

CT of the Pelvis:

Cross-sectional anatomy made easy!

Landmarks

General

- Iliac and femoral vessels
- Bladder and ureters
- Colon and rectum
- Muscles and bones

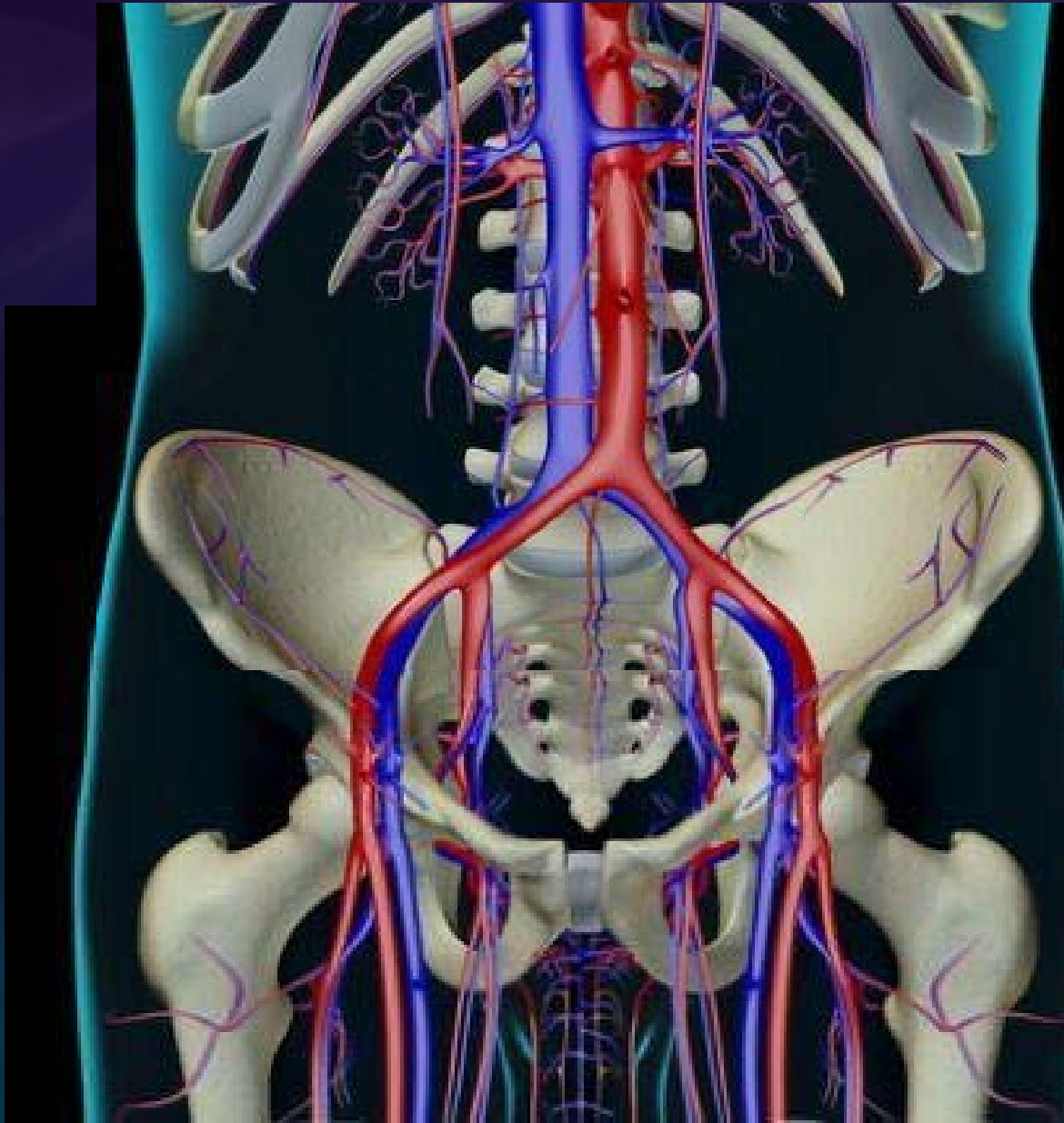
Male

- Prostate, seminal vesicles, vas deferens

Female

- Uterus, ovaries, round ligaments

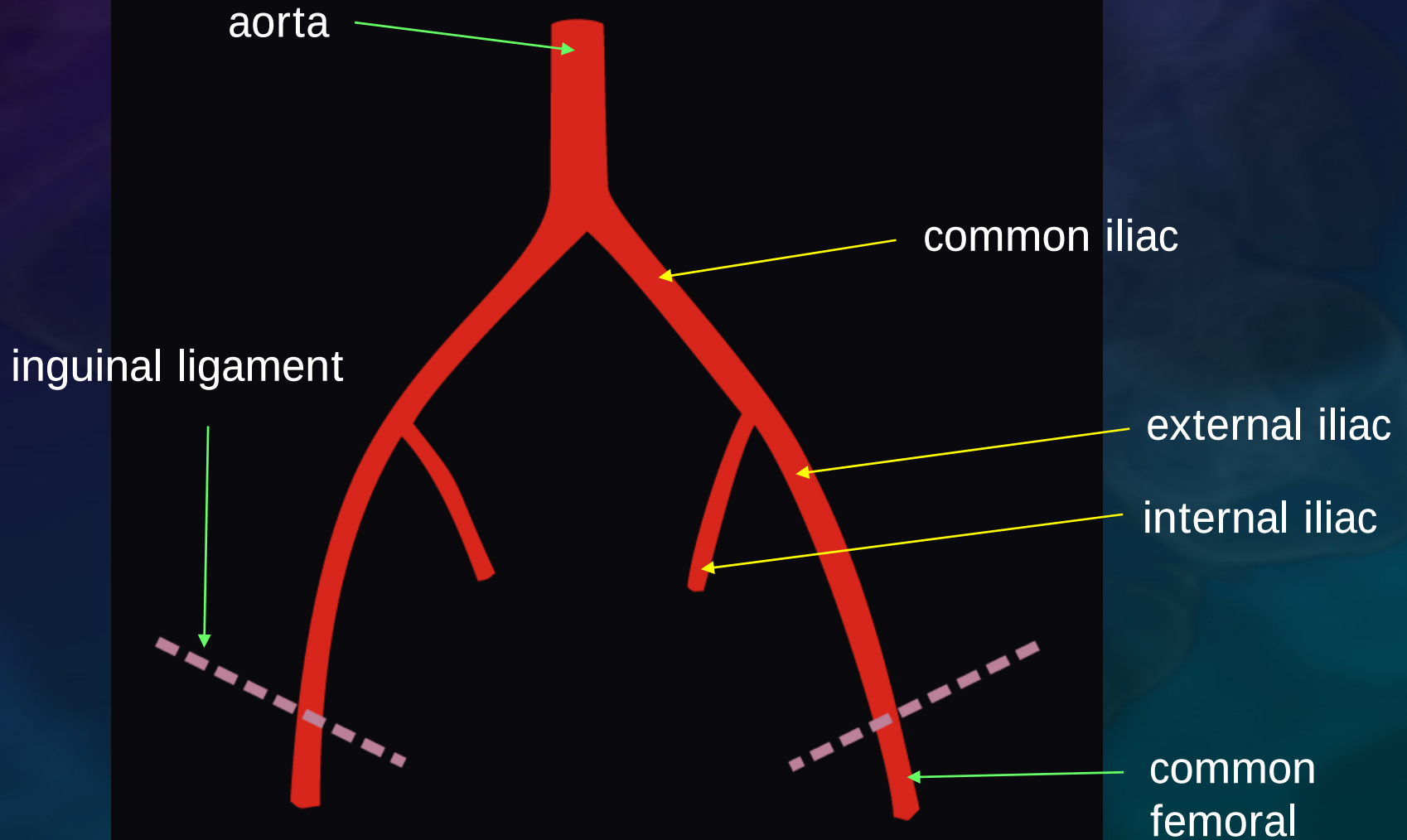
Iliac arteries & veins



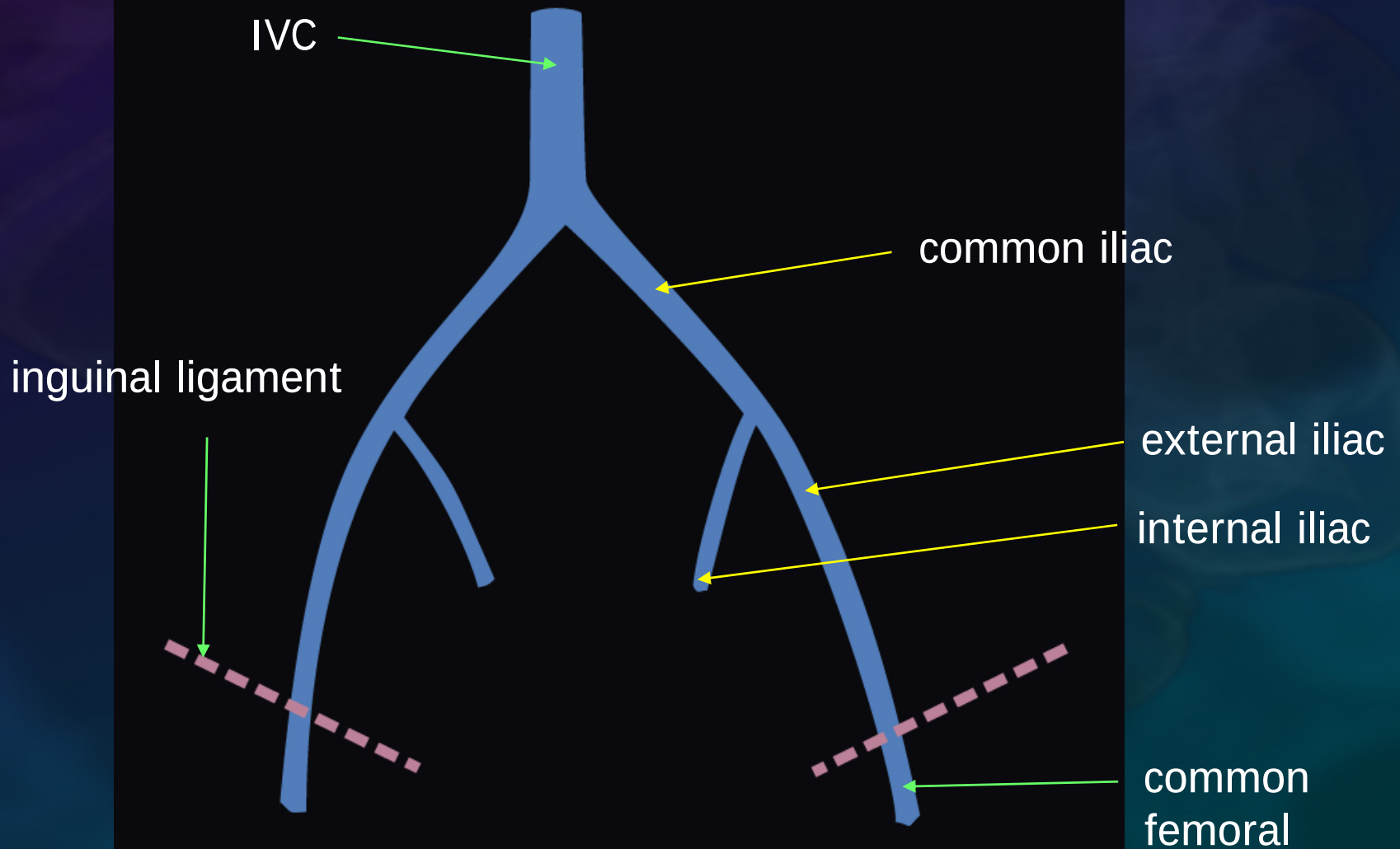
Common iliac a.:
from L4 vertebra to
just below the
lumbosacral disc,
moving in front of
their corresponding v.

Int. iliac a.:
from lumbosacral
disc & end at upper
margin of greater
sciatic notch

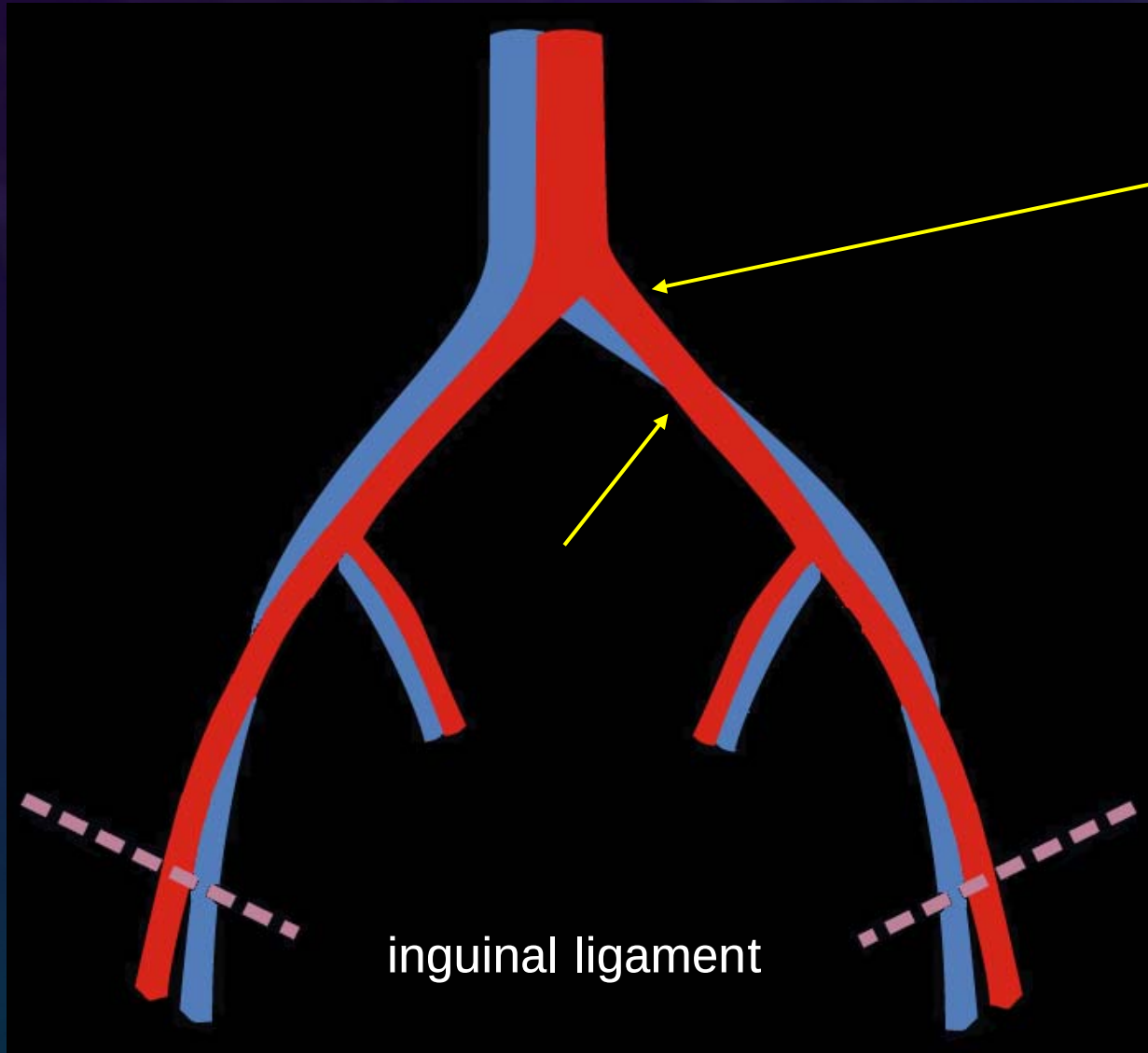
Iliac arteries



Iliac veins



Iliac vessels superimposed



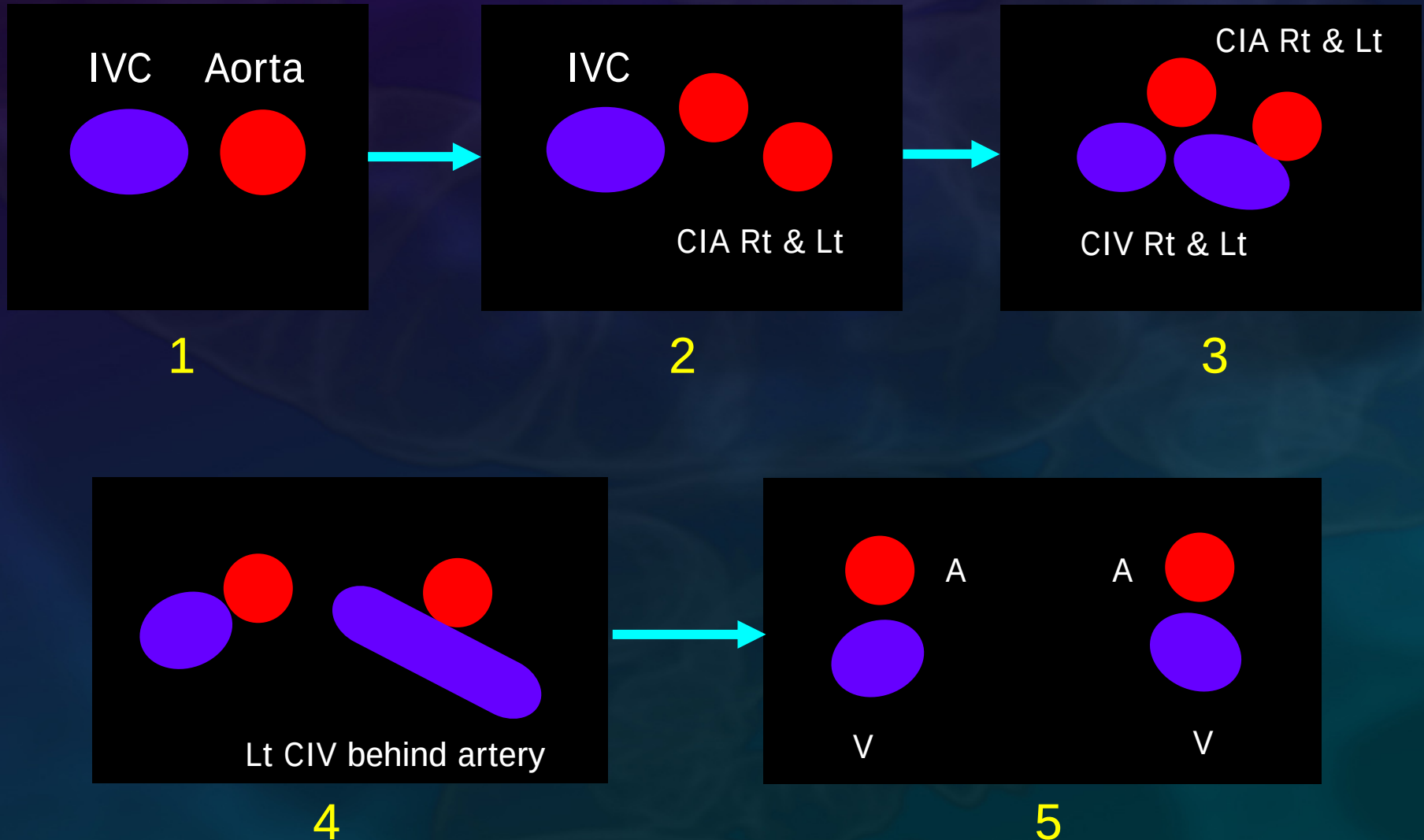
Common iliac arteries arise **in front** of their corresponding veins

Left common iliac vein is longer than the right

(needs to get to the IVC; crosses behind the artery)

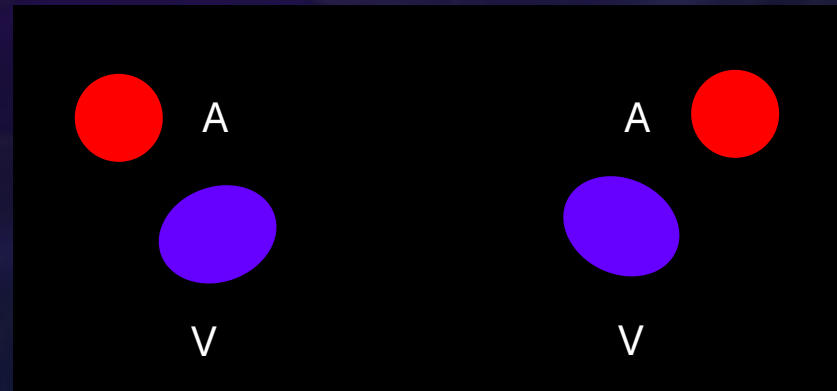
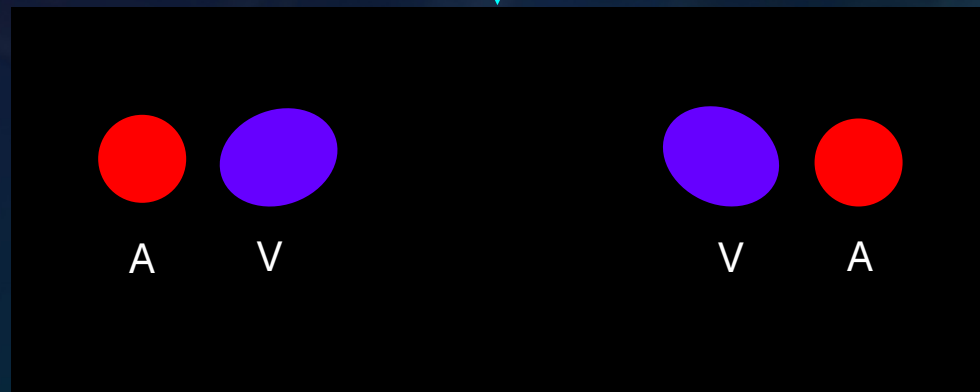
Common femoral artery lies lateral to the vein in the inguinal region

Iliac vessels – axial relationship



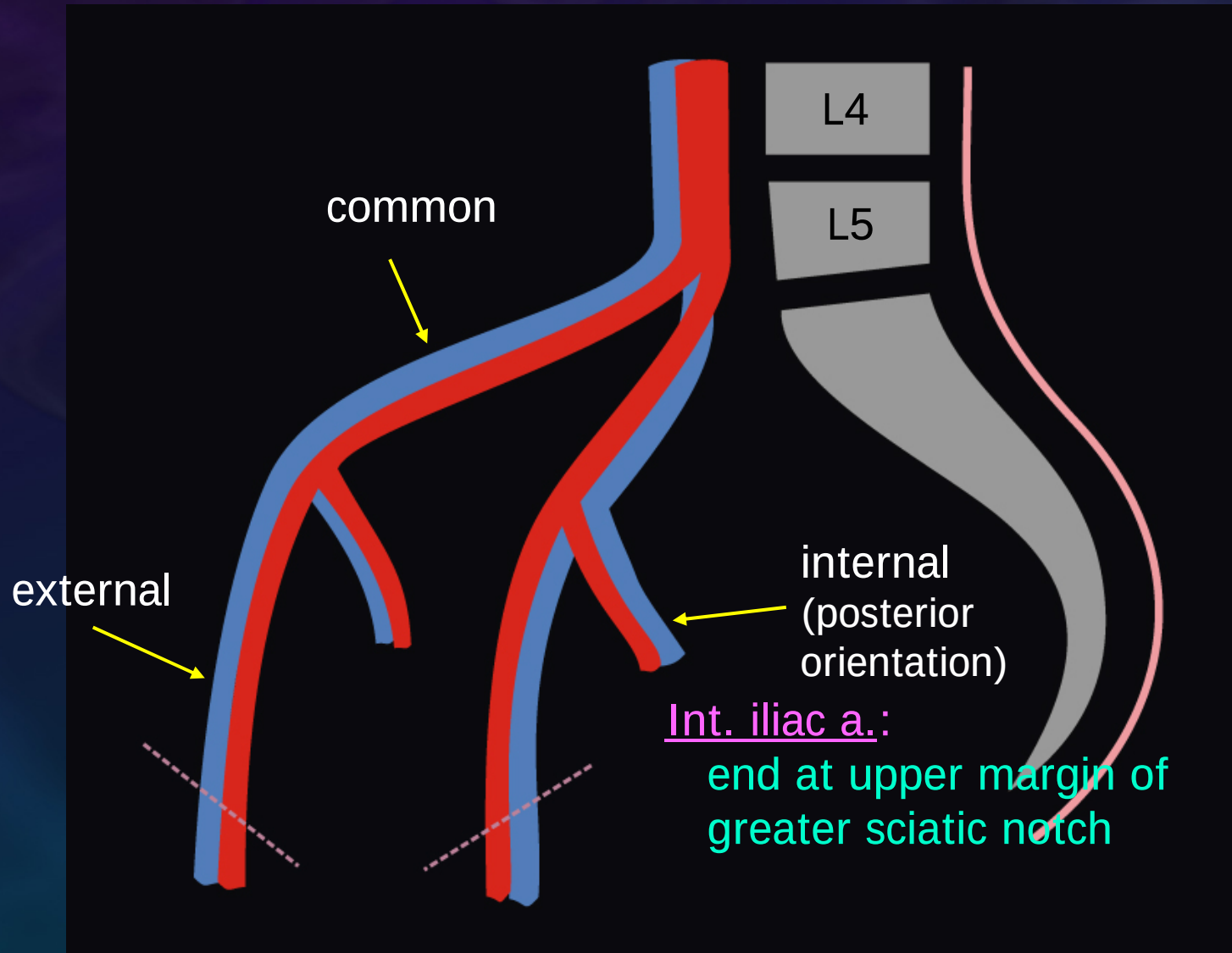
Iliac vessels – axial relationship

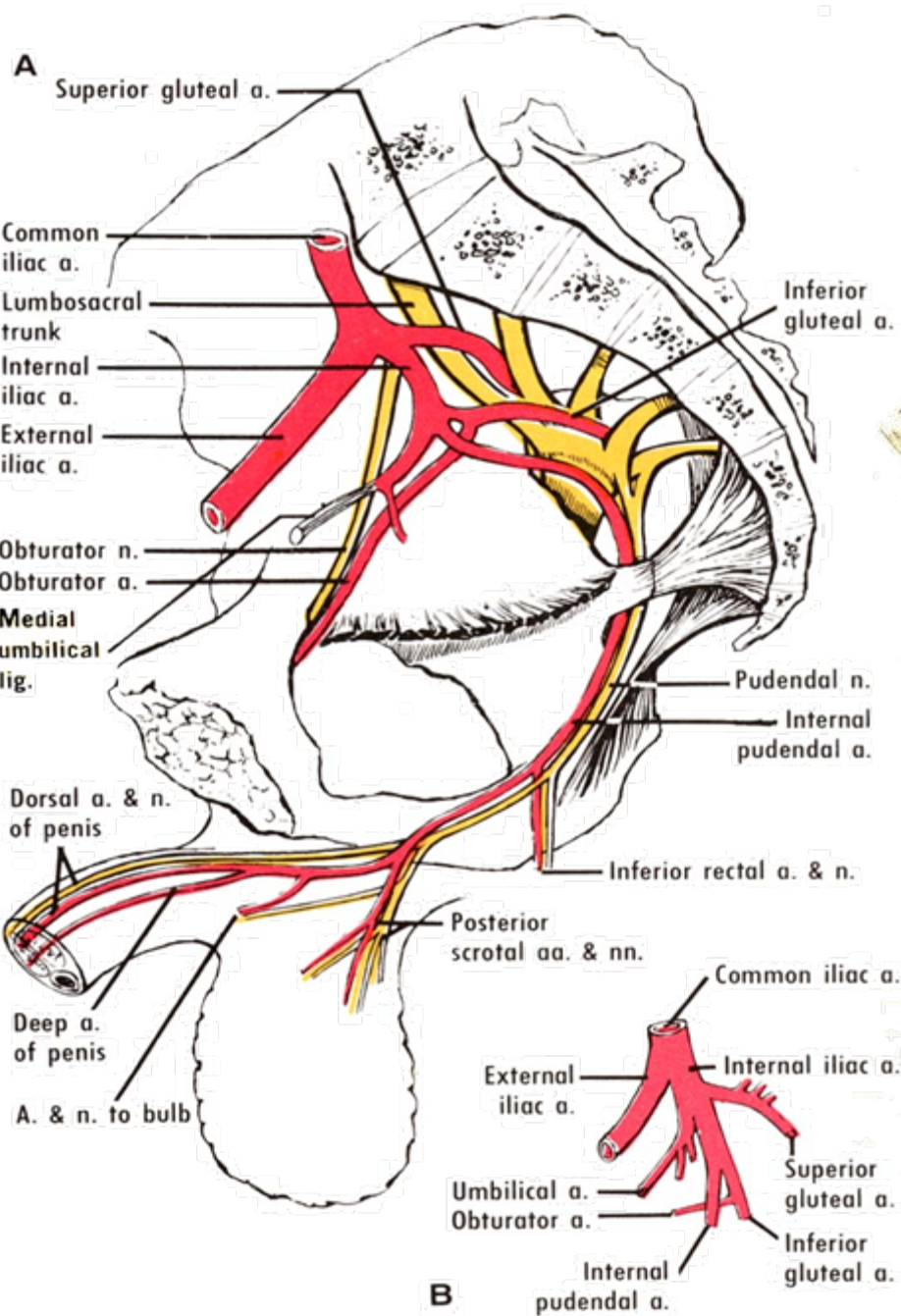
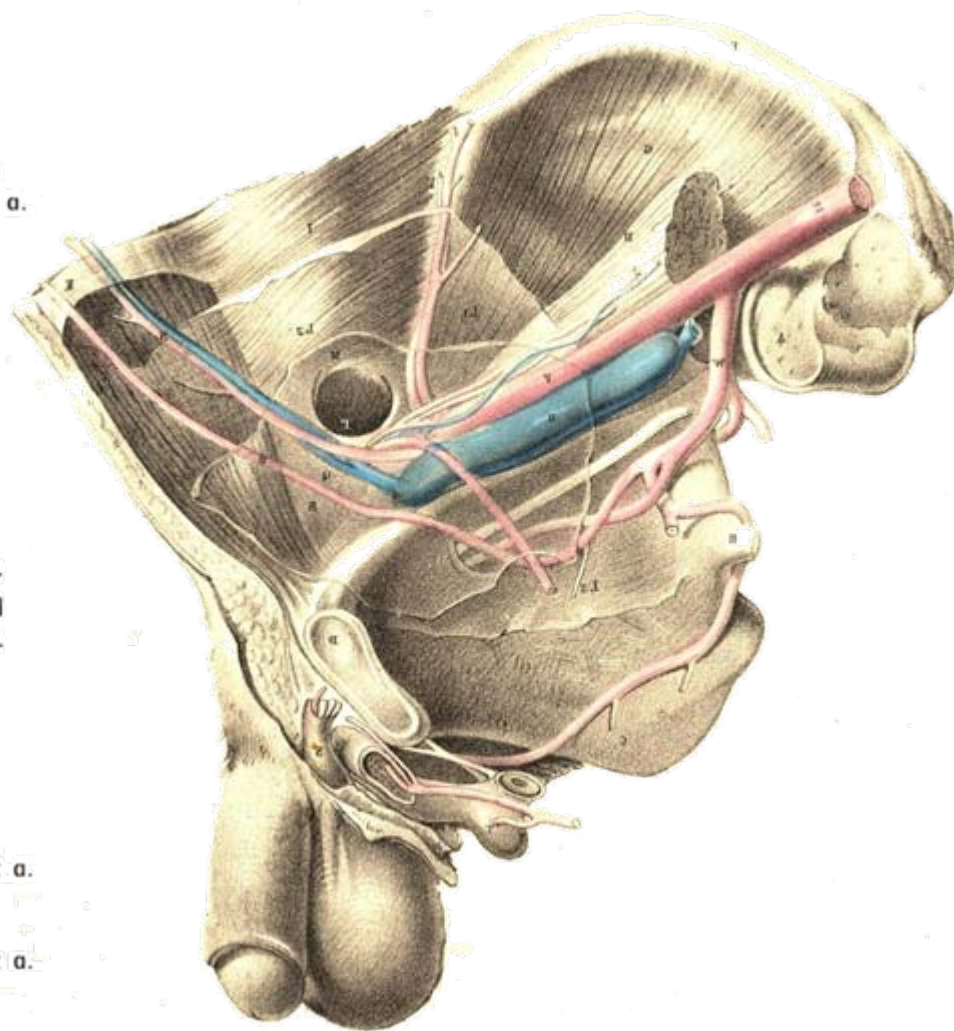
External iliac
arteries
become
more lateral
as they exit
the pelvis

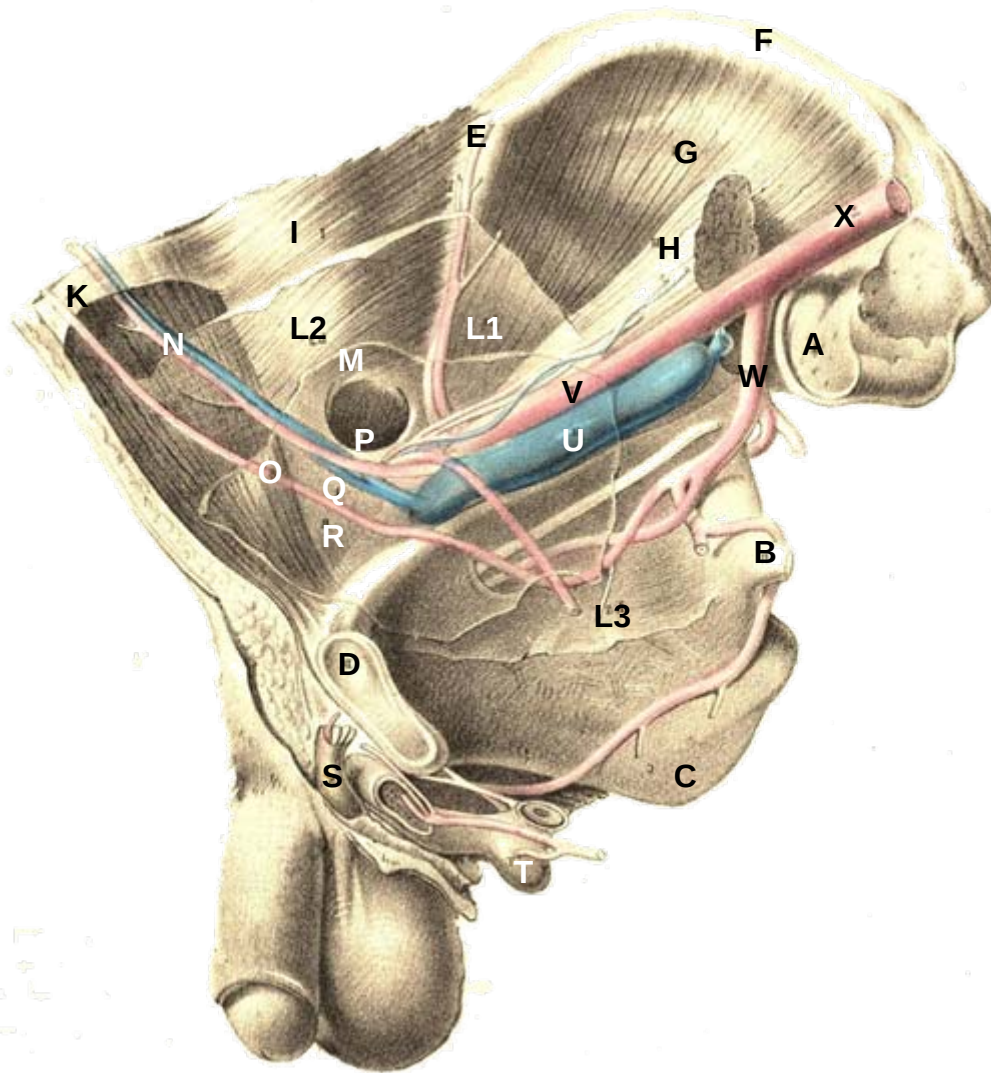


Common femoral artery lies lateral to the vein in the inguinal region

Iliac vessels – lateral orientation

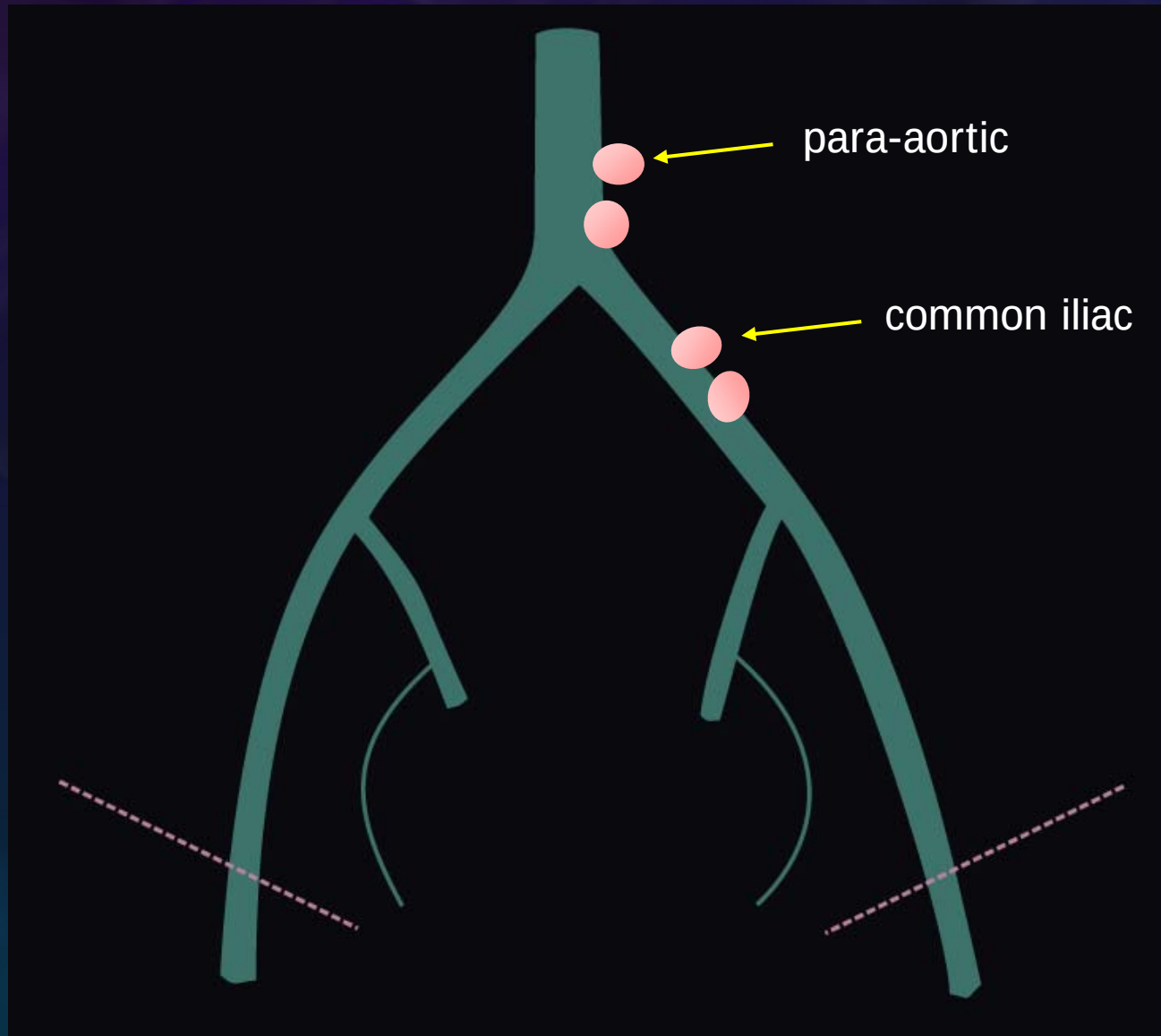




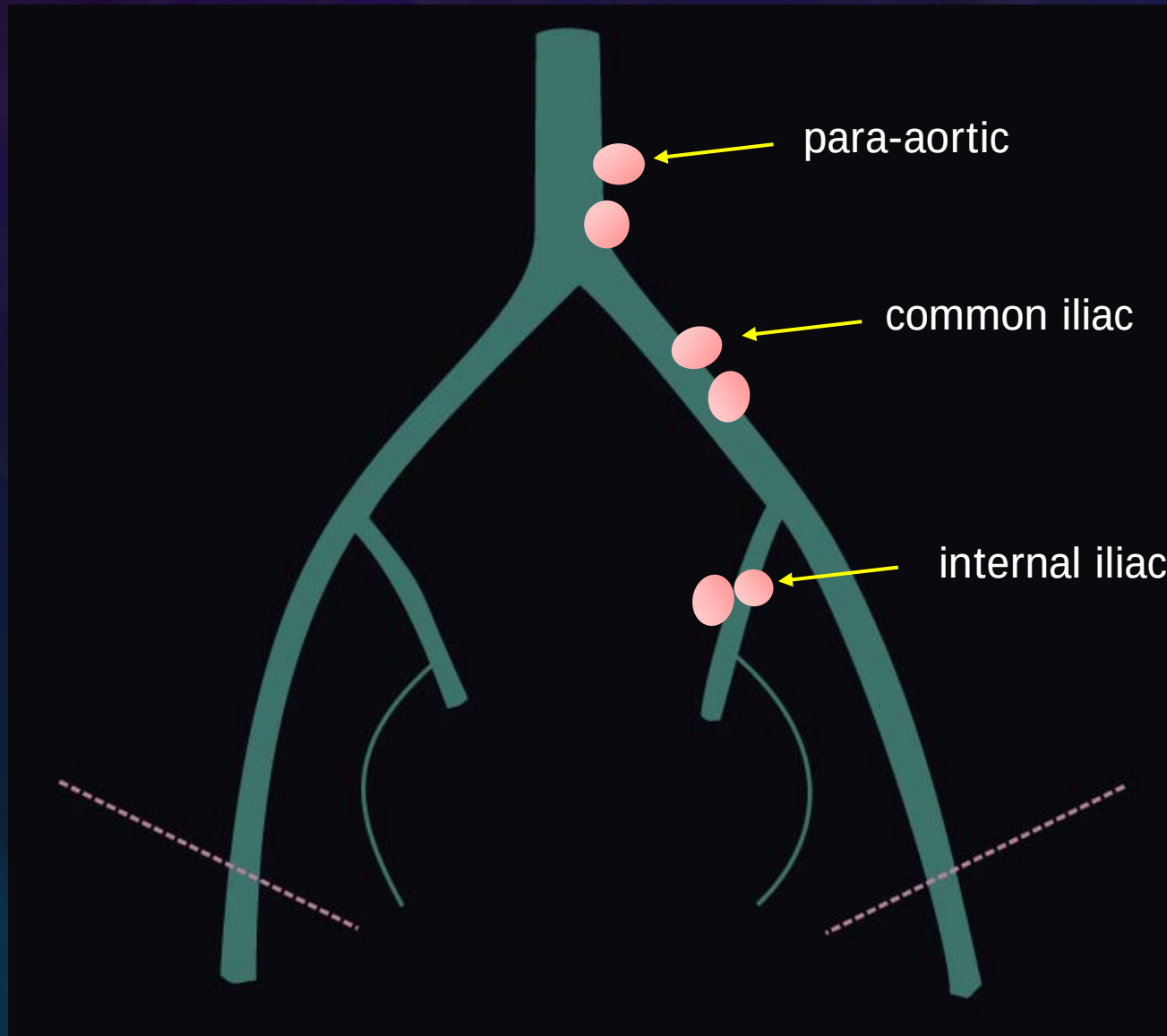


- A.** That part of the ilium which abuts against the sacrum.
- B.** The spine of the ischium.
- C.** The tuberosity of the ischium.
- D.** The symphysis pubis.
- E.** Situation of the anterior superior iliac spine.
- F.** Crest of the ilium.
- G.** Iliacus muscle.
- H.** Psoas magnus muscle supporting the spermatic vessels.
- I.** Transversalis muscle.
- K.** Termination of the sheath of the rectus muscle.
- L1 L2 L3.** The iliac, transverse and pelvic portions of the transversalis fascia.
- M.** The peritoneum lining the groin.
- N.** The epigastric vessels lying between the peritoneum, M, and the transversalis fascia, L2.
- O.** The umbilical ligament.
- P.** The neck of the sac of an external inguinal hernia formed before the spermatic vessels.
- Q.** An interval which occasionally occurs between the umbilical ligament and the epigastric artery.
- R and Q.** Situations where the direct inguinal hernia occurs when, as in this case, the umbilical ligament crosses the space named the internal fossa--the triangle of Hesselbach.
- S.** Lower part of the right spermatic cord.
- T.** The bulb of the urethra.
- U.** External iliac vein covered by the peritoneum.
- V.** External iliac artery covered by the peritoneum.
- W.** Internal iliac artery.
- X.** Common iliac artery.

