

MSK US of Hip

A 3D anatomical model of a human hip and spine, rendered in a blue, semi-transparent style. The hip joint is highlighted with a bright red and pink glow, indicating the focus of the ultrasound training. The spine is visible in the background, and the overall image has a dark blue background.

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Advantages of US

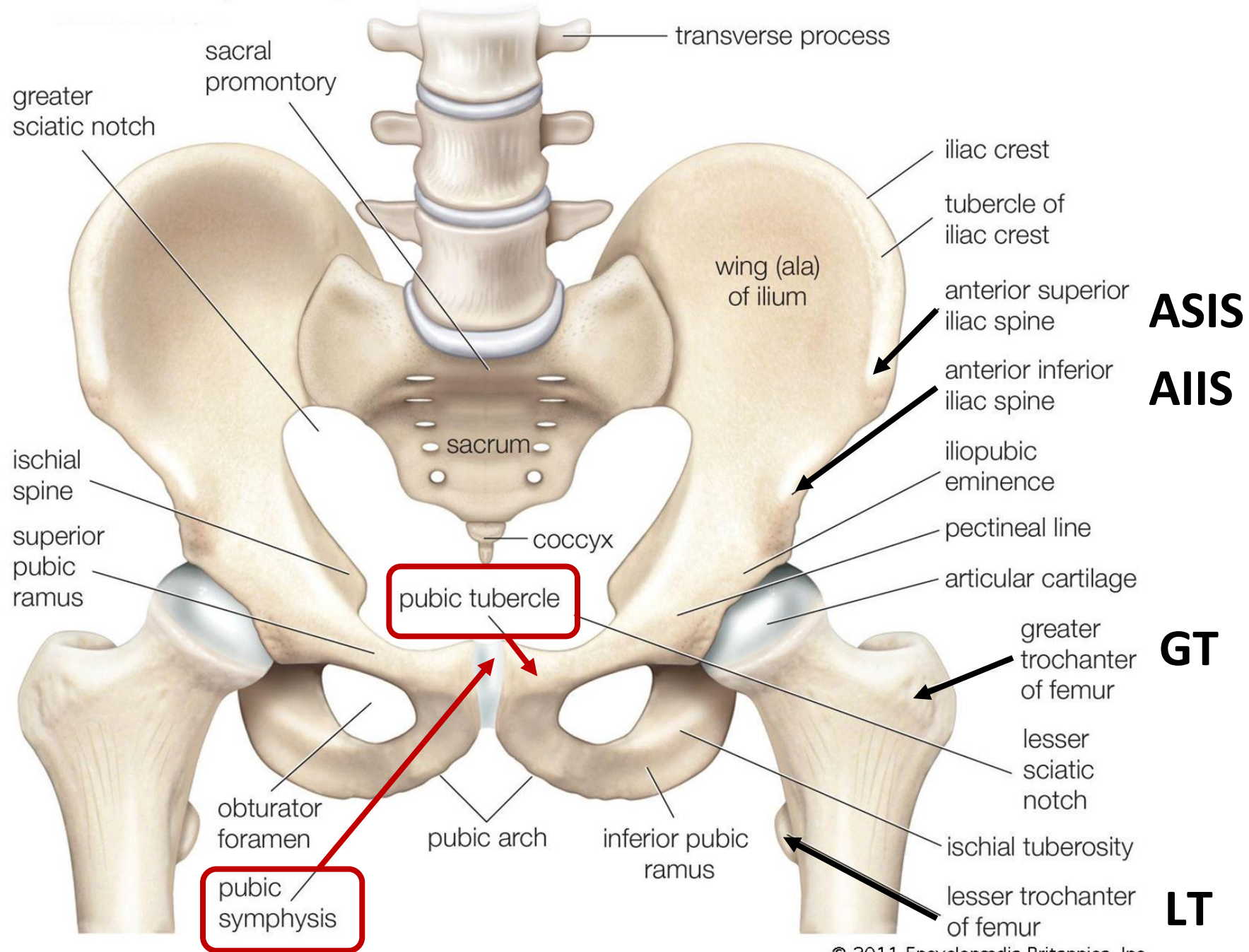
- Superior spatial resolution
- Dynamic assessment: ex. Snapping or clicking
- Sonopalpation
- Lack of artifact associated with orthopedic hardware
- Anesthetic injection under ultrasound guidance

Limitations of US

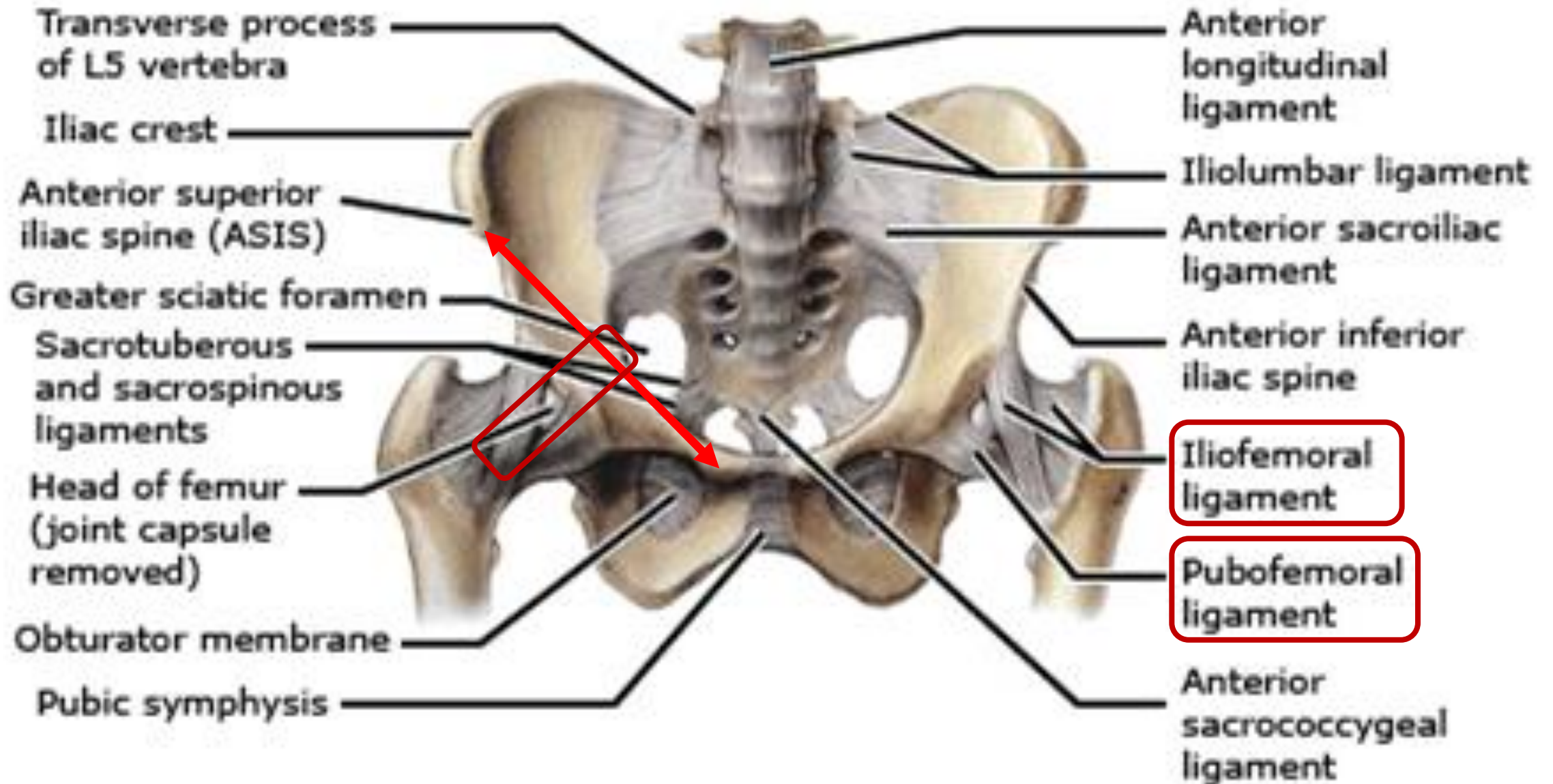
- Deep structures
- Intra-articular structures

Anterior Hip

Bones of the pelvic girdle

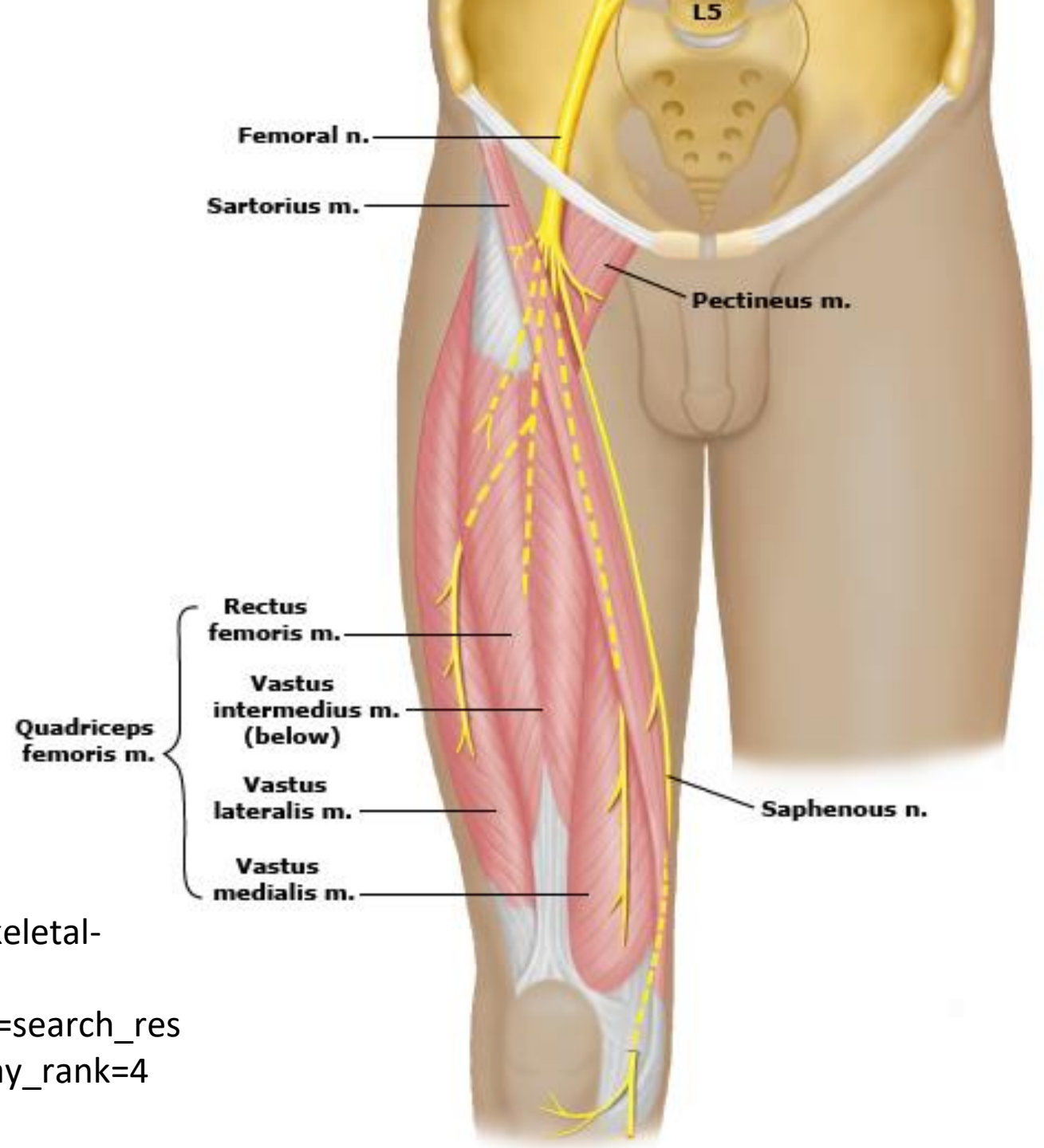


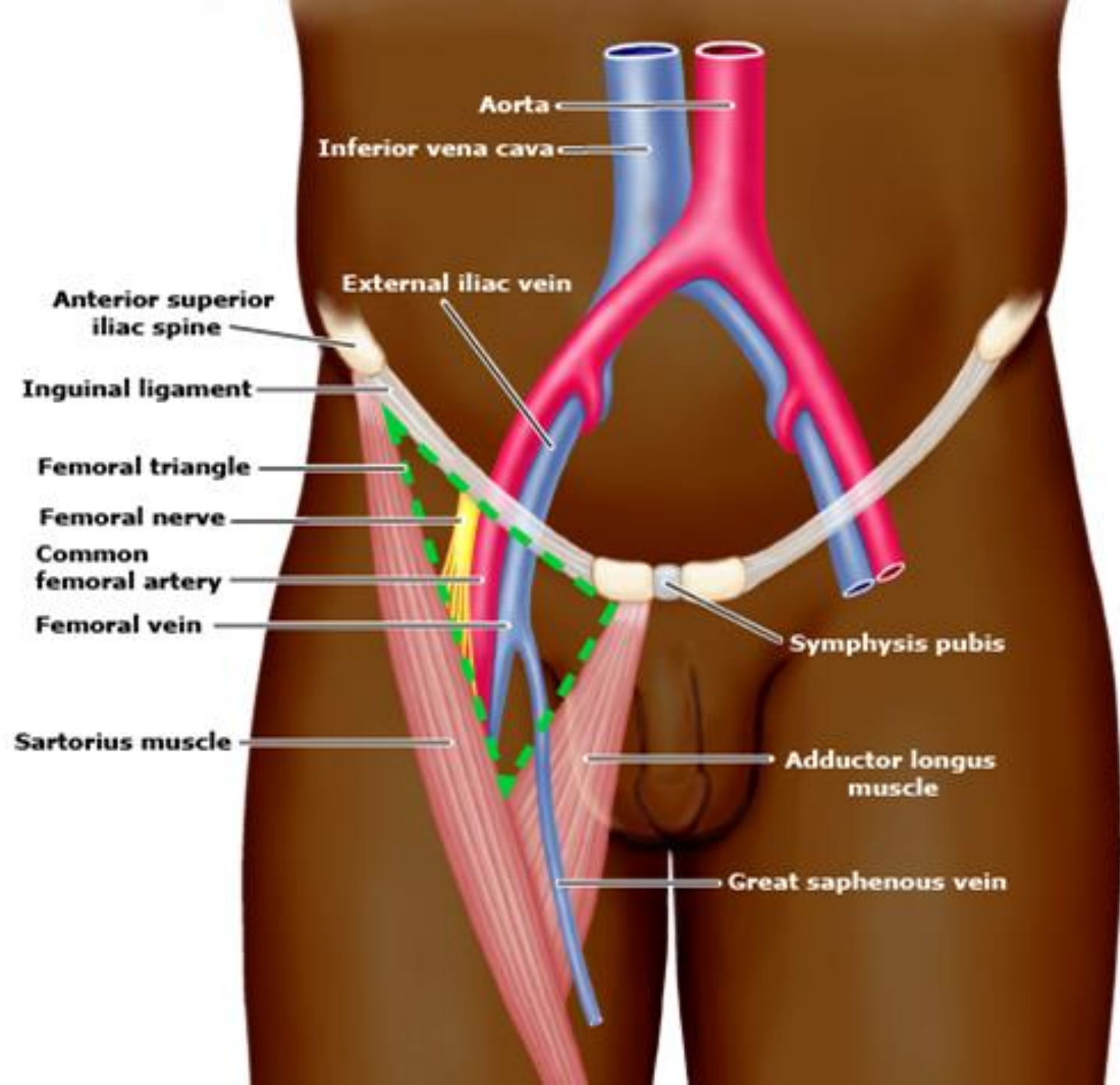
B Anterior view - ligaments

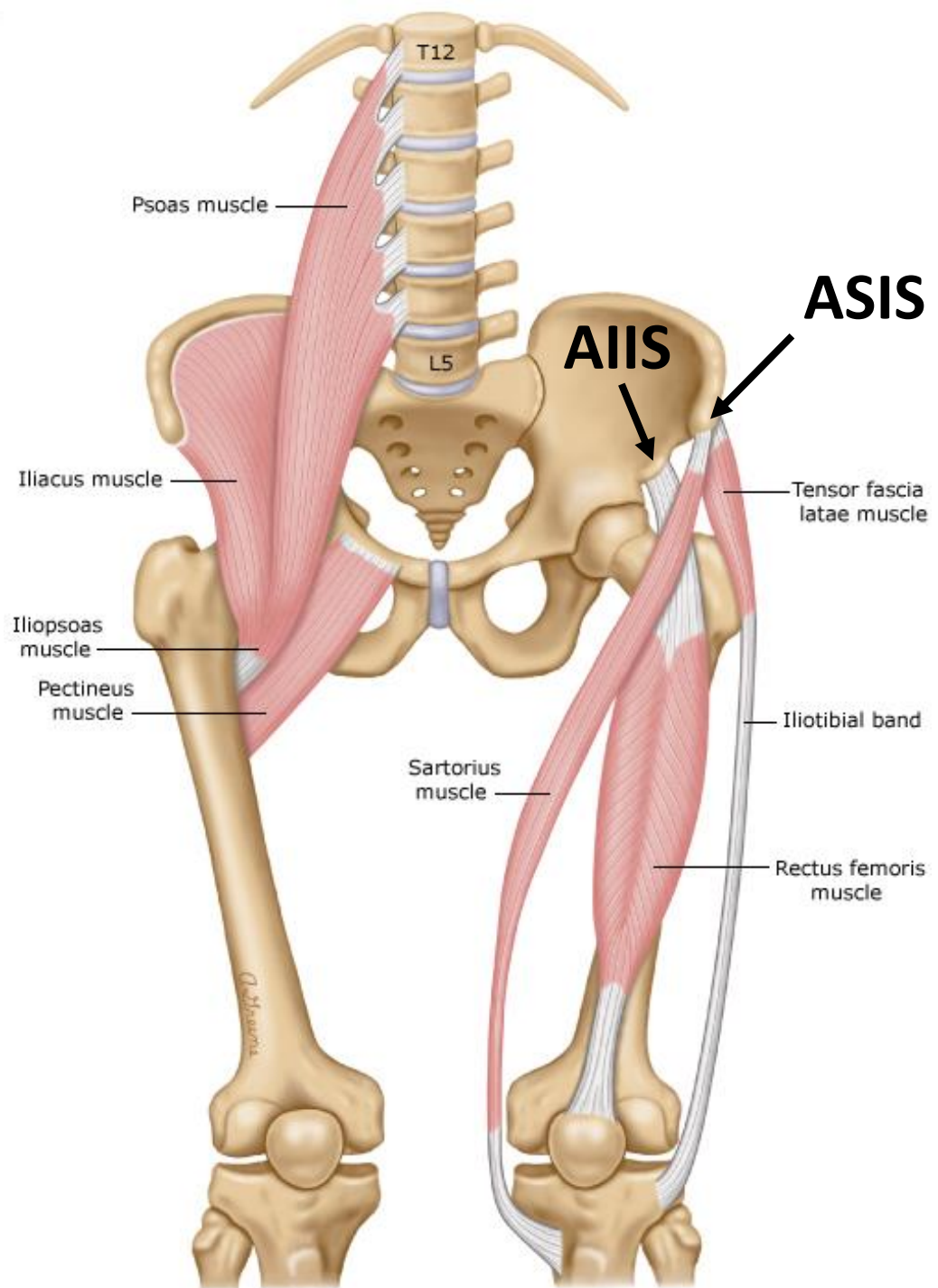
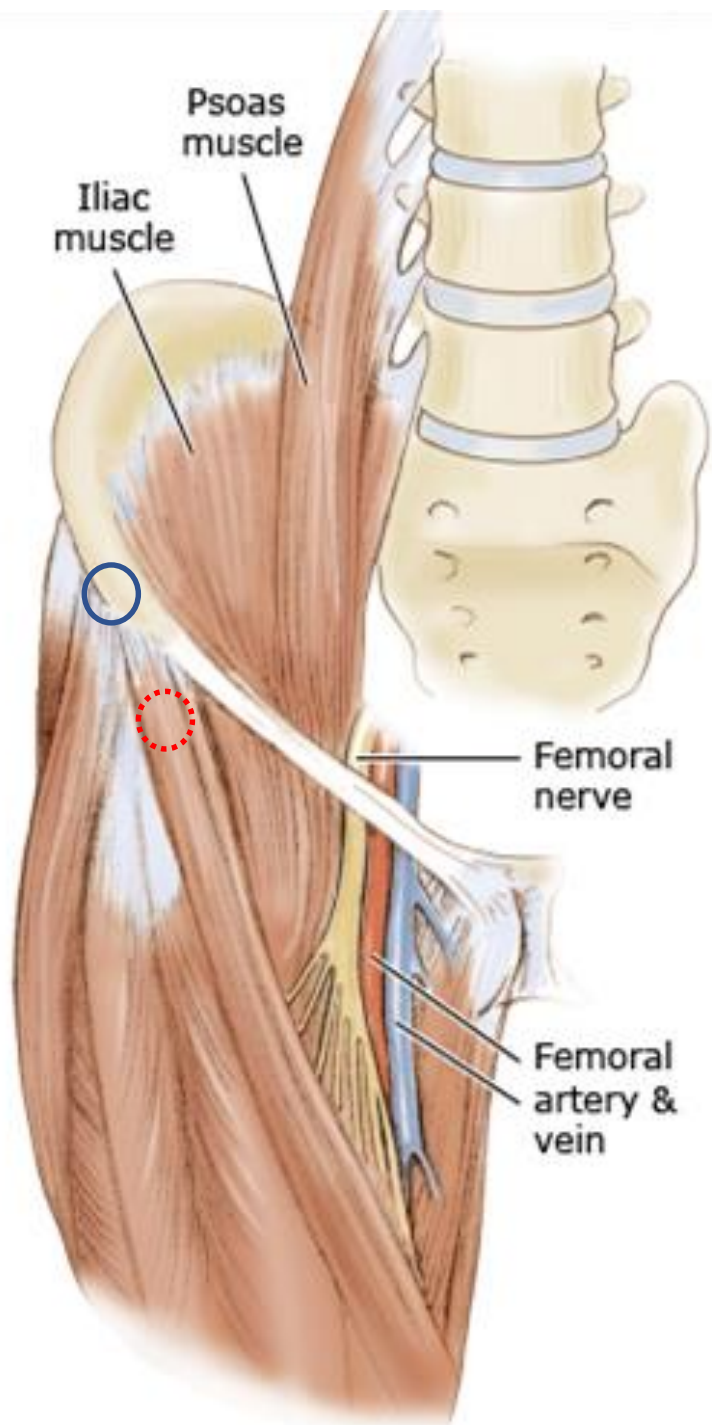


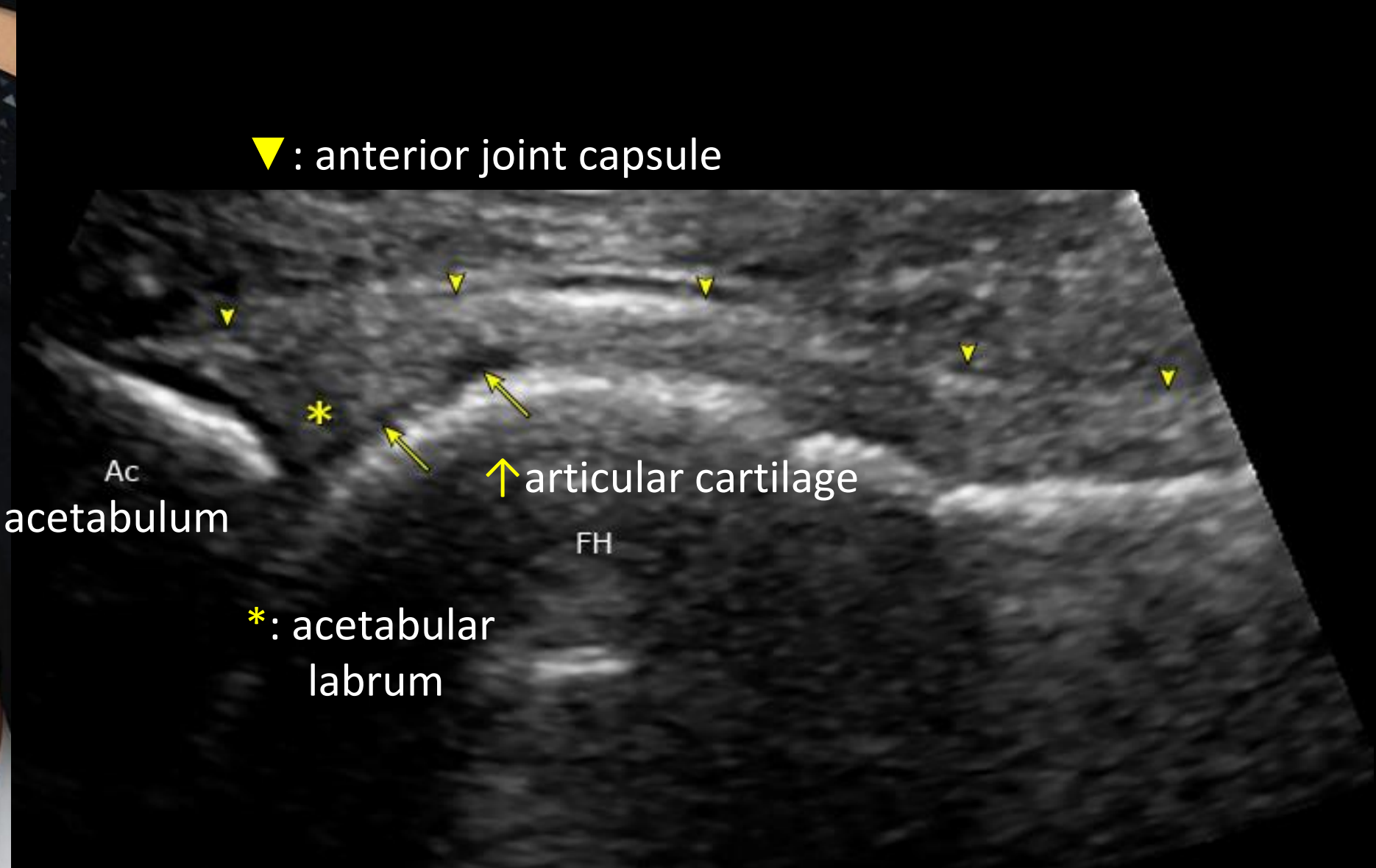
Femoral nerve anatomy (L2 to L4)

https://www-uptodate-com.utorpa.cmu.edu.tw:8443/contents/musculoskeletal-ultrasound-of-the-hip?search=musculoskeletal%20ultrasound&source=search_result&selectedTitle=4~86&usage_type=default&display_rank=4

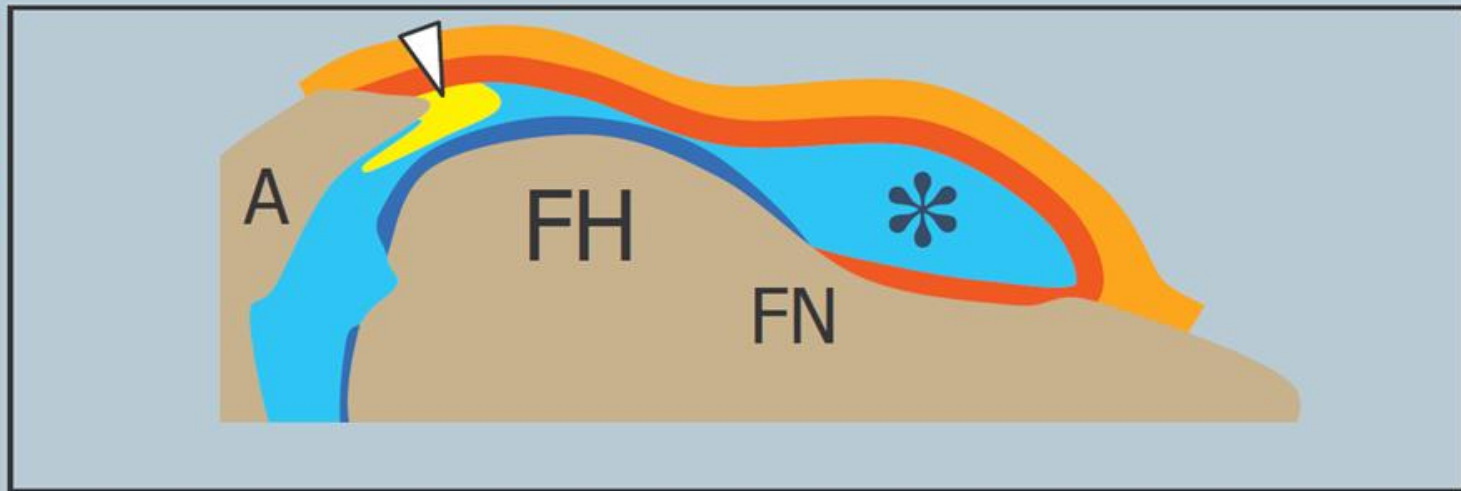
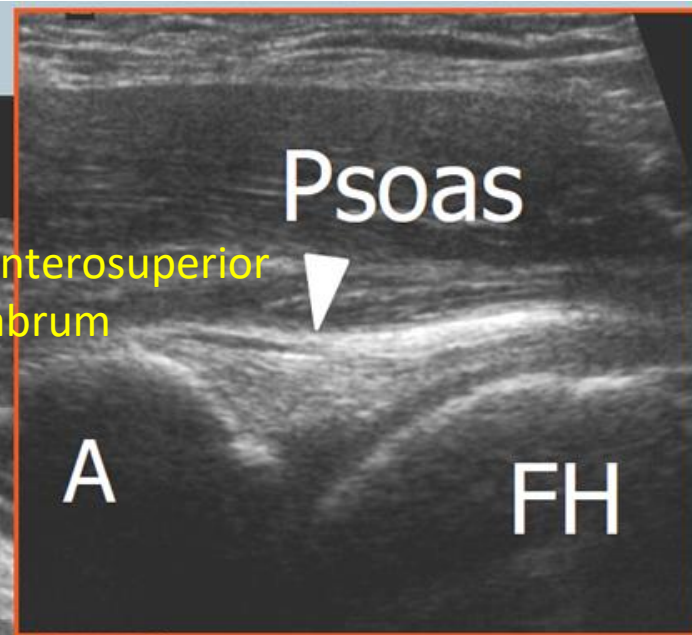
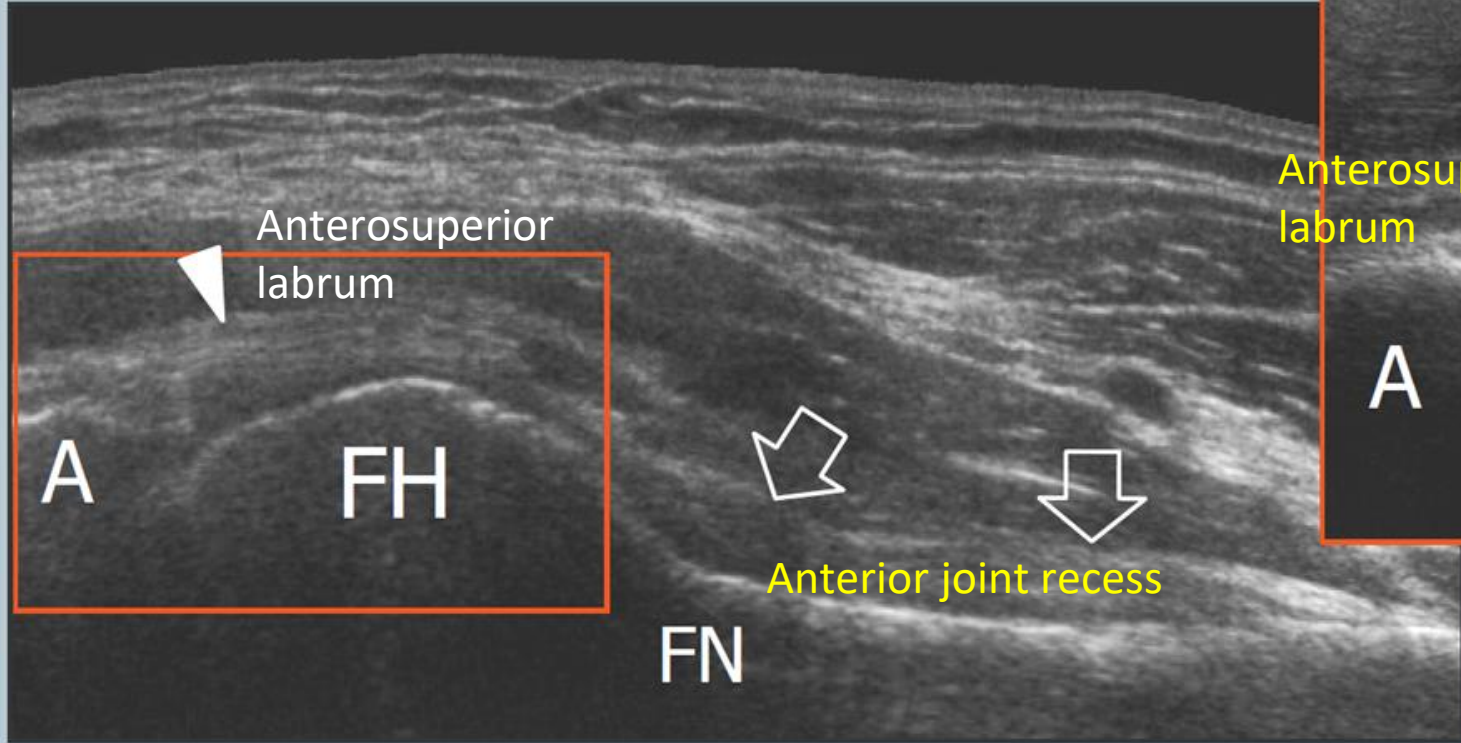




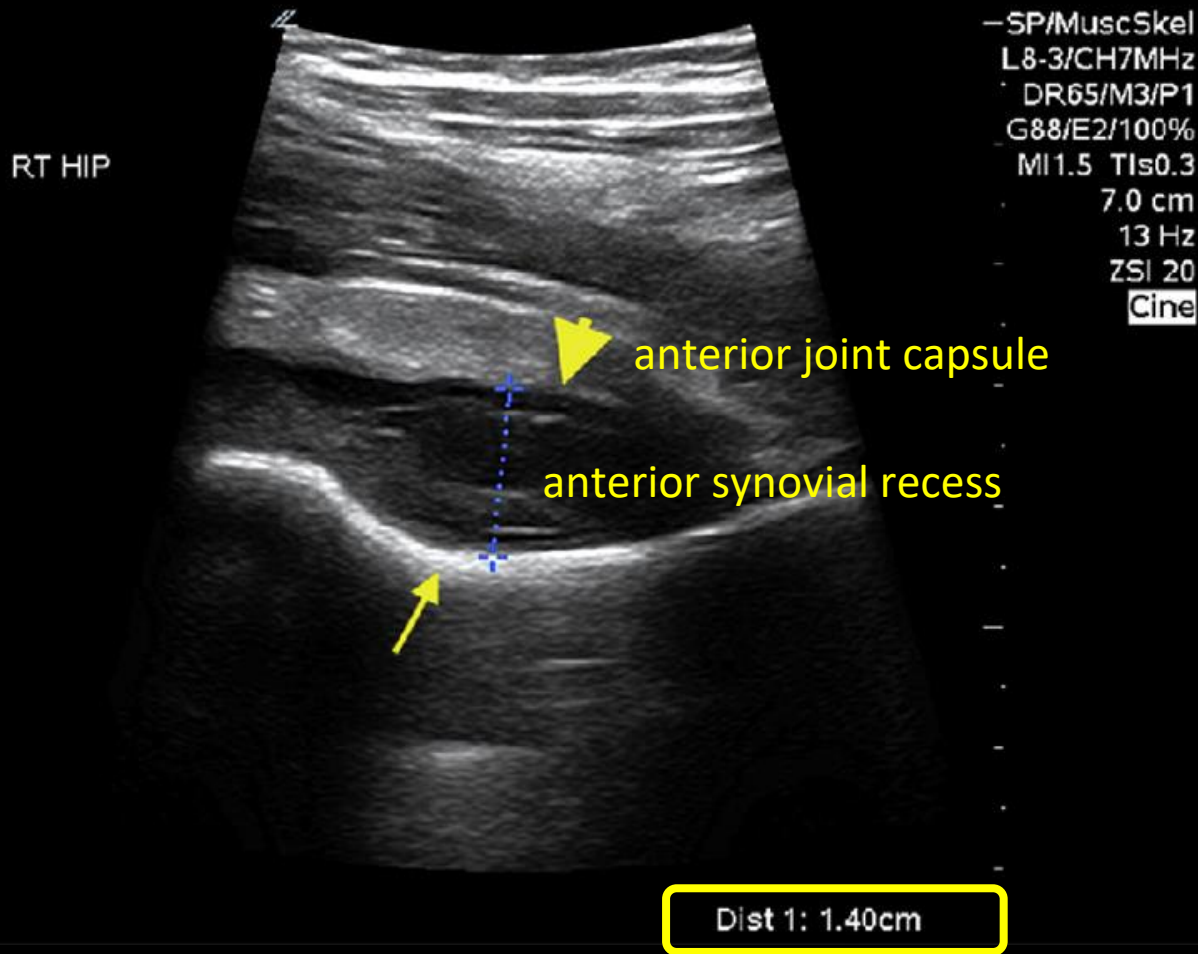




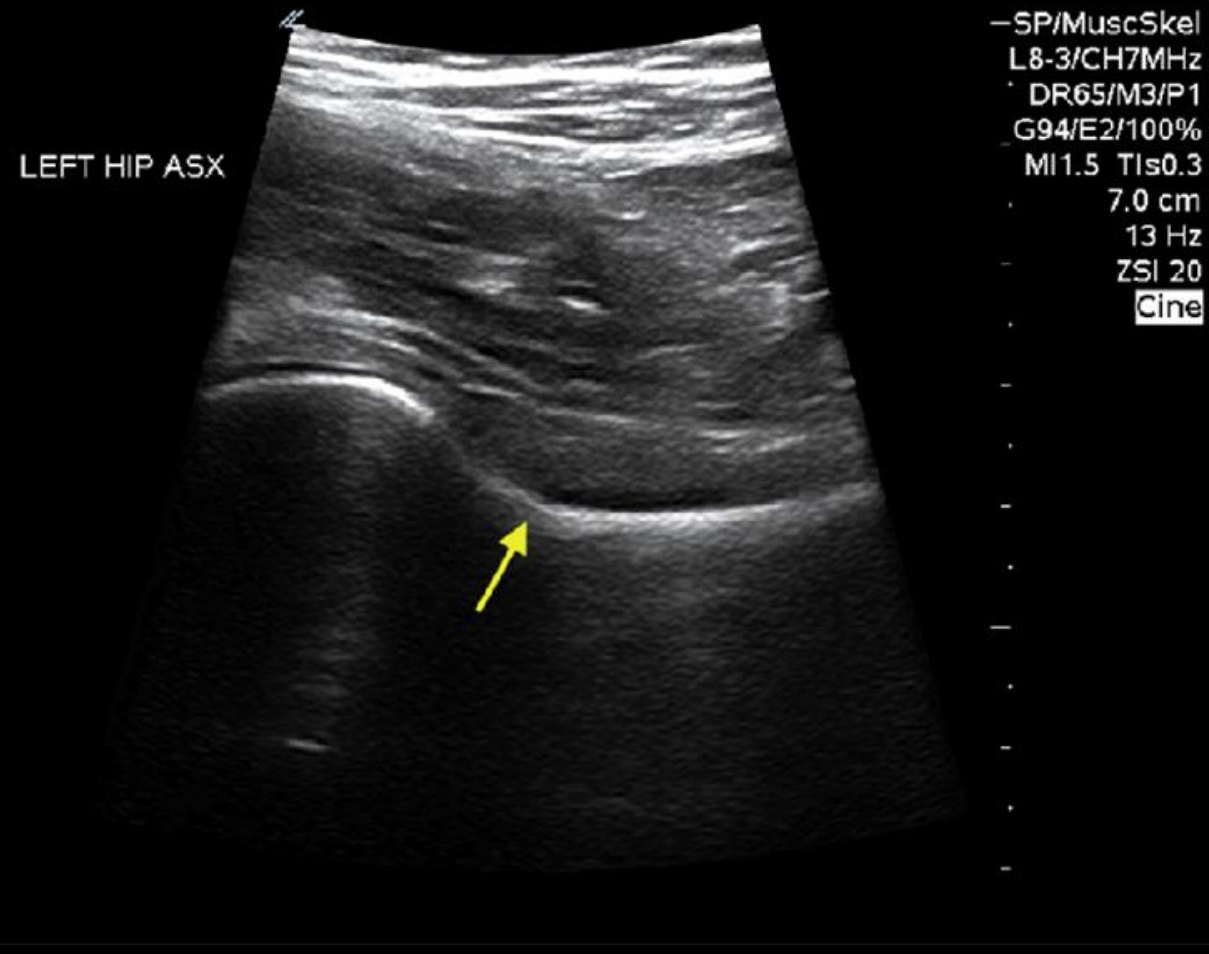
superficial to the labrum.



