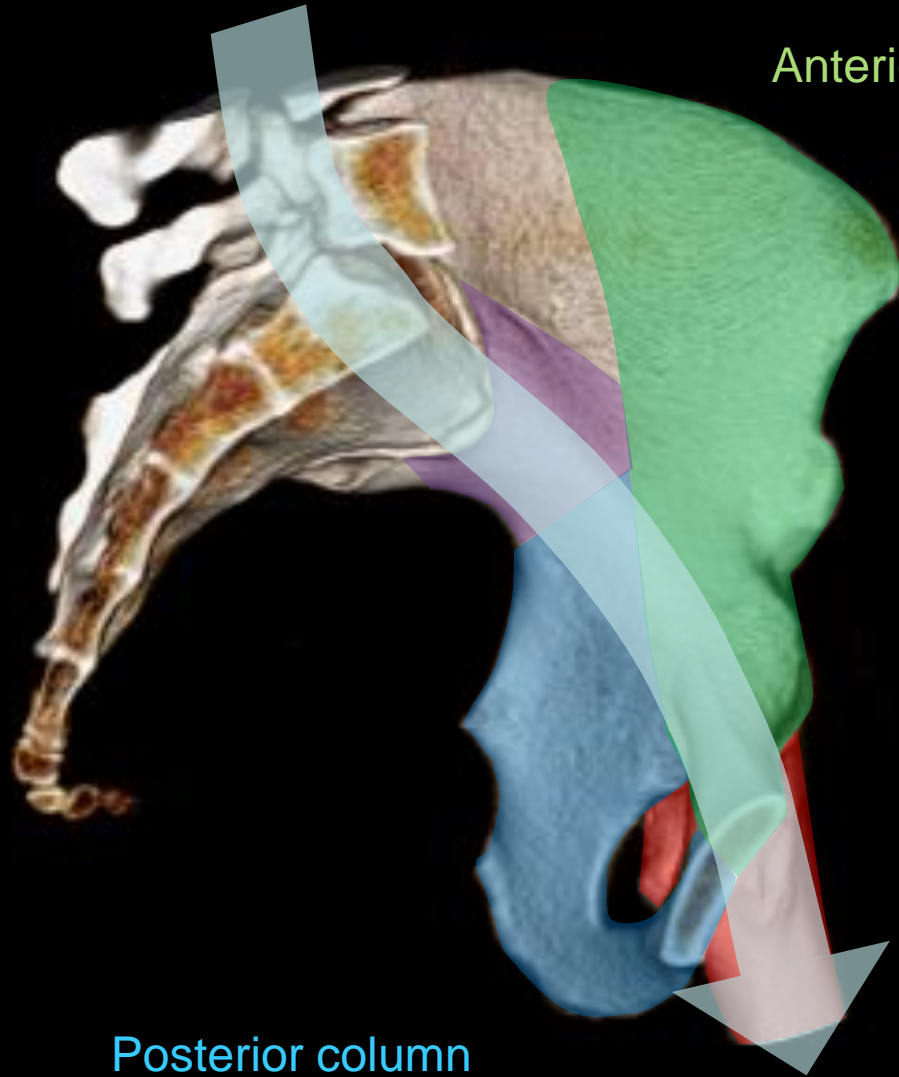
**Both column
(associated)**

Function – Acetabular columns



Part of the system that transfers weight from the spine to the lower extremities

Function – Acetabular columns



Weight is transferred along the spine

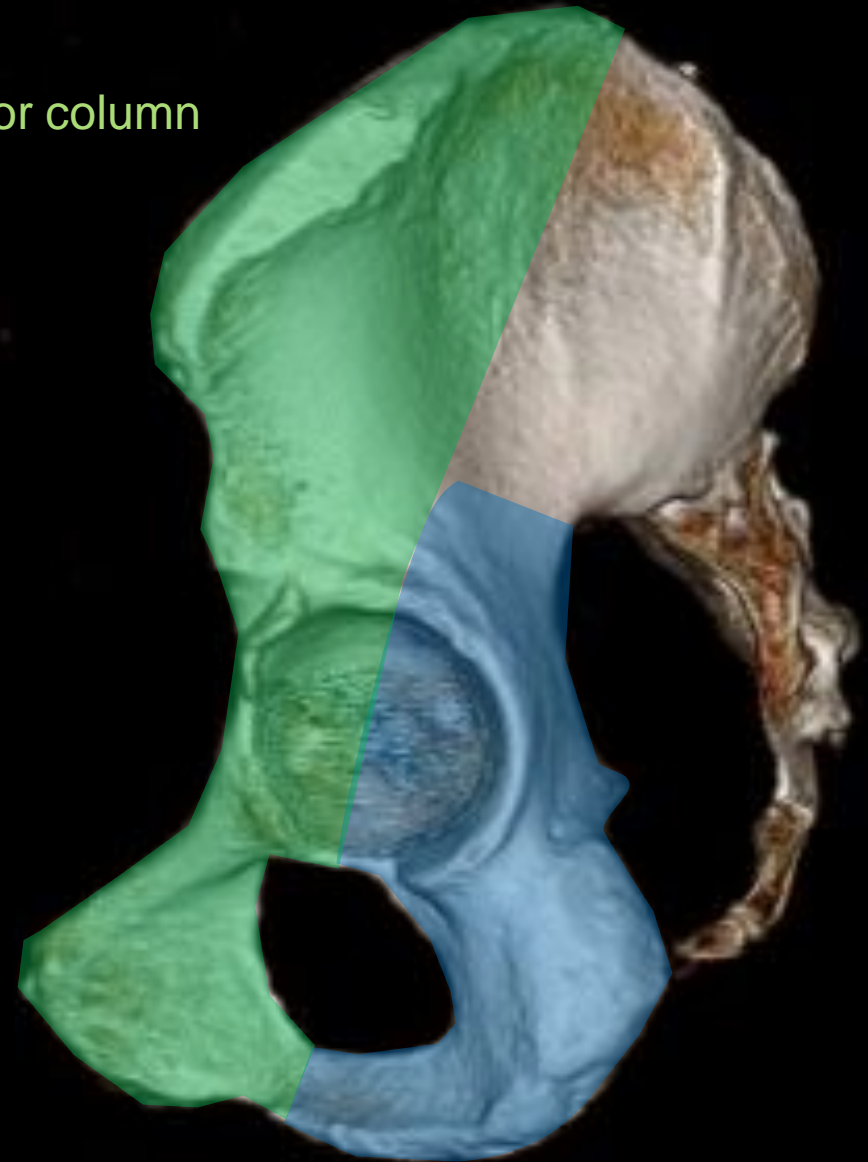
- first 3 sacral segments
- sciatic buttress
- anterior and posterior columns
- lower extremity through the hip

Anatomy – Acetabular columns

Anterior column

Anterior column: pubic body, superior pubic ramus and a large portion of the anterior iliac wing

Posterior column: the ischium and a small portion of the ilium (up to the level of the greater sciatic notch).



Posterior column

So what is a wall?

Projection from the anterior & posterior column



- deepens the acetabular cup
- provides stability to the femoral head.