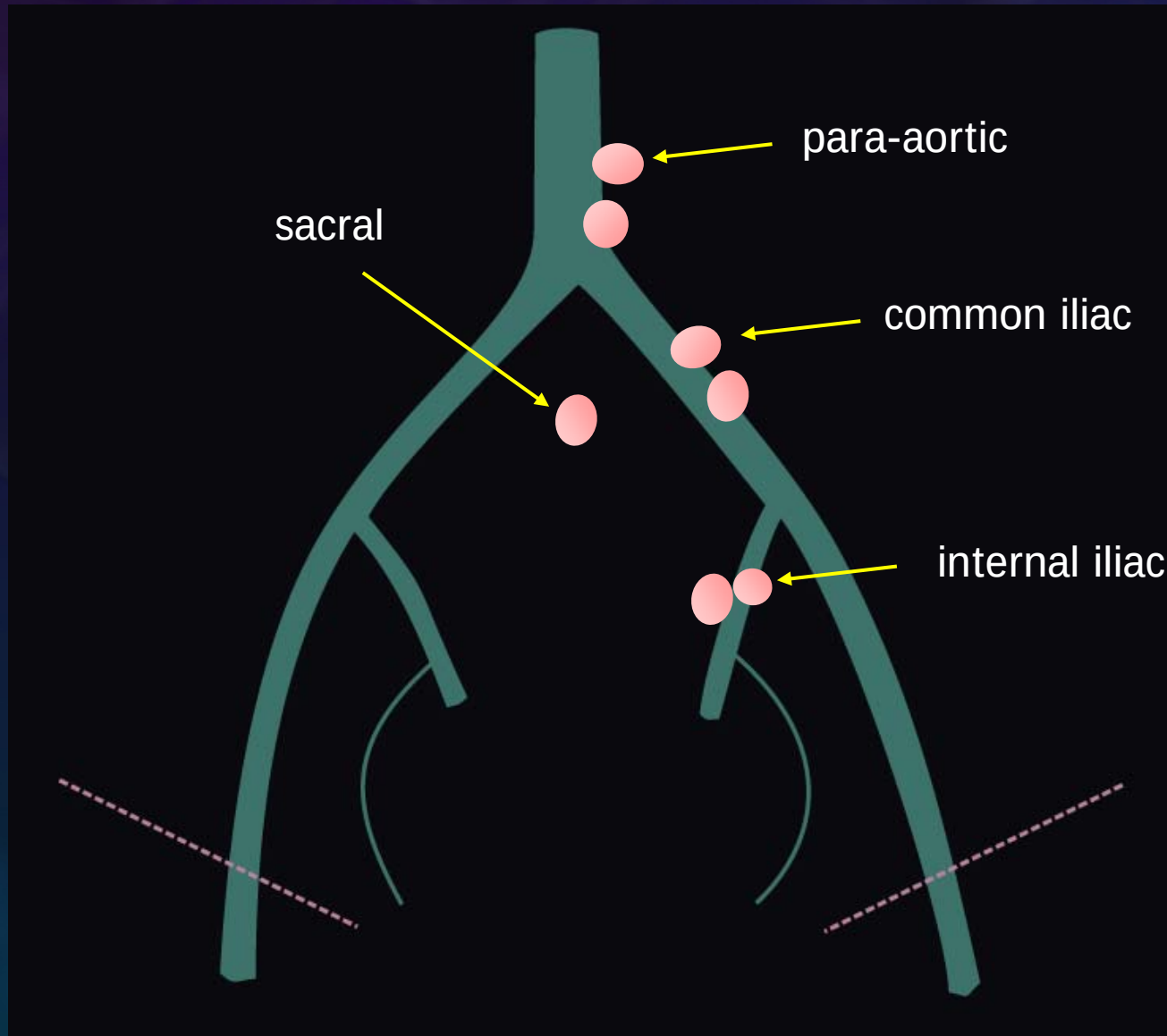
Pelvic lymph nodes



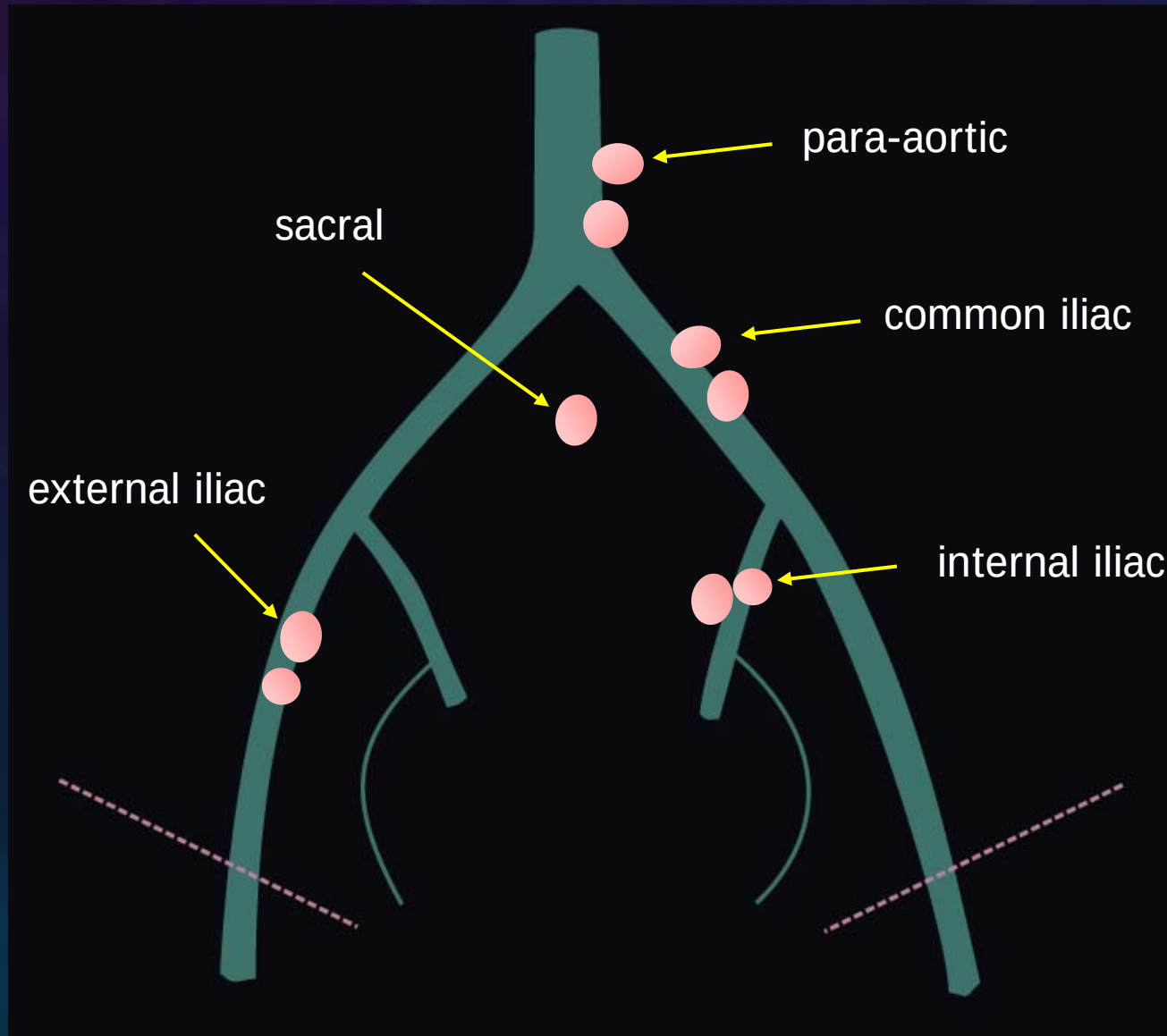
Pelvic lymph nodes



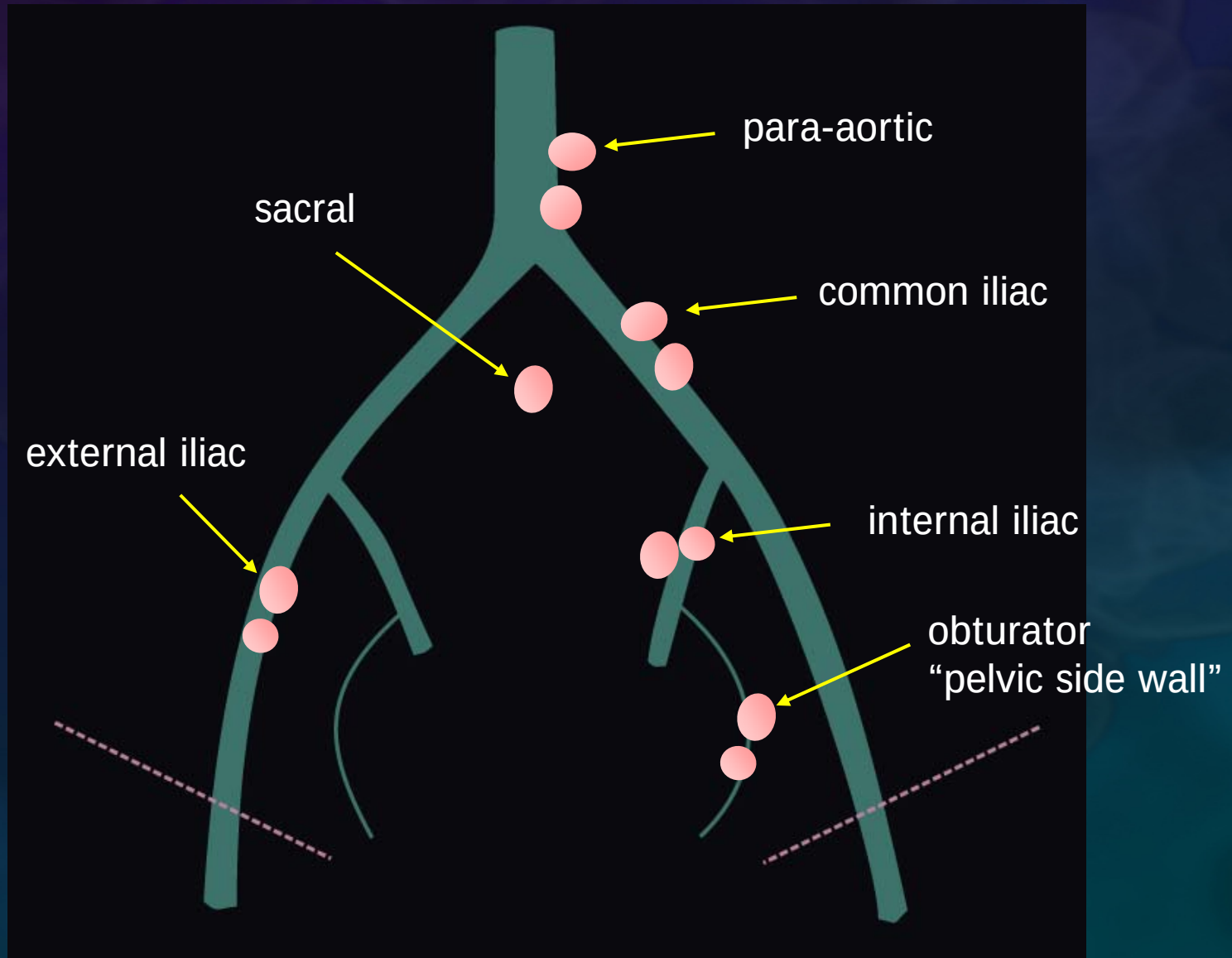
Pelvic lymph nodes



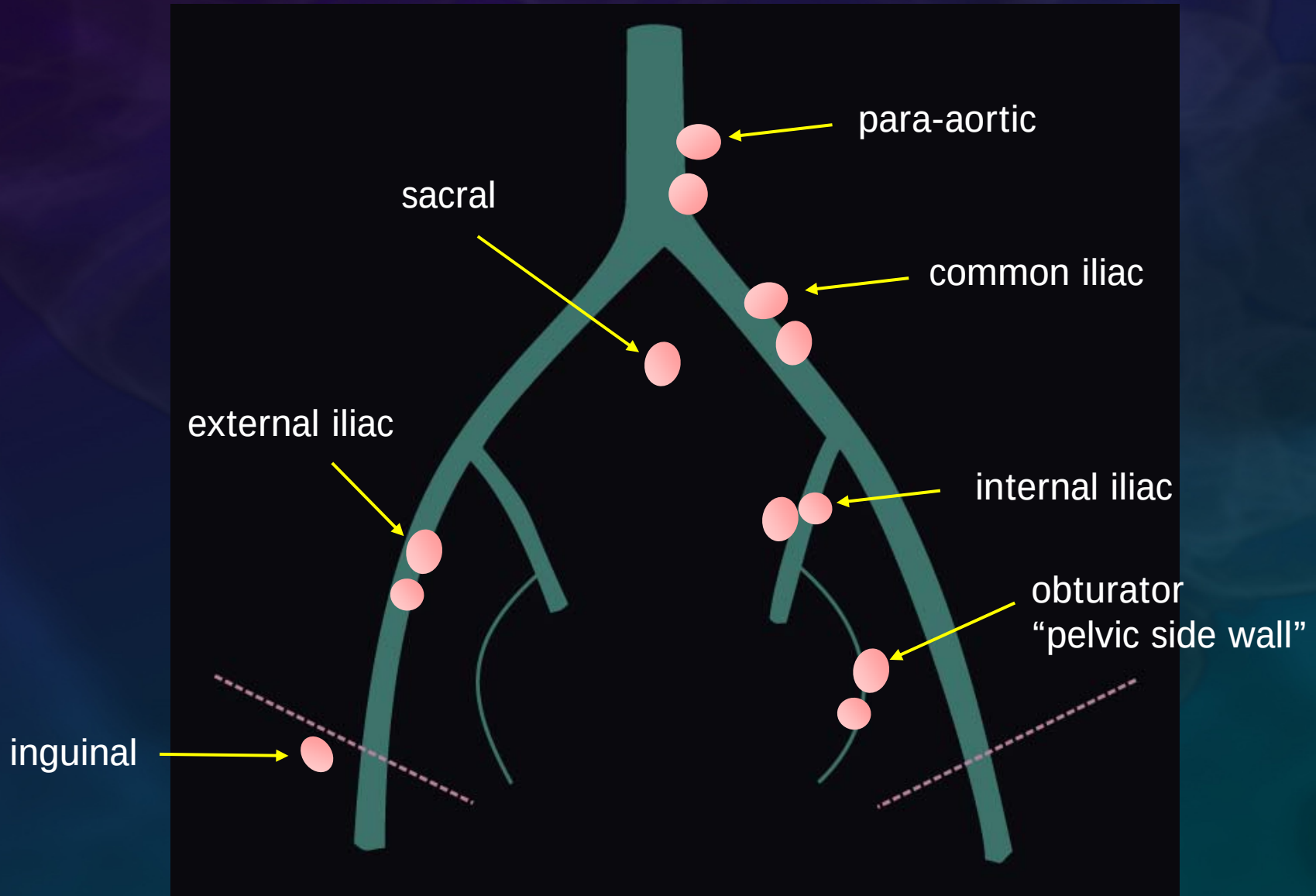
Pelvic lymph nodes



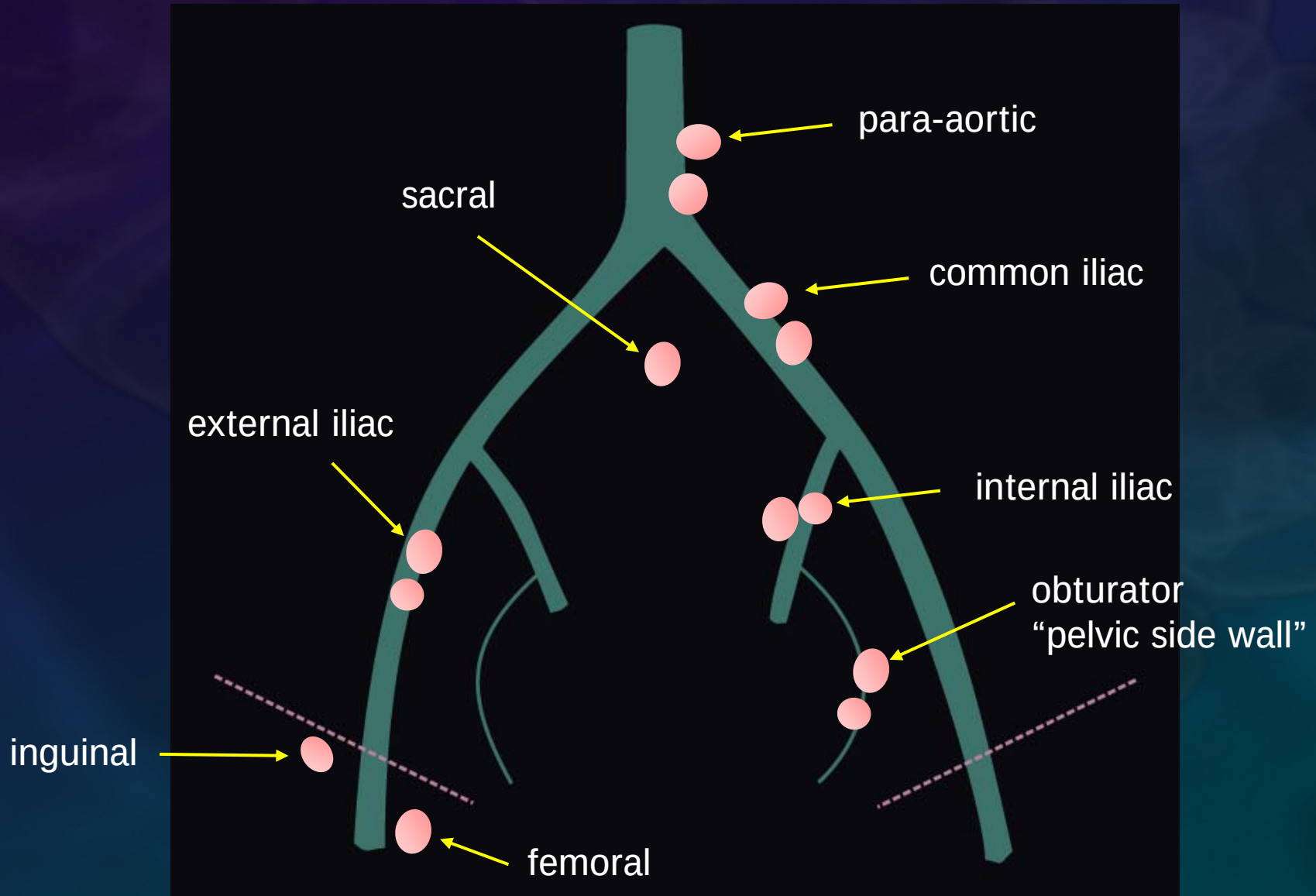
Pelvic lymph nodes



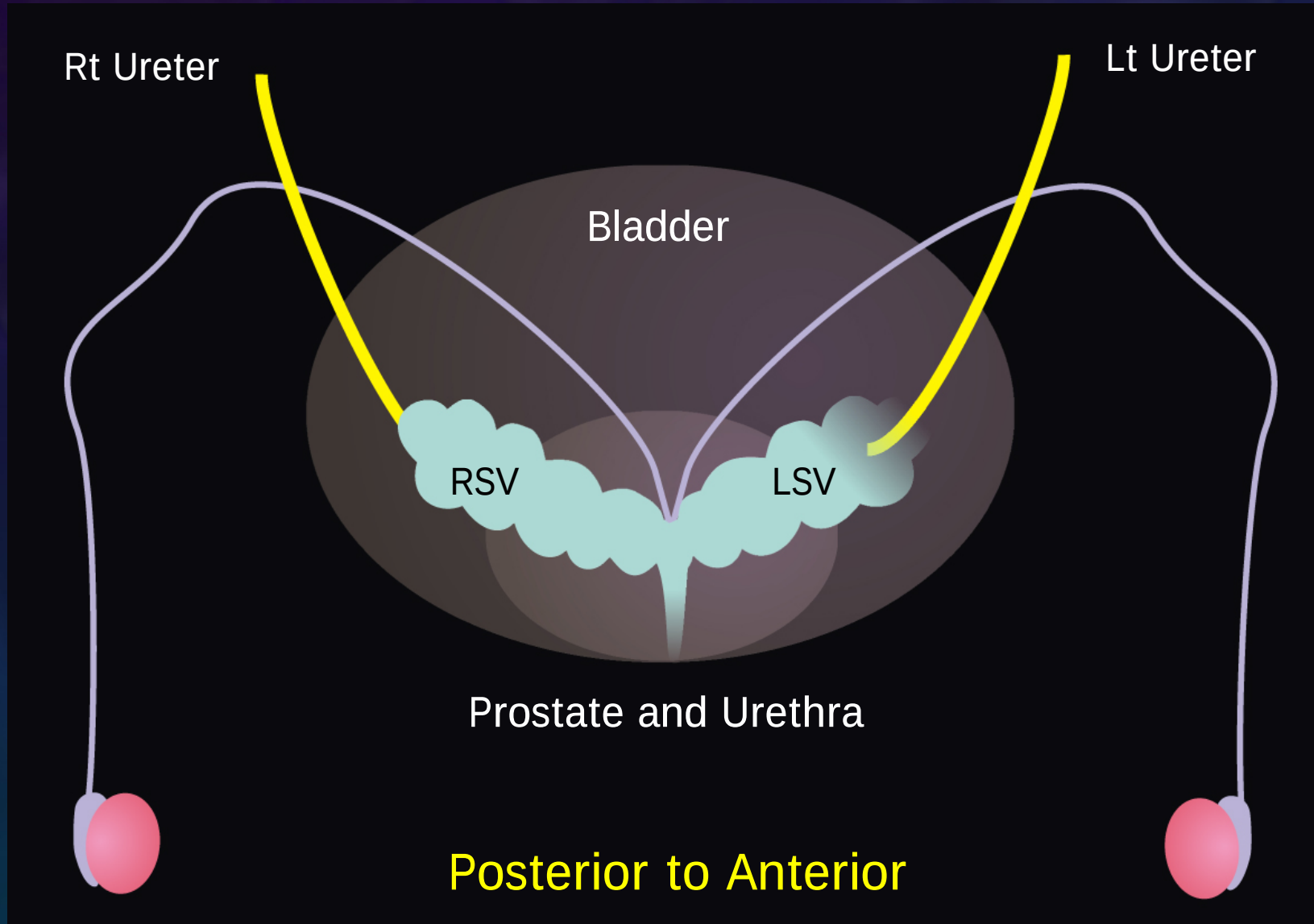
Pelvic lymph nodes



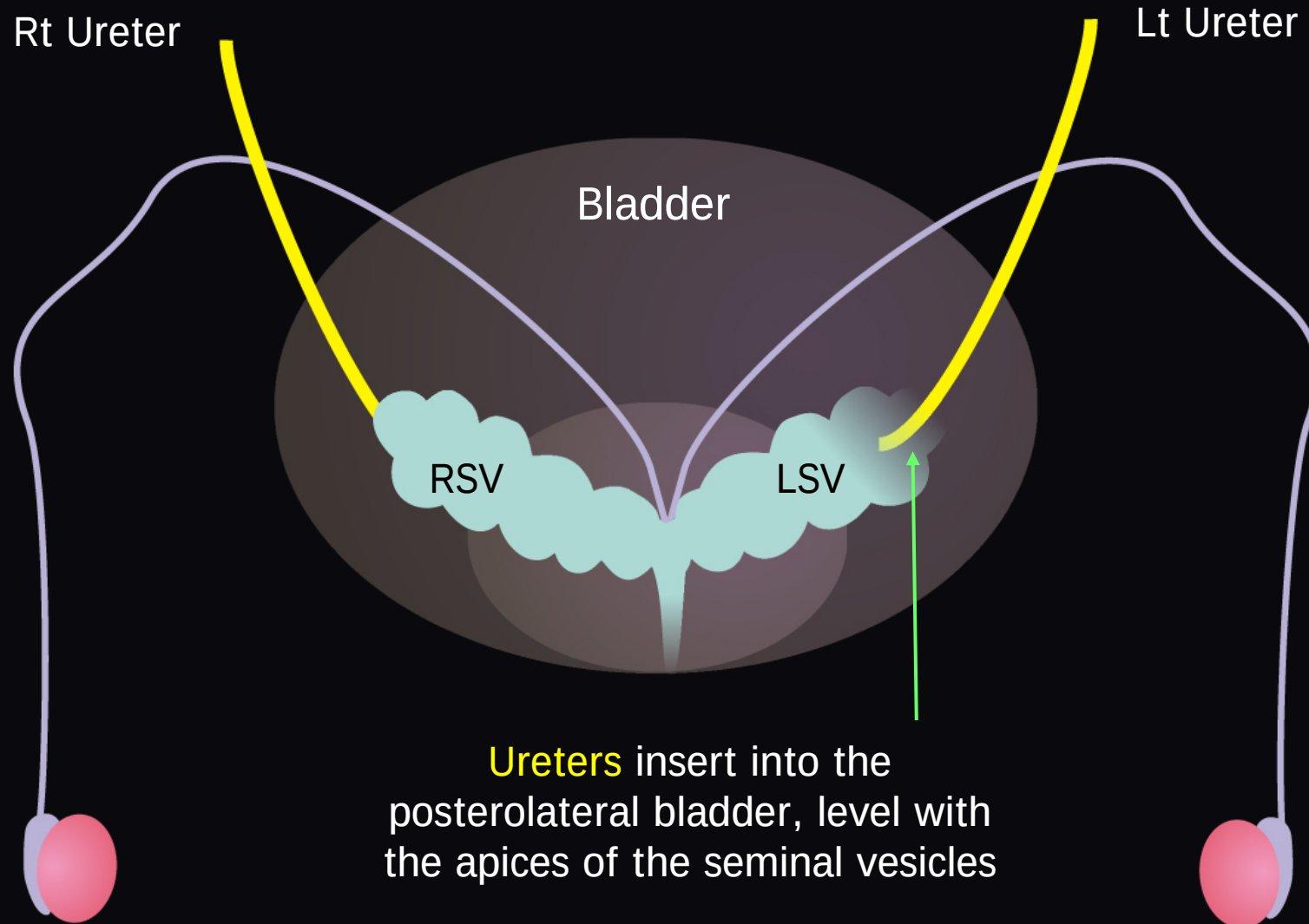
Pelvic lymph nodes



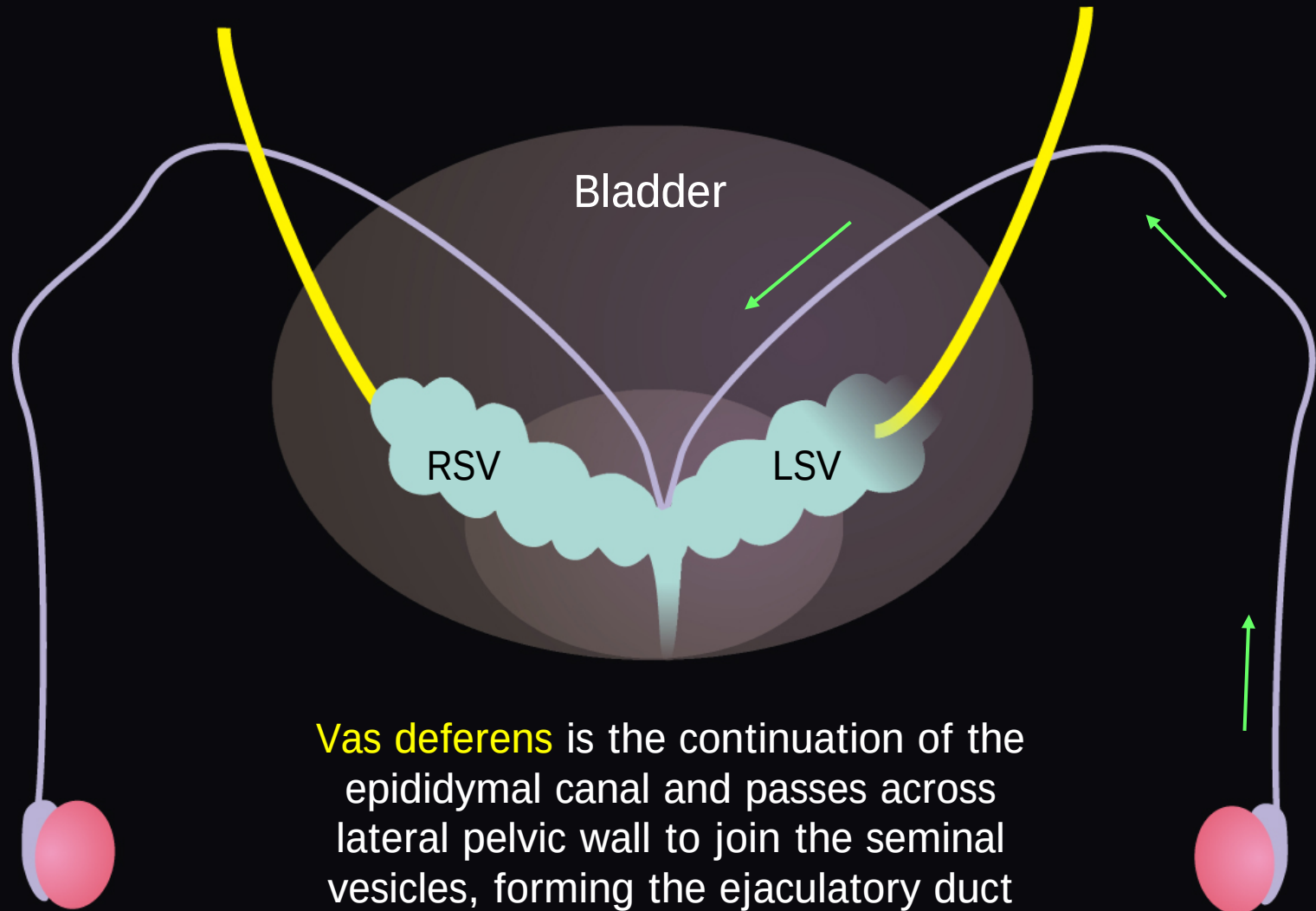
Male Pelvis - Landmarks



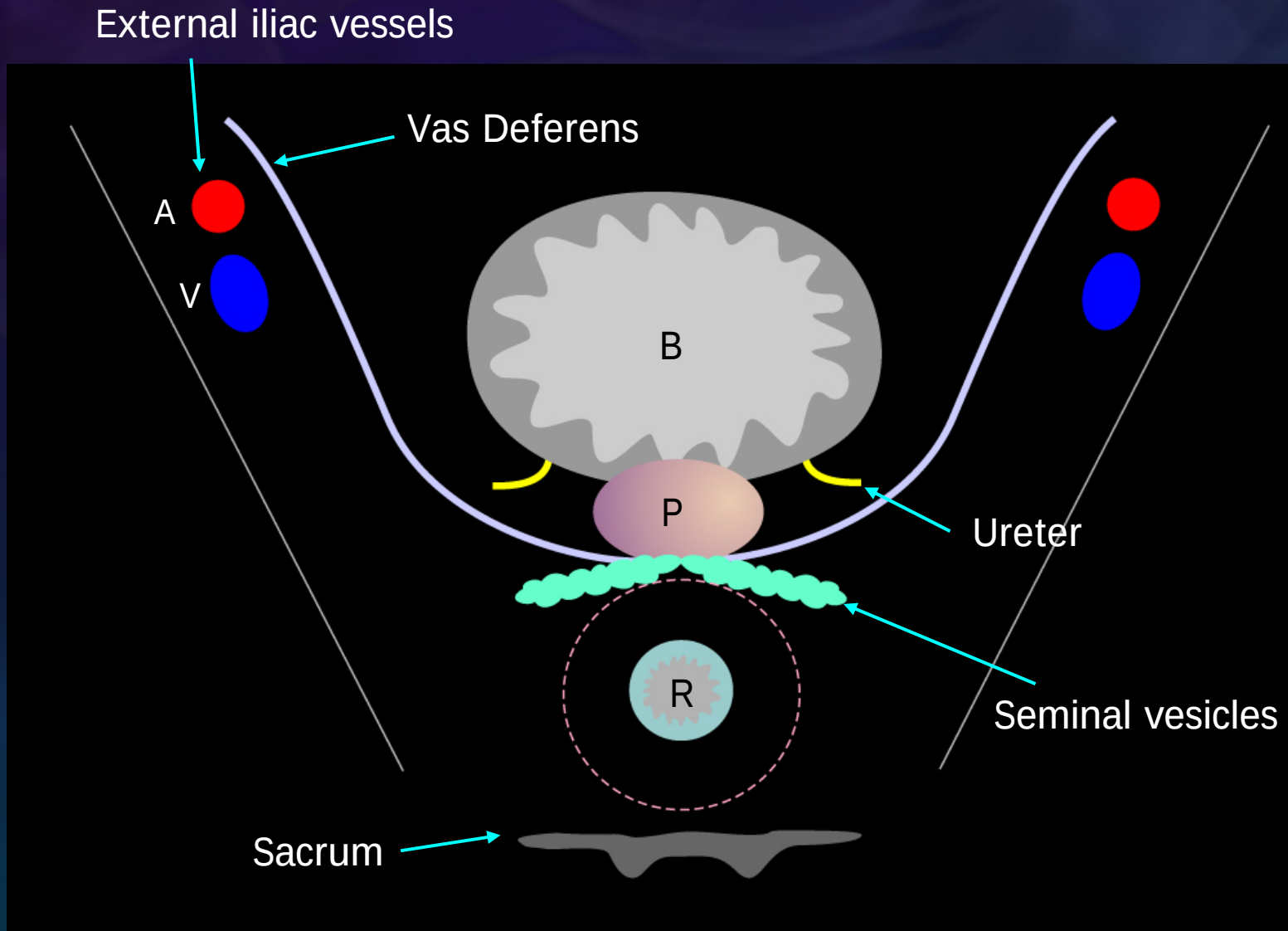
Male Pelvis - Landmarks



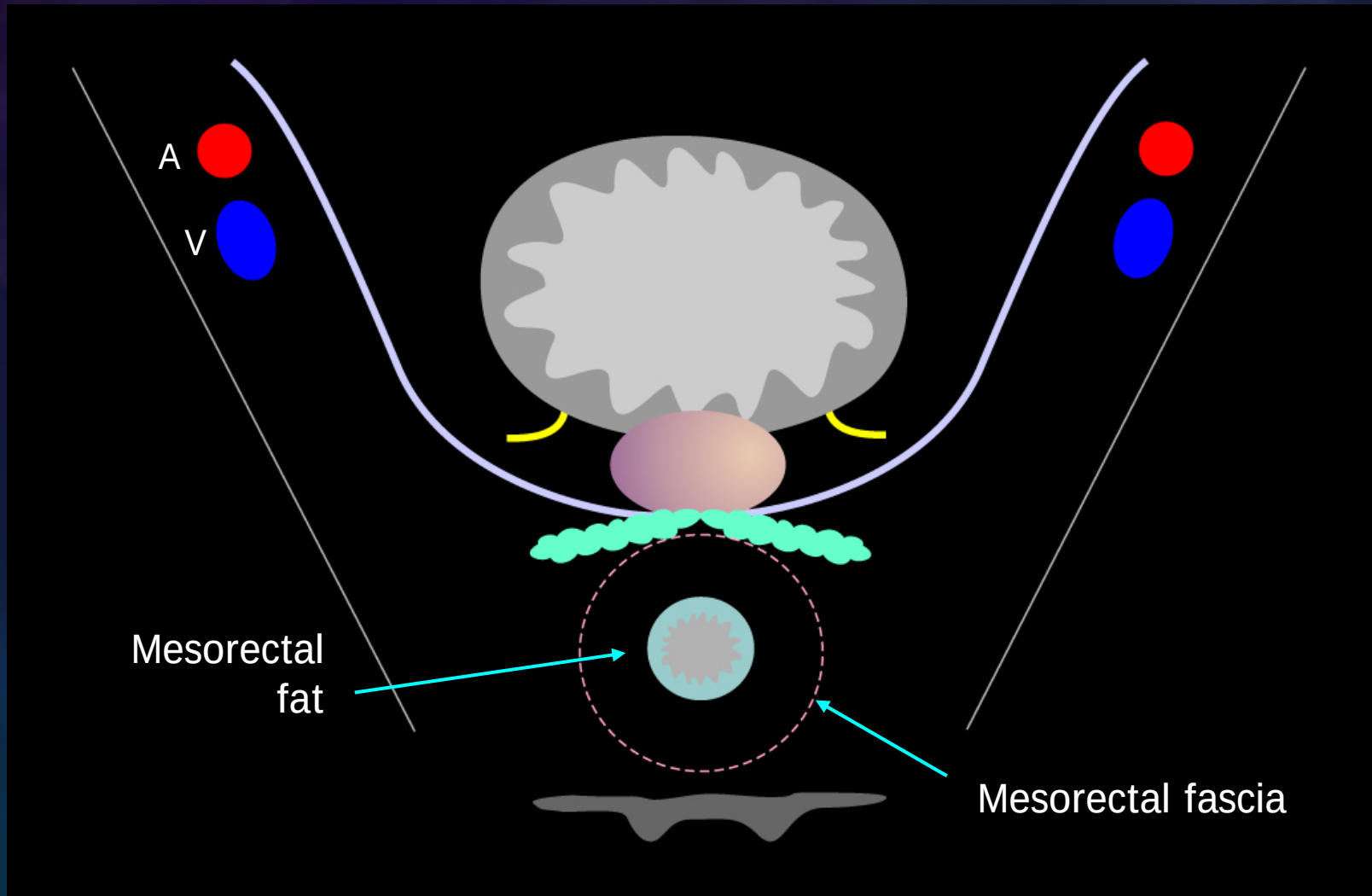
Male Pelvis - Landmarks



Male Pelvis – Axial anatomy



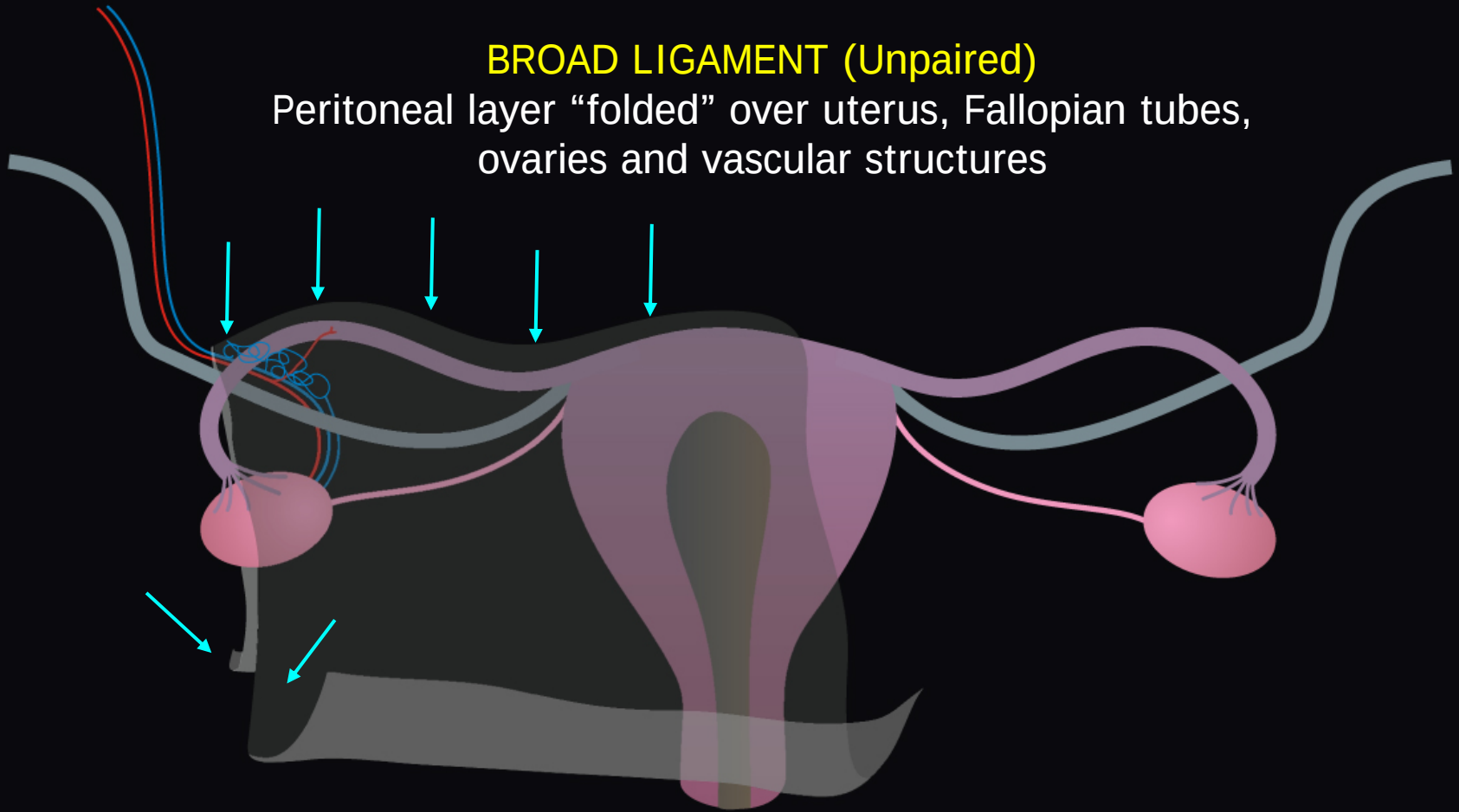
Male Pelvis – Axial anatomy



Female Pelvis - Landmarks

BROAD LIGAMENT (Unpaired)

Peritoneal layer “folded” over uterus, Fallopian tubes, ovaries and vascular structures

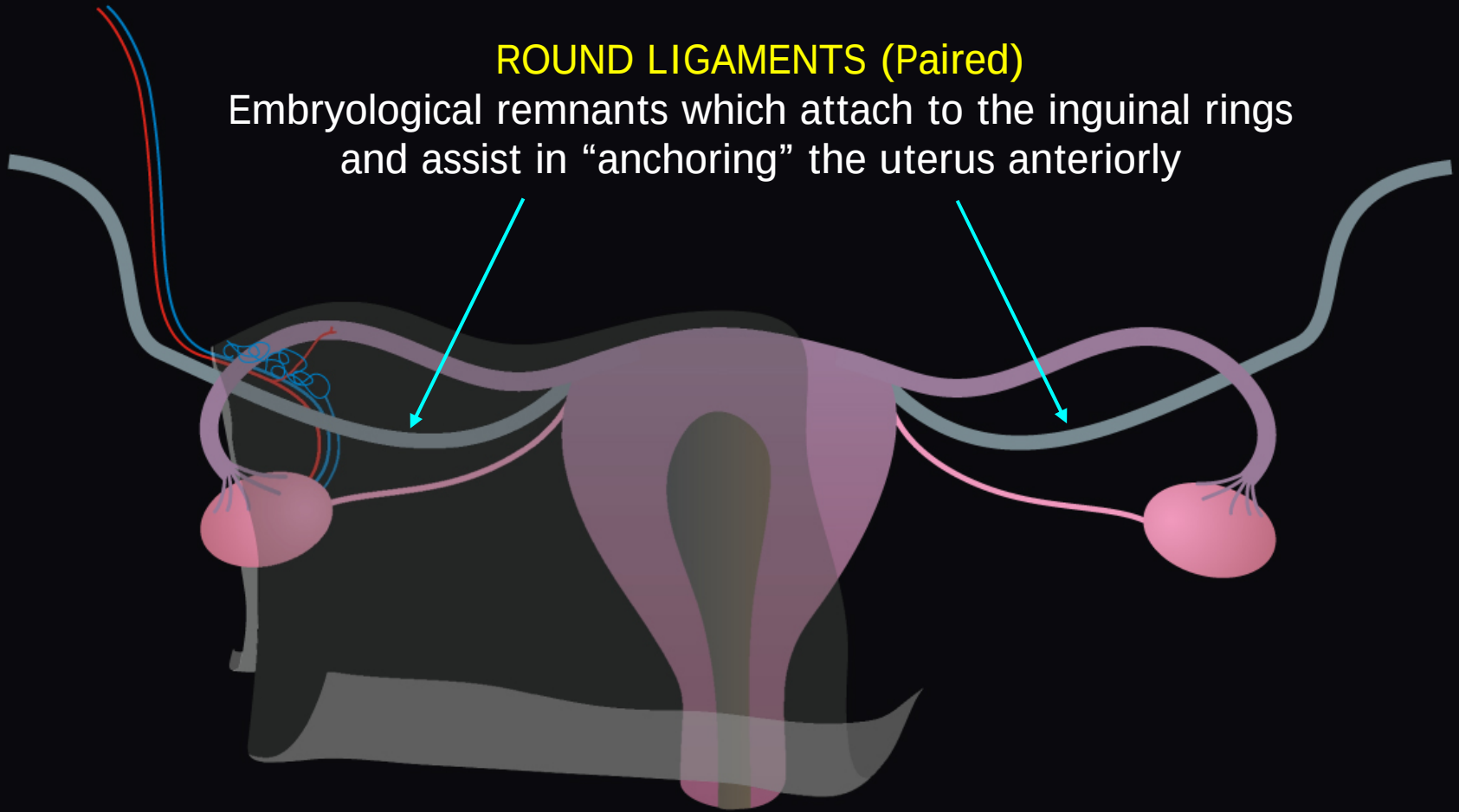


Peritoneum is reflected posteriorly and anteriorly
Posterior reflection is the rectouterine pouch (of Douglas)

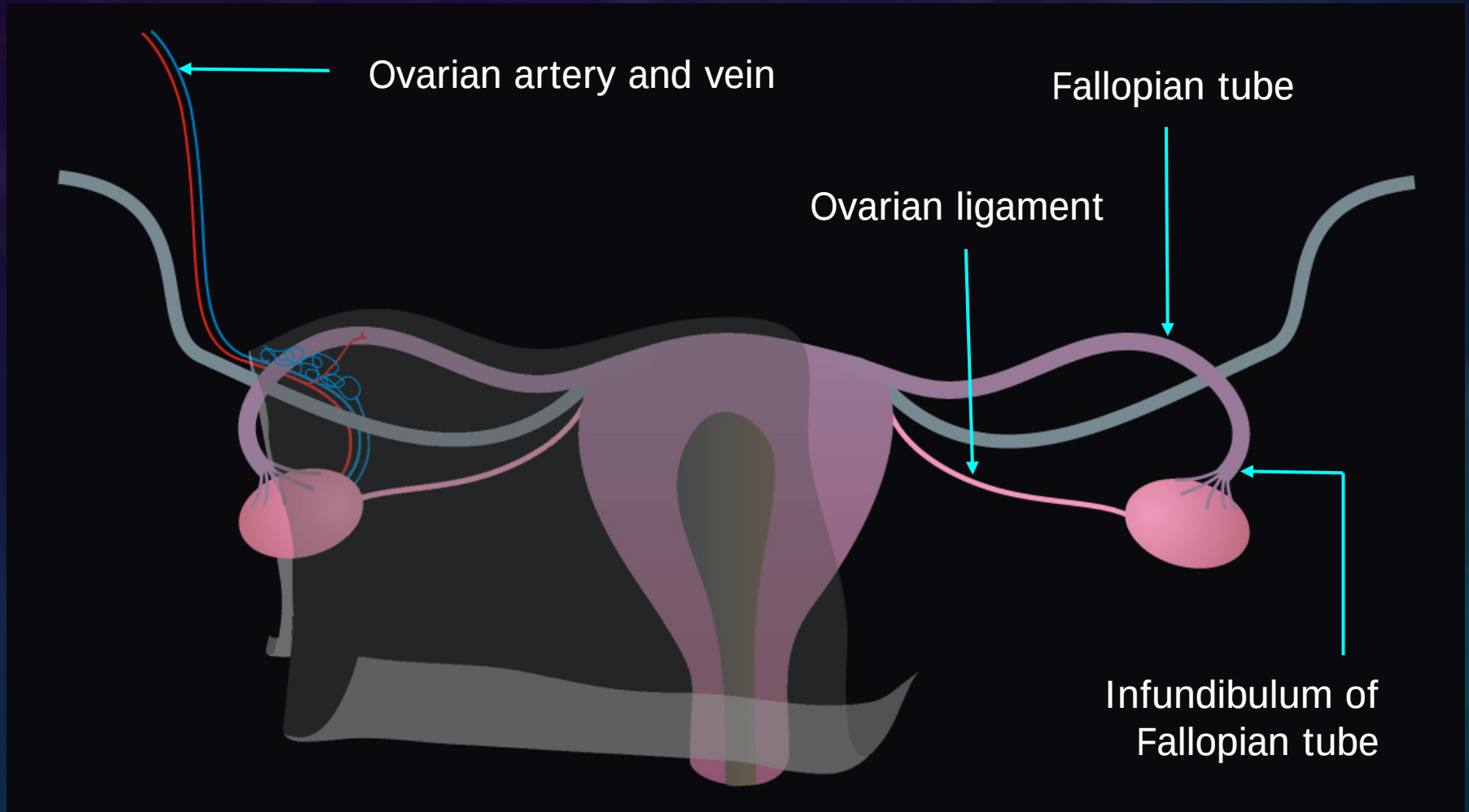
Female Pelvis - Landmarks

ROUND LIGAMENTS (Paired)

Embryological remnants which attach to the inguinal rings and assist in “anchoring” the uterus anteriorly

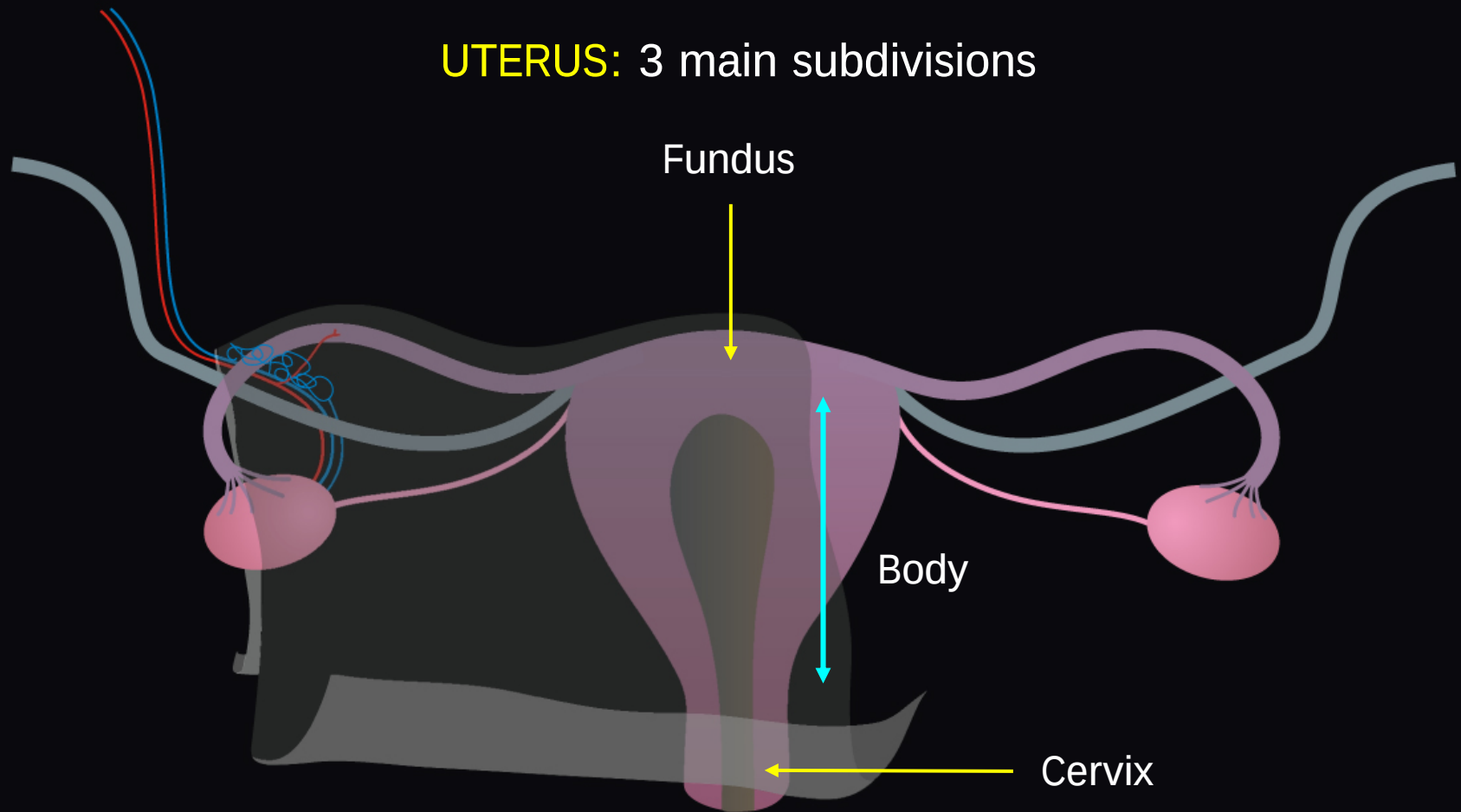


Female Pelvis - Landmarks



Female Pelvis - Landmarks

UTERUS: 3 main subdivisions



Uterus: Variations in position

This will affect the appearance in cross-sectional images



anteverted



retroverted



anteflexed



retroflexed

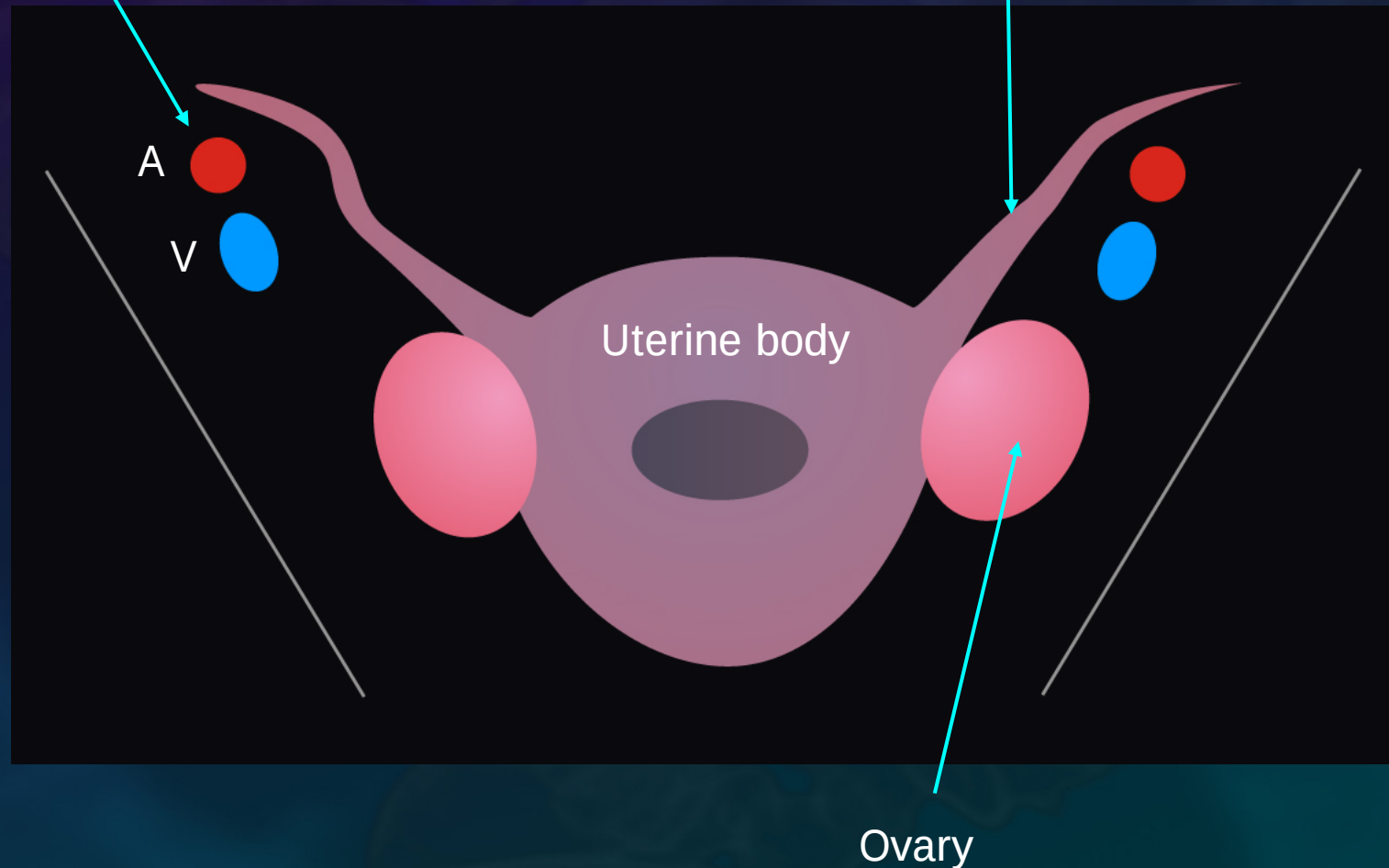


“axial”