Legend: A, acetabulum; arrowhead, anterosuperior labrum; arrows, anterior joint recess; asterisk, distended anterior recess by joint effusion; FH, femoral head; FN, femoral neck

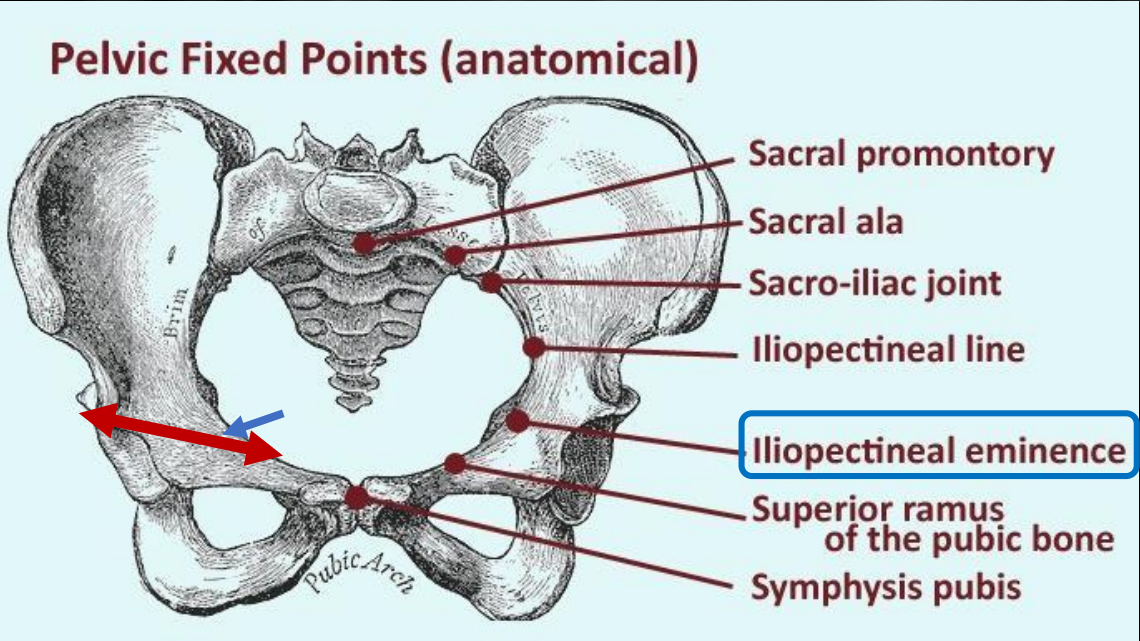
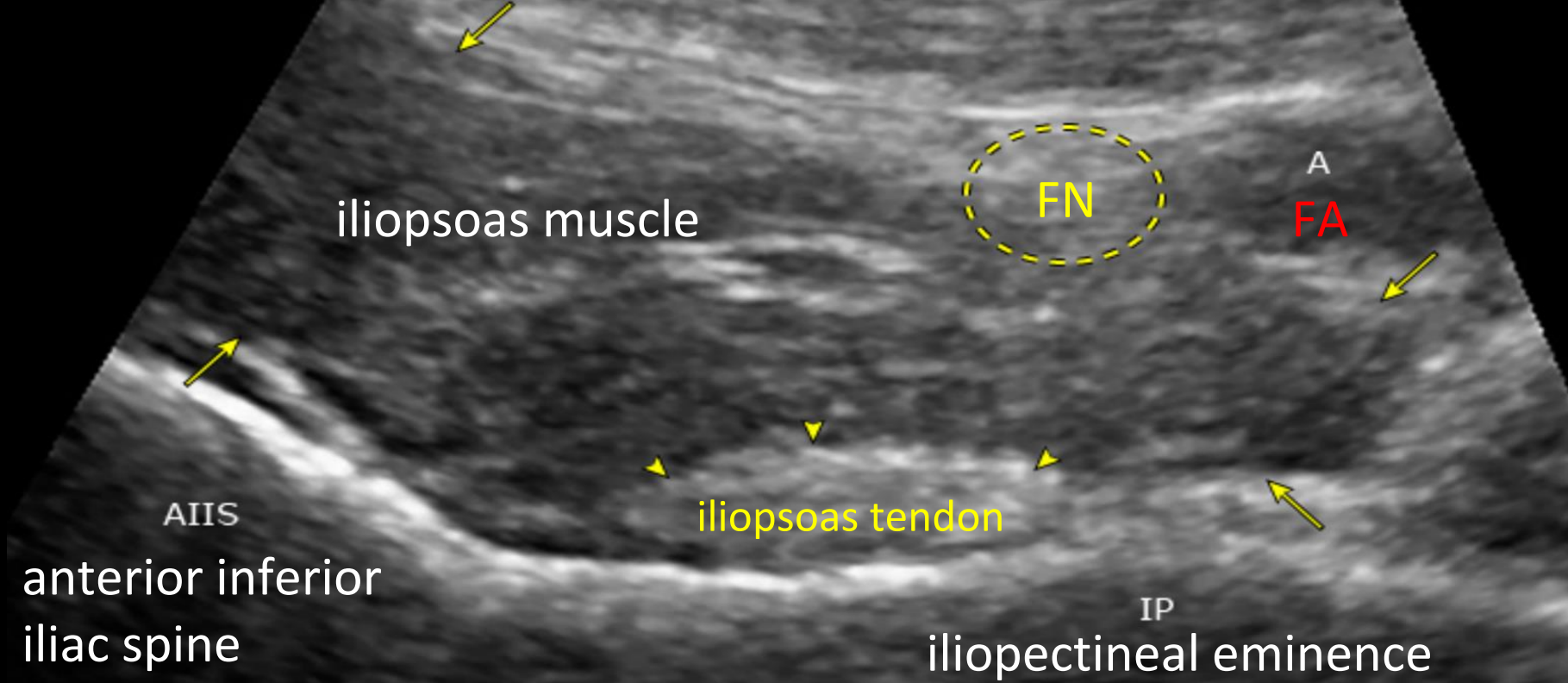


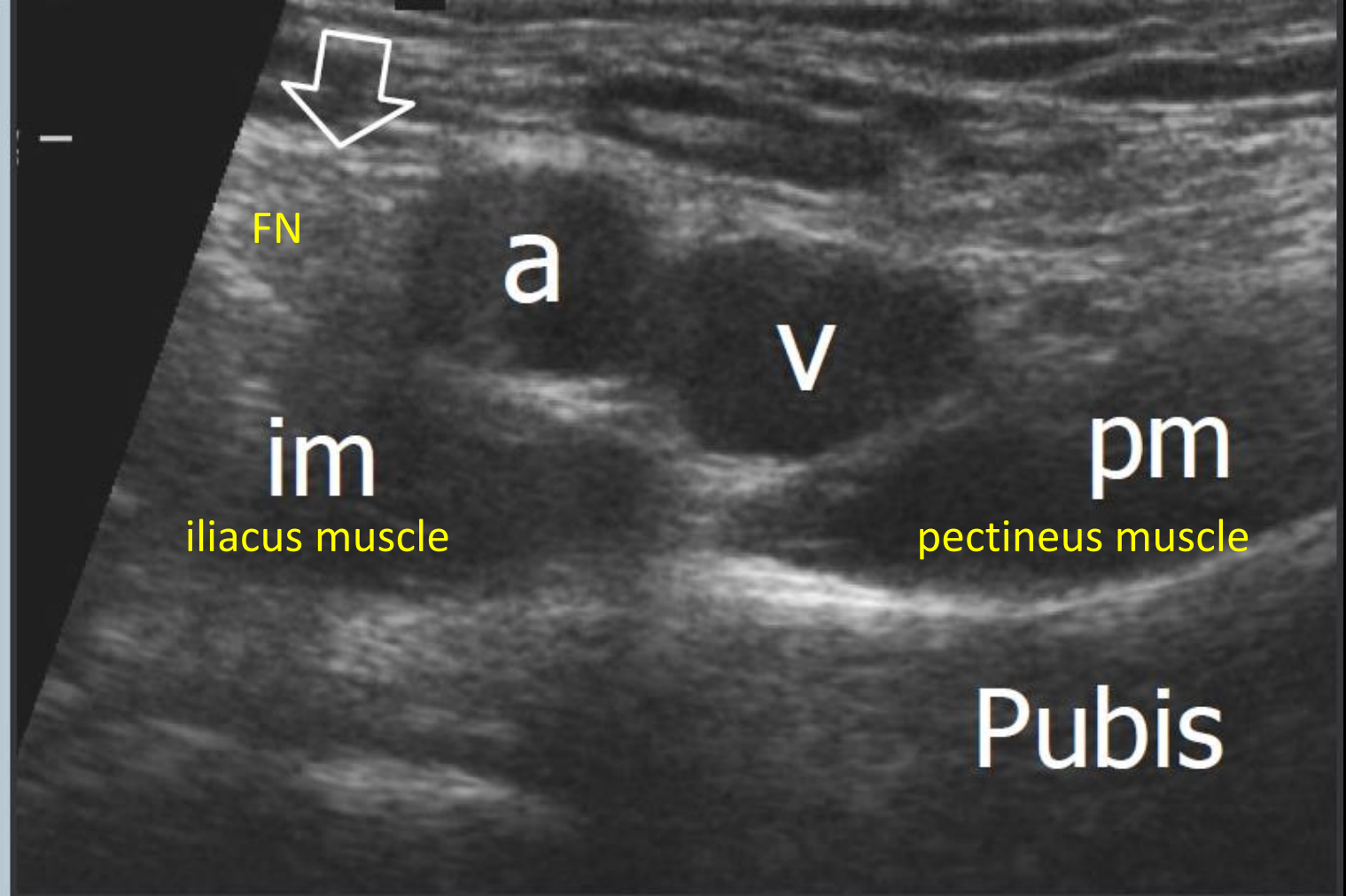
24F, bipolar disease, IV drug use,
right groin pain



Normal side

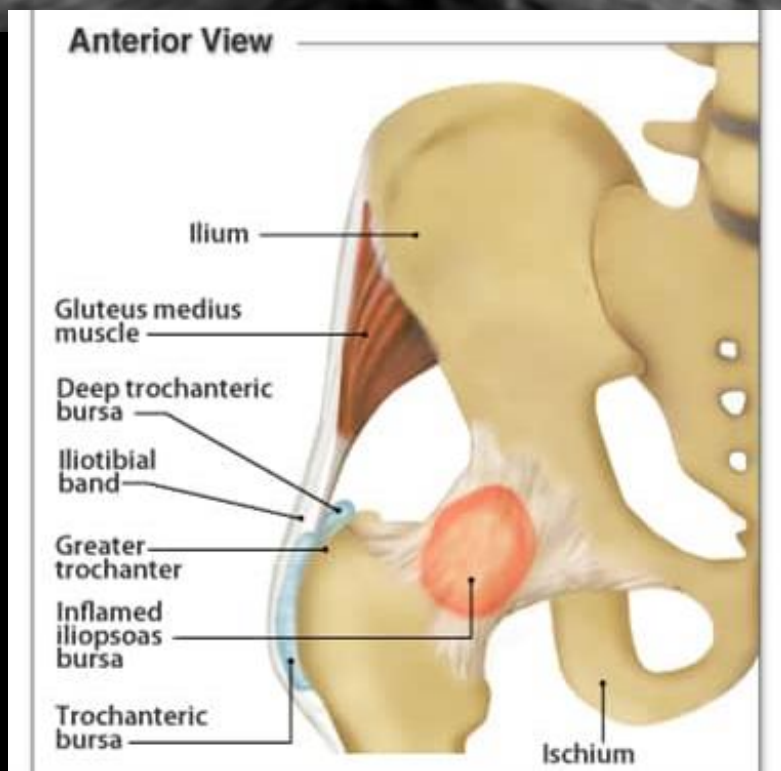
**Iliopsoas tendon
transverse
oblique view**



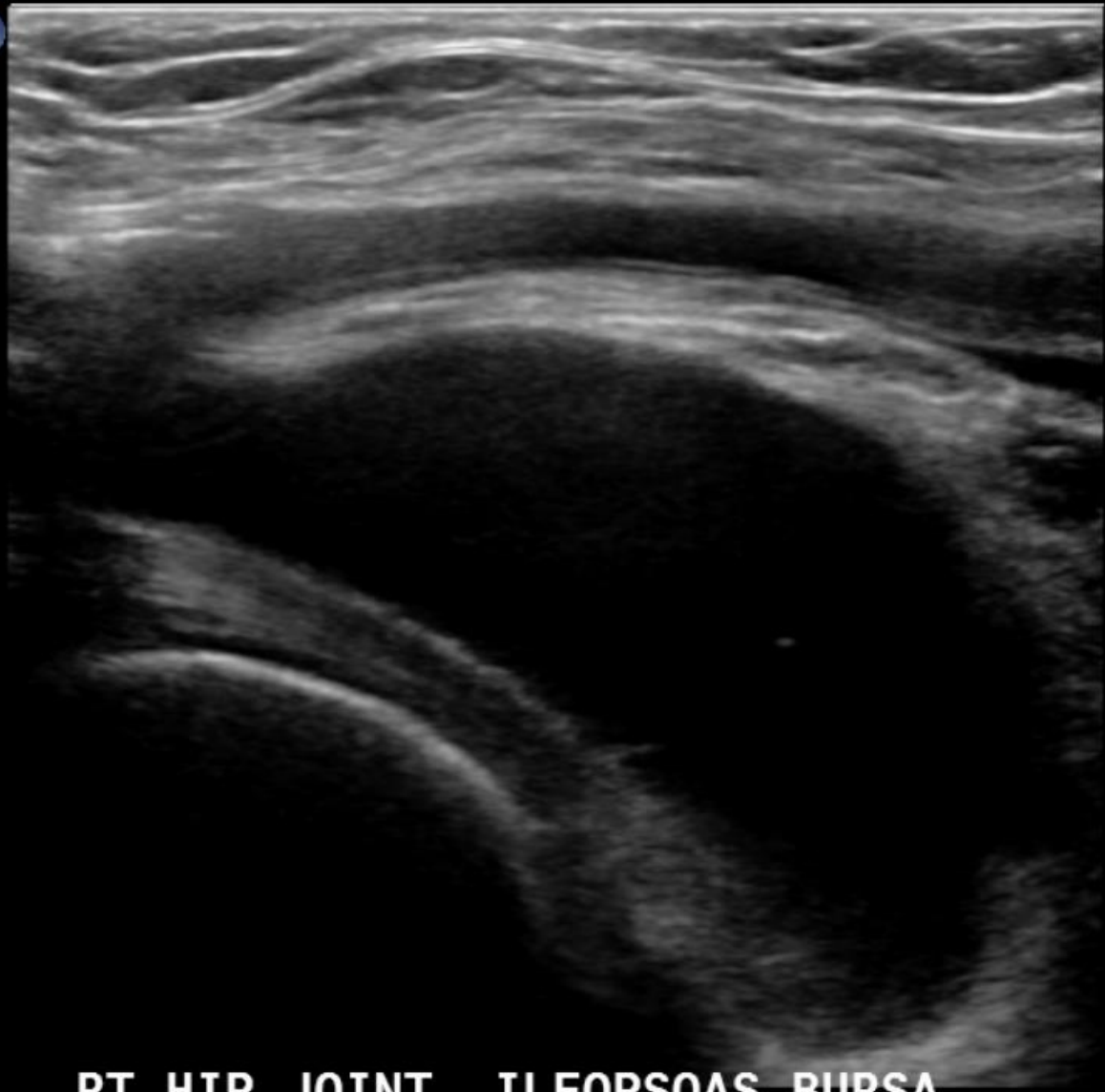




iliopsoas bursa



P



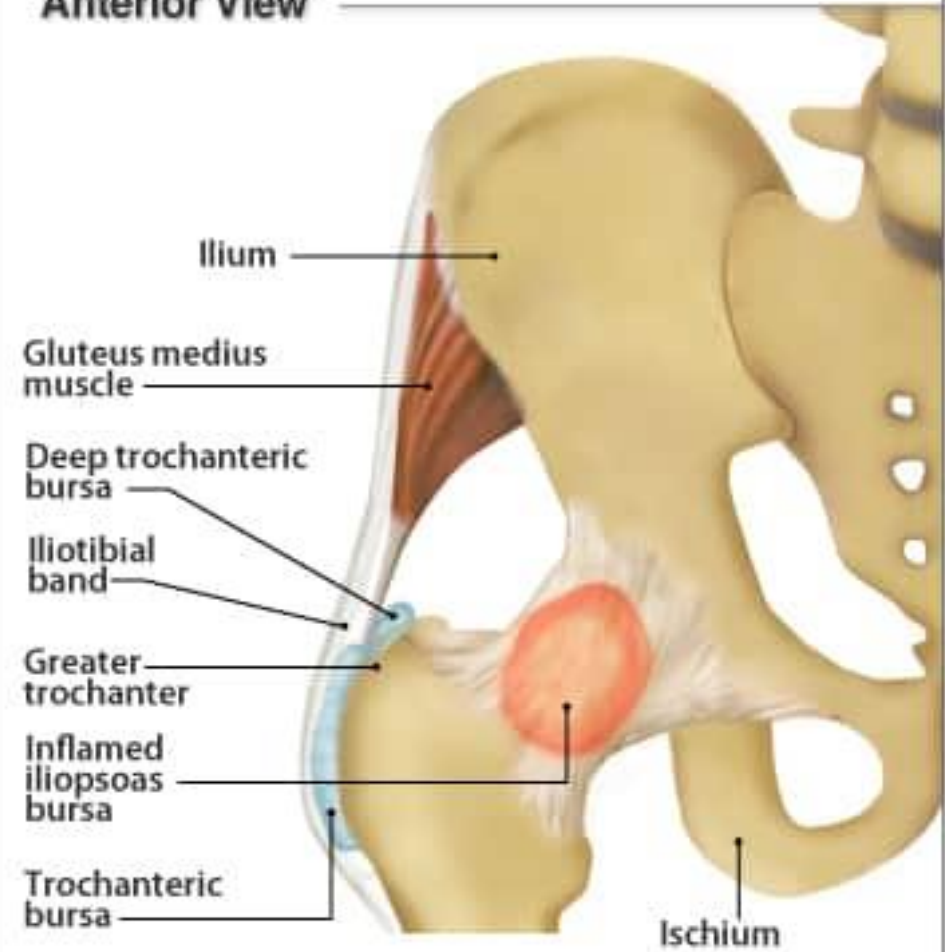
RT HIP JOINT ILEOPSOAS BURSA

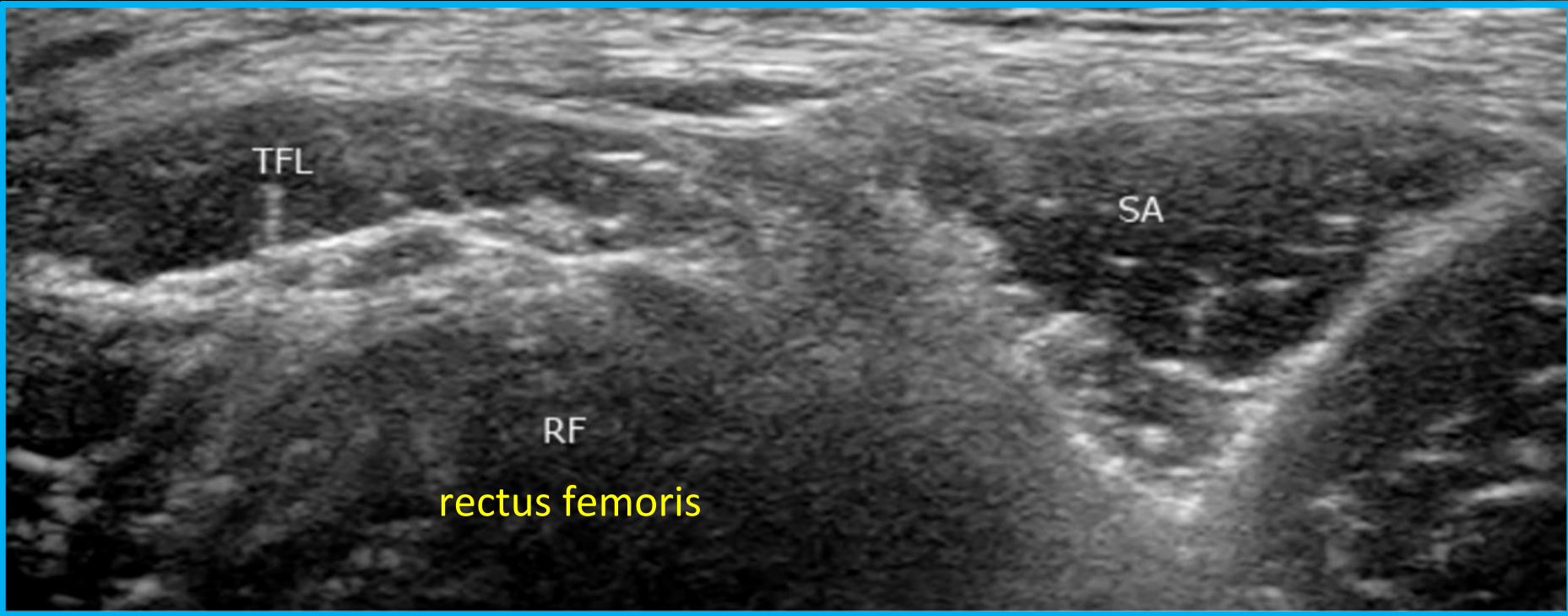
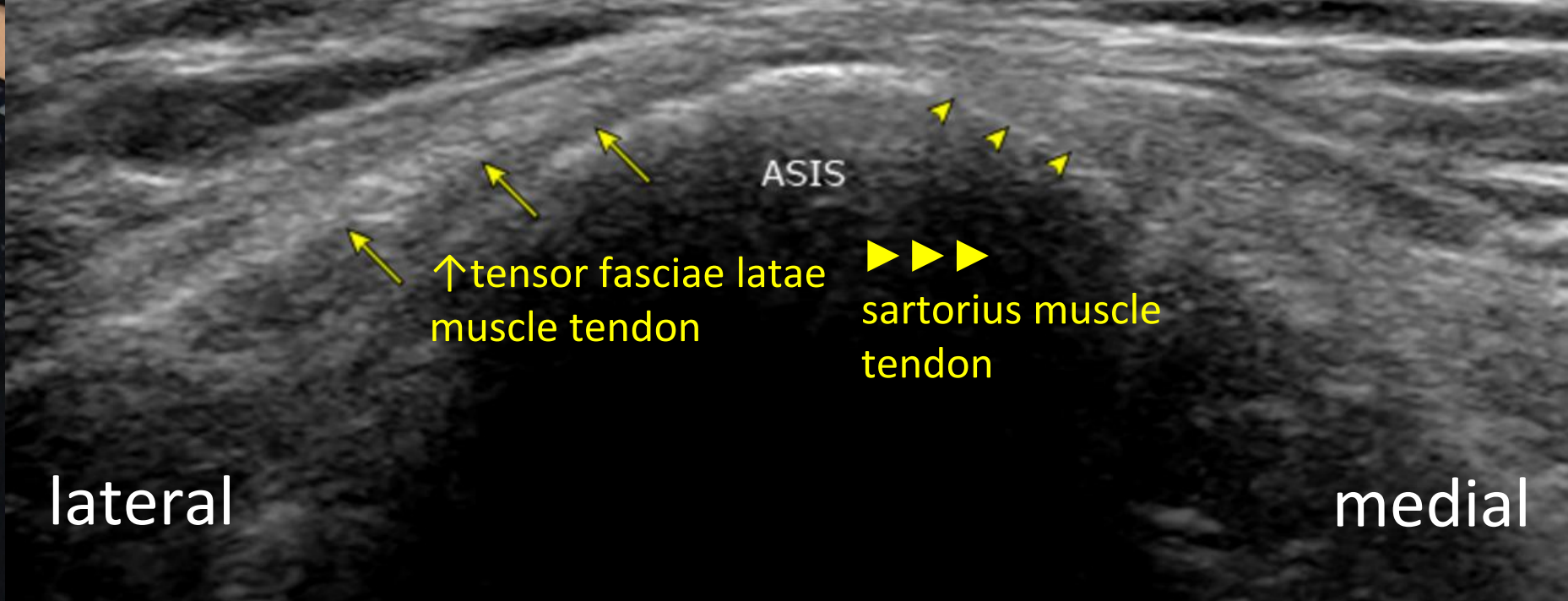
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Bursitis of the Hip

Iliopsoas Bursitis

Anterior View





TFL origin in sagittal view



TFL

GMI

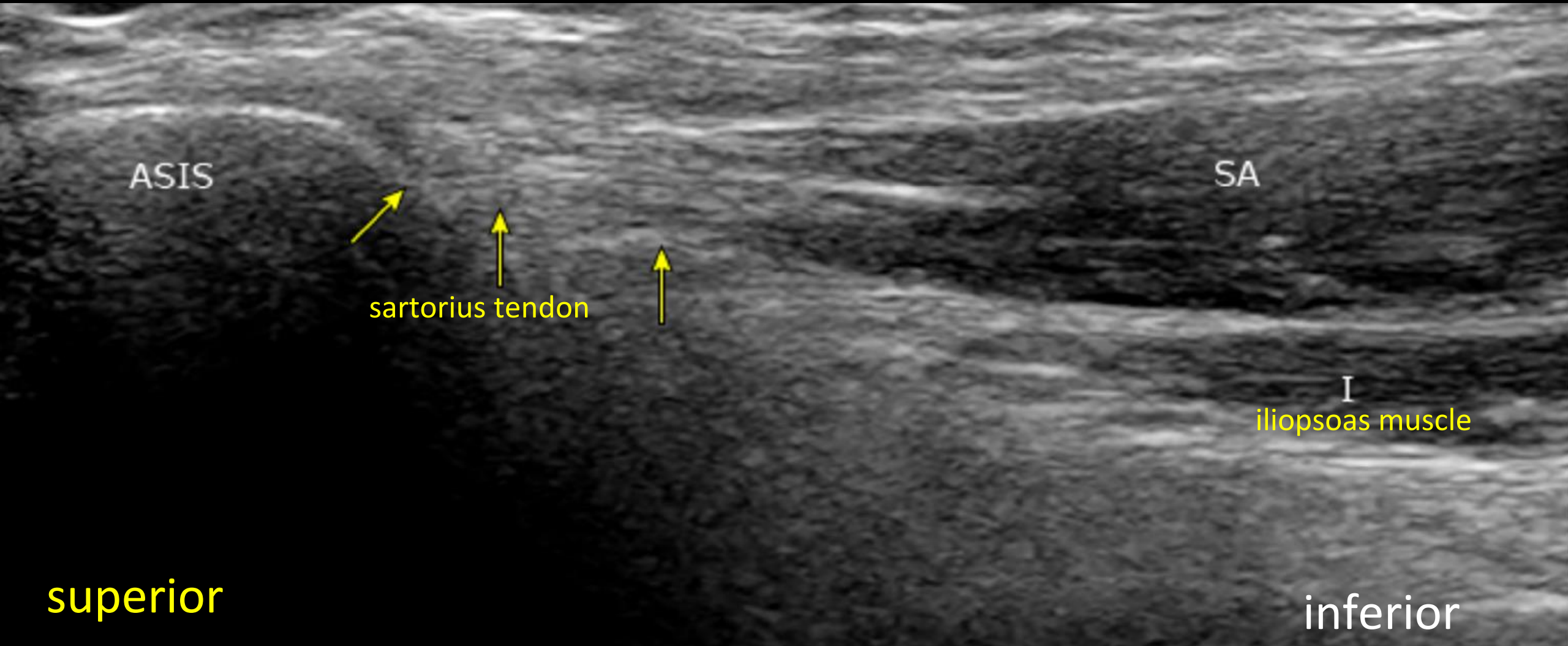
gluteus minimus muscle

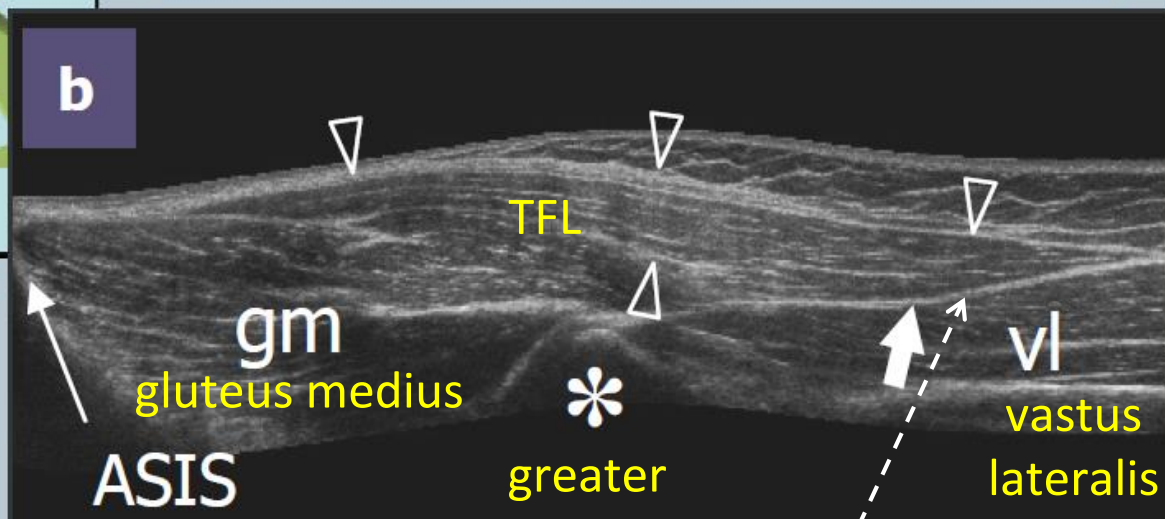
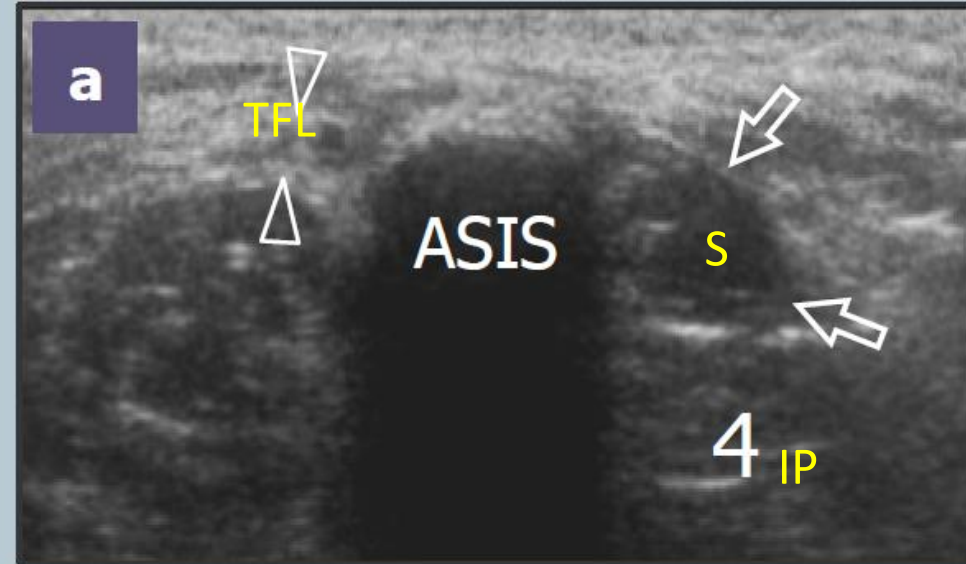
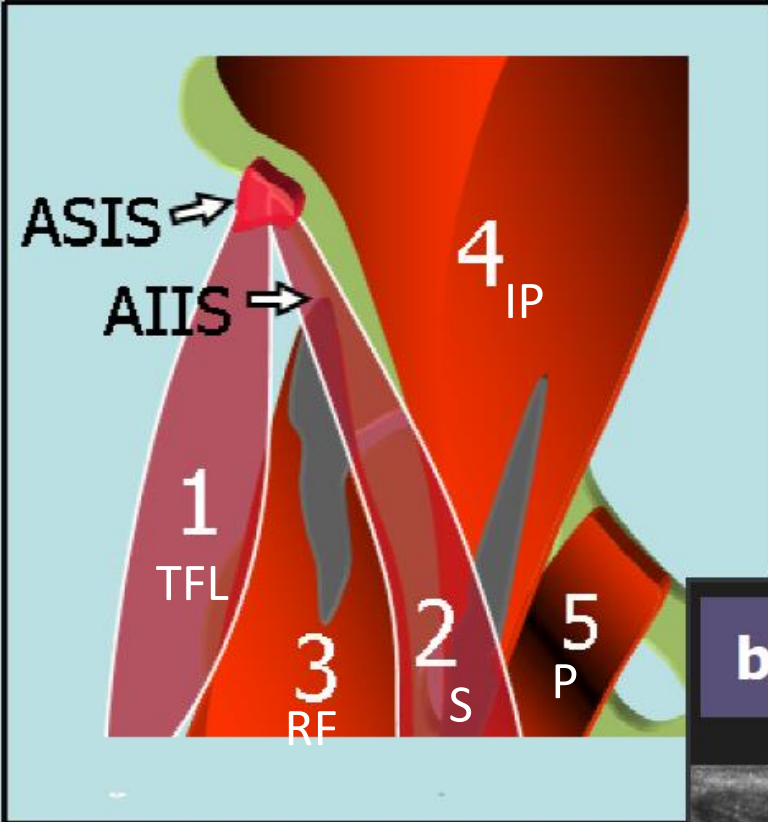
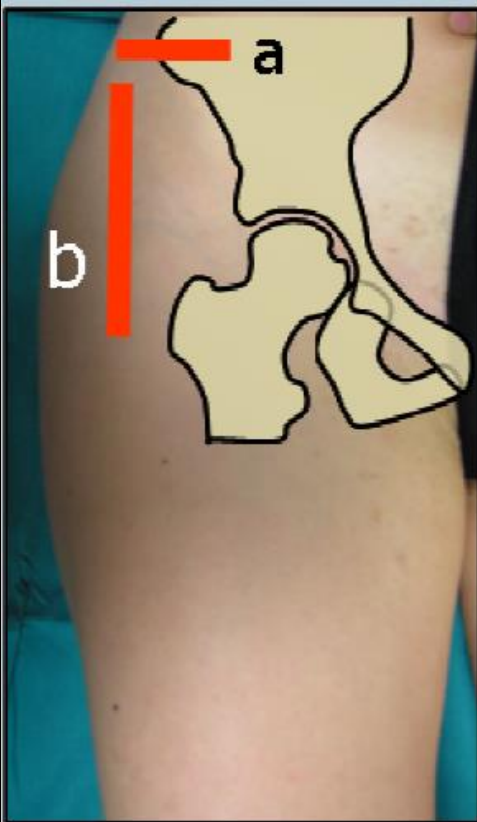
ASIS

inferior

superior

sartorius origin in sagittal view





Legend: arrowheads and 1, tensor fasciae latae muscle; AIIS, anteroinferior iliac spine; ASIS, anterosuperior iliac spine; asterisk, greater trochanter; curved arrow, lateral femoral cutaneous nerve; gm, gluteus medius muscle; 3, rectus femoris muscle; 4, iliopsoas muscle; 5, pectineus

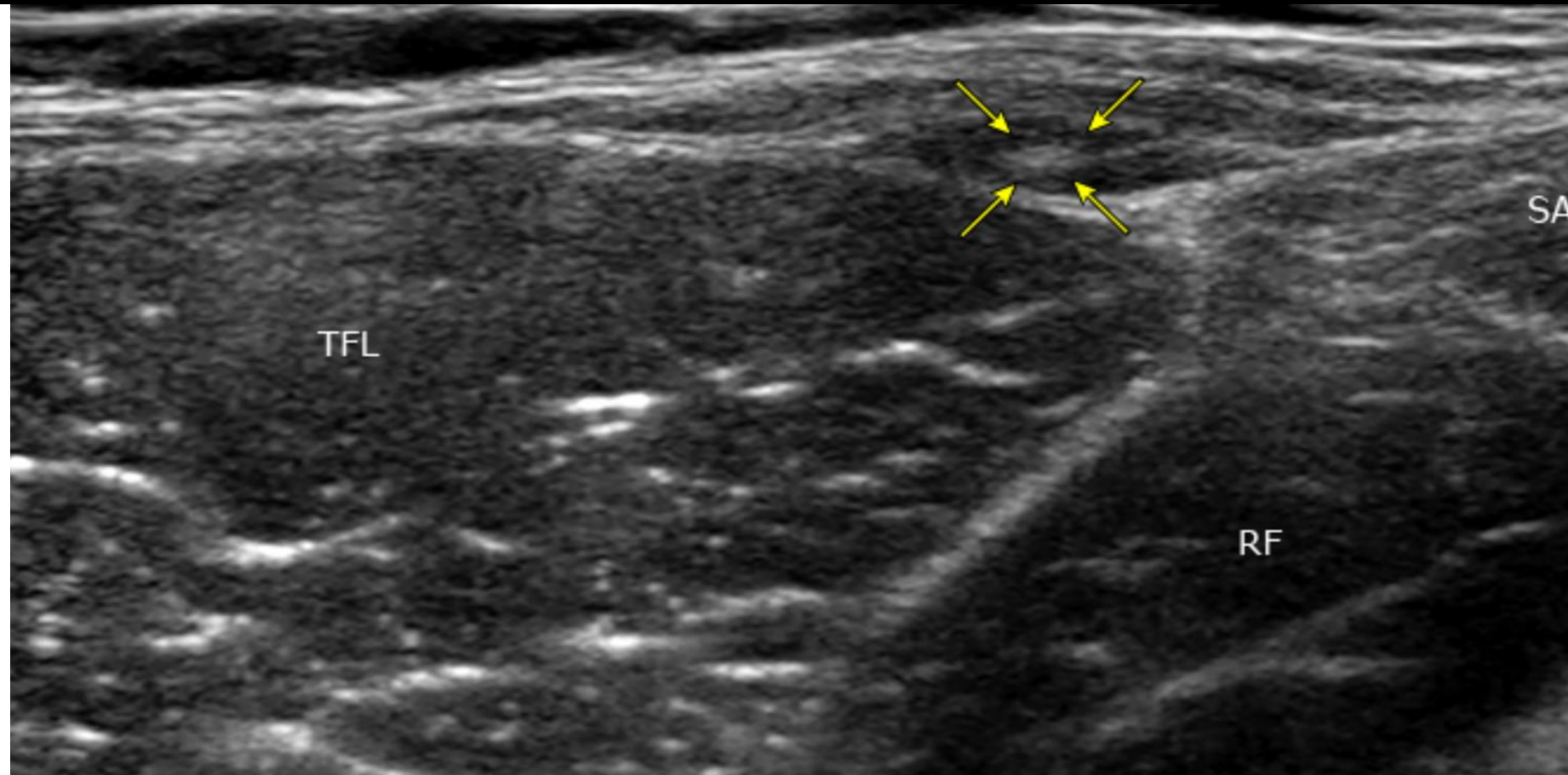
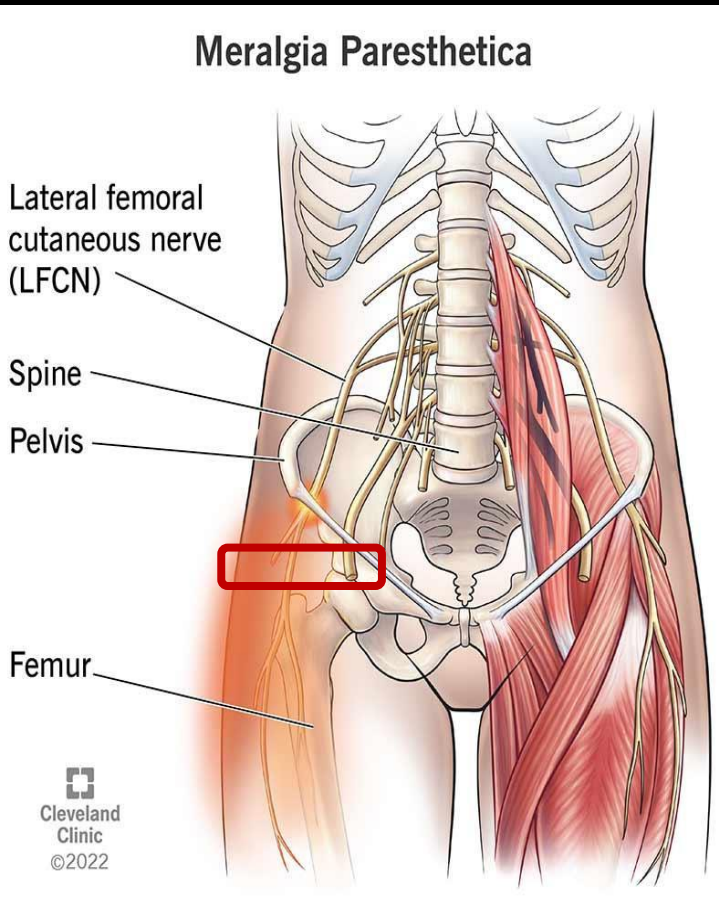
- 1, tensor fasciae latae muscle;
- 2, sartorius muscle;
- 3, rectus femoris muscle; 4, iliopsoas muscle;
- 5, pectineus muscle

insertion of TFL

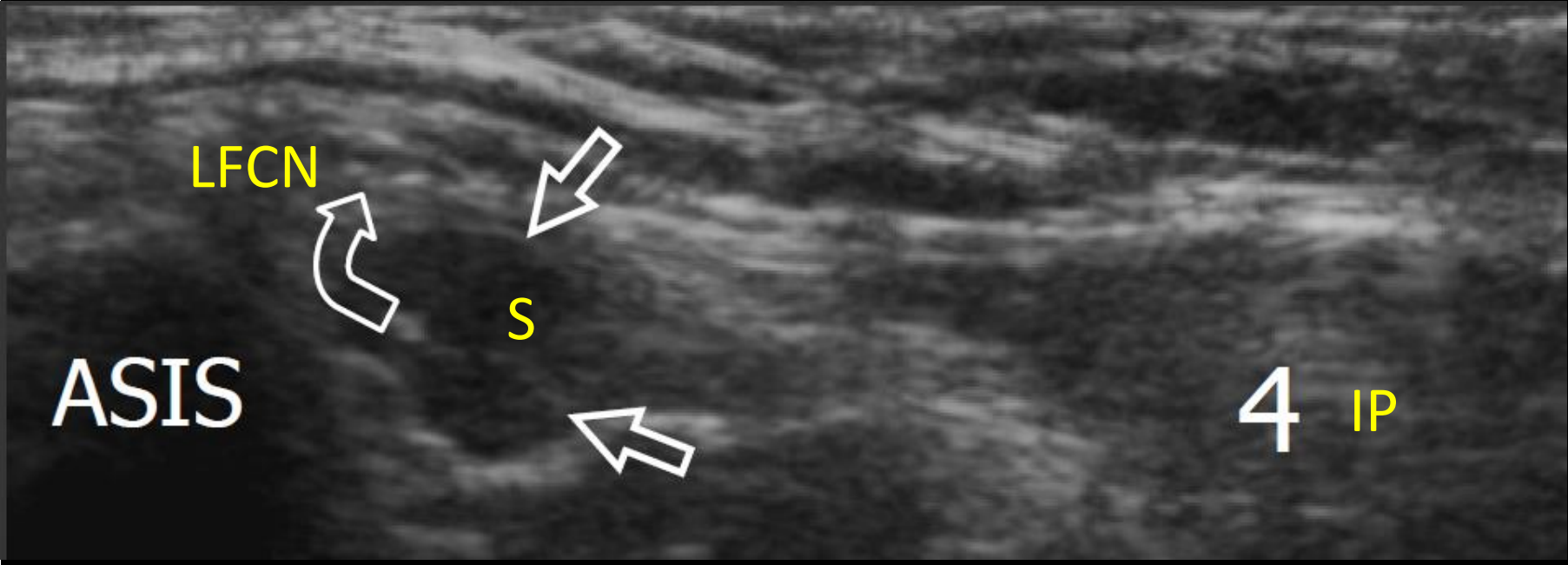
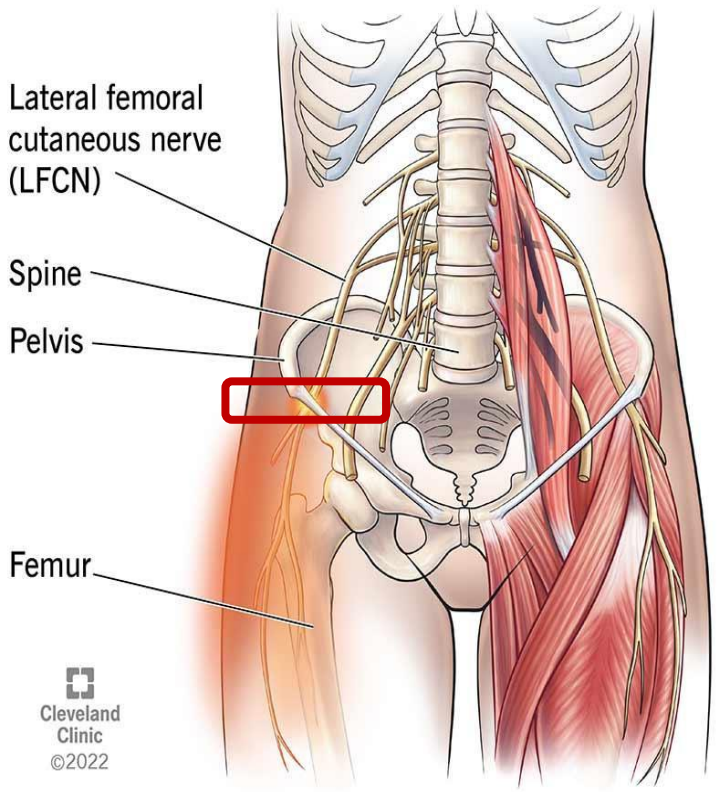
lateral femoral cutaneous nerve in transverse view (lateral cutaneous nerve of thigh)

lateral

medial



Meralgia Paresthetica





大腿外側又痛又麻
原來是**麻痛性股痛**

麻痛性股痛 (Meralgia Paresthetica)常見因素？



腰部皮帶
或衣褲太緊



腹股溝韌帶附近
有瘢痕組織



肥胖
糖尿病
年齡較大



懷孕

 Blogger 陳彥文 神經專科醫師



牛仔褲太緊



站久走久



體重過重



盤腿坐



壓迫測試

壓迫測試 (Pelvic compression Test)

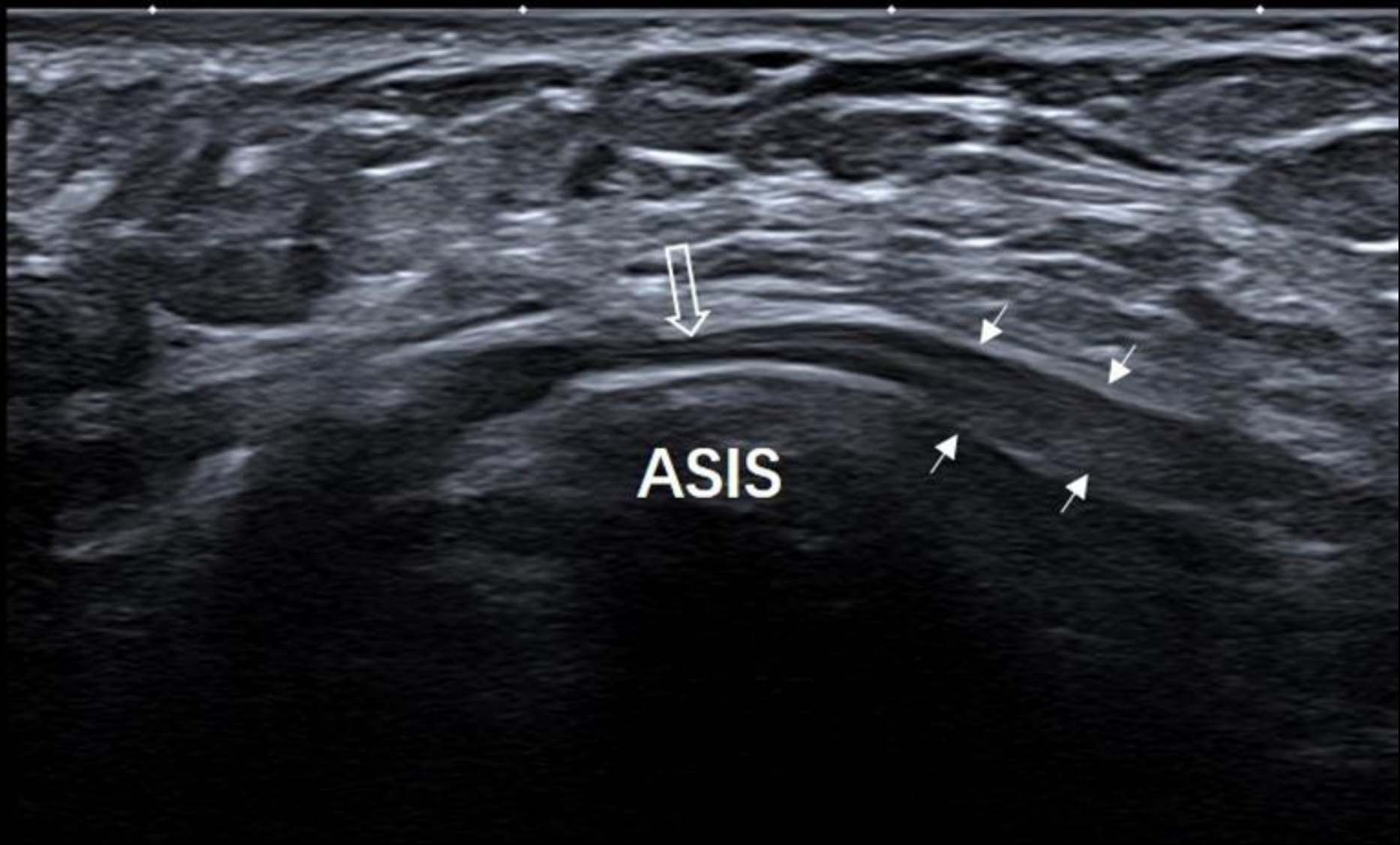
- 側躺，有症狀的大腿在上
- 對著骨盆持續下壓45秒
- 此時復股溝韌帶會相對放鬆，股外側皮神經被壓迫的狀況減輕。如果病人覺得大腿症狀減緩，表示病人有麻痛性股痛