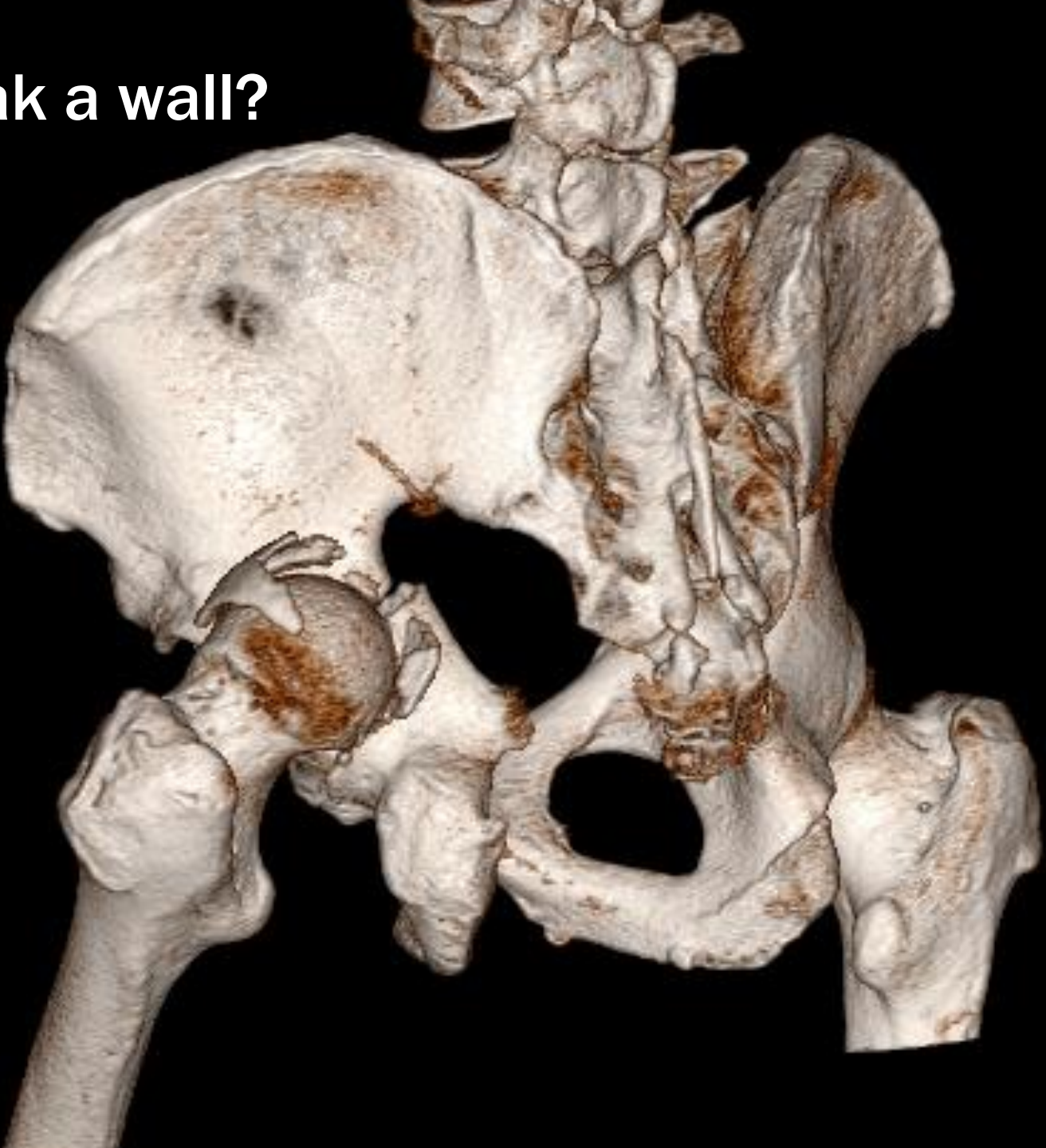


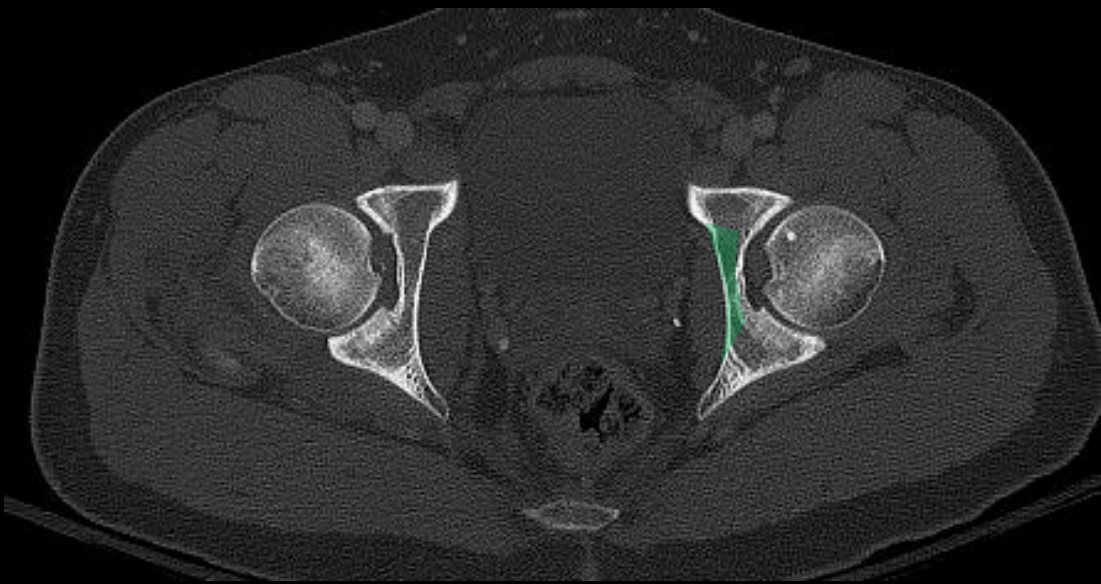
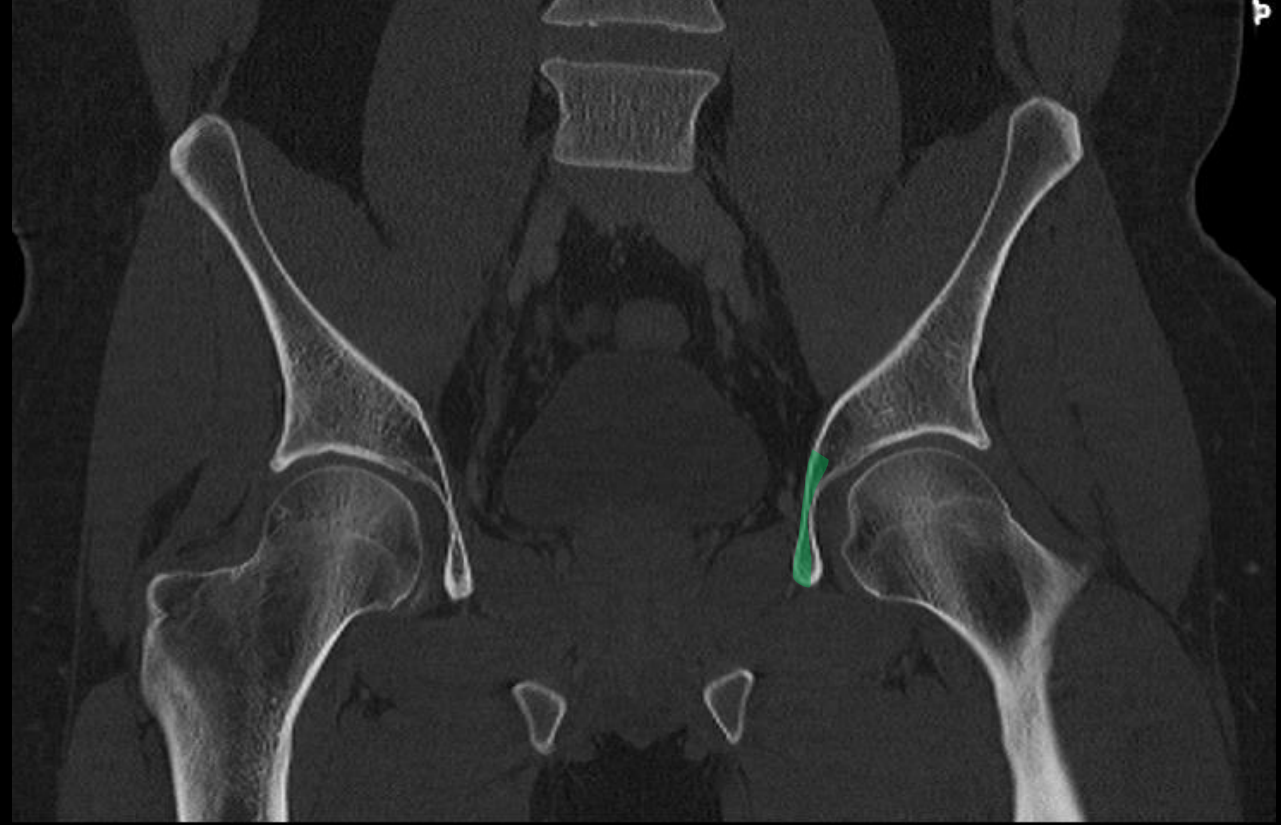
What happens if I break a wall?

Femoral head → **unstable**

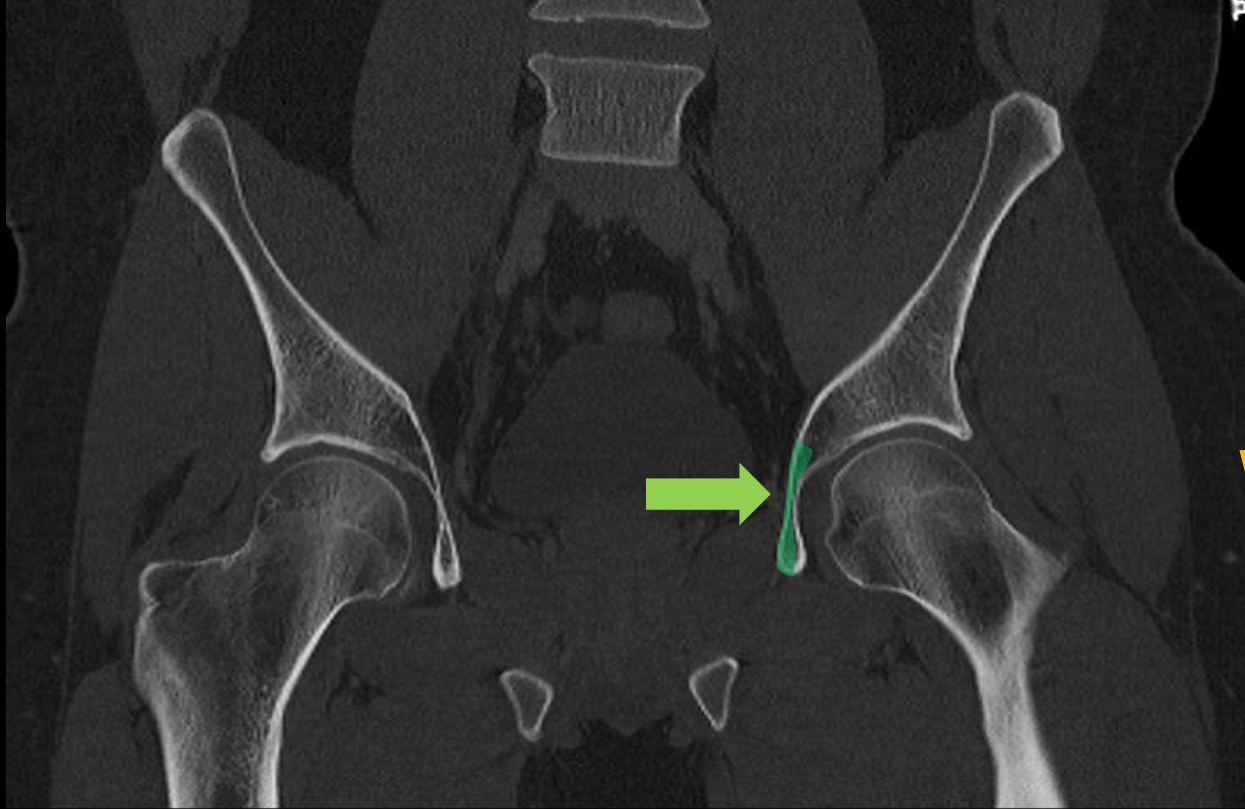


HOW do you break a wall?