Female Pelvis – Axial anatomy

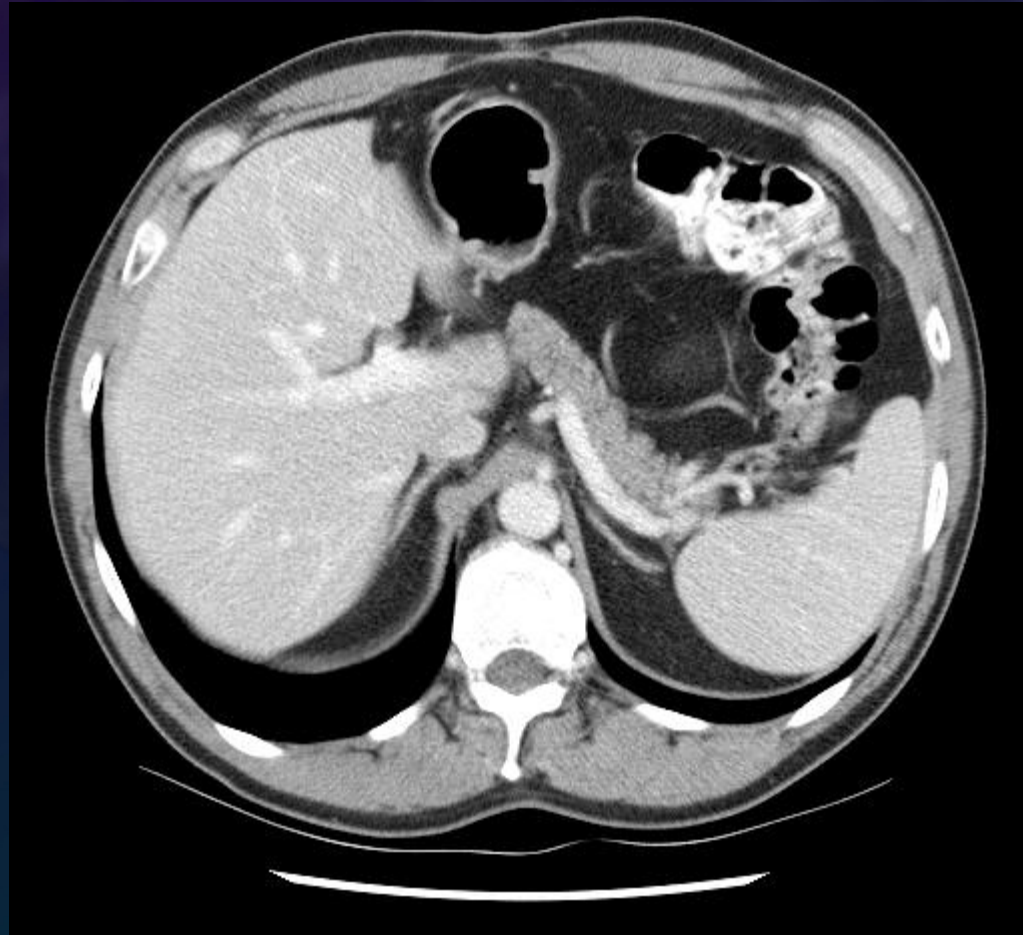
External Iliac Vessels

Round ligament

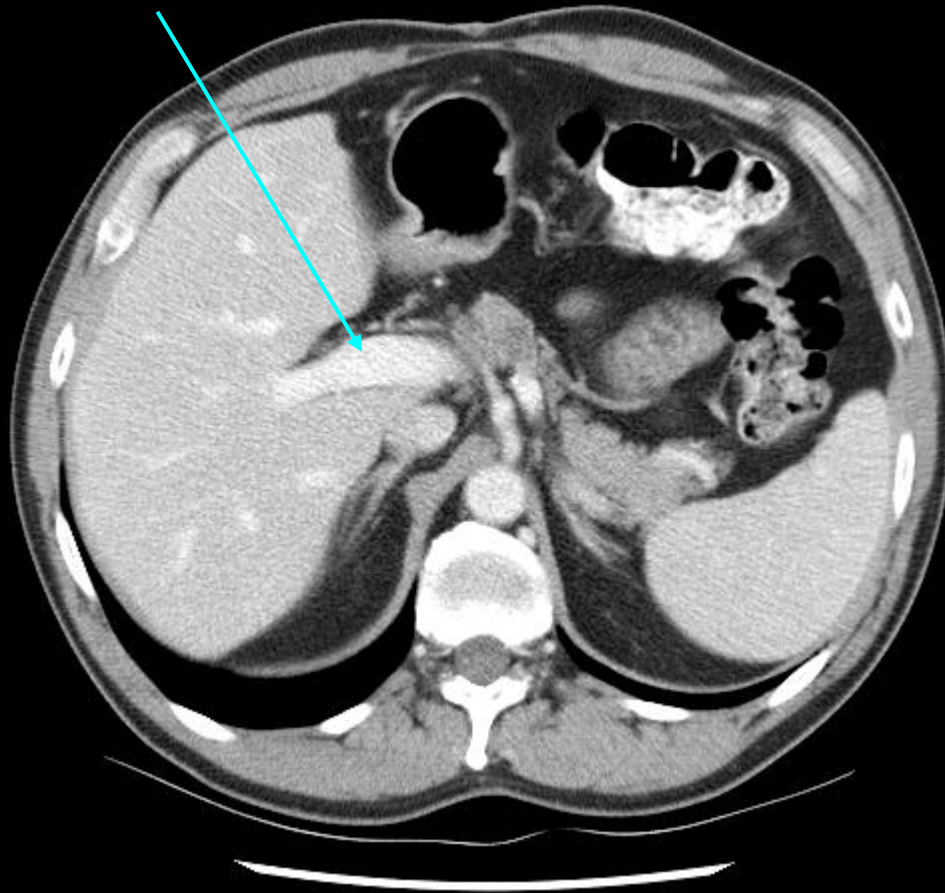


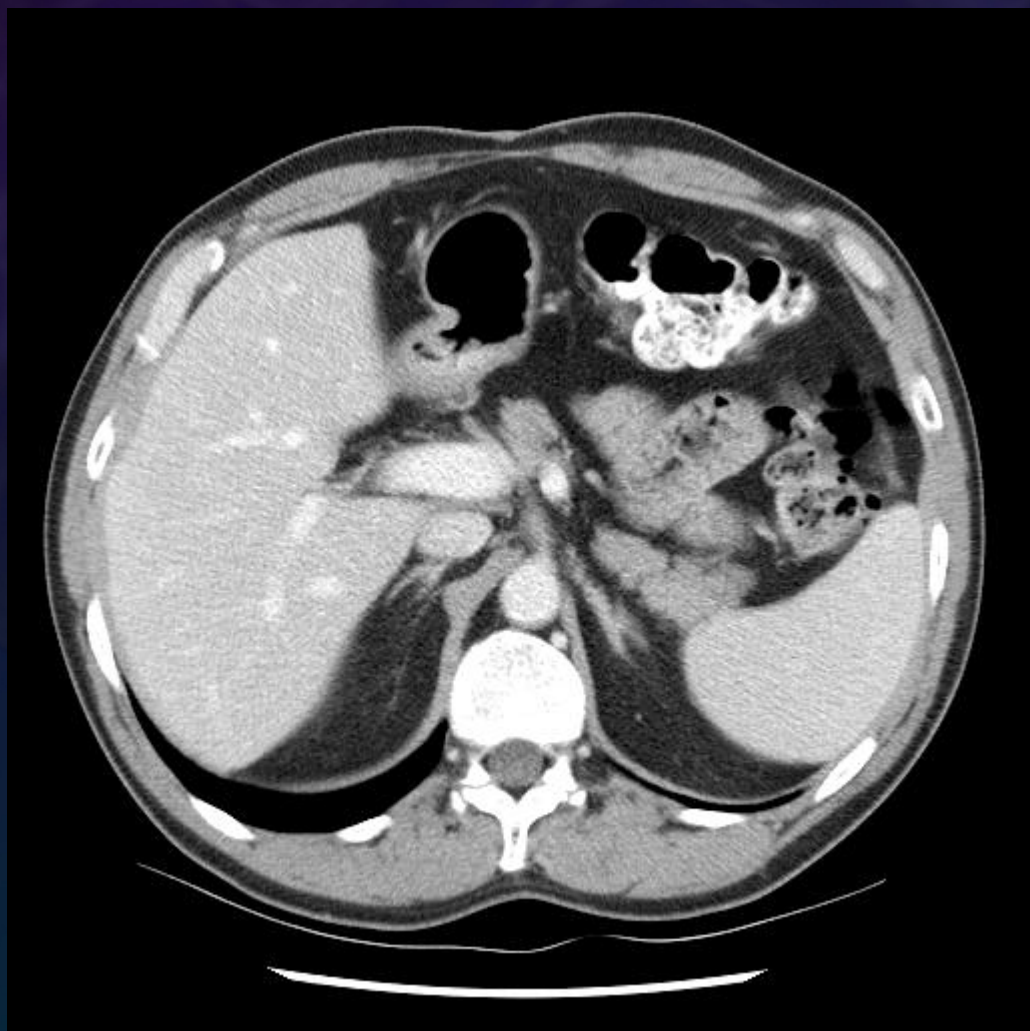
Abdominal / Pelvic CT: Male Patient

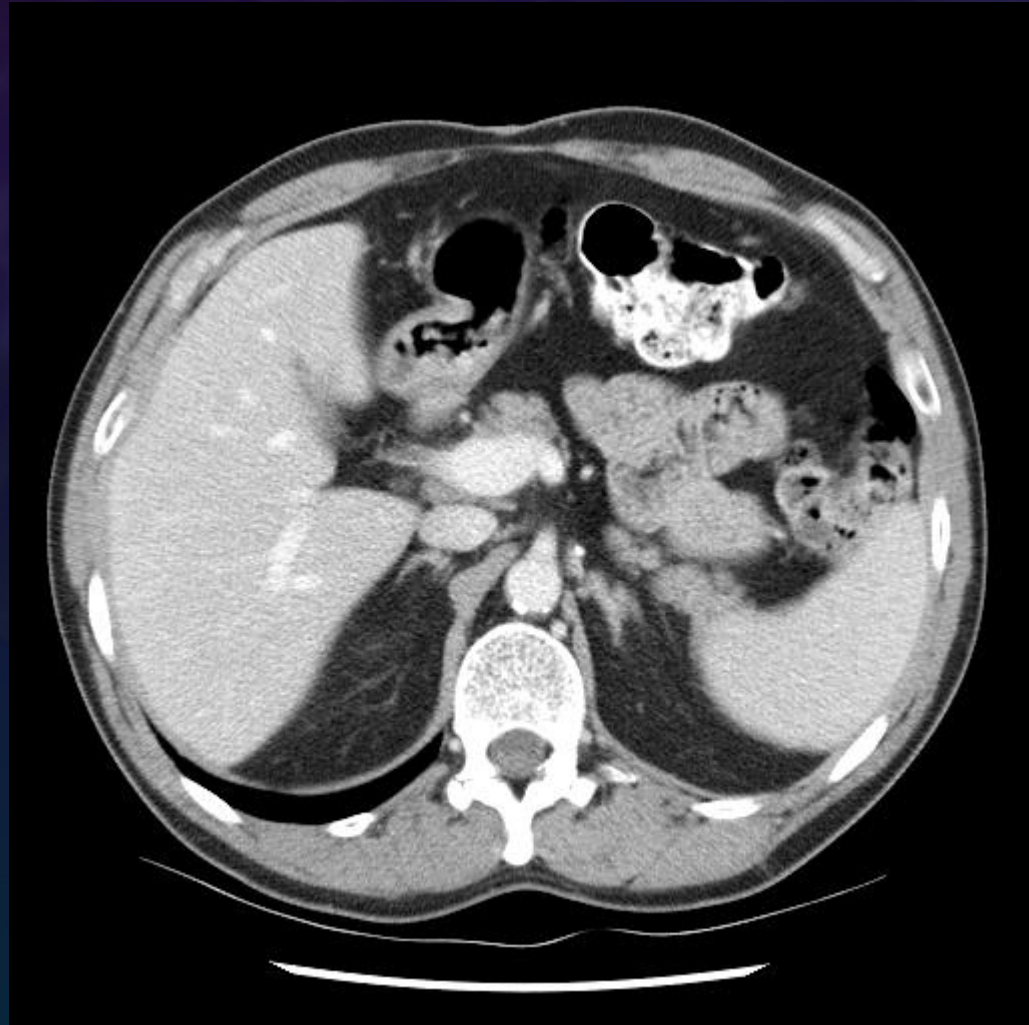
Vascular and organ landmarks

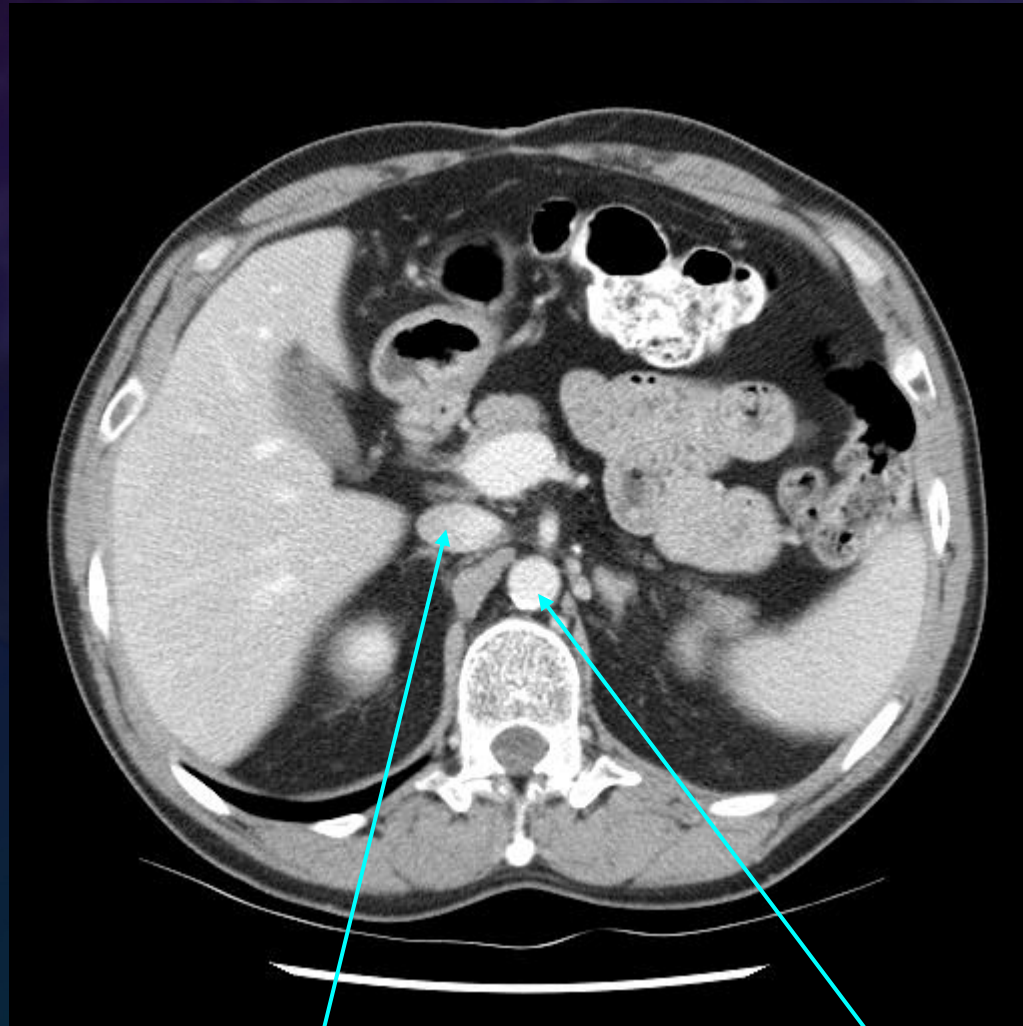


Portal vein





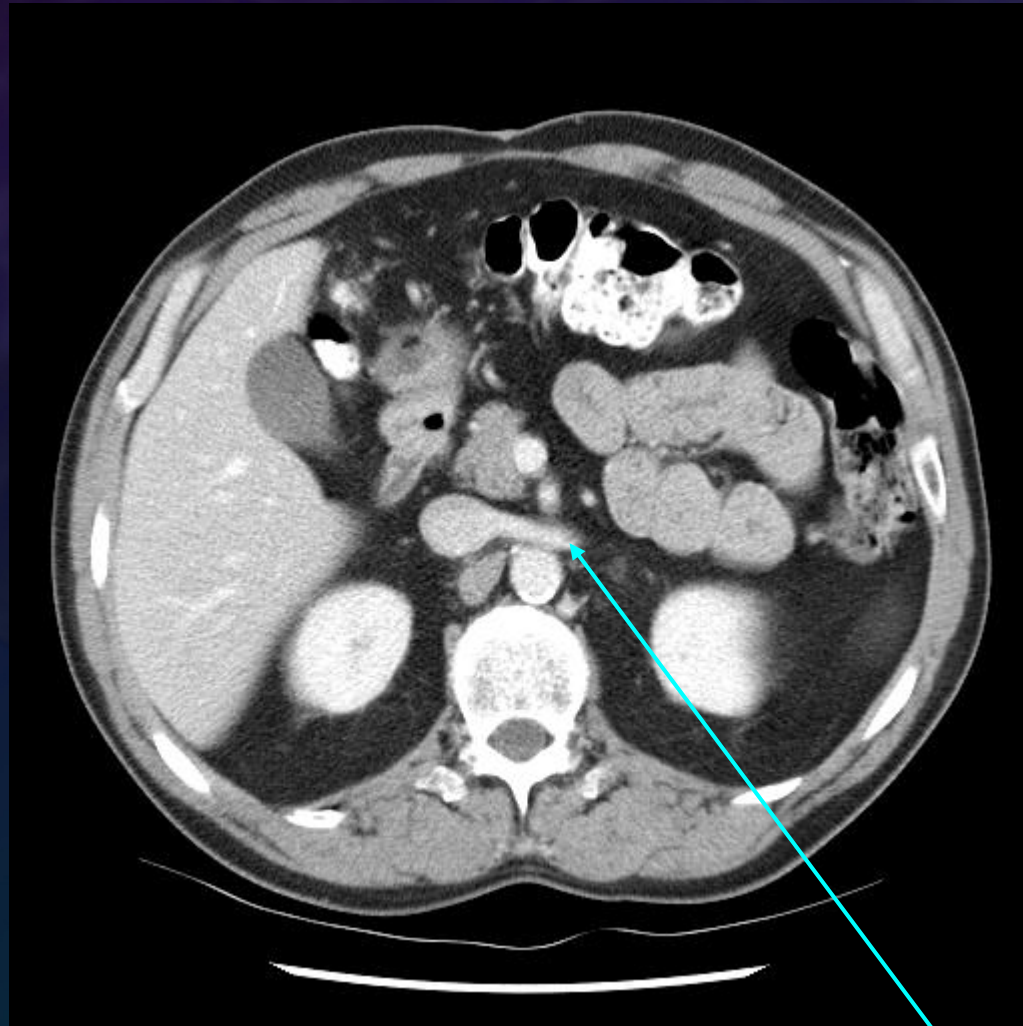




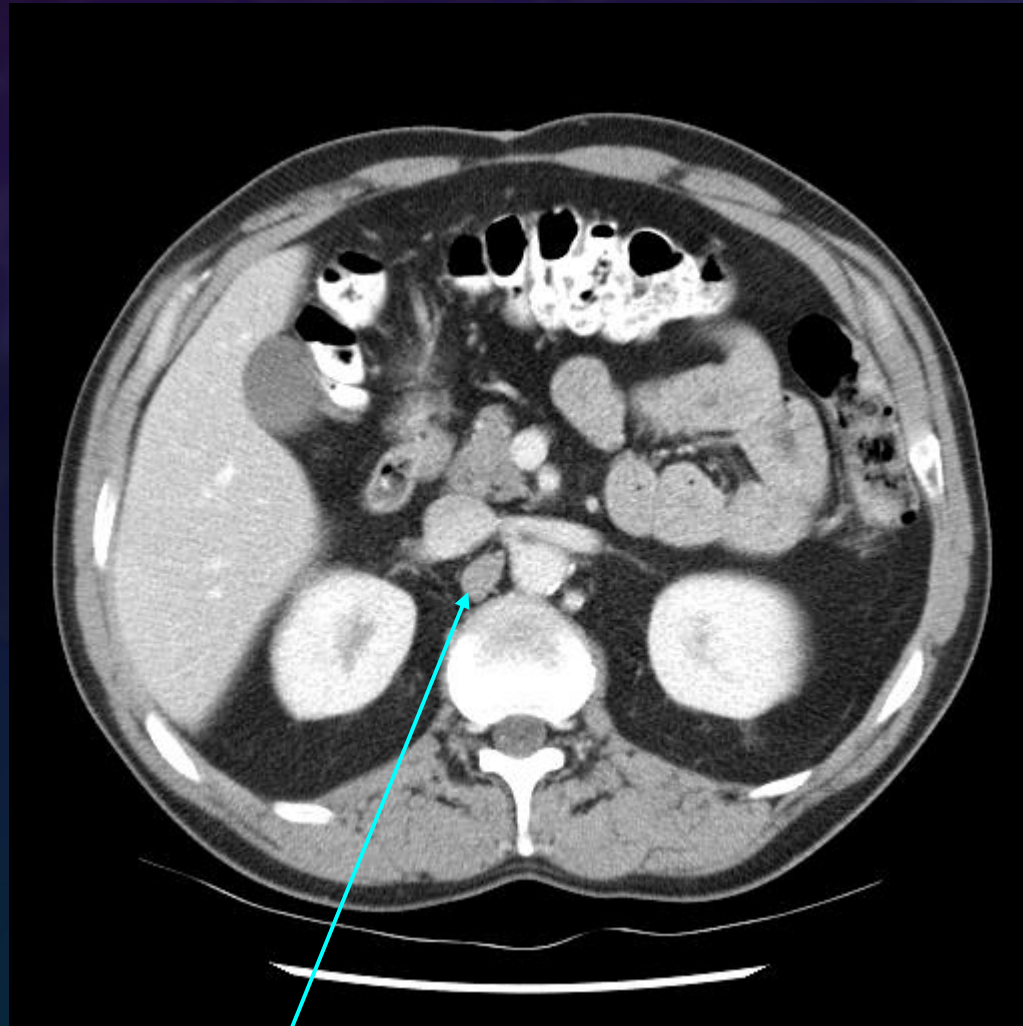
IVC

Abdominal aorta



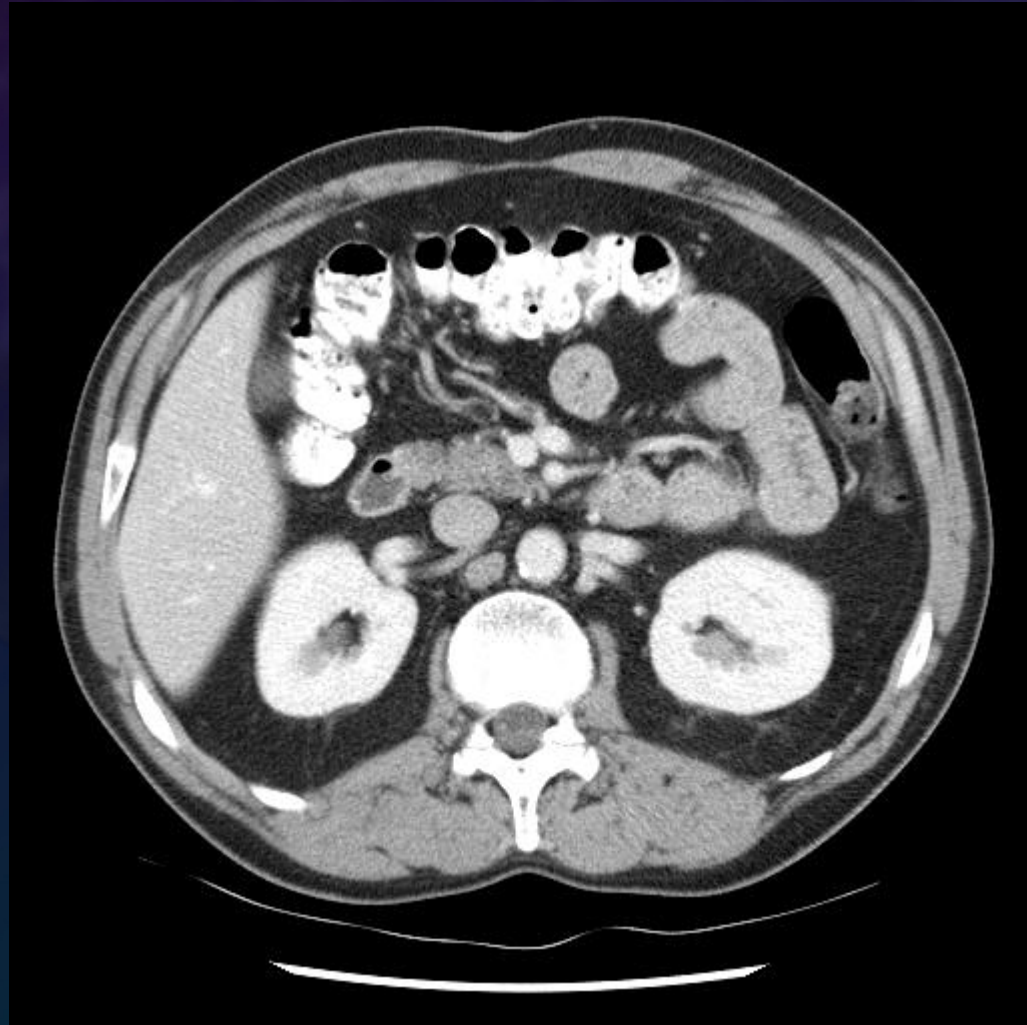


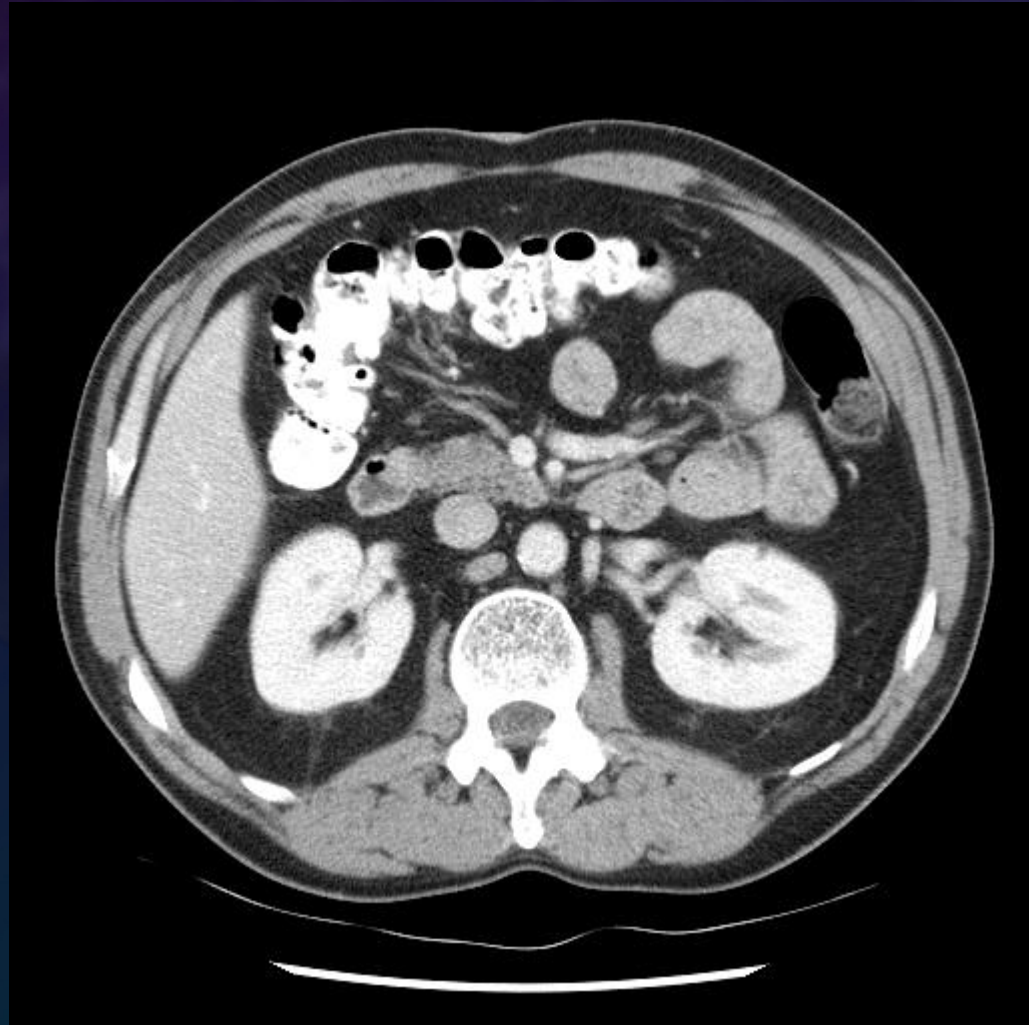
Left renal vein

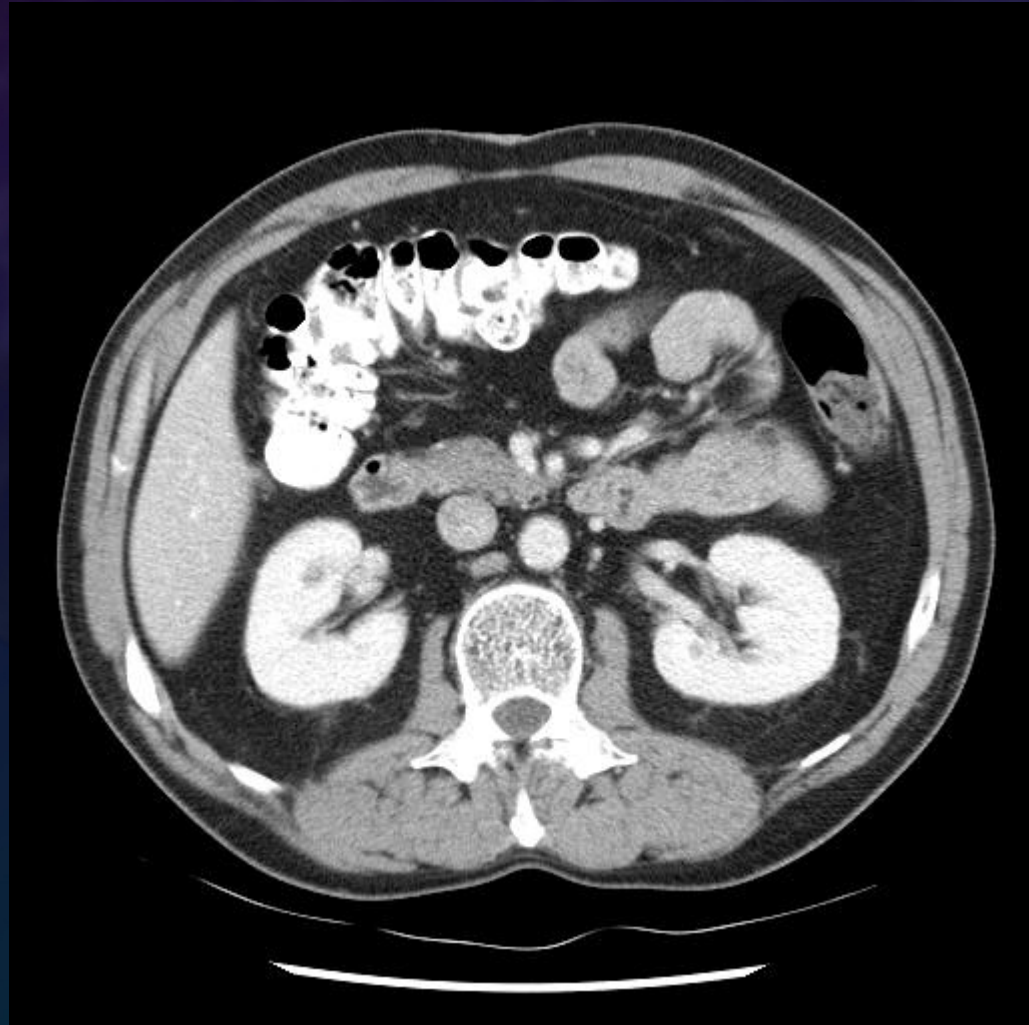


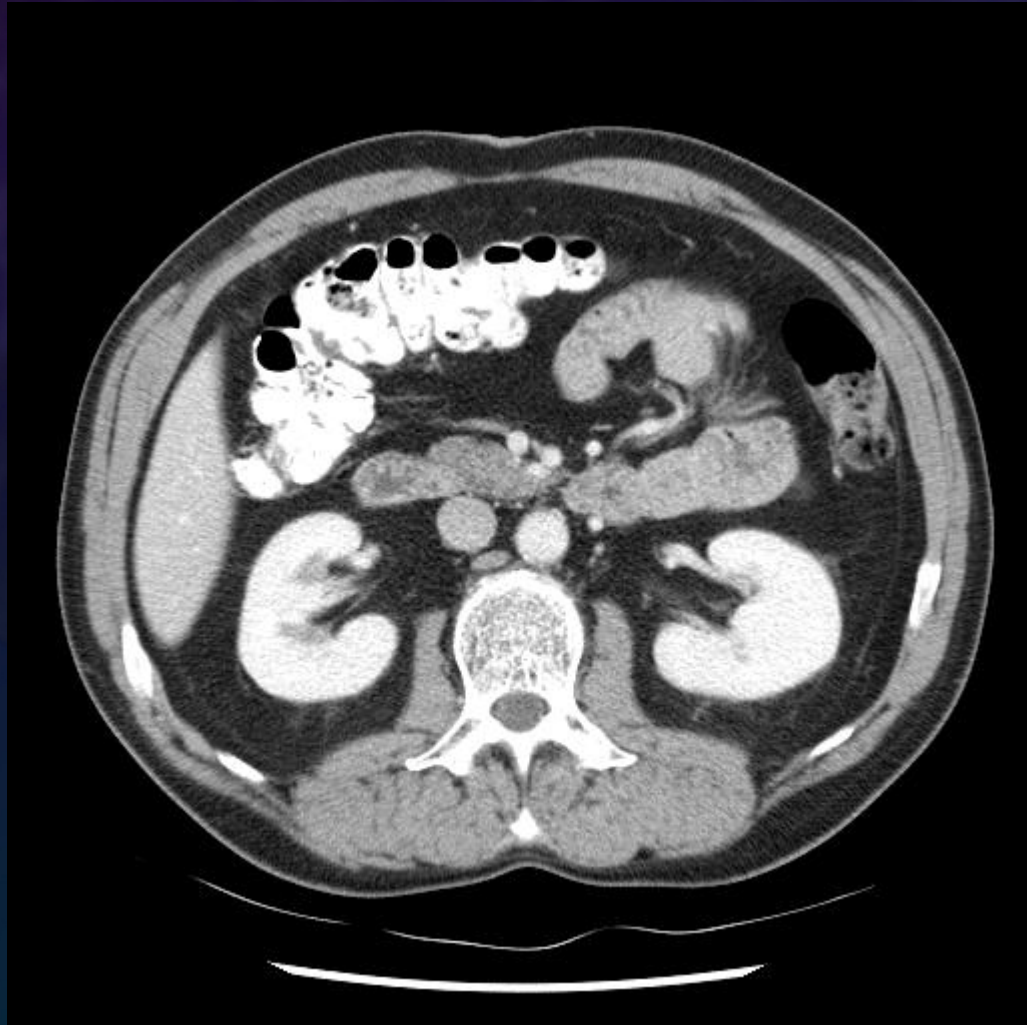
Right diaphragmatic crus

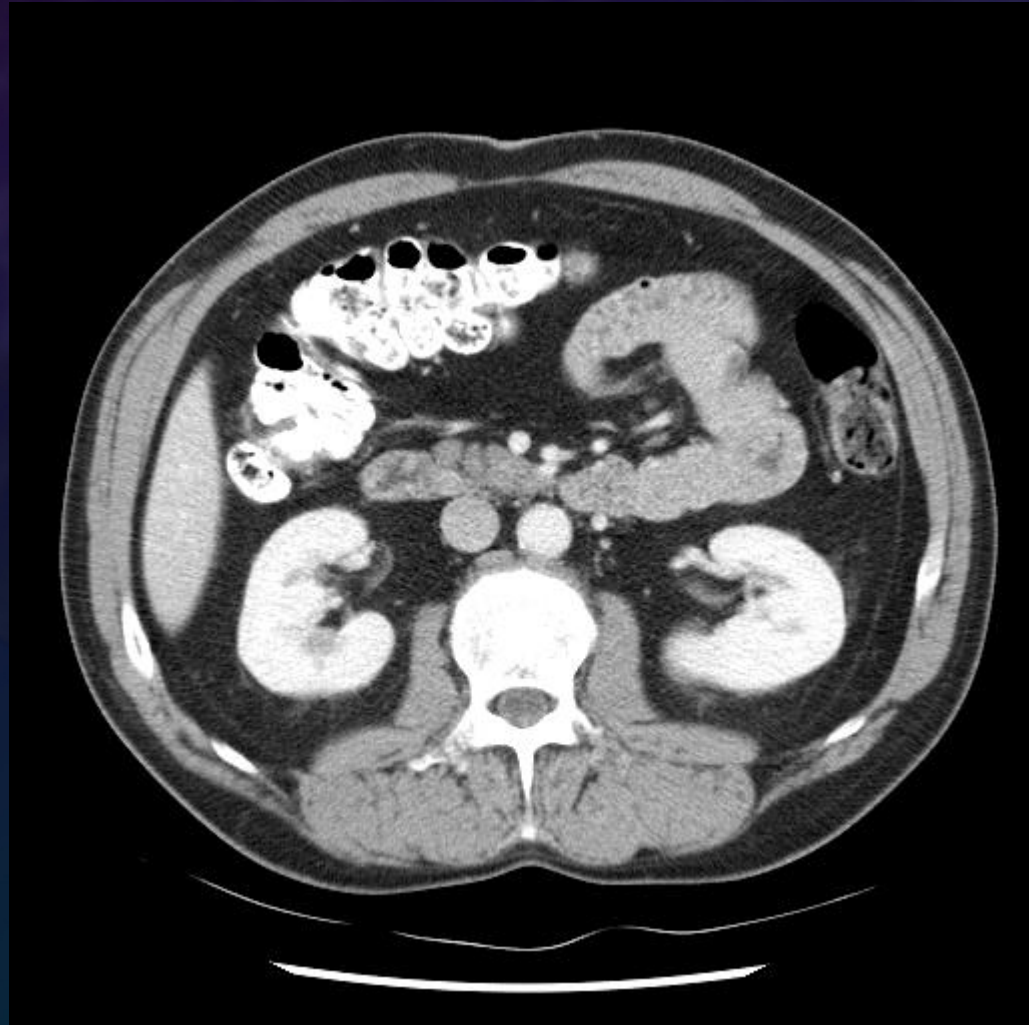


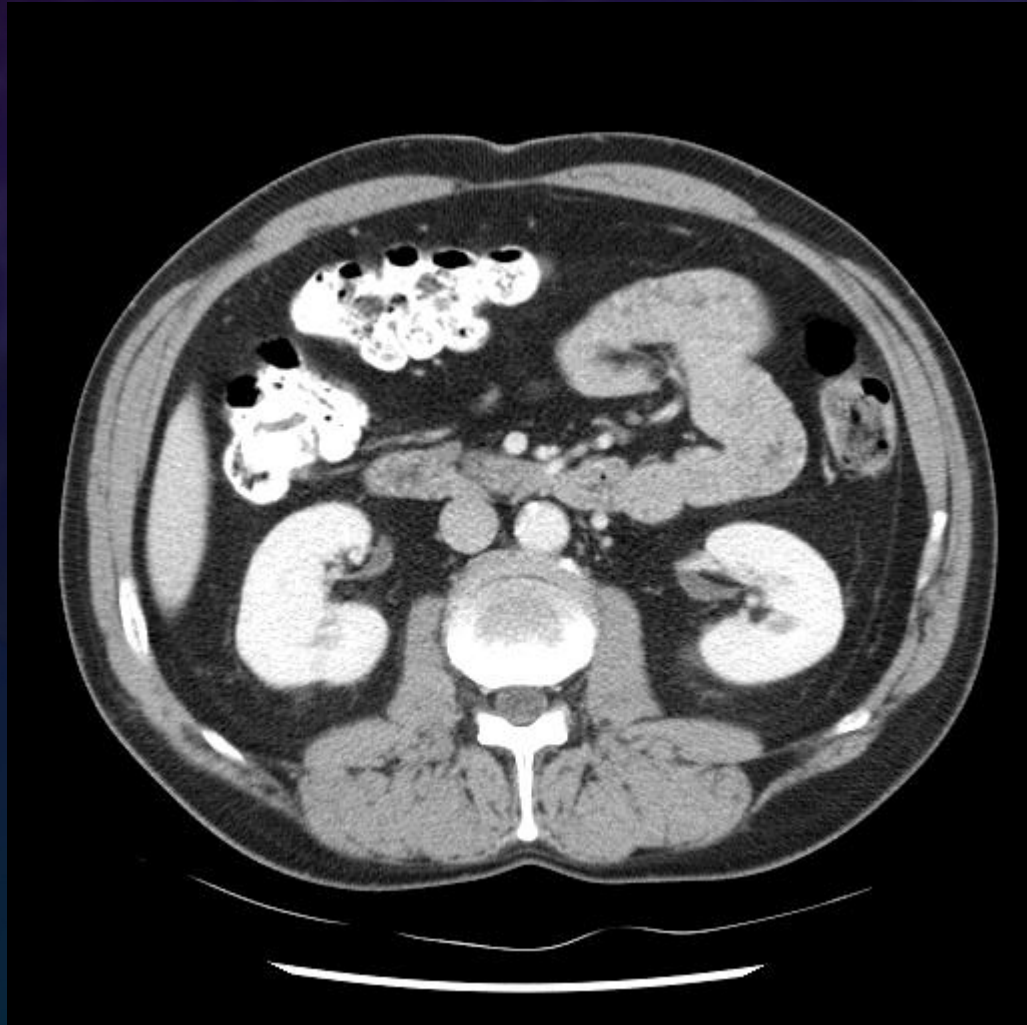


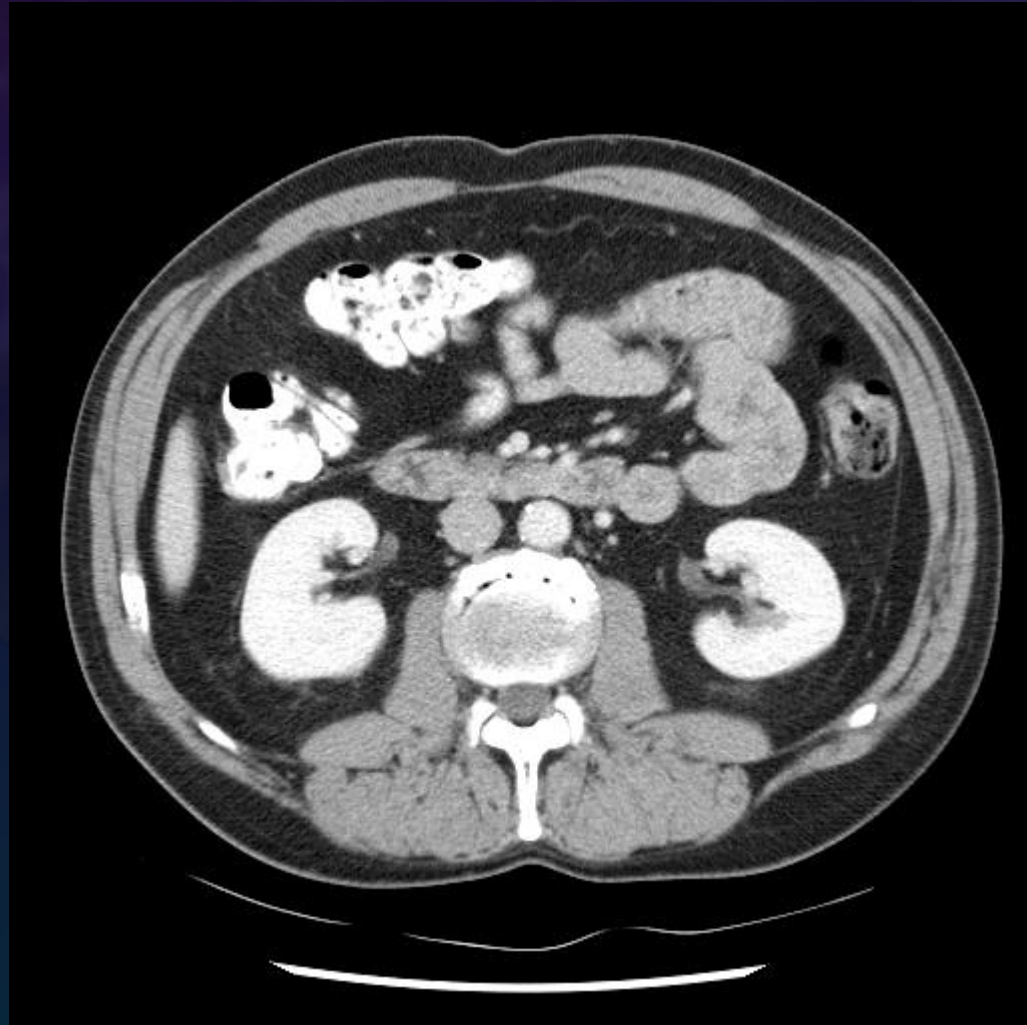


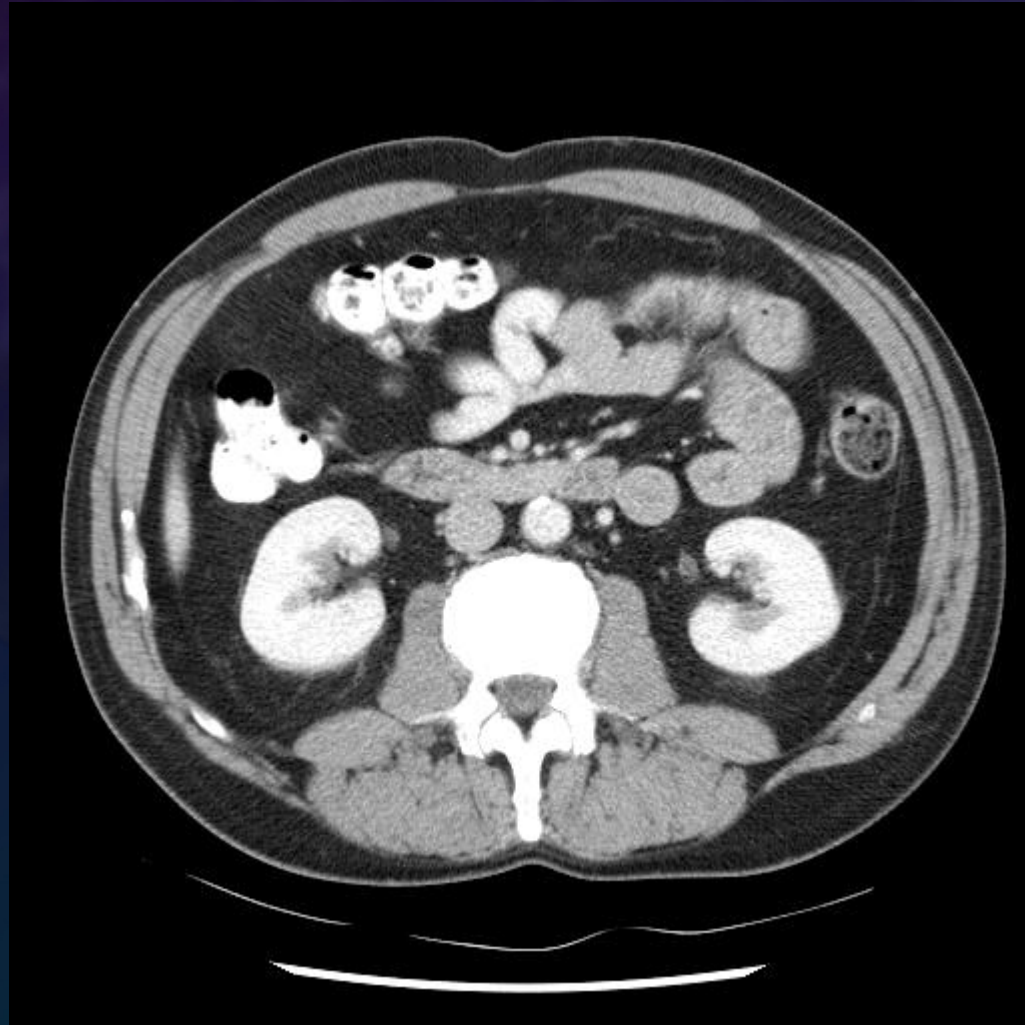