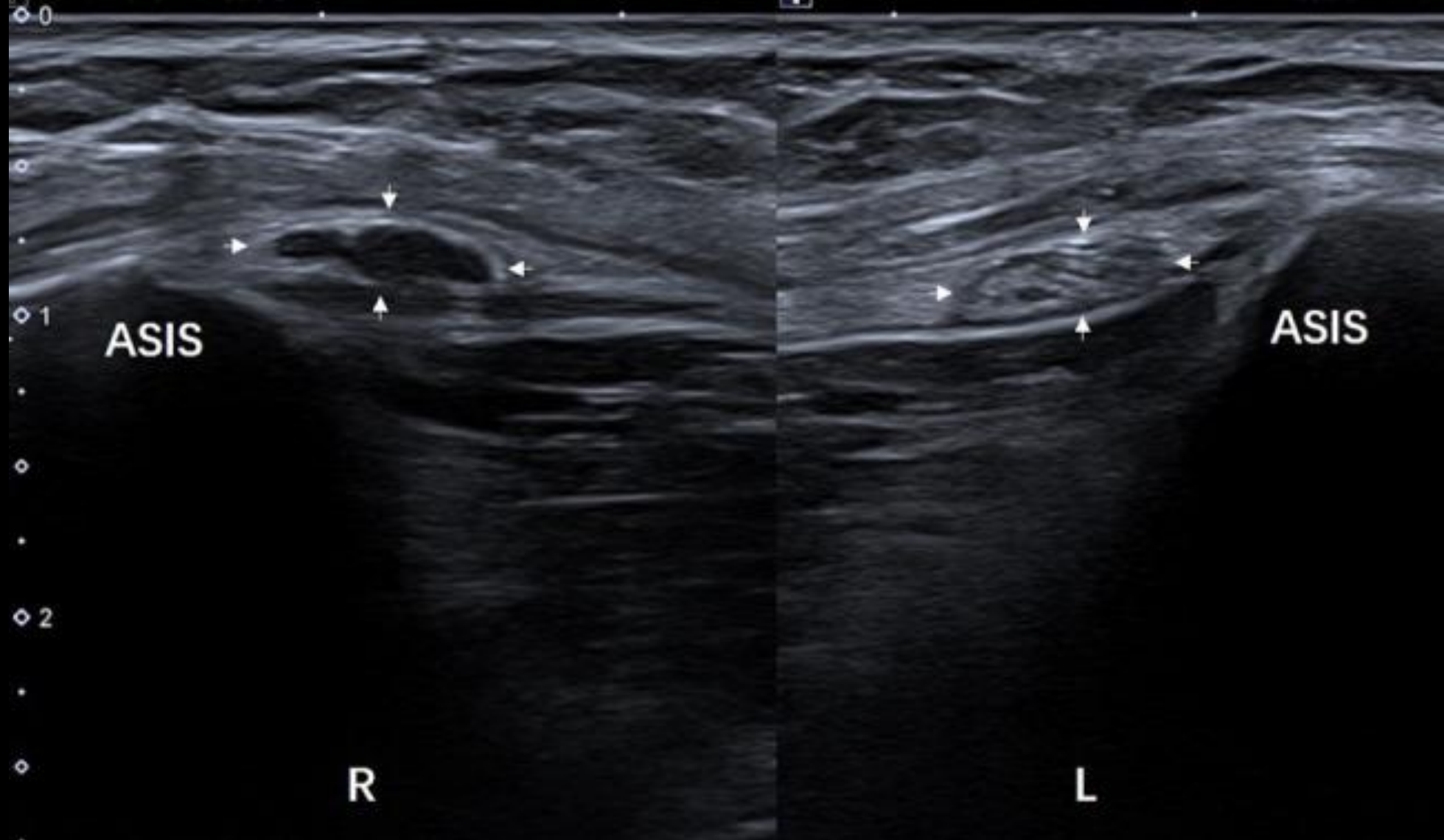
神經動態測試

神經動態測試(Neurodynamic Test)

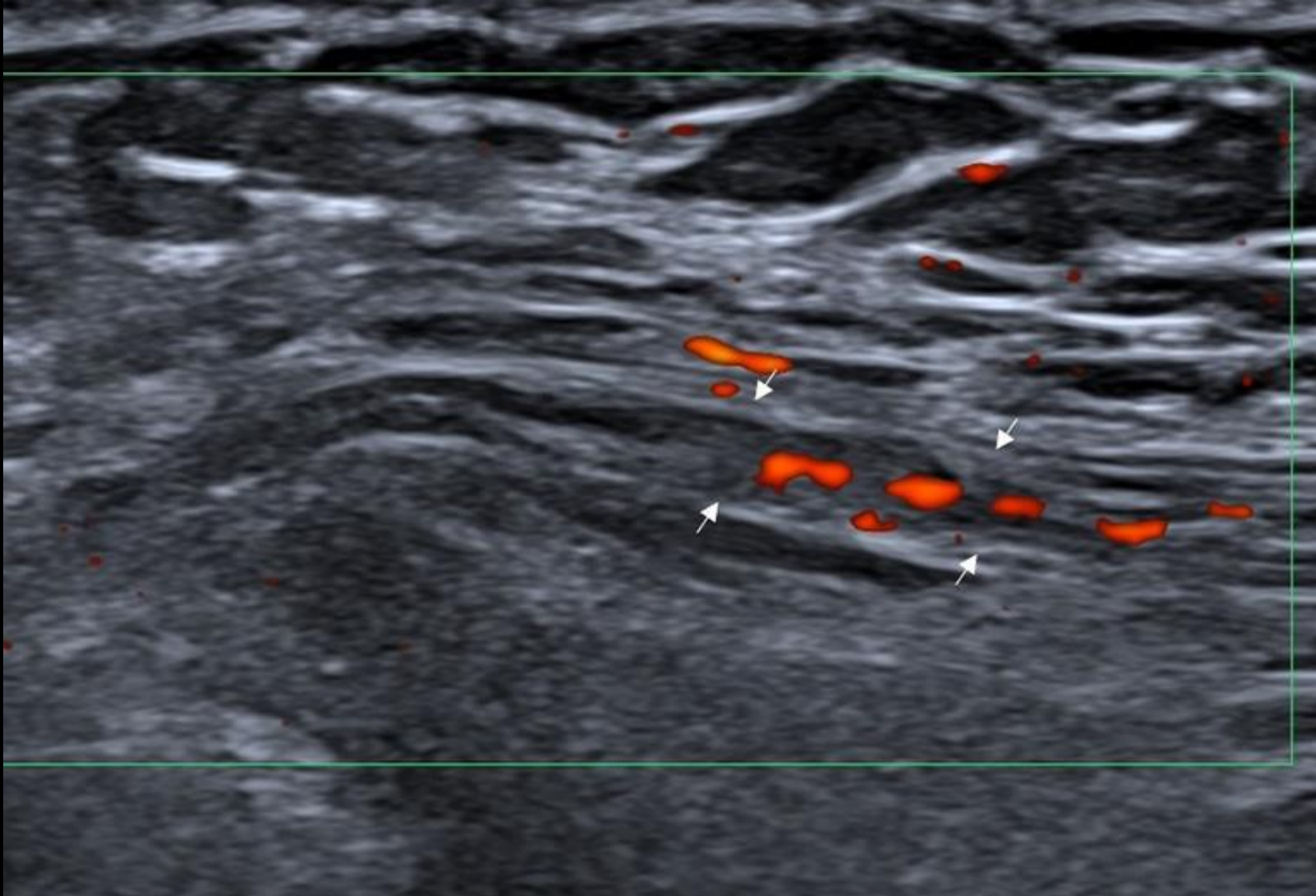
- 將病人膝蓋彎曲，大腿往後拉，並把大腿往桌子方向壓
- 此時股外側皮神被拉緊，如果大腿痠麻癢痛的症狀出現的話，表示病人有麻痛性股痛



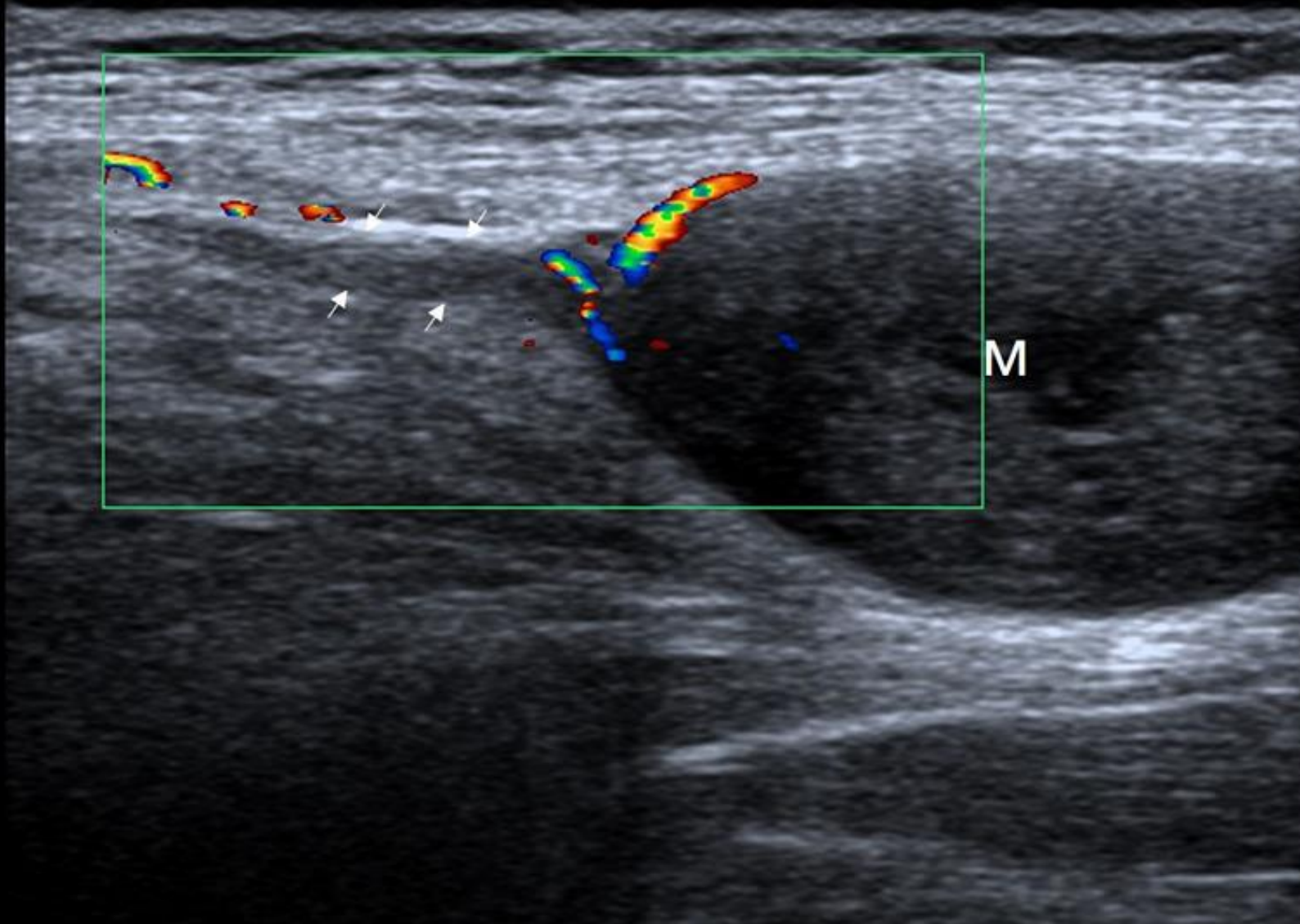
Longitudinal ultrasound image shows the abrupt caliber change of the nerve (empty arrow). Arrow, lateral femoral cutaneous nerve; ASIS, anterior superior iliac spine.



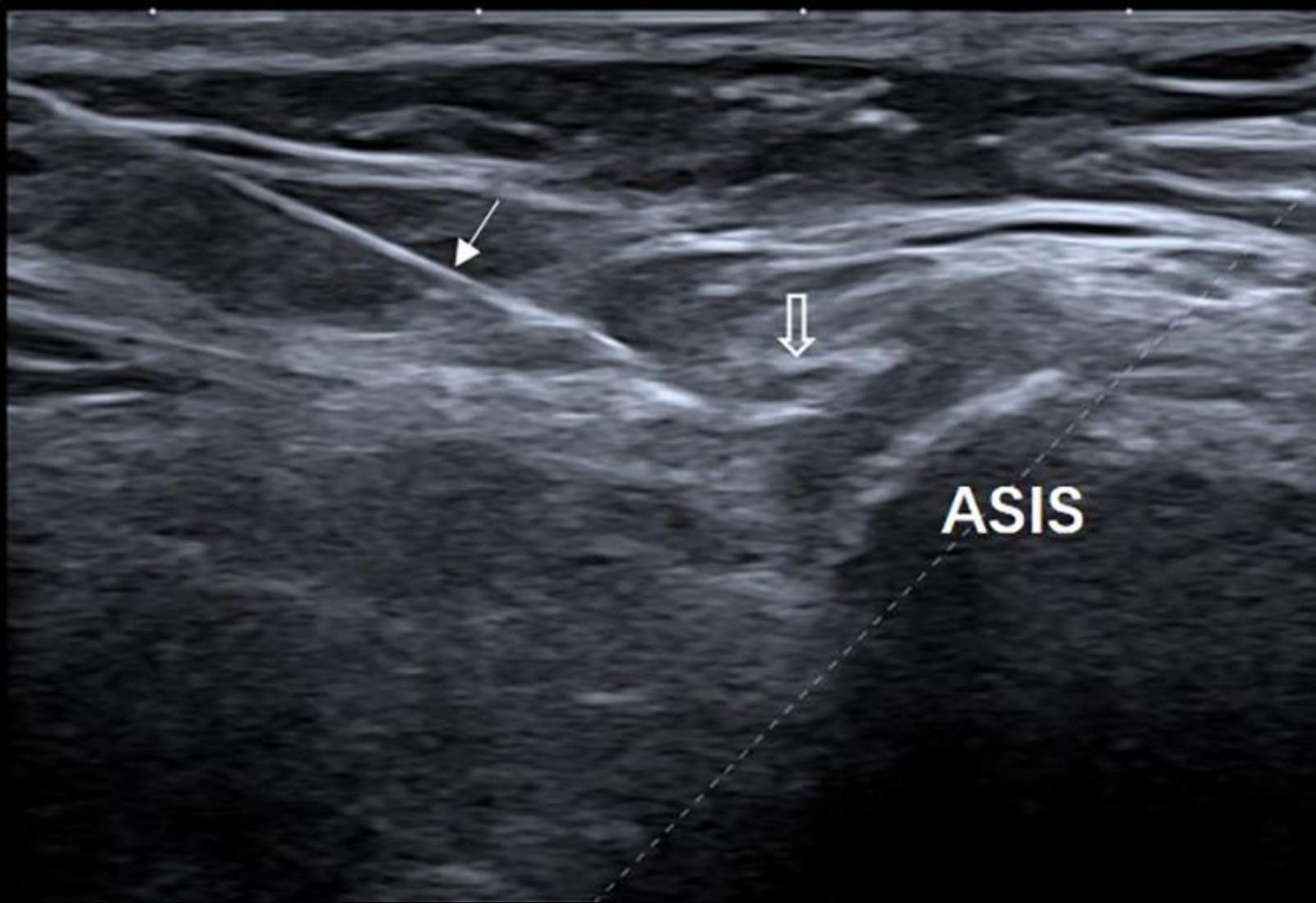
Transverse ultrasound image shows the indistinct perineurium of the right nerve (left shows a normal nerve). Arrow: lateral femoral cutaneous nerve. R: right; L: left; ASIS: anterior superior iliac spine.



Longitudinal ultrasound image shows intraneural vascularity. Arrow: lateral femoral cutaneous nerve.



Longitudinal ultrasound image of the schwannoma. Arrow: lateral femoral cutaneous nerve.

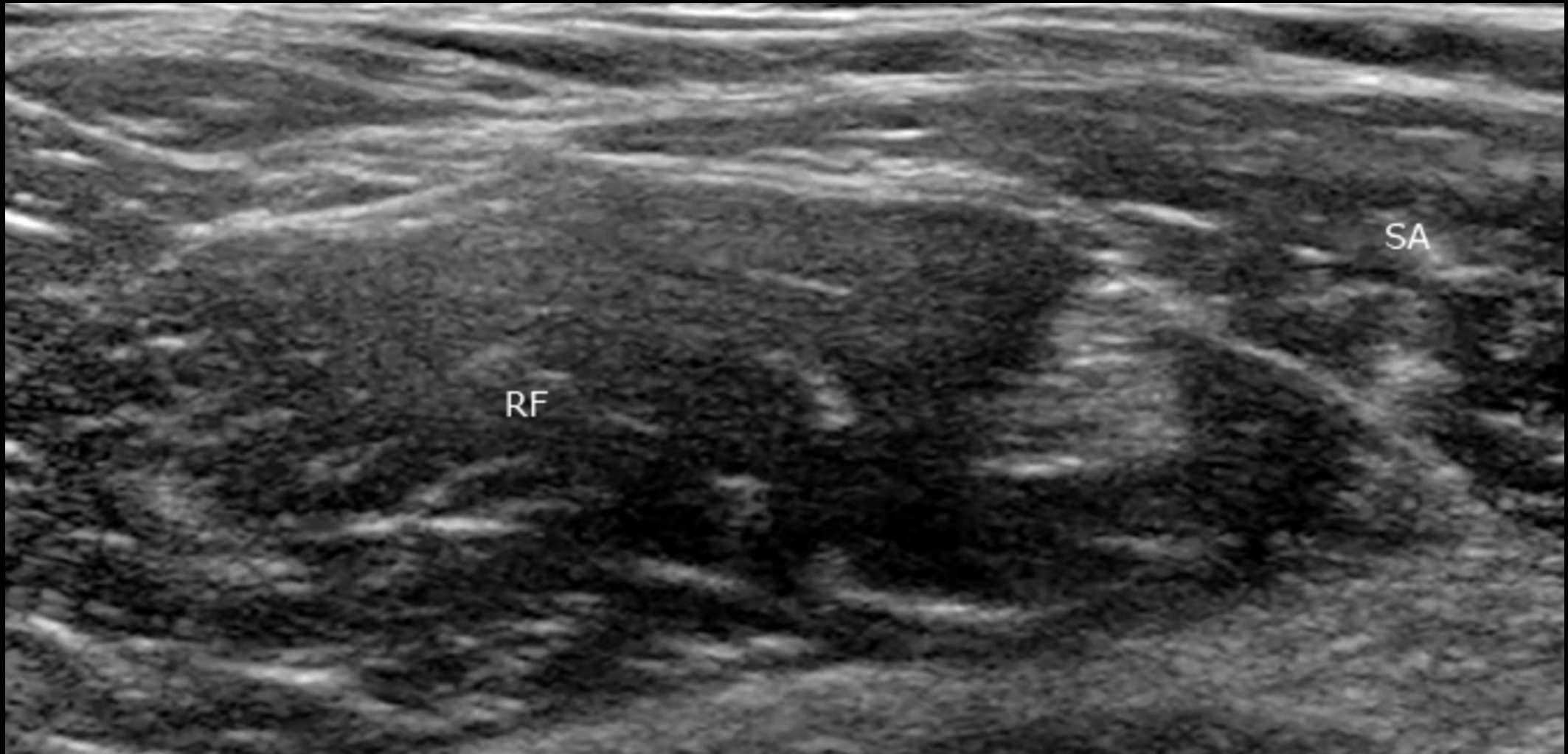


Ultrasound-guided nerve block. Arrow: needle; empty arrow: lateral femoral cutaneous nerve; ASIS, anterior superior iliac spine.

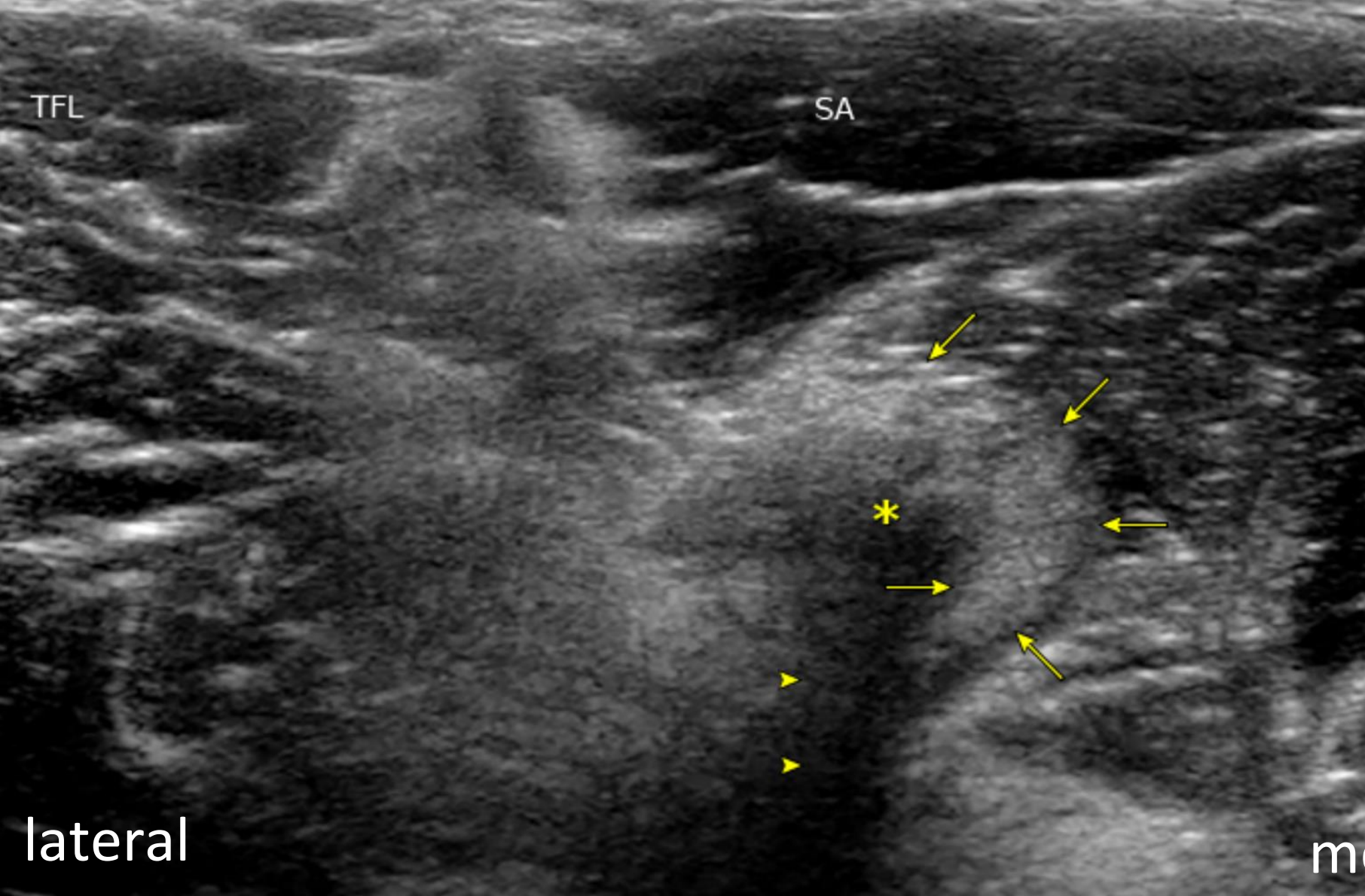
proximal rectus femoris in transverse view

lateral

medial



rectus femoris direct and indirect tendons in transverse view



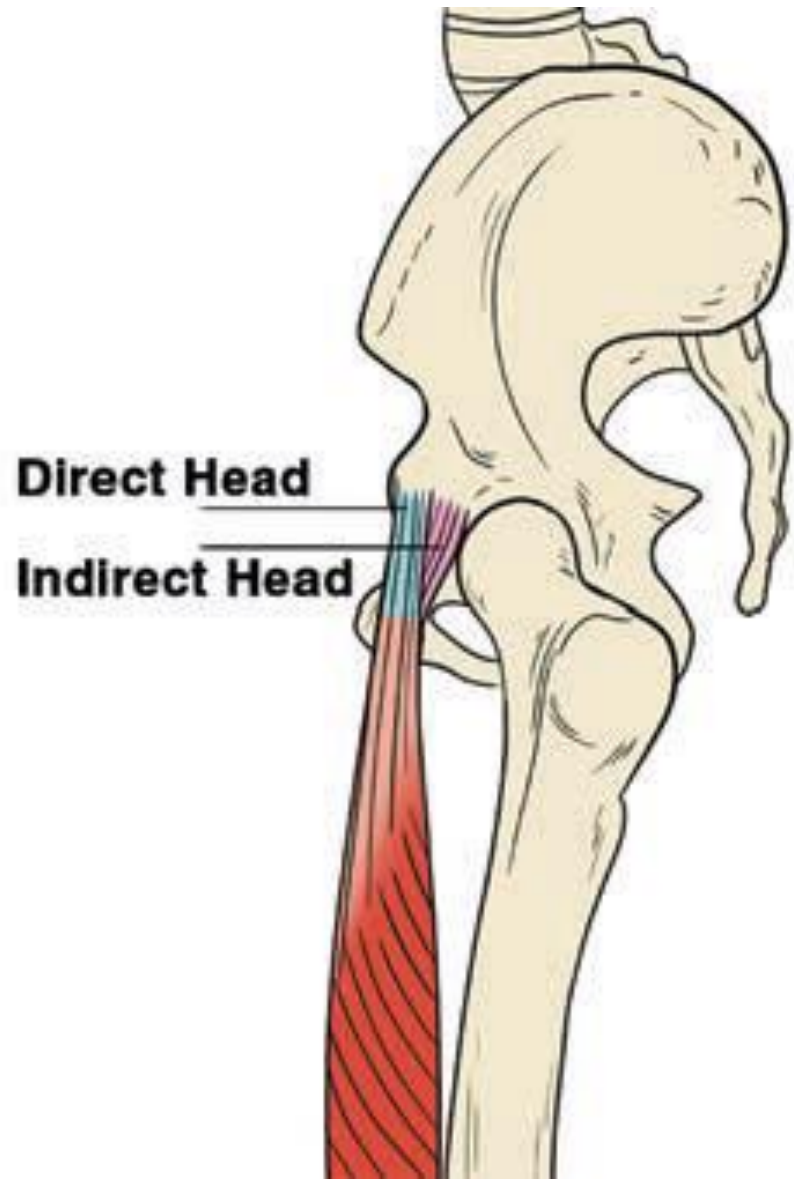
↑: **direct** head of rectus femoris tendon

* : **indirect** head of rectus femoris tendon

▶▶ : posterior acoustic shadowing of indirect head of rectus femoris tendon

lateral

medial



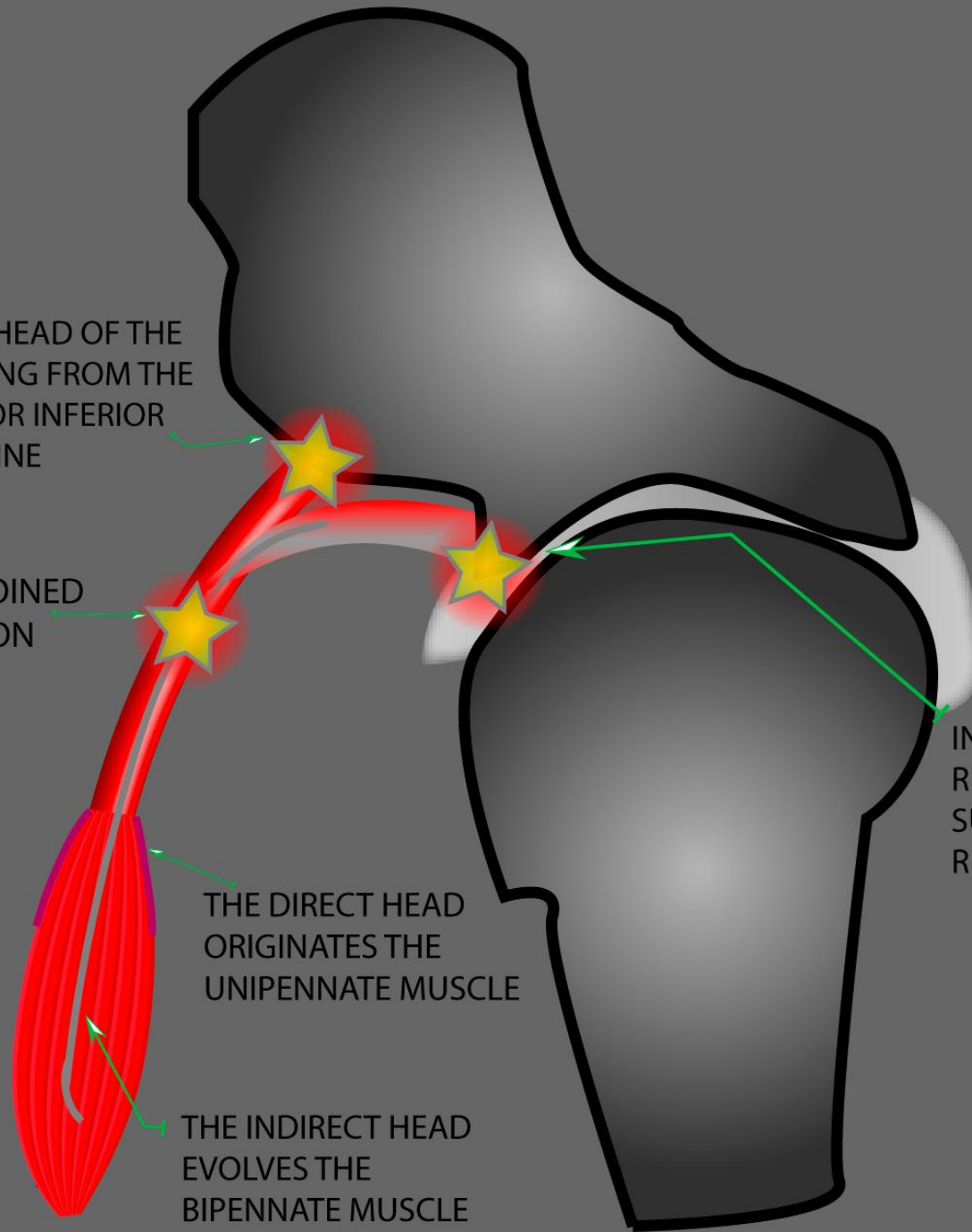
DIRECT HEAD OF THE
RF ARISING FROM THE
ANTERIOR INFERIOR
ILIAC SPINE

CONJOINED
TENDON

THE DIRECT HEAD
ORIGINATES THE
UNIPENNATE MUSCLE

THE INDIRECT HEAD
EVOLVES THE
BIPENNATE MUSCLE

INDIRECT HEAD OF THE
RF ARISING FROM THE
SUPRA-ACETABULAR
RIDGE



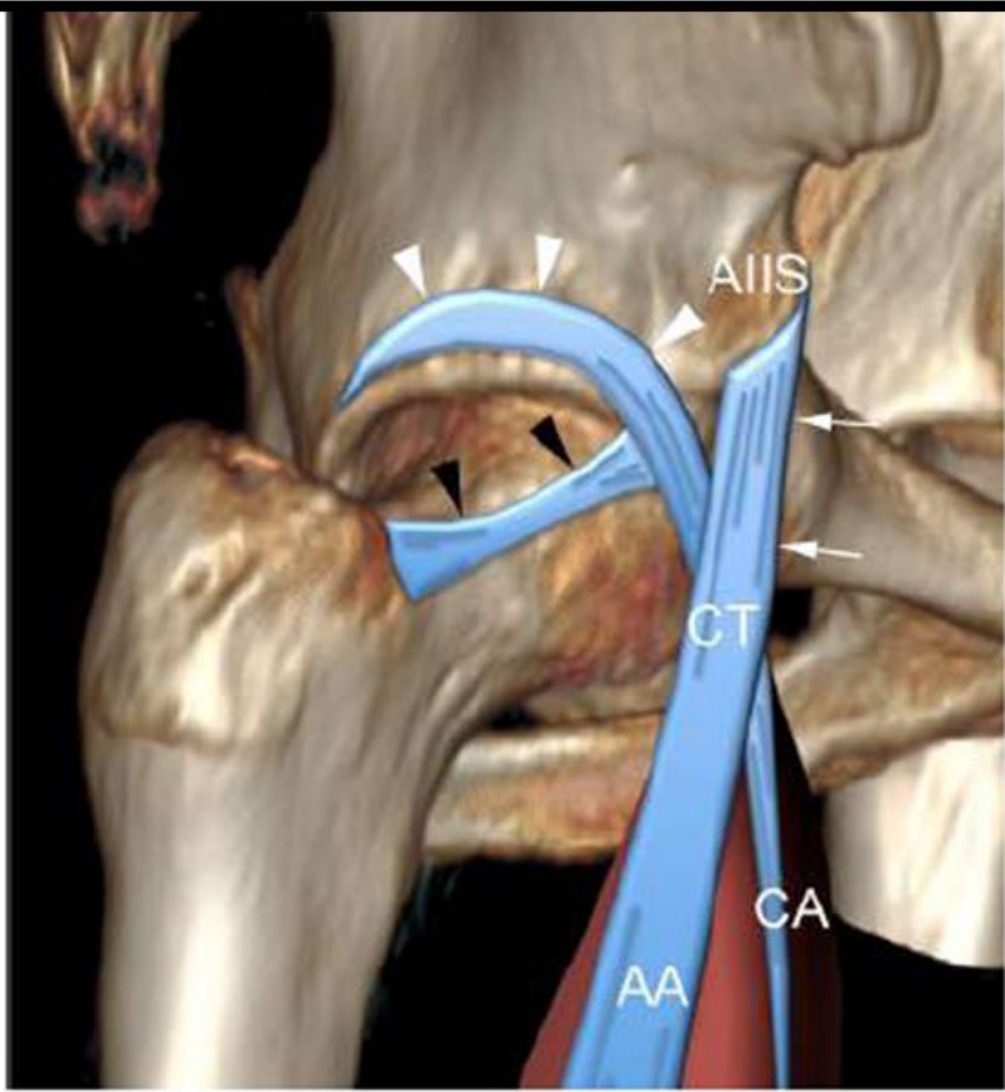
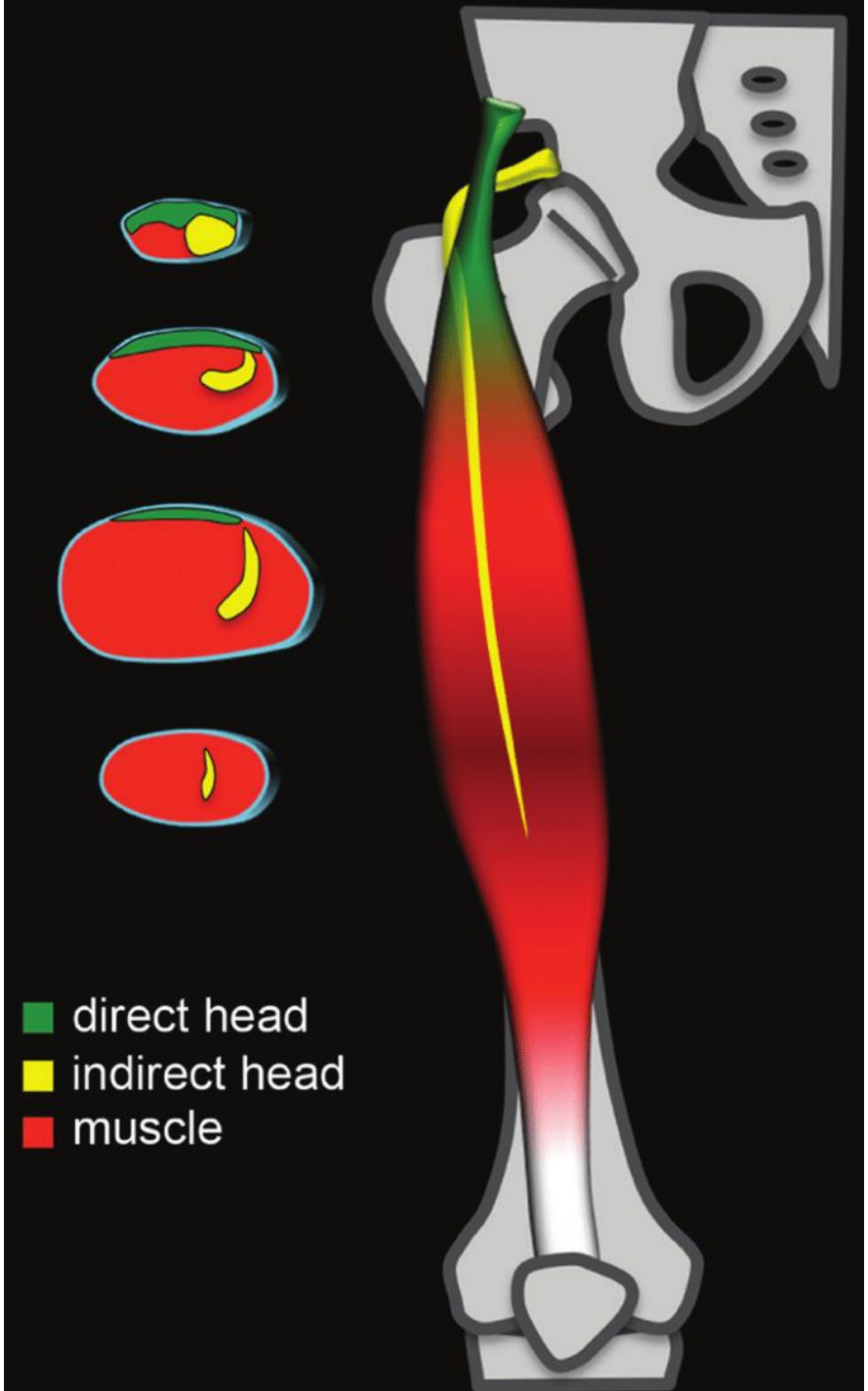
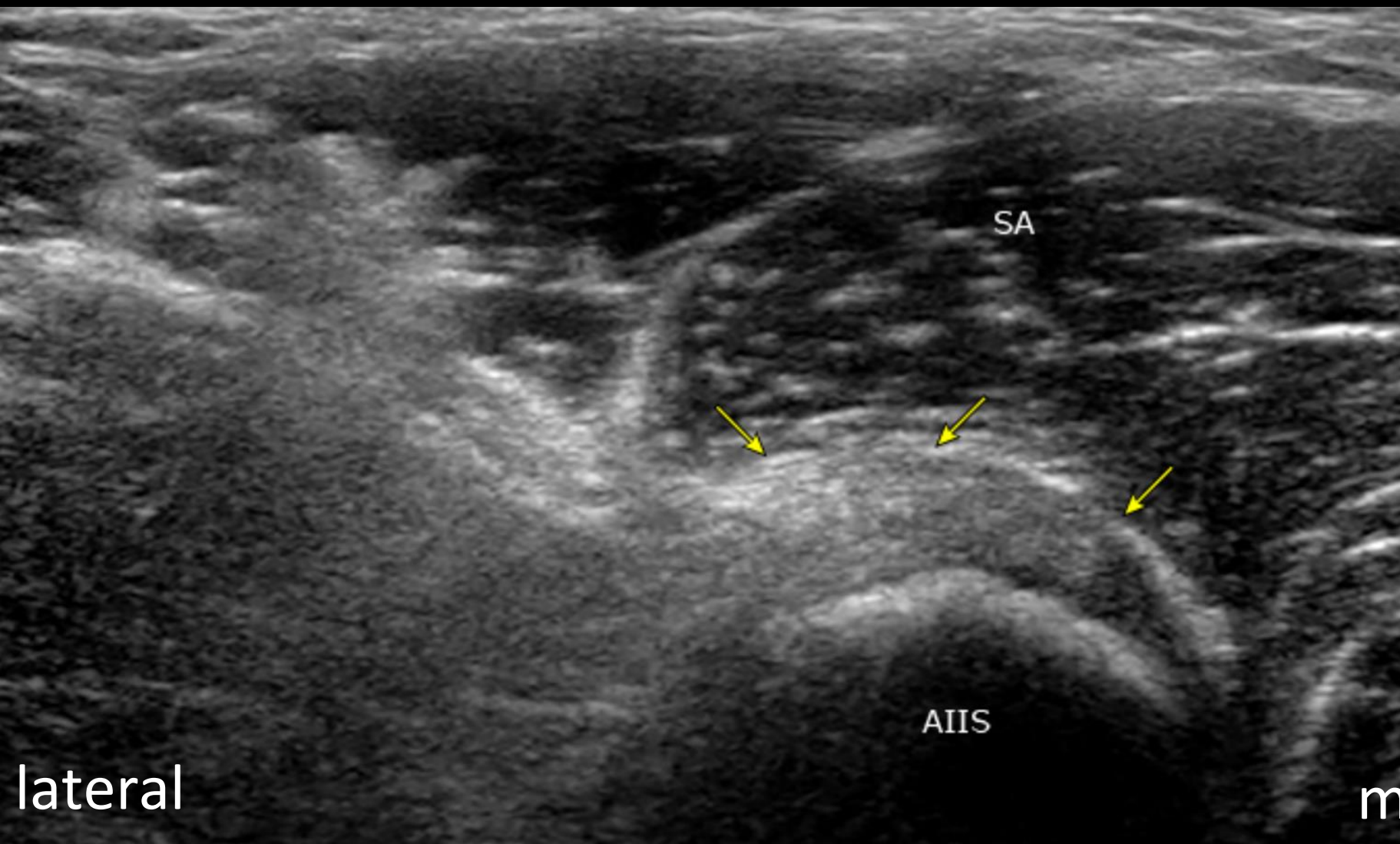


Fig. 1 Illustration of an anterolateral view of the proximal insertion of the rectus femoris (*white arrowheads*, indirect tendon; *arrows*, direct tendon; *black arrowheads*, 3rd head tendon; *CT*, conjoined tendon; *AIIS*, anteroinferior iliac spine; *CA*, central aponeurosis; *AA*, anterior aponeurosis)

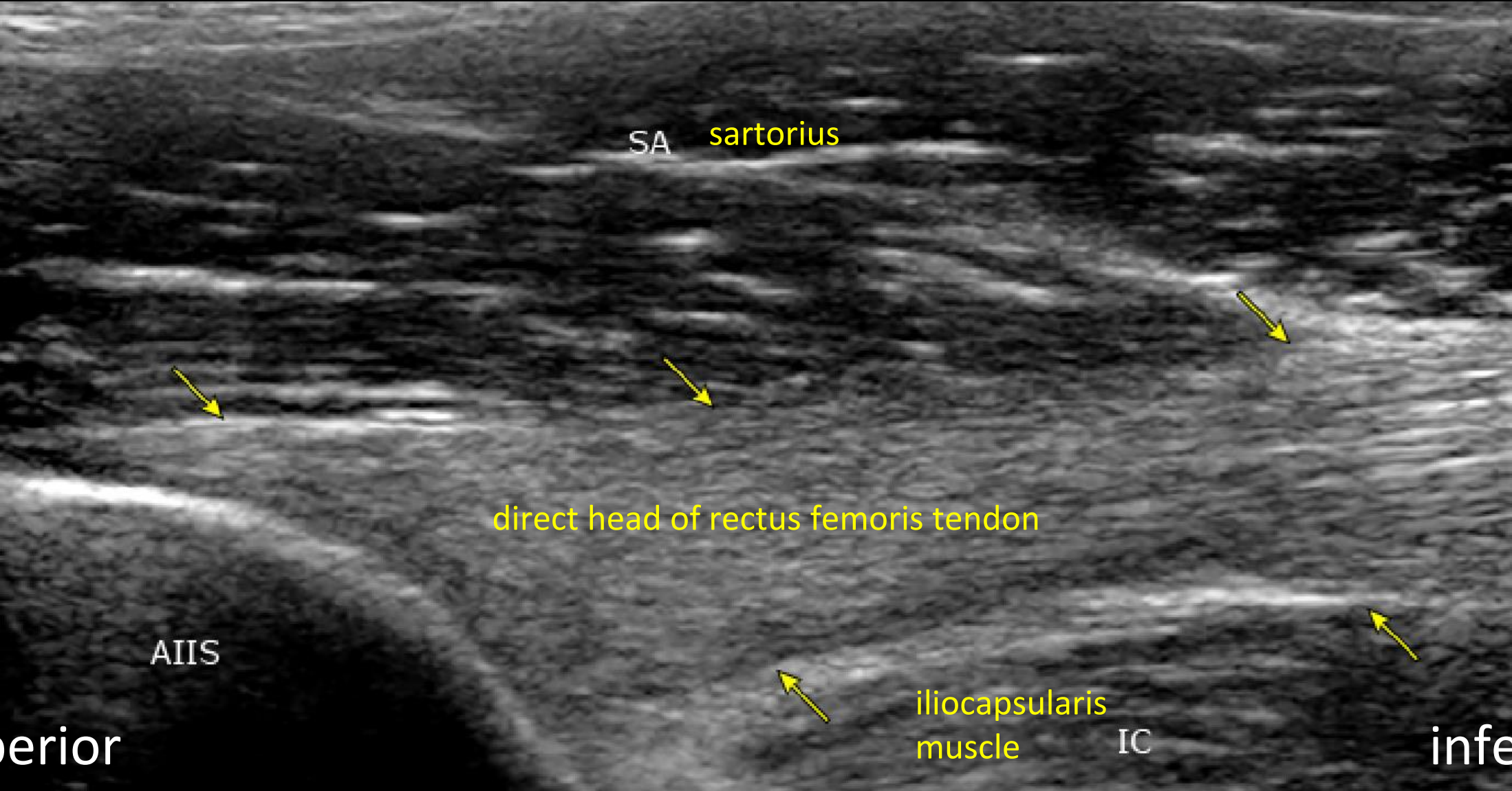


rectus femoris tendon direct head in transverse view



↑↑: **direct** head of
rectus femoris tendon

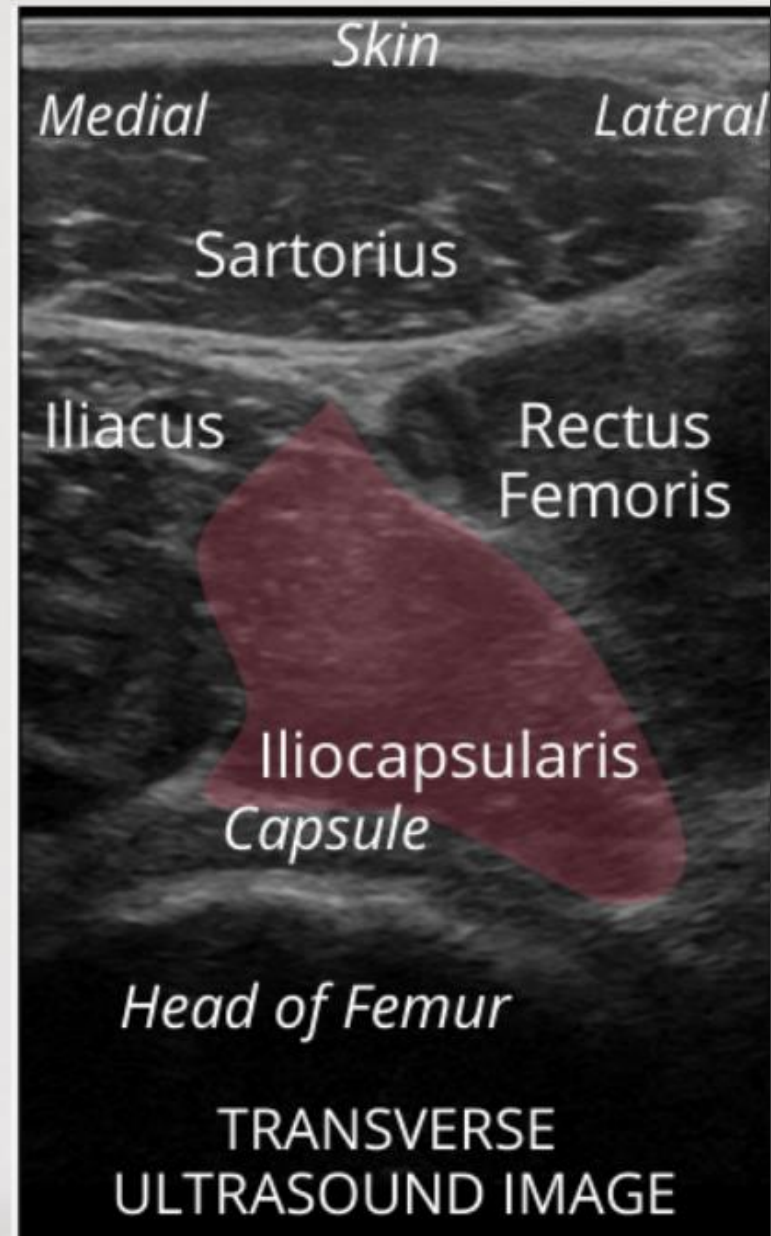
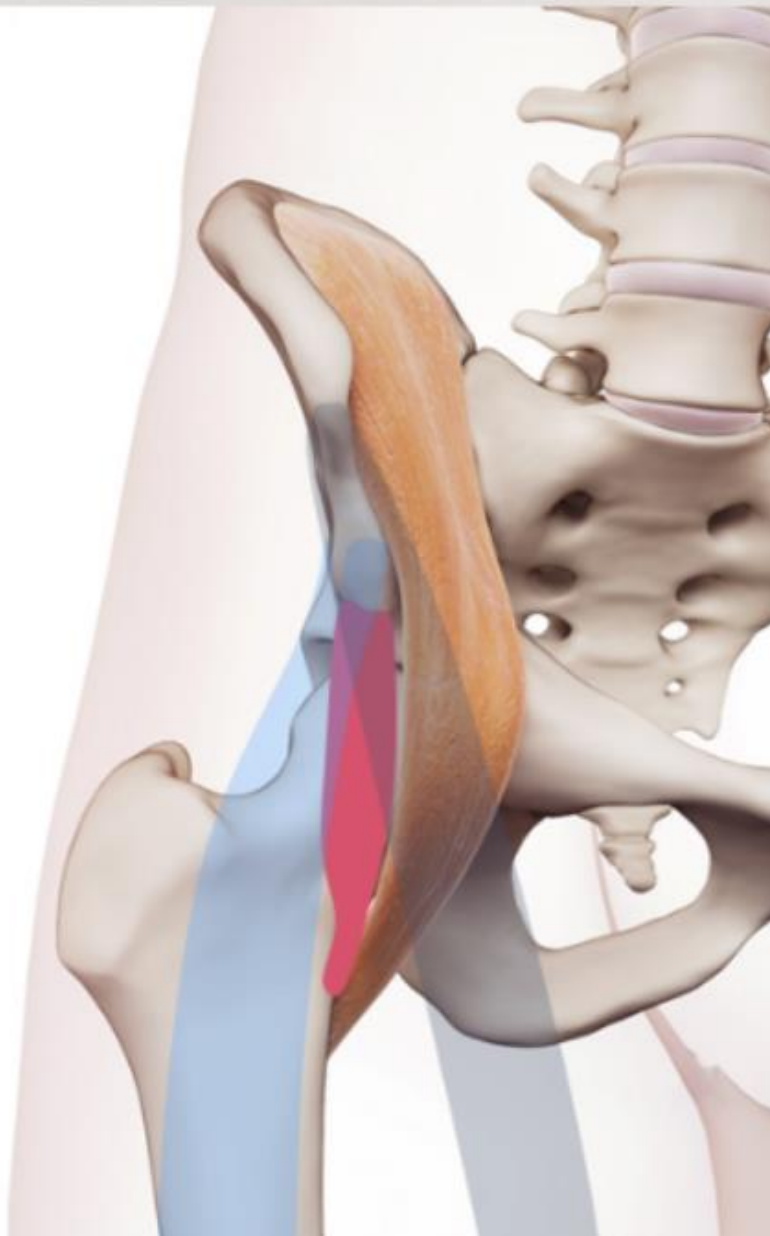
rectus femoris direct tendon in sagittal view