Quadrilateral plate: lies over the medial wall of the acetabulum



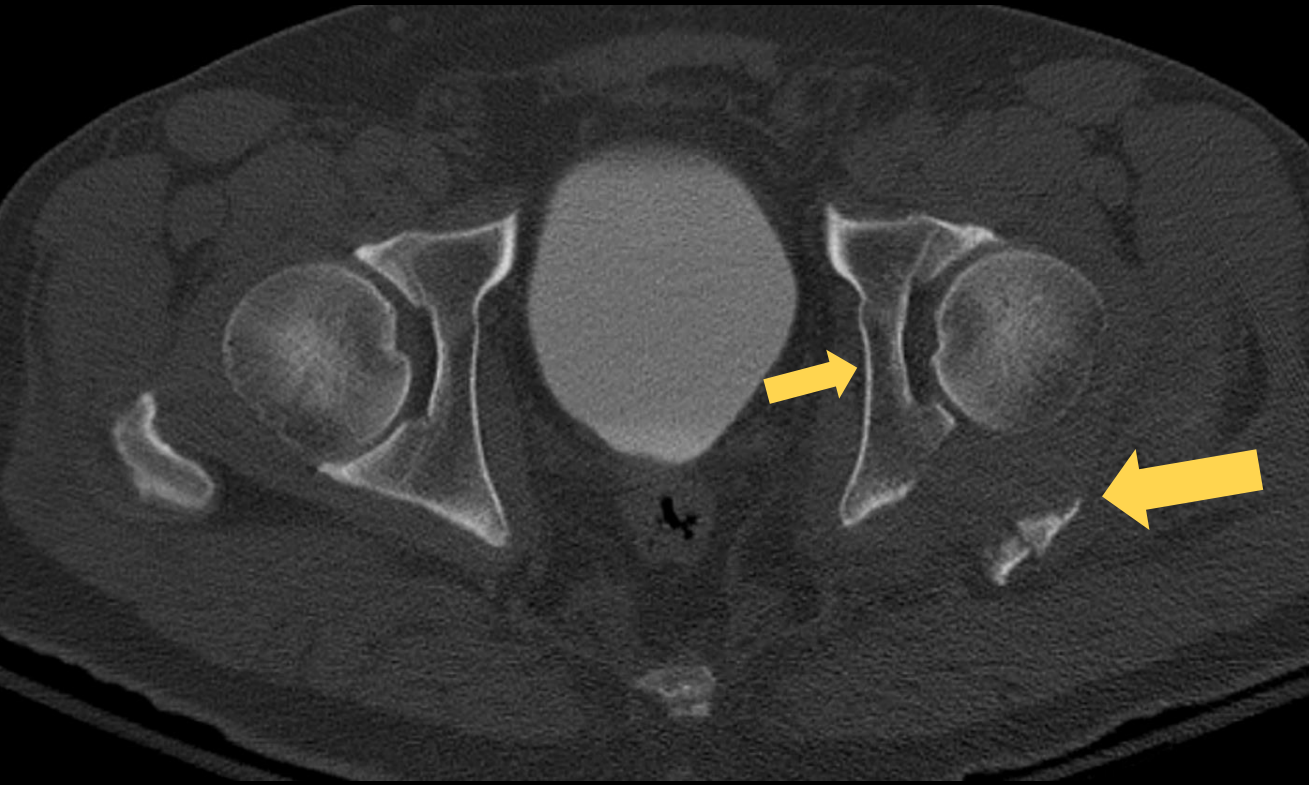
Wall or column fracture?

Quick rule of thumb:

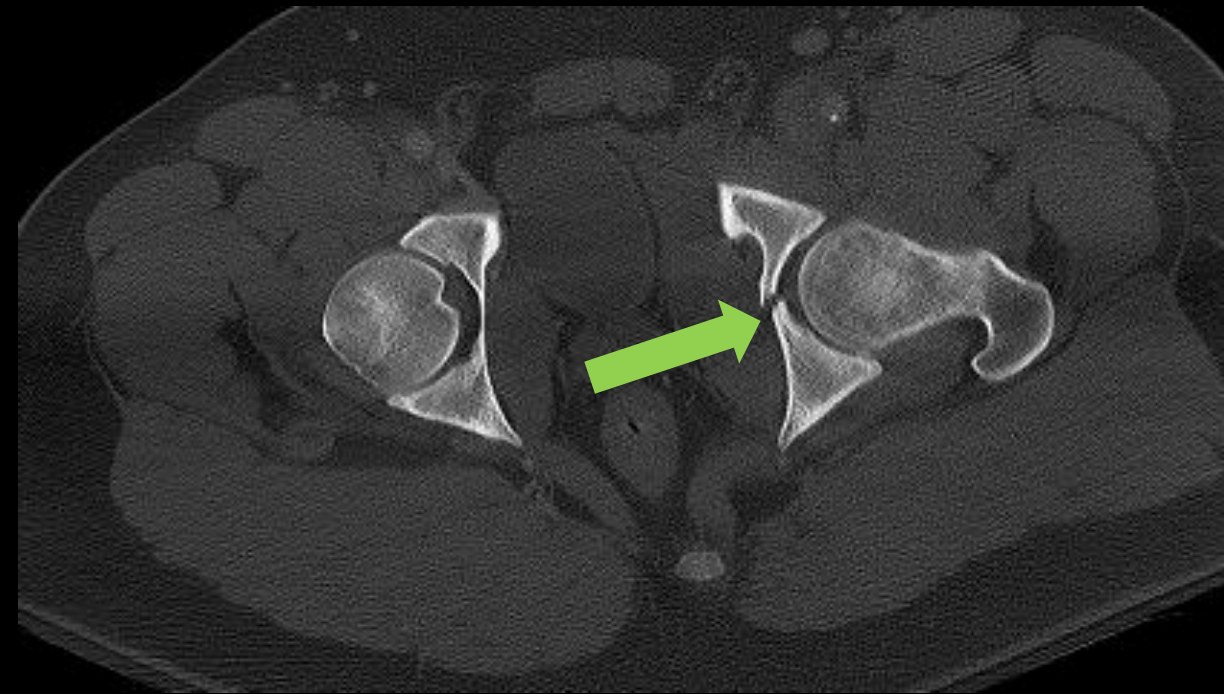
If an acetabular fracture involves the **quadrilateral plate**, it's a **column** fracture.
If it doesn't, it's a **wall** fracture*

- The rare **anterior wall** fracture may sometimes involve a *small* portion of the quadrilateral plate.

So am I looking at a wall or a column fracture?



Big fracture fragment...displaced
but **no** involvement of the quadrilateral
plate => **wall** fracture



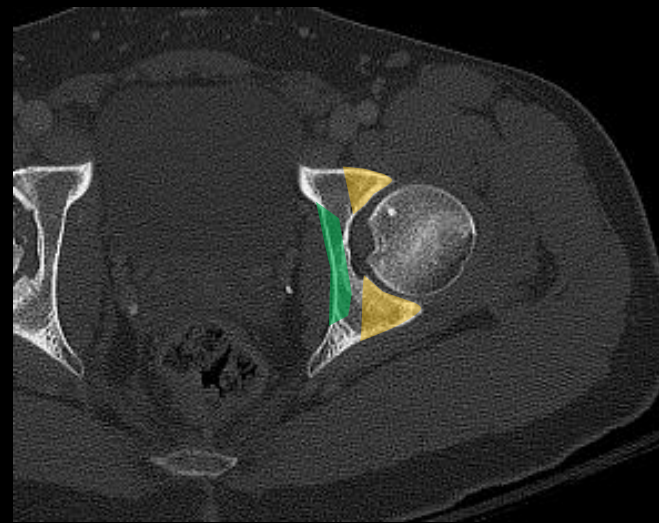
Acetabular fracture involves the
quadrilateral plate:
now I'm looking for a **column** fracture