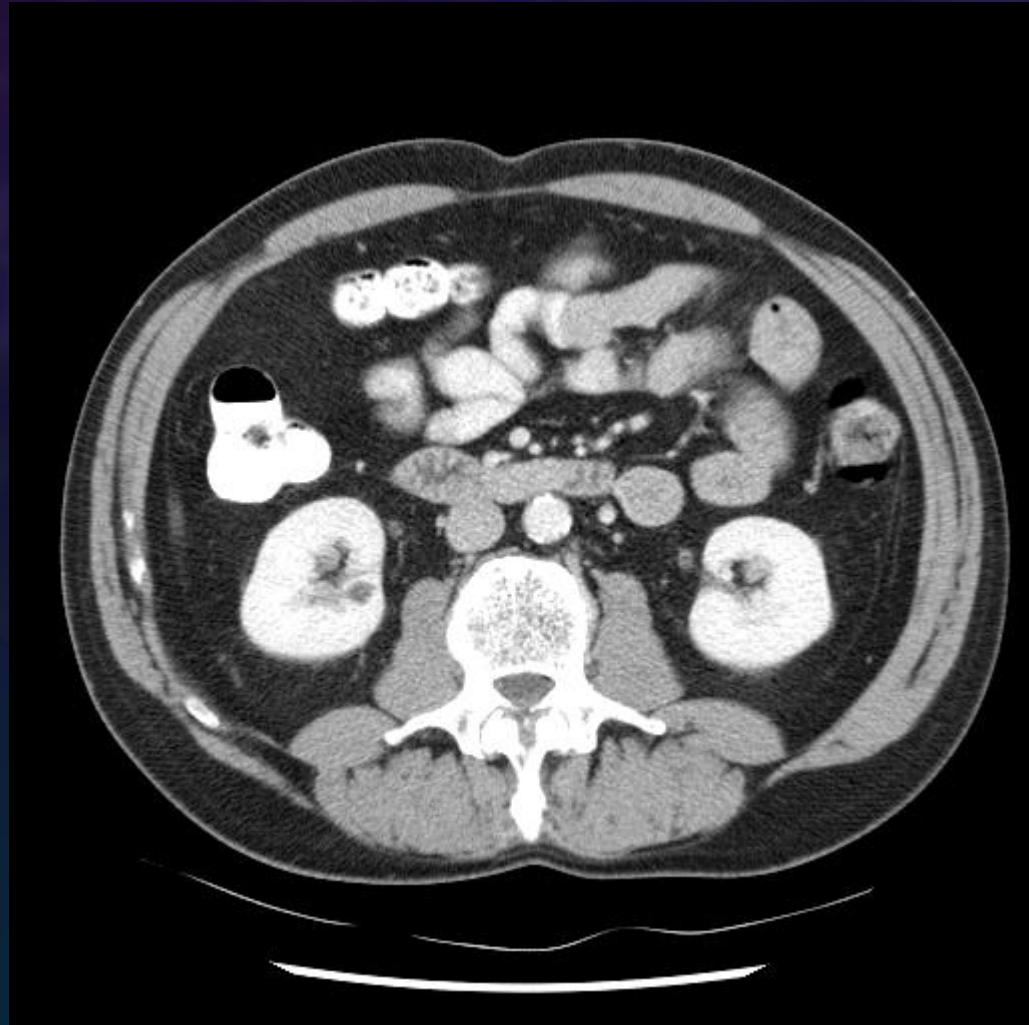






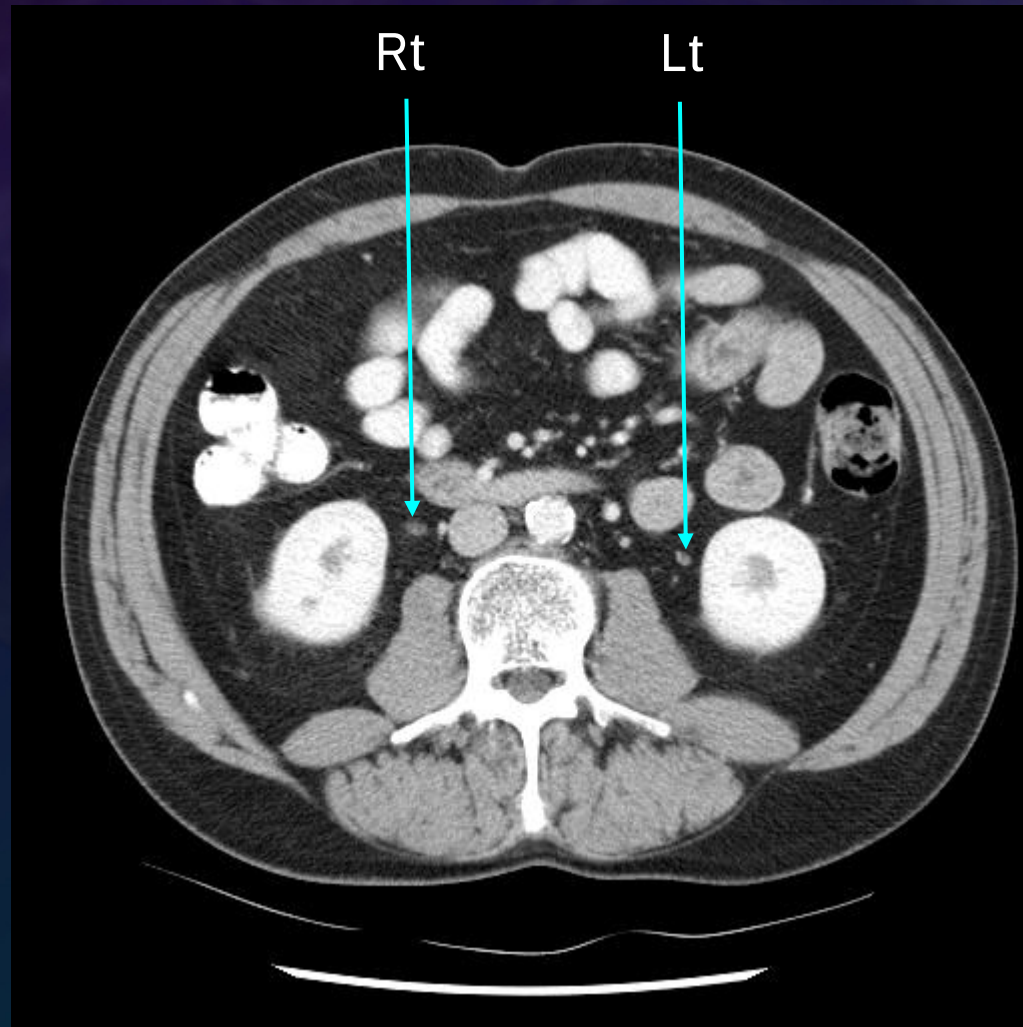


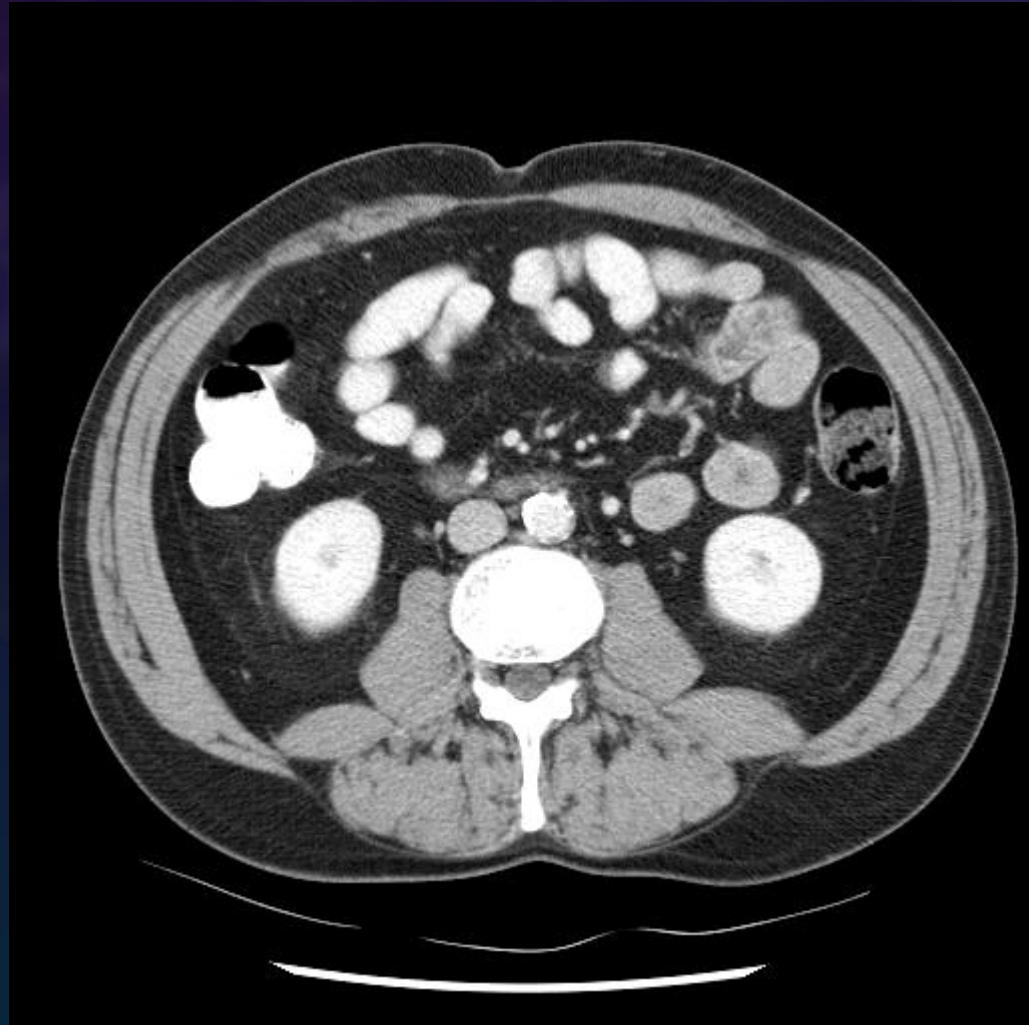


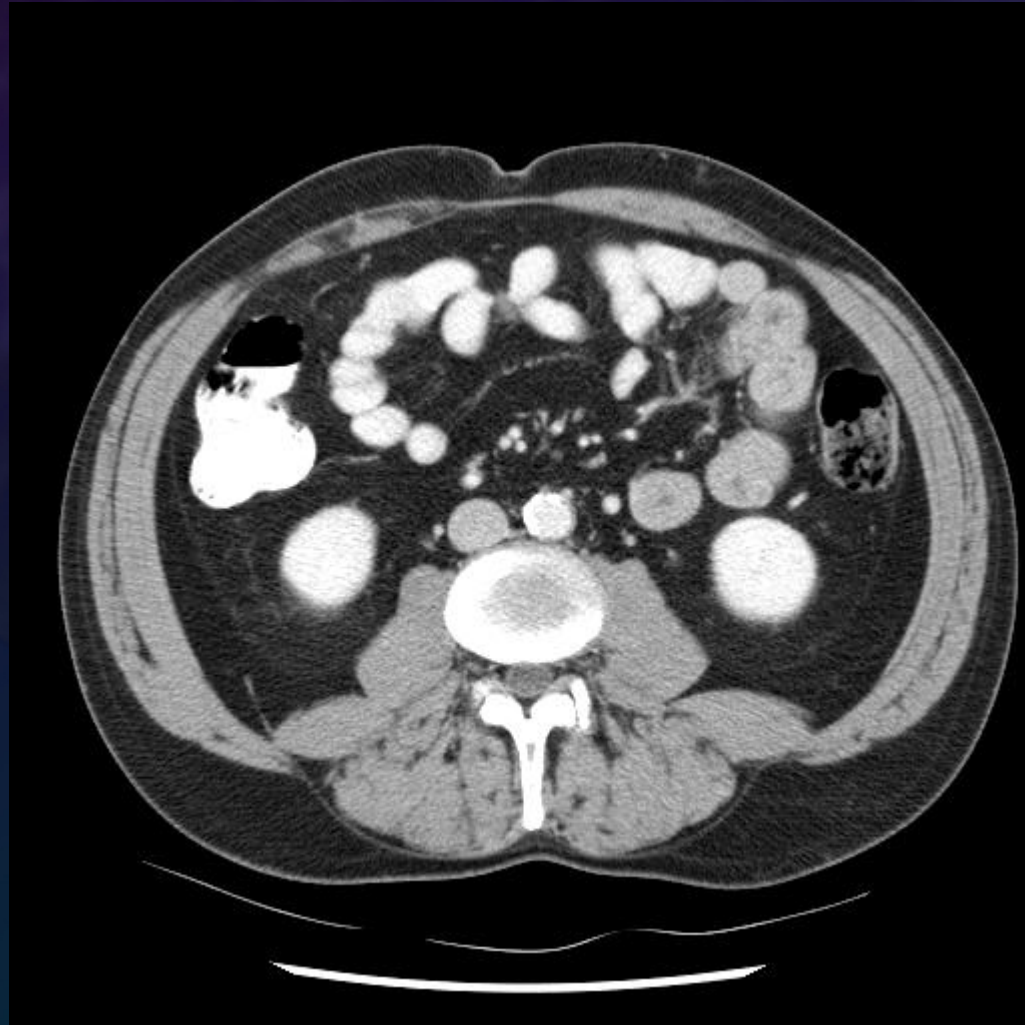


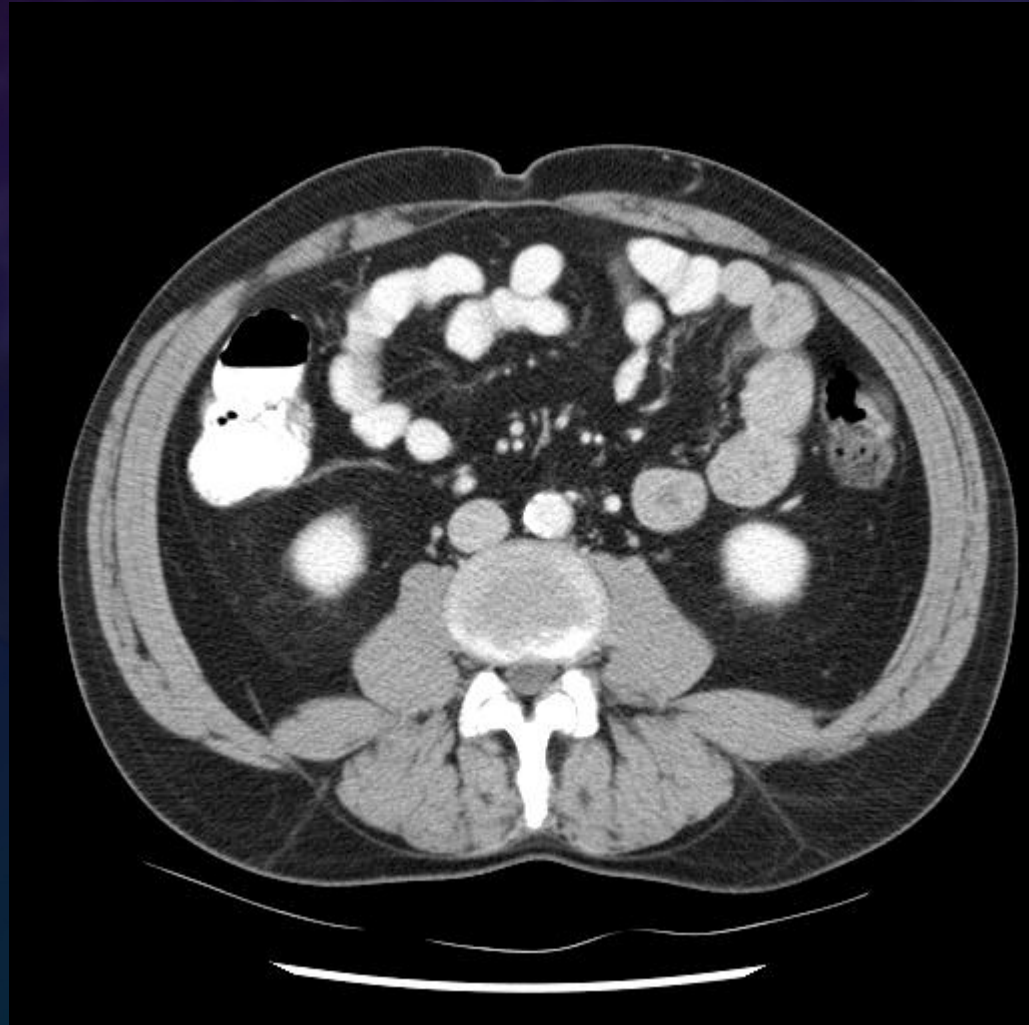


Ureters









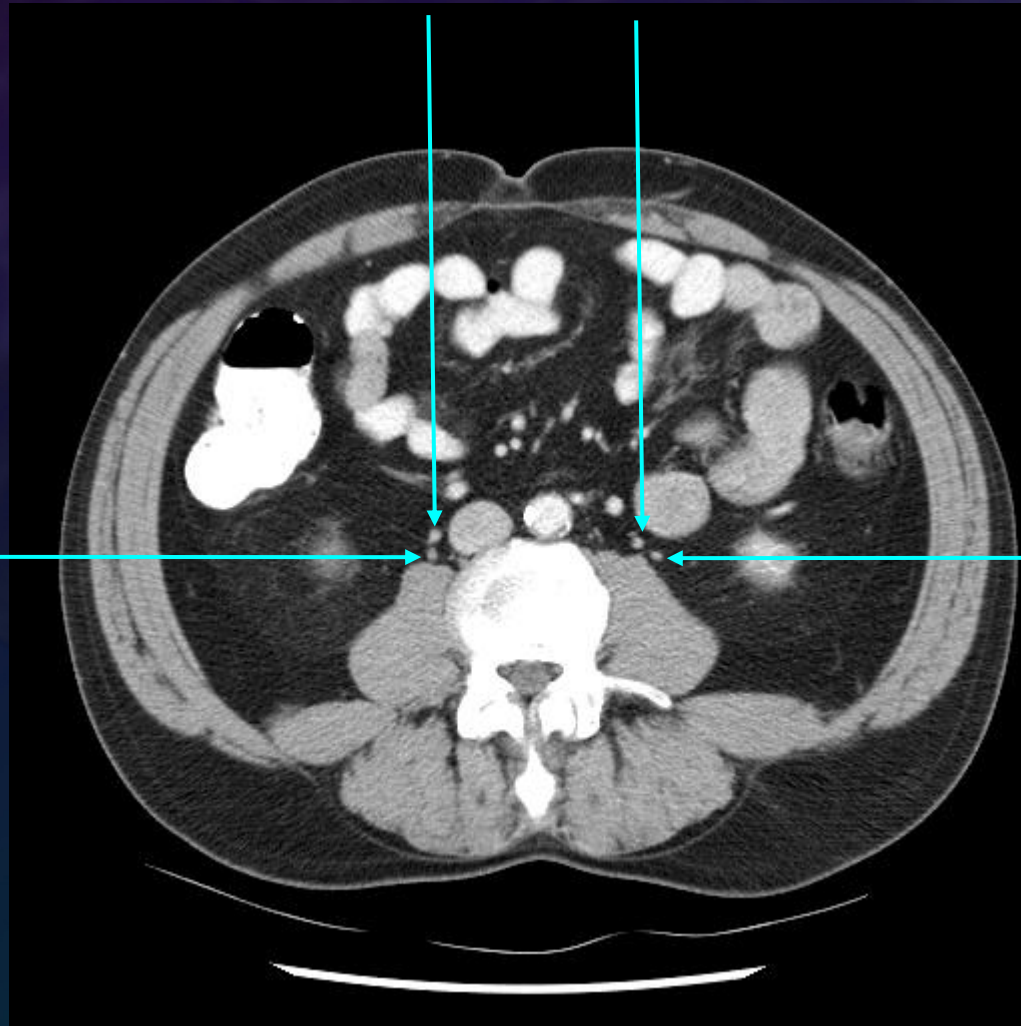
Testicular Veins

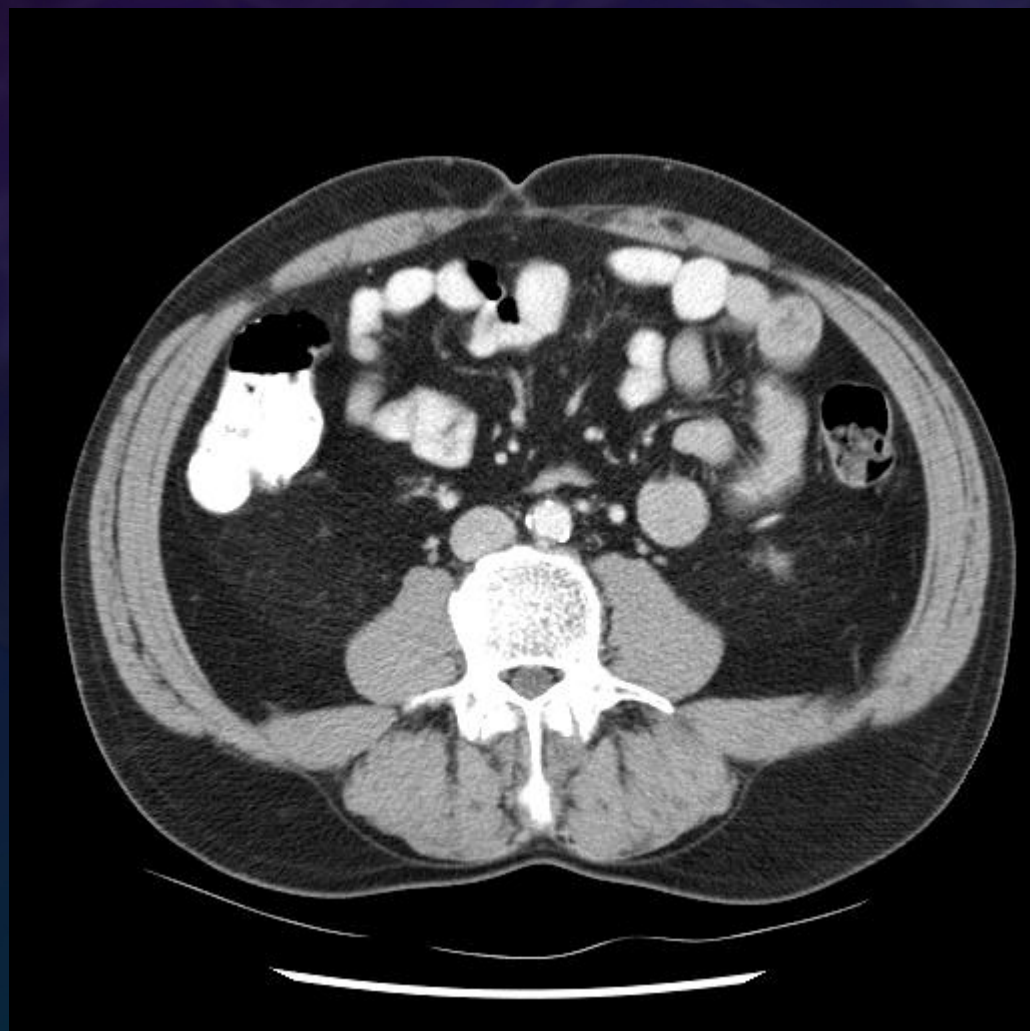
Rt

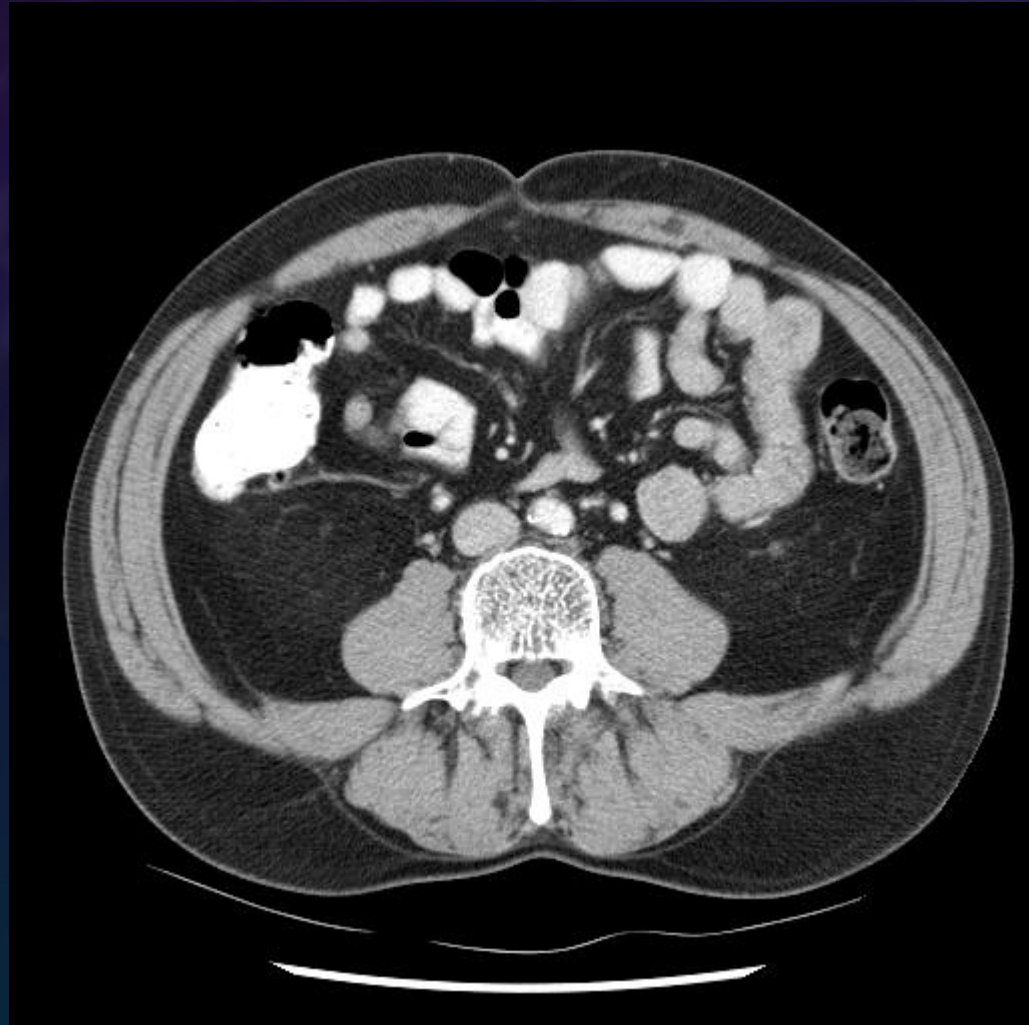
Lt

Right Ureter

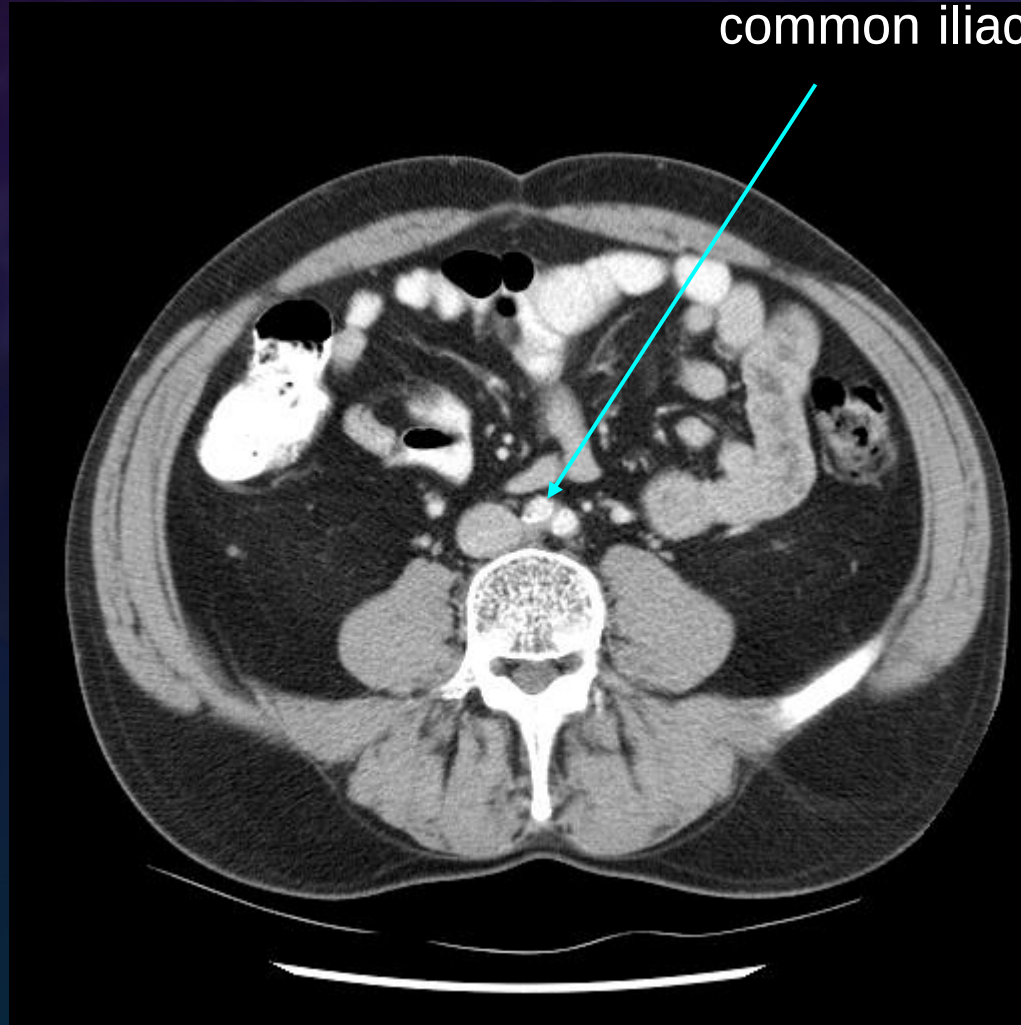
Left Ureter

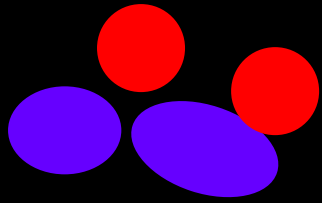




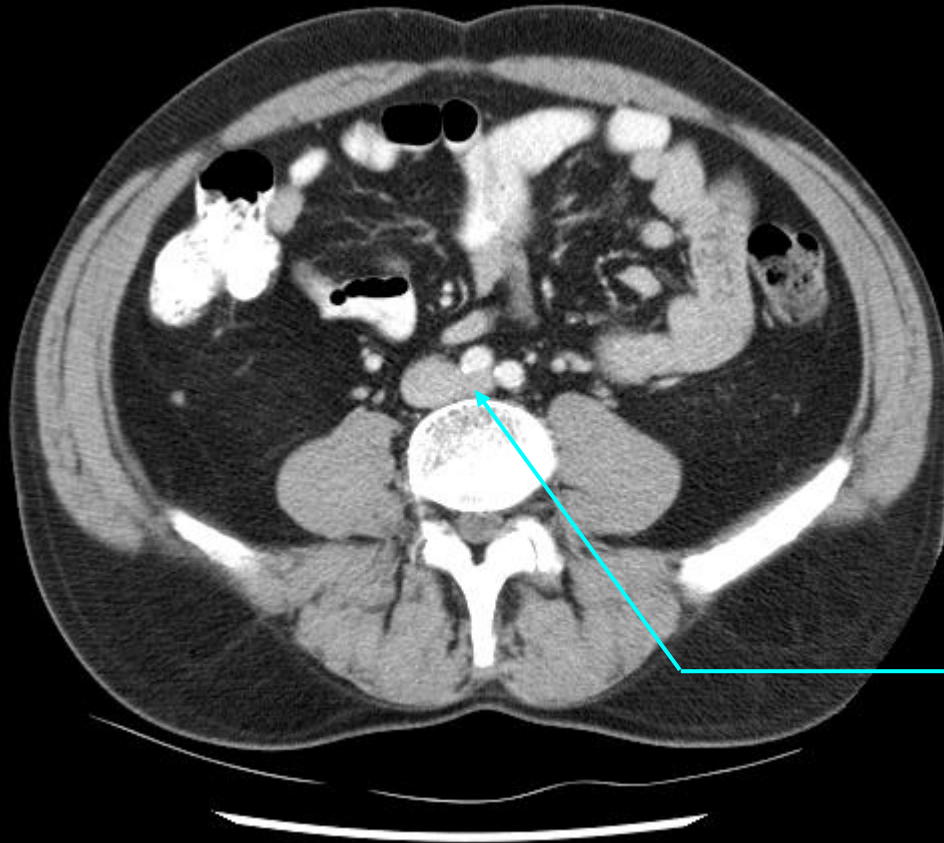


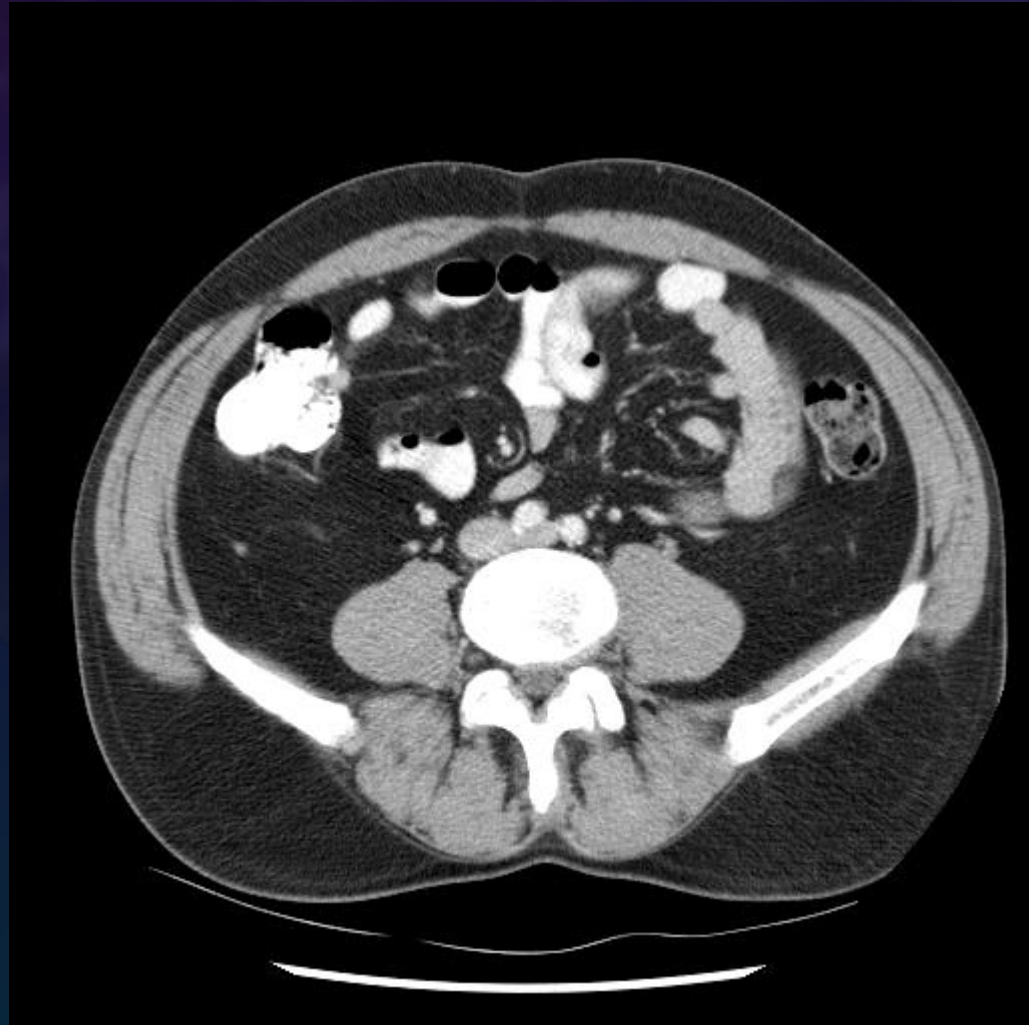
Aortic bifurcation
(becomes left and right
common iliac arteries)

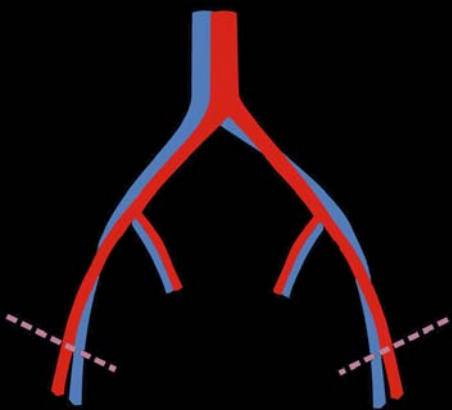
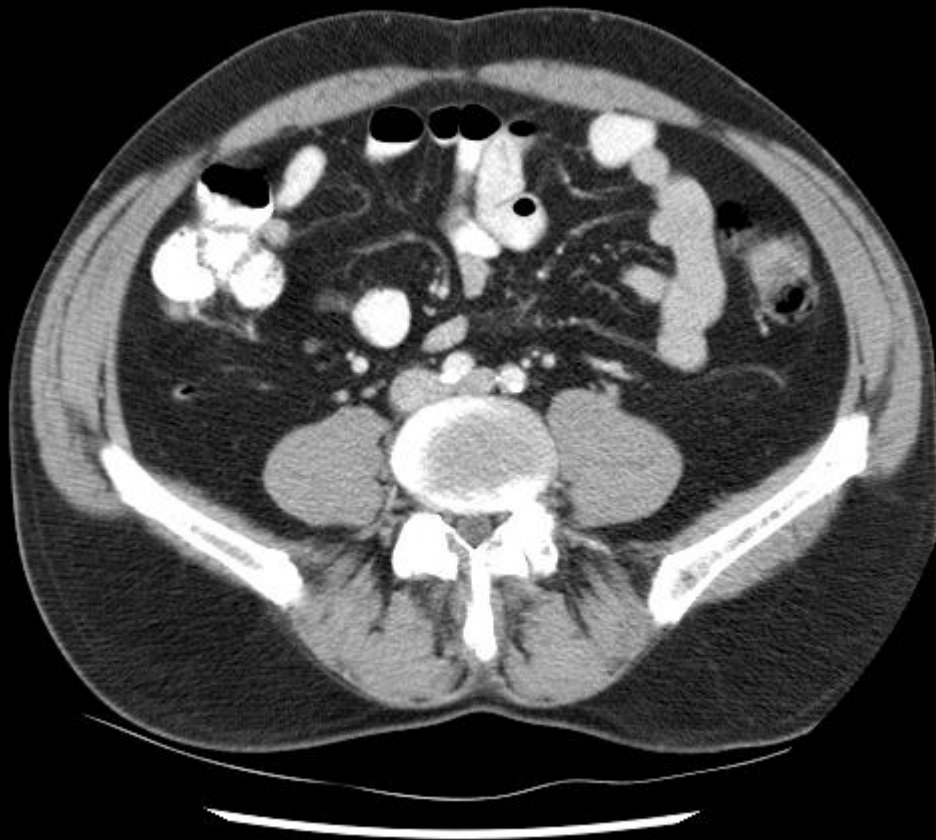


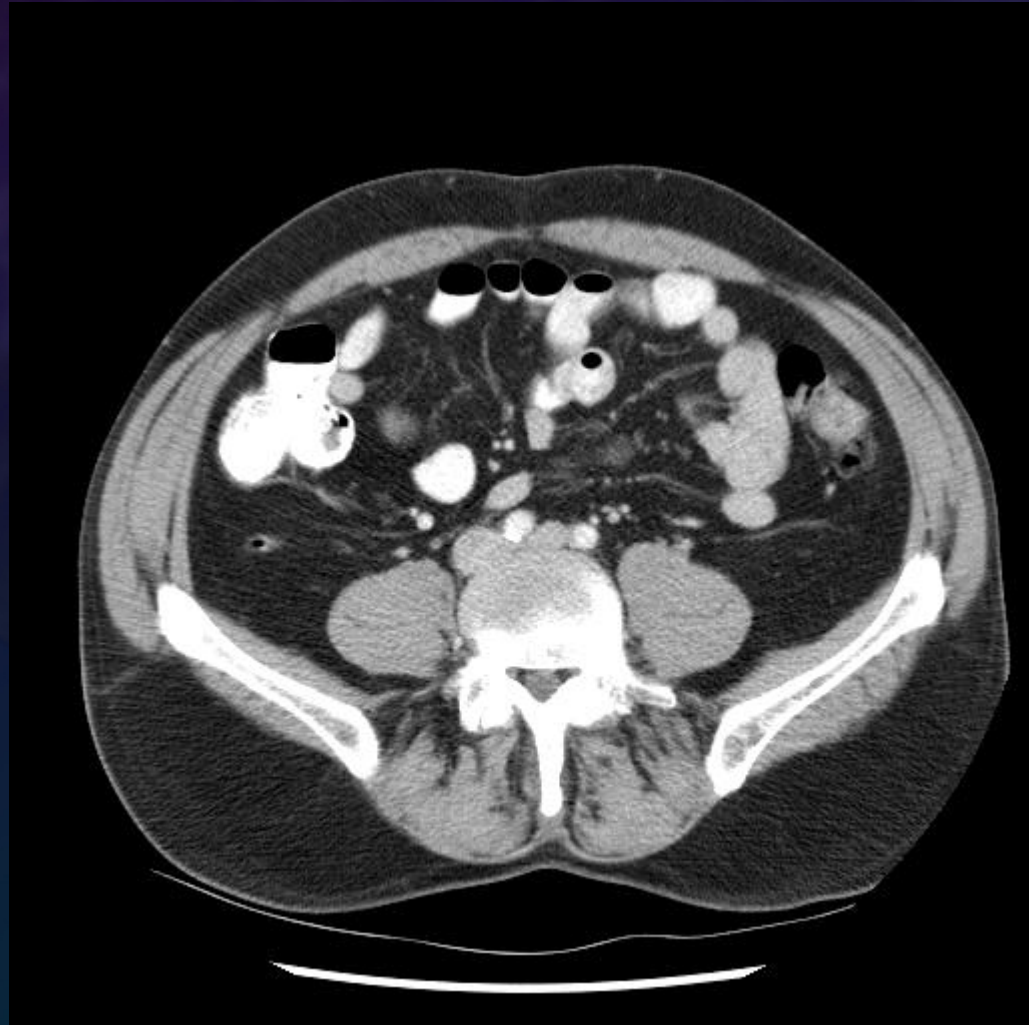


Common iliac veins
(join to form the IVC, behind the
common iliac arteries)