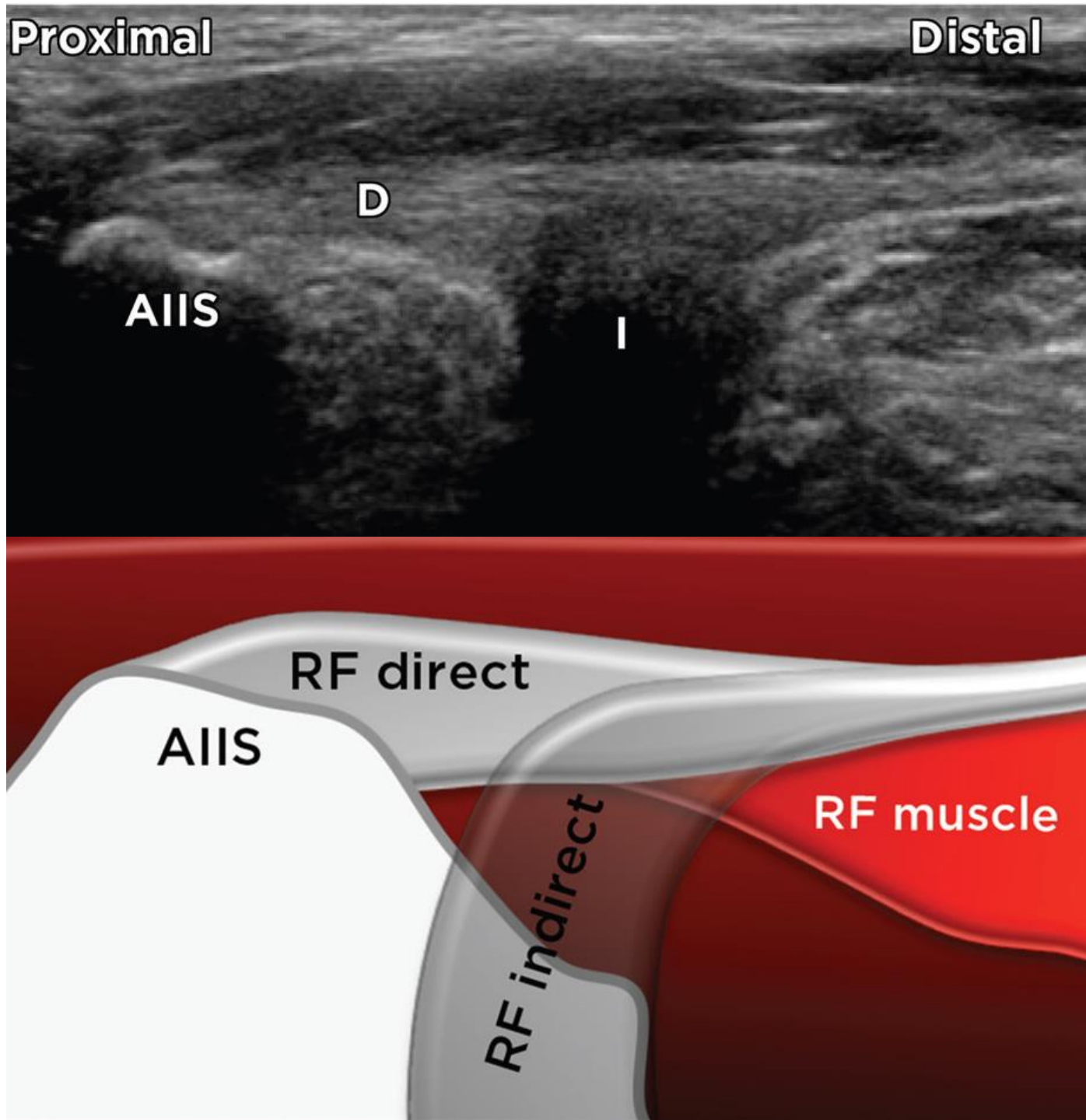
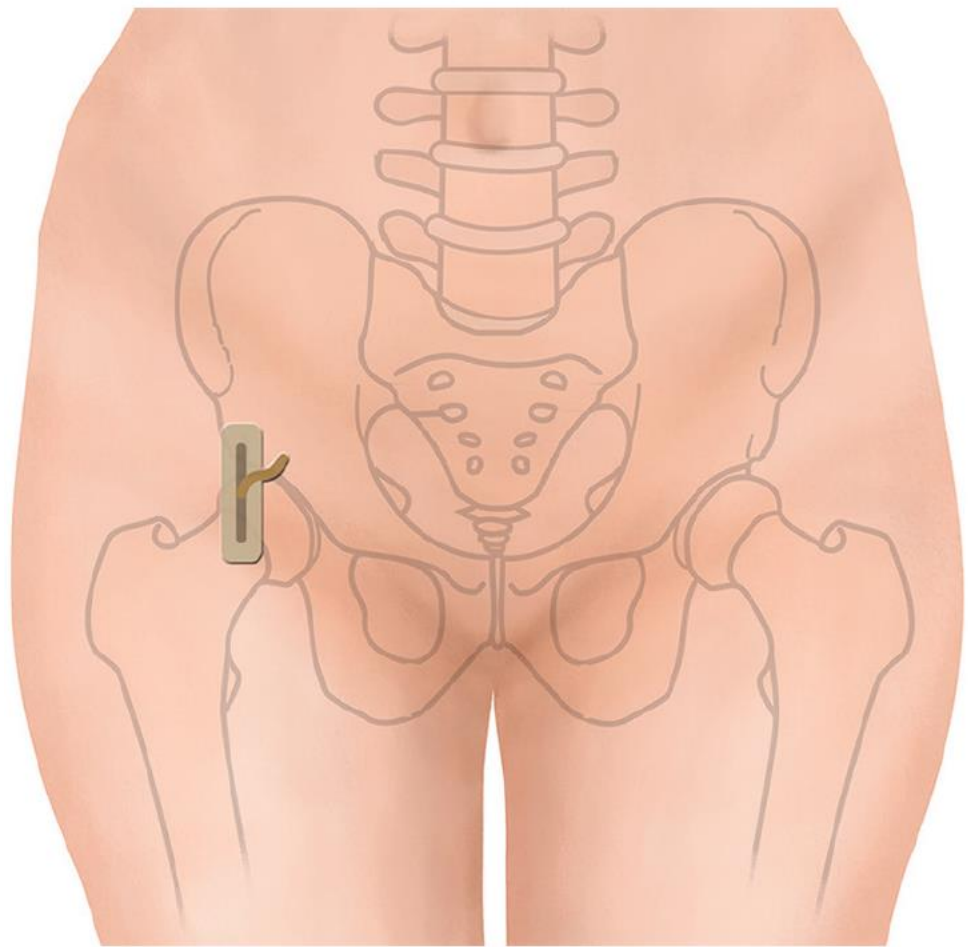


Iliocapsularis:

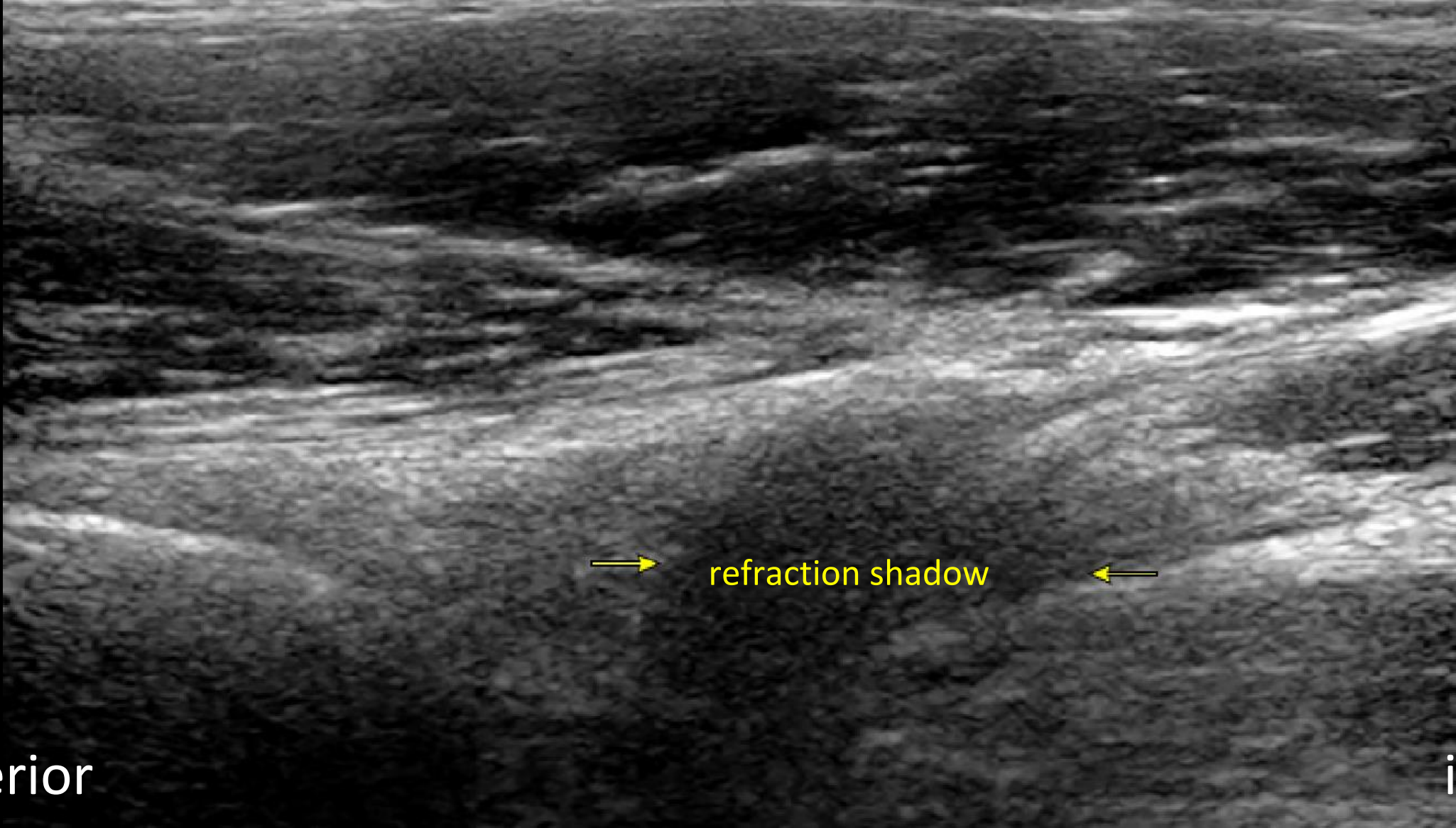
- is a consistent anatomical structure
- is a deep hip flexor
- sits lateral to the iliacus
- sits deep to rectus femoris & sartorius
- originates from the inferior facet of the Anterior Inferior Iliac Spine
- has a firm attachment directly onto the anterior hip joint capsule
- inserts 1.5 cm distal to the lesser trochanter

- Iliocapsularis
- Sartorius
- Iliacus
- Rectus Femoris





rectus femoris indirect tendon refraction shadow
in coronal view



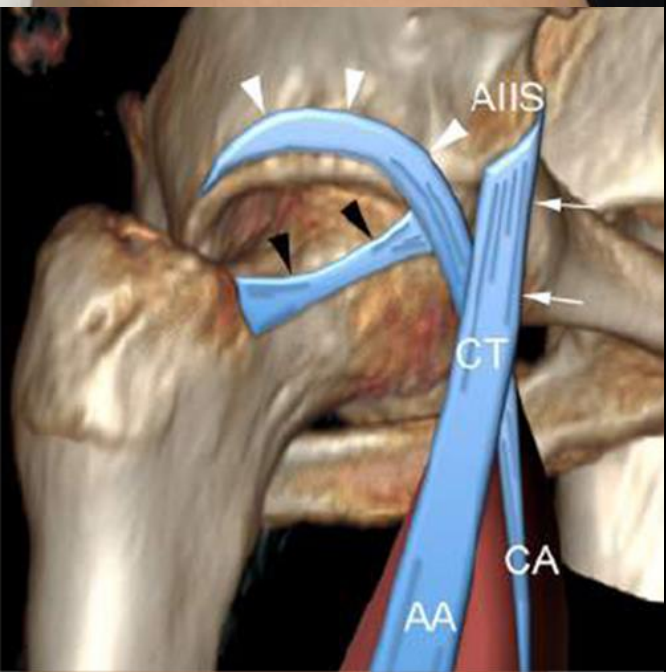
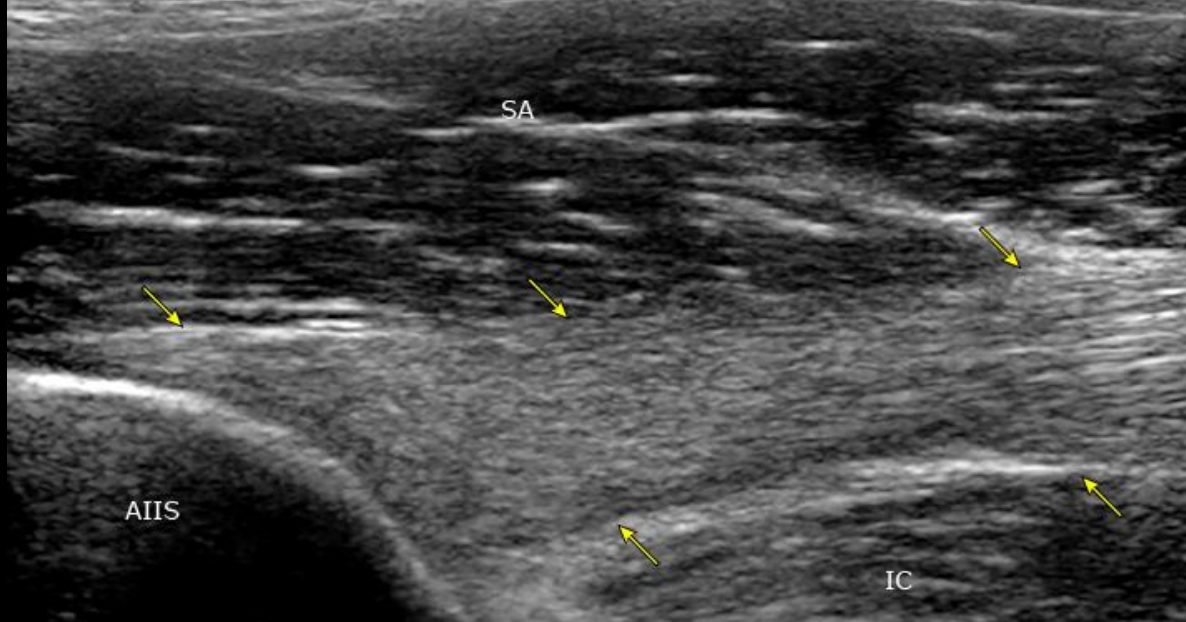
superior

inferior

rectus femoris tendon
in long axis

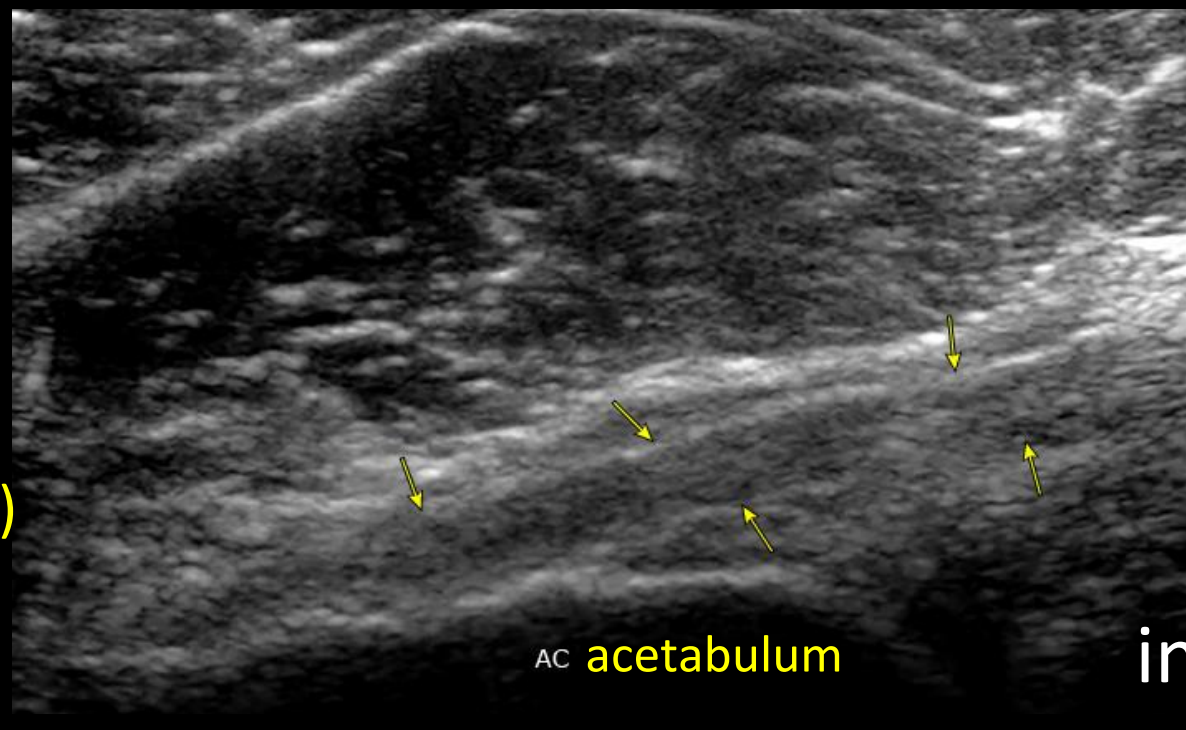


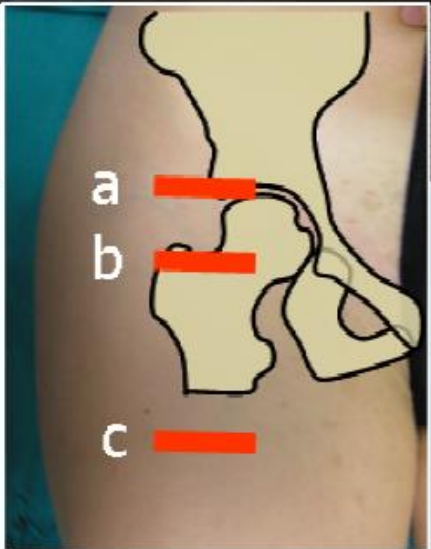
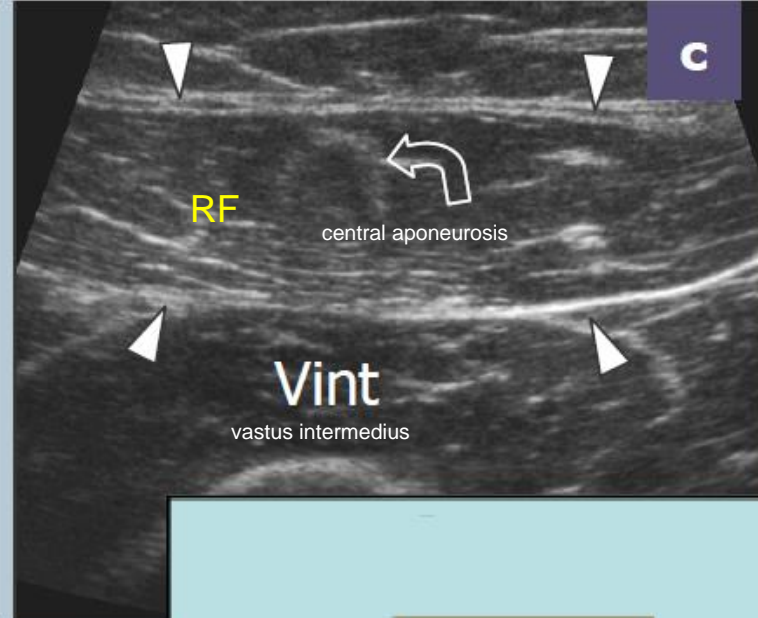
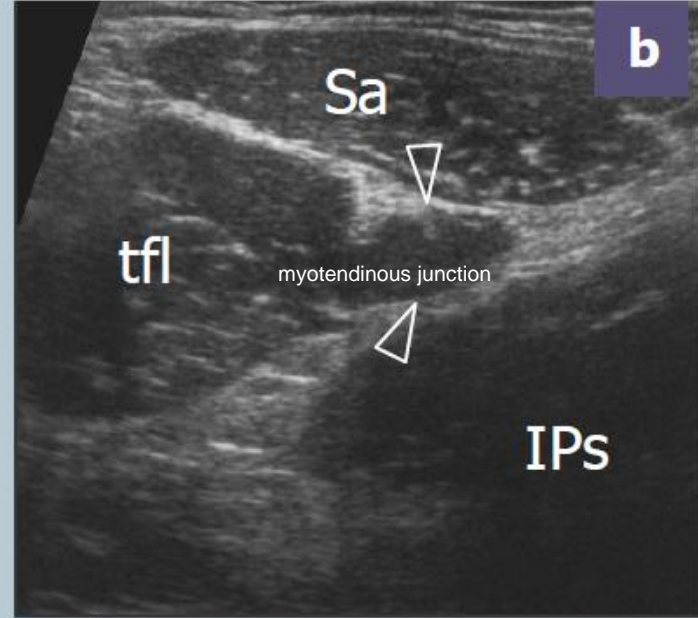
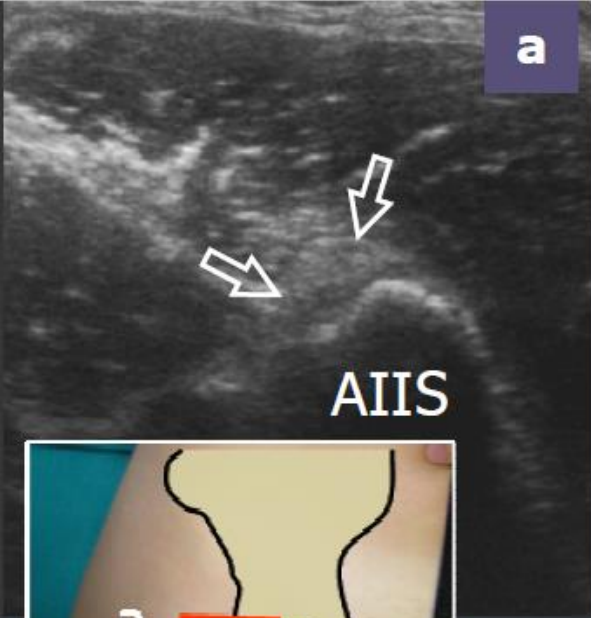
direct head(A)



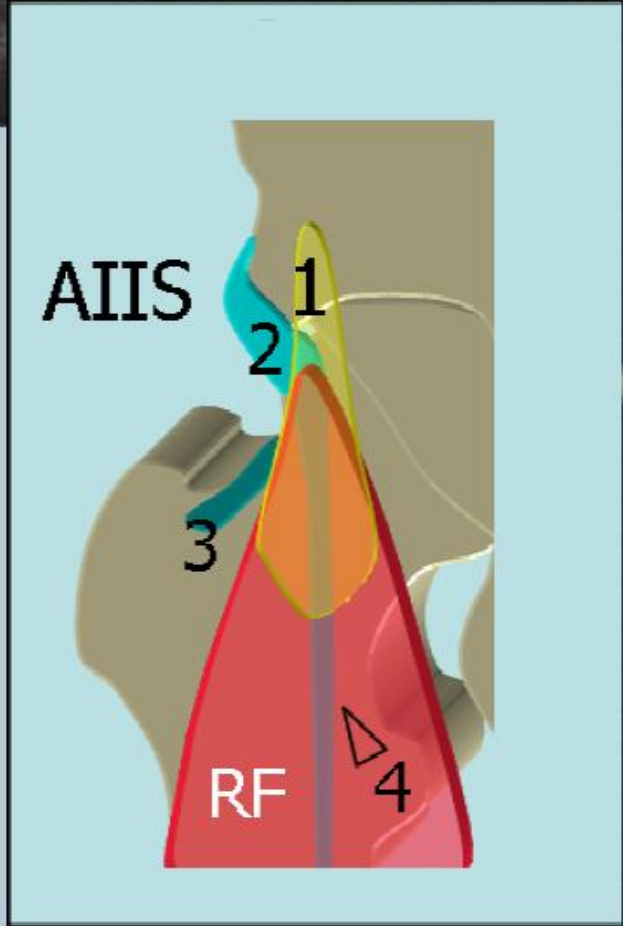
indirect head(B)

superior





Legend: AIIS, anteroinferior iliac spine; arrows, direct tendon of the rectus femoris muscle; curved arrow, central aponeurosis; IPs, iliopsoas muscle; Sa, sartorius muscle; tfl, tensor fasciae latae muscle; Vint, vastus intermedius muscle; void arrowheads, proximal myotendinous junction of the rectus femoris muscle; white arrowheads, rectus femoris muscle



1, direct tendon;
2, indirect tendon;
3, reflected tendon;
4, central aponeurosis

In the proximal rectus femoris muscle, the central aponeurosis is the distal continuity of the indirect tendon, whereas the superficial aponeurosis arises from the direct tendon.

Legend: AIIS, anteroinferior iliac spine; 1, direct tendon; 2, indirect tendon; 3, reflected tendon; 4, central aponeurosis; RF, rectus femoriis muscle

US hip snapping iliopsoas tendon

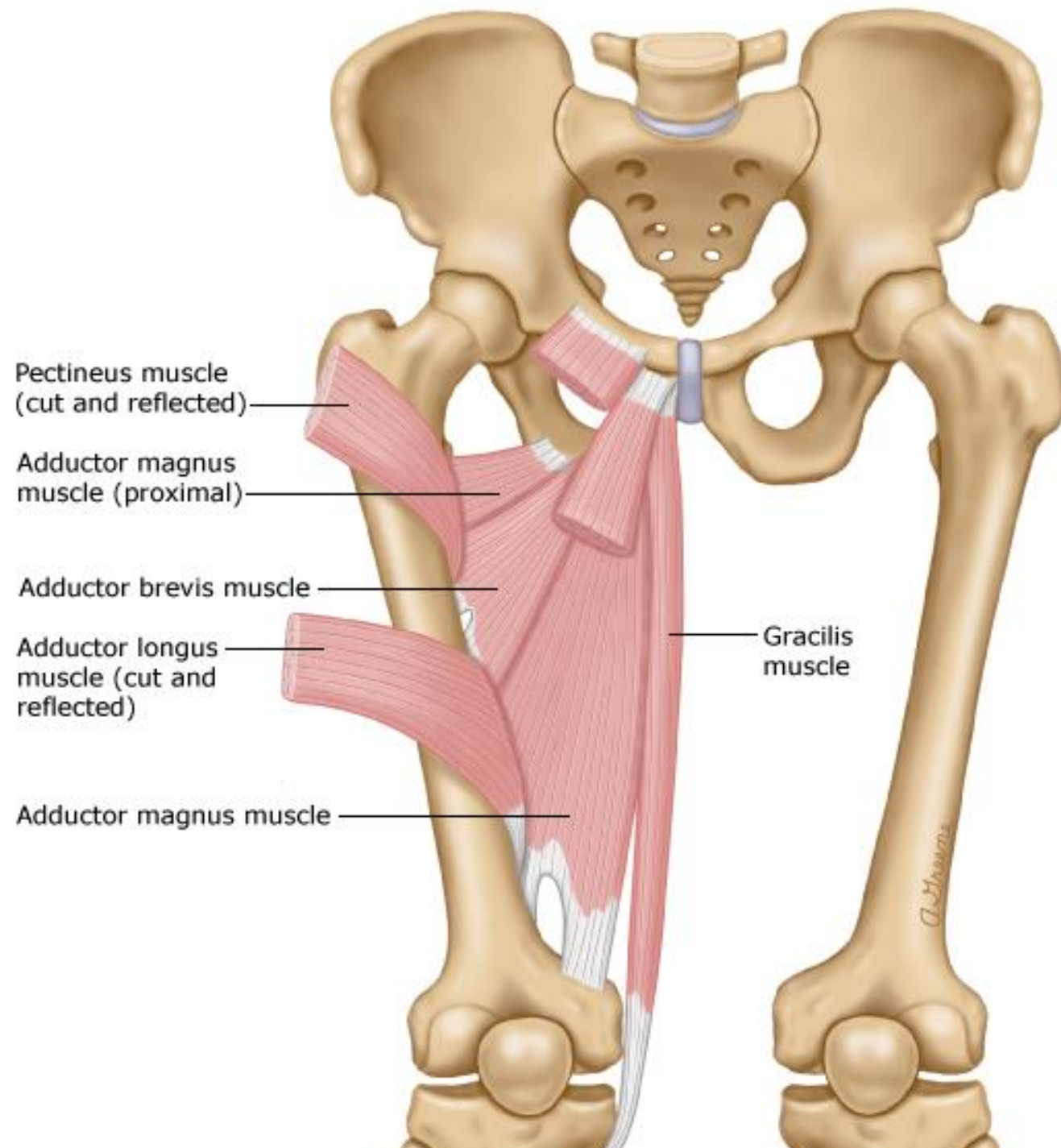


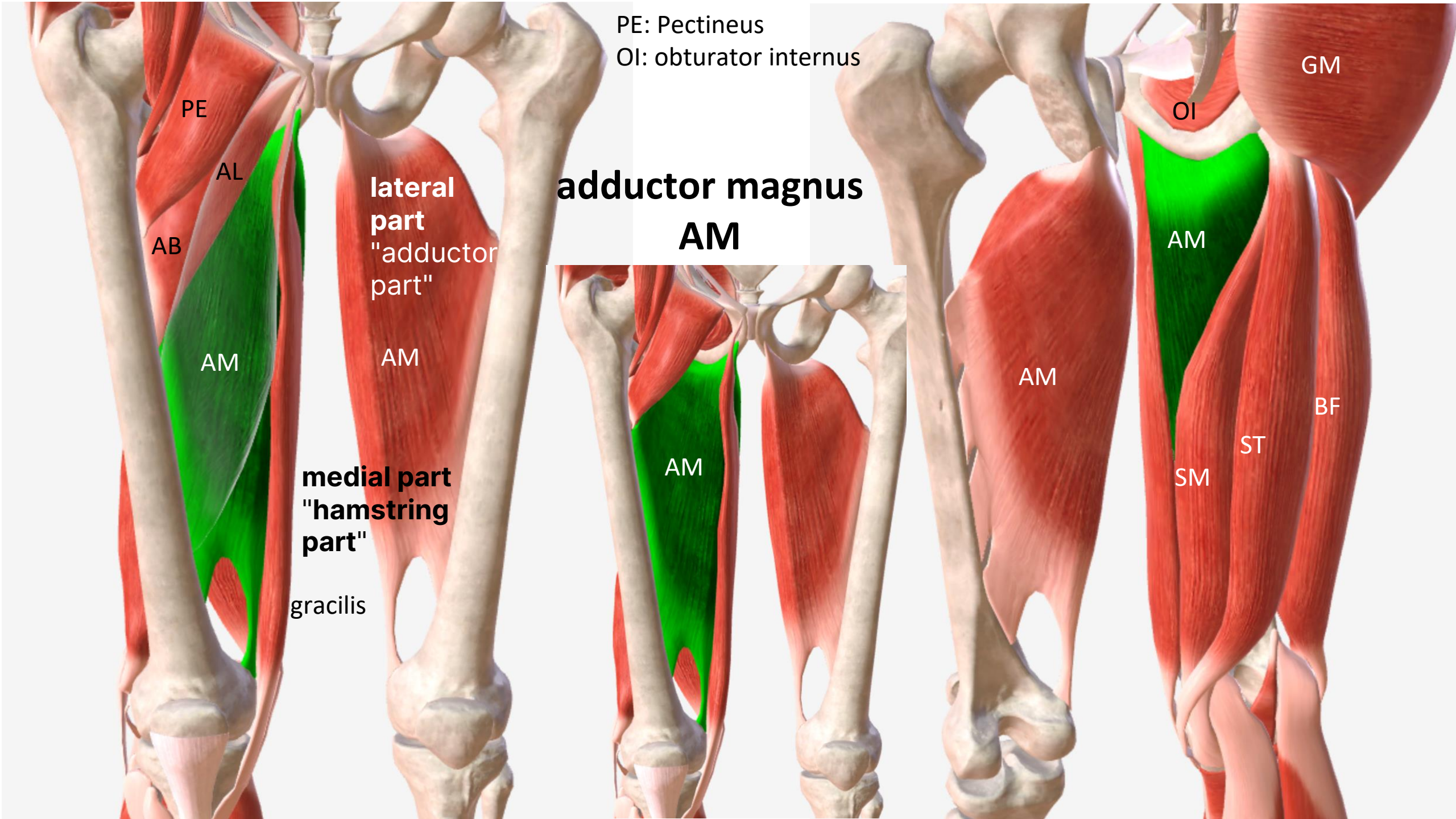
Iliopsoas tendon (IP) snapping.

internal, extra-articular snapping hip (coxa saltans)

Medial Hip

Hip adductor muscle





PE: Pectineus
OI: obturator internus

PE
AL
AB
AM

lateral part
"adductor part"

AM

medial part
"hamstring part"

gracilis

adductor magnus
AM

AM

AM

OI

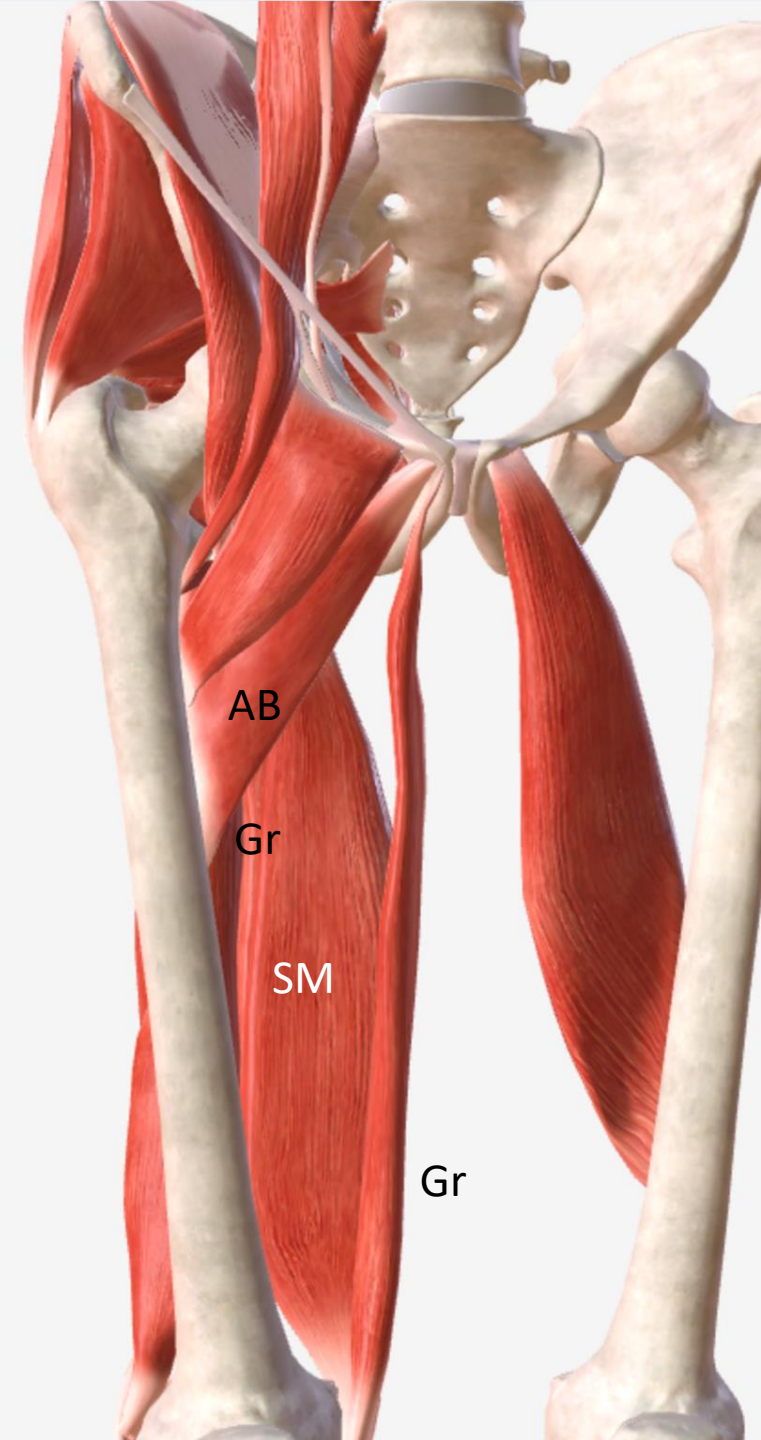
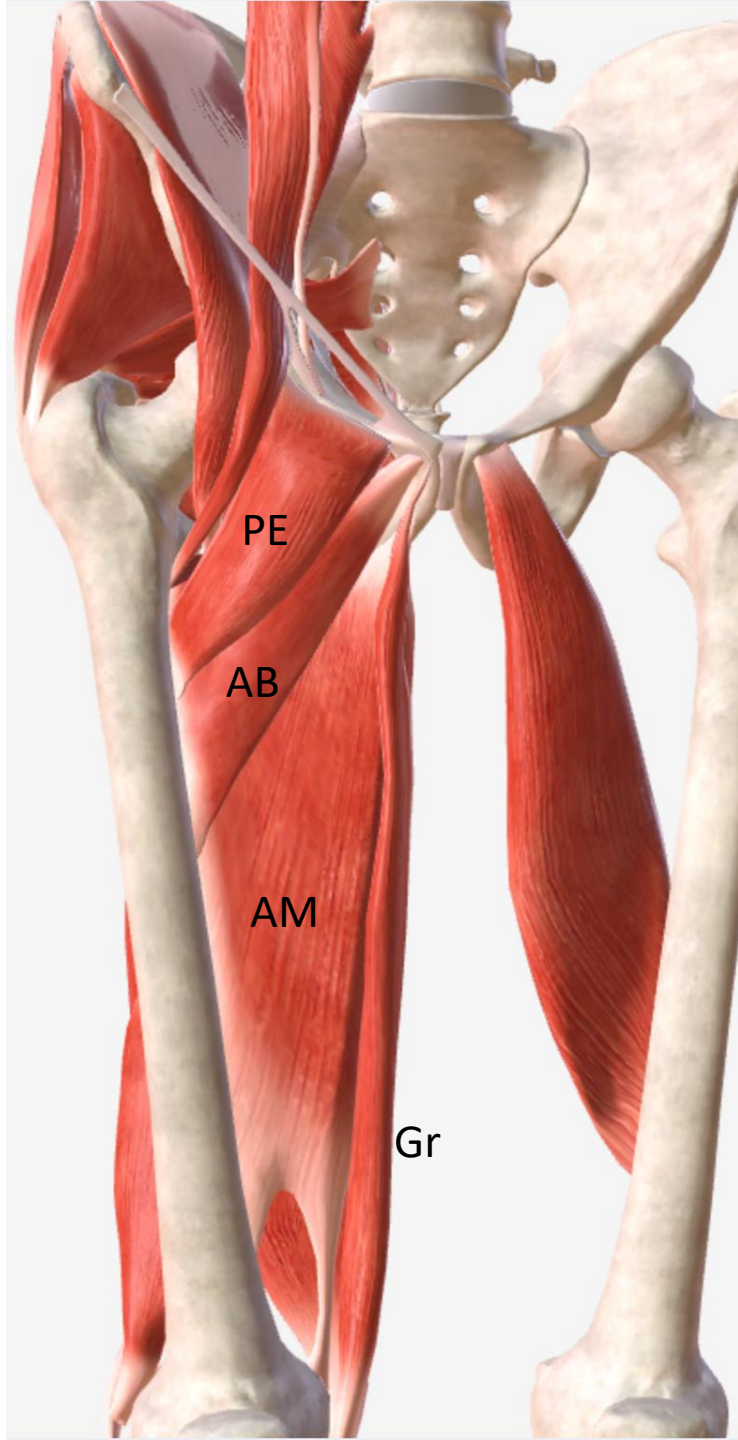
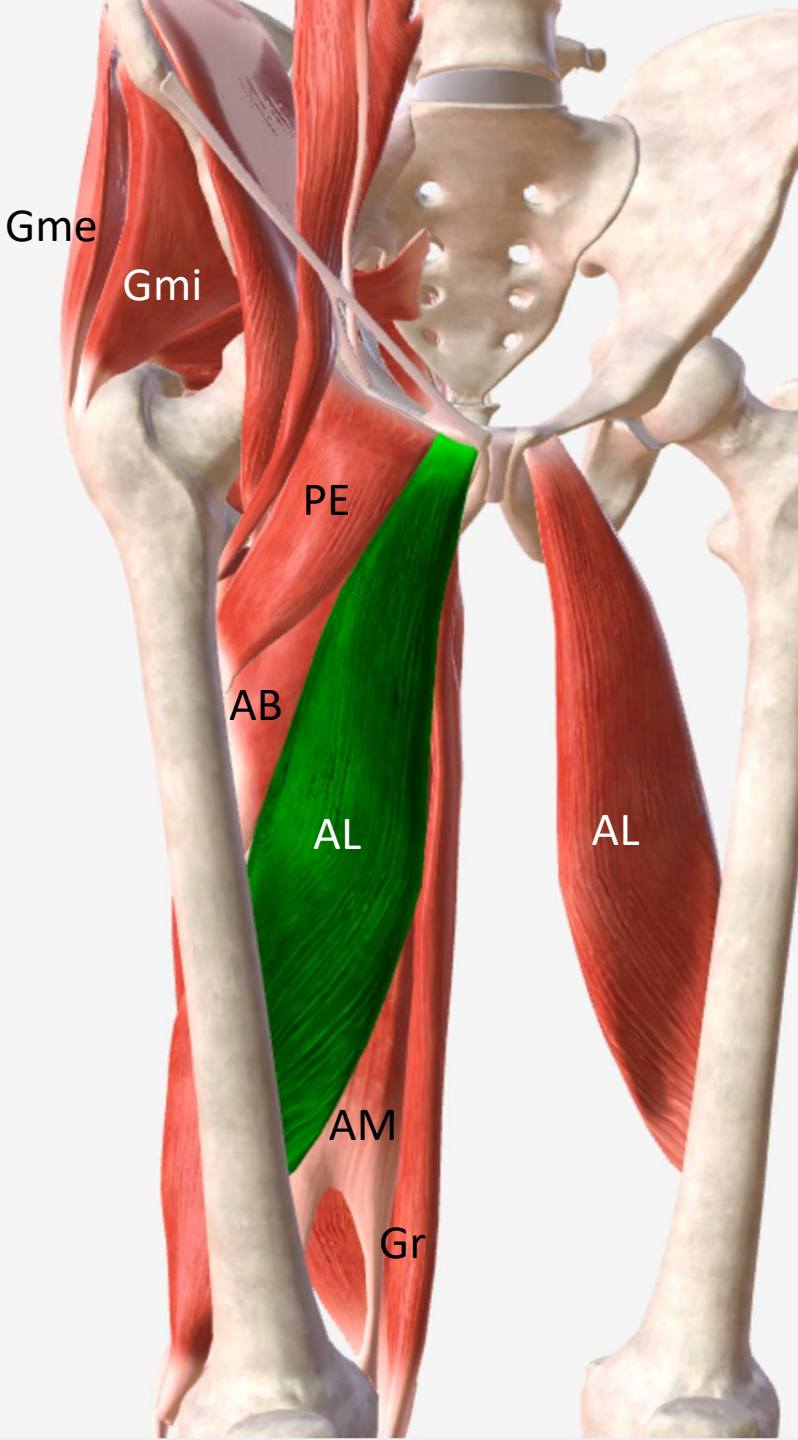
AM