← Quadrilateral plate →

Wall

3



Column

4

Judet-Letournel Classification

**S
I
M
P
L
E**



Posterior wall



Posterior column



Anterior wall



Anterior column



Transverse

**C
O
M
P
L
E
X**



Posterior column posterior wall



Transverse posterior wall



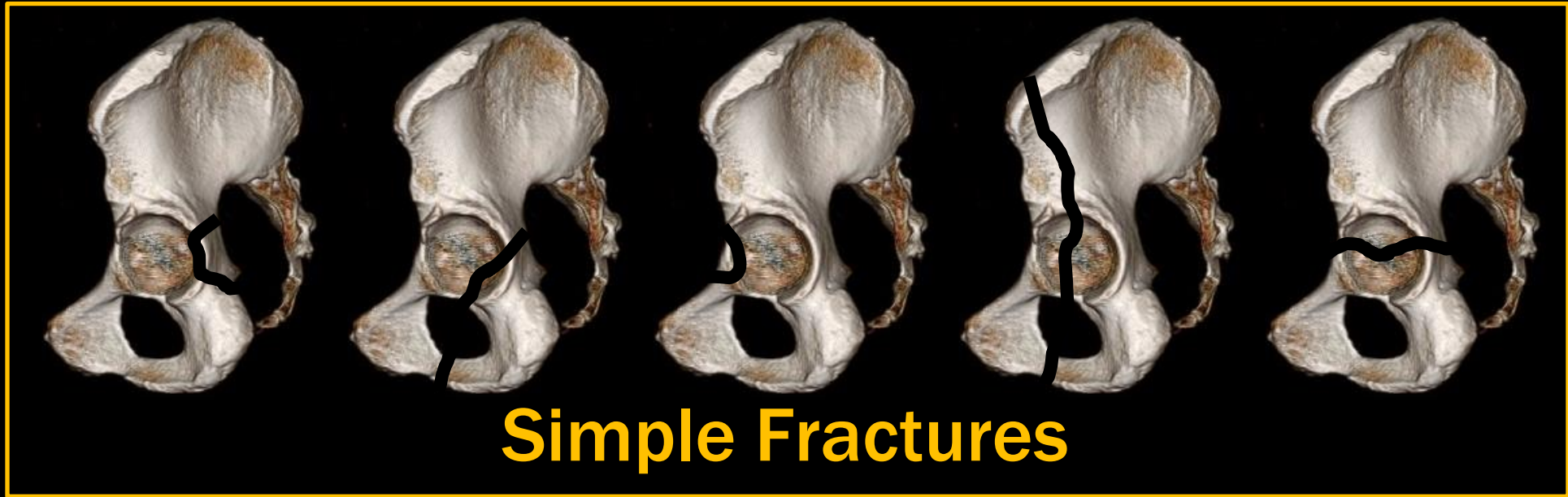
T-shaped



Both column



Anterior column posterior hemi-transverse



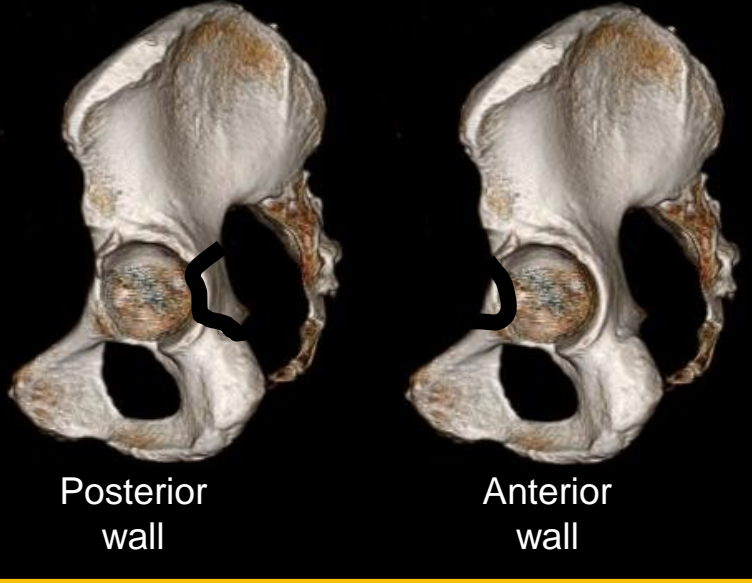
What does “**simple**” mean?



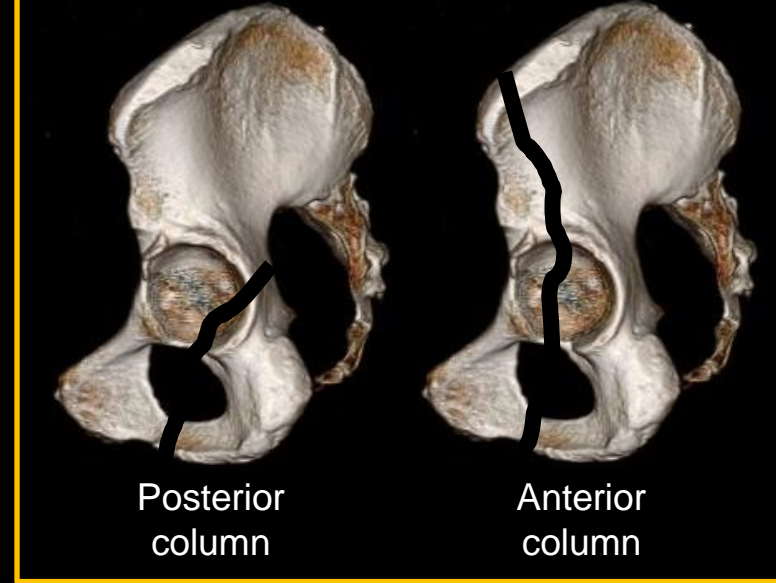
ONE dominant fracture line
(that may be comminuted)

A simple fracture means...