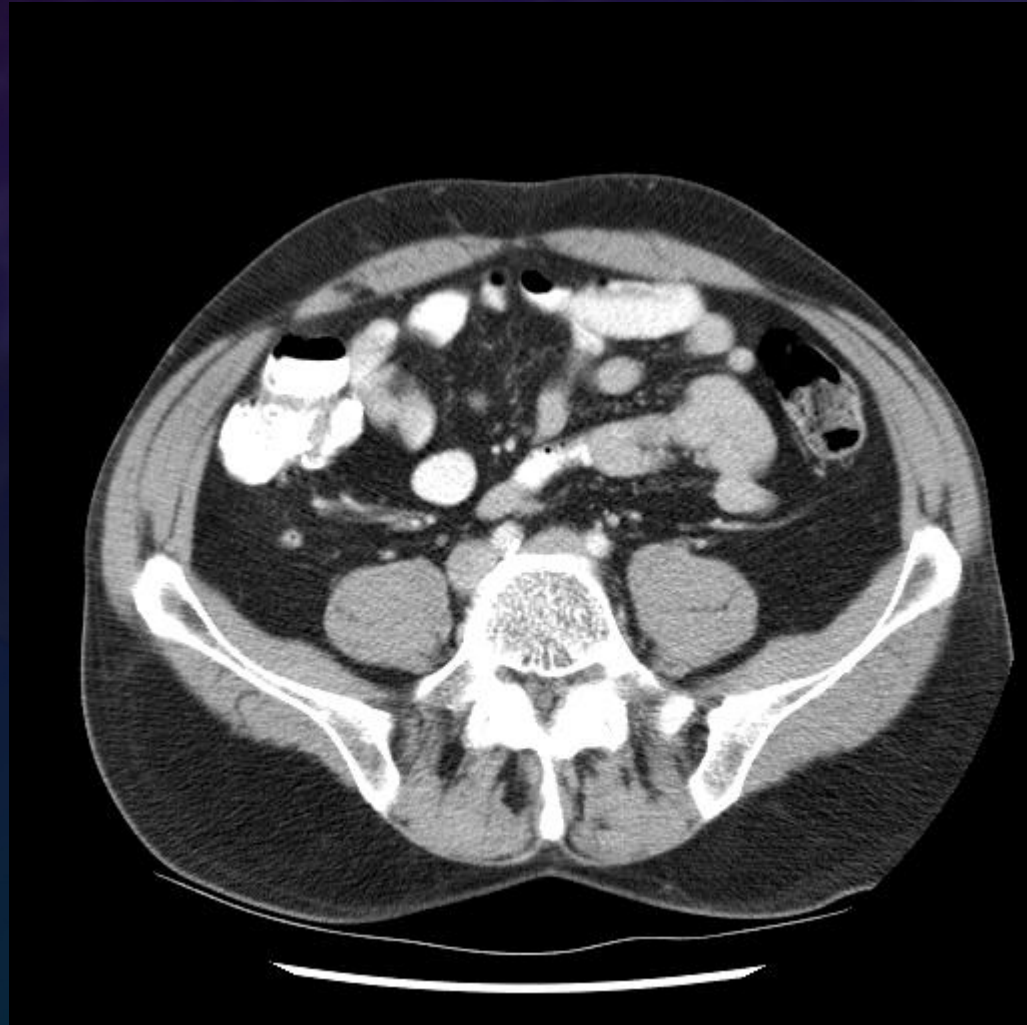


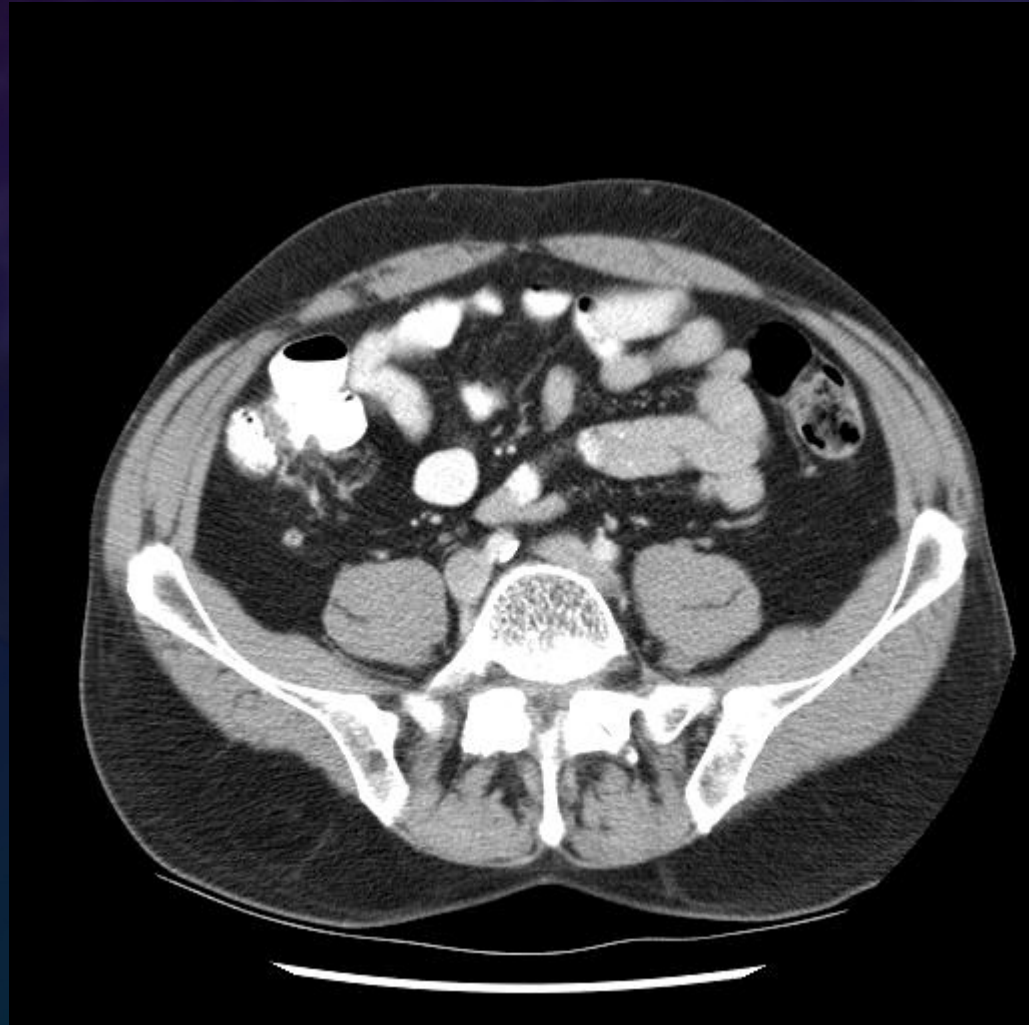




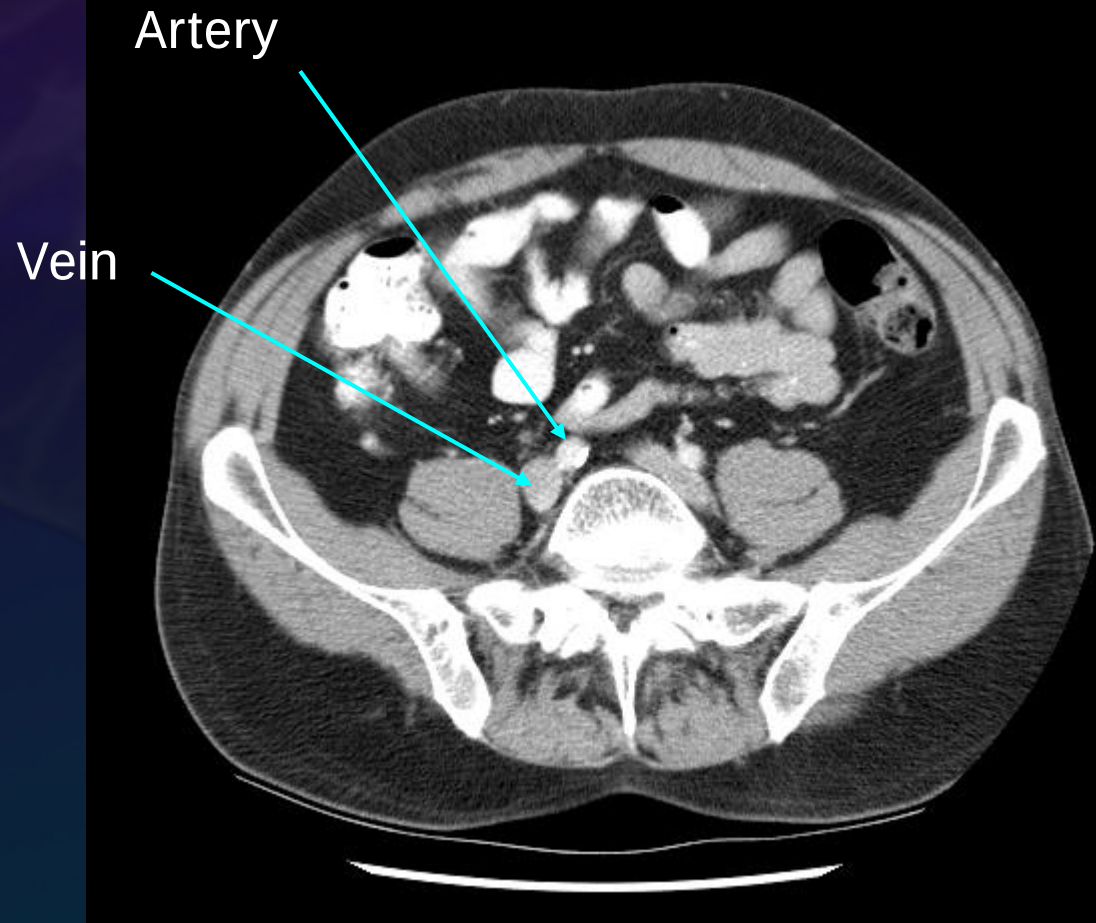




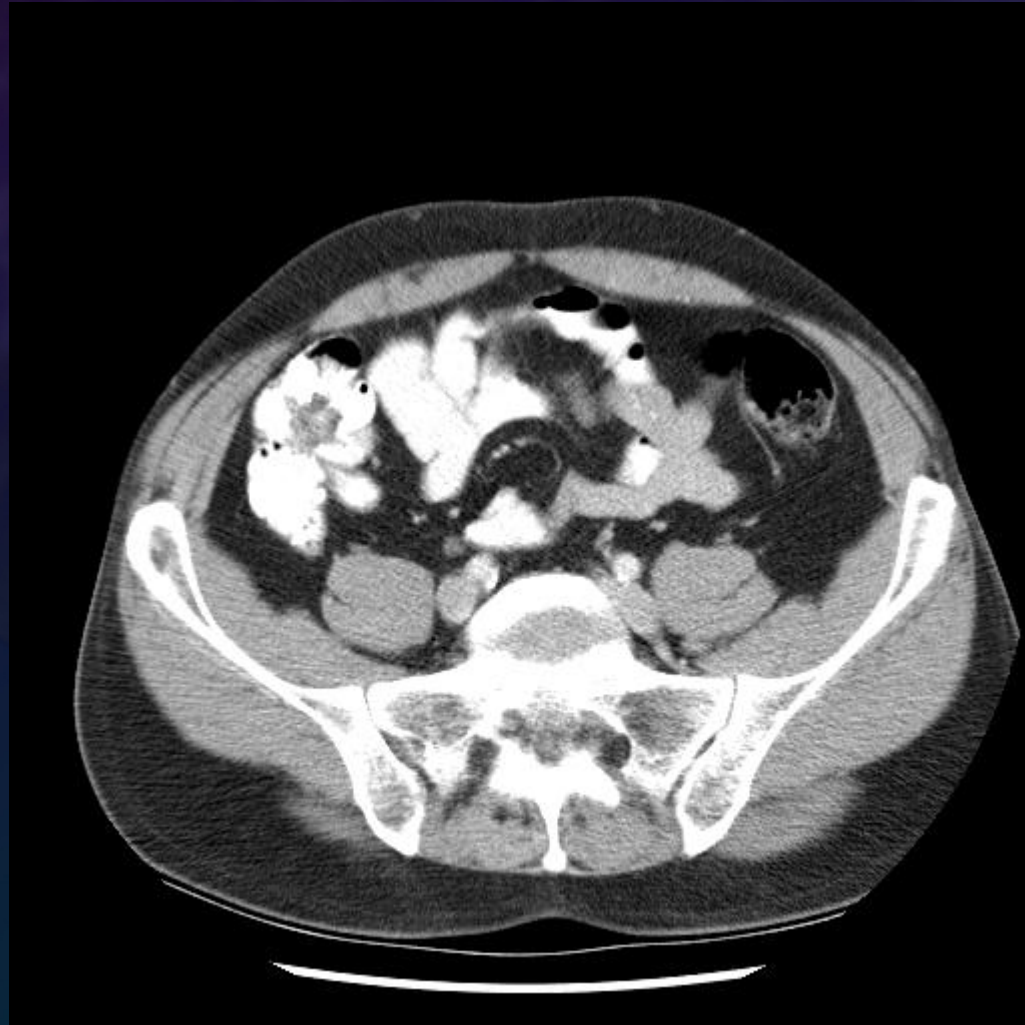




COMMON ILIAC VESSELS





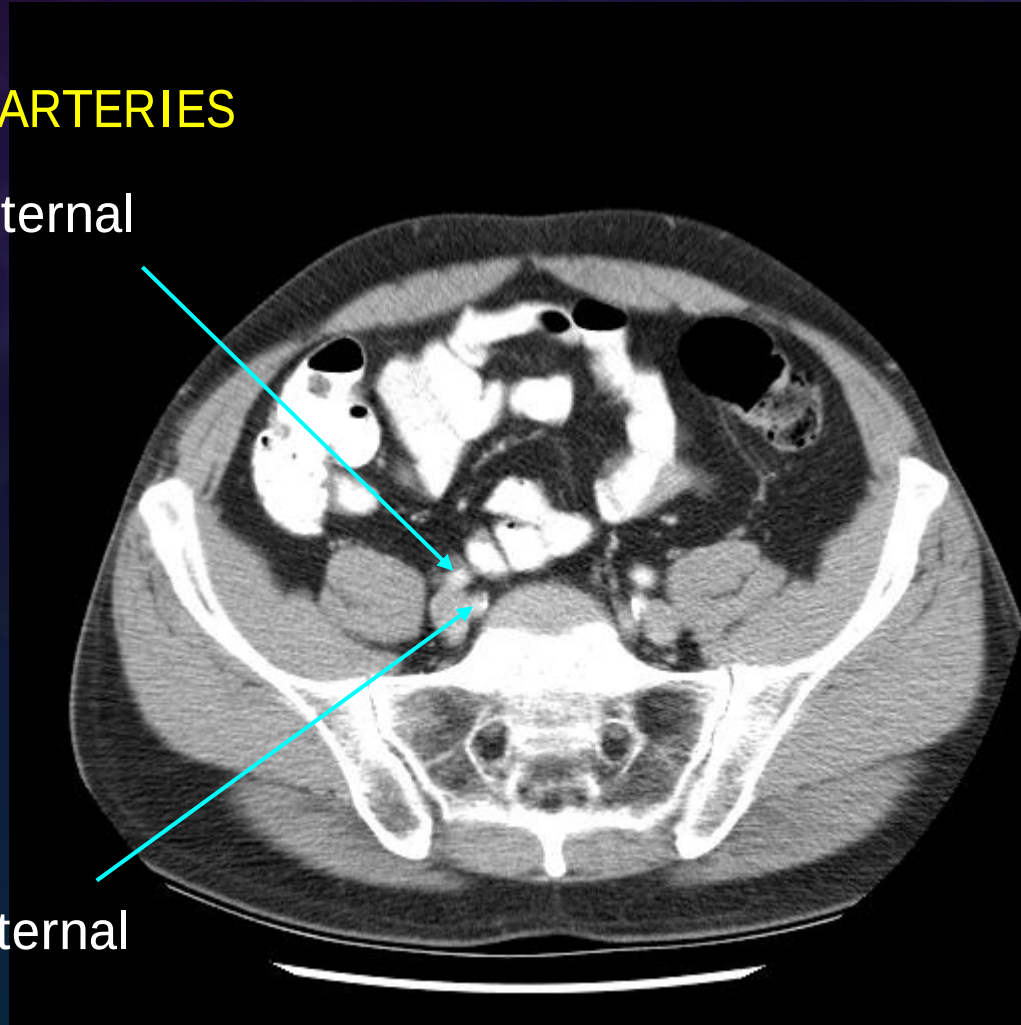




ILIAC ARTERIES

External

Internal



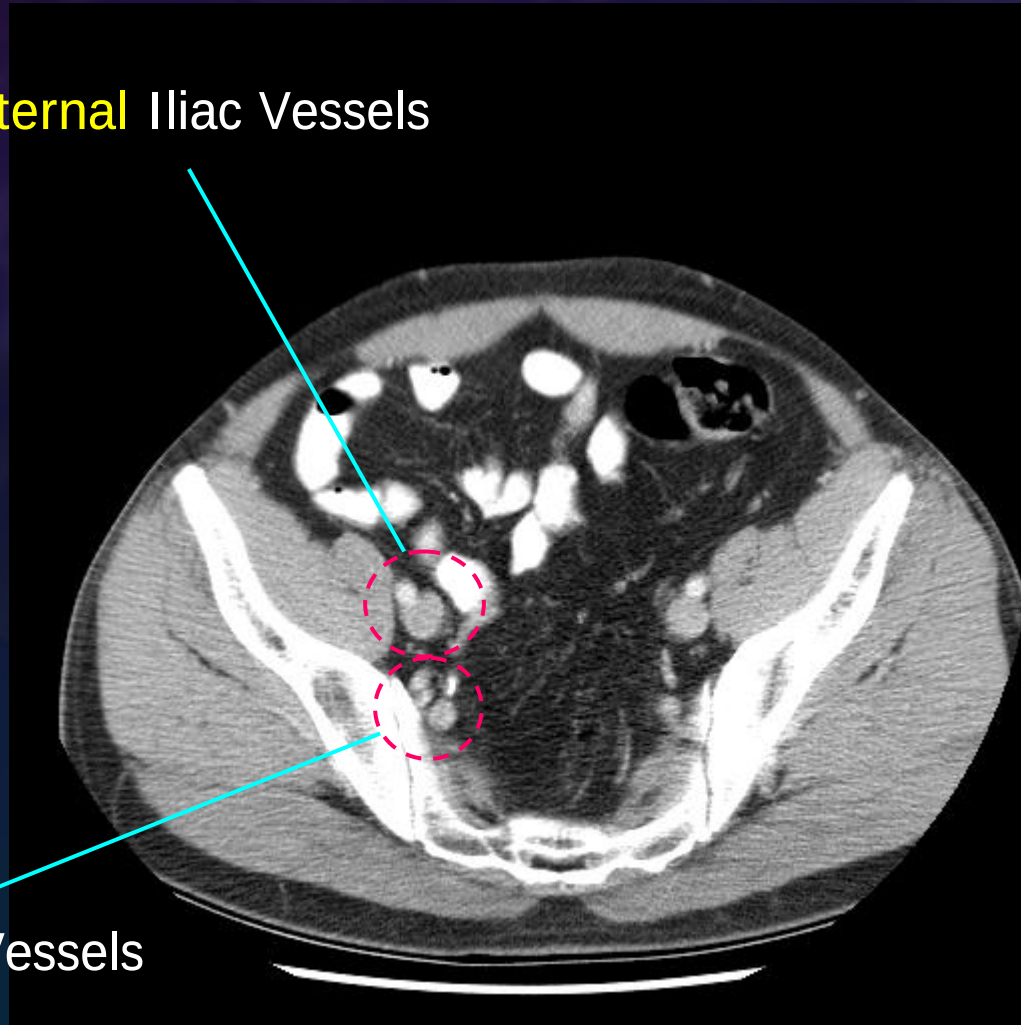








External Iliac Vessels



Internal Iliac Vessels

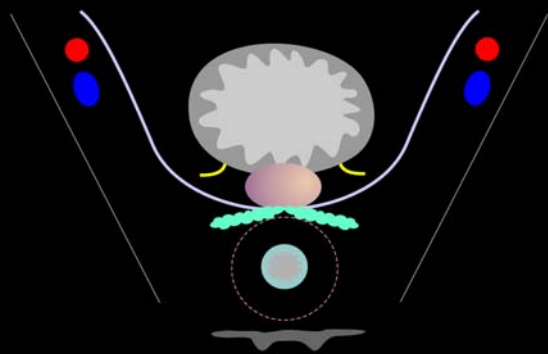








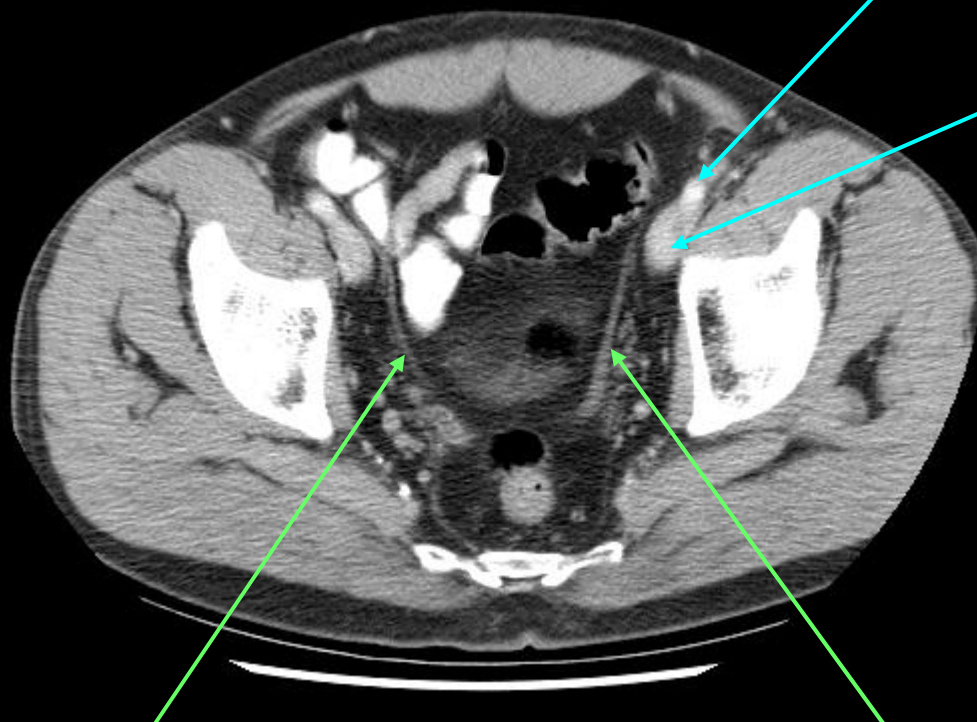




EXTERNAL ILIAC VESSELS

Artery

Vein

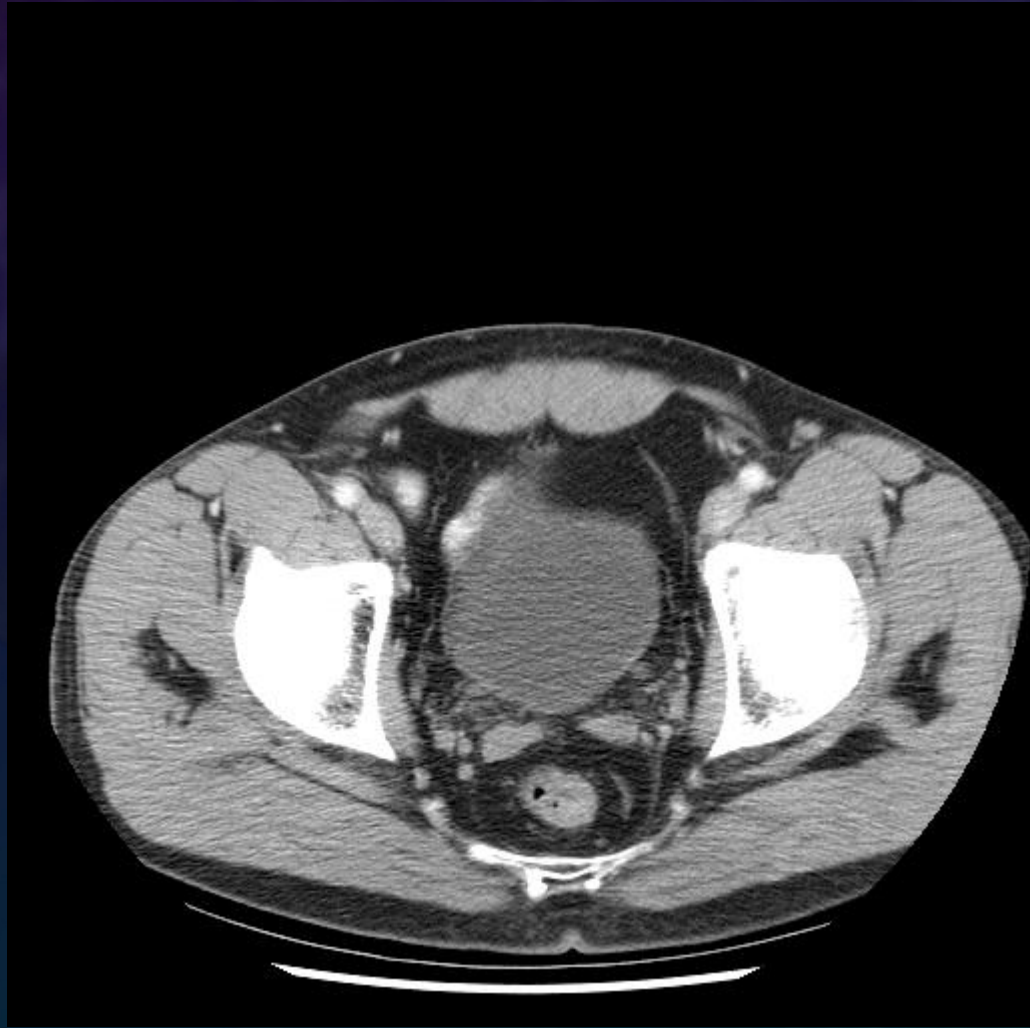


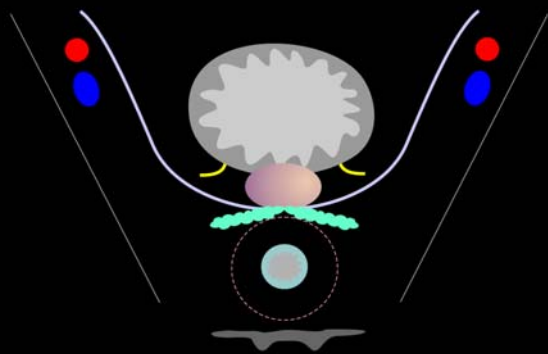
Right Vas Deferens

Left Vas Deferens

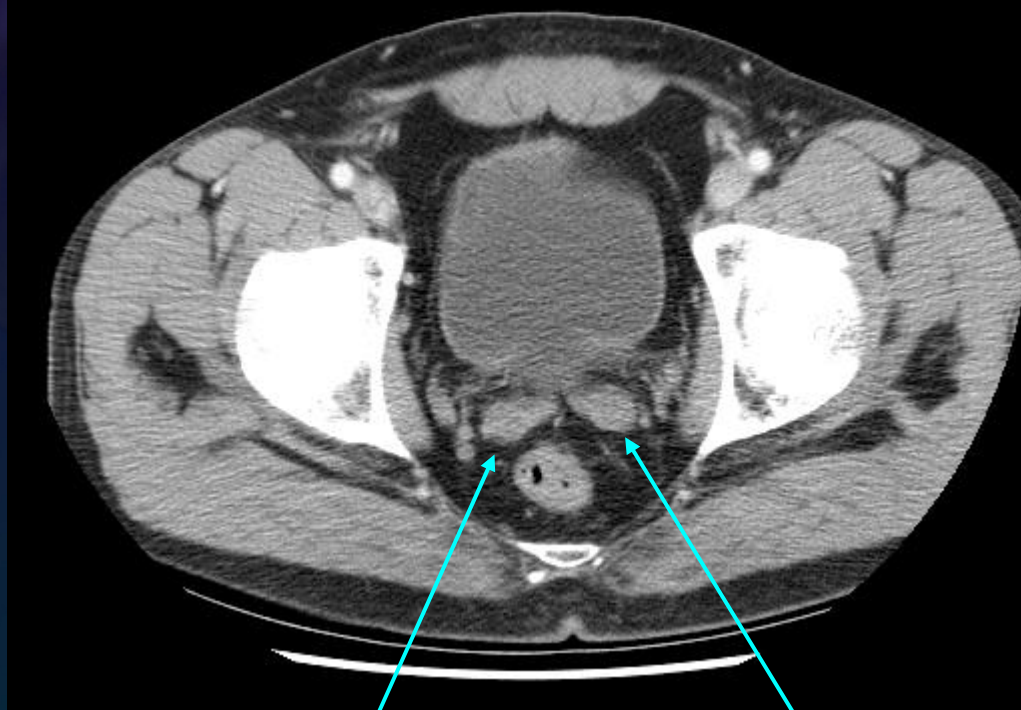
Left Vas Deferens





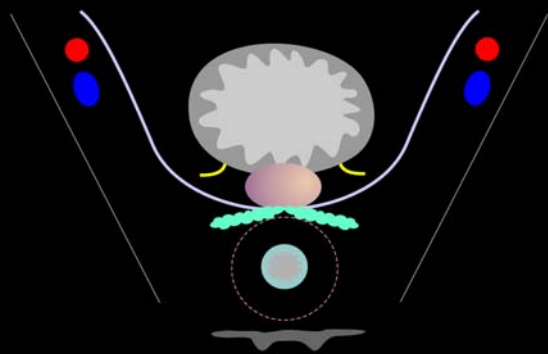


Seminal Vesicles



Rt

Lt



Mesorectal Fat





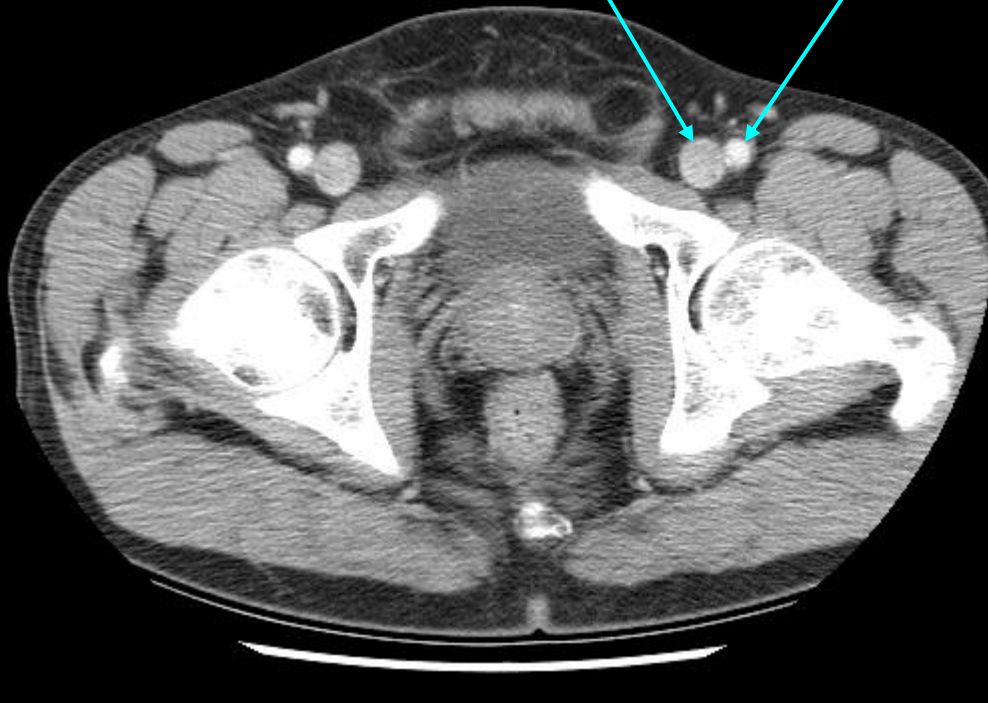
A V

V A

COMMON FEMORAL VESSELS

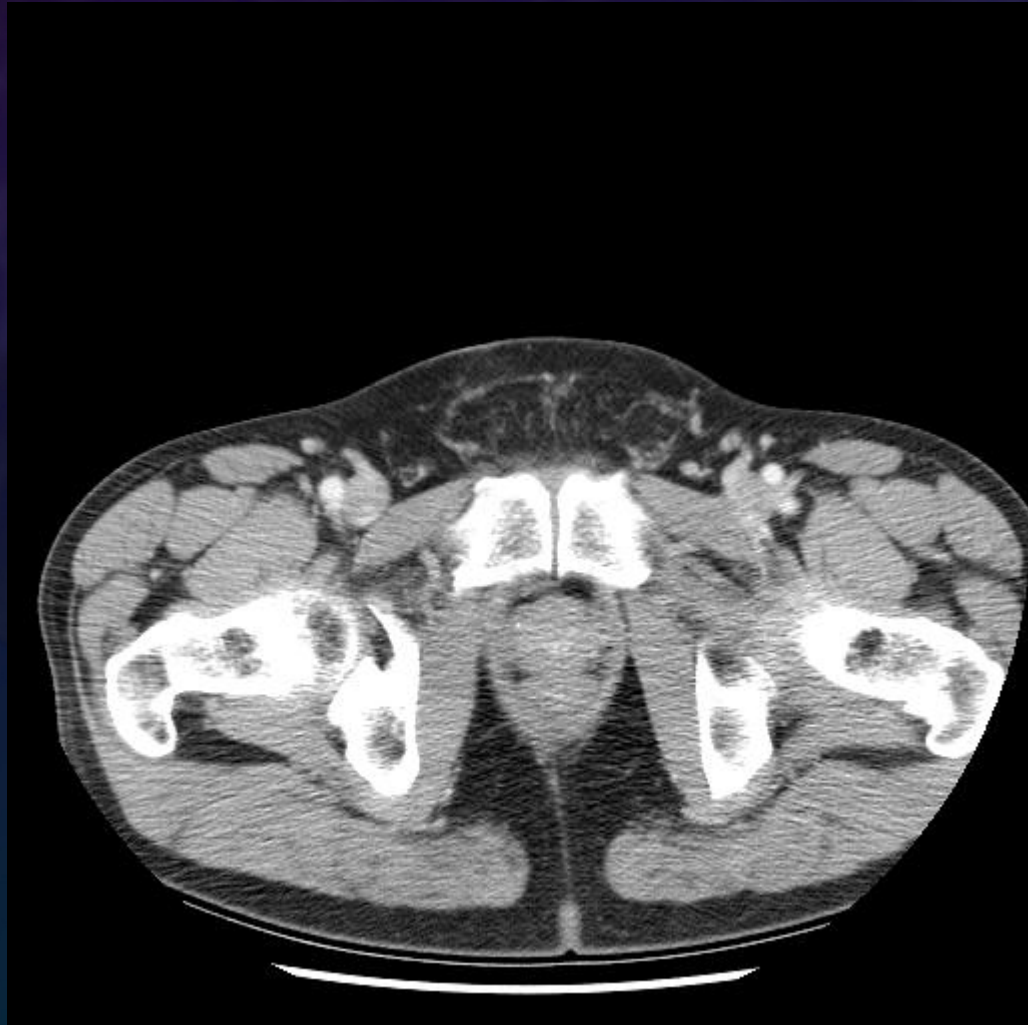
Vein (medial)

Artery (lateral)



Prostate



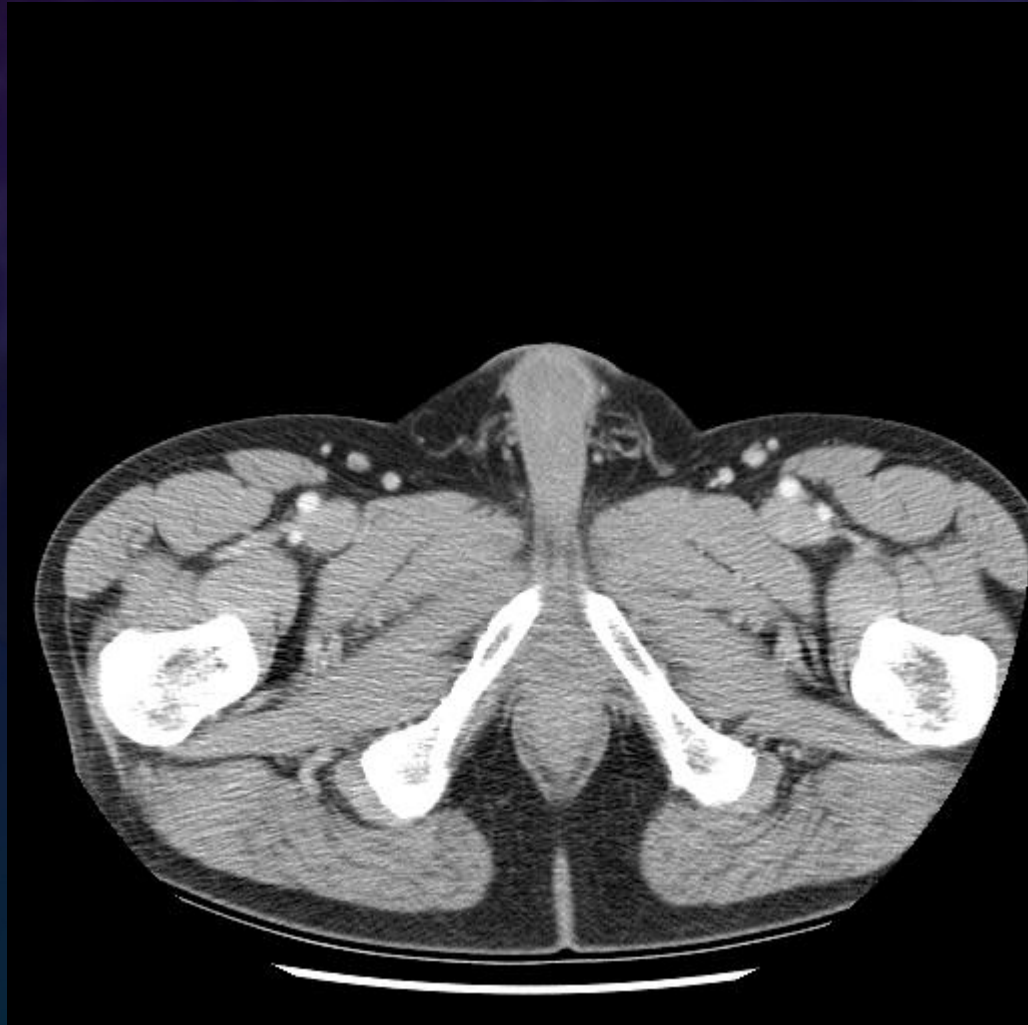


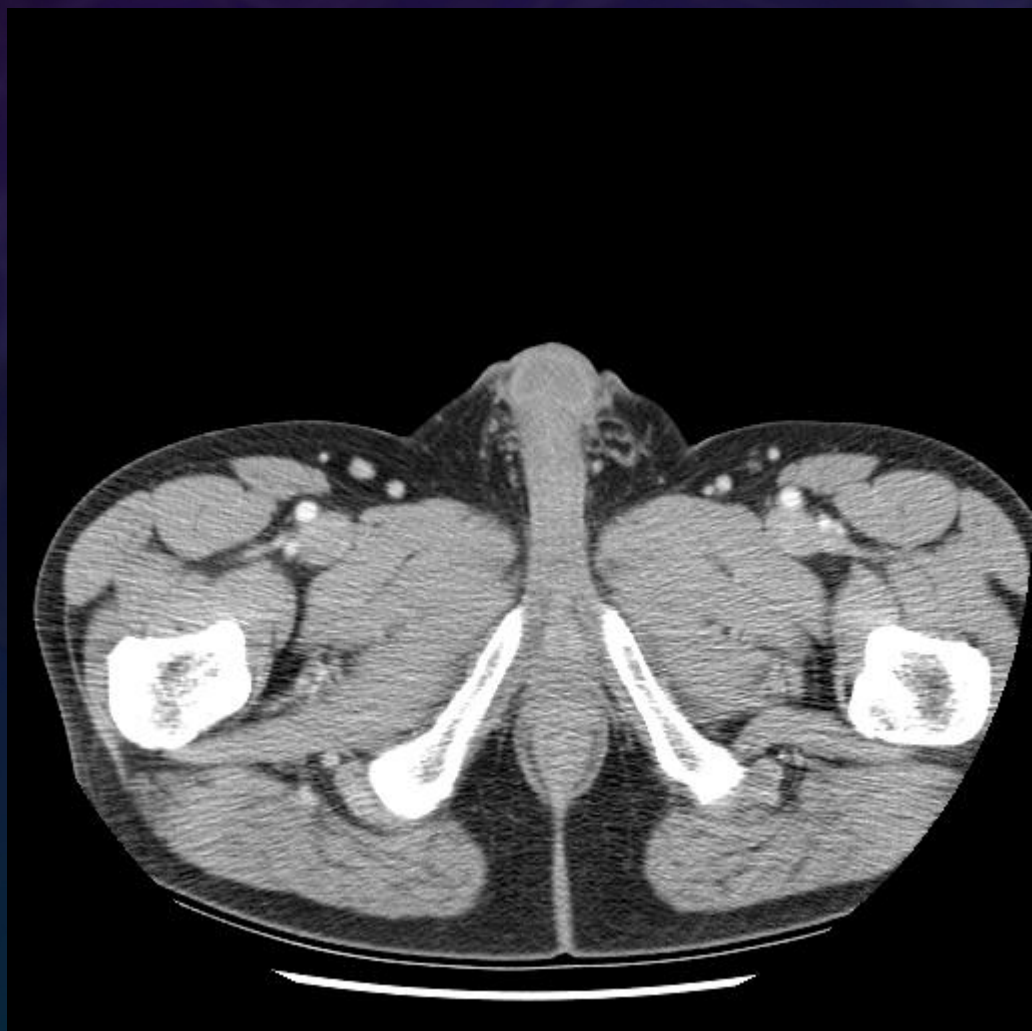










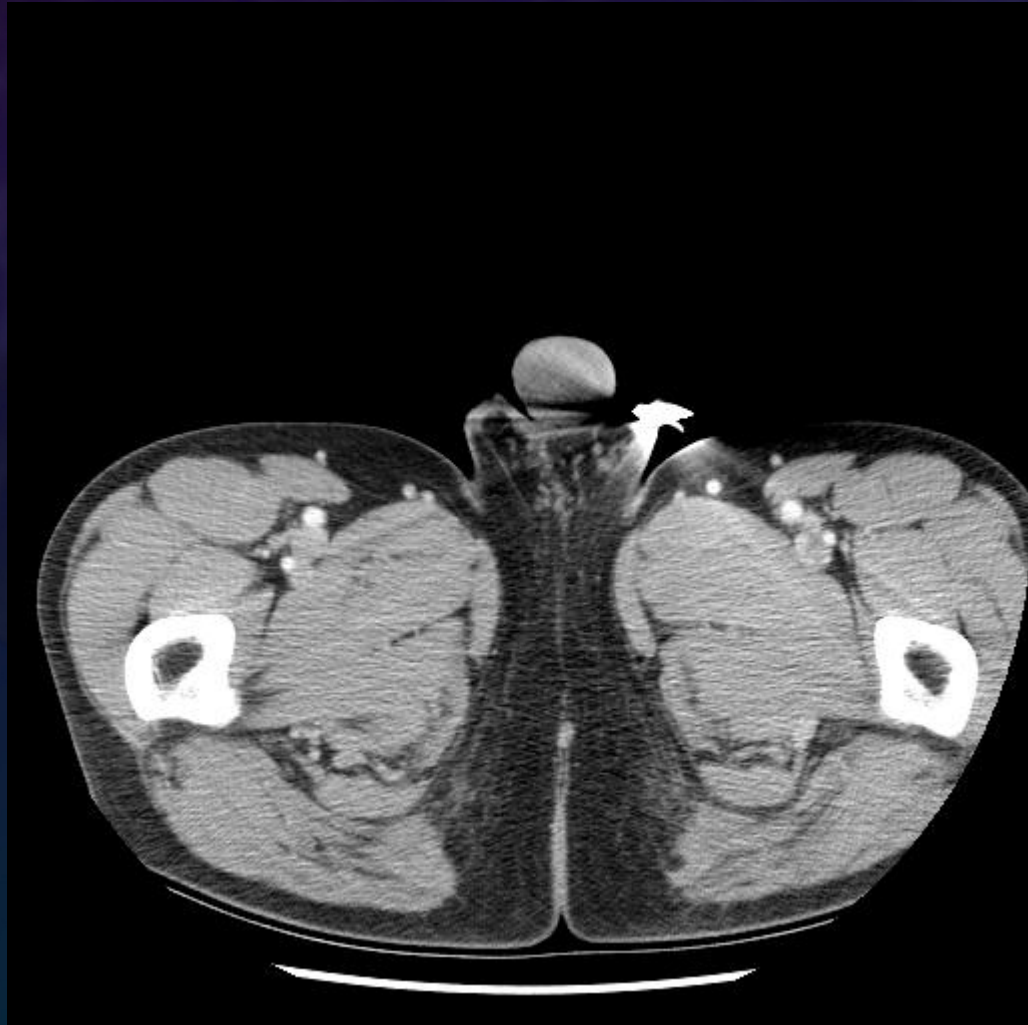




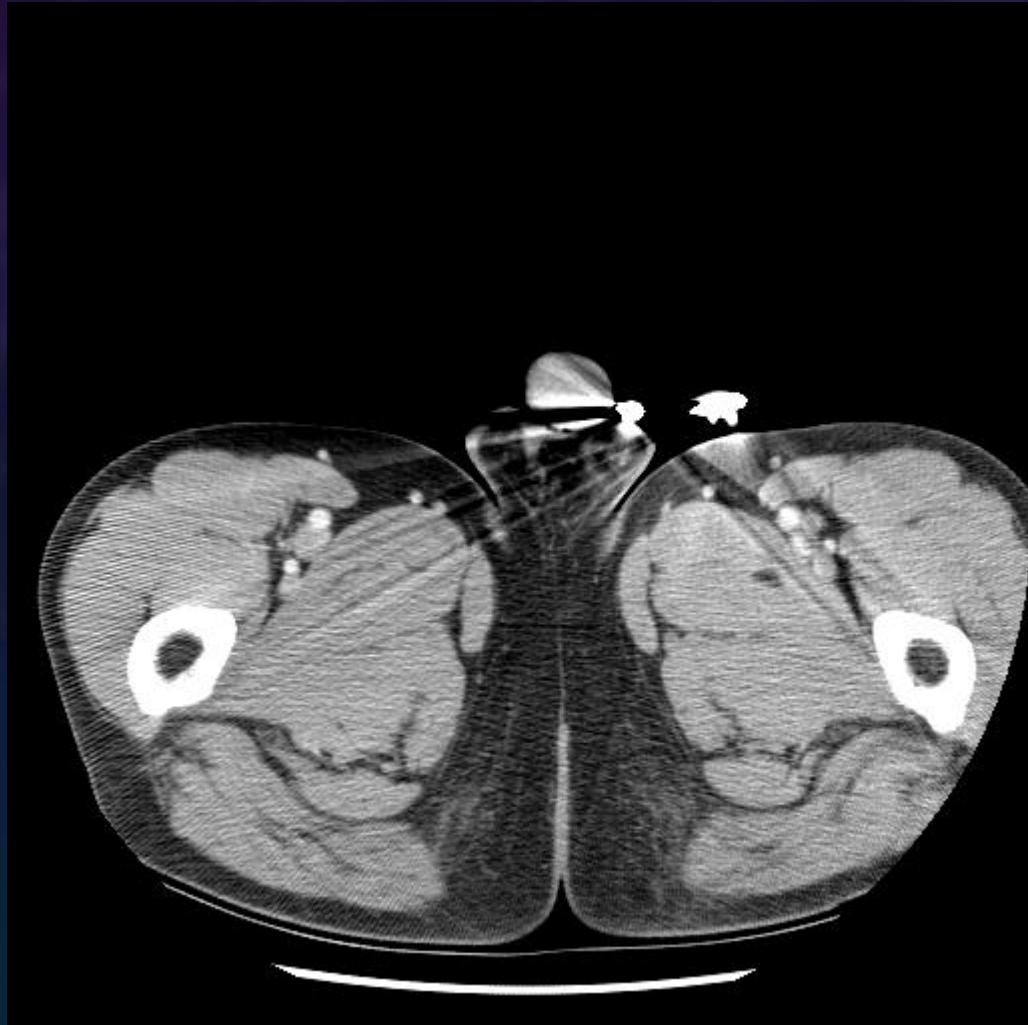








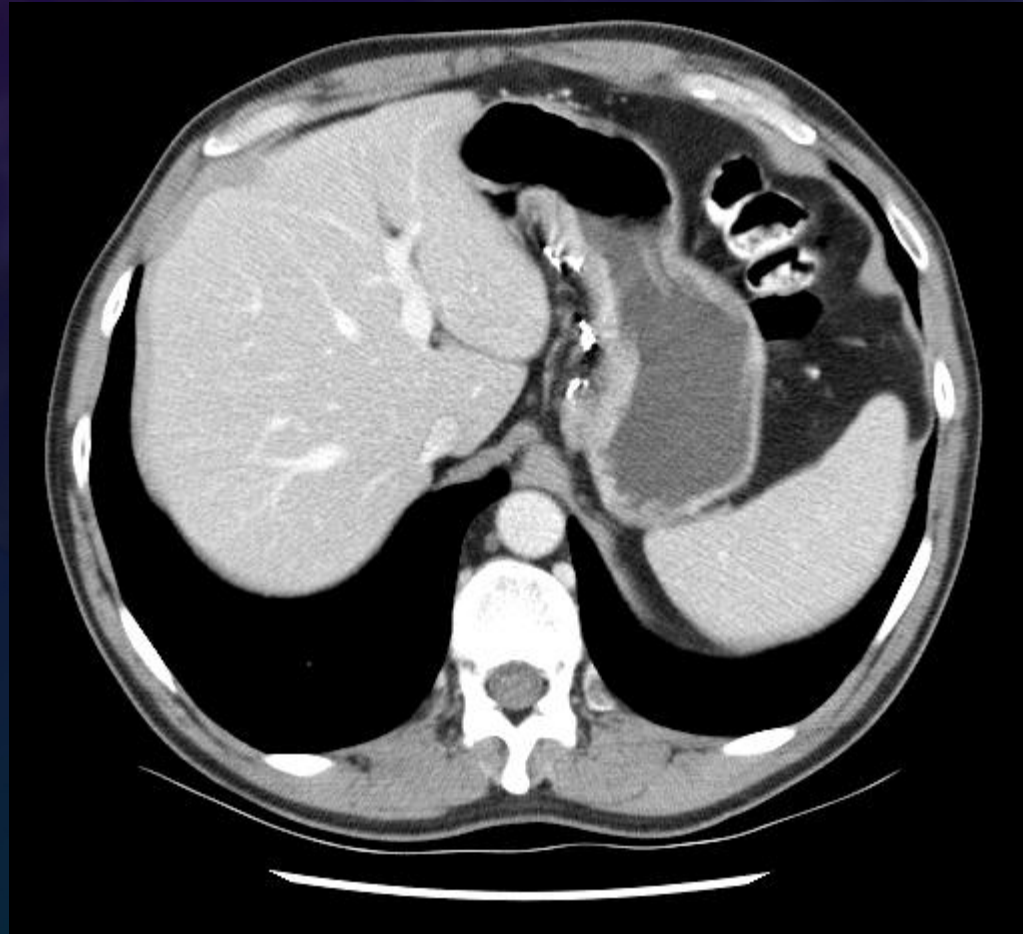


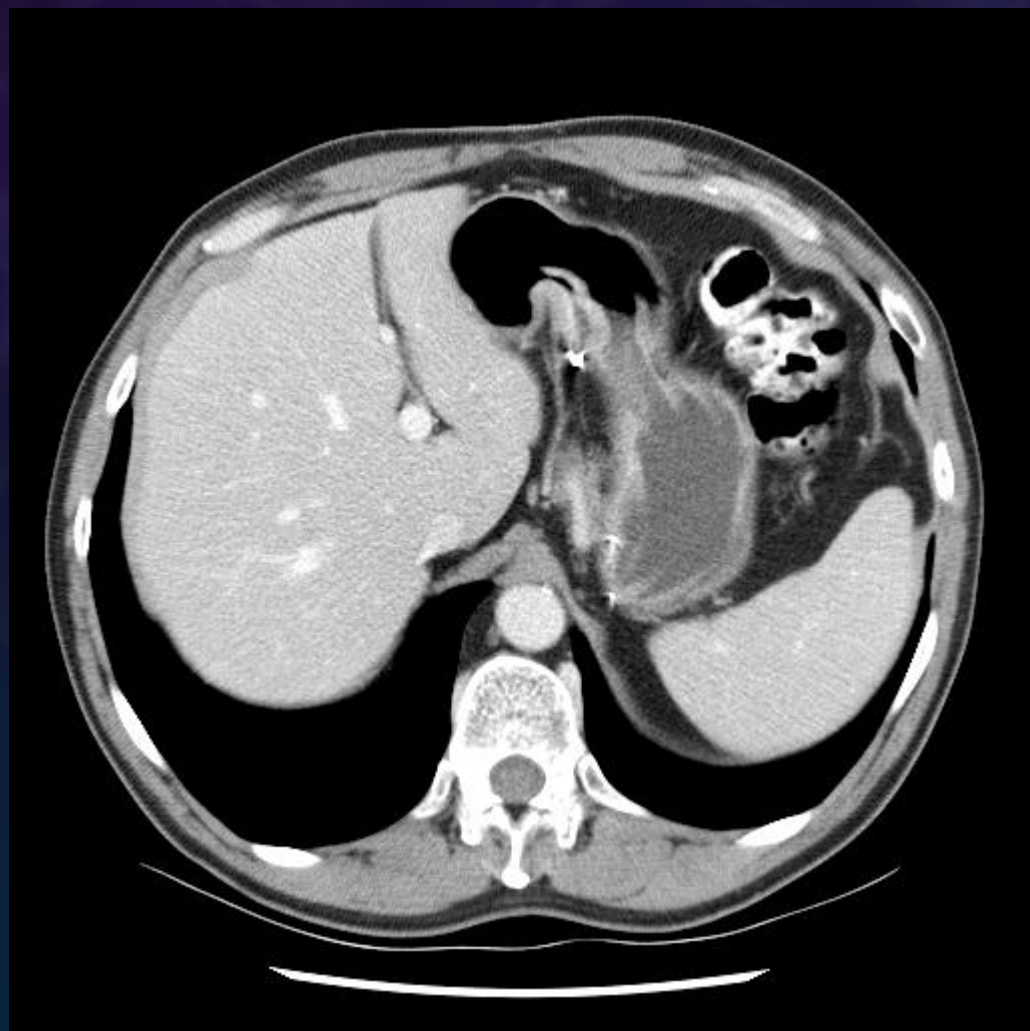


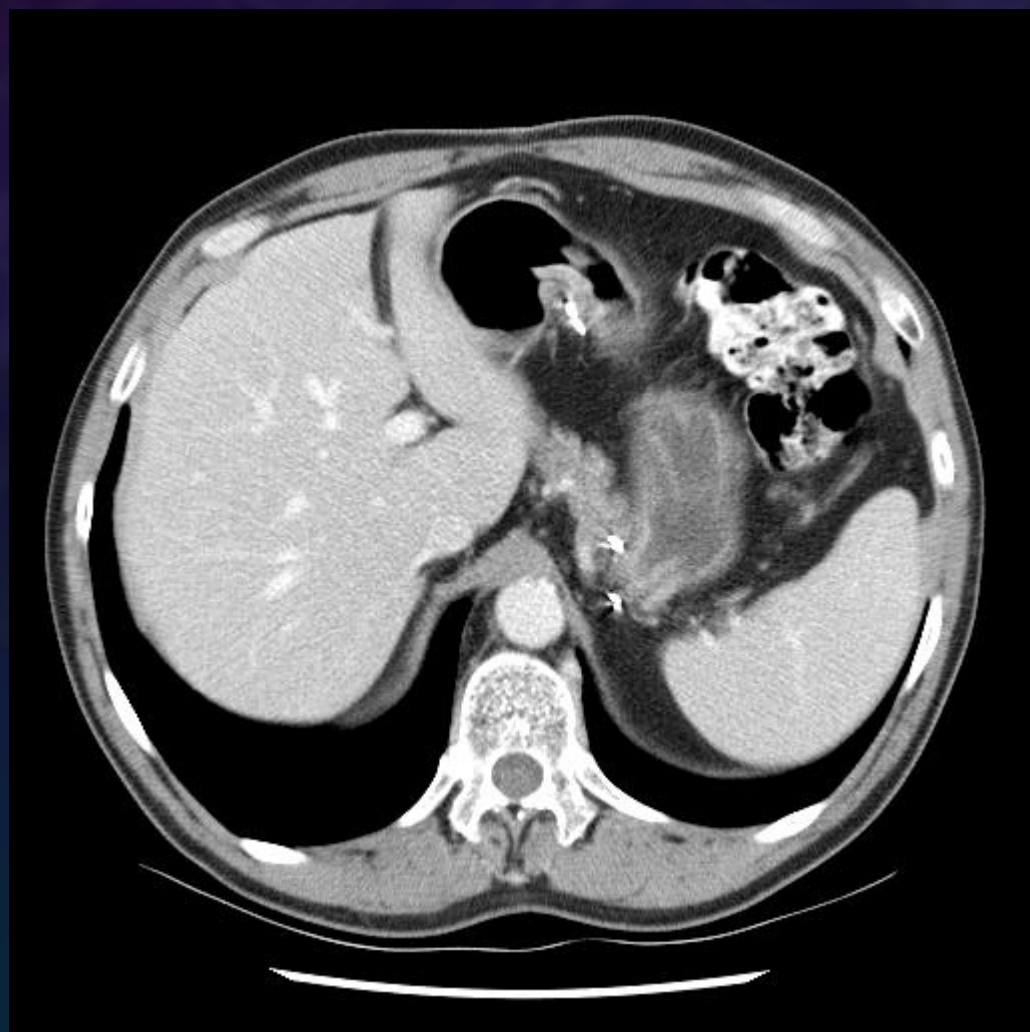




Muscular and bony landmarks

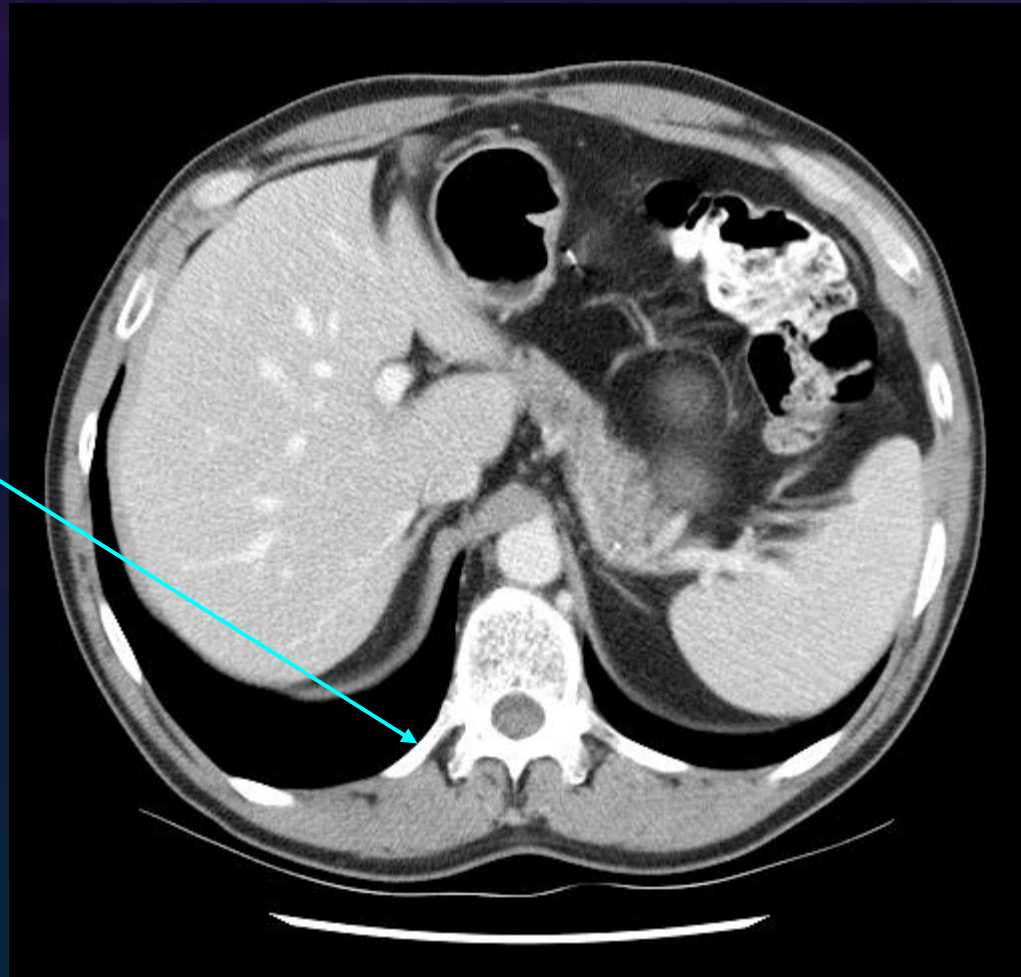




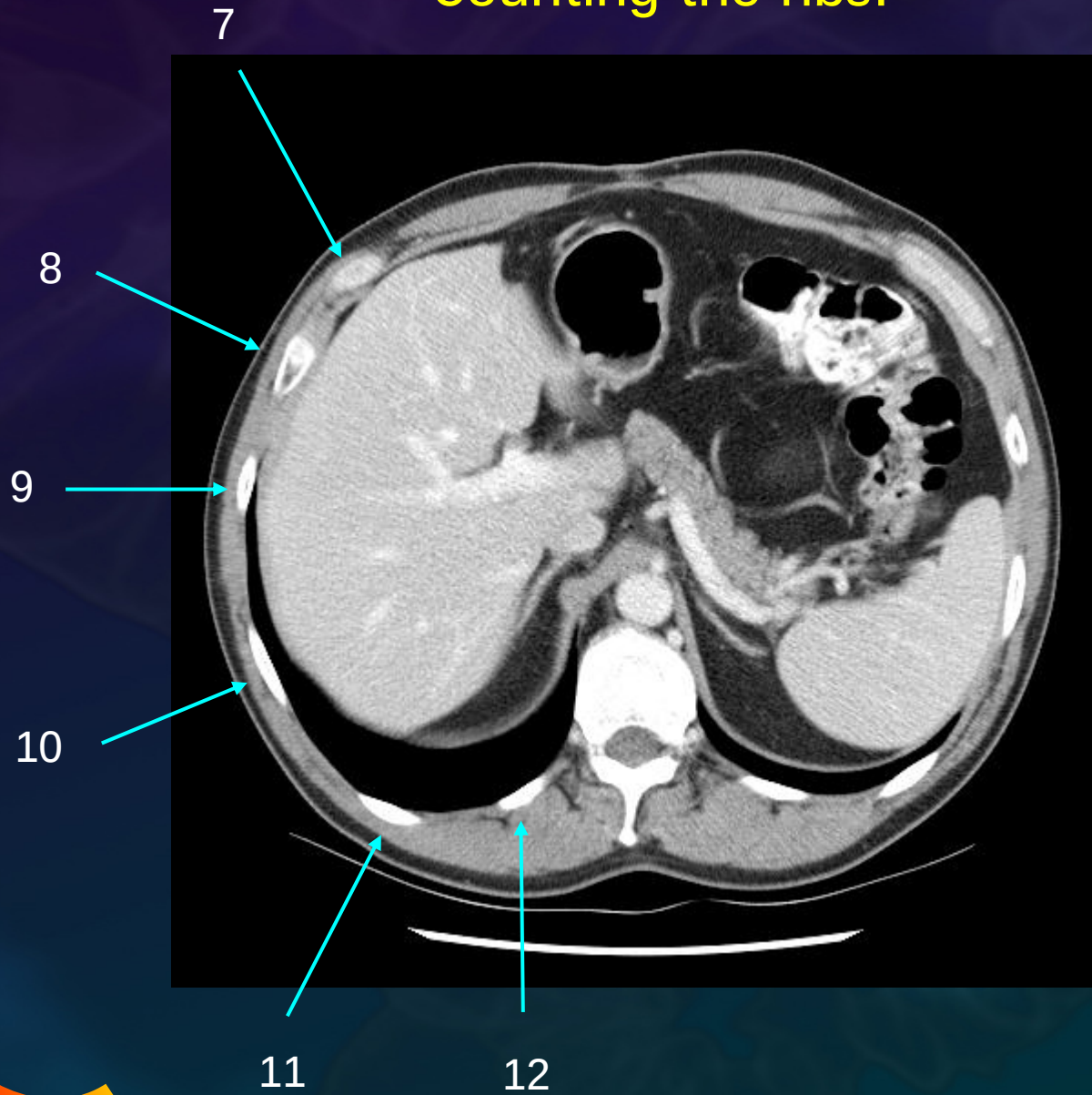


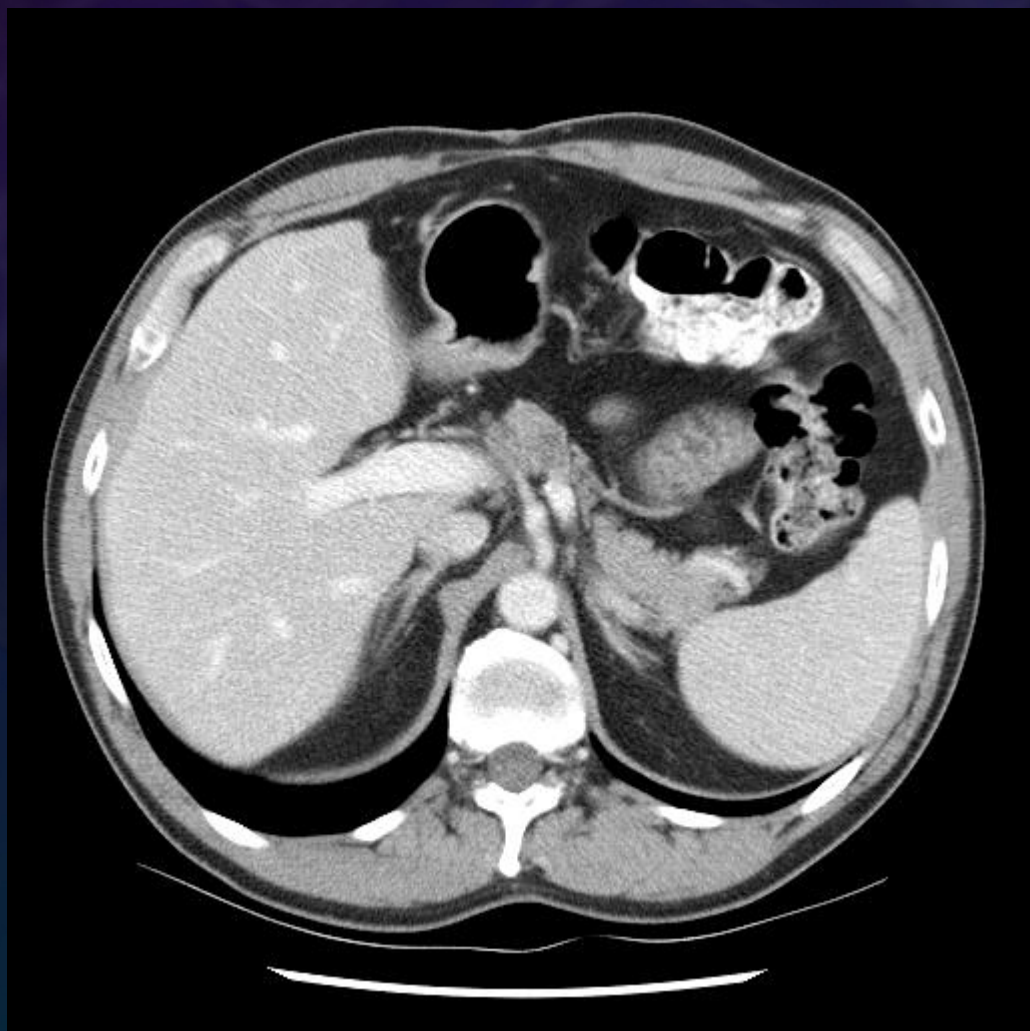
T12 level

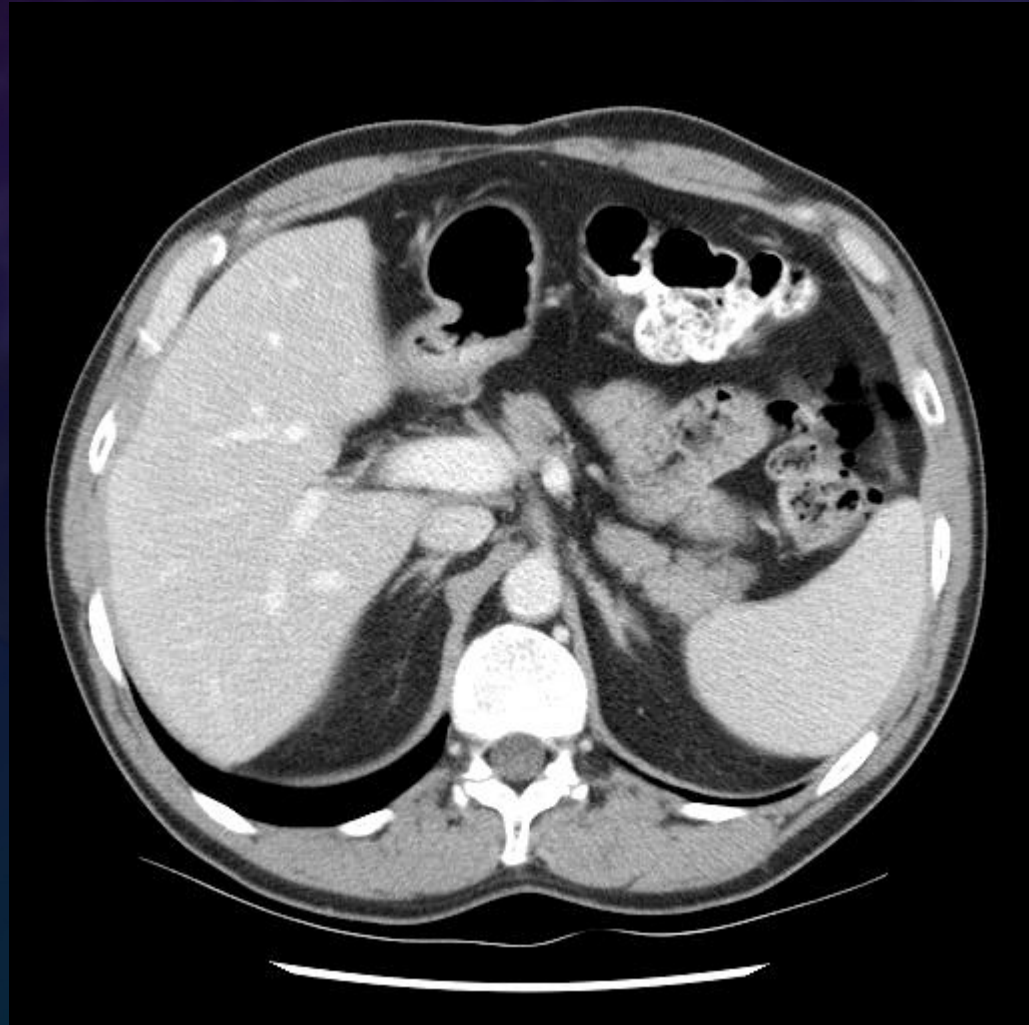
12th Rib

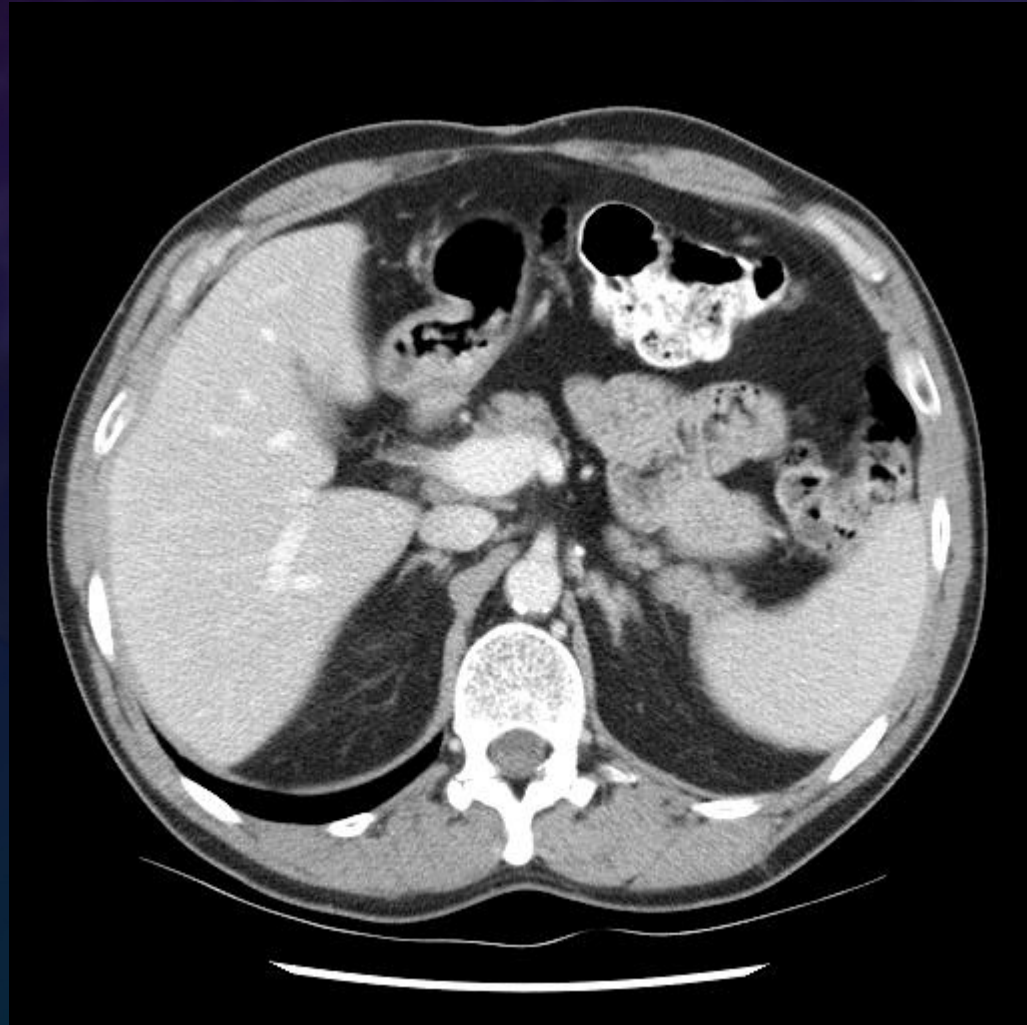


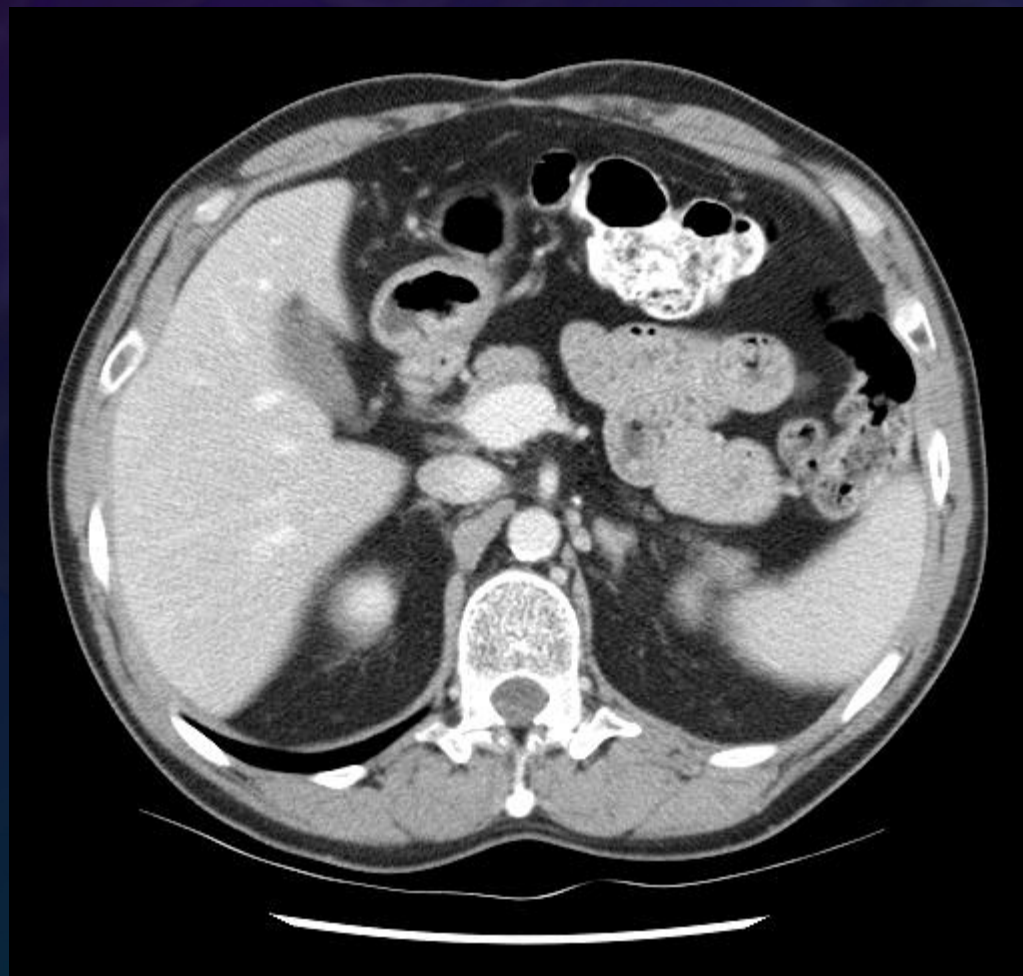
Counting the ribs!