GM

SM

ST

BF

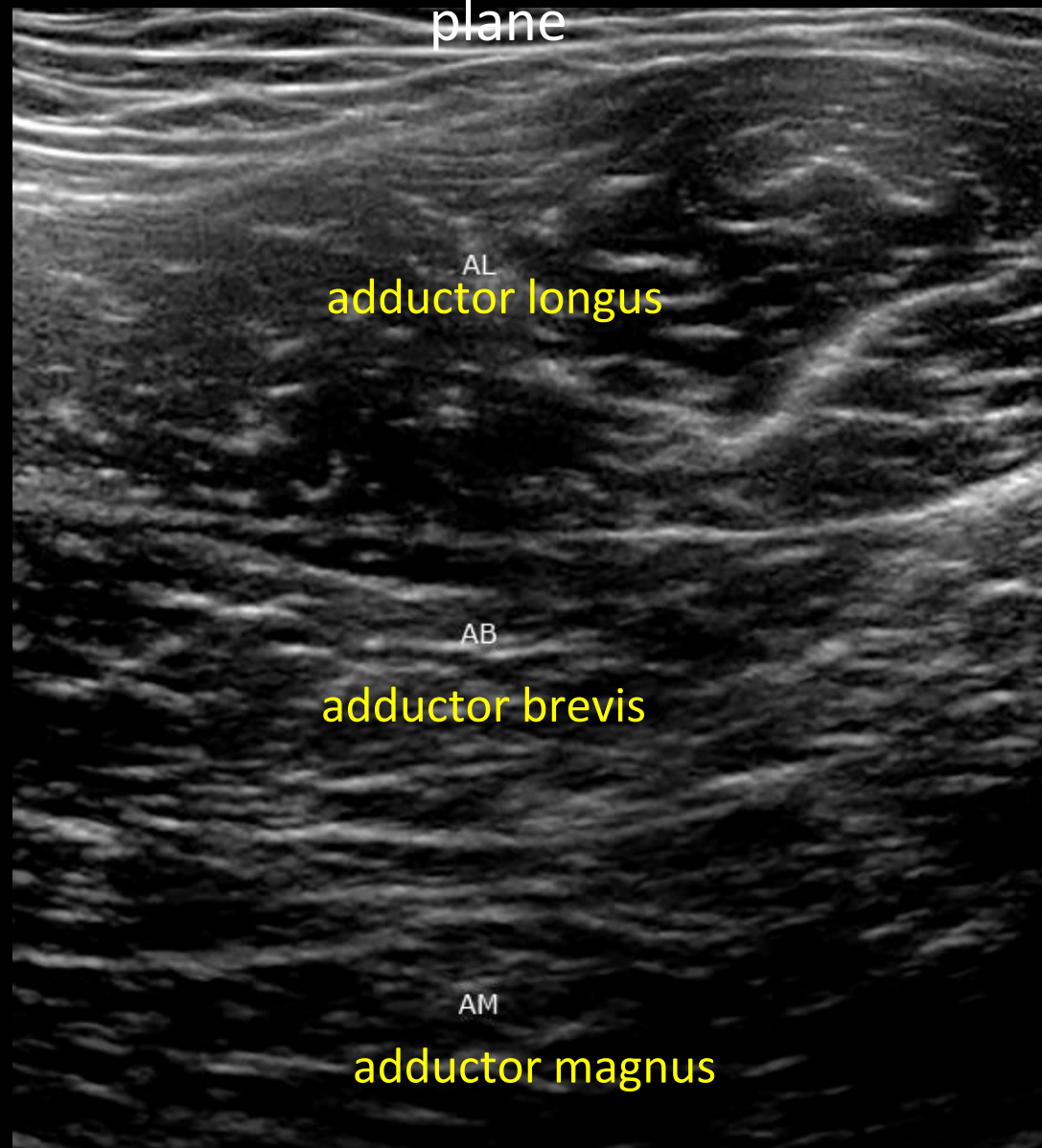




medial hip

frog leg

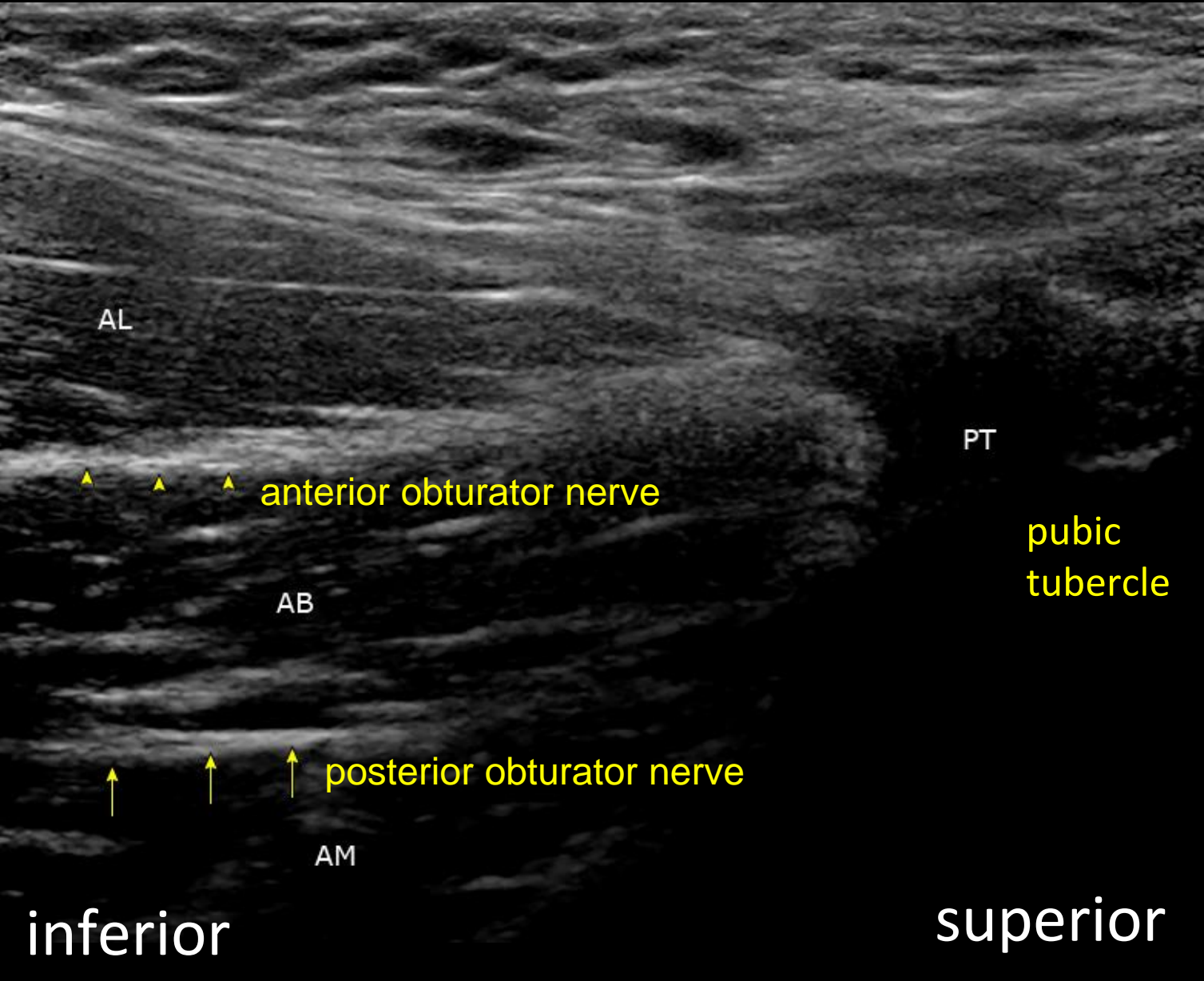
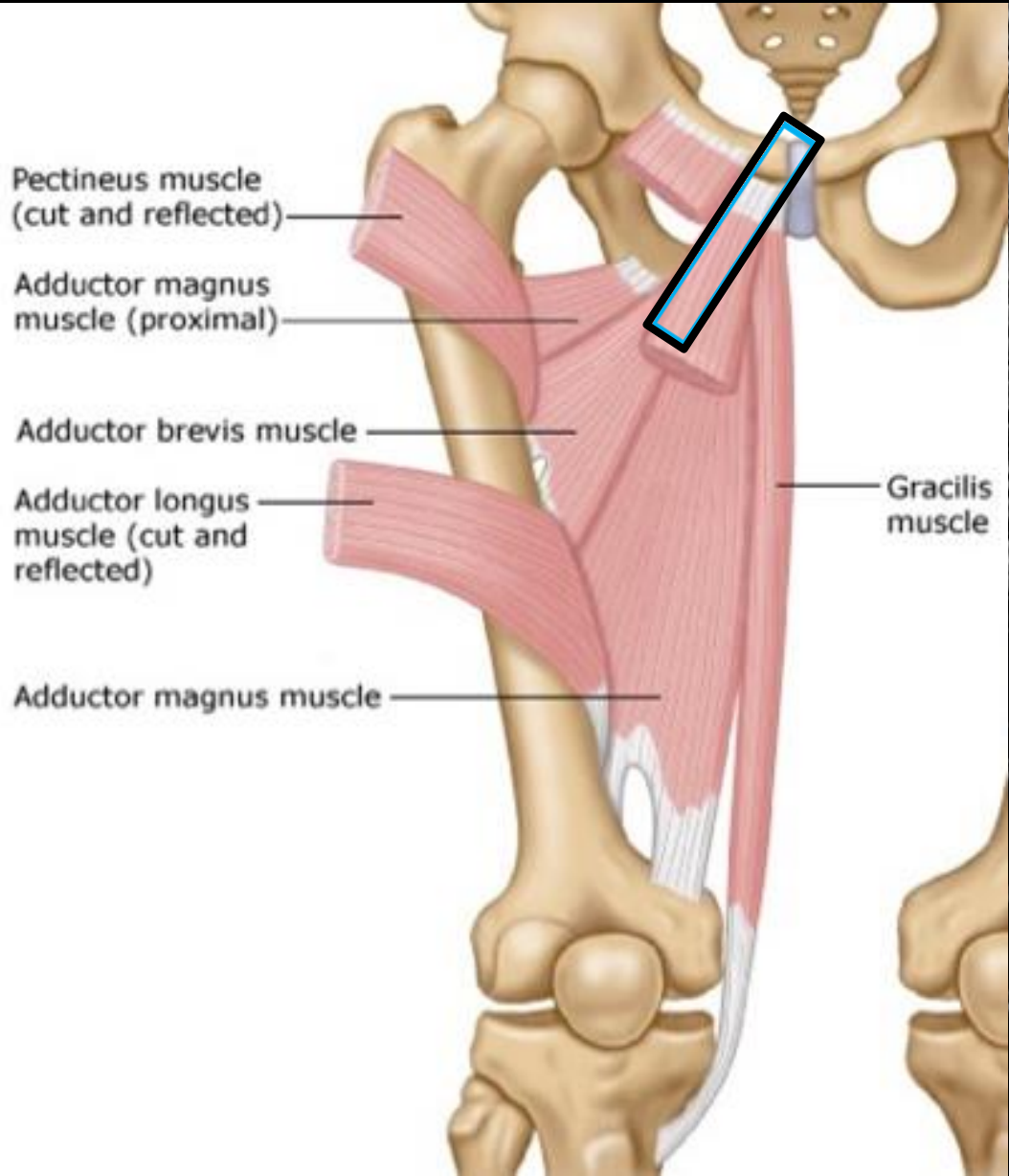
proximal adductors in transverse plane



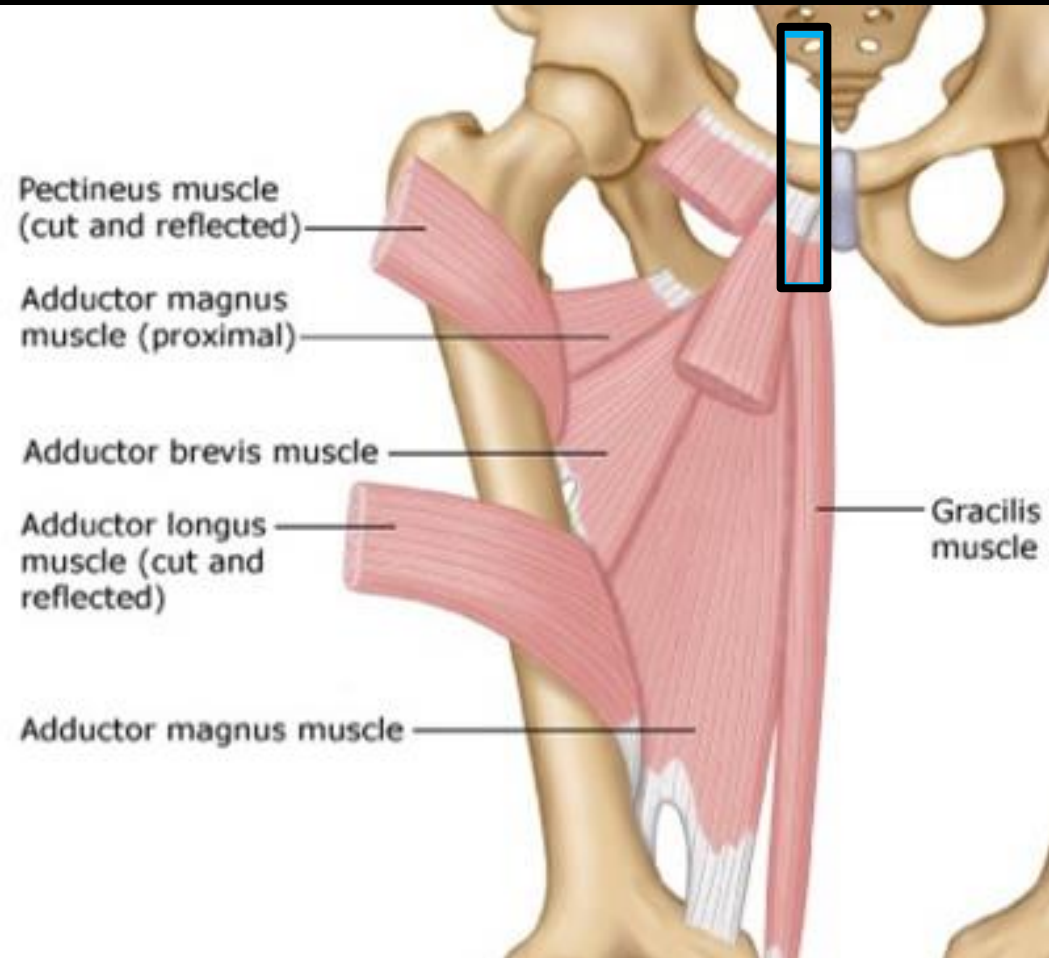
anterior

posterior

adductor insertion in coronal plane

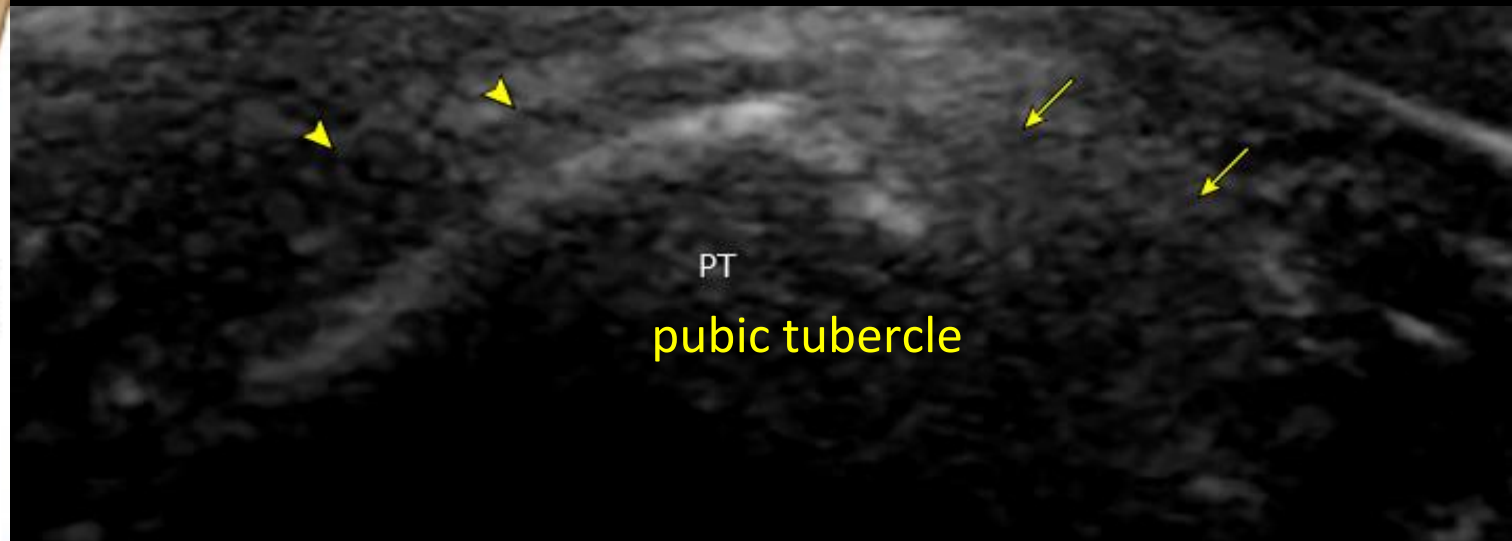


pubic tubercle with adductor and rectus abdominus tendon insertion



▼ adductor tendons

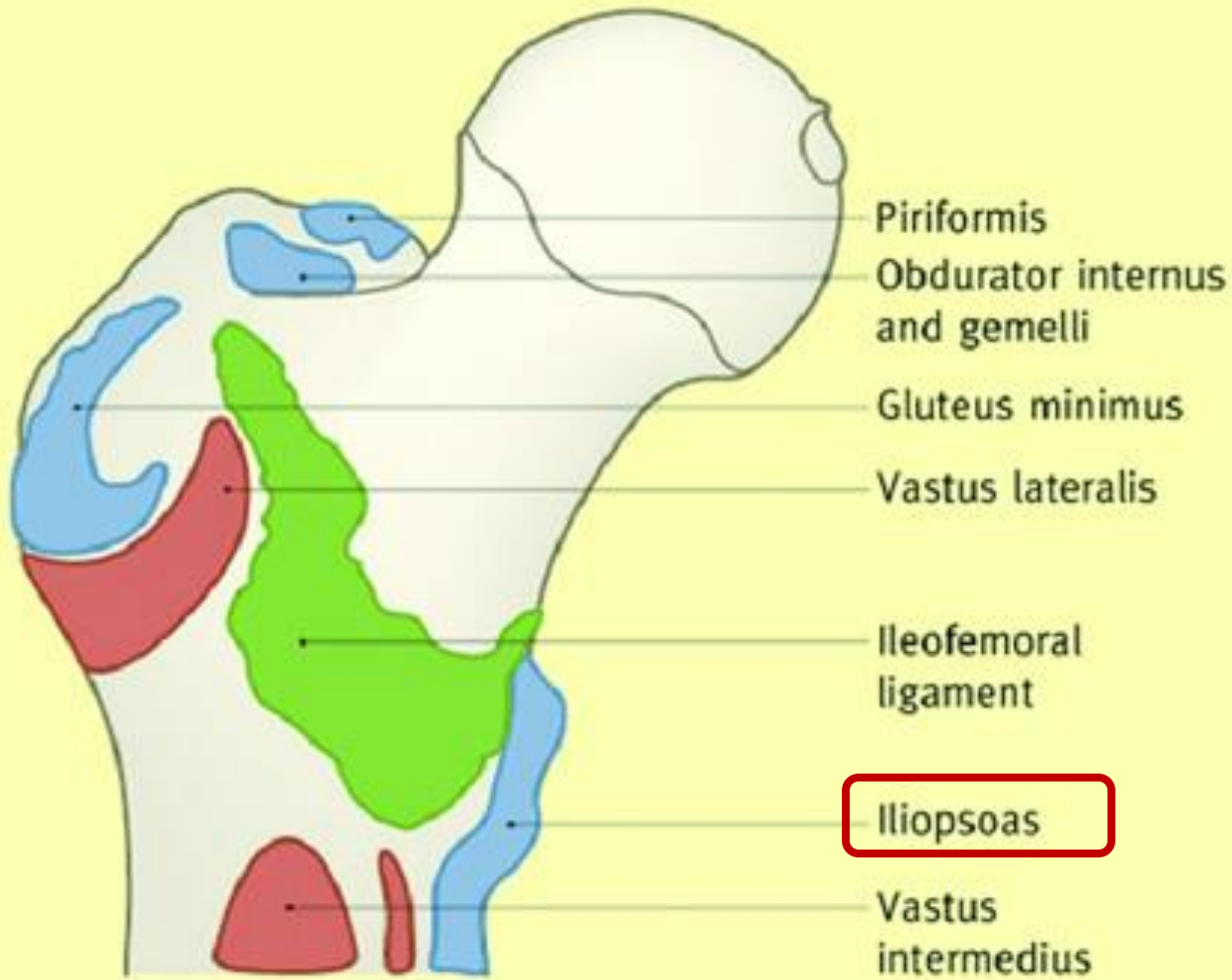
↑ rectus abdominus tendon



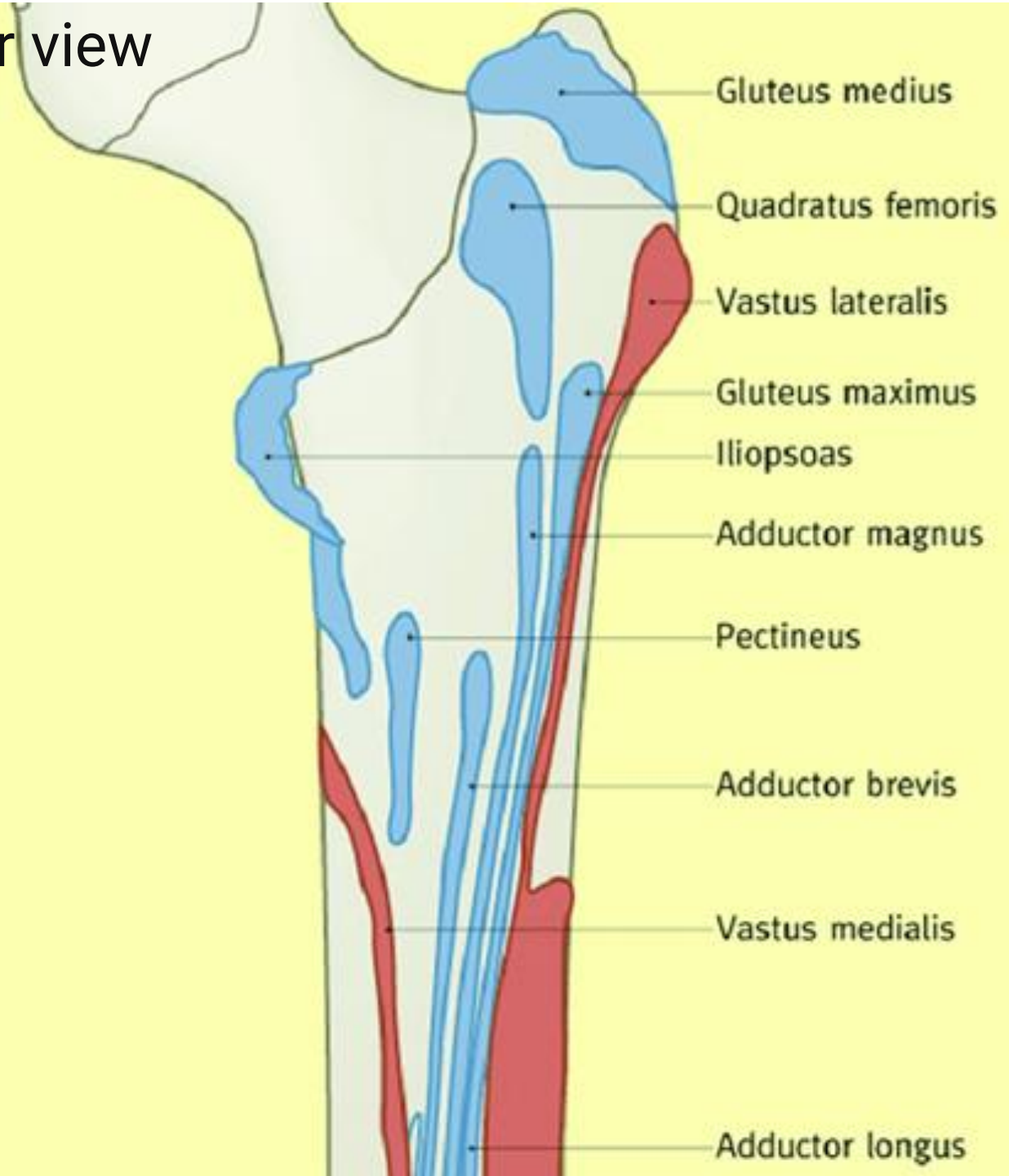
inferior

superior

Anterior view



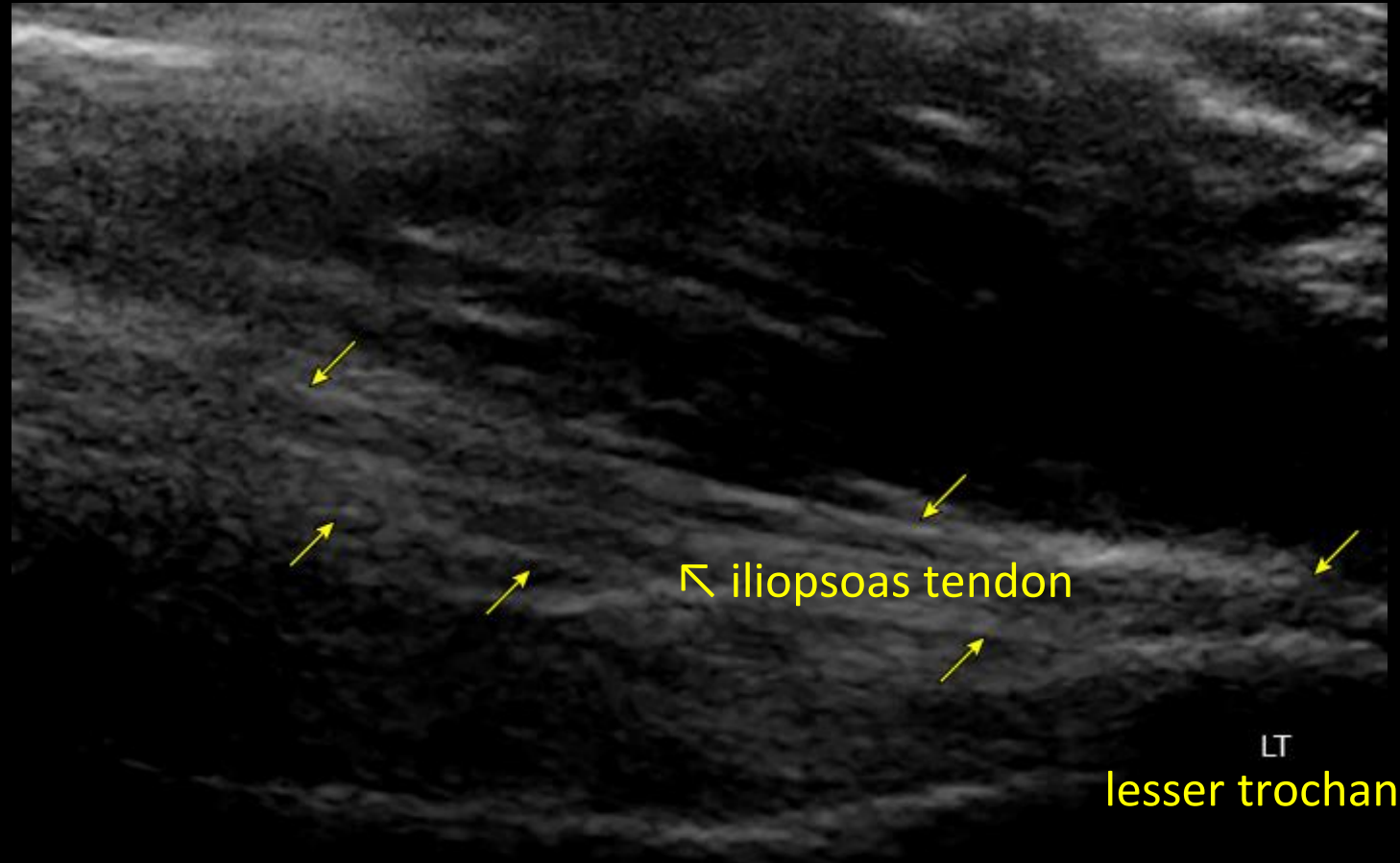
Posterior view



US transducer position to examine iliopsoas insertion in coronal view



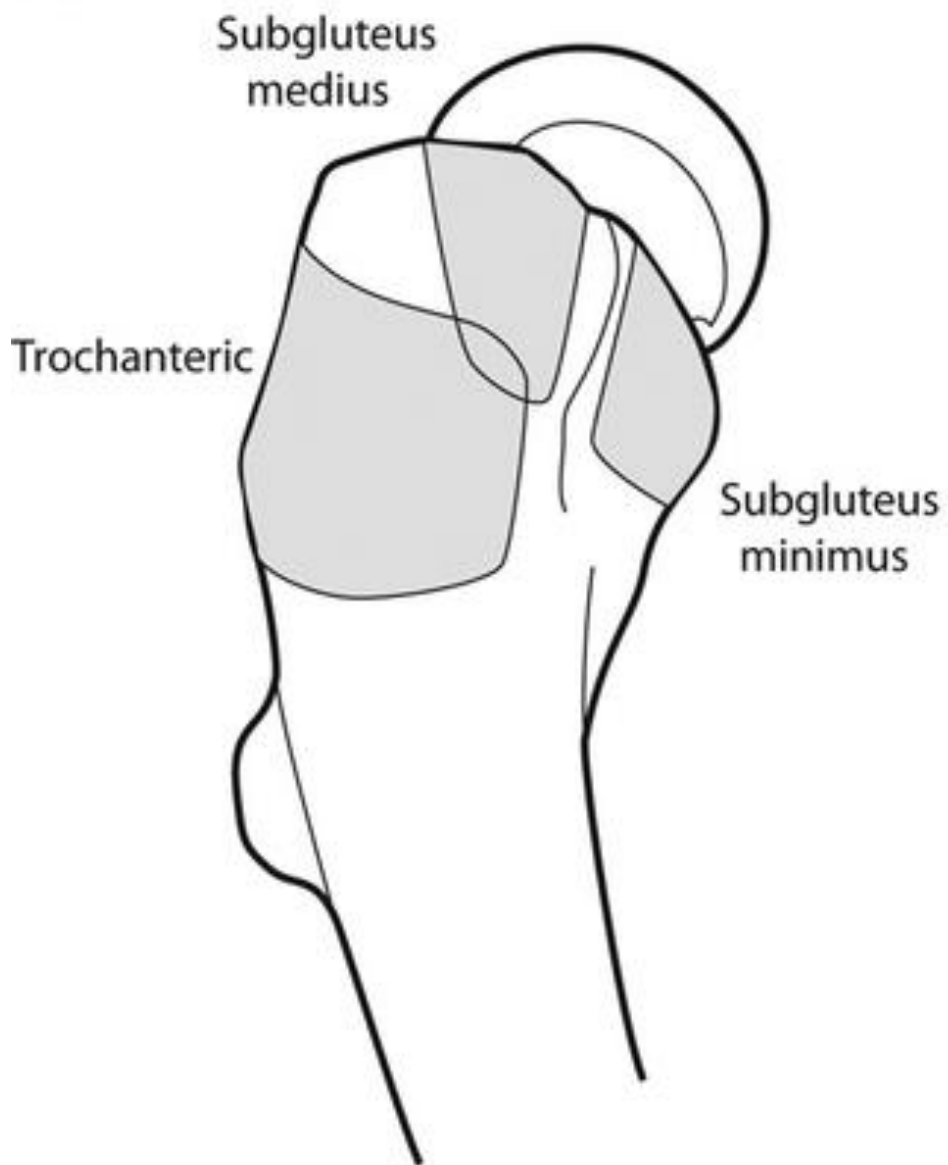
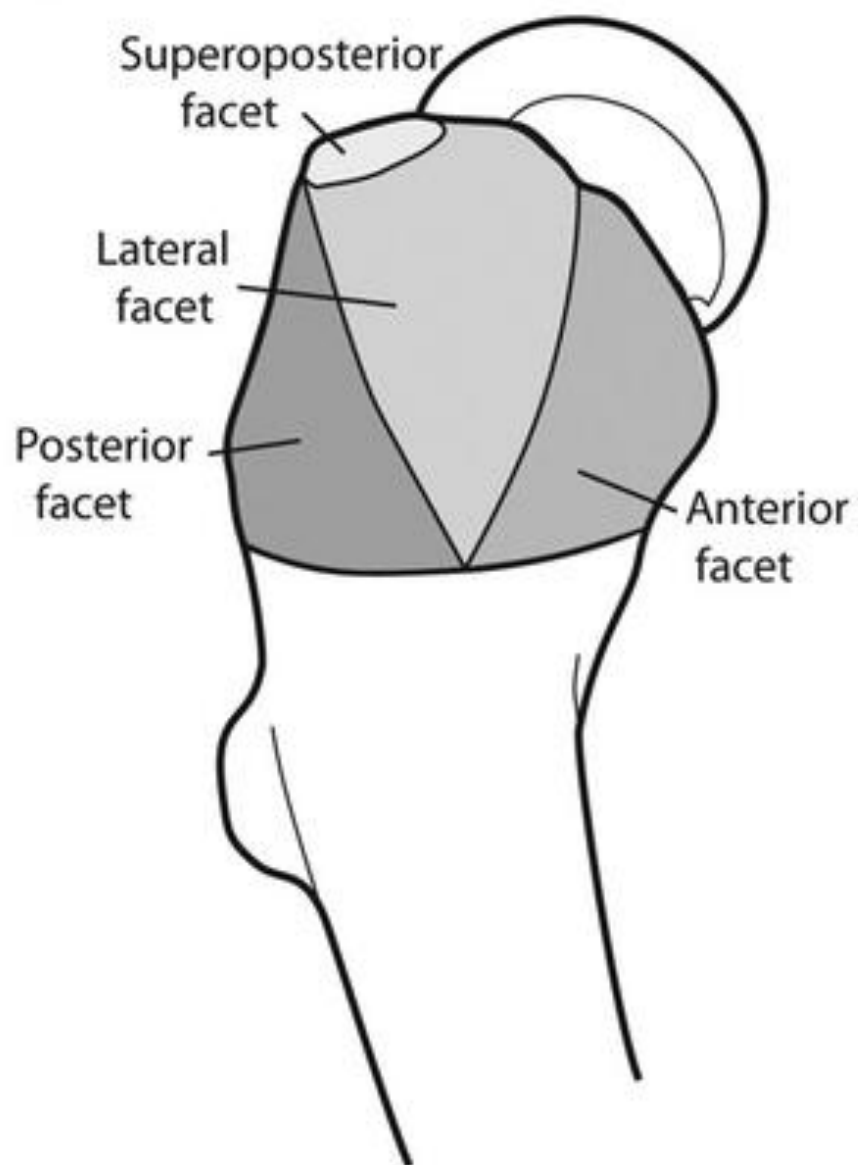
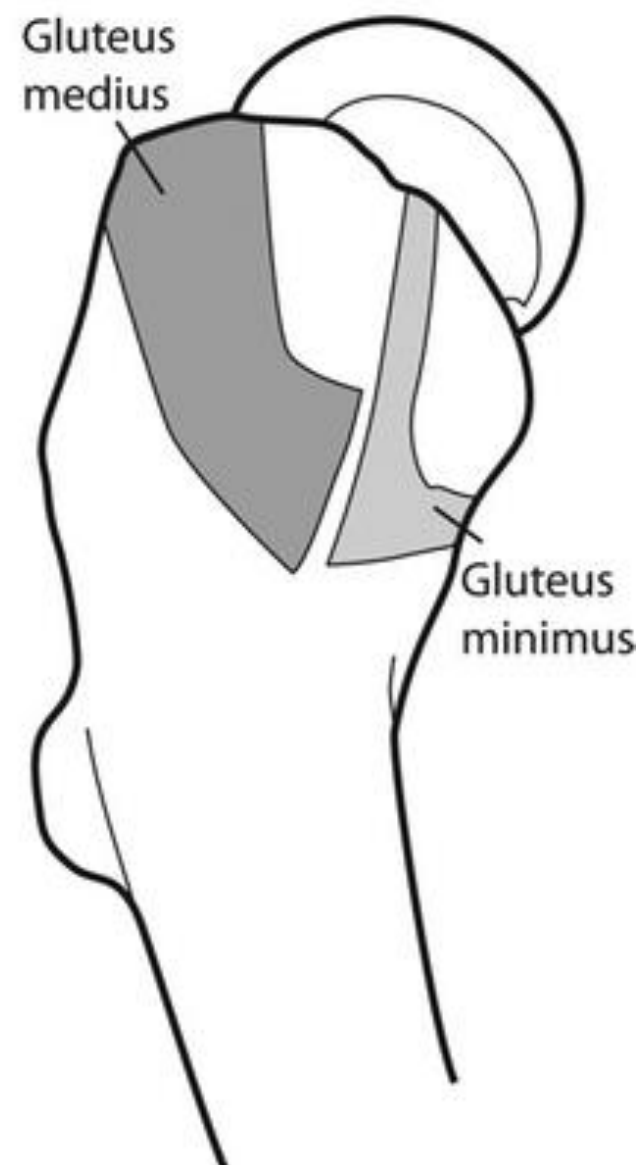
iliopsoas tendon insertion onto lesser trochanter in coronal oblique view