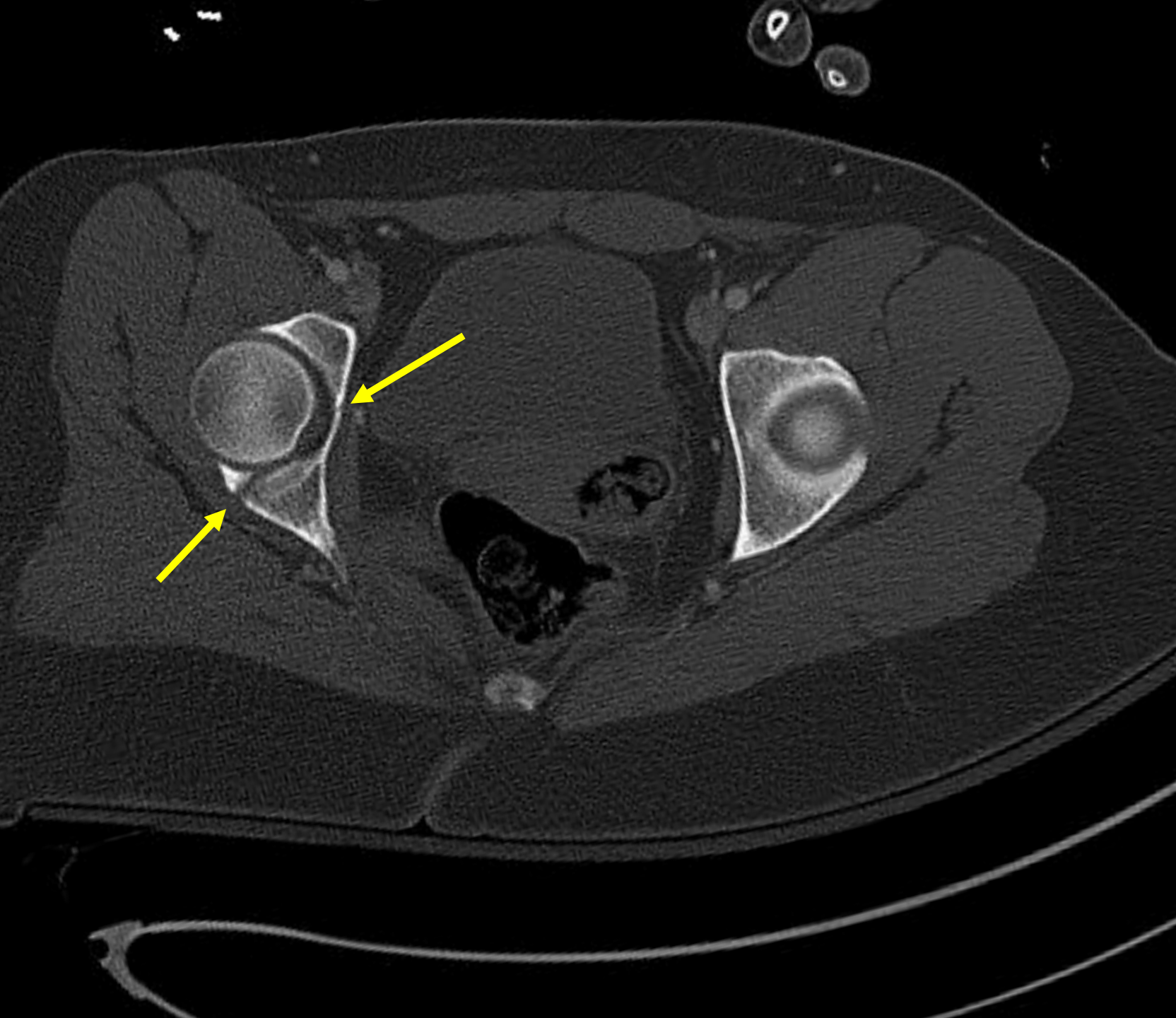
One wall



One column

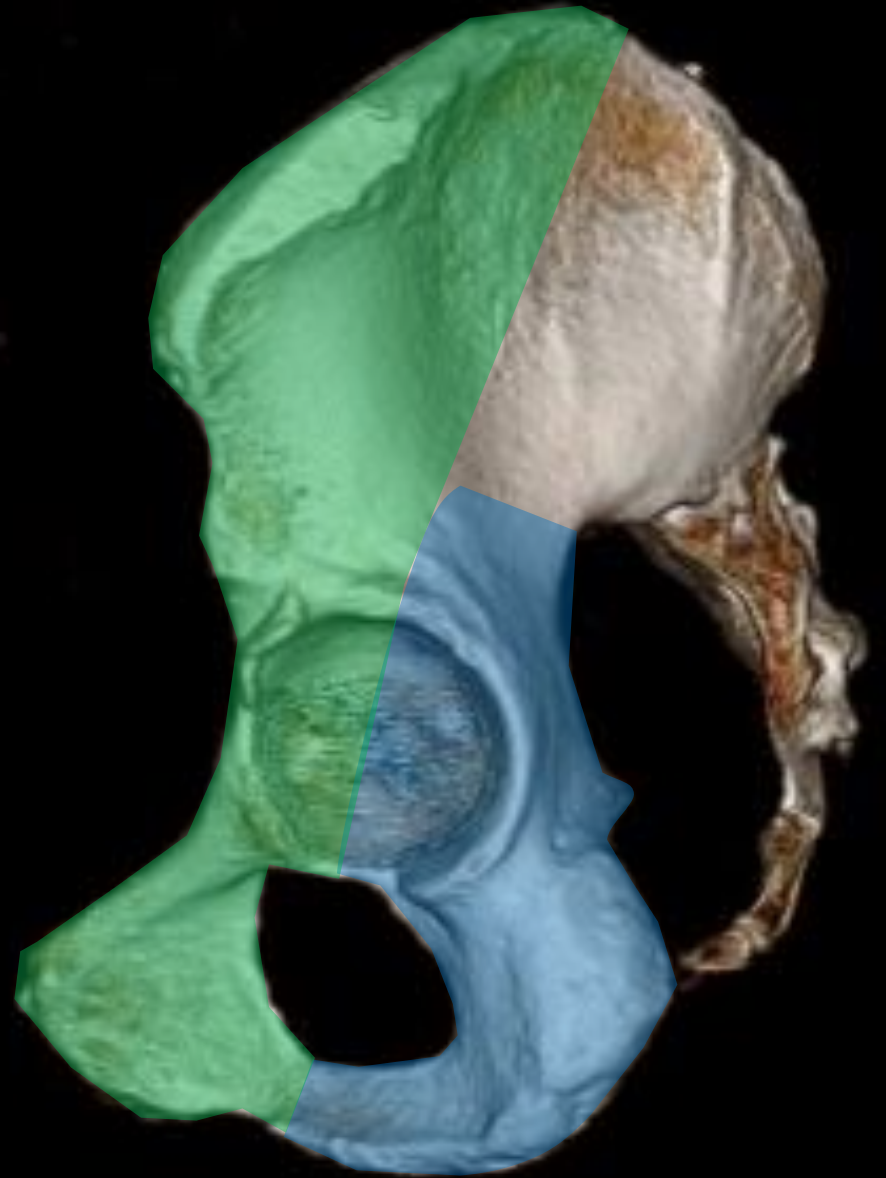


...or a
straight line
front to back



Posterior Column

A note on anterior column fractures



A note on anterior column fractures



Acetabular fracture
involving **iliac wing** =
always **anterior column**

One wall



Posterior
wall

Anterior
wall

One column



Posterior
column

Anterior
column



Transverse

Now we need to talk about

← transverse fractures

Transverse



Coronal images

~ Same plane in your line of sight



Transverse fracture:

Must cross both the anterior and posterior columns

≠

“both column” fracture



Transverse fracture:

Must cross both the anterior and posterior **walls**

≠

transverse with anterior and posterior wall

Simple single fracture line = simple name

One wall



Posterior
wall

Anterior
wall



One column



Posterior
column

Anterior
column



Transverse



If these are the “simple” fractures,
what are the “complex” ones?

One wall



Posterior
wall

Anterior
wall

One column



Posterior
column

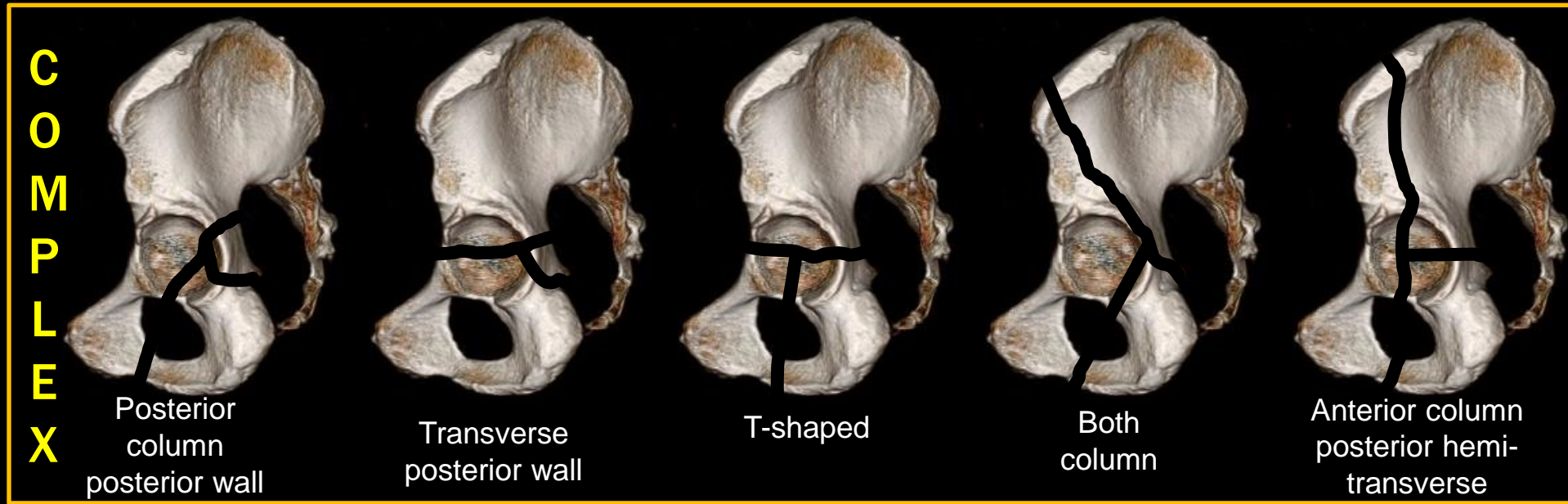
Anterior
column



Transverse

A complex fracture means...

**...some combination of
these**



Judet-Letournel: created by surgeons

=> describe a fracture **separately** if they have to **fix it separately**

C
O
M
P
L
E
X



Posterior
column
posterior wall



Transverse
posterior wall



T-shaped



Both
column



Anterior column
posterior hemi-
transverse



Let's take this one, for example

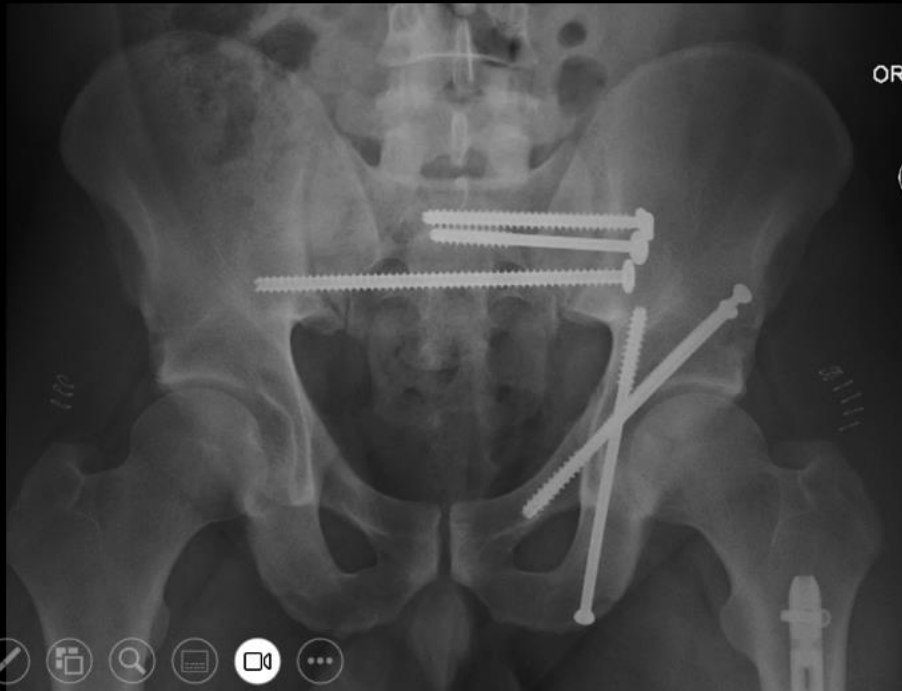
“Transverse posterior wall” =>
posterior wall is **comminuted**...

=> a **separate surgery** to fix it

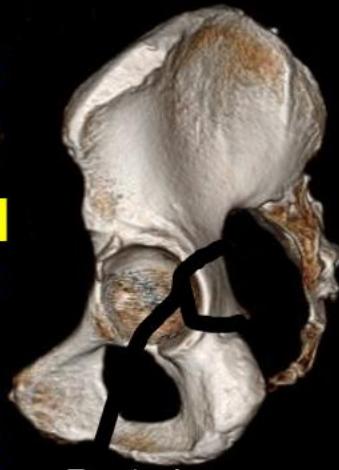
Transverse



Transverse Posterior Wall



C
O
M
P
L
E
X



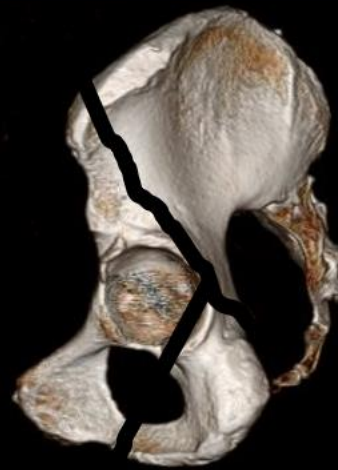
Posterior
column
posterior wall



Transverse
posterior wall



T-shaped



Both
column



Anterior column
posterior hemi-
transverse

Same theme.