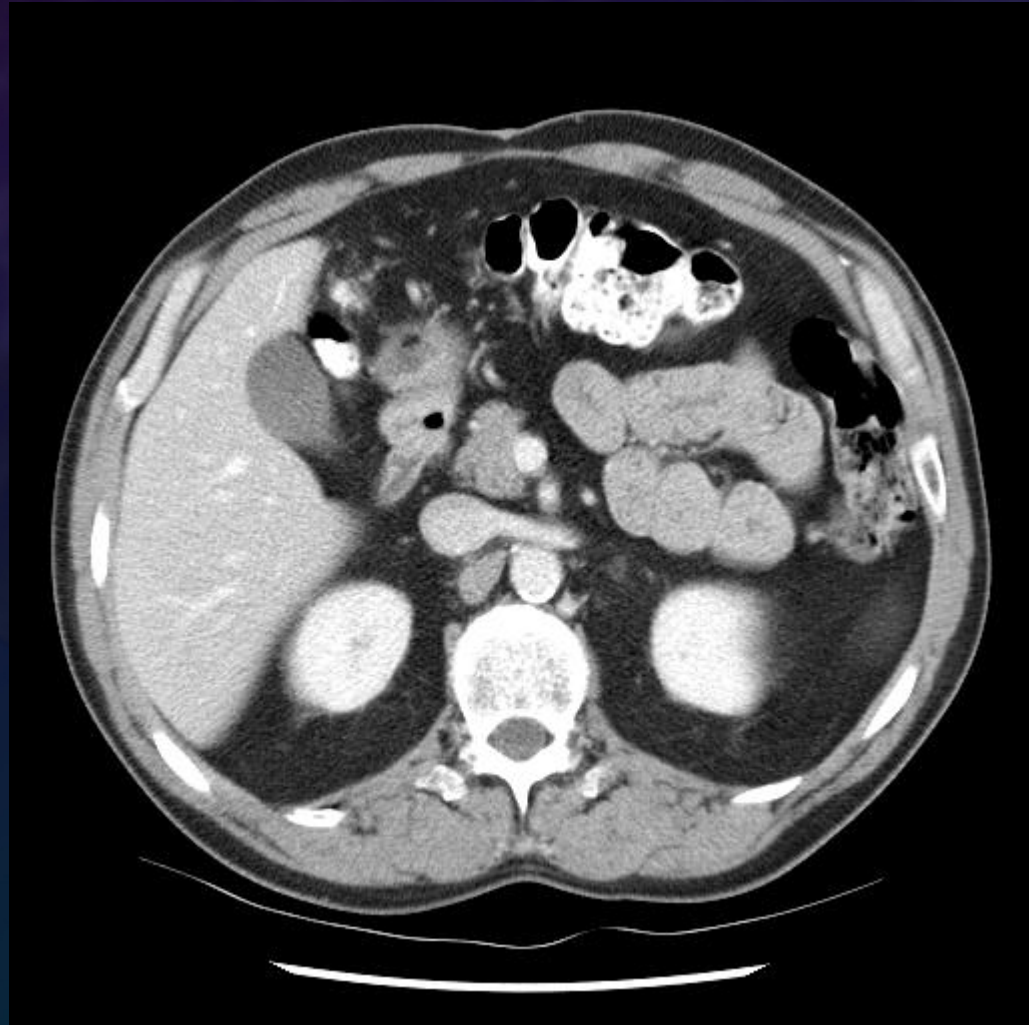


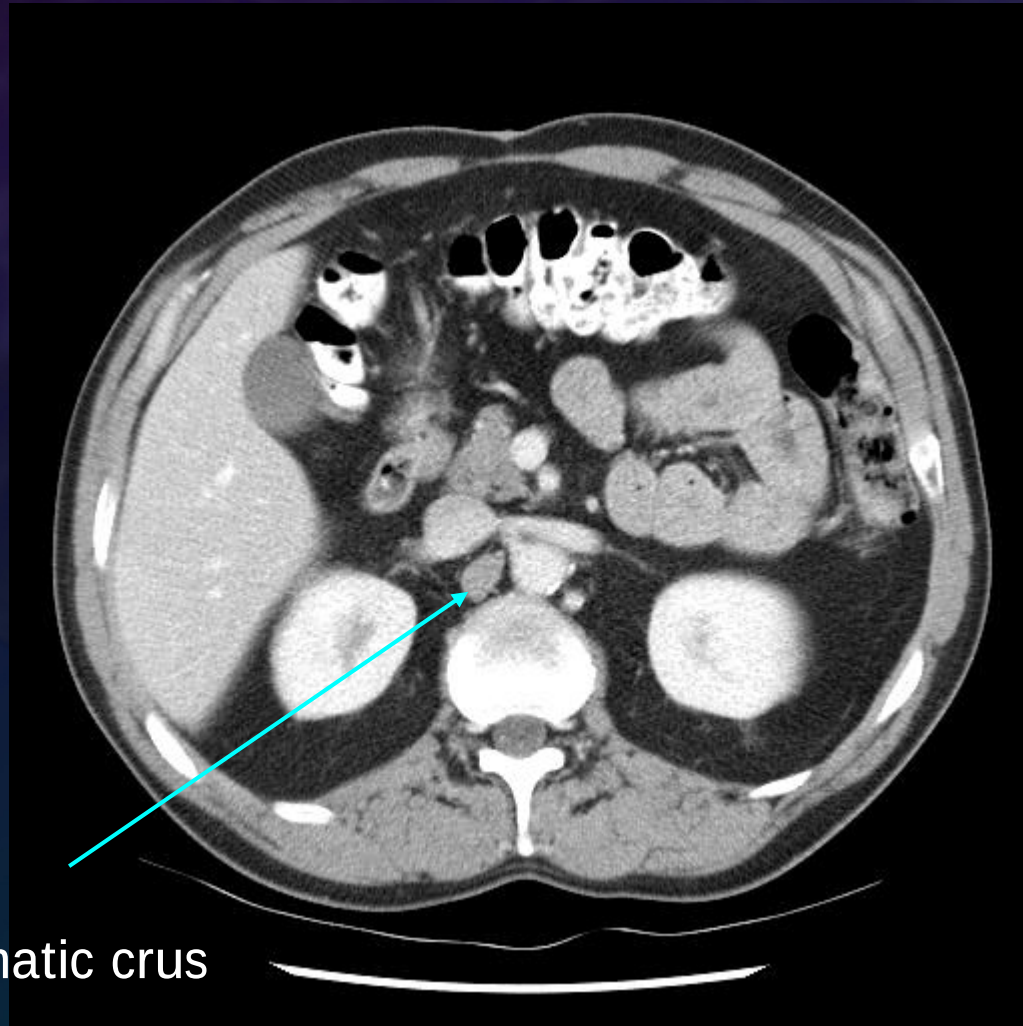




L1



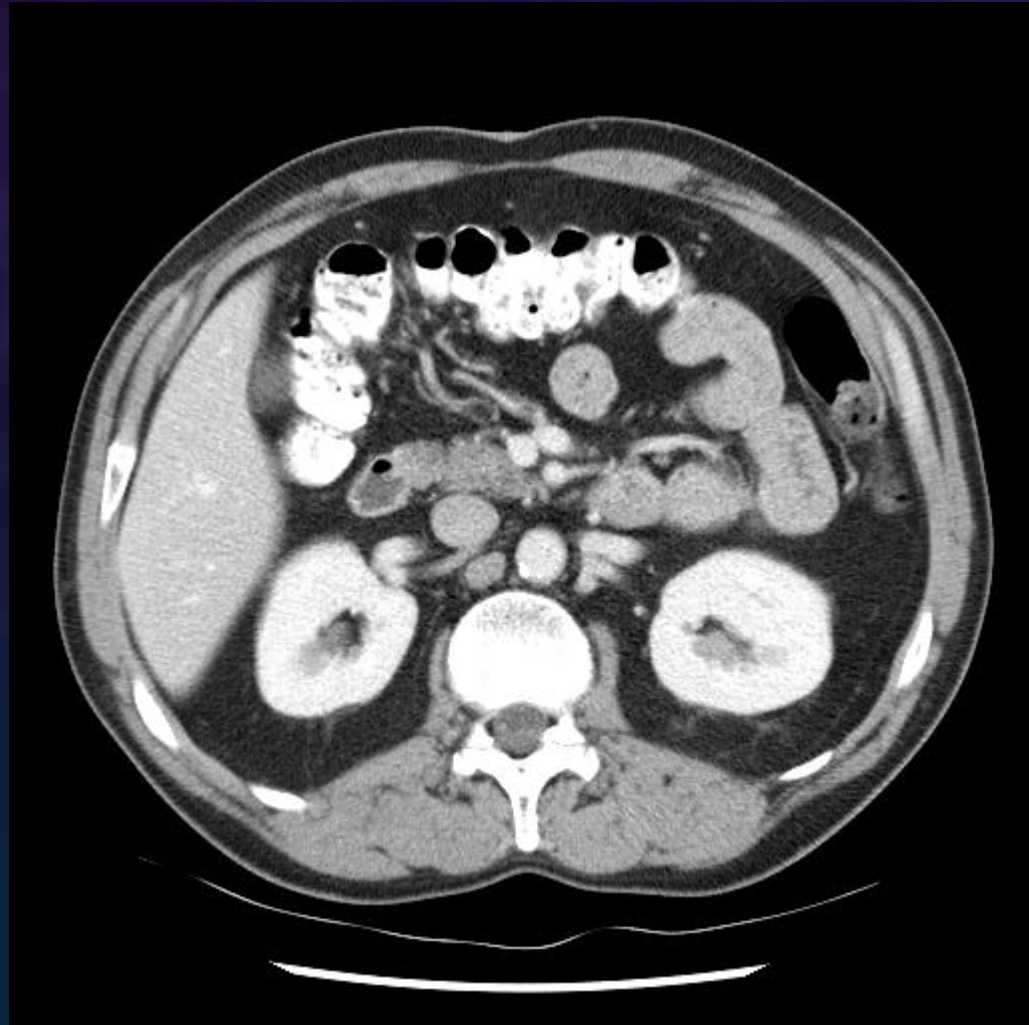


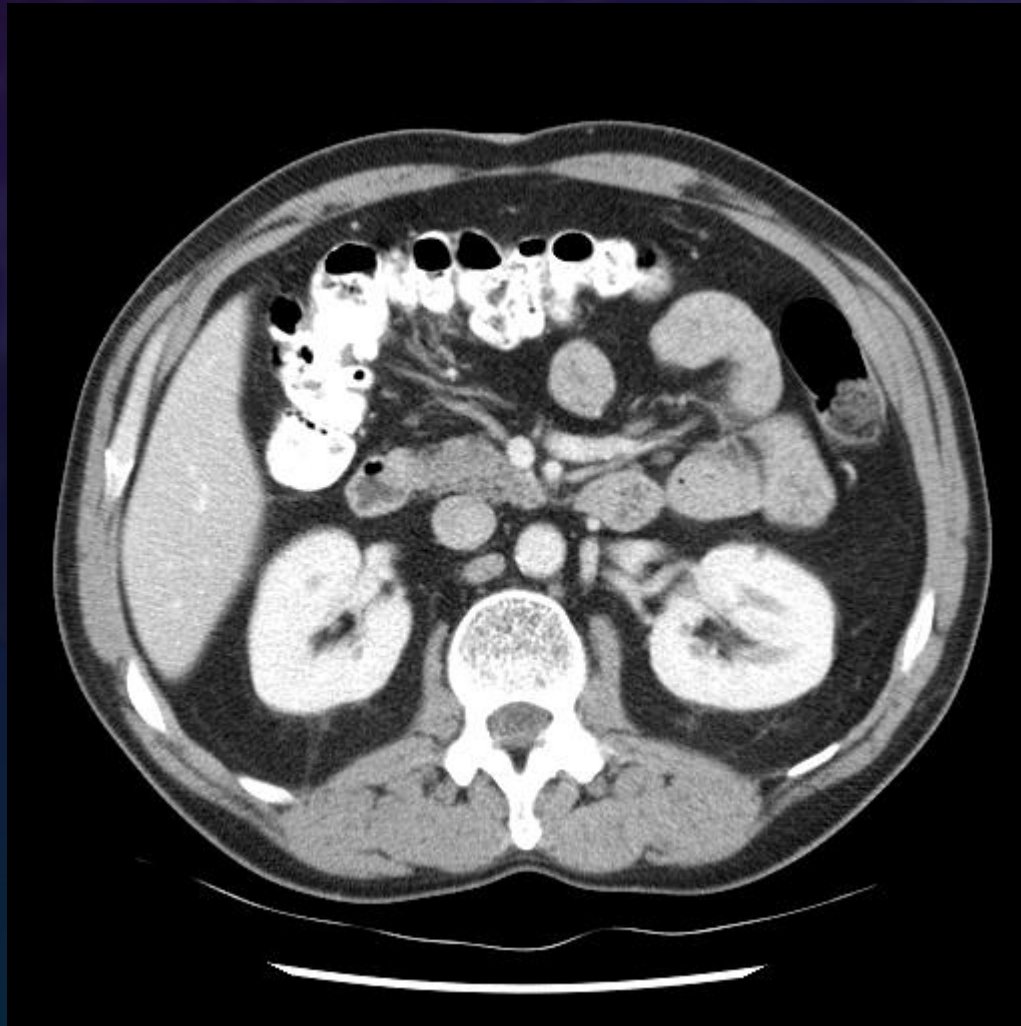


Right diaphragmatic crus

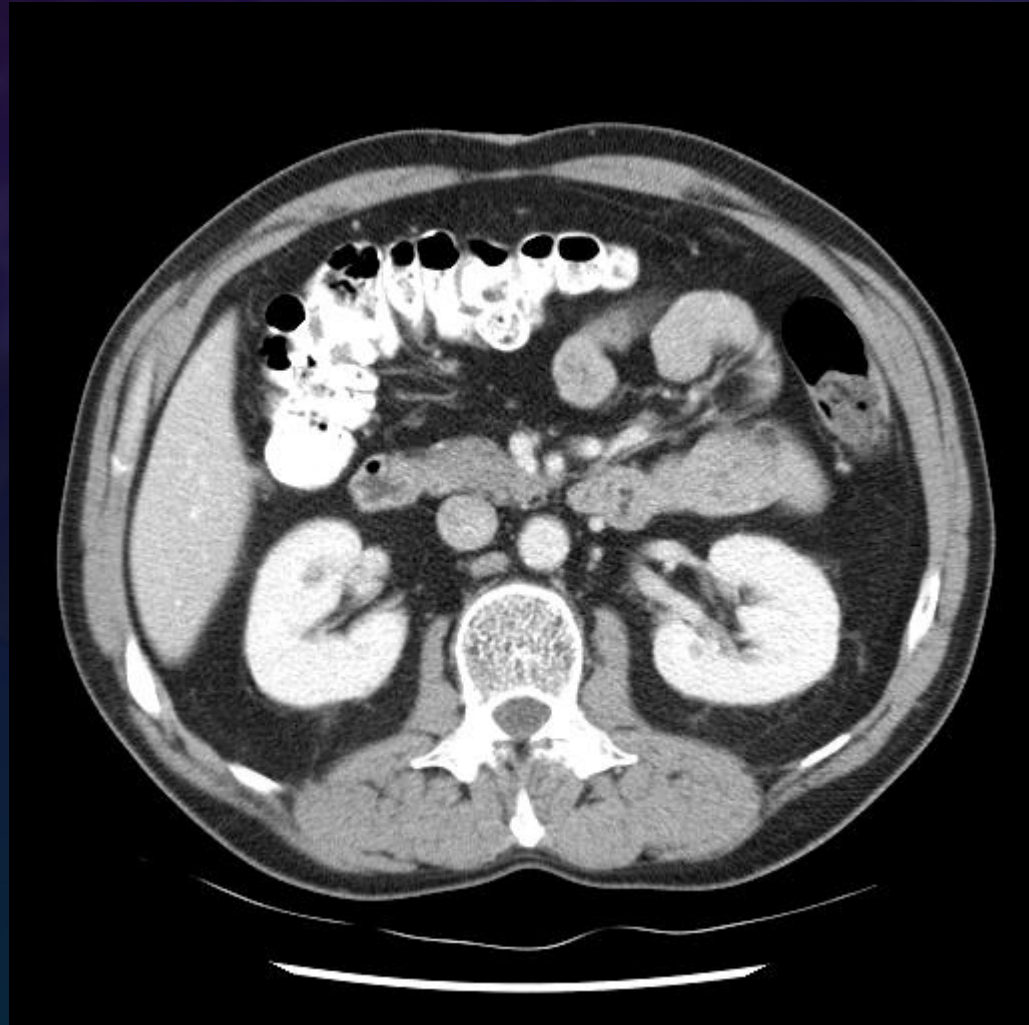
L1/2

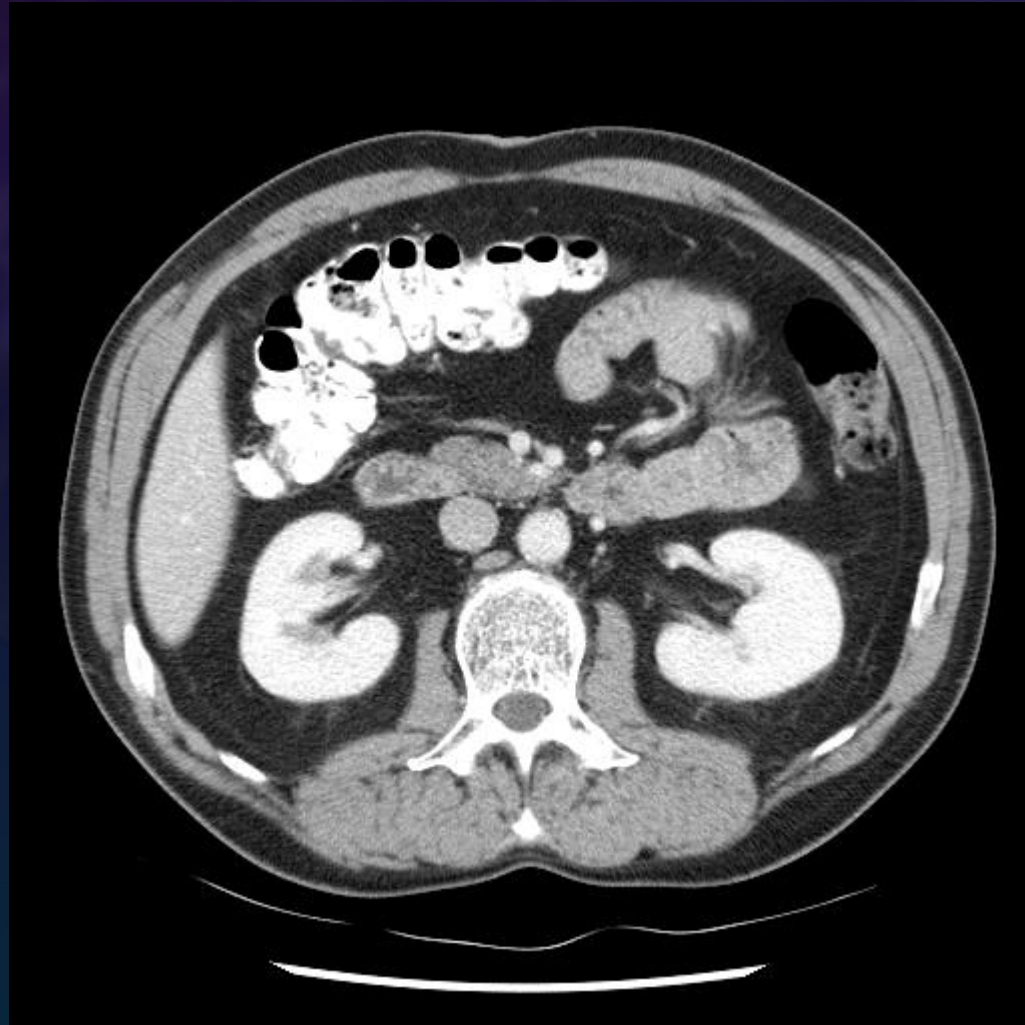


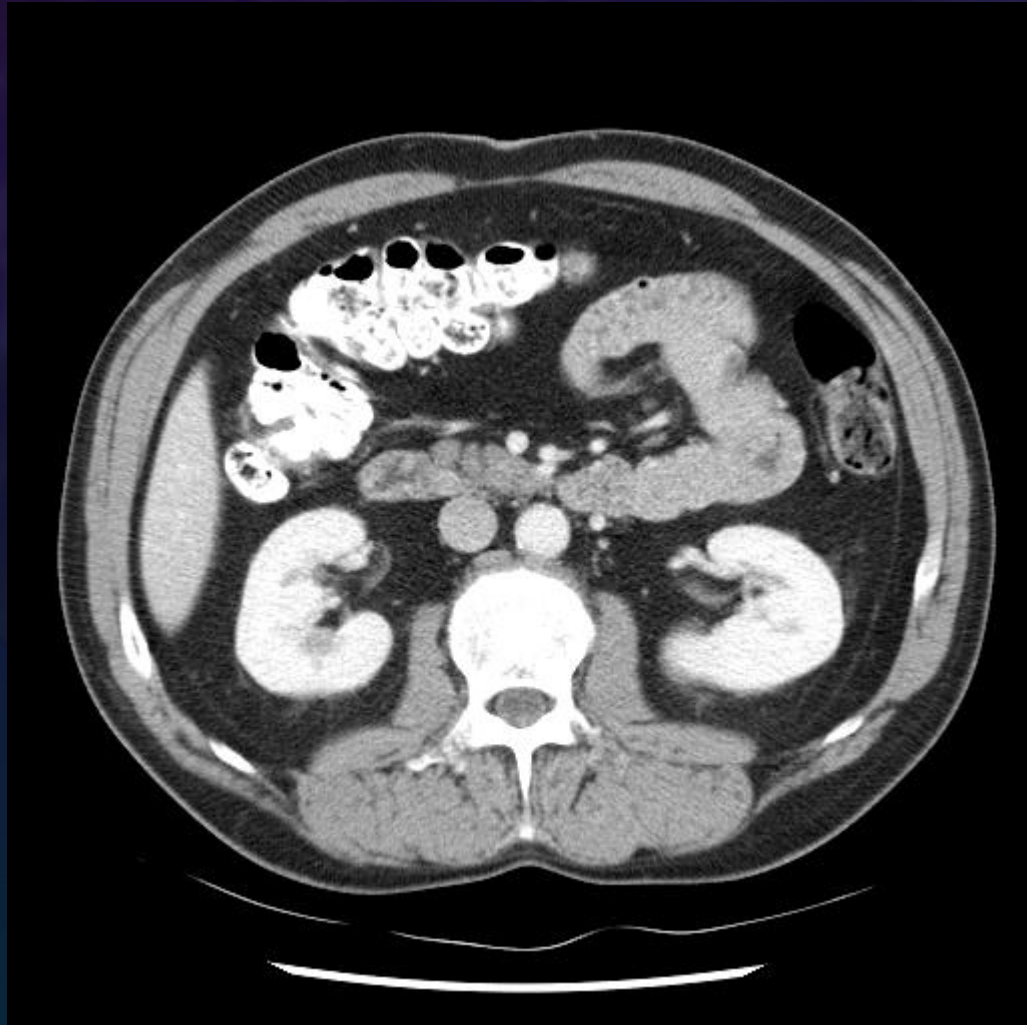




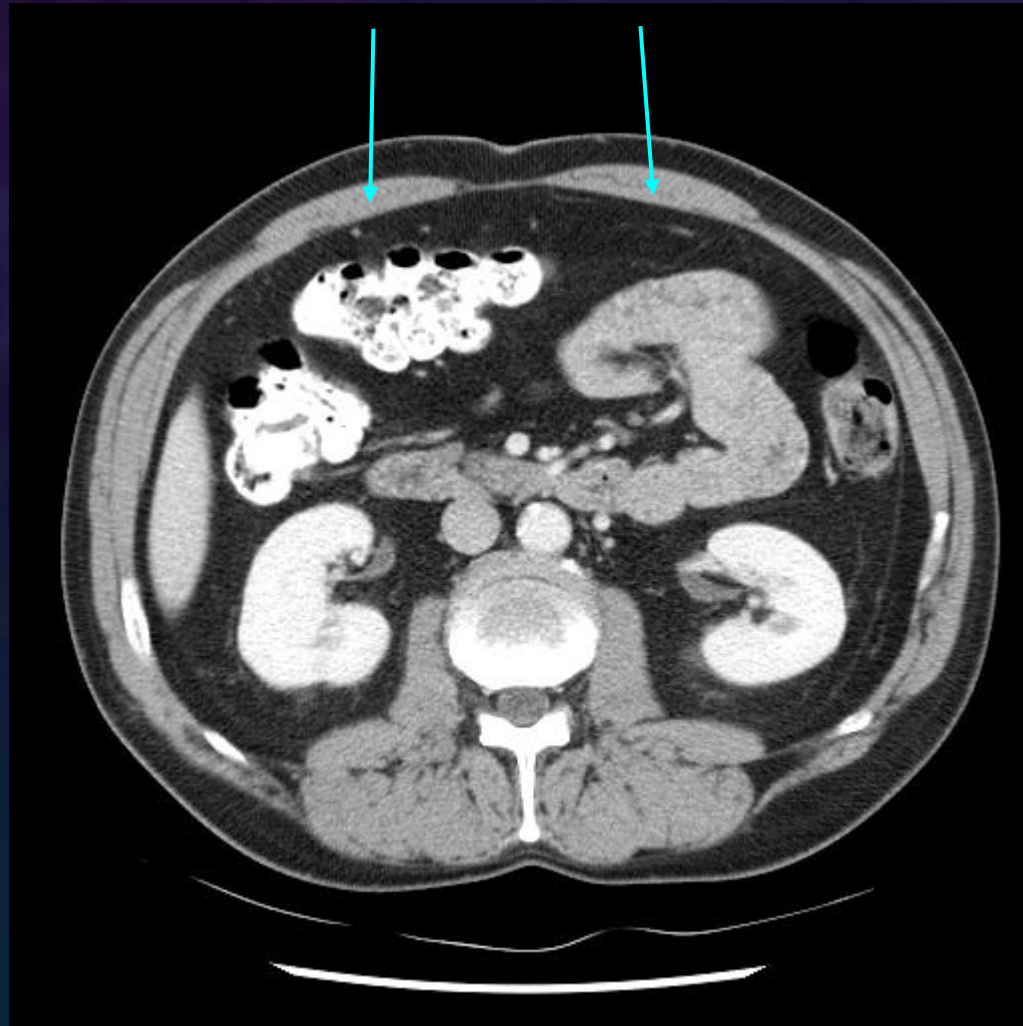
L2





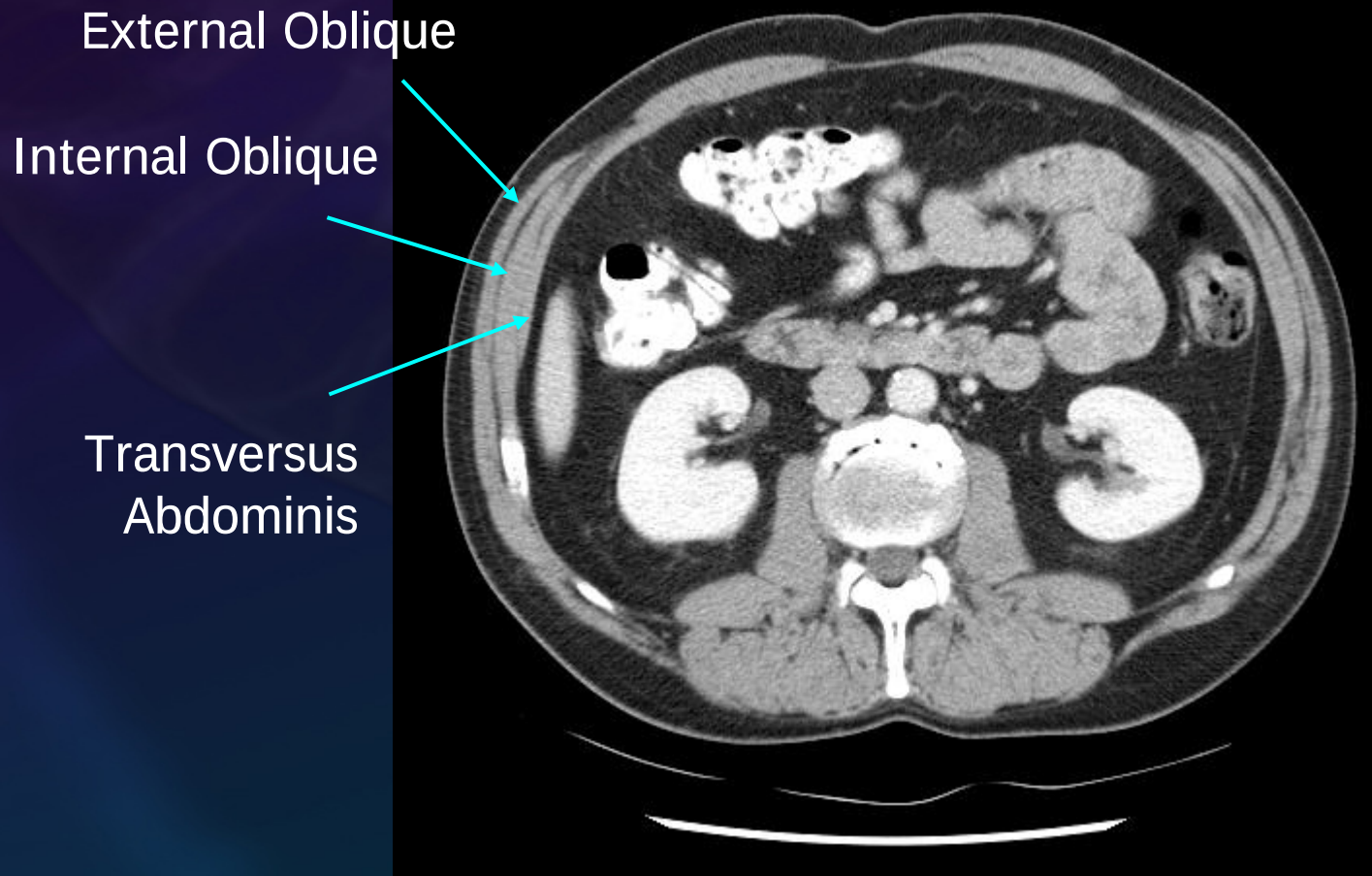


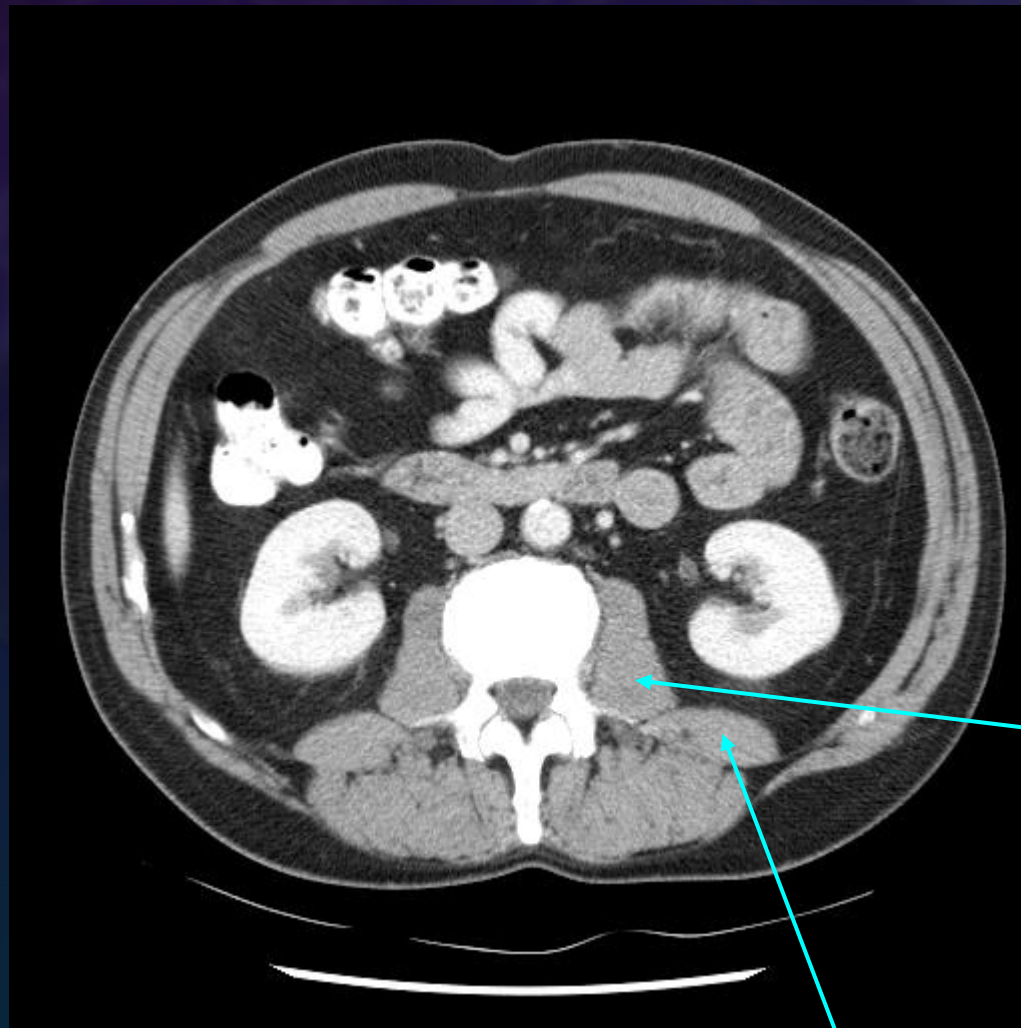
Rectus abdominis muscle



L2/3

Abdominal Wall Musculature: 3 layers

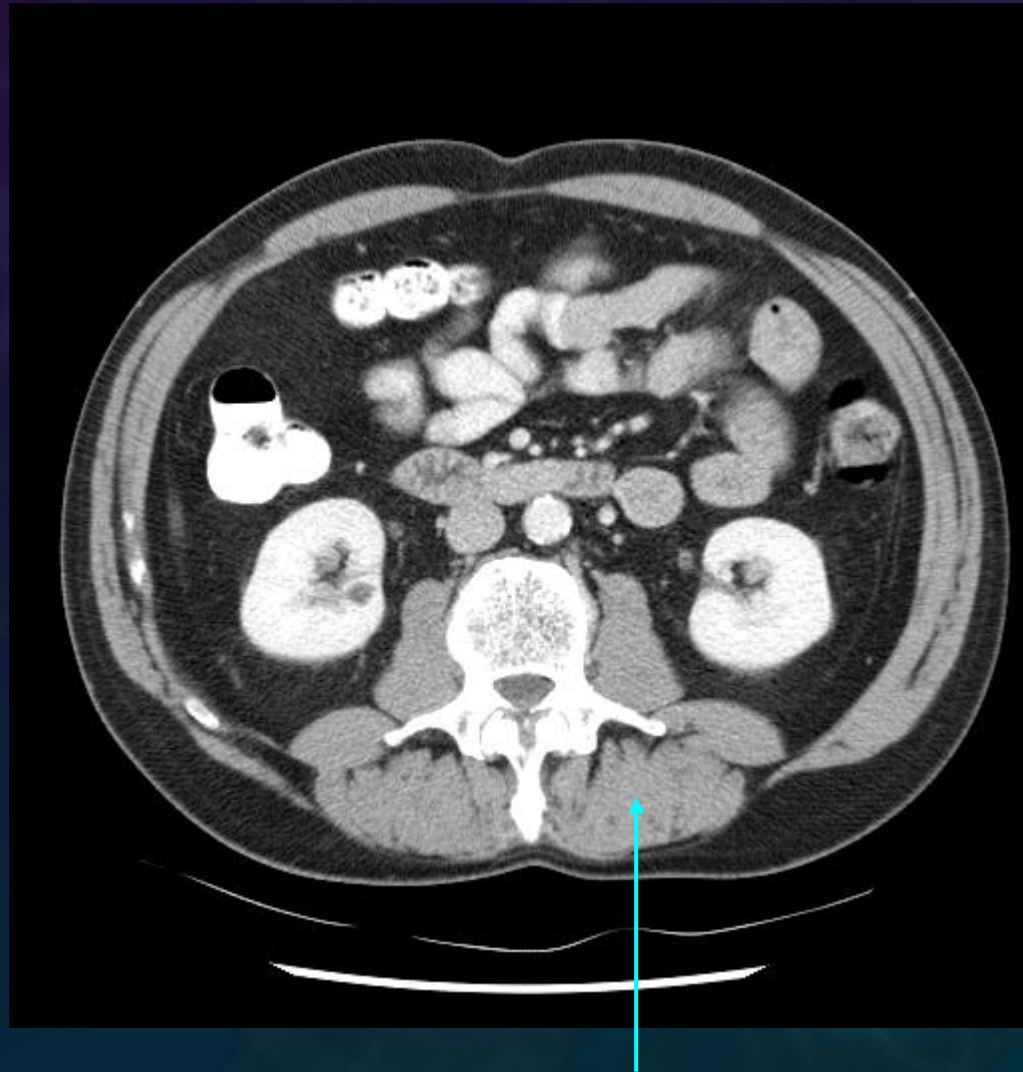




Psoas muscle

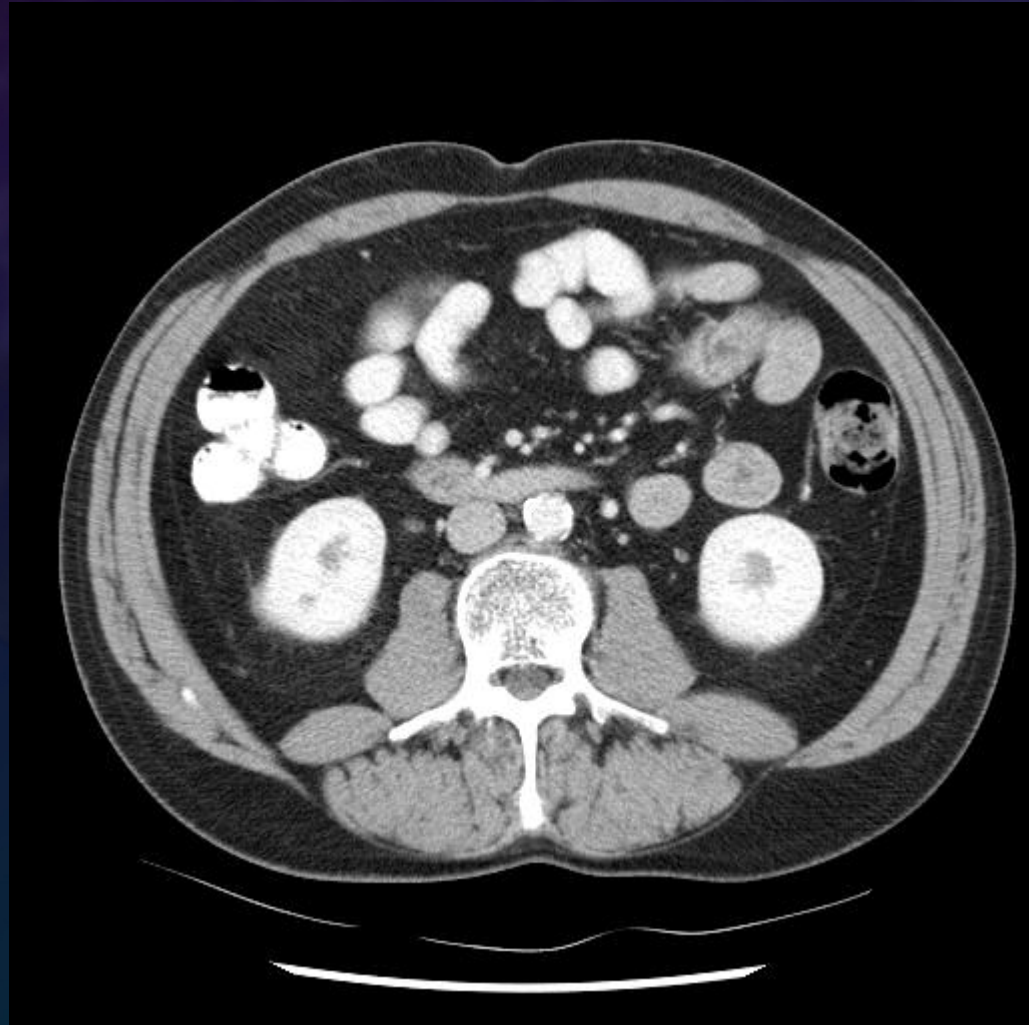
L3

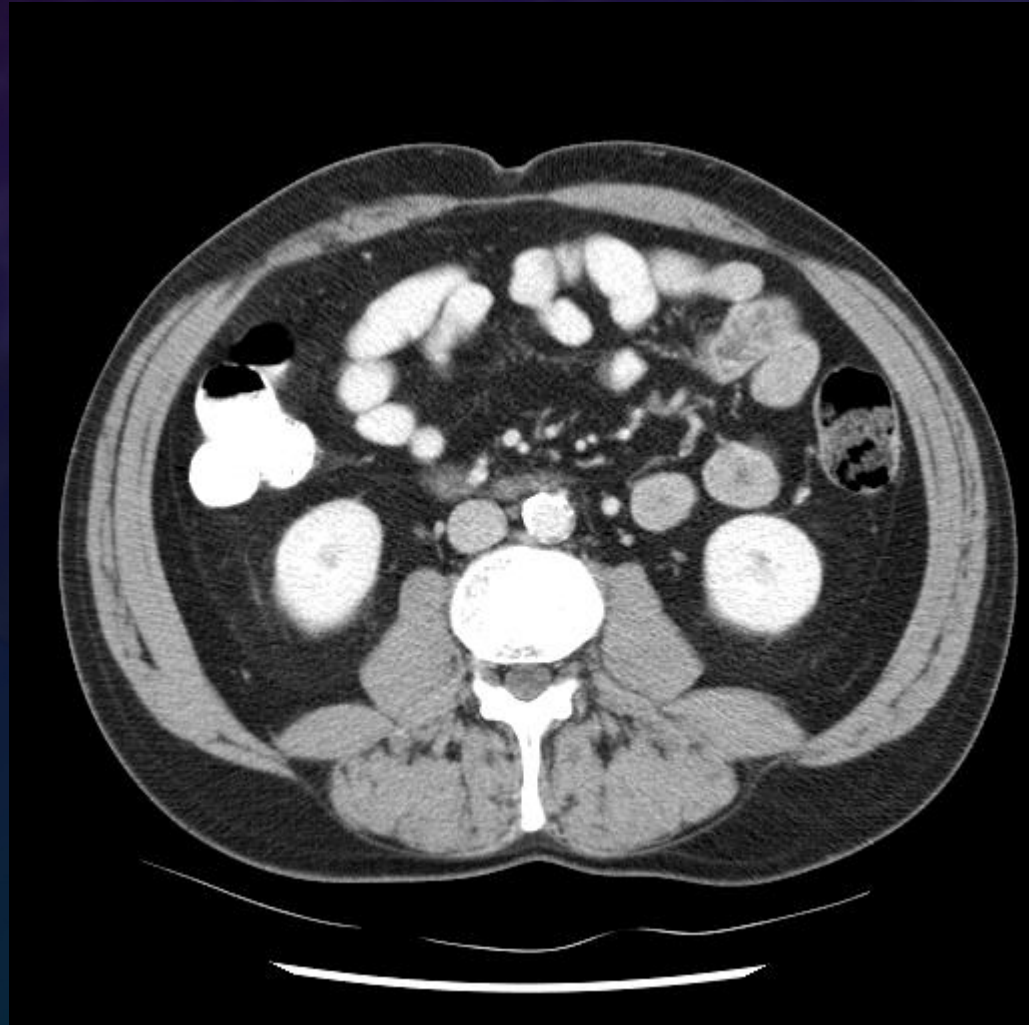
Quadratus lumborum muscle

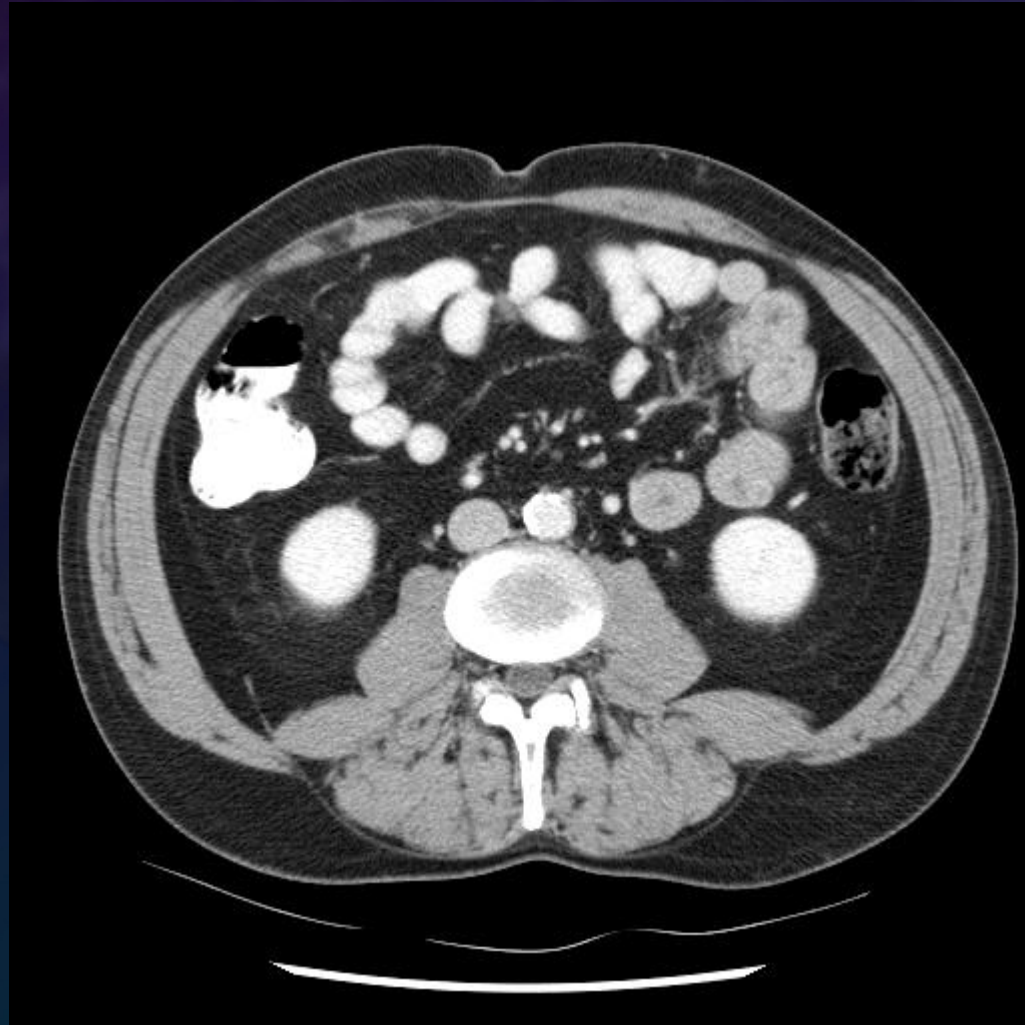


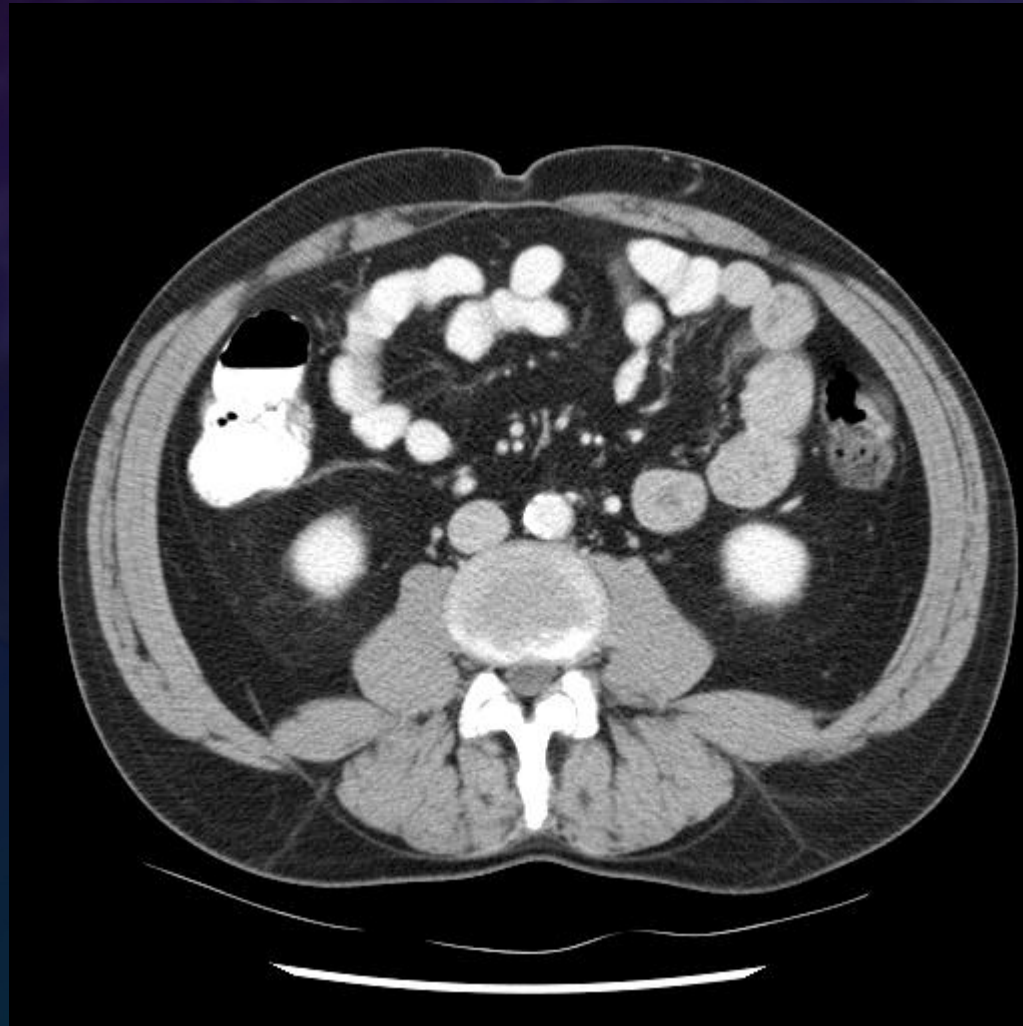
Paraspinal muscles (main component = *erector spinae*)