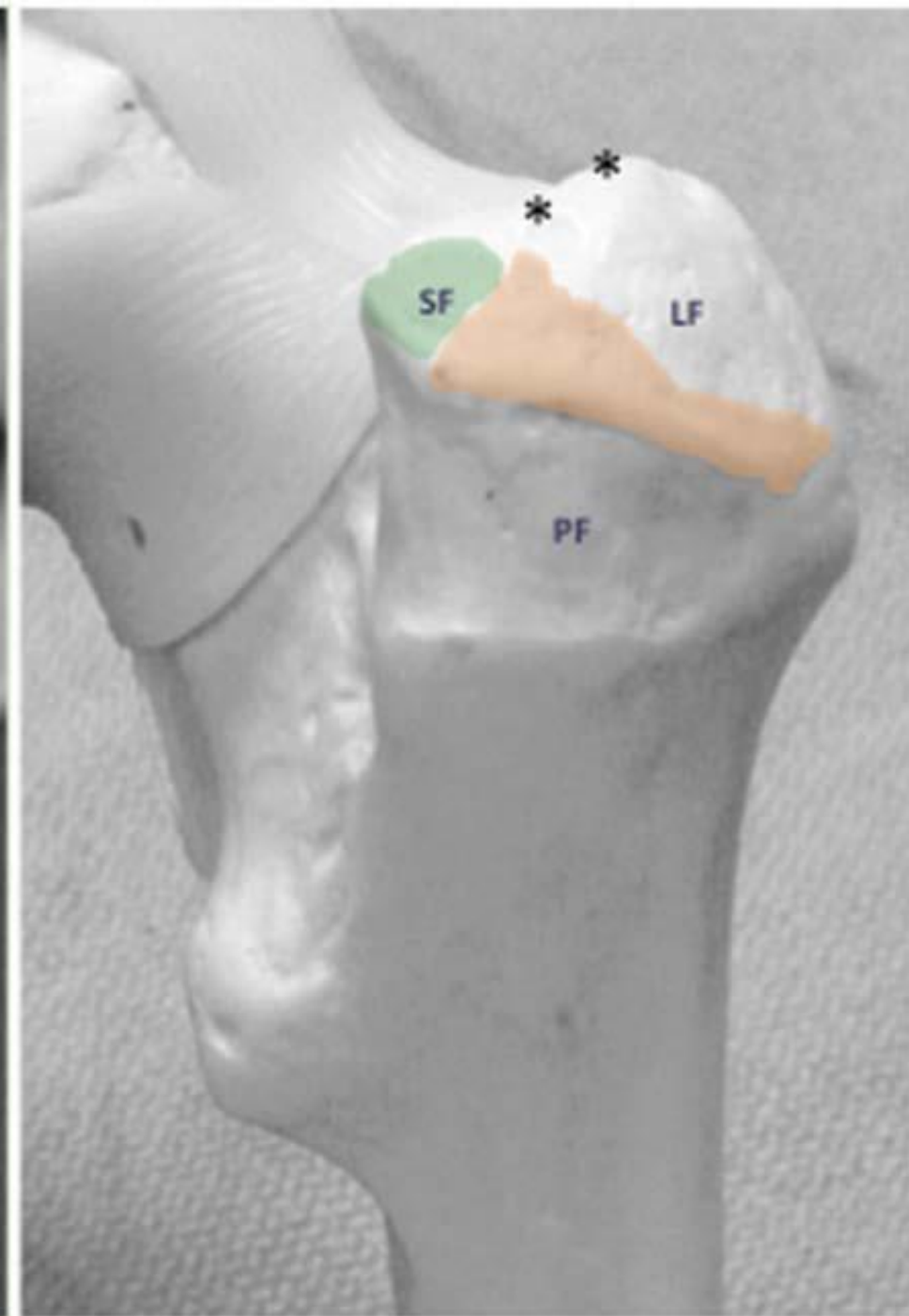


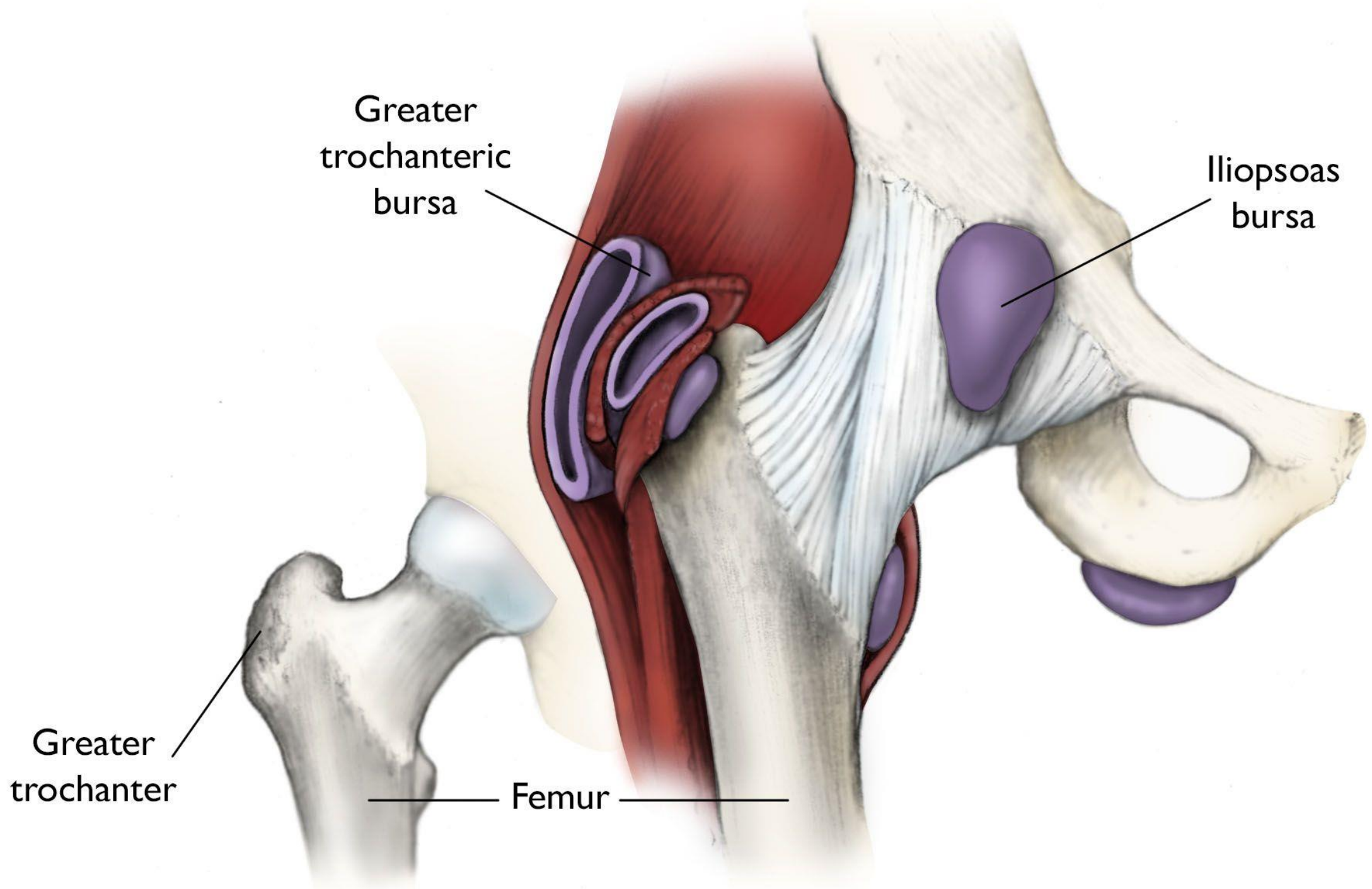
superior

inferior

Lateral Hip

A**B****C**

A**B**



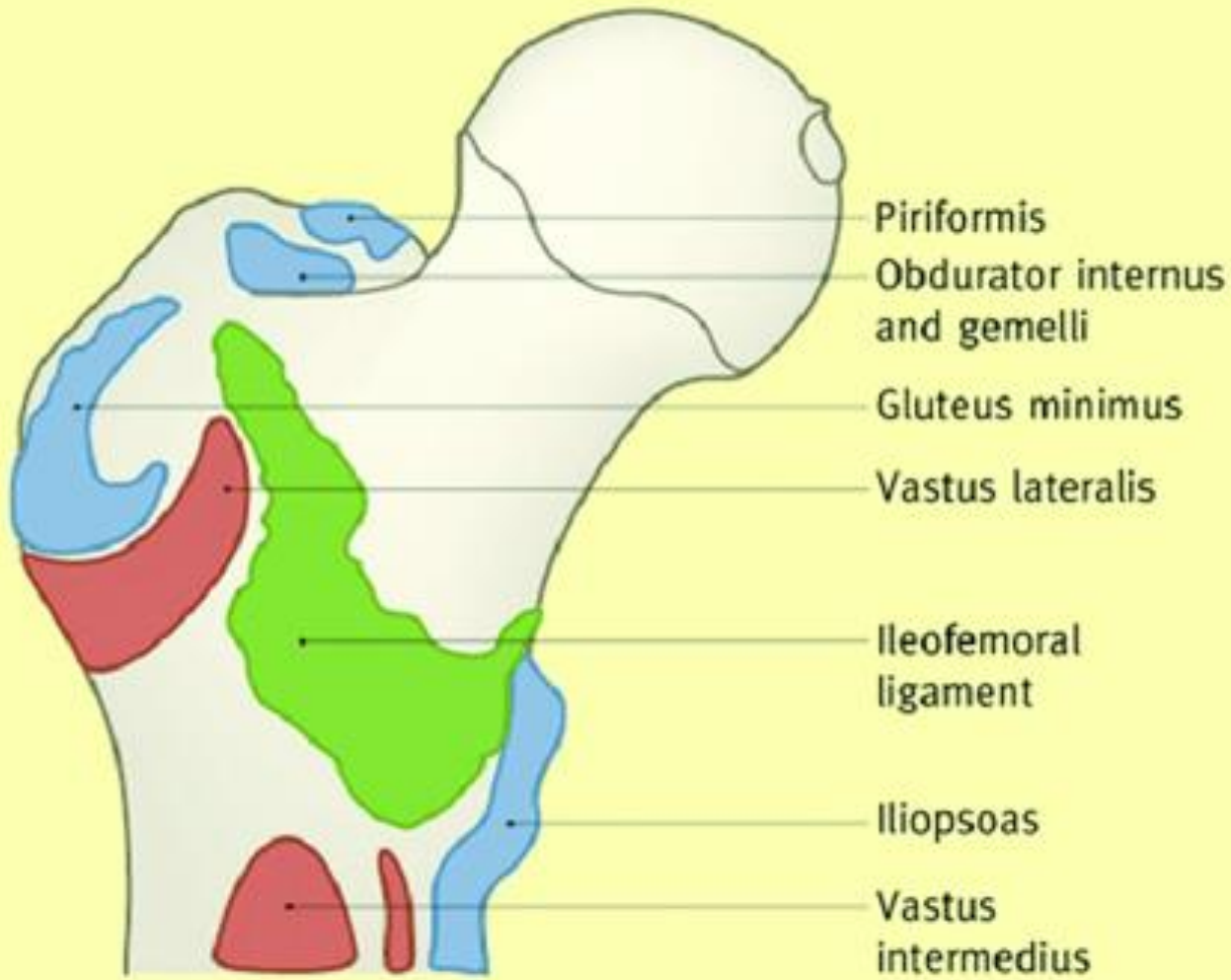
Greater trochanteric bursa

Iliopsoas bursa

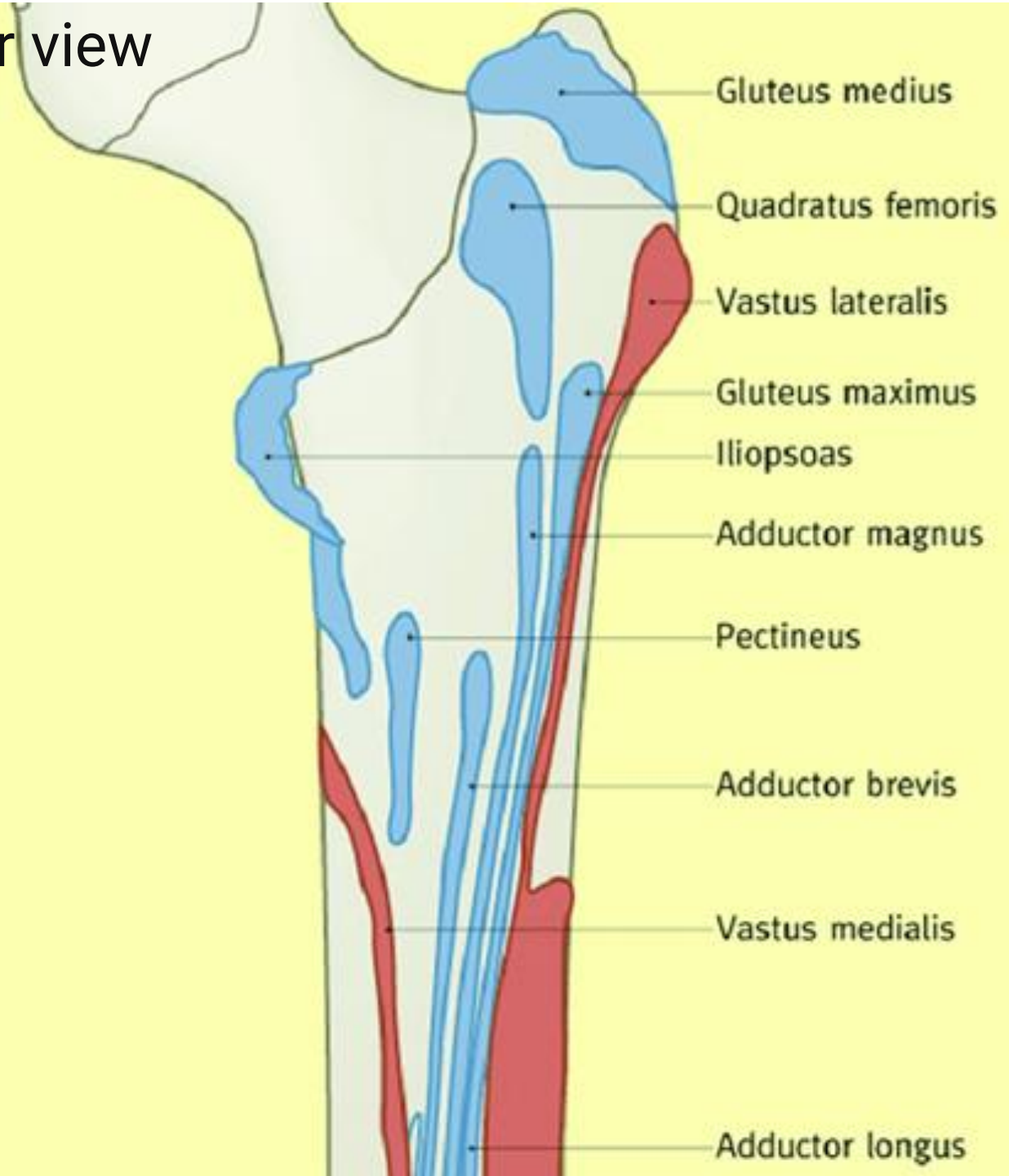
Greater trochanter

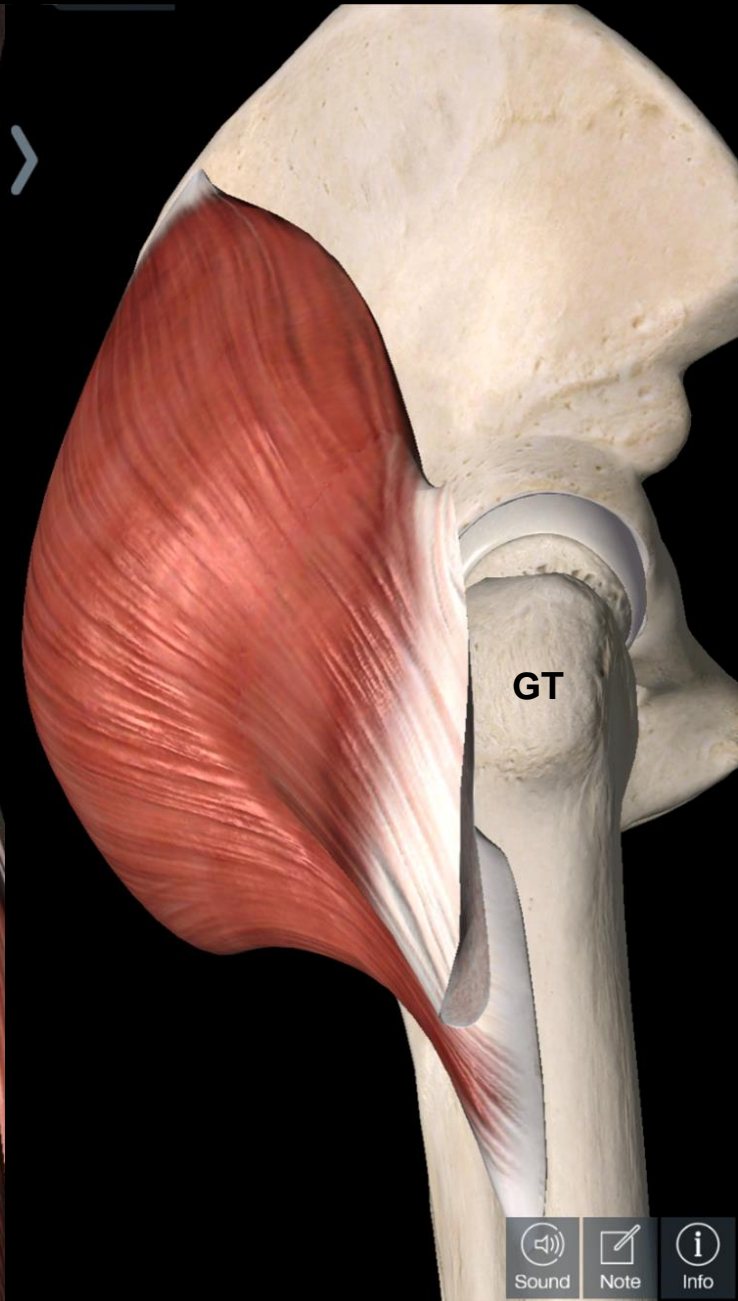
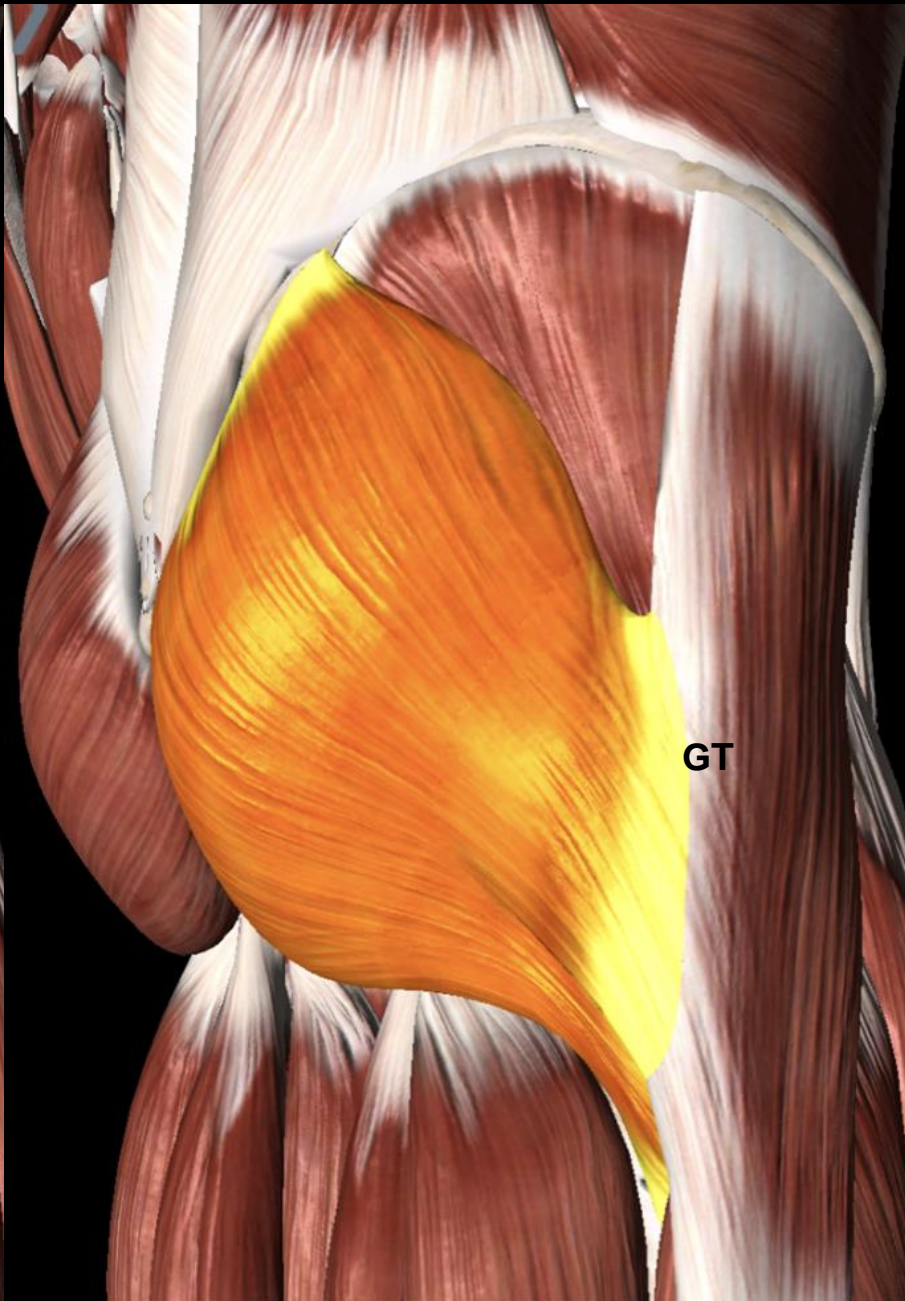
Femur

Anterior view



Posterior view

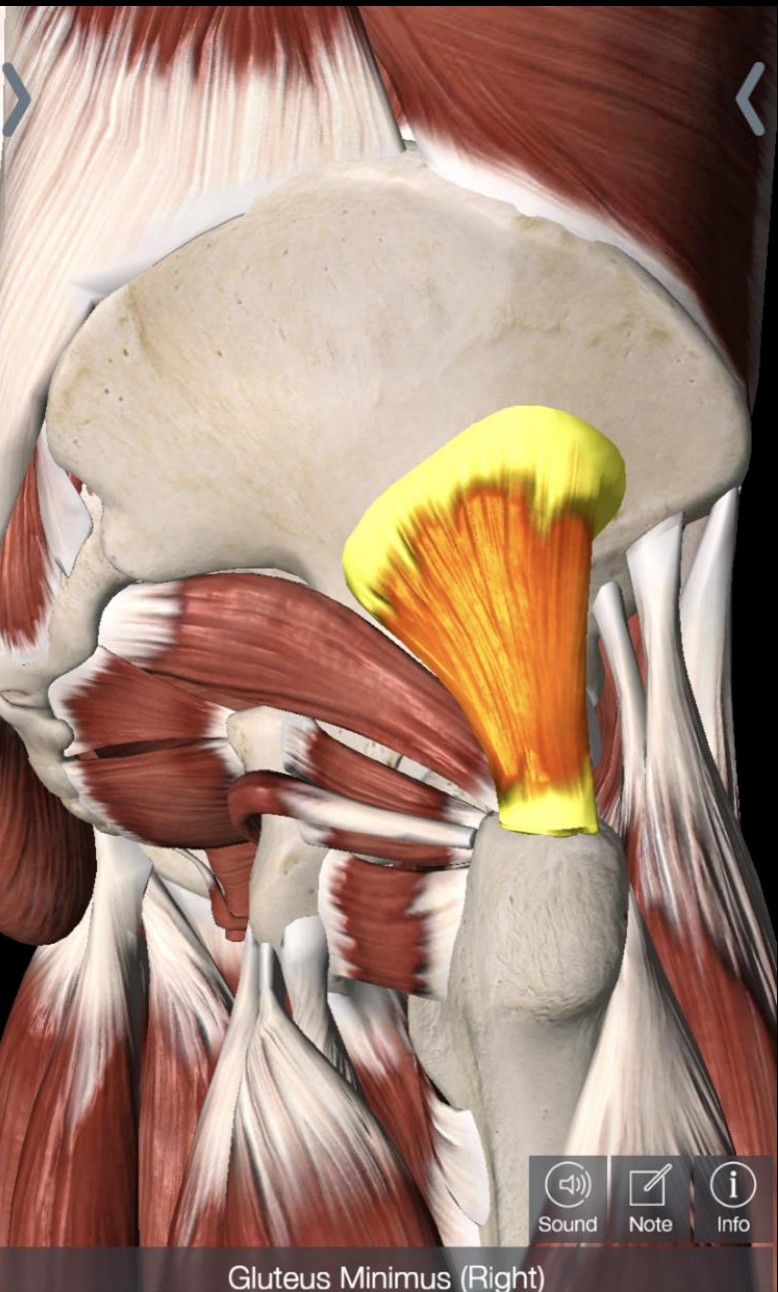






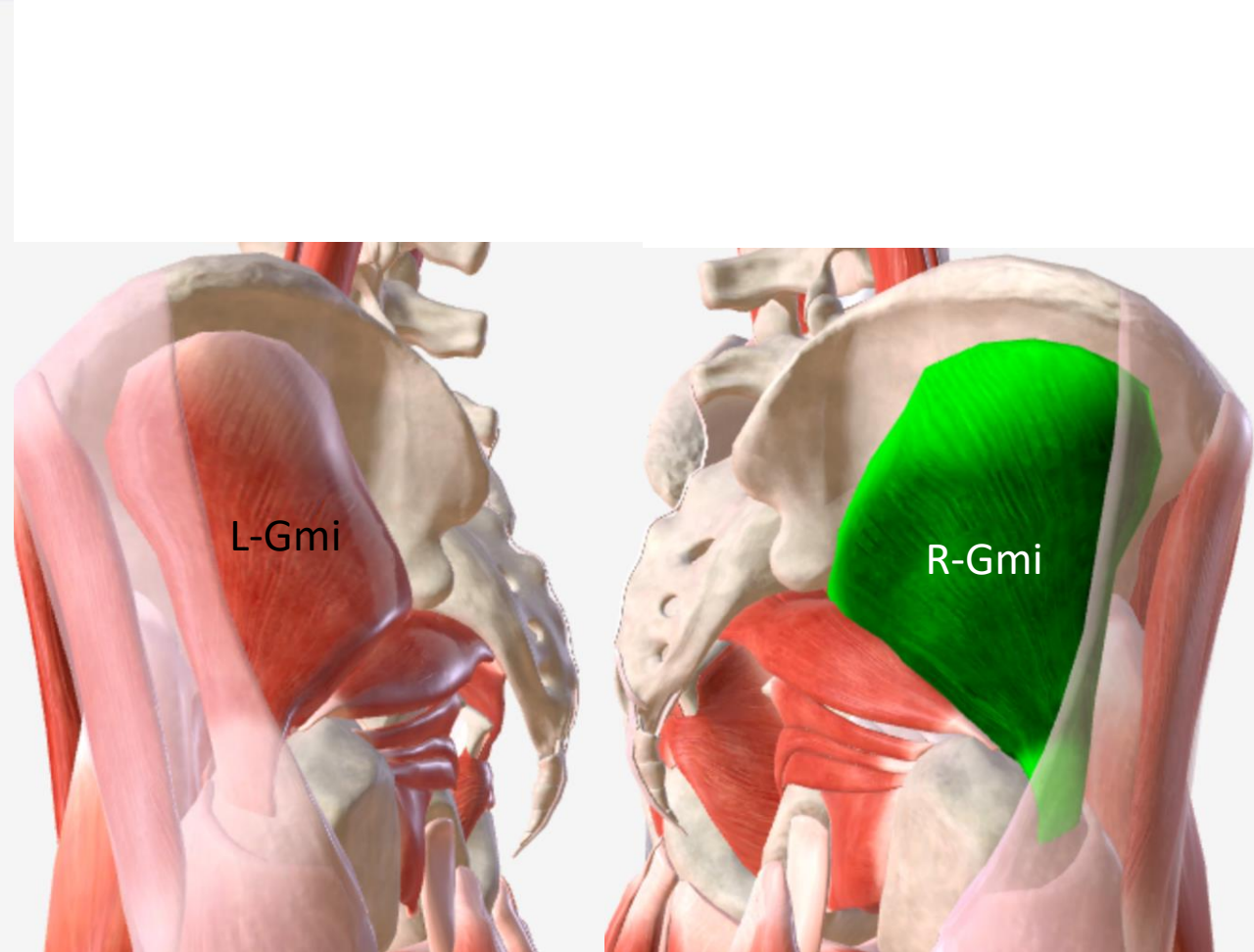
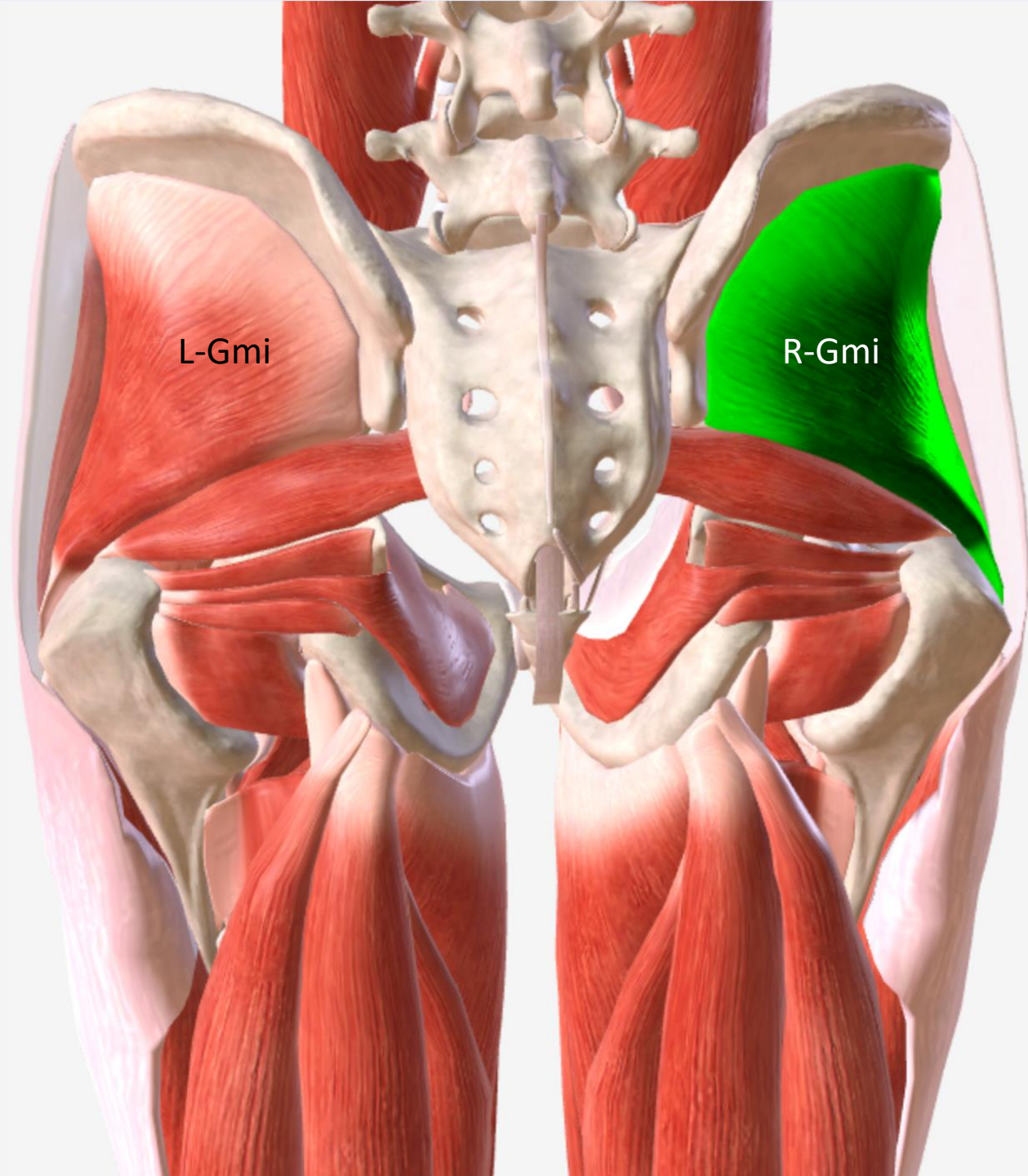
Sound Note Info

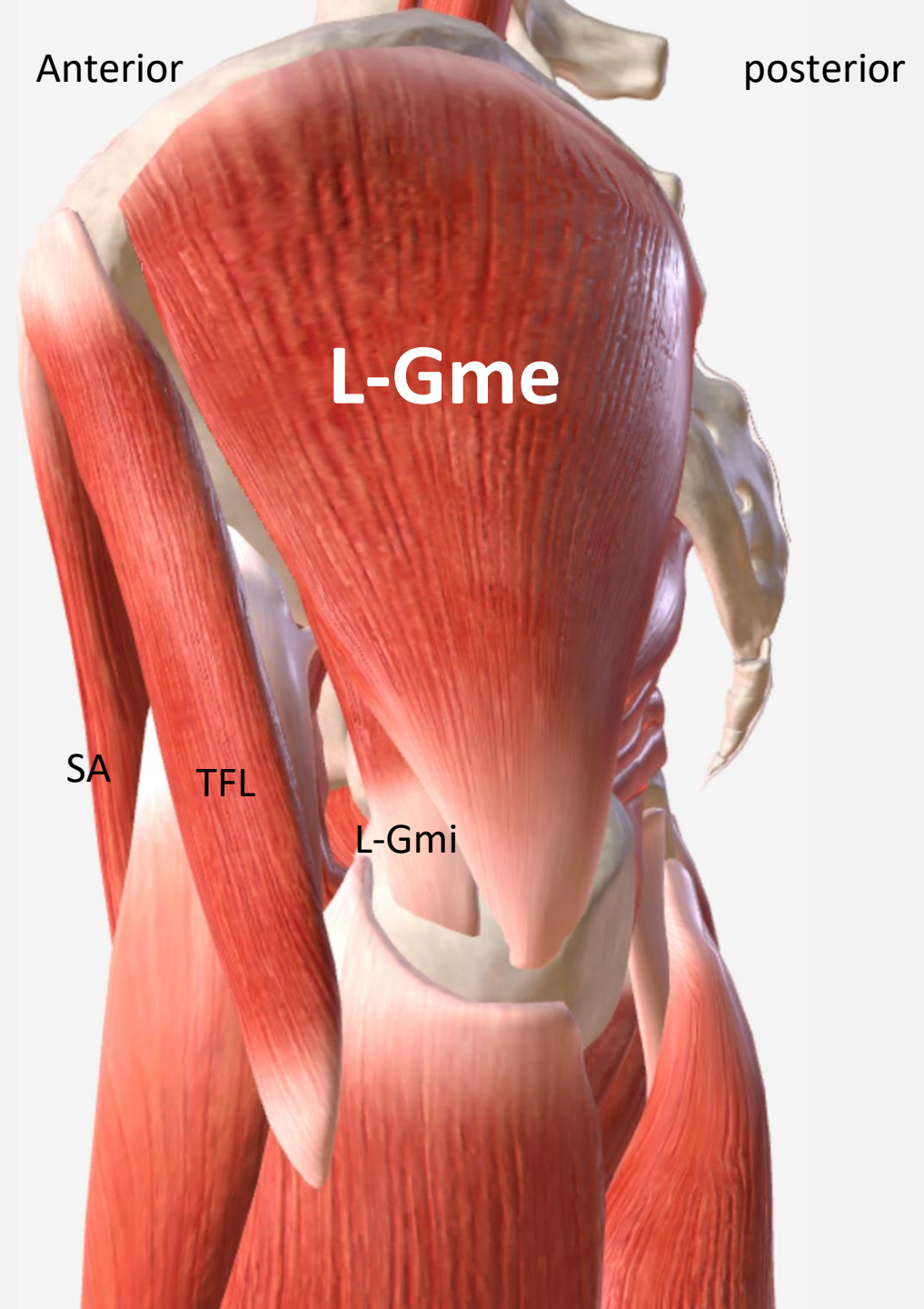
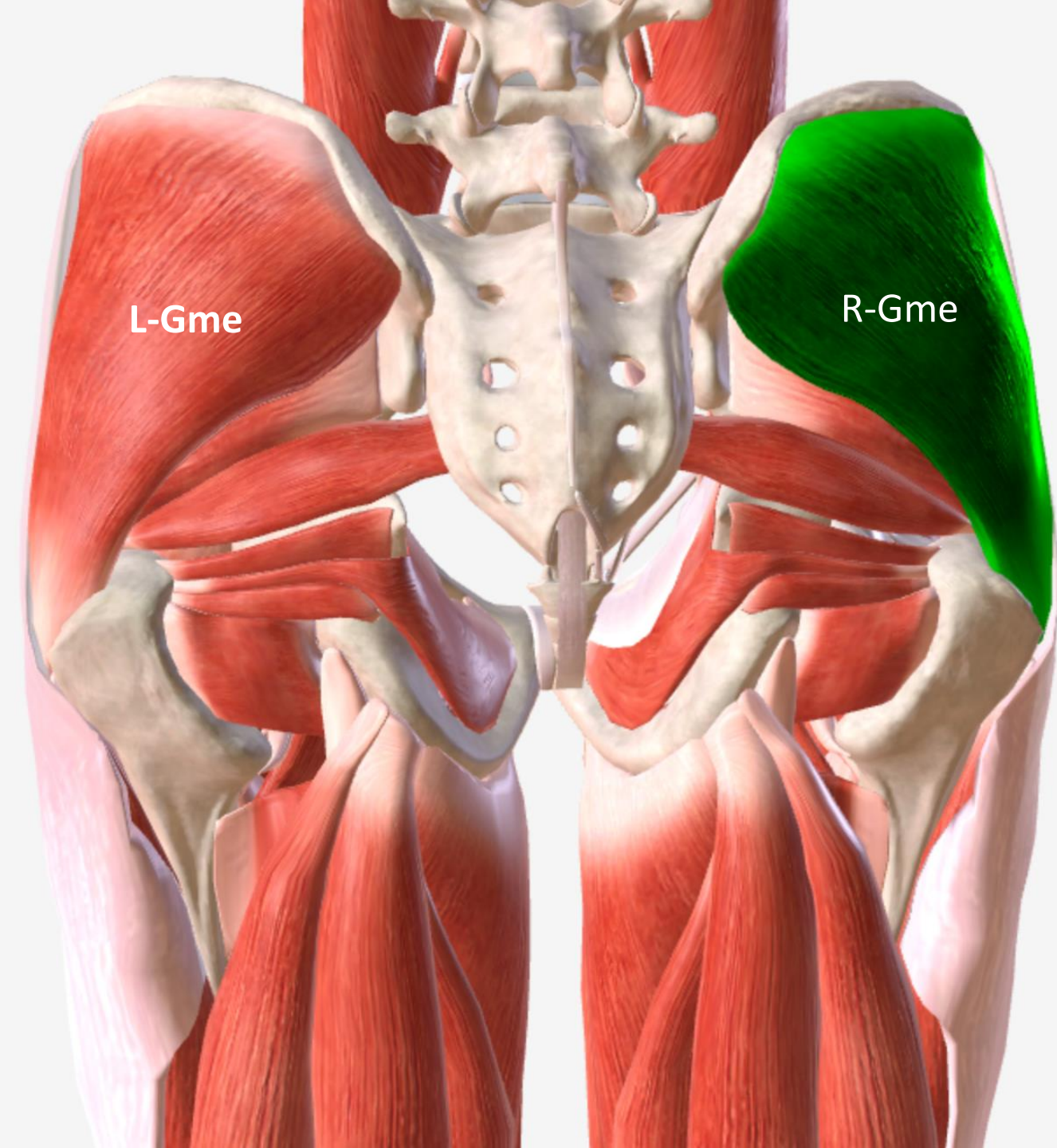
Gluteus Medius (Right)

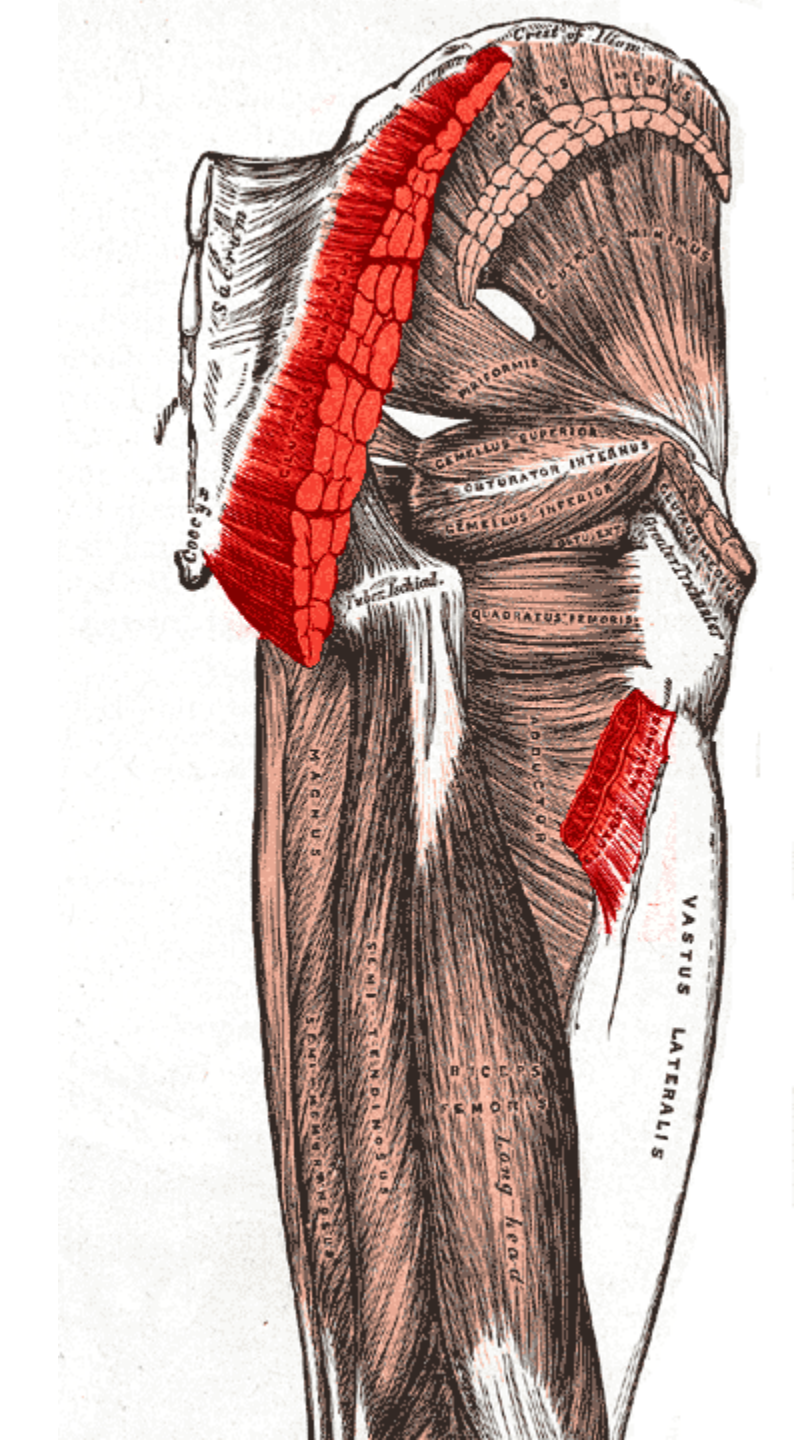
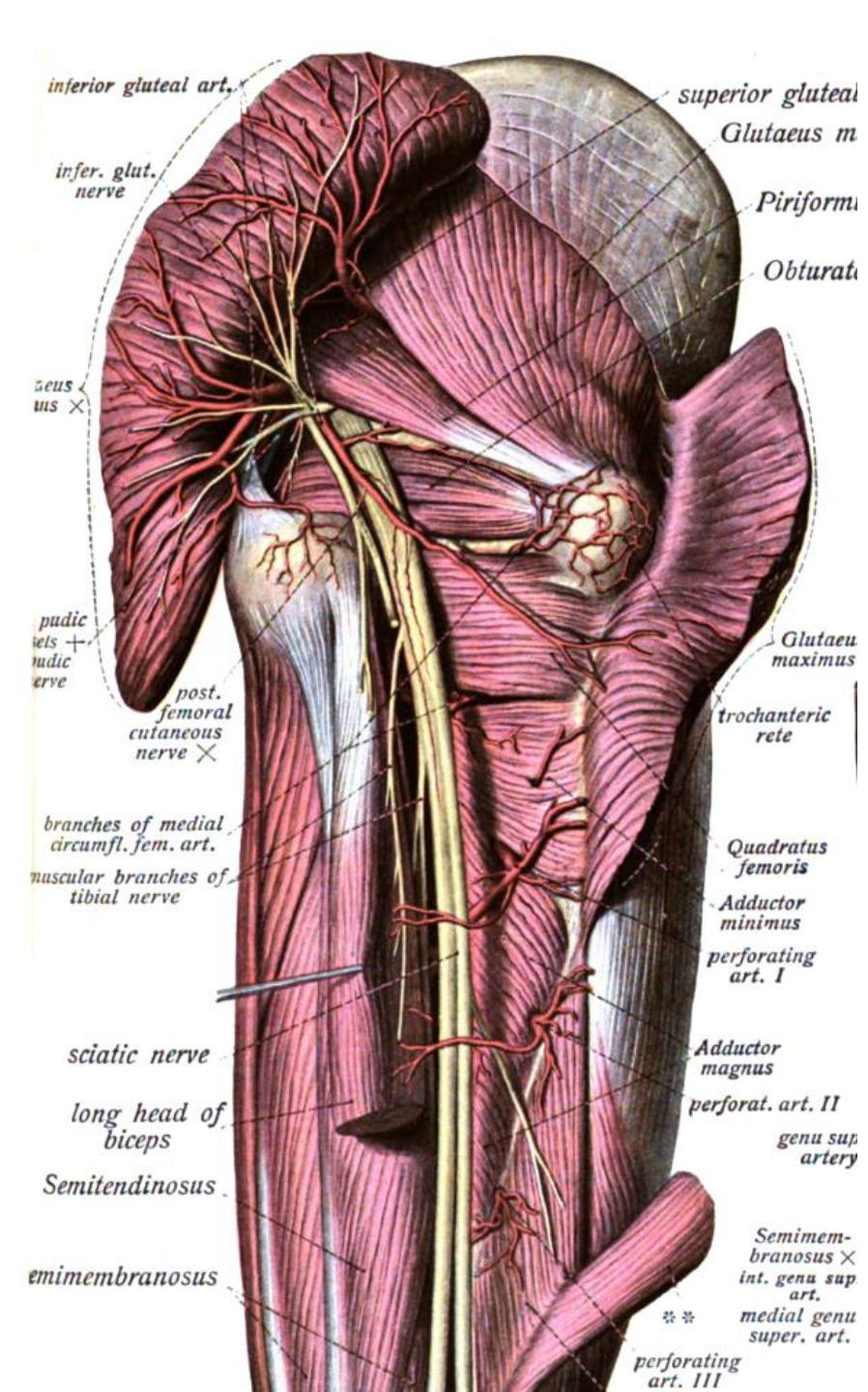
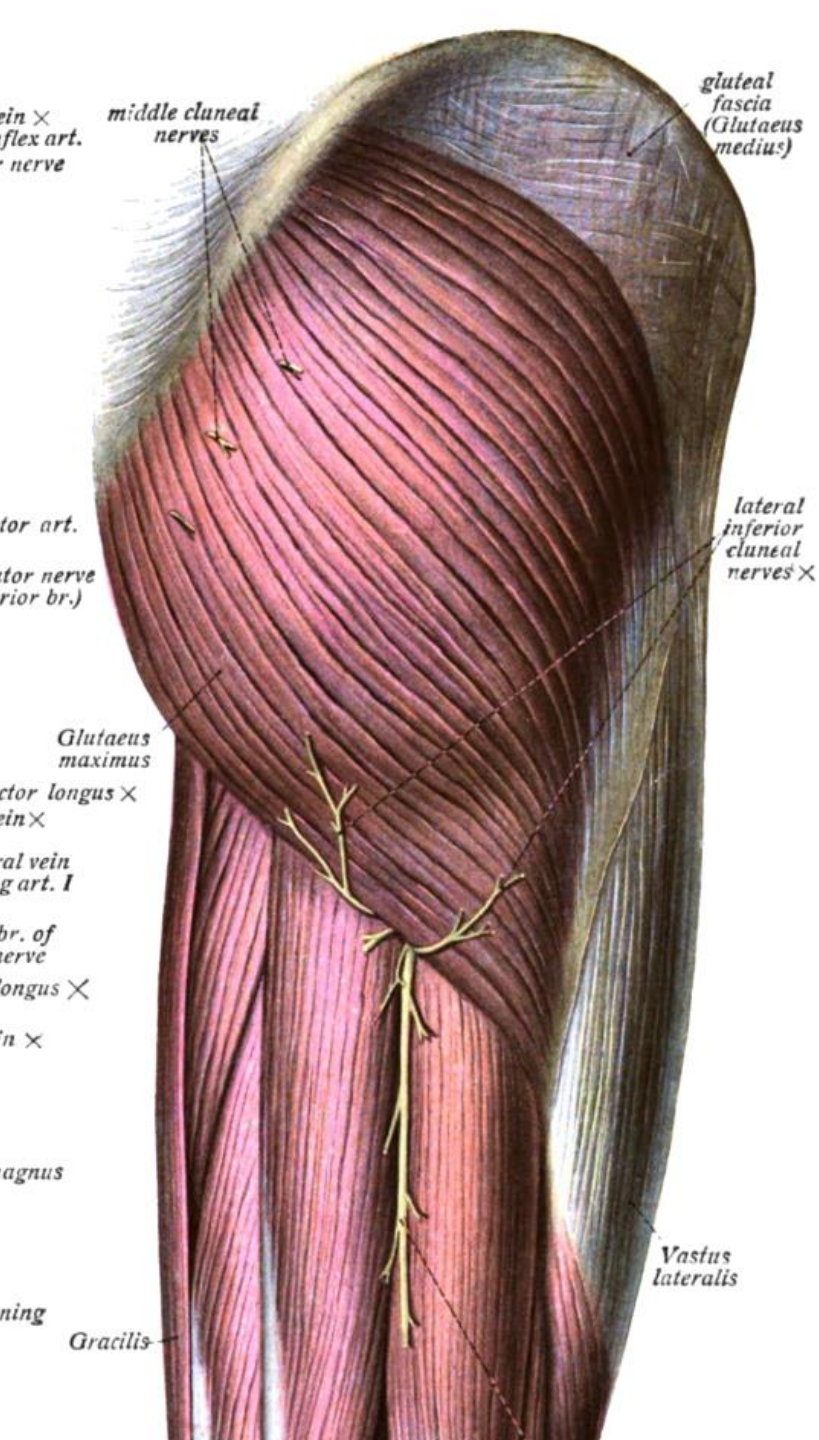


Sound Note Info

Gluteus Minimus (Right)







lateral hip

B: greater trochanter region



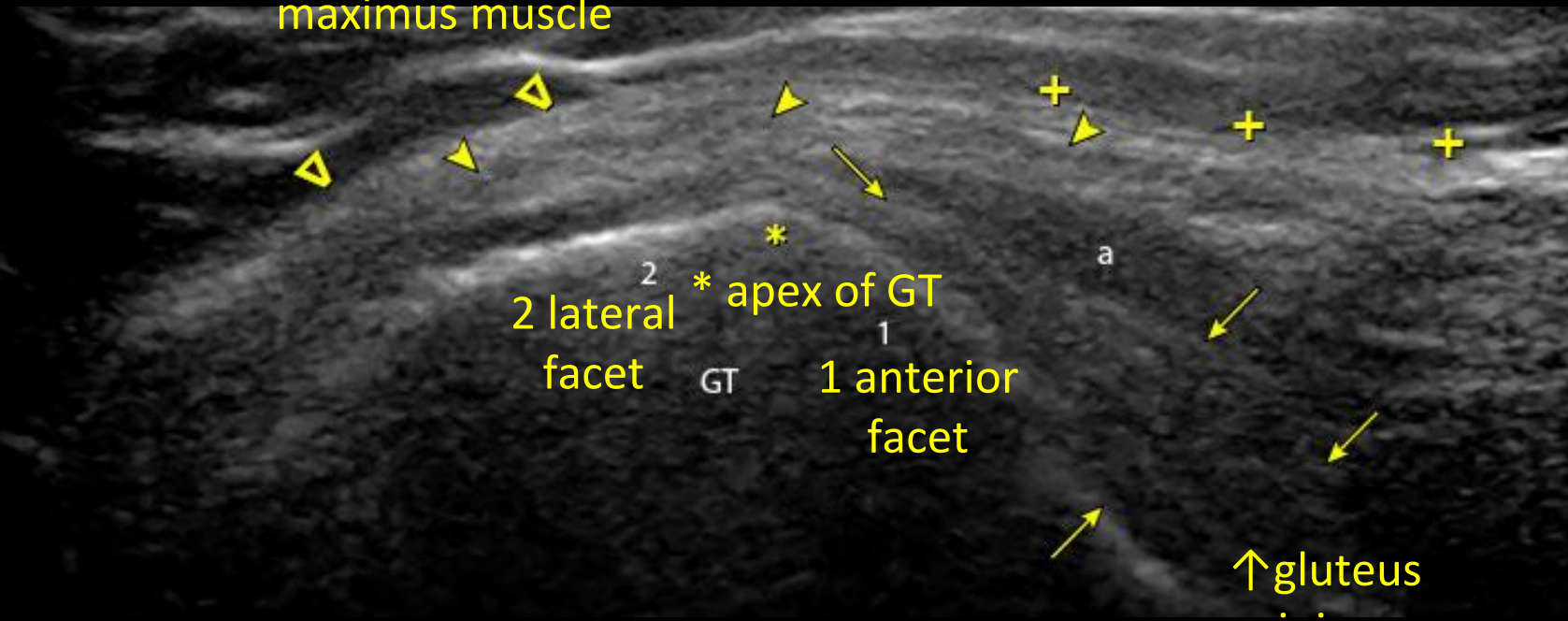
A: initial position



lying on side and the hip flexed 20 to 30 degrees

Gluteal tendon insertion on Greater Trochanter (GT)