Posterior column with posterior wall

C
O
M
P
L
E
X



Posterior
column
posterior wall



Transverse
posterior wall



T-shaped



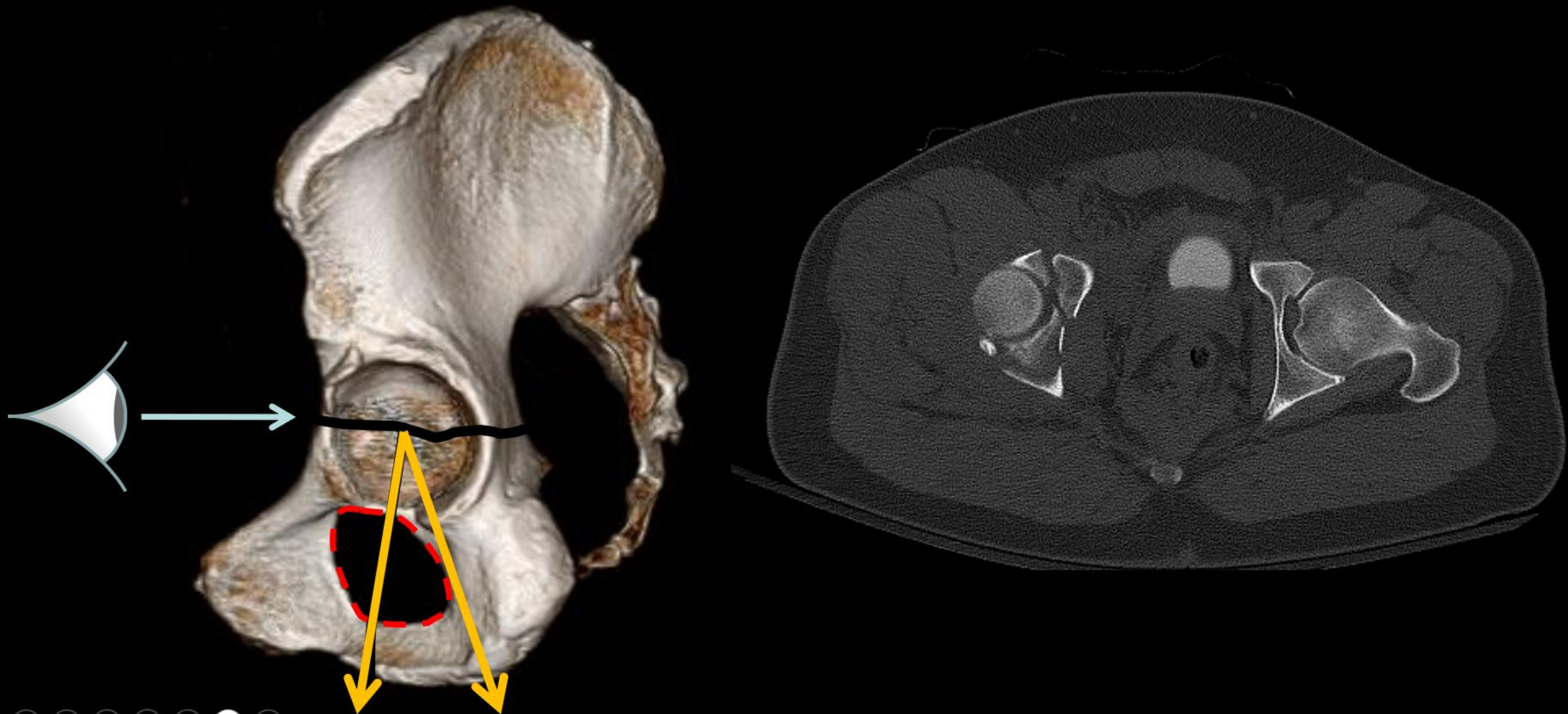
Both
column



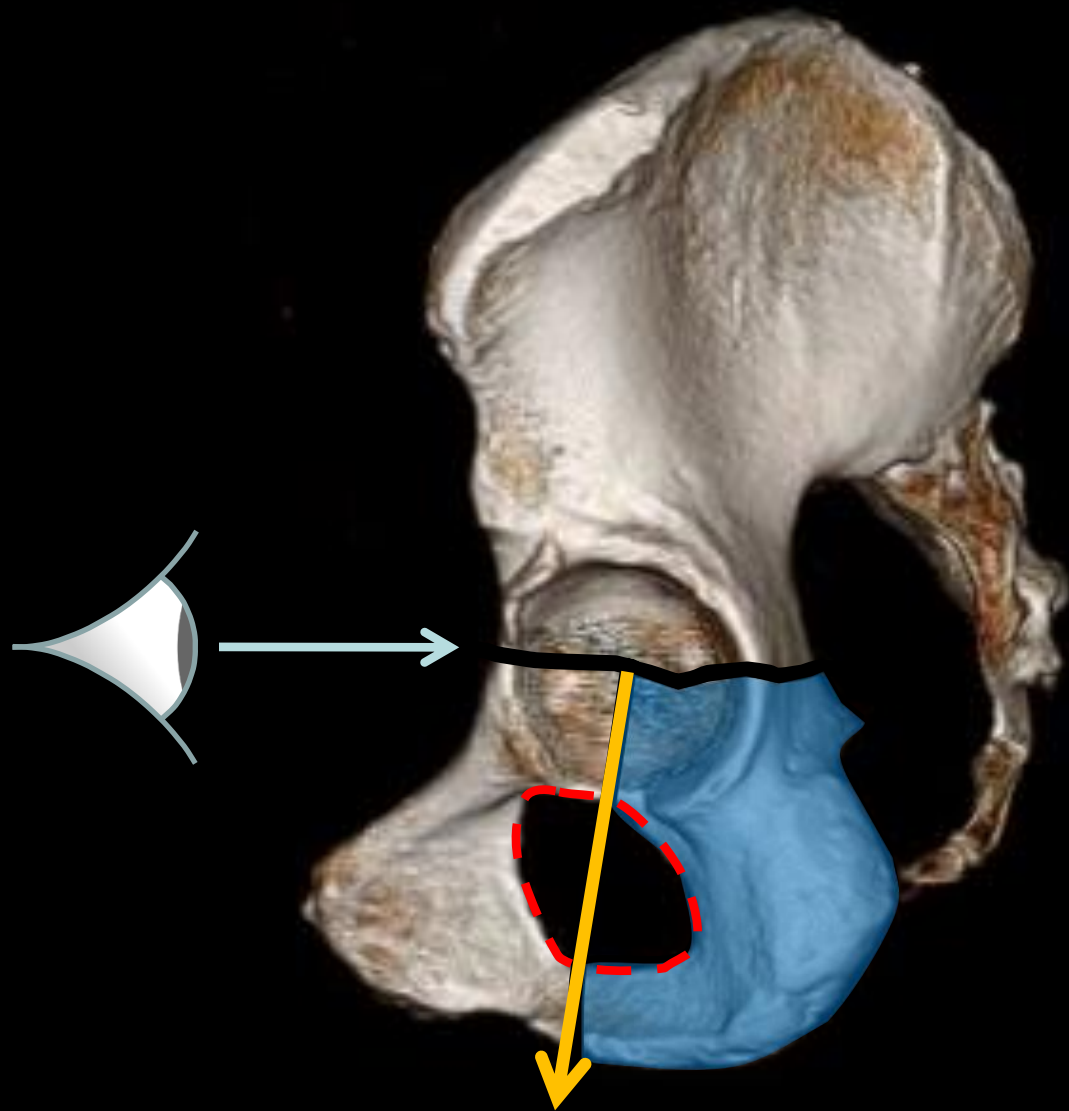
Anterior column
posterior hemi-
transverse

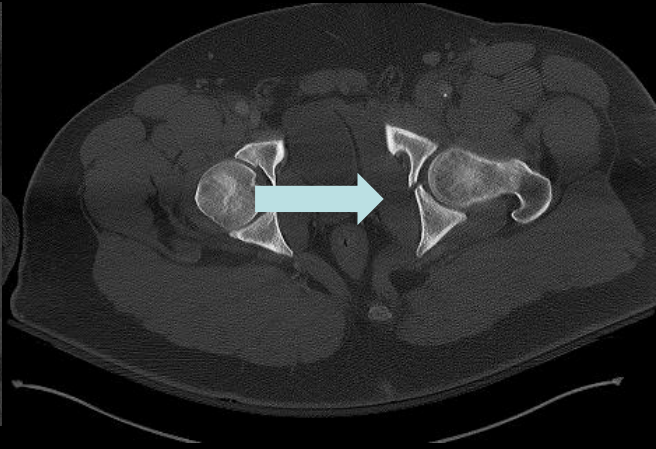
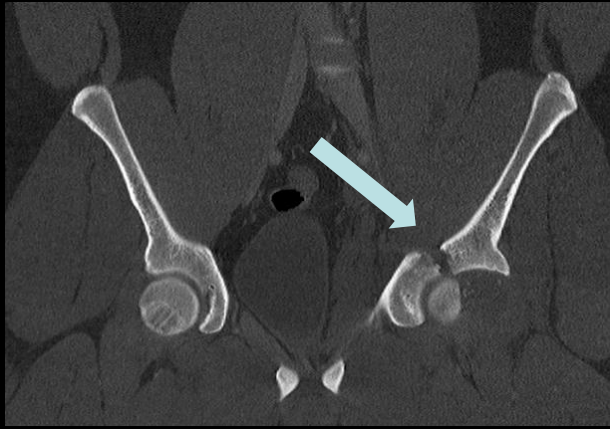
This one looks just like its name...

How will I recognize this?



Why does it matter?