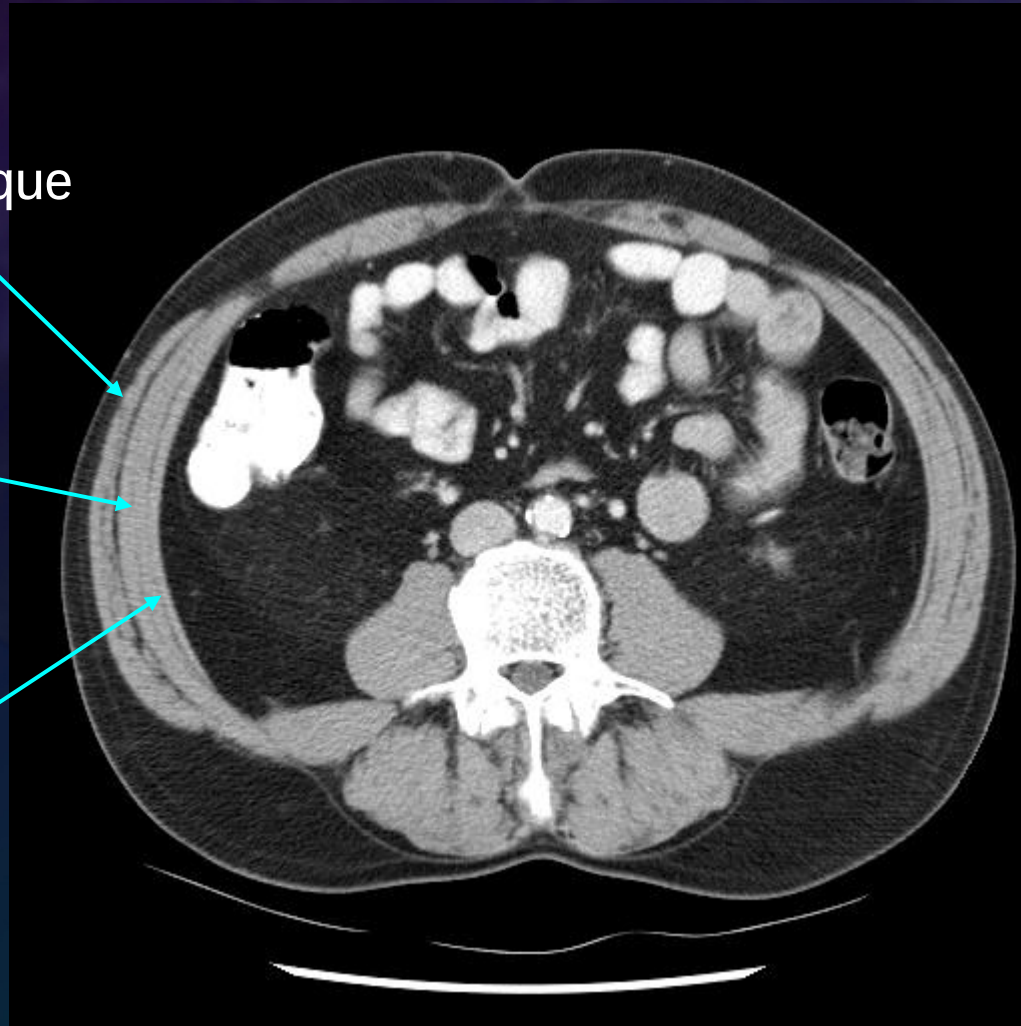
L3/4



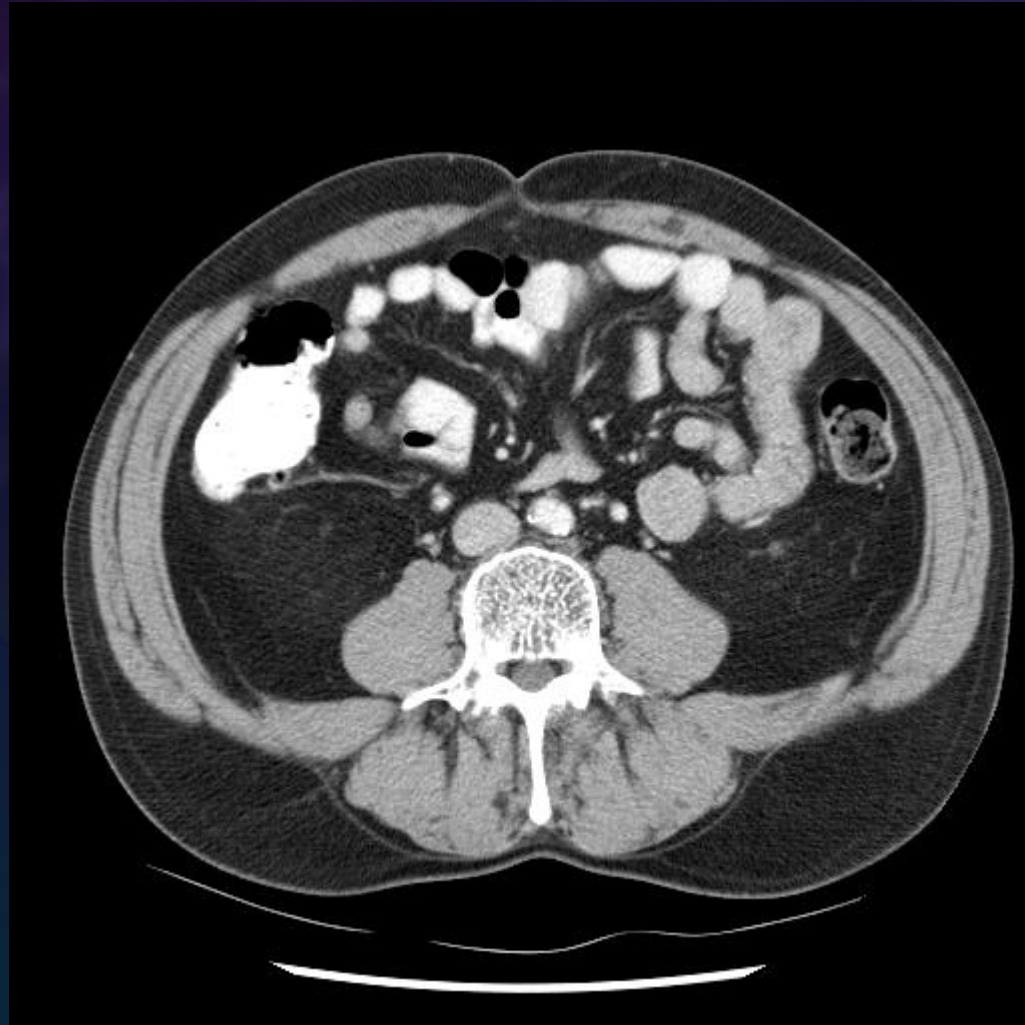
External Oblique

Internal Oblique

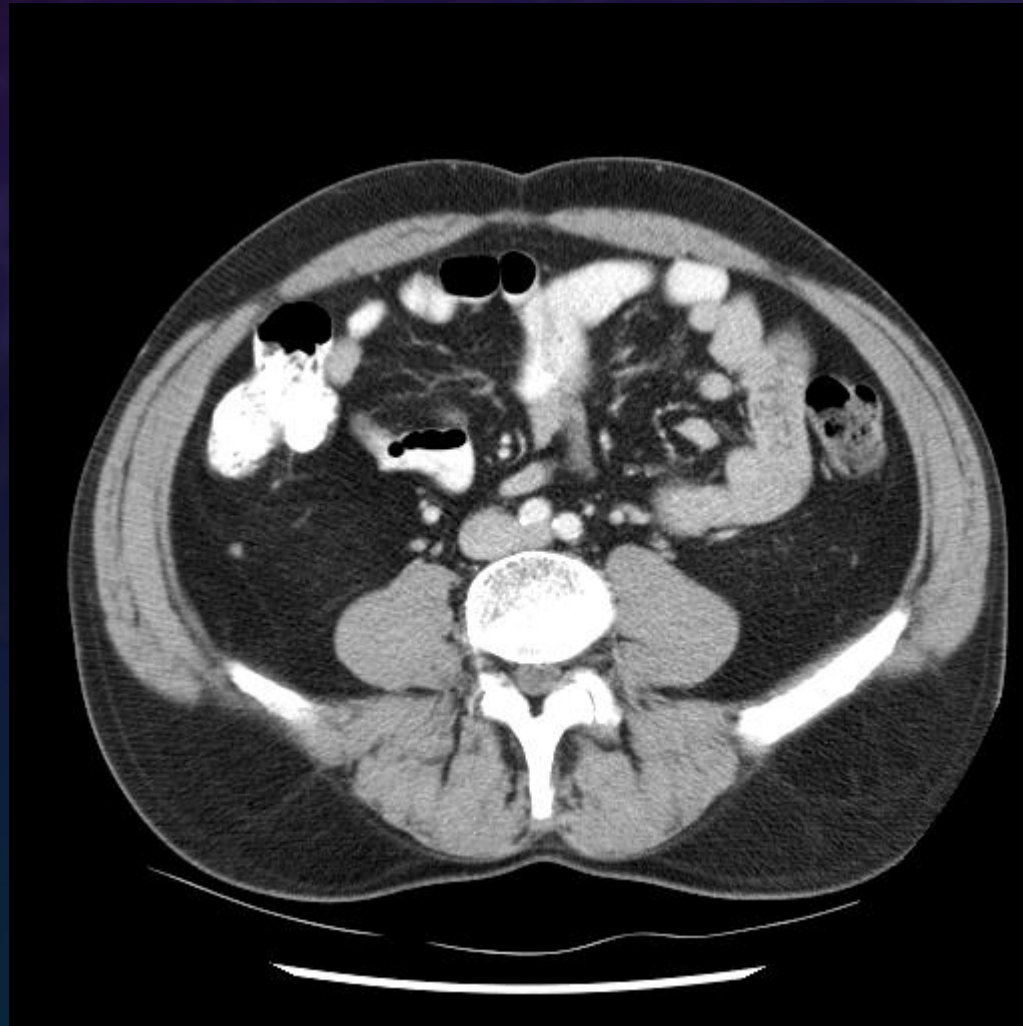
Transversus Abdominis



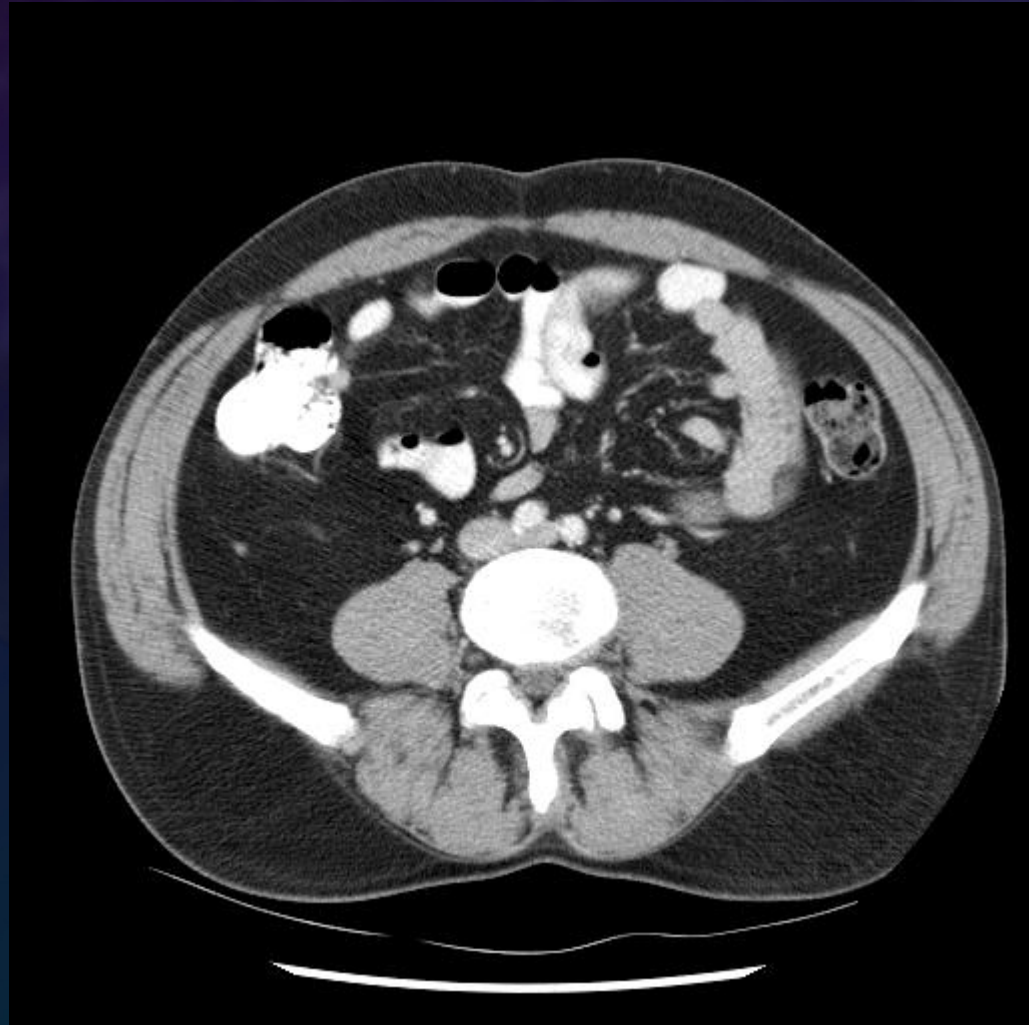
L4

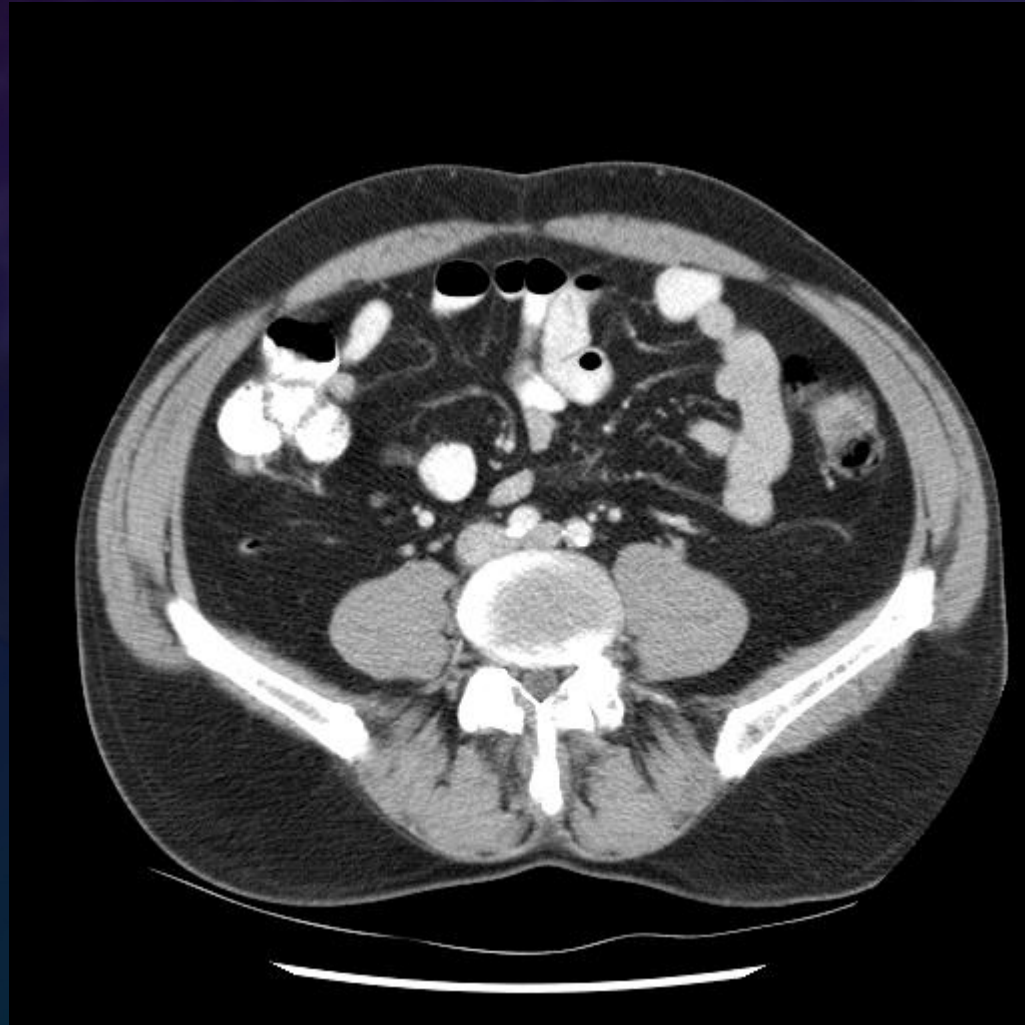


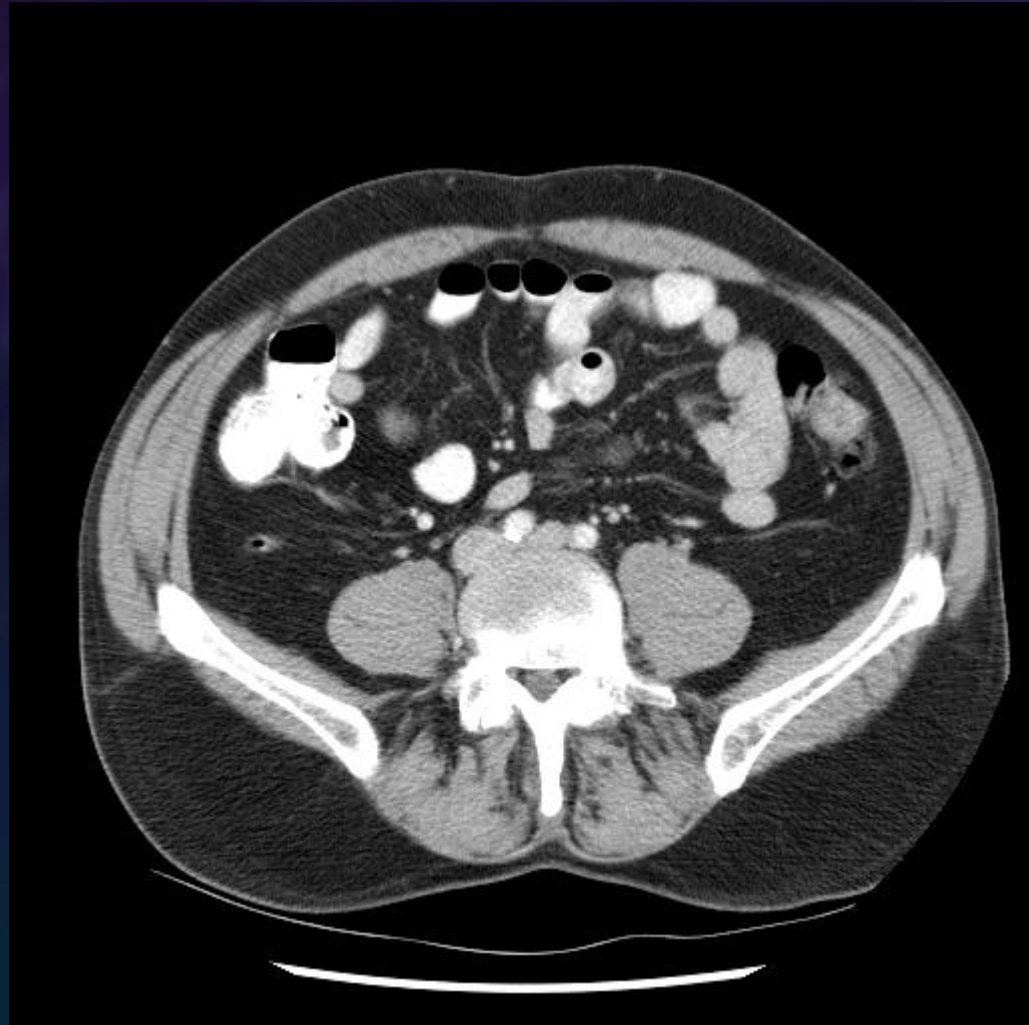




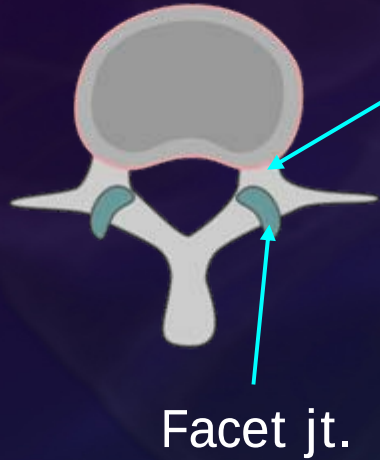
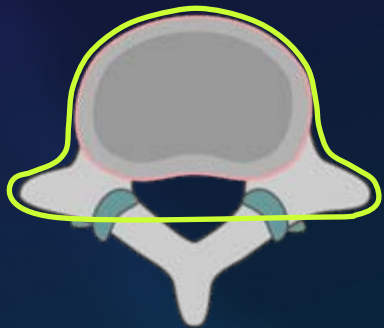
L4/5





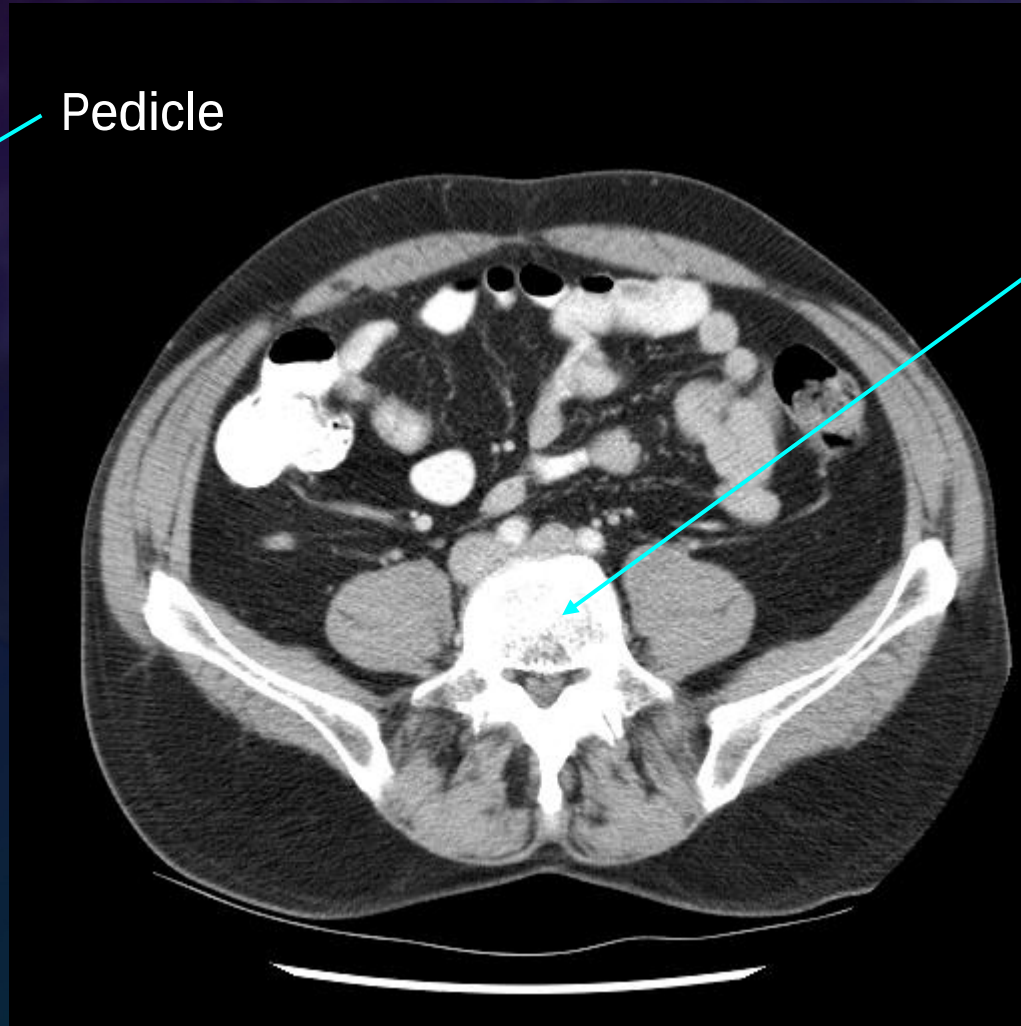


“typical” lumbar
vertebra L1-4



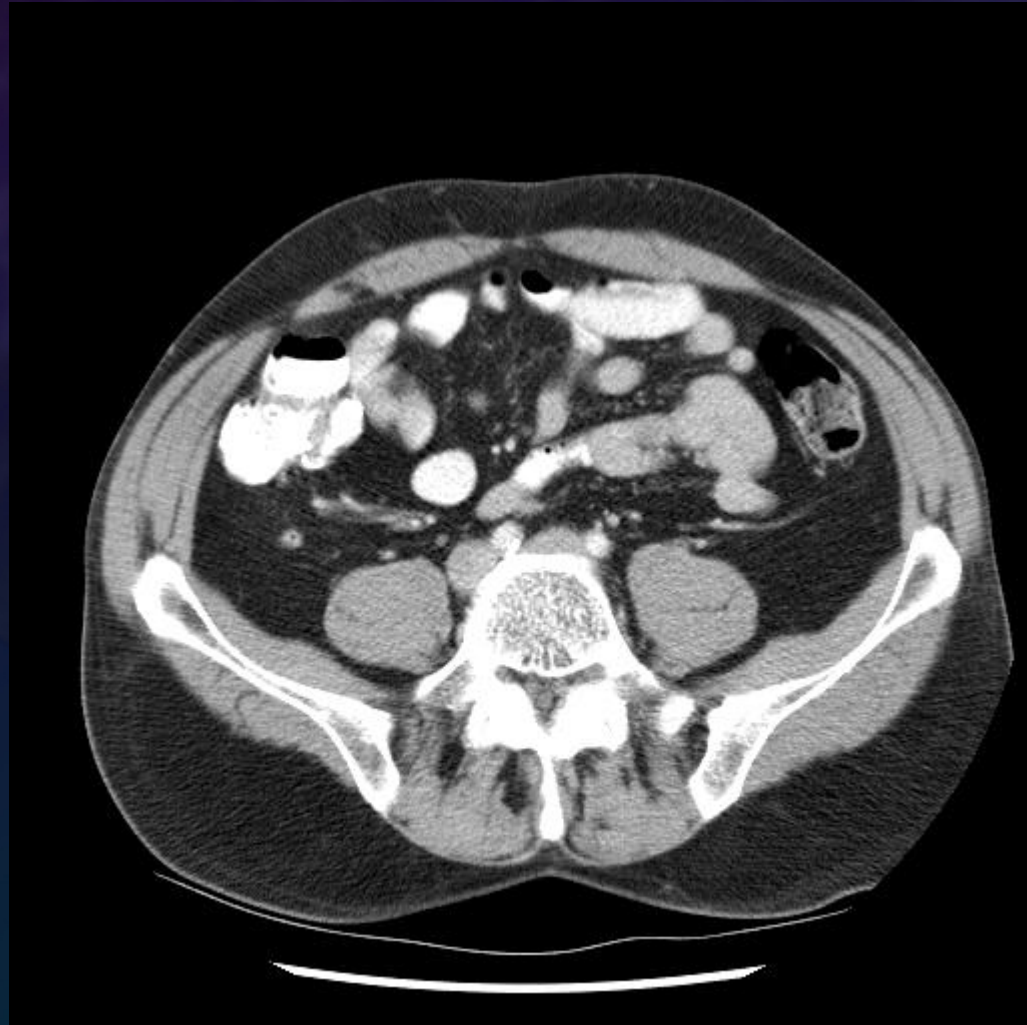
L5 vertebra

Pedicle broad & transverse
process short & stout.

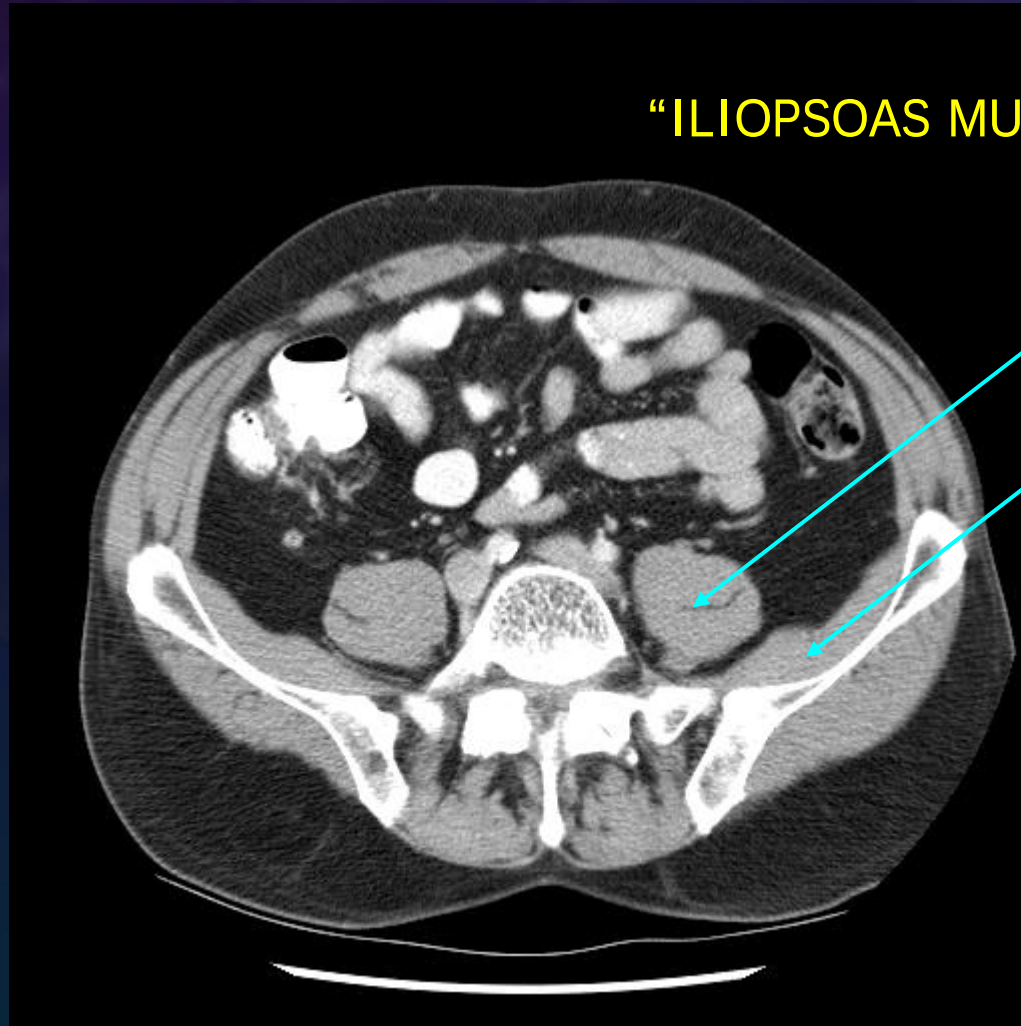


L5 Vertebra
“Napoleon hat”
appearance

L5



“ILIOPSOAS MUSCLE COMPLEX”



Psoas muscle

Iliacus muscle



L5/S1

Sacral Ala





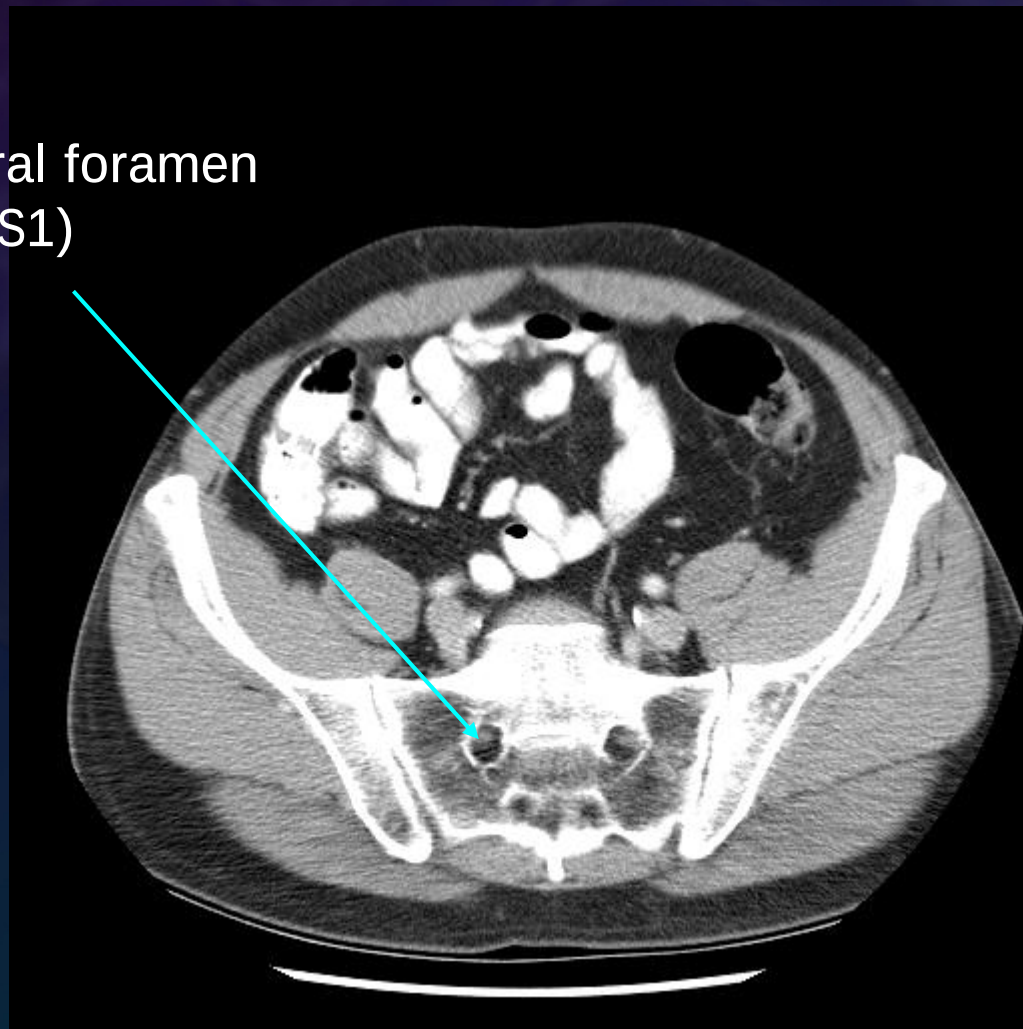
Lumbosacral trunk

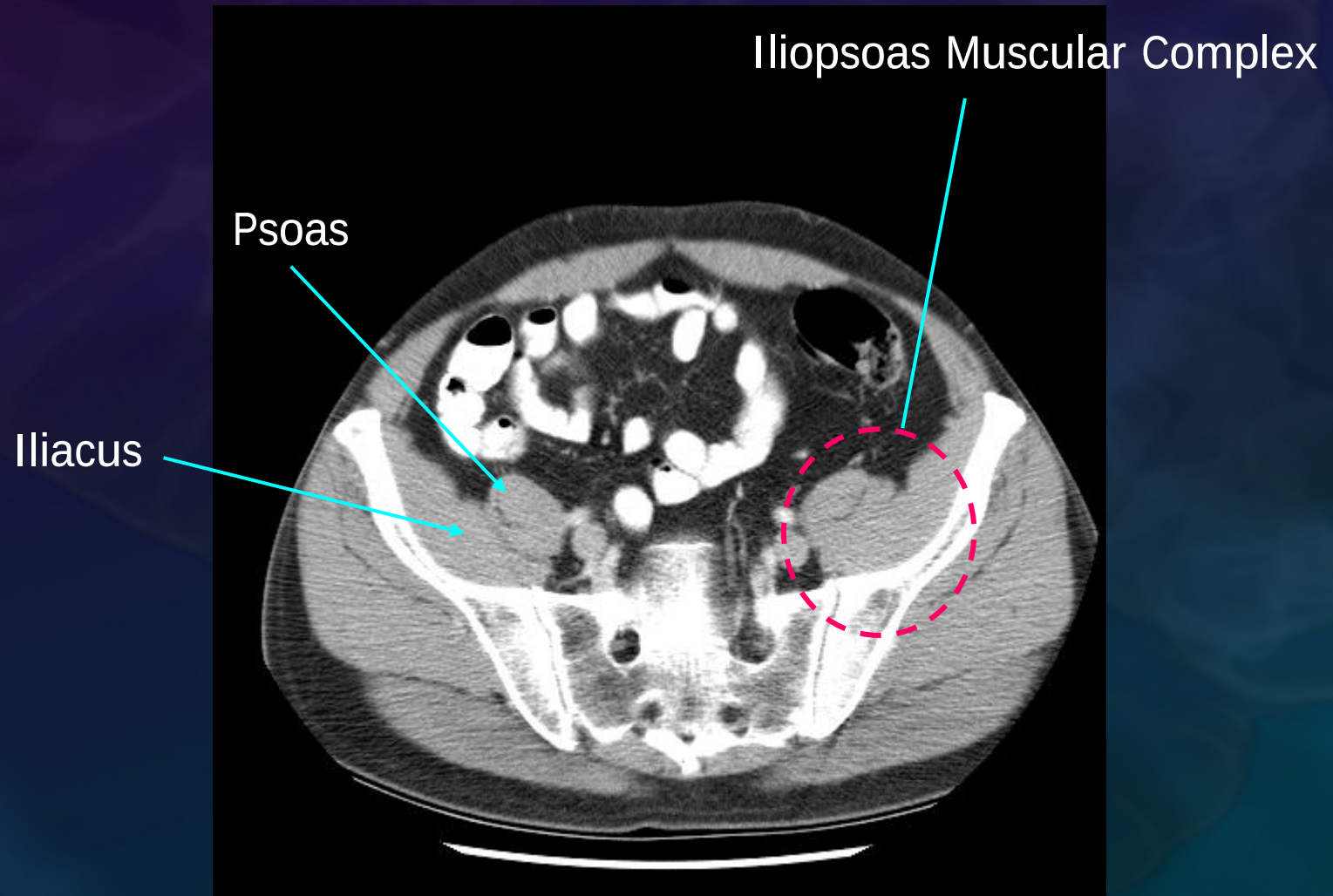


S1

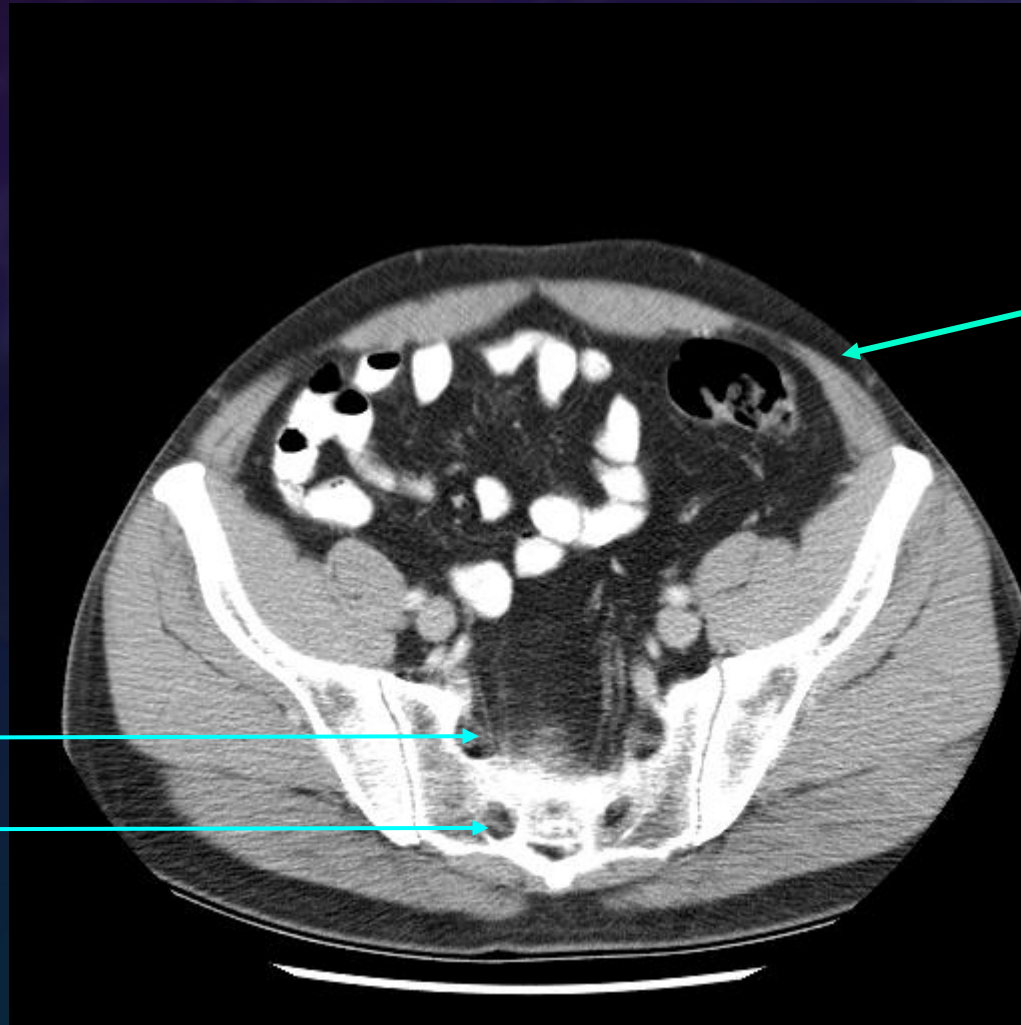


First sacral foramen
(S1)





Inguinal ligament



Sacral Foraminae

S1

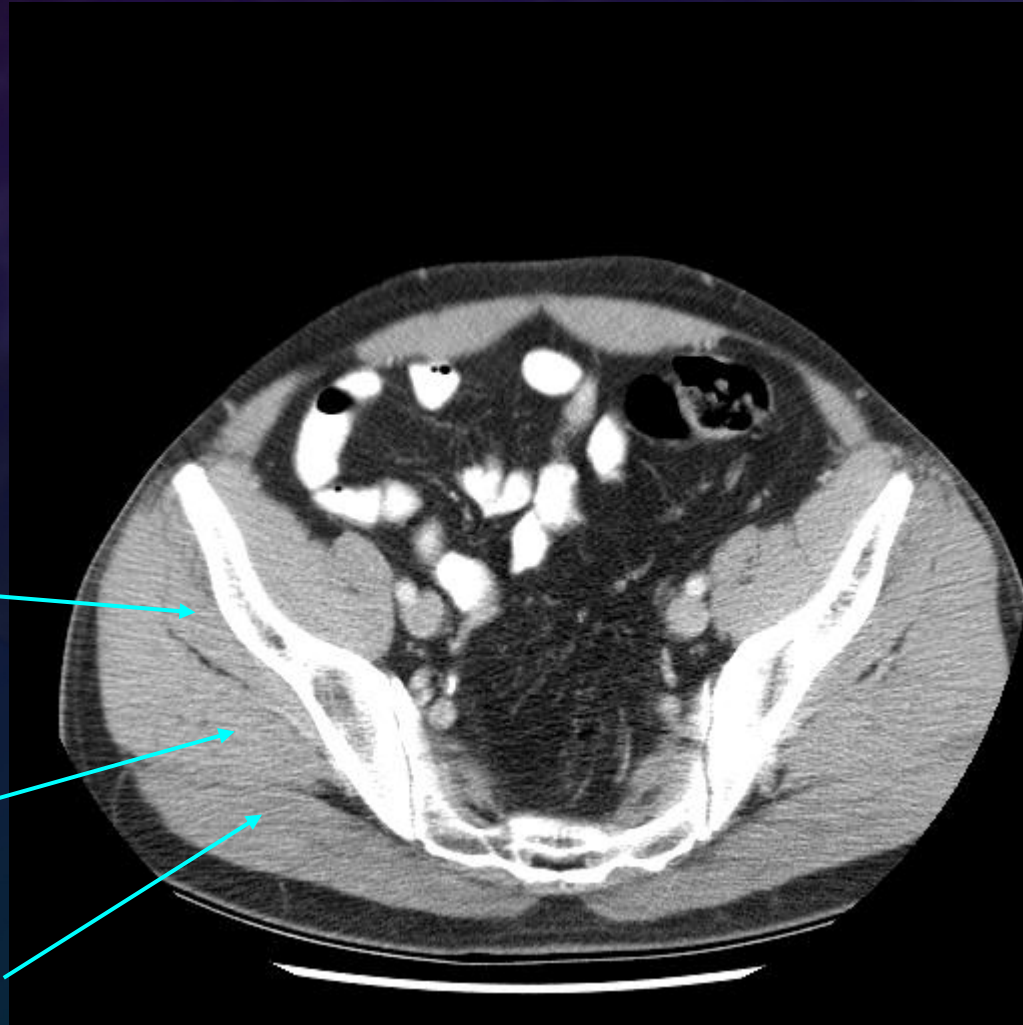
S2



Gluteus Minimus

Gluteus Medius

Gluteus Maximus



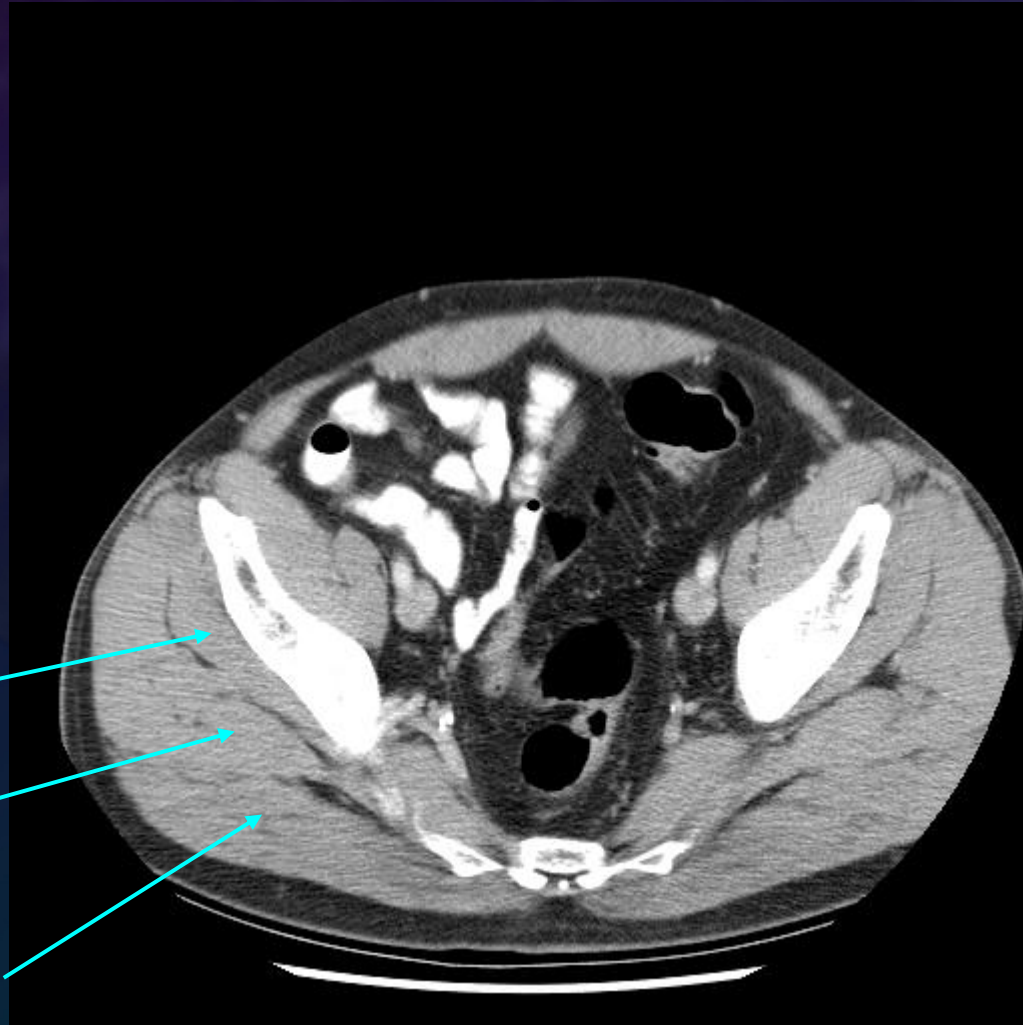
S3



Gluteus Minimus

Gluteus Medius

Gluteus Maximus





Inferior Epigastric Artery



Sciatic Nerve

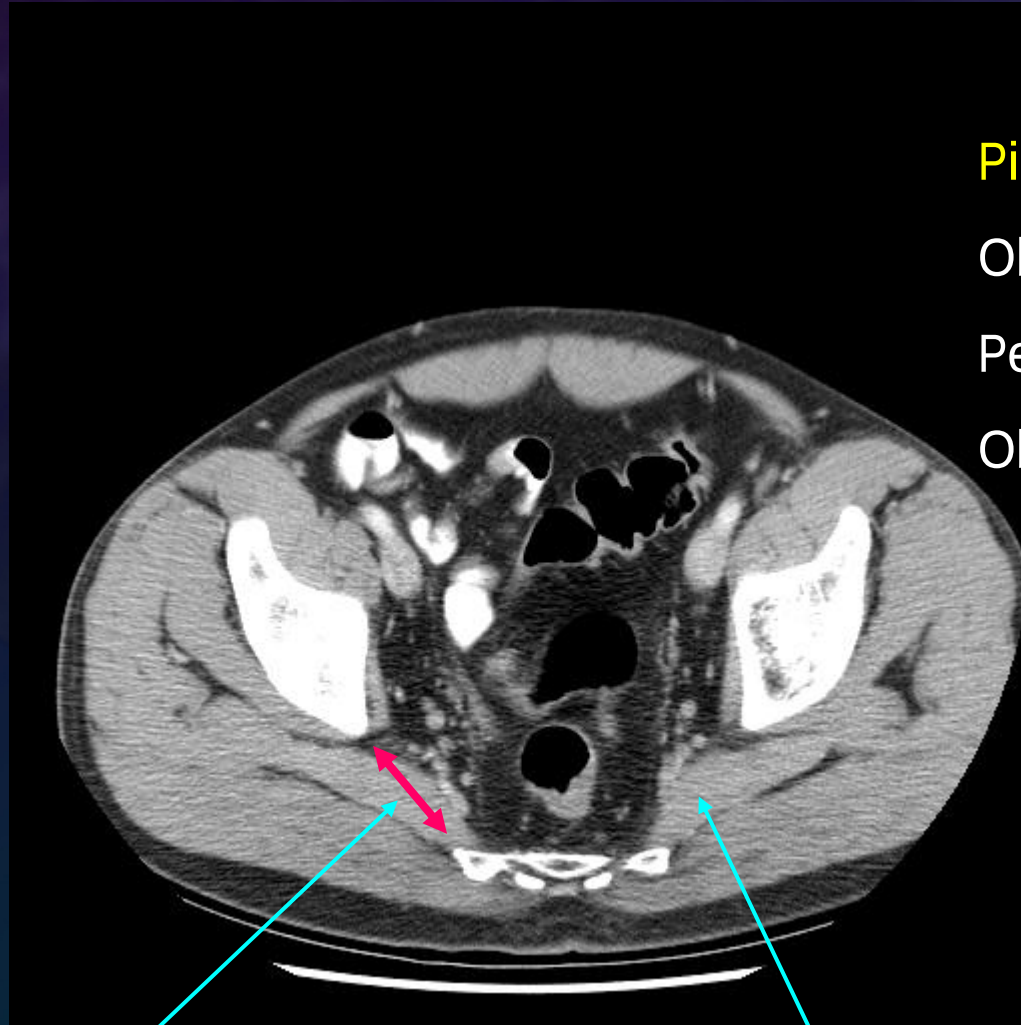
Exits through
LATERAL part
of greater sciatic
notch