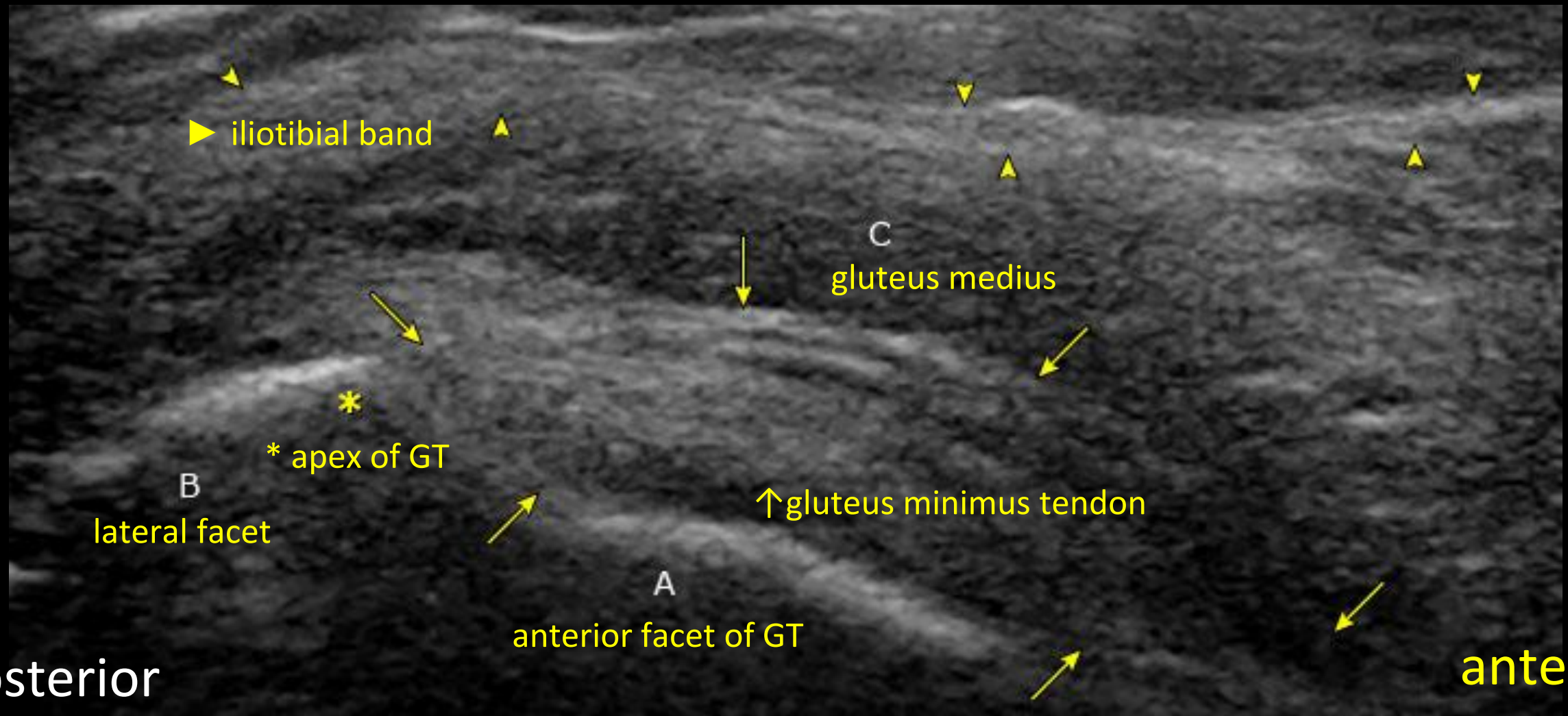
- + iliotibial band
- ▶ gluteus medius tendon
- ▽ musculotendinous transition of gluteus maximus muscle
- a: gluteus medius muscle



posterior

↑ gluteus minimus tendon
anterior

Gluteus minimus tendon insertion in transverse view

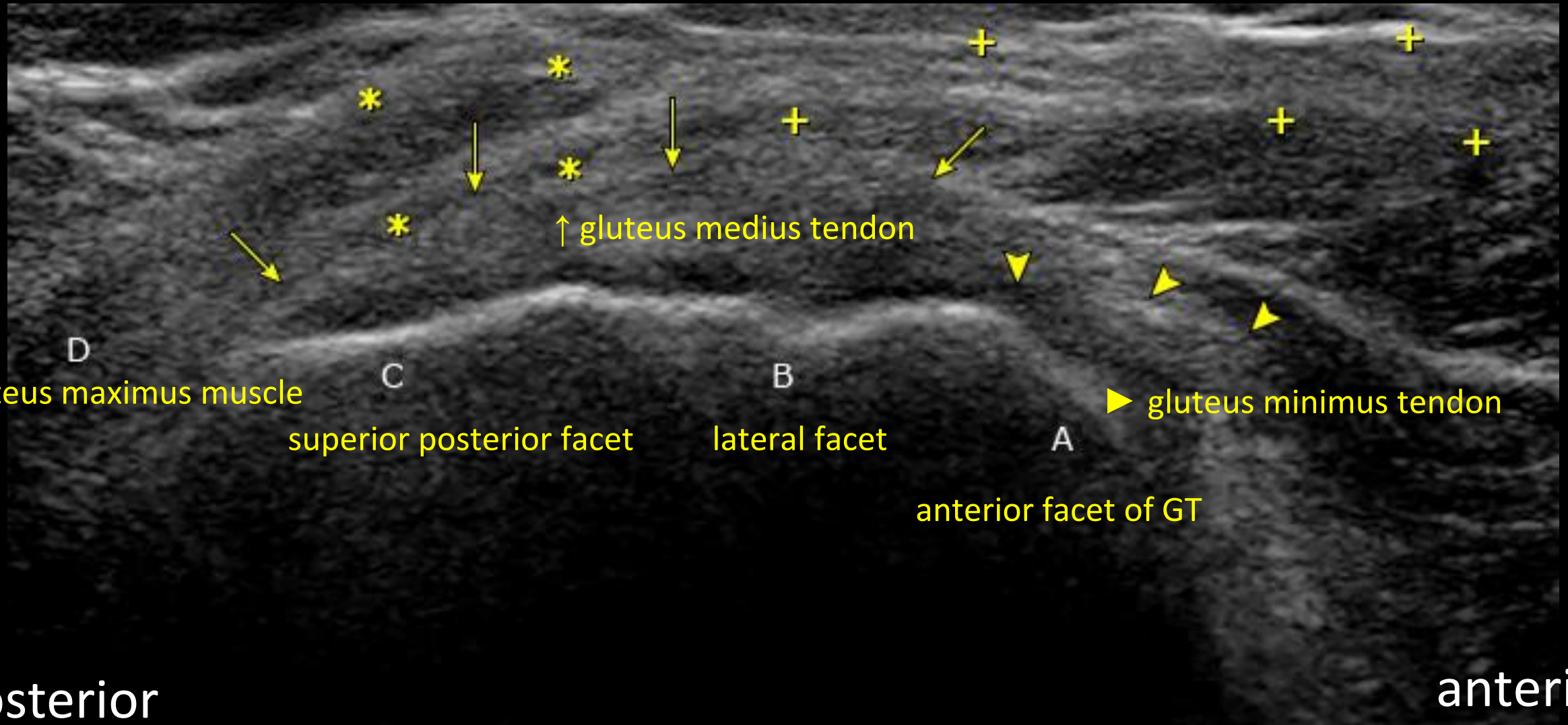


the gluteus minimus bursa deep to the tendon

Gluteus **medius** tendon insertion in transverse view

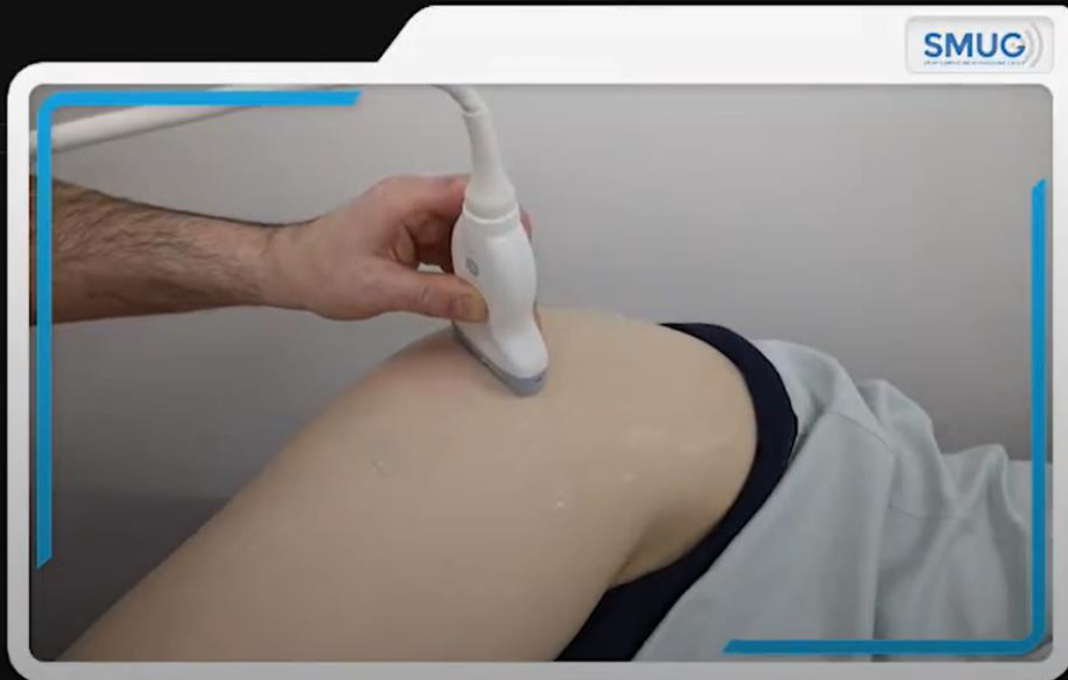
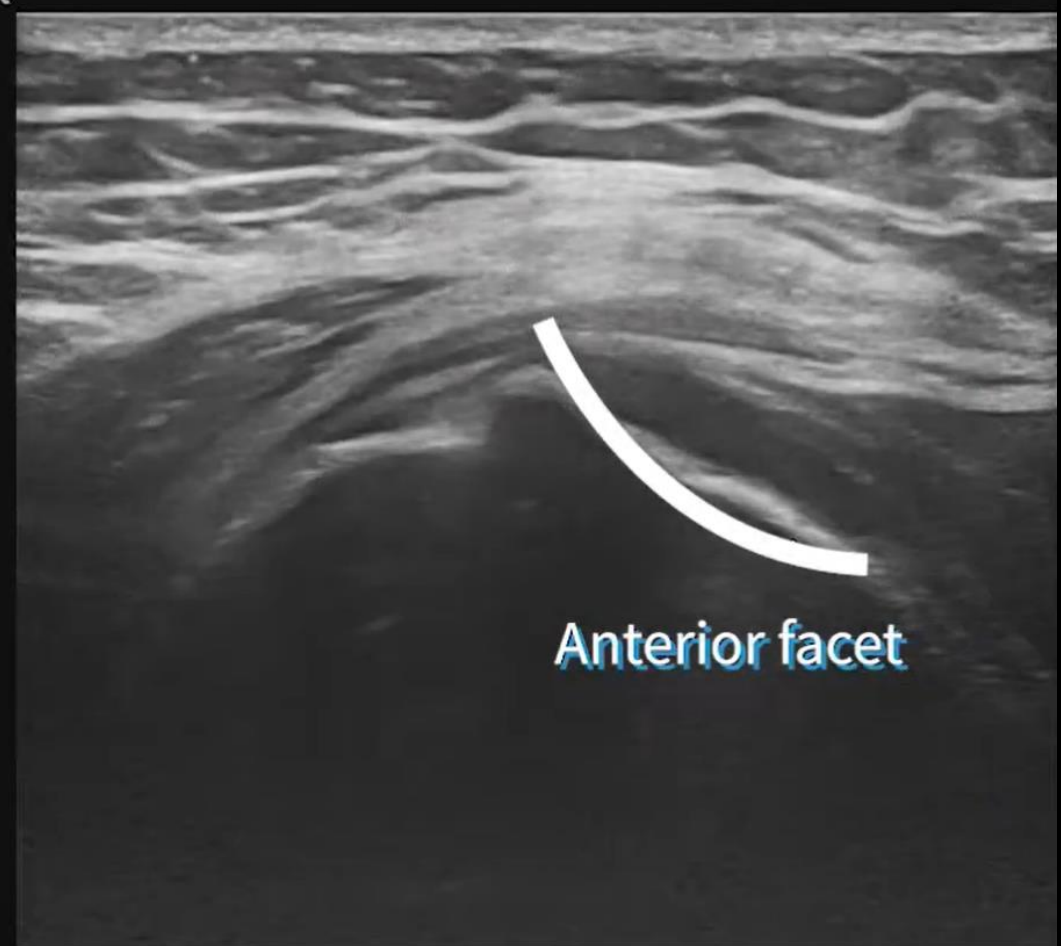
* * musculotendinous portion of
gluteus maximus muscle

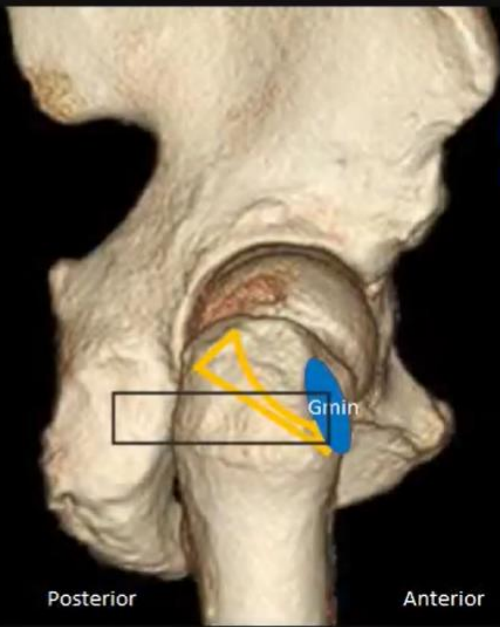
+ iliotibial band



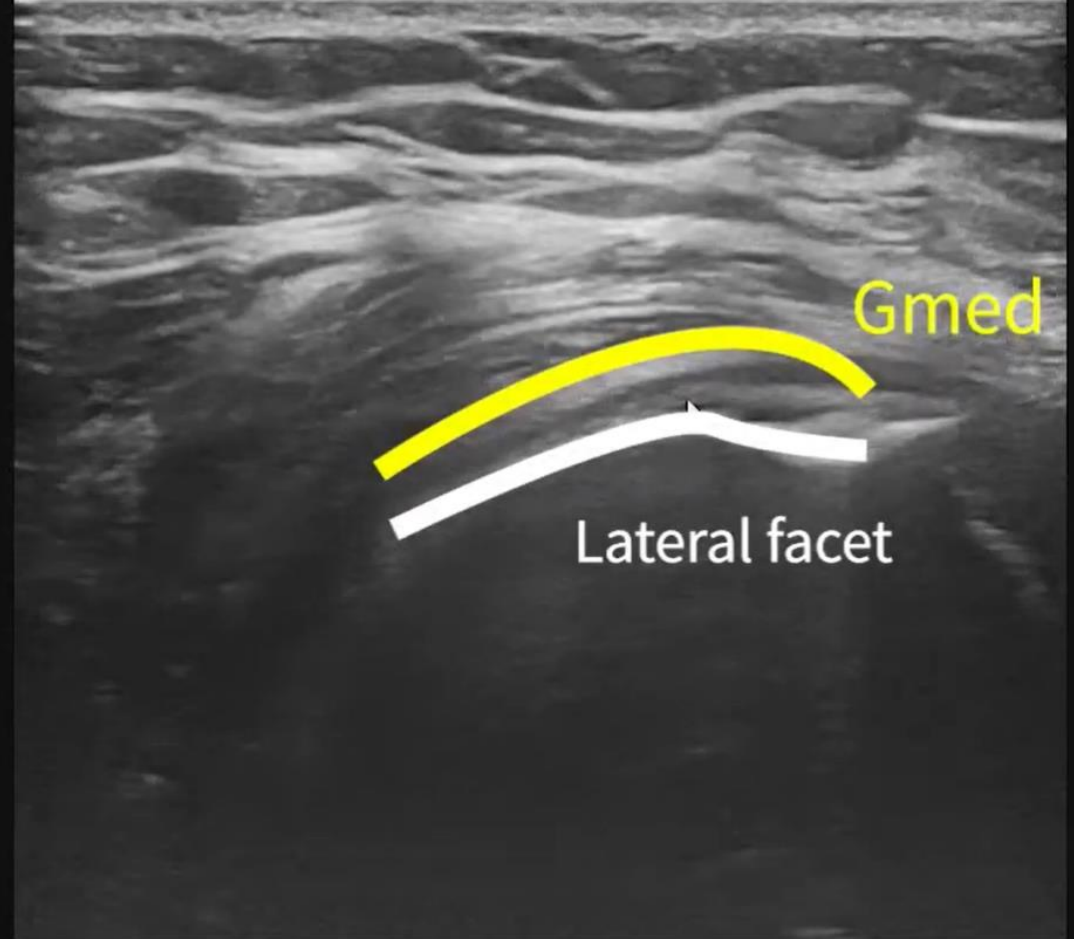
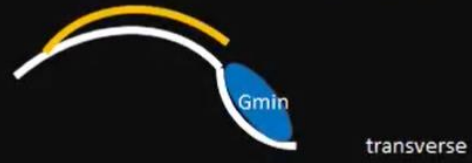


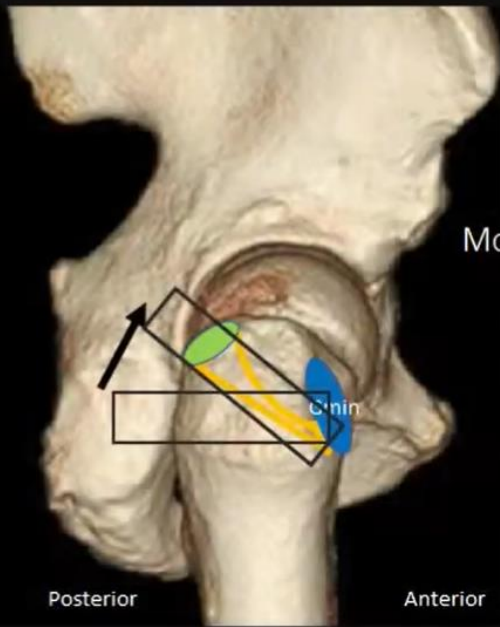
Landmark:
Anterior facet = concave = Gmin





Landmark:
Lateral facet = convex = Gmed lateral band



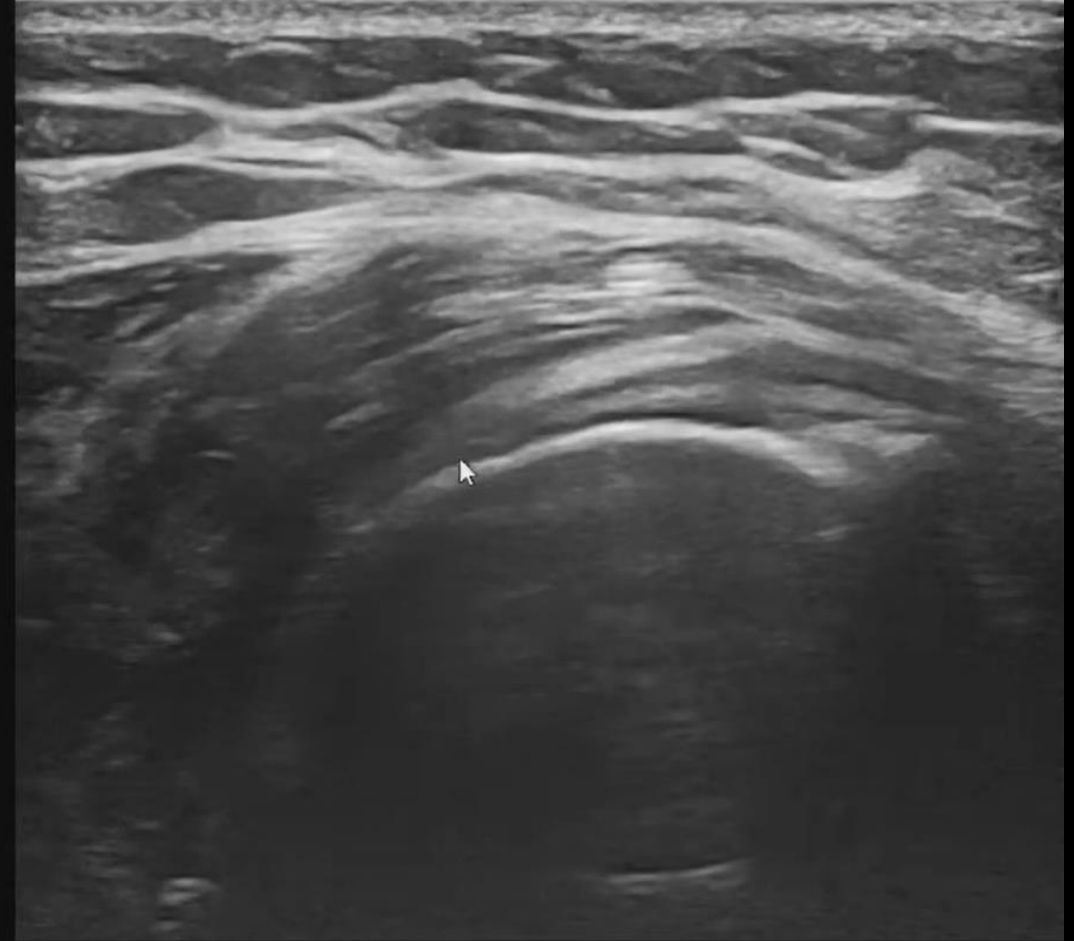


Move posterior probe end proximal (around 40°)



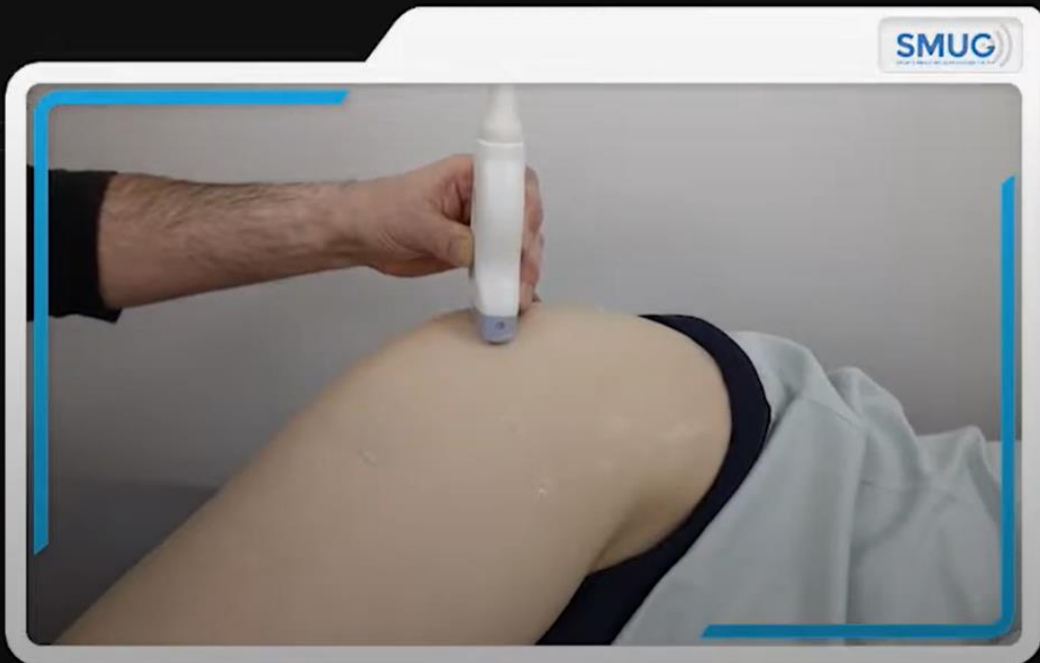
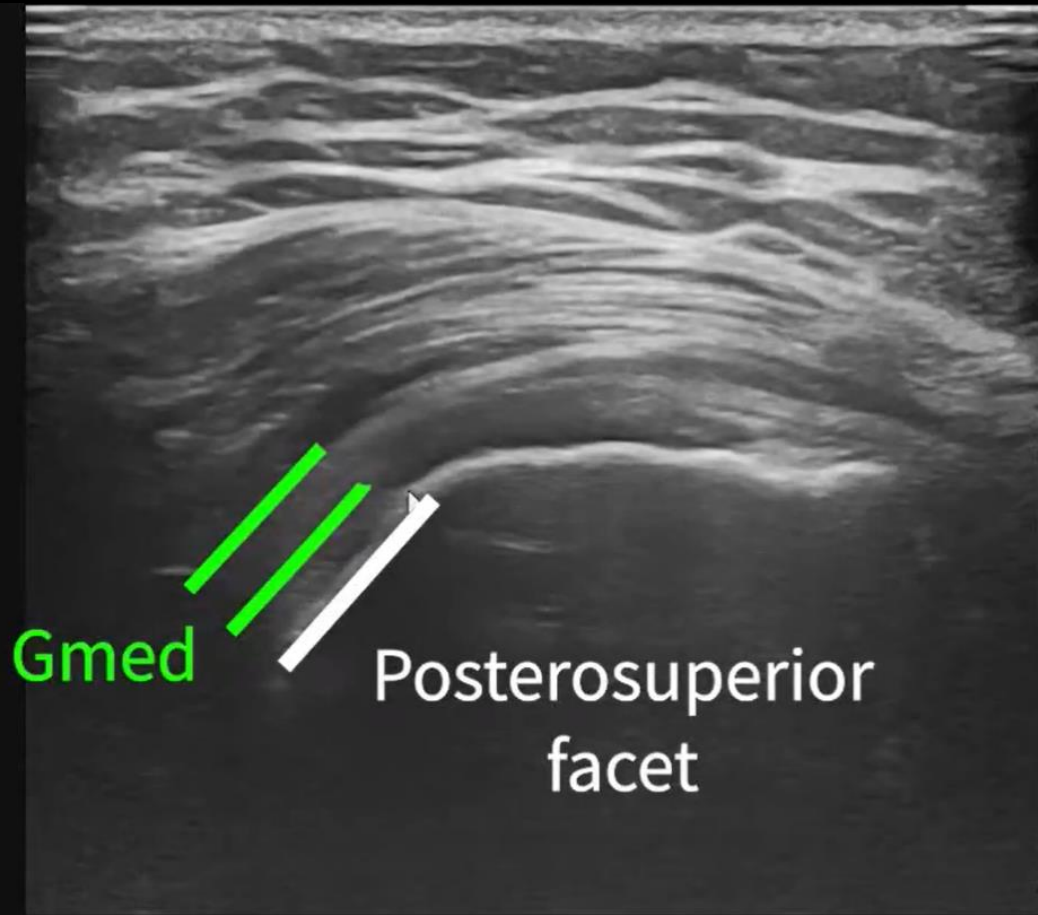
Landmarks: In correct plane:

1. Parallel band of tissue = Gmed lat band
2. Posterosuperior facet = straight slope
3. Gmed posterior band in transverse

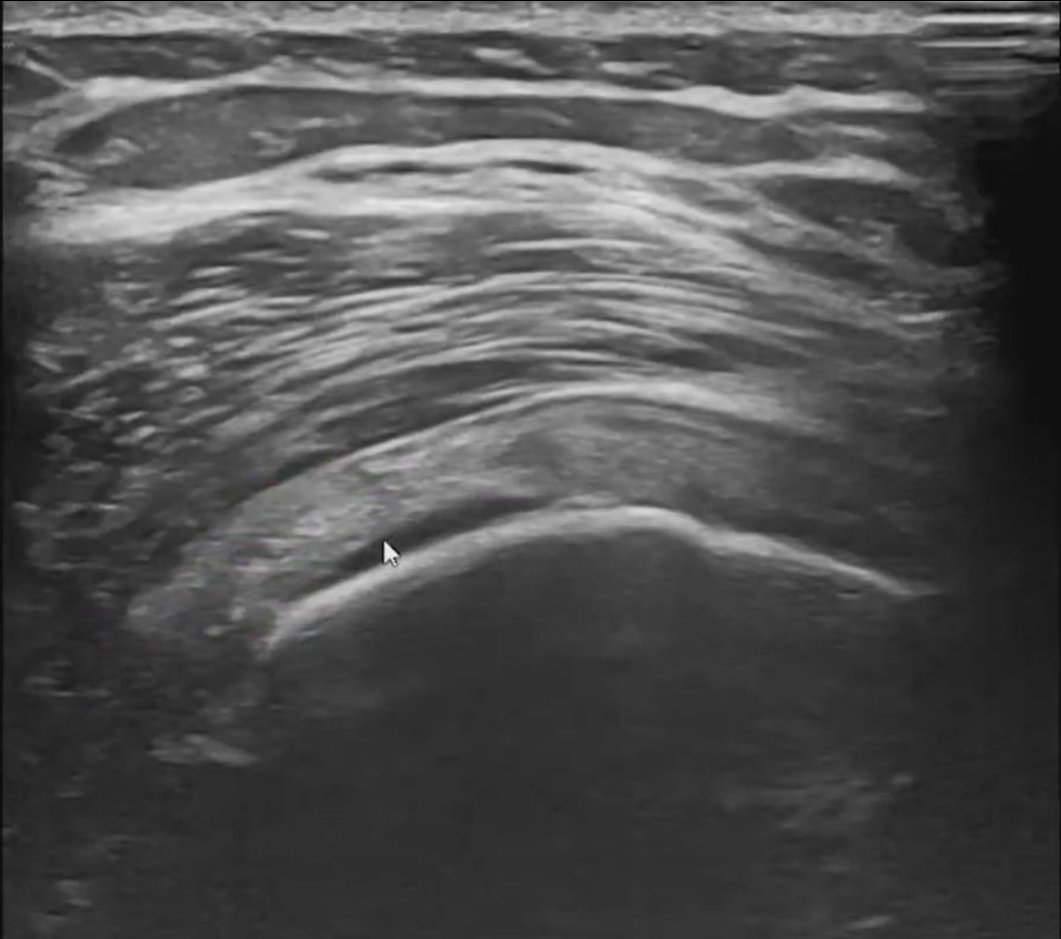
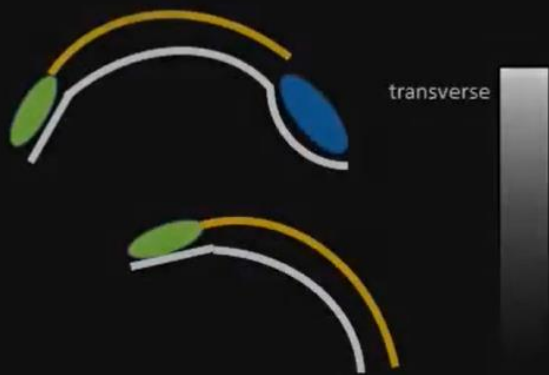
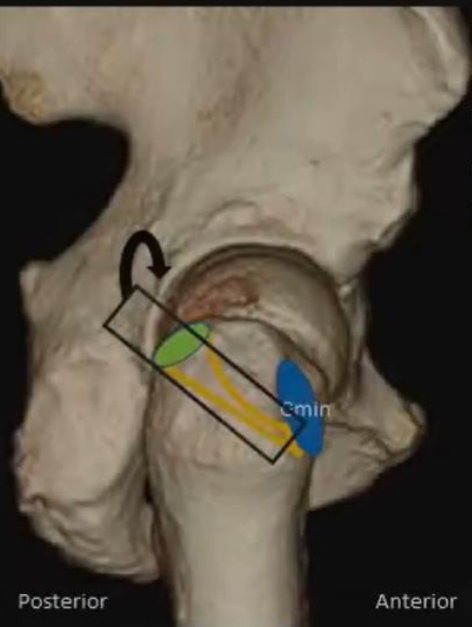


SMUG

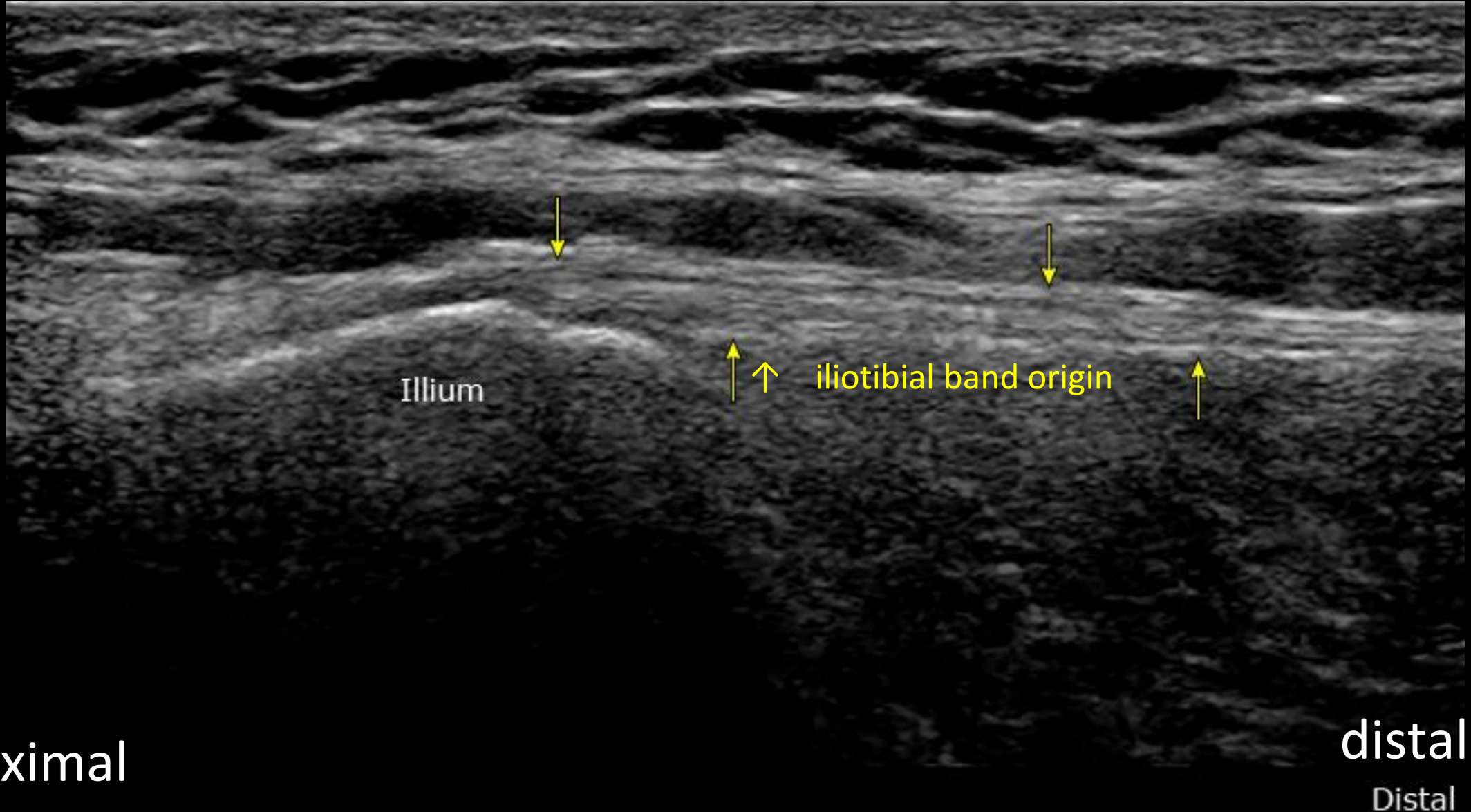




Tip:
Push the posterior side of the probe down to
improve visualisation posterosuperior facet and
transverse Gmed posterior band.



iliotibial band origin long axis view



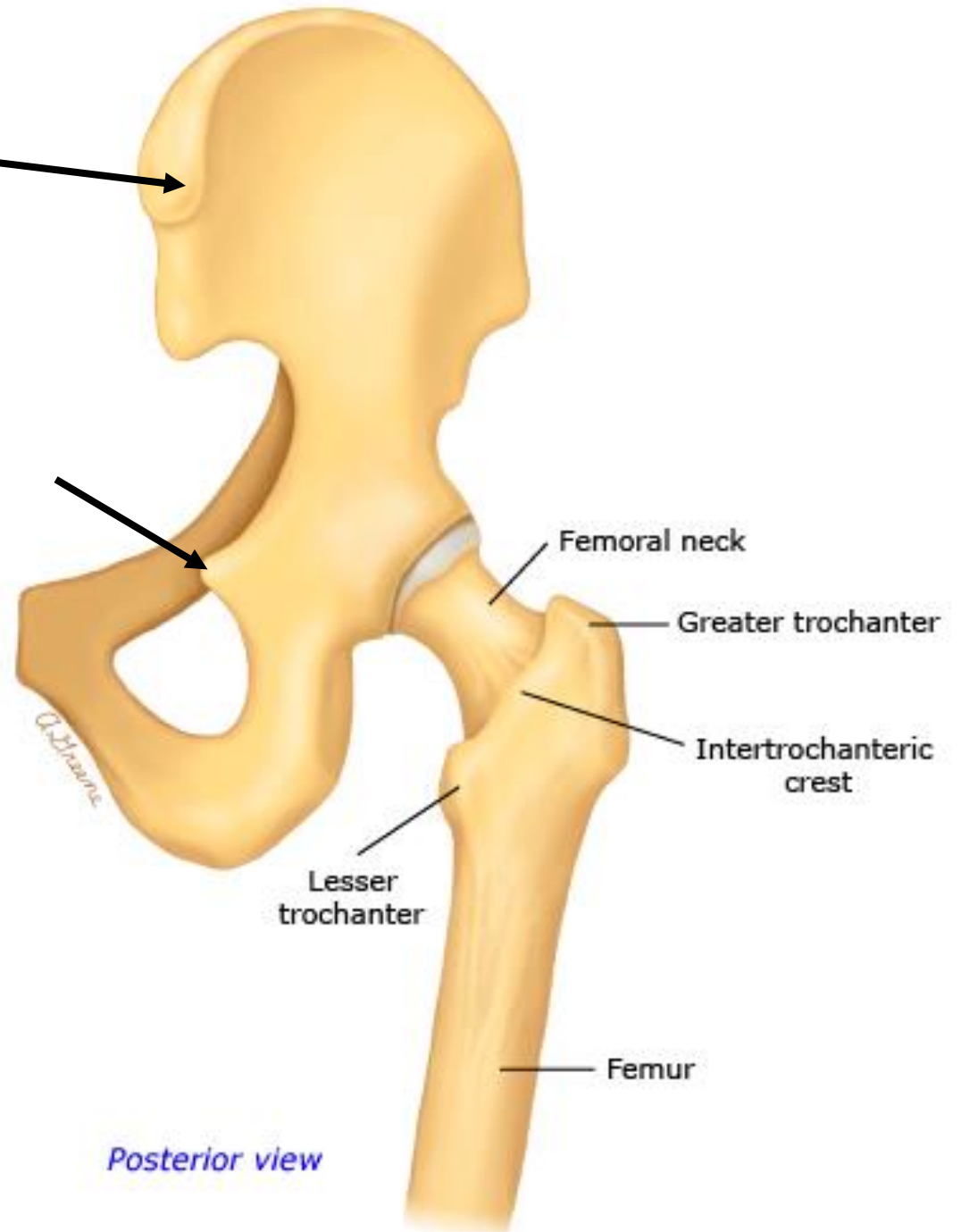
external snapping hip (external coxa saltans)

Posterior Hip

Posterior superior iliac spine (PSIS)



Ischial spine



Femoral neck

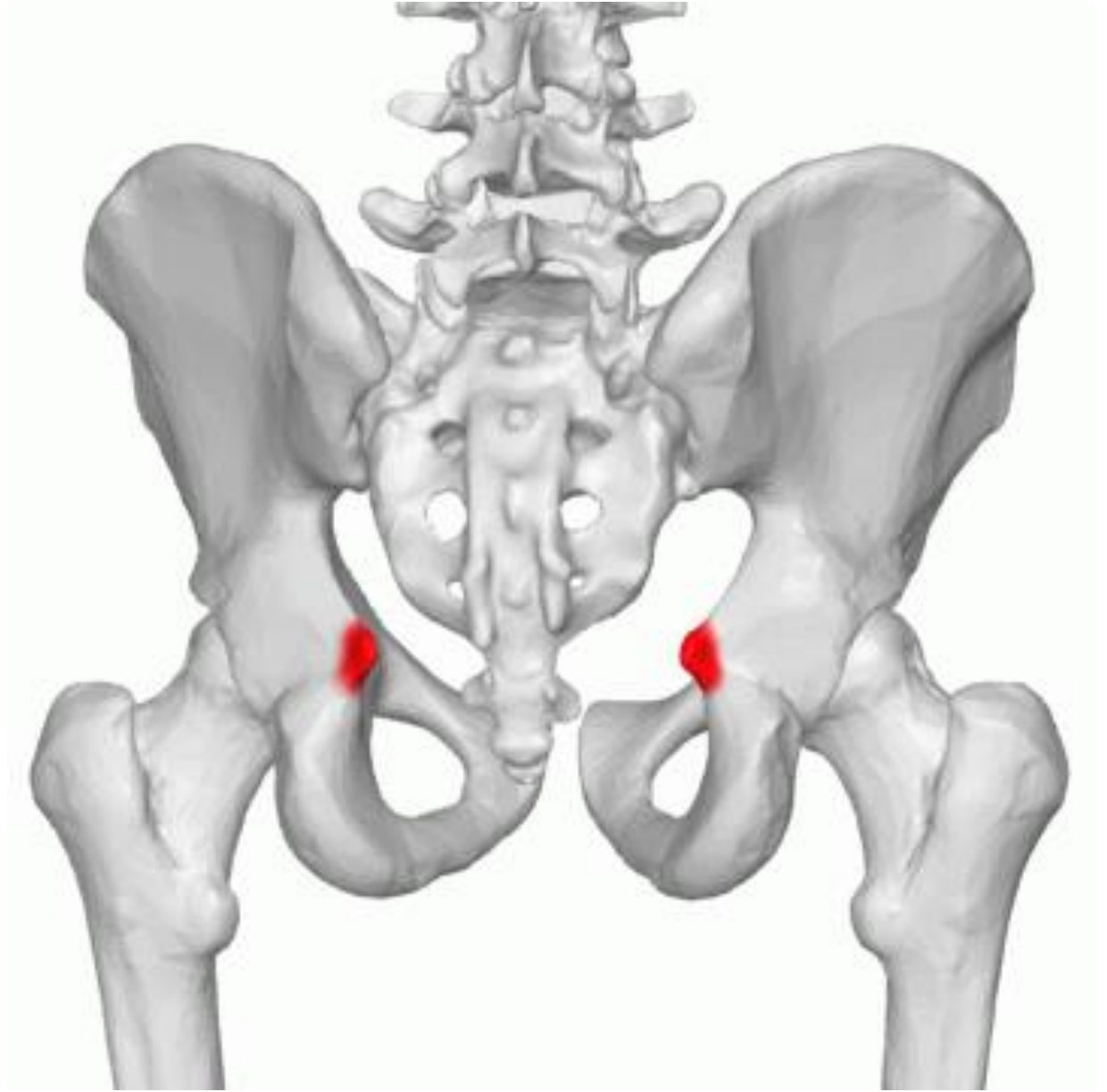
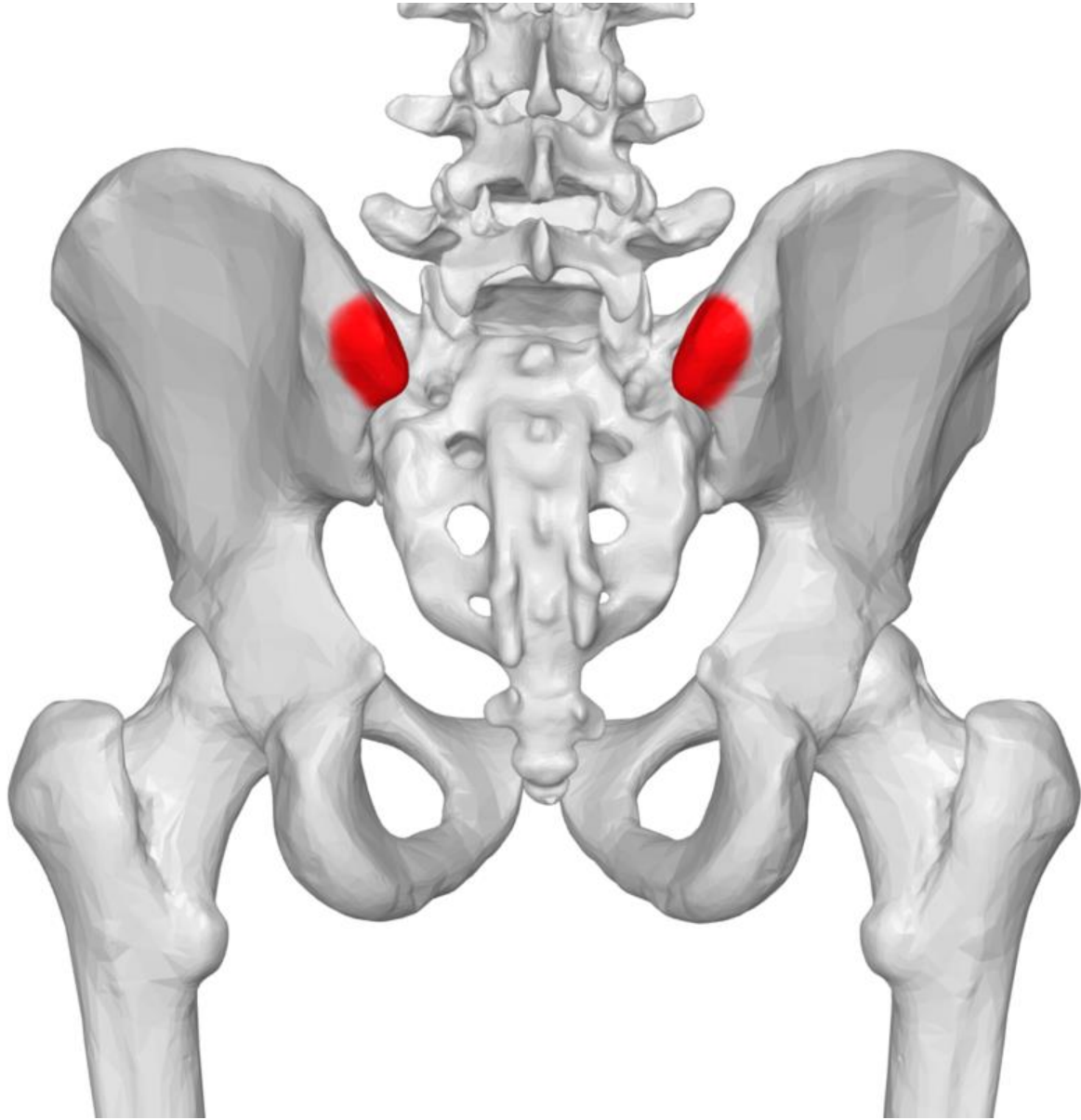
Greater trochanter