T-shaped

C
O
M
P
L
E
X



Posterior
column
posterior wall



Transverse
posterior wall



T-shaped

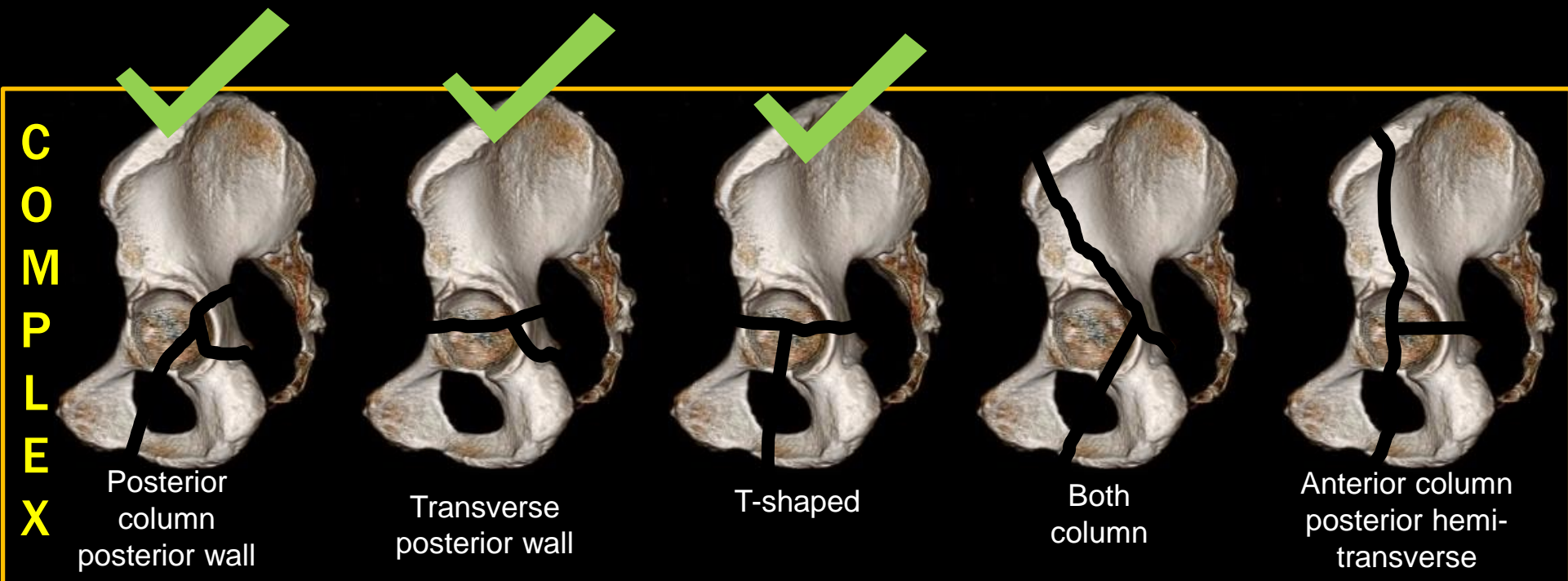


Both
column



Anterior column
posterior hemi-
transverse

So what's left?





Both
column



Anterior column
posterior hemi-
transverse

This one is just another combination of the fracture types we're already familiar with

The “both column” fracture...



Remember I told you to keep the sciatic buttress in mind?

And that “both column” fracture was reserved for a specific fracture type?



Both
column

A “both column associated” fracture:

Fractures both columns

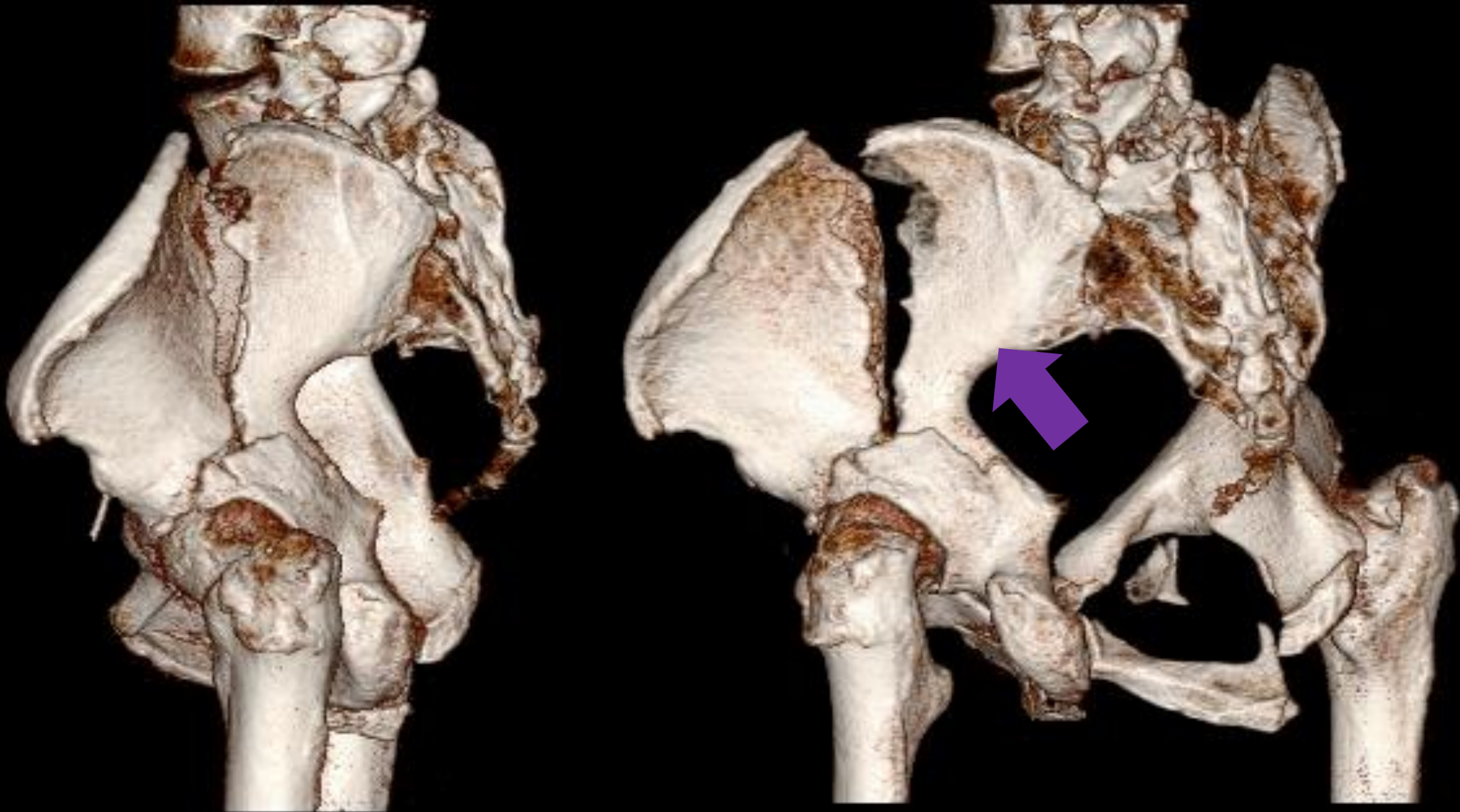
Separates the **entire acetabular articular surface** from the **sciatic buttress**



Both
column



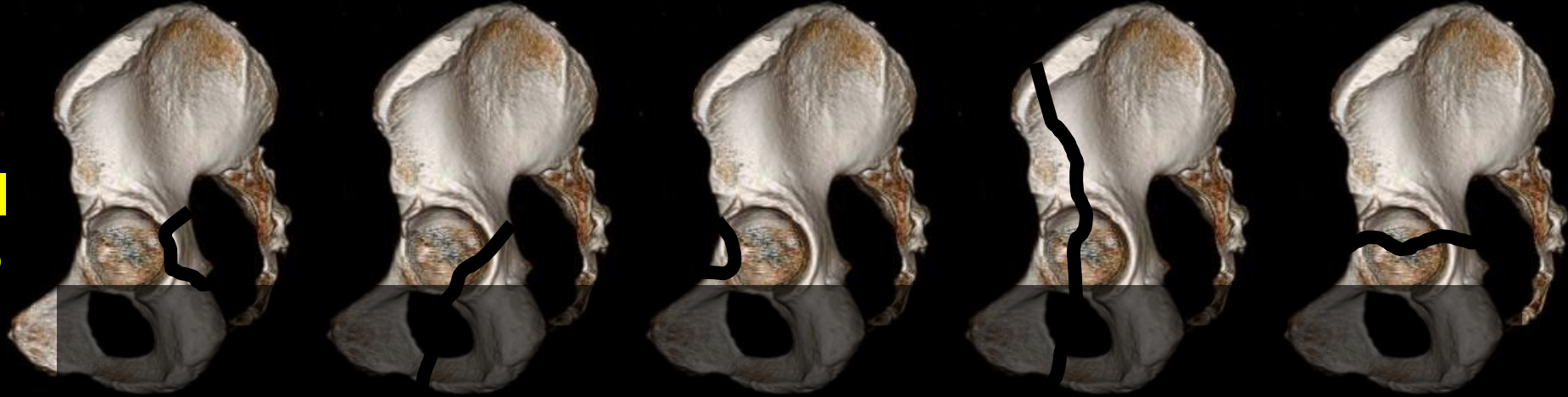
Anterior column
posterior hemi-
transverse



Complete separation of the **sciatic buttress** from the acetabular surface: both column fracture

Judet-Letournel Classification

S
I
M
P
L
E



Posterior
wall

Posterior
column

Anterior
column

Anterior
column

Transverse

No need to memorize this system, just

have it handy somewhere for reference

C
O
M
P
L
E
X



Posterior
column
posterior wall

Transverse
posterior wall

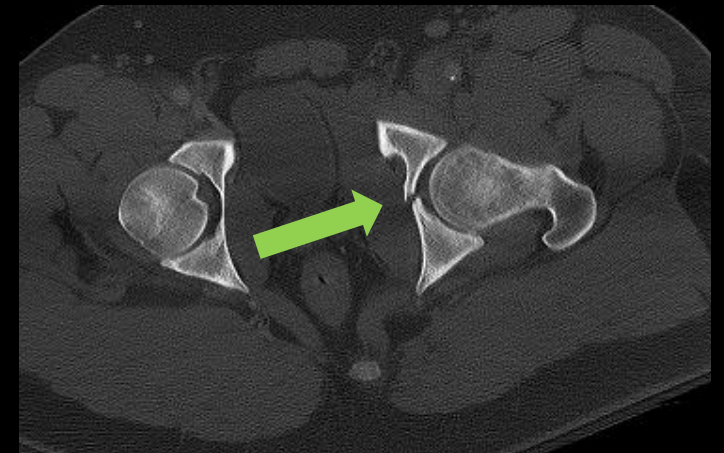
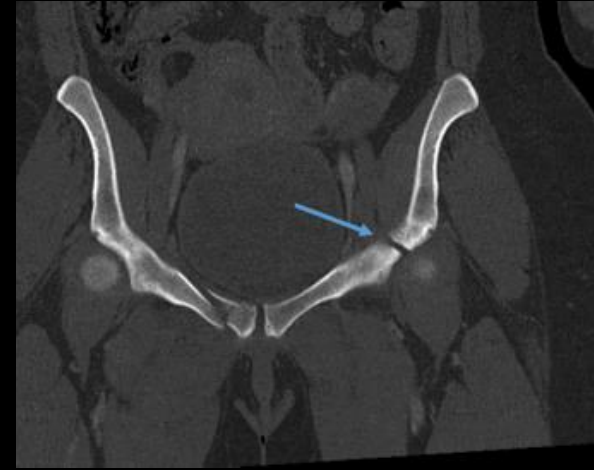
T-shaped