Intertrochanteric crest

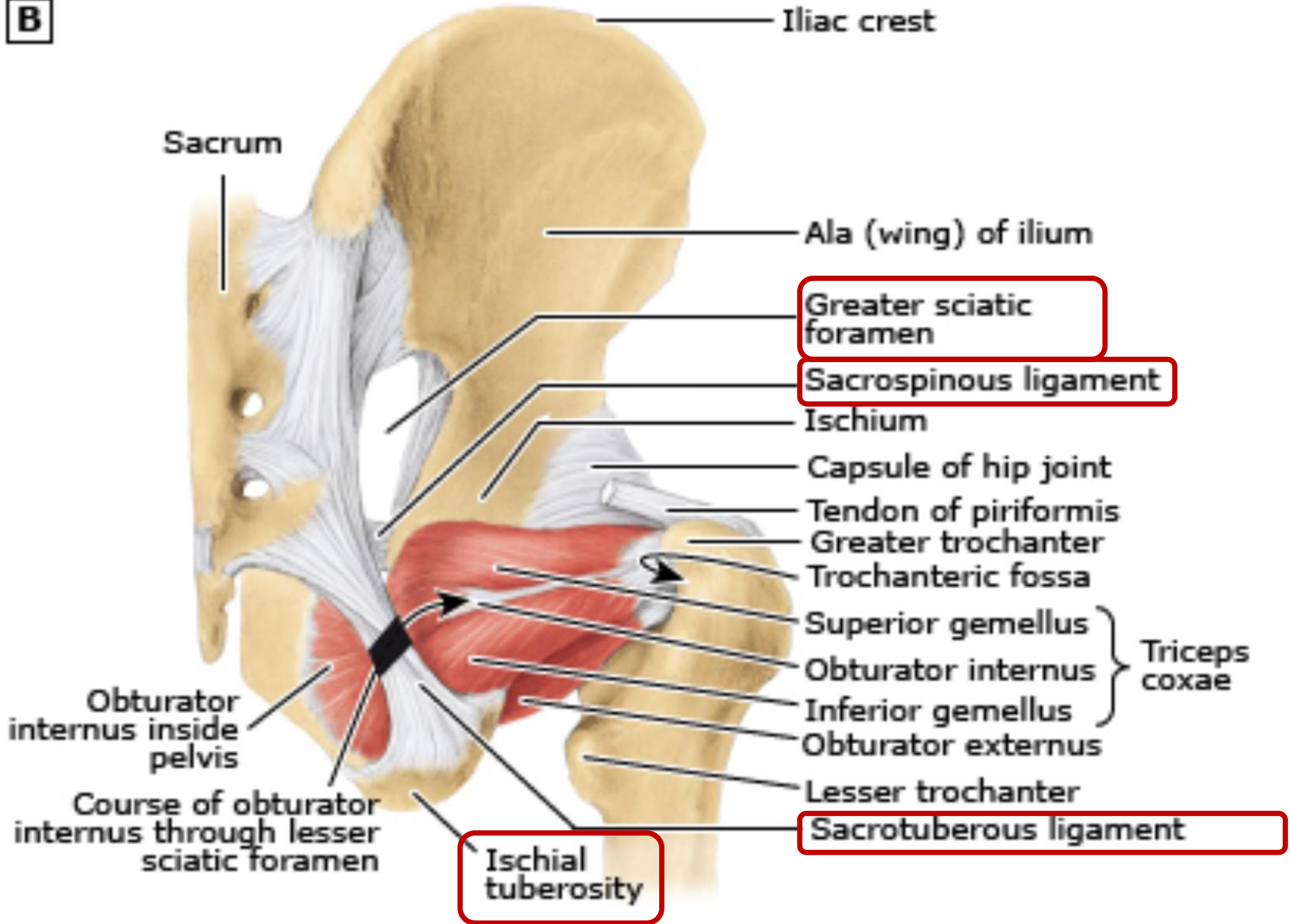
Lesser trochanter

Femur

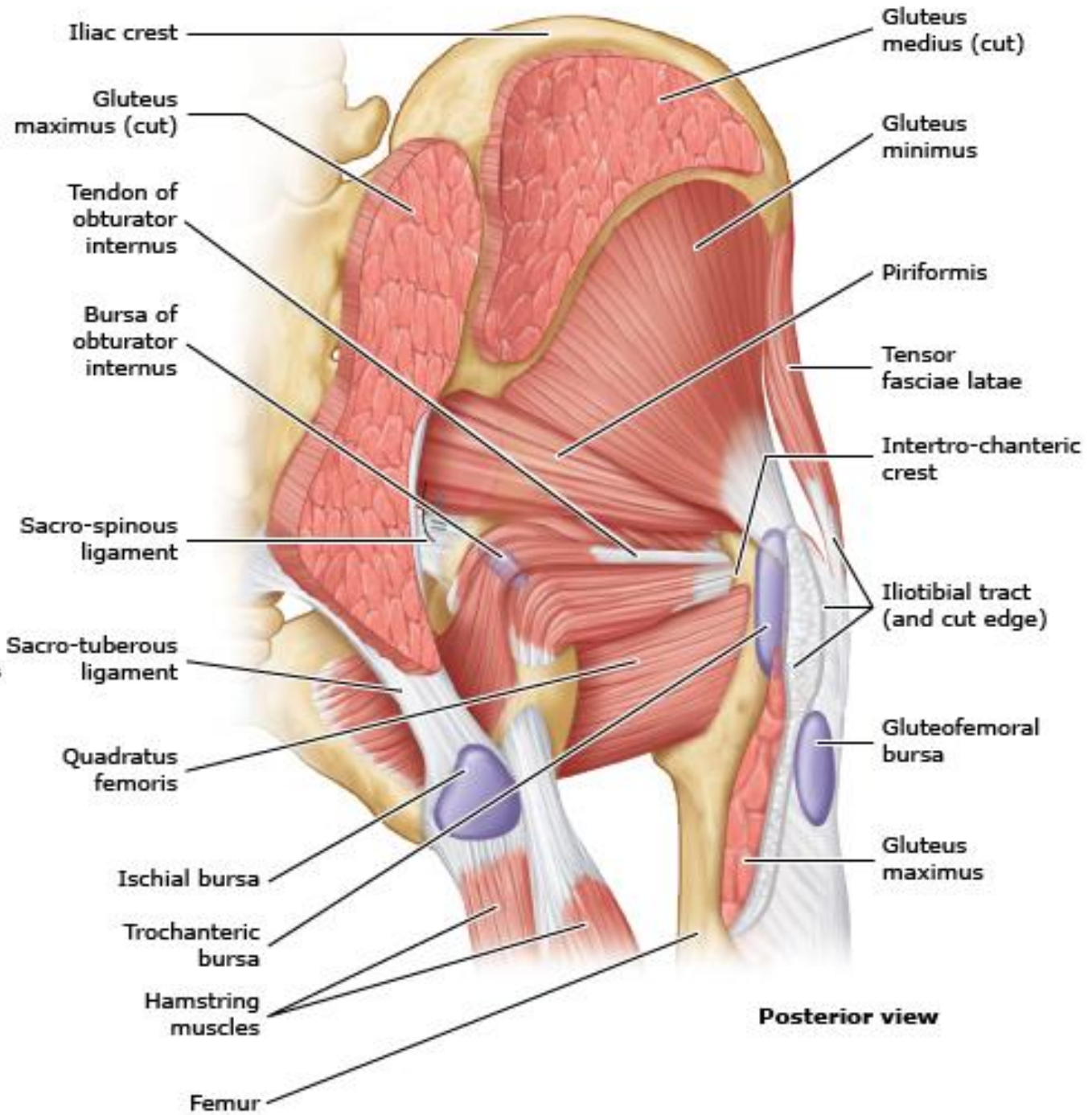
Posterior view



B

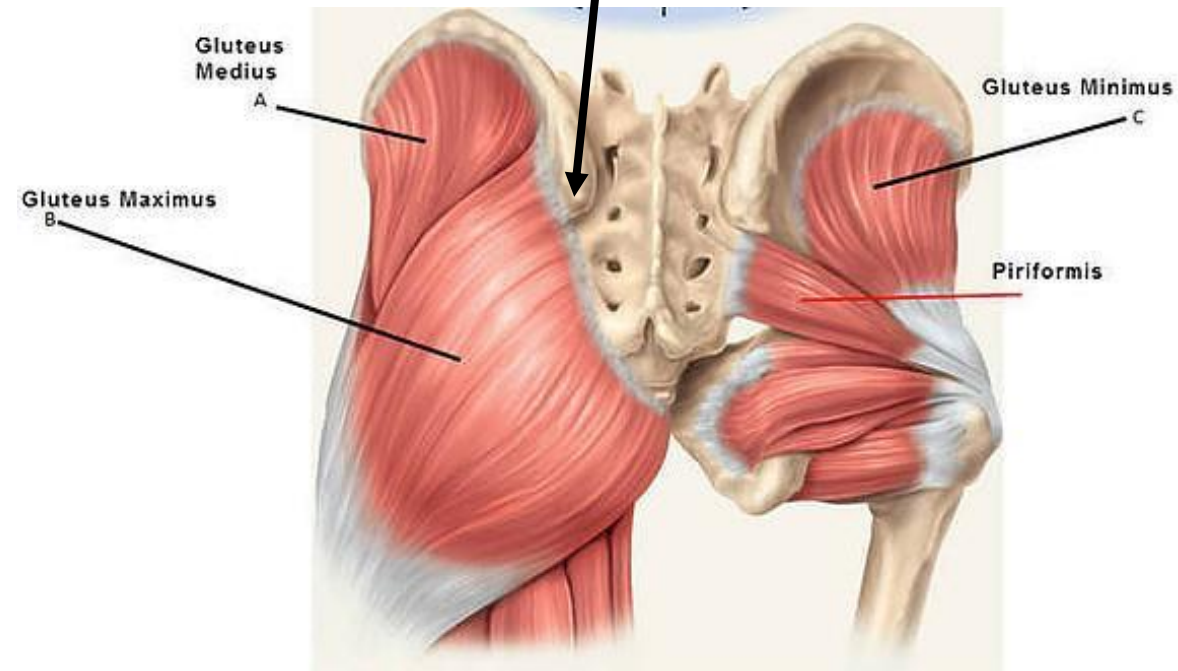


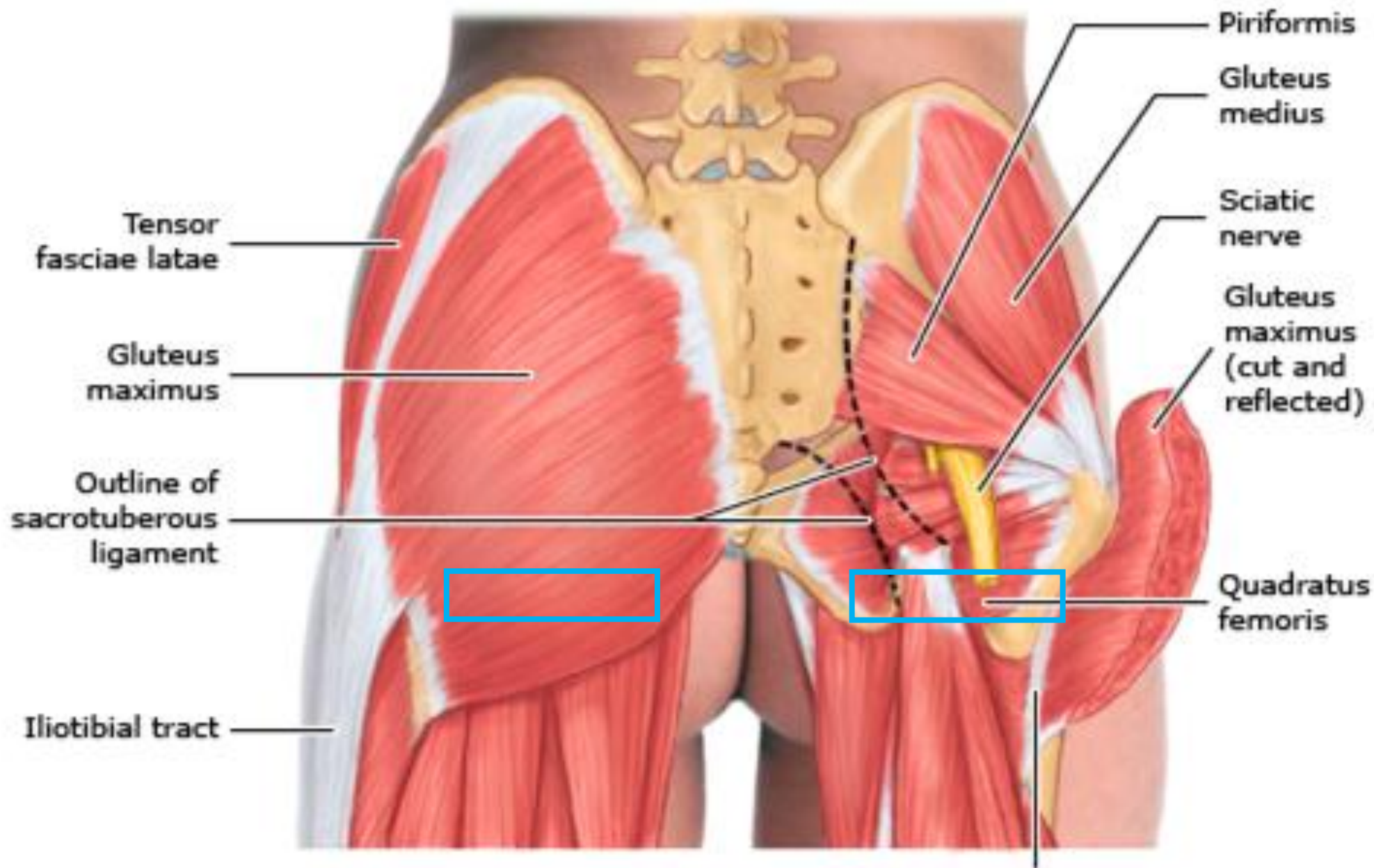
Gluteal muscles and bursae



Posterior view

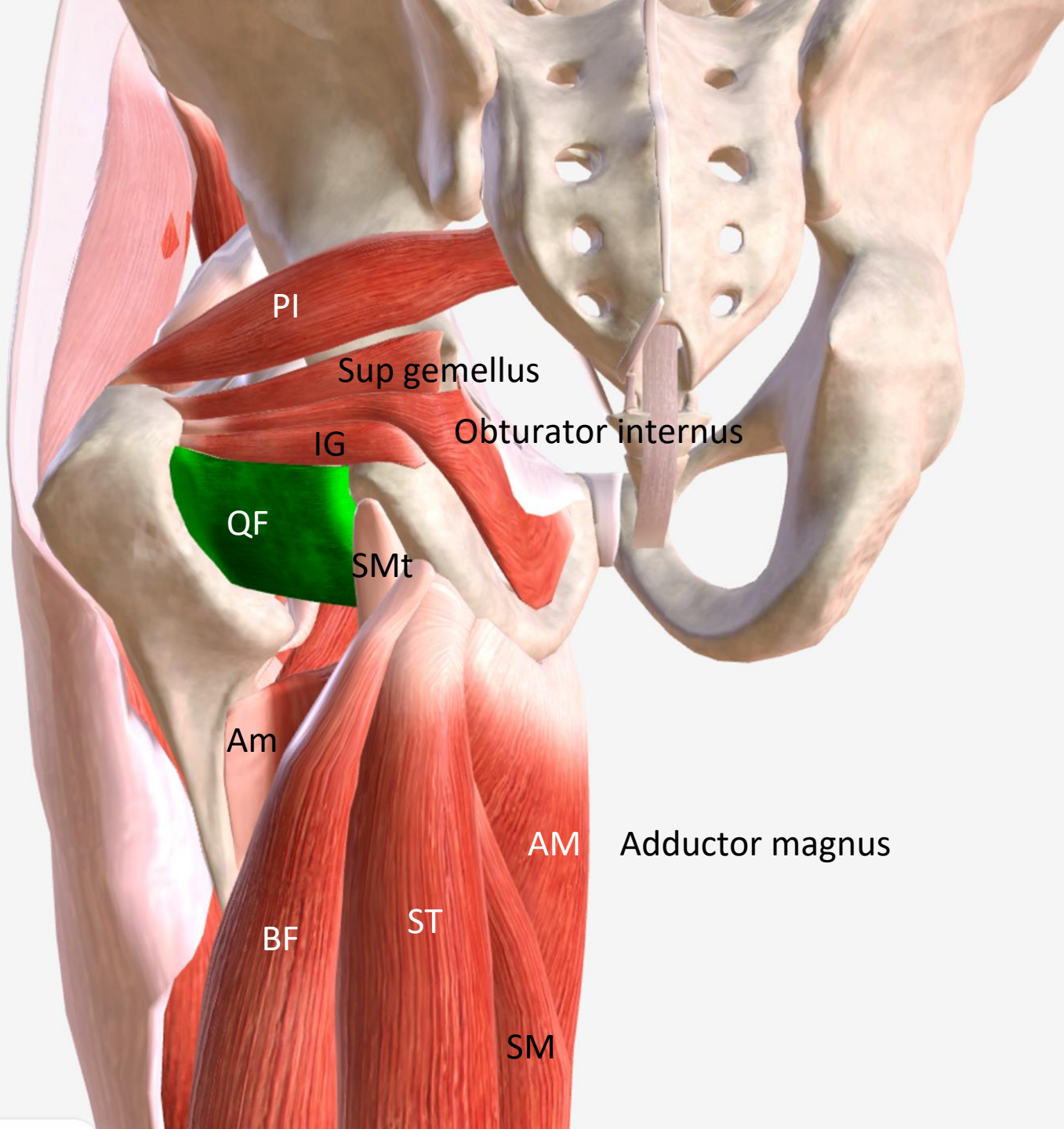
PSIS





Posterior view

Attachment of inferior half of deep part of gluteus maximus to gluteal tuberosity



PI

Sup gemellus

IG

Obturator internus

QF

SMt

Am

Am
Adductor minimus

AM

Adductor magnus

BF

ST

SM

posterior hip

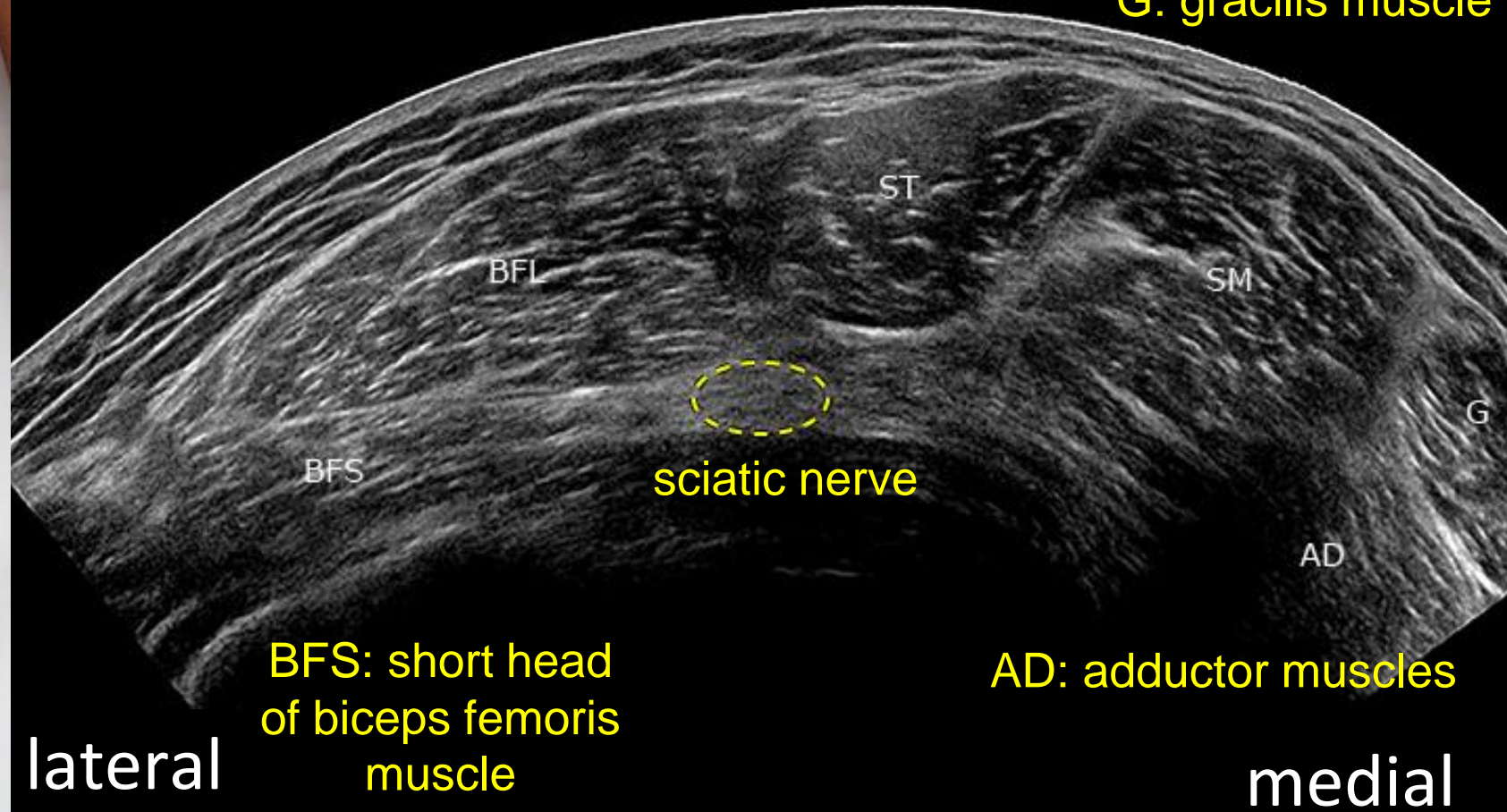


hamstring muscles extended field transverse view

BFL: long head of
biceps femoris
muscle

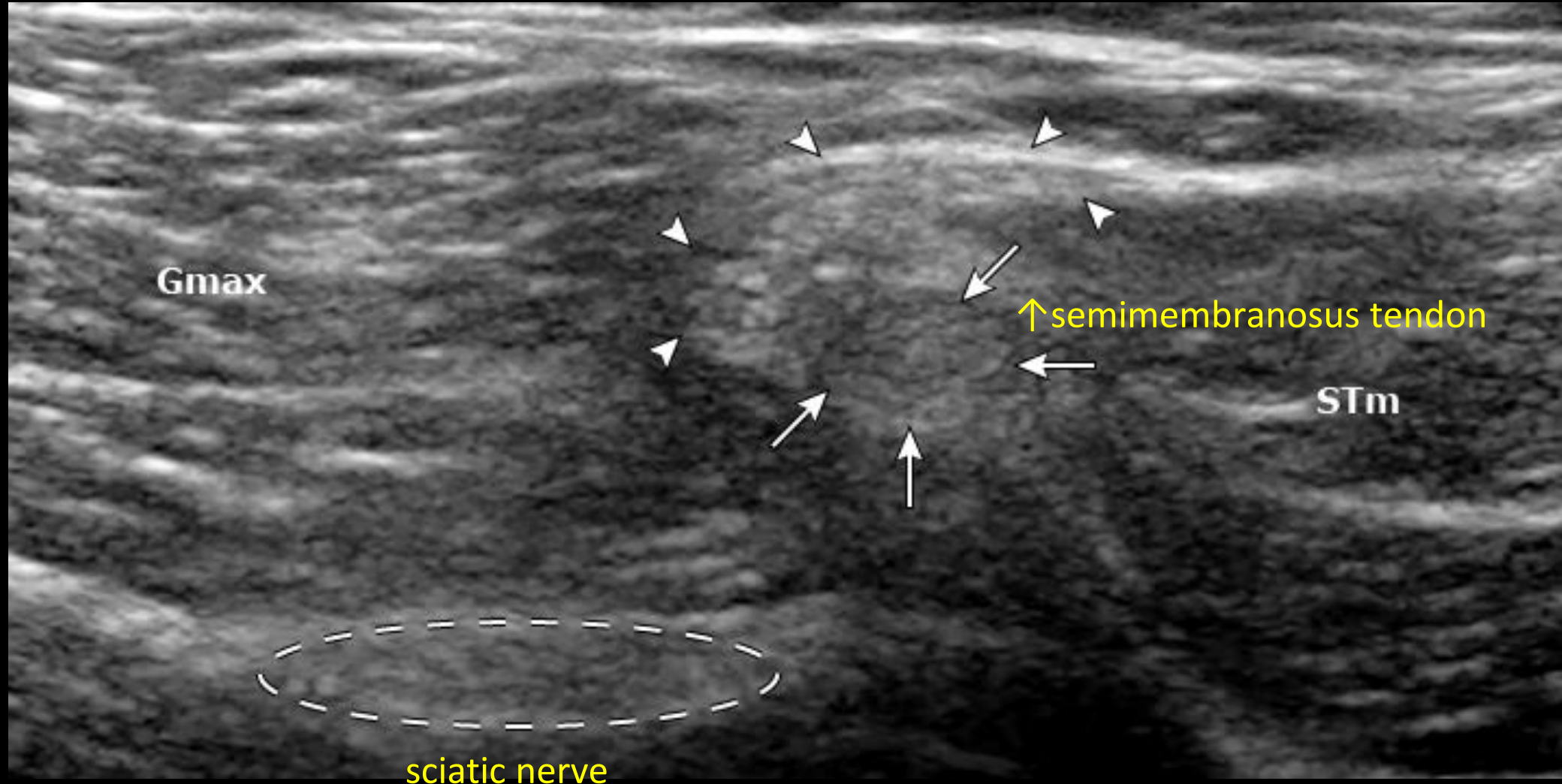
ST:
semitendinosus
muscle

SM:
semimembranosus
muscle
G: gracilis muscle



proximal hamstring and conjoint tendon in transverse view

▼ conjoint tendon

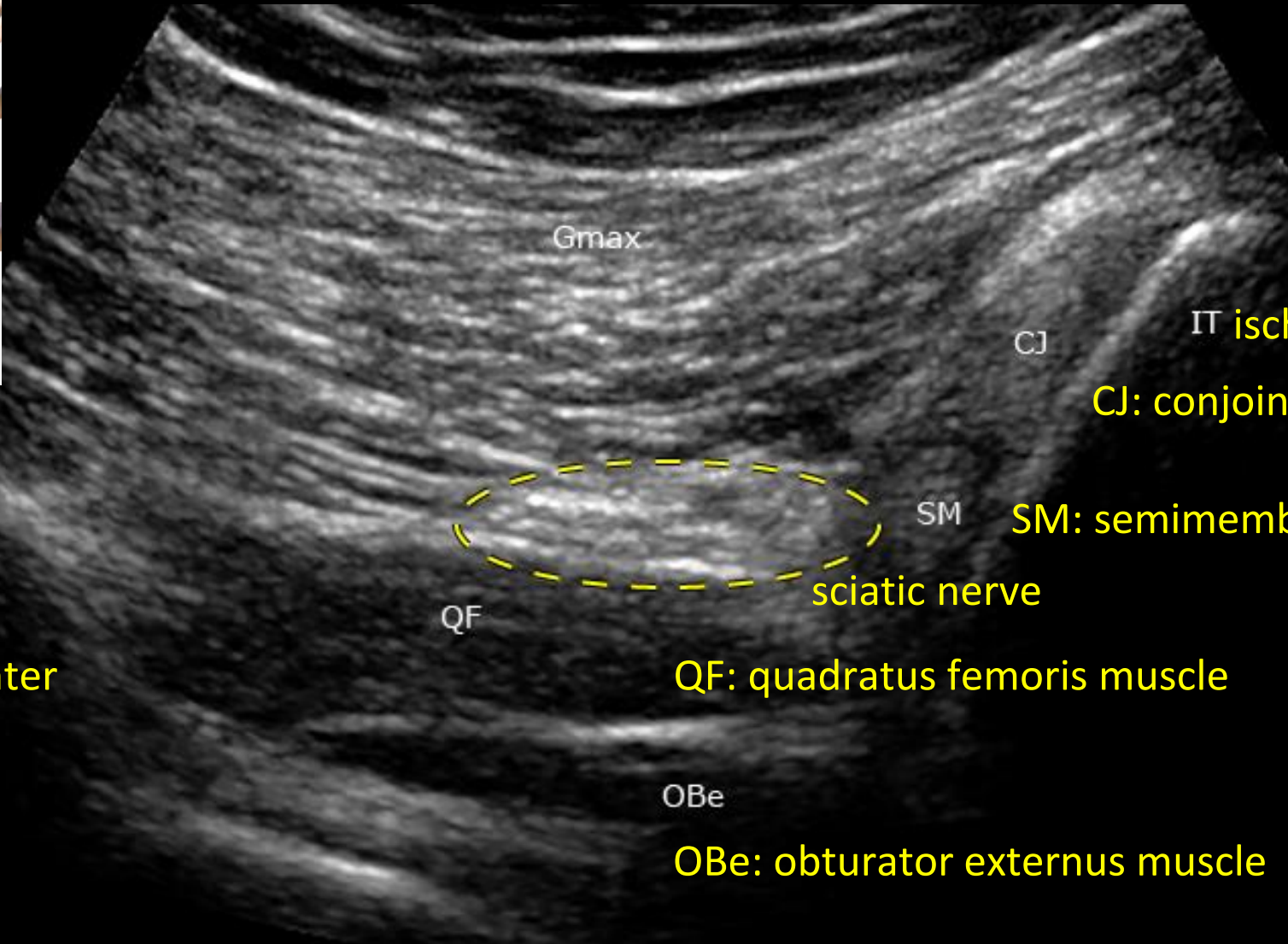
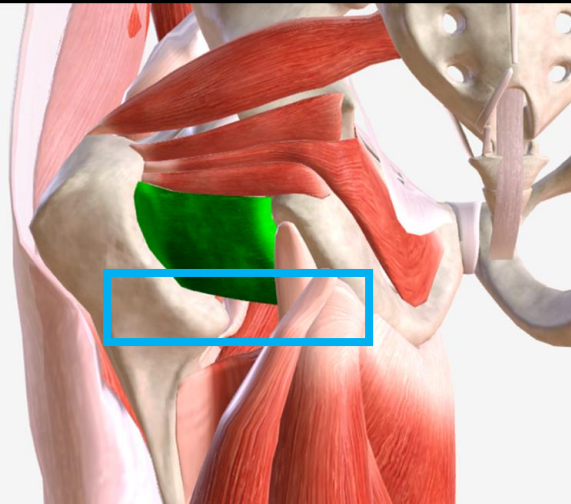


lateral

medial

maximus and quadratus femoris and other external rotators in transverse plane

Gmax: gluteus maximus muscle



Gmax

CJ

IT ischial tuberosity

CJ: conjoint tendon

SM

SM: semimembranosus muscle

sciatic nerve

QF

QF: quadratus femoris muscle

OBe

OBe: obturator externus muscle

LT

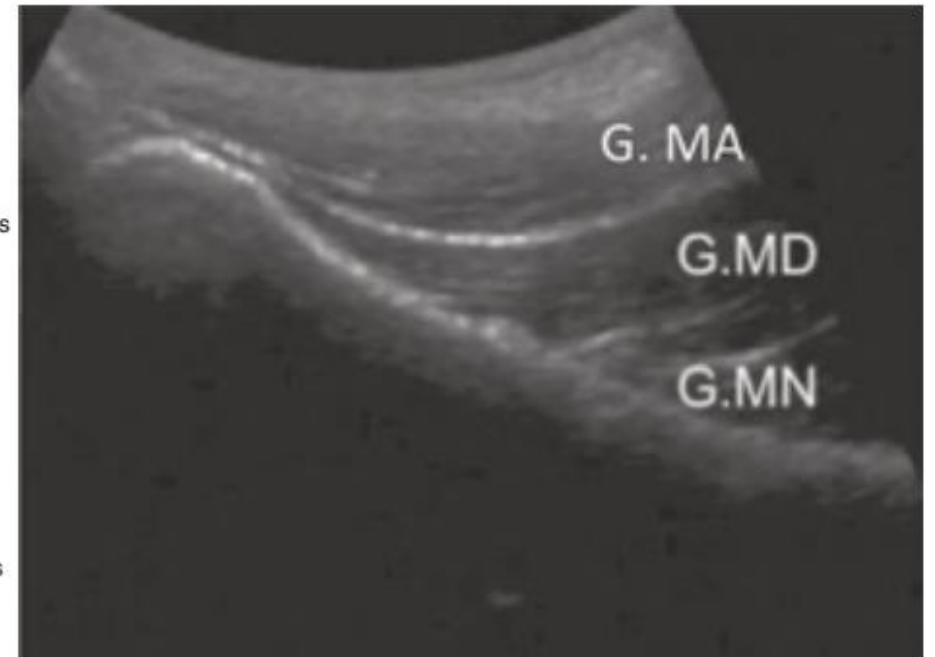
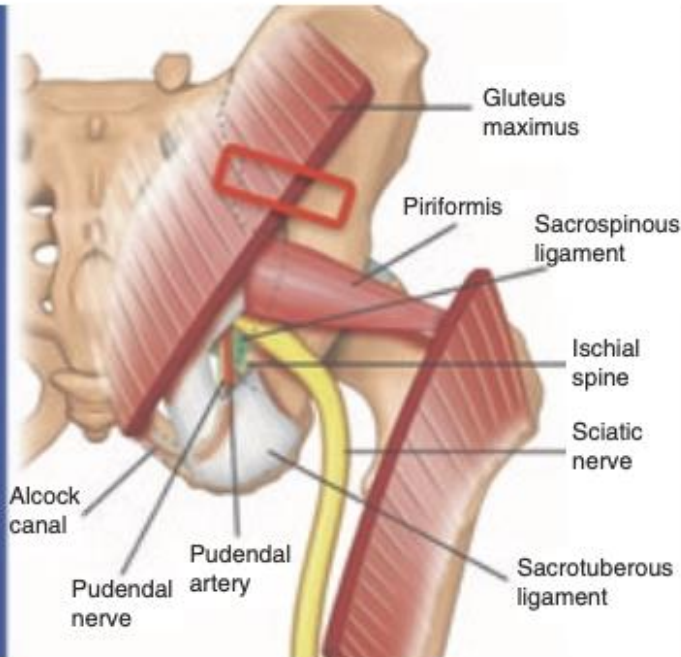
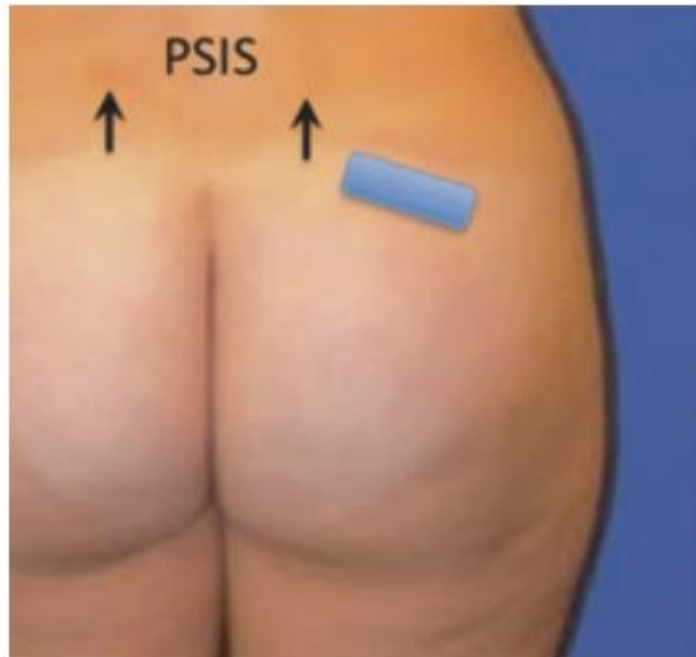
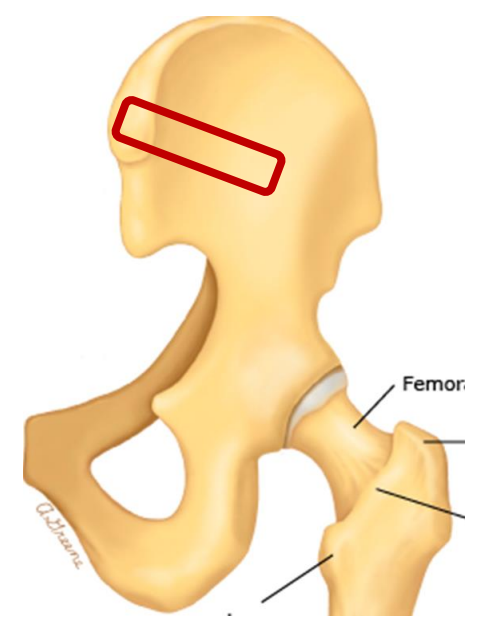
lesser trochanter

lateral

medial

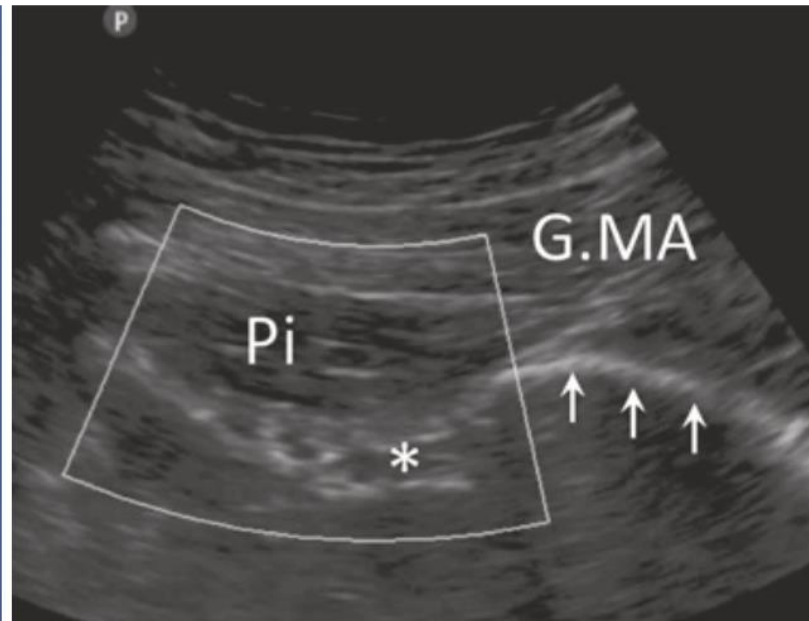
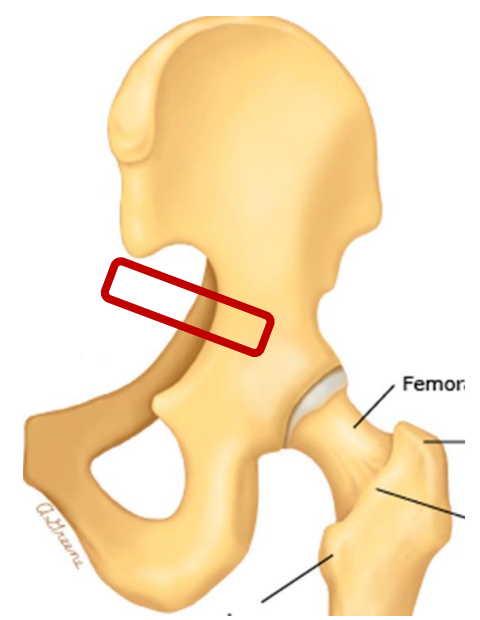
Scan 1 Over the iliac crest

- Key landmark: **posterior superior iliac spine (PSIS)**.
- The structures will be iliac crest with 3 layers of gluteus muscles in view.



Scan 2 At the sciatic notch

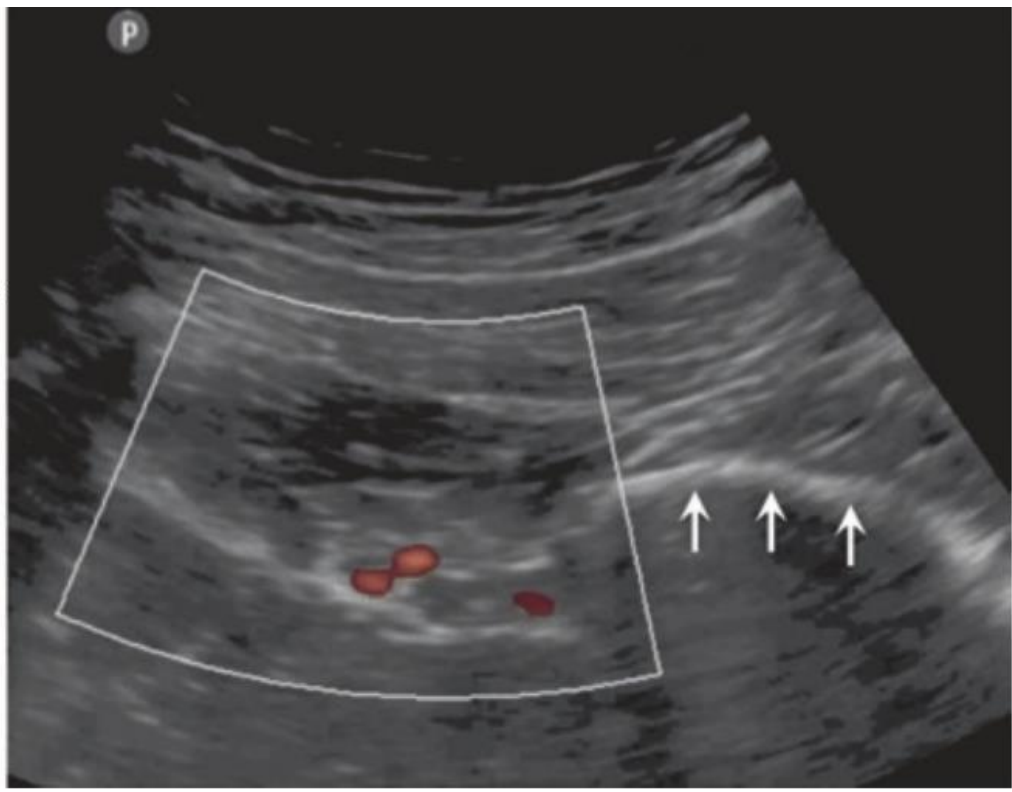
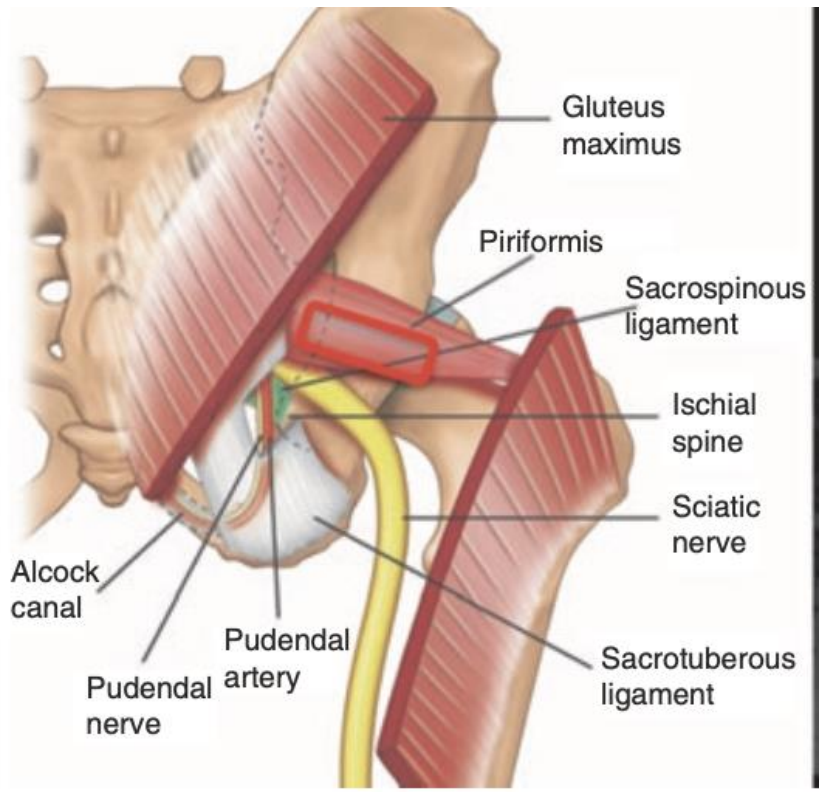
- Ischium appears as curved structure (arrows) as it forms the posterior wall of the acetabulum.
- 2 layers of muscles are seen in this scan: Gluteus maximus covering the Piriformis.



Ischium

Scan 2 At the sciatic notch

- Deep to the piriformis, the sciatic nerve is seen and is always accompanied by the branch of Inferior gluteal artery (red in color Doppler).



Ischium

piriformis in transverse plane