Both
column

Anterior column
posterior hemi-
transverse

Summary

- All fracture types are some combination of:
 - column
 - wall
 - transverse (think **line of sight**)!
- **Quadrilateral plate** fracture = **column** fracture*



Wall fractures

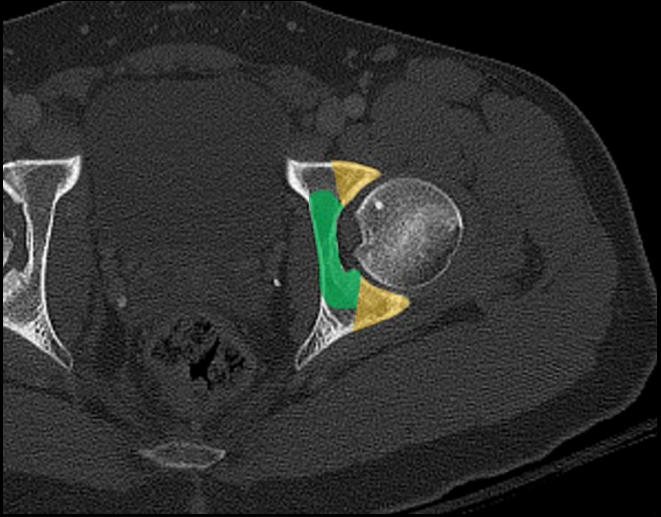


- Fracture of the rim that deepens the acetabular cup
- Can result in hip joint instability (mostly posterior)

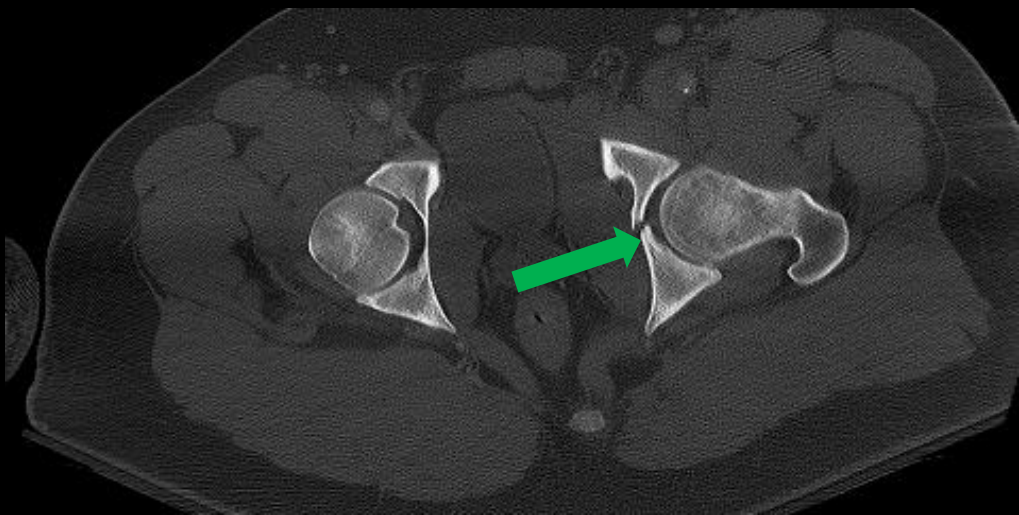


- To call a wall fracture **in addition** to another fracture (e.g. transverse with posterior wall) the wall must be **comminuted**

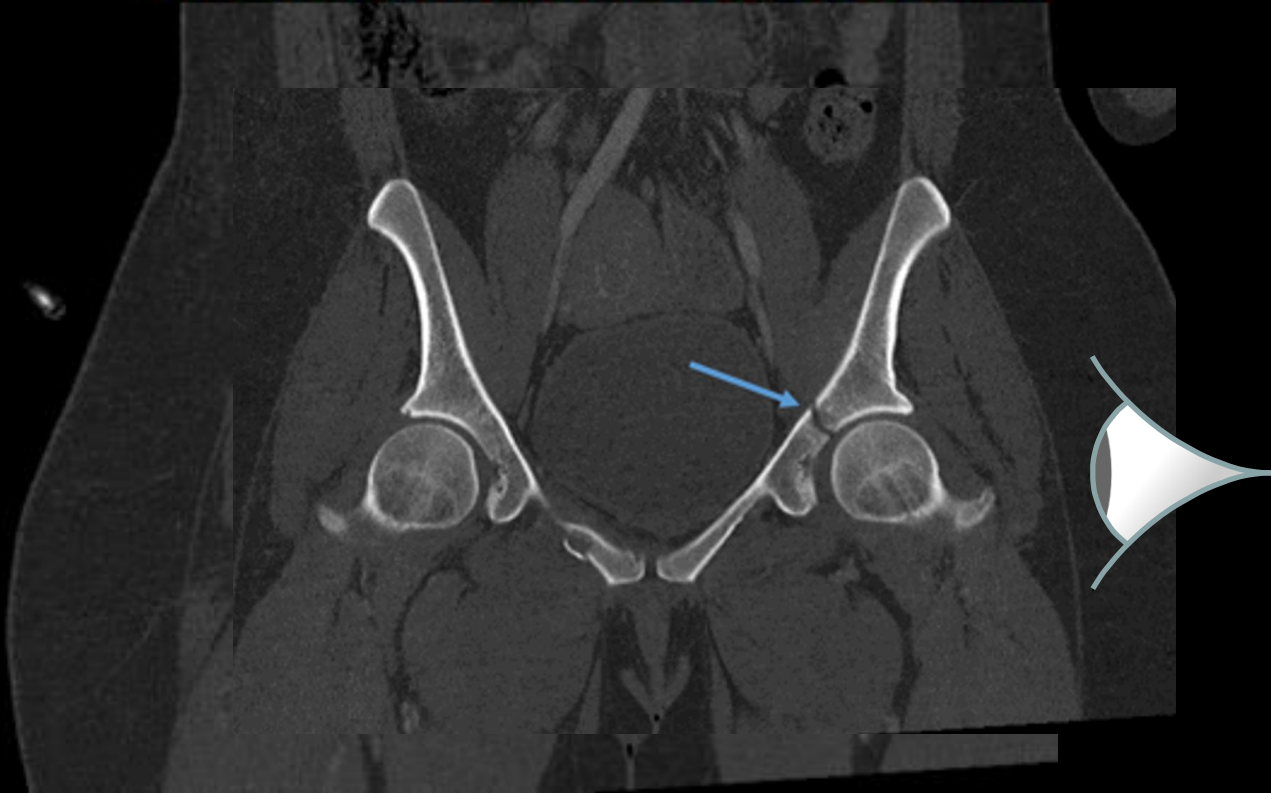
Column fractures



- Fracture through the acetabulum that involves the **quadrilateral plate**
- Disrupts transfer of weight/force to the lower extremity



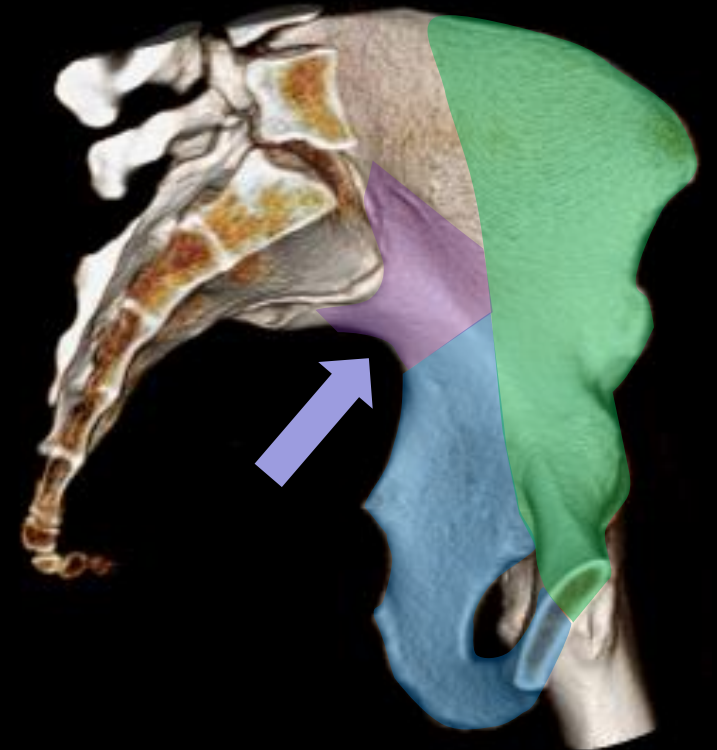
Transverse fractures



Horizontal fracture that follows **line of sight** on the **coronal** images

Both column (associated) fractures

Entire acetabular surface
separated from the sciatic
buttress



Thank you!



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