Piriformis muscle

Obturator Internus

Pectineus muscle

Obturator externus



Greater sciatic notch

Piriformis muscle





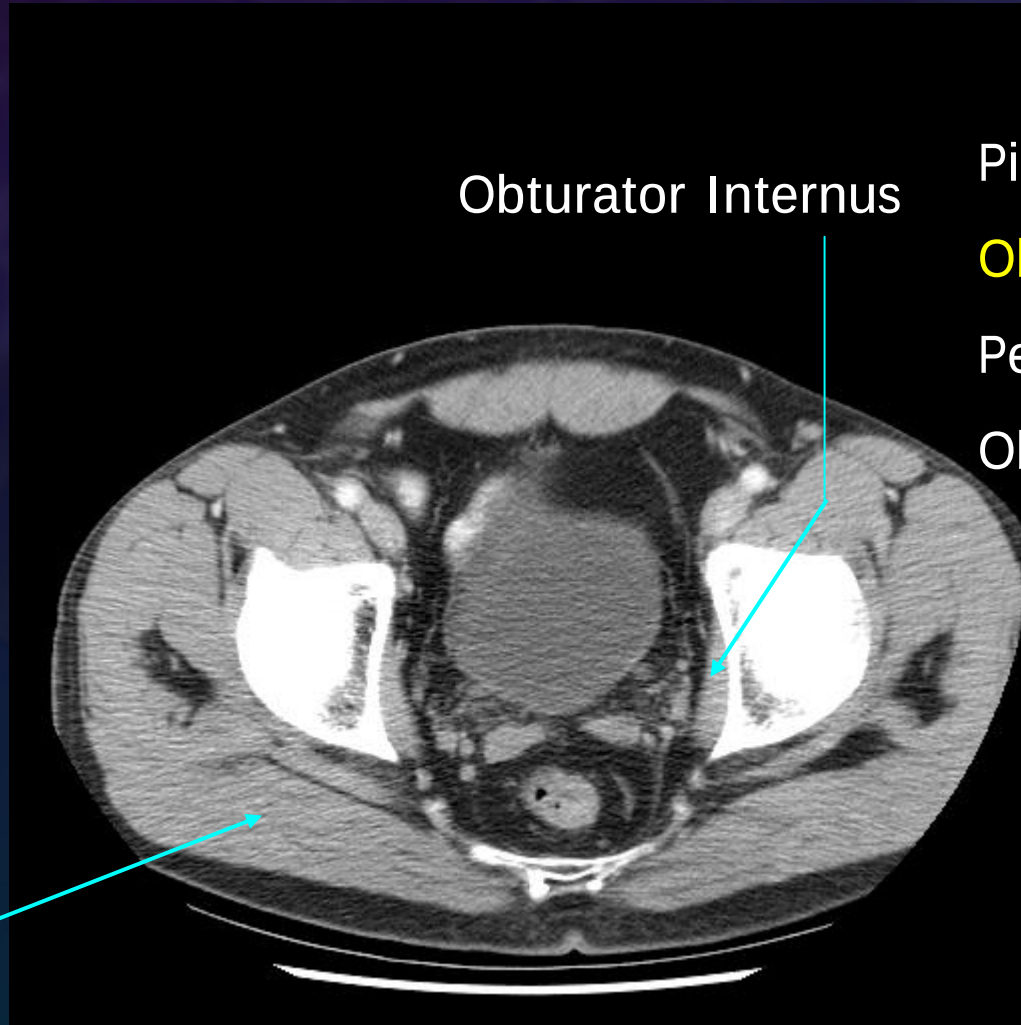
Obturator Internus

Piriformis muscle

Obturator Internus

Pectineus muscle

Obturator externus



Gluteus Maximus



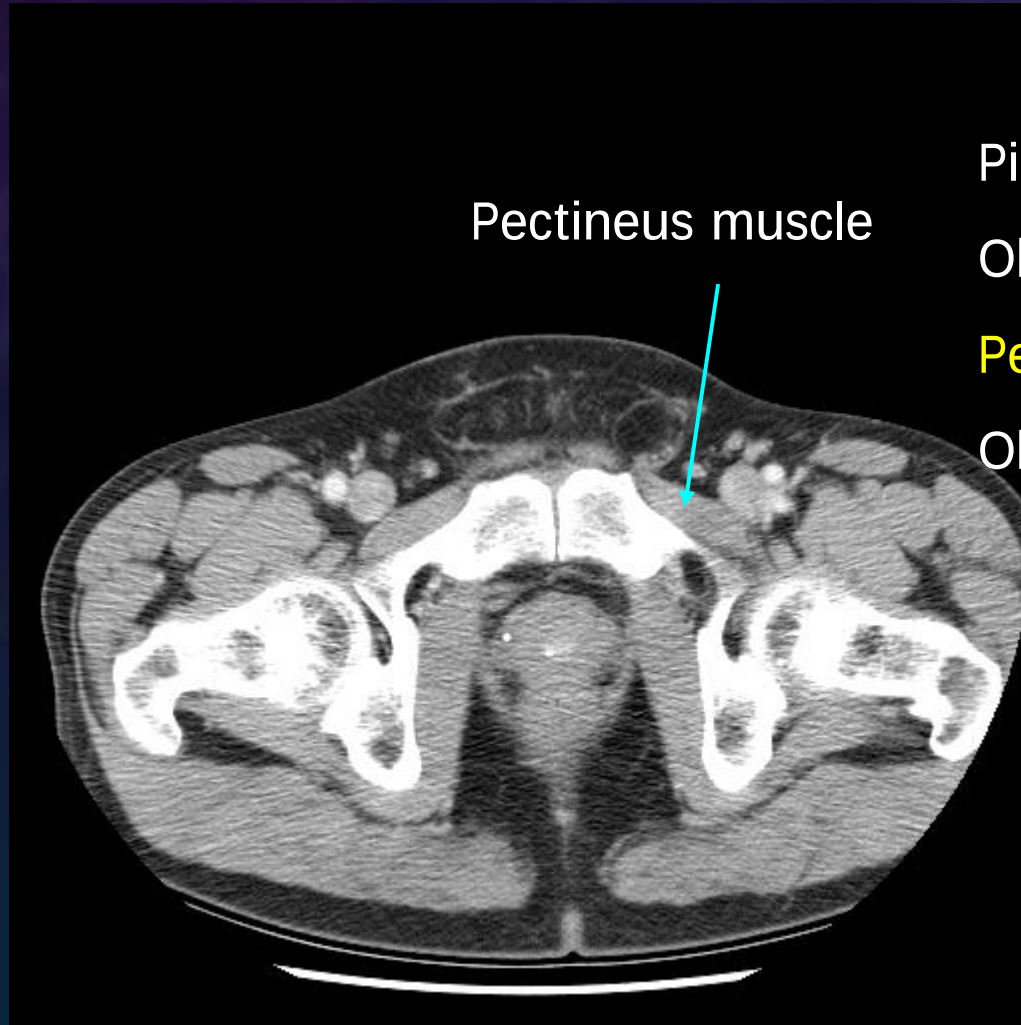






Obturator internus muscle





Pectineus muscle

Piriformis muscle

Obturator Internus

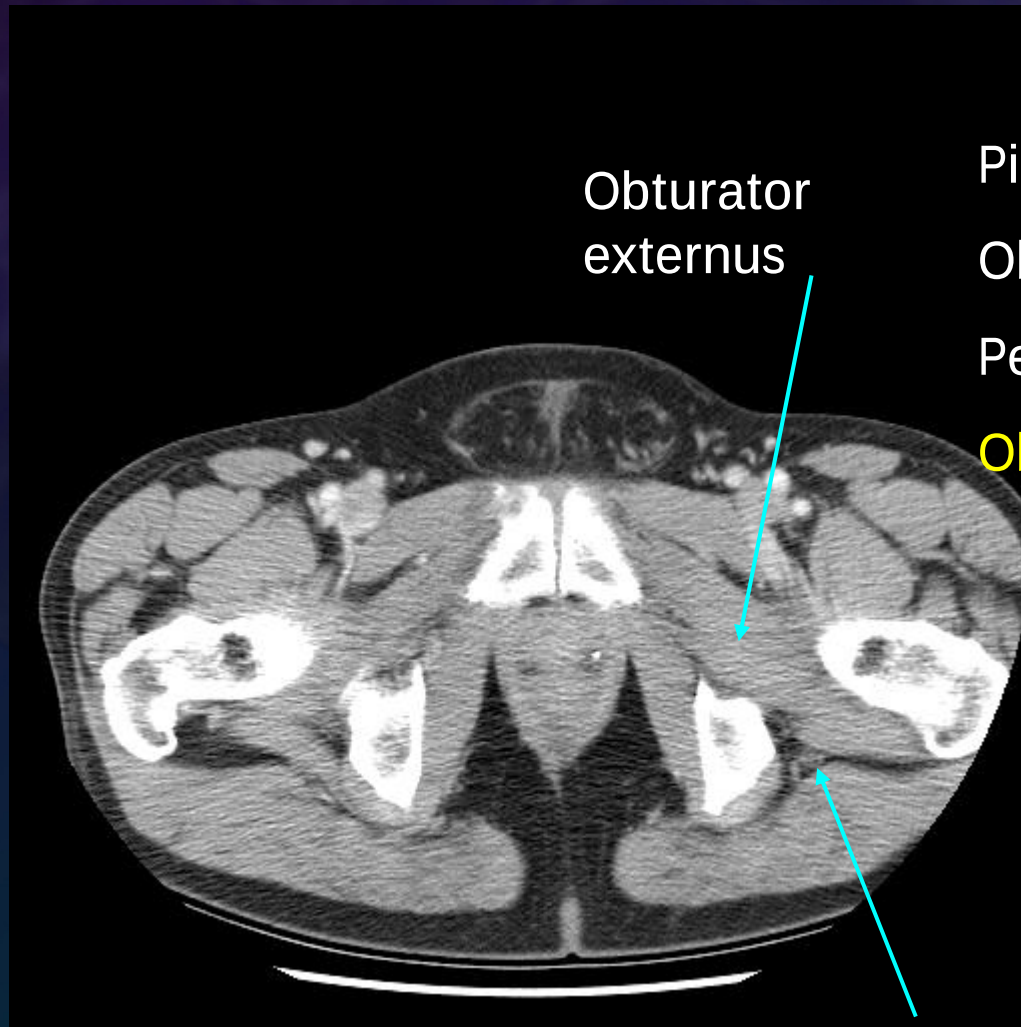
Pectineus muscle

Obturator externus

Obturator internus muscle



Quadratus
femoris m. &
gemellus
inferior m.



Obturator
externus

Piriformis muscle

Obturator Internus

Pectineus muscle

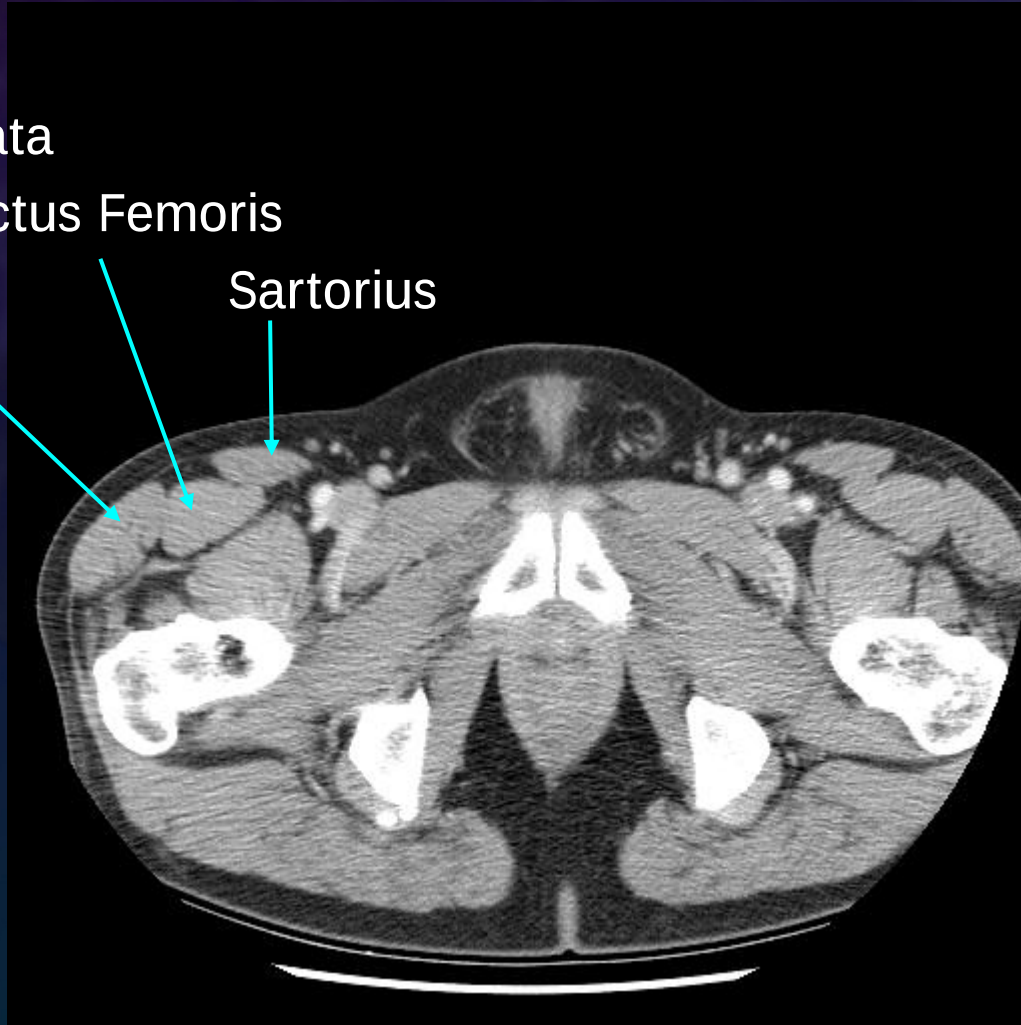
Obturator externus

Sciatic nerve

Tensor Fascia Lata

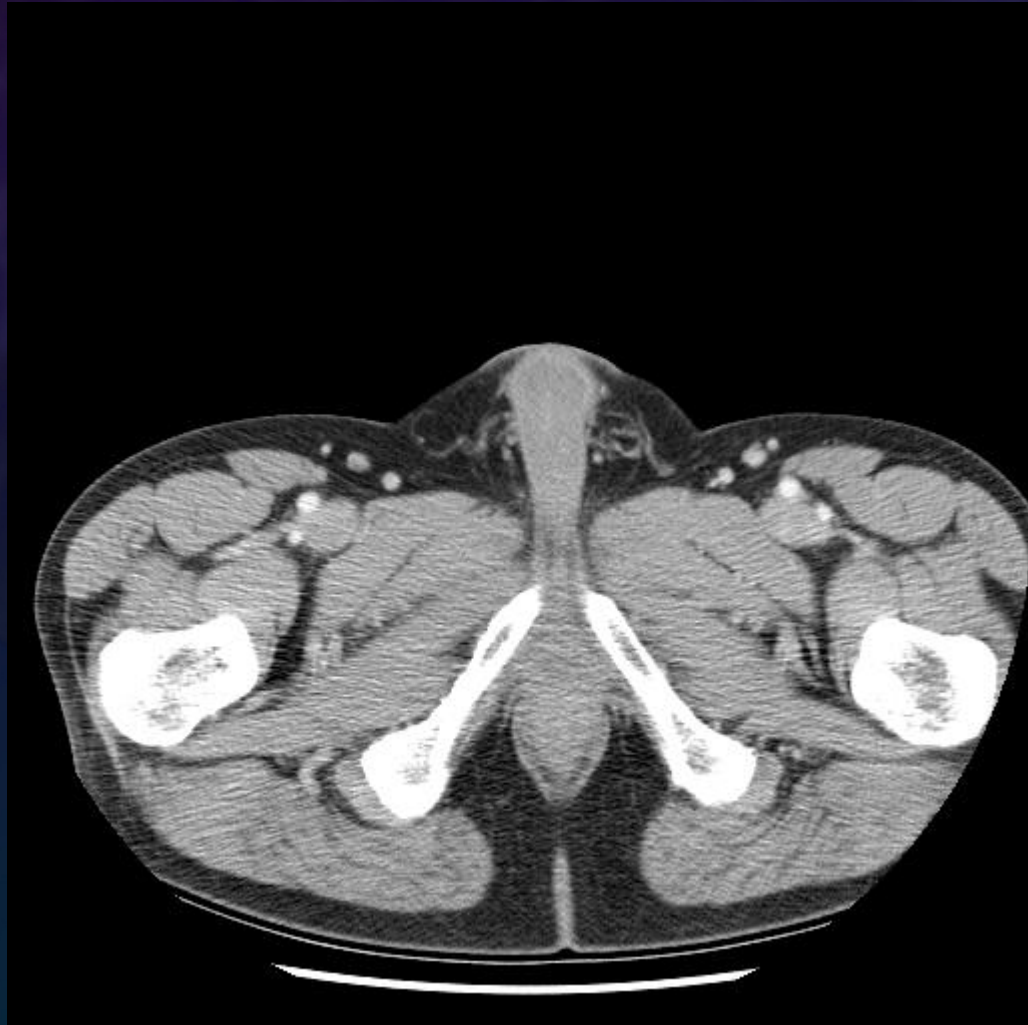
Rectus Femoris

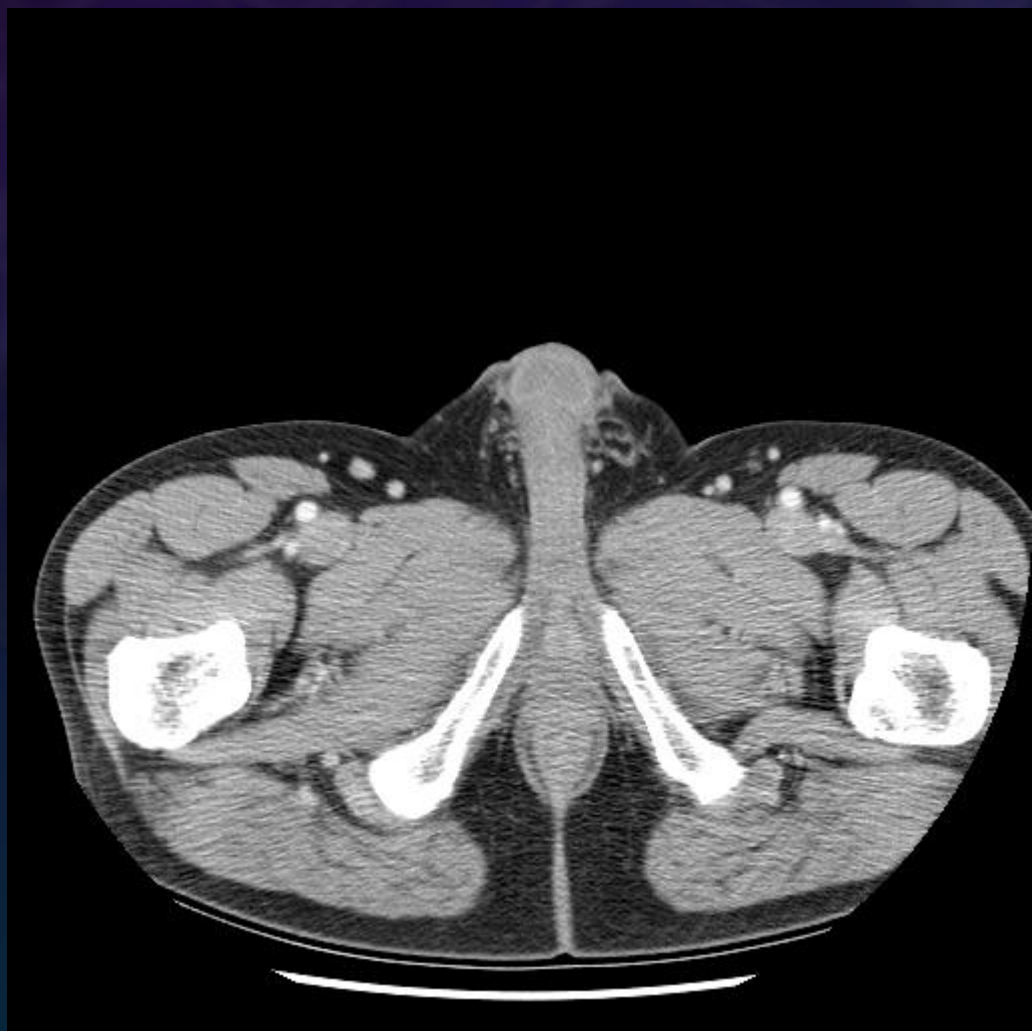
Sartorius







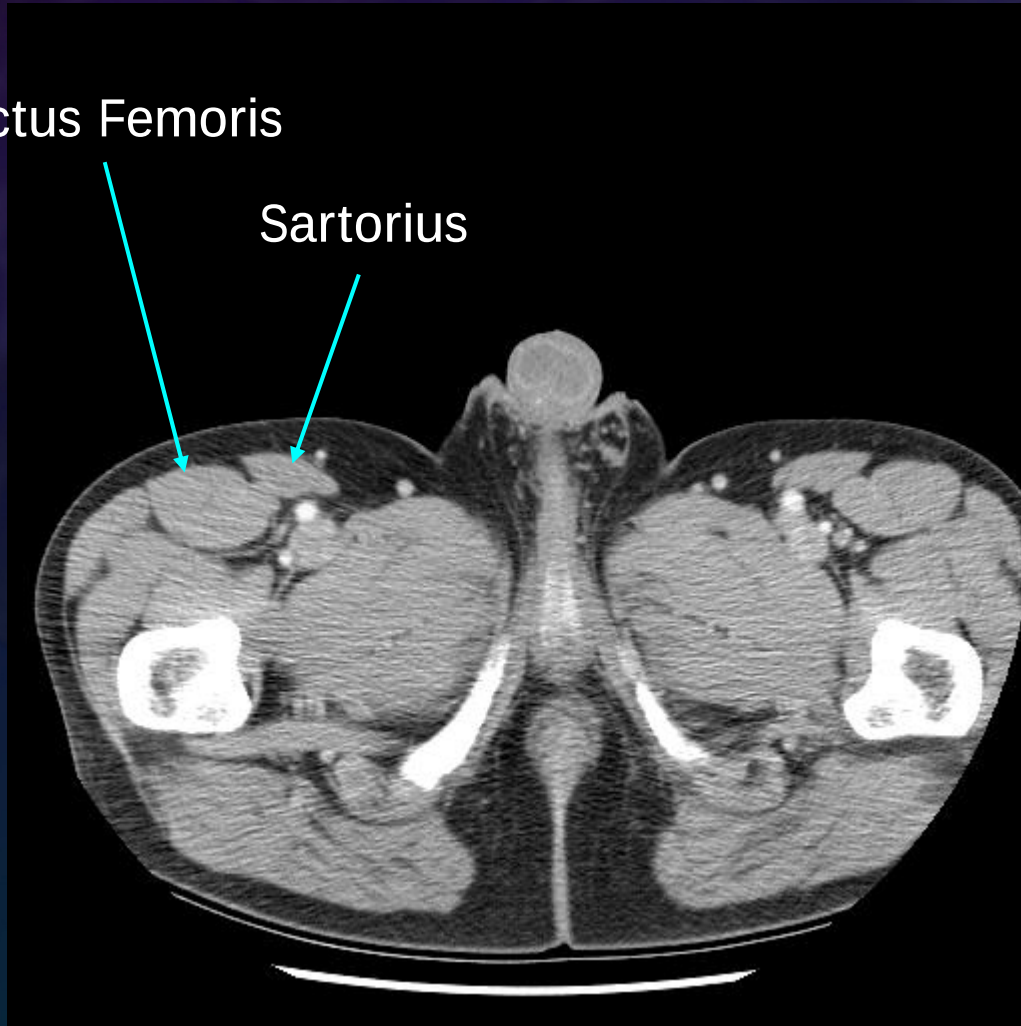






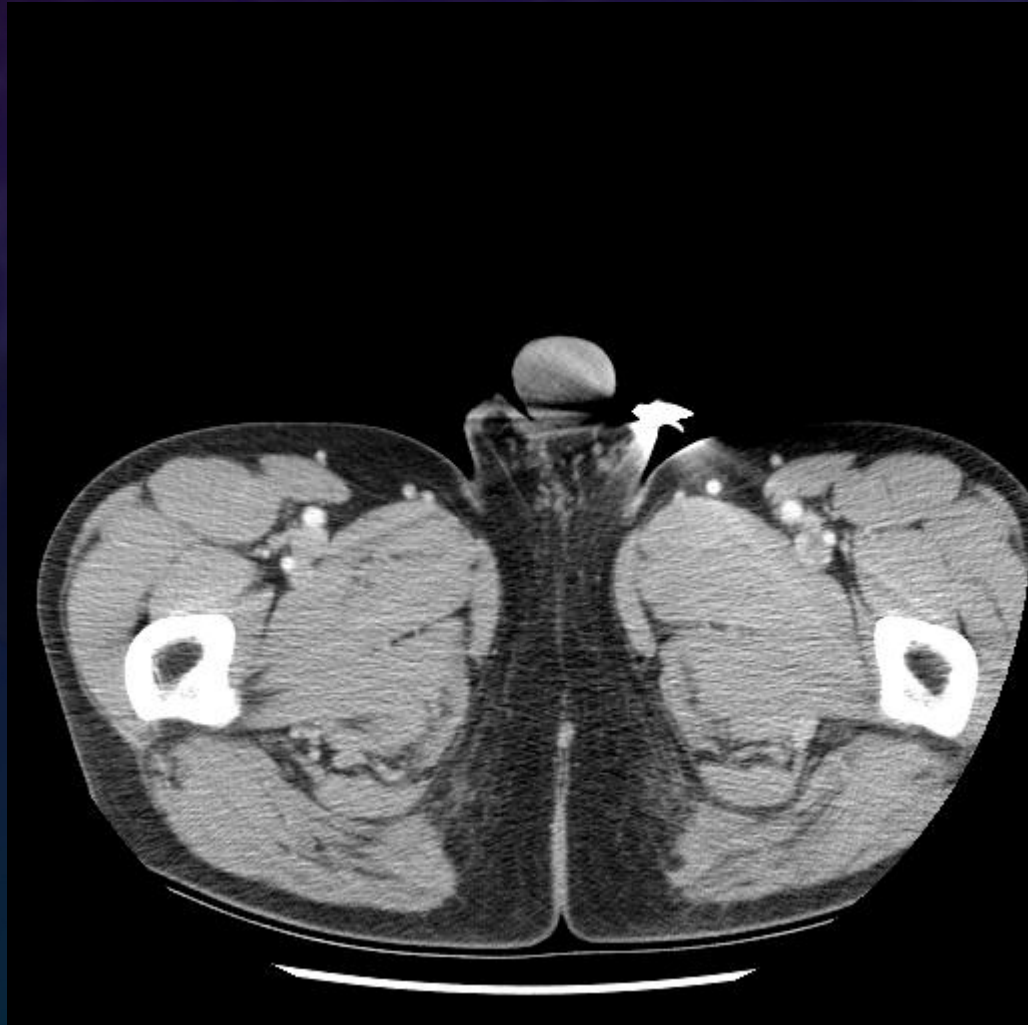
Rectus Femoris

Sartorius

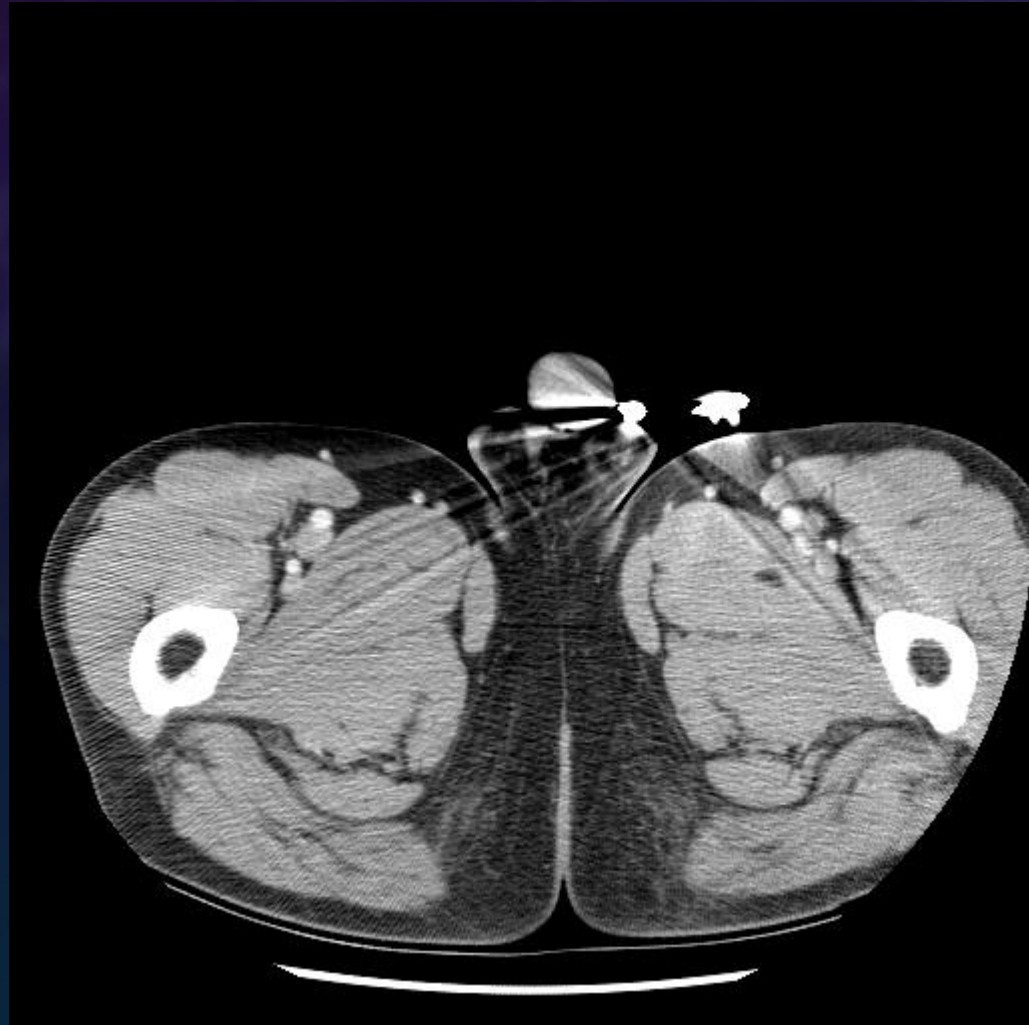








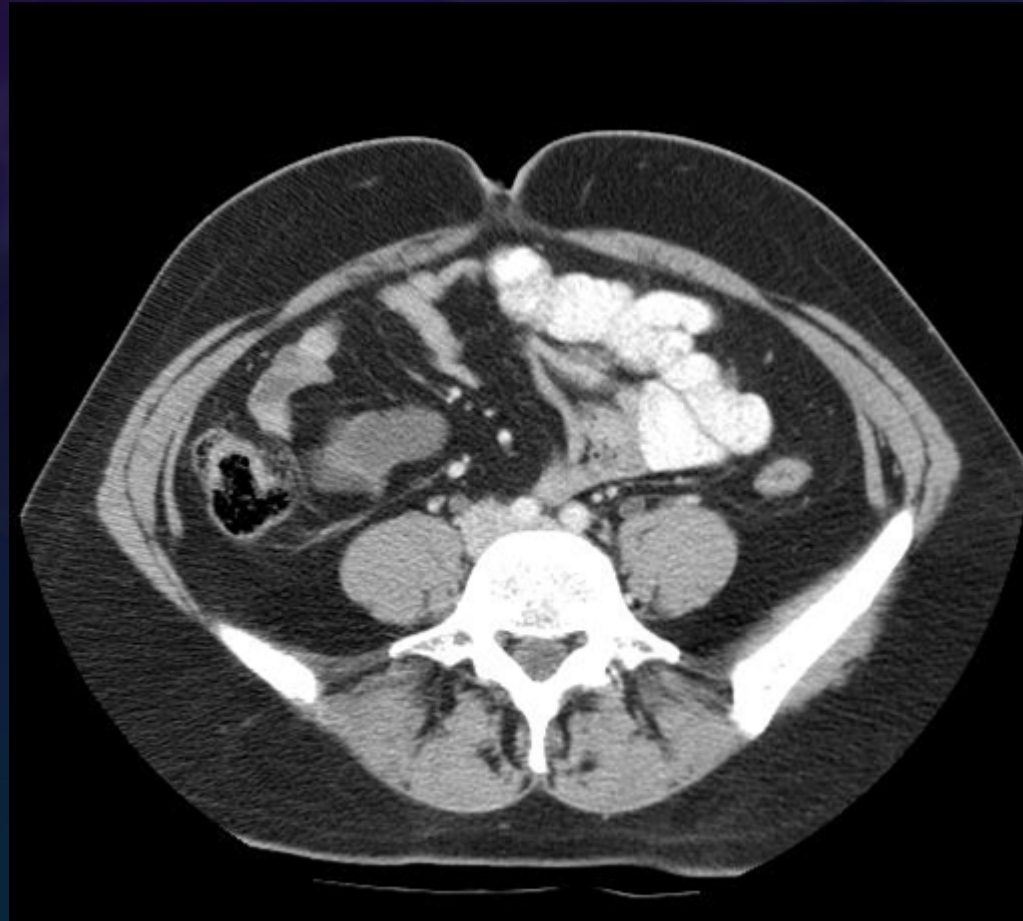


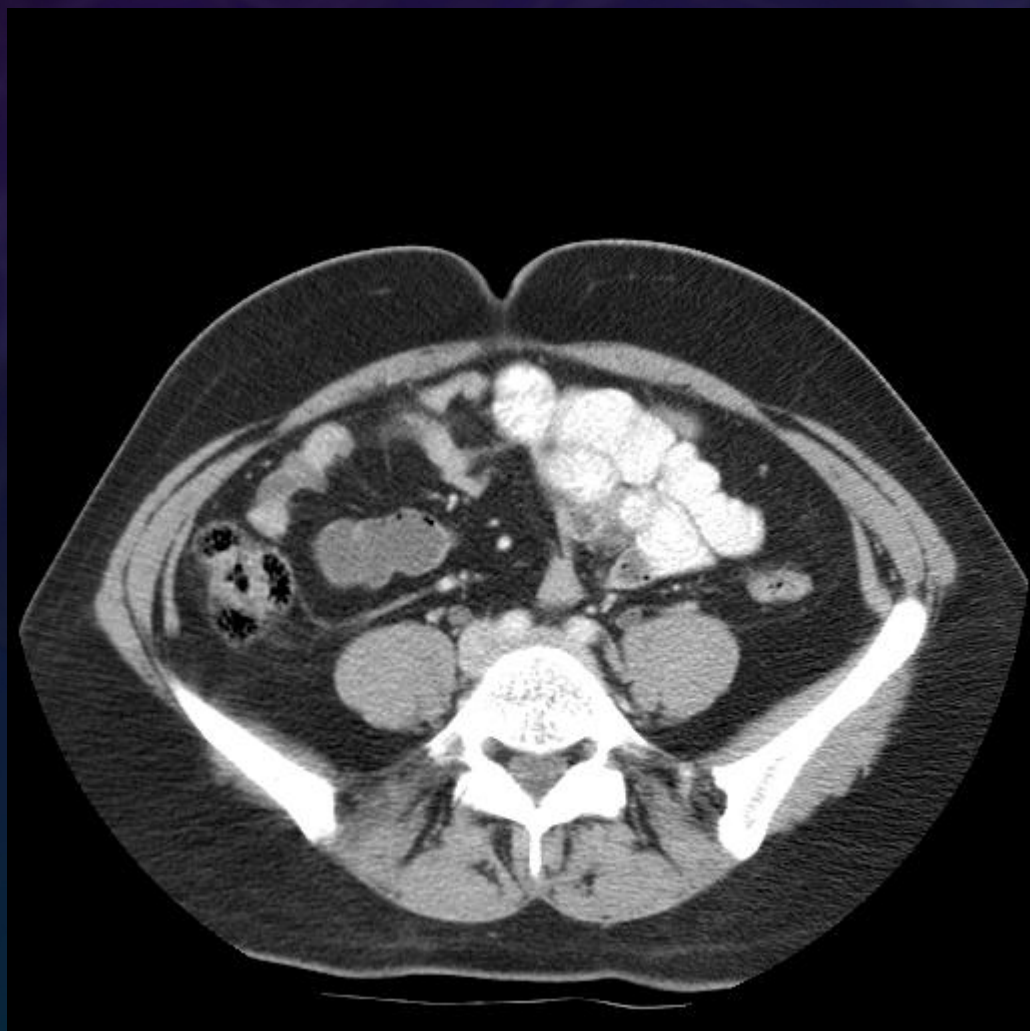




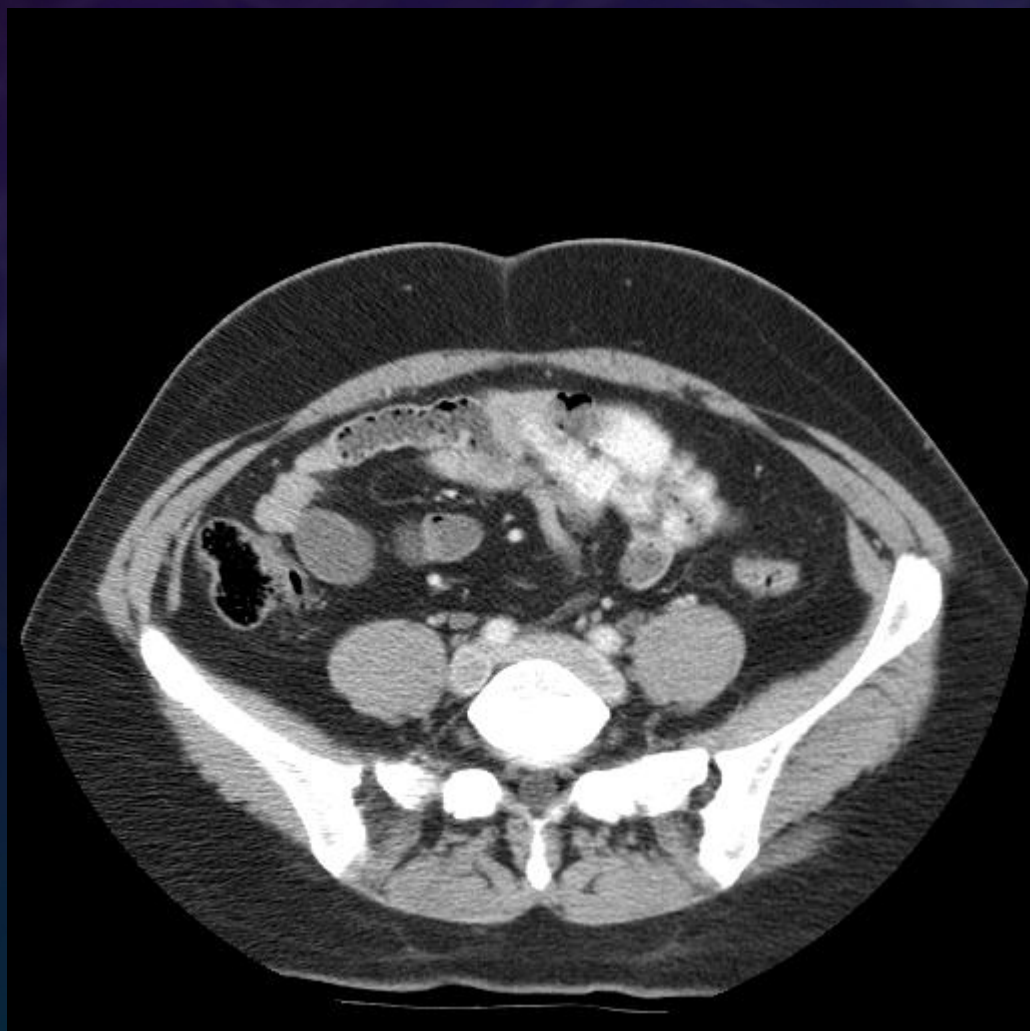


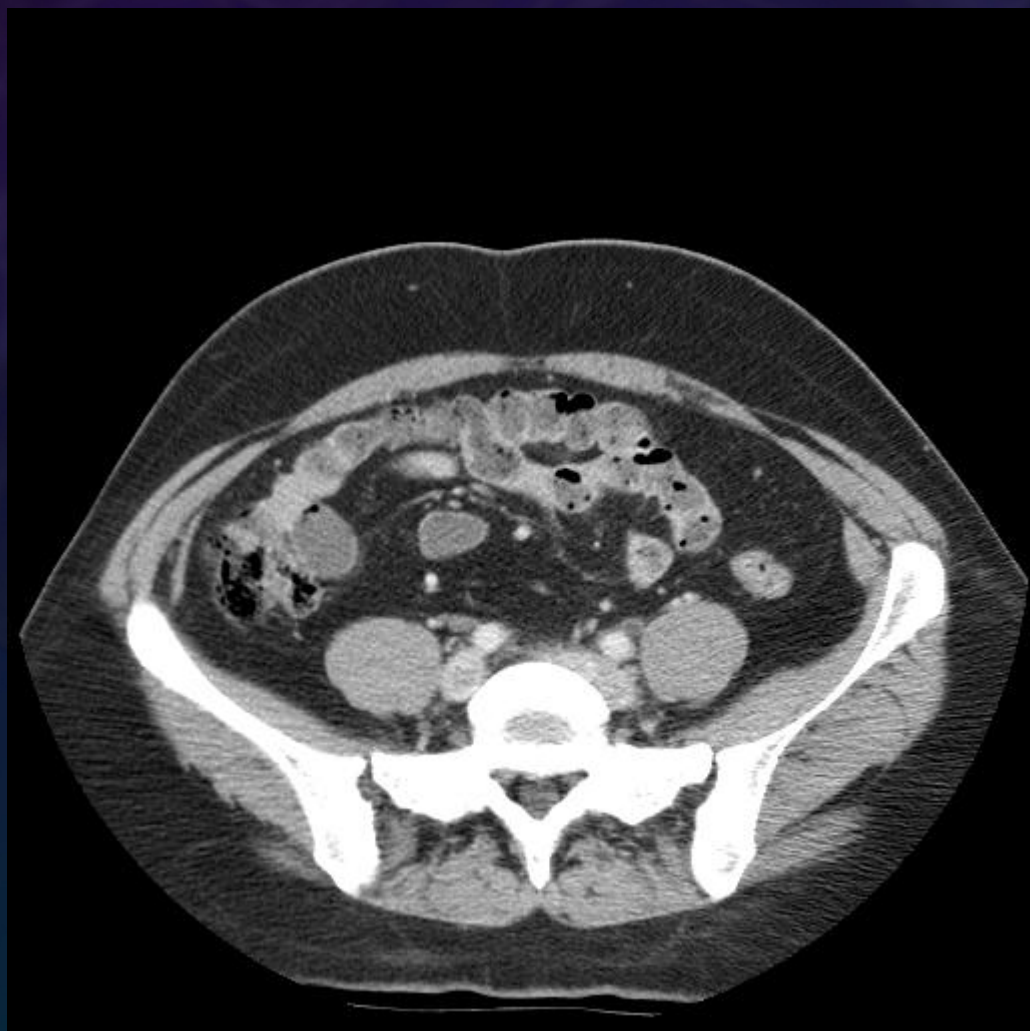
Normal Young Female Pelvis















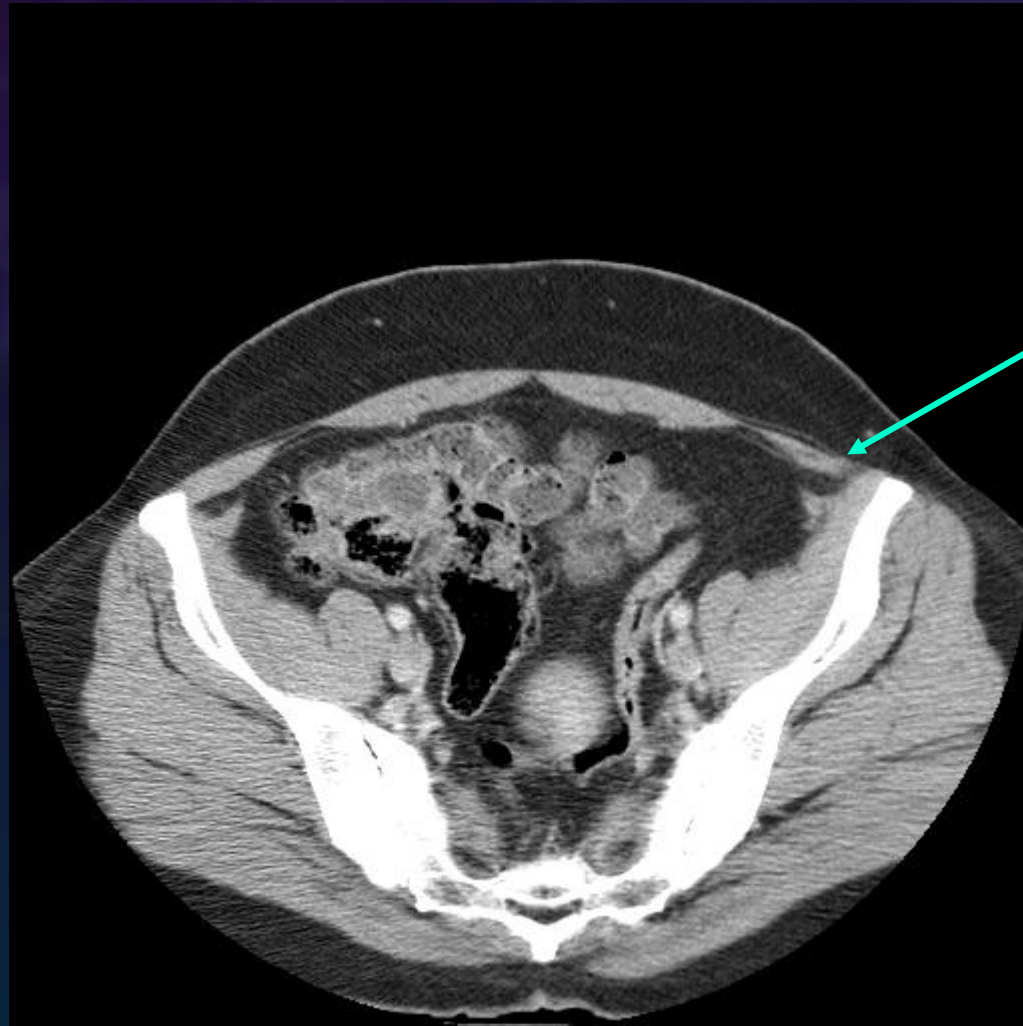












Inguinal ligament



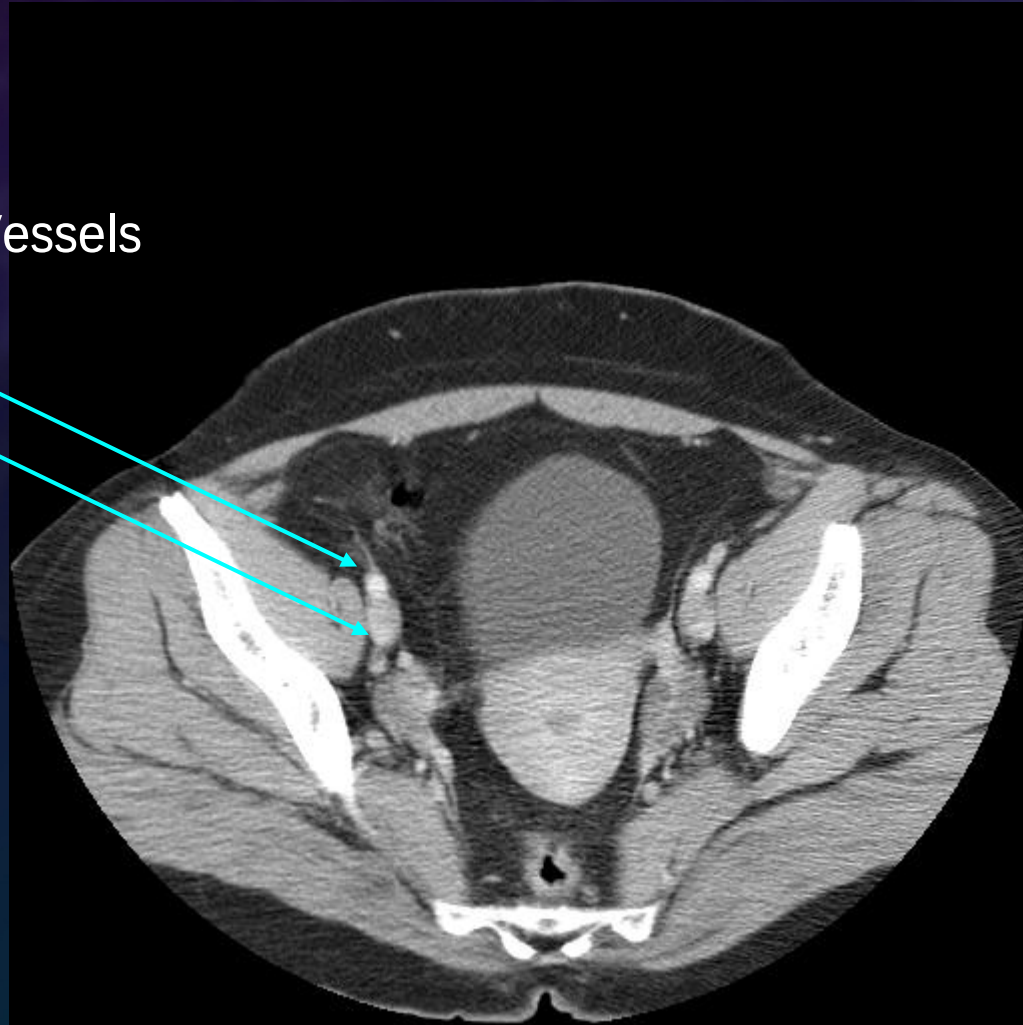
Uterine Fundus

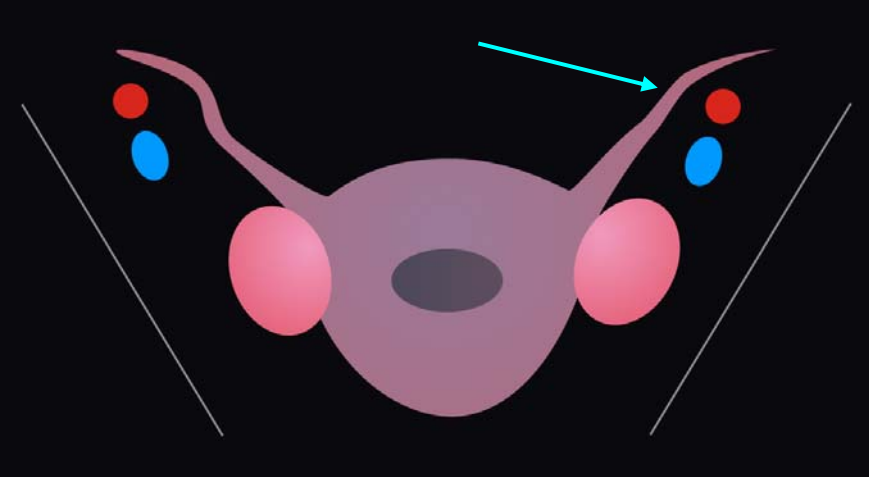




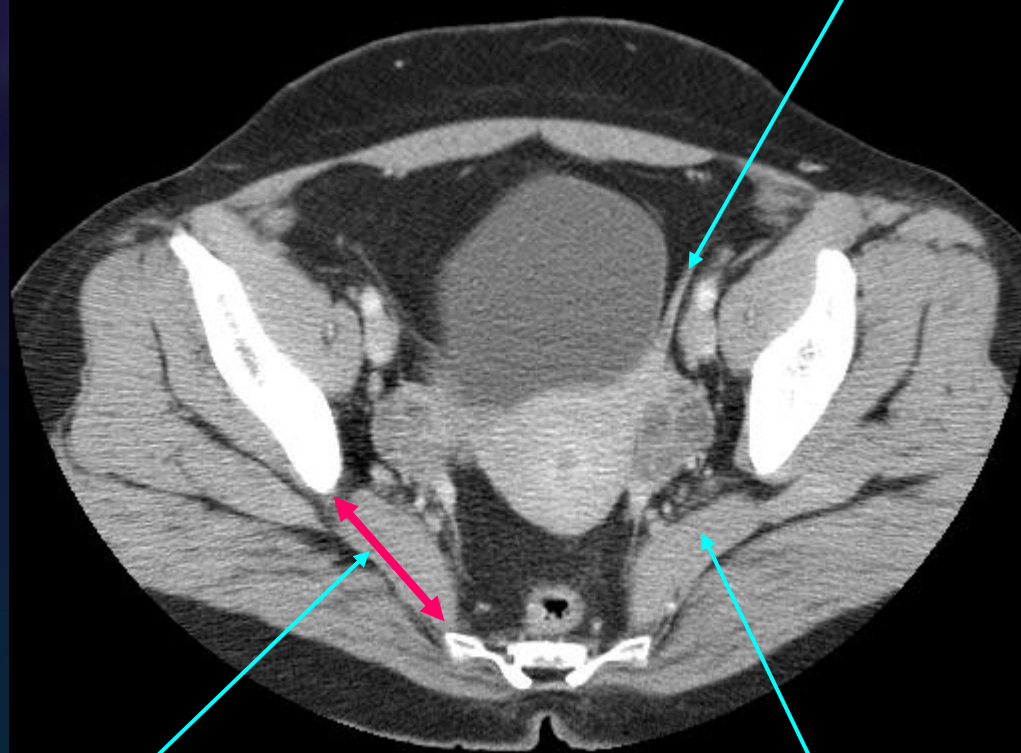
External Iliac Vessels

artery
vein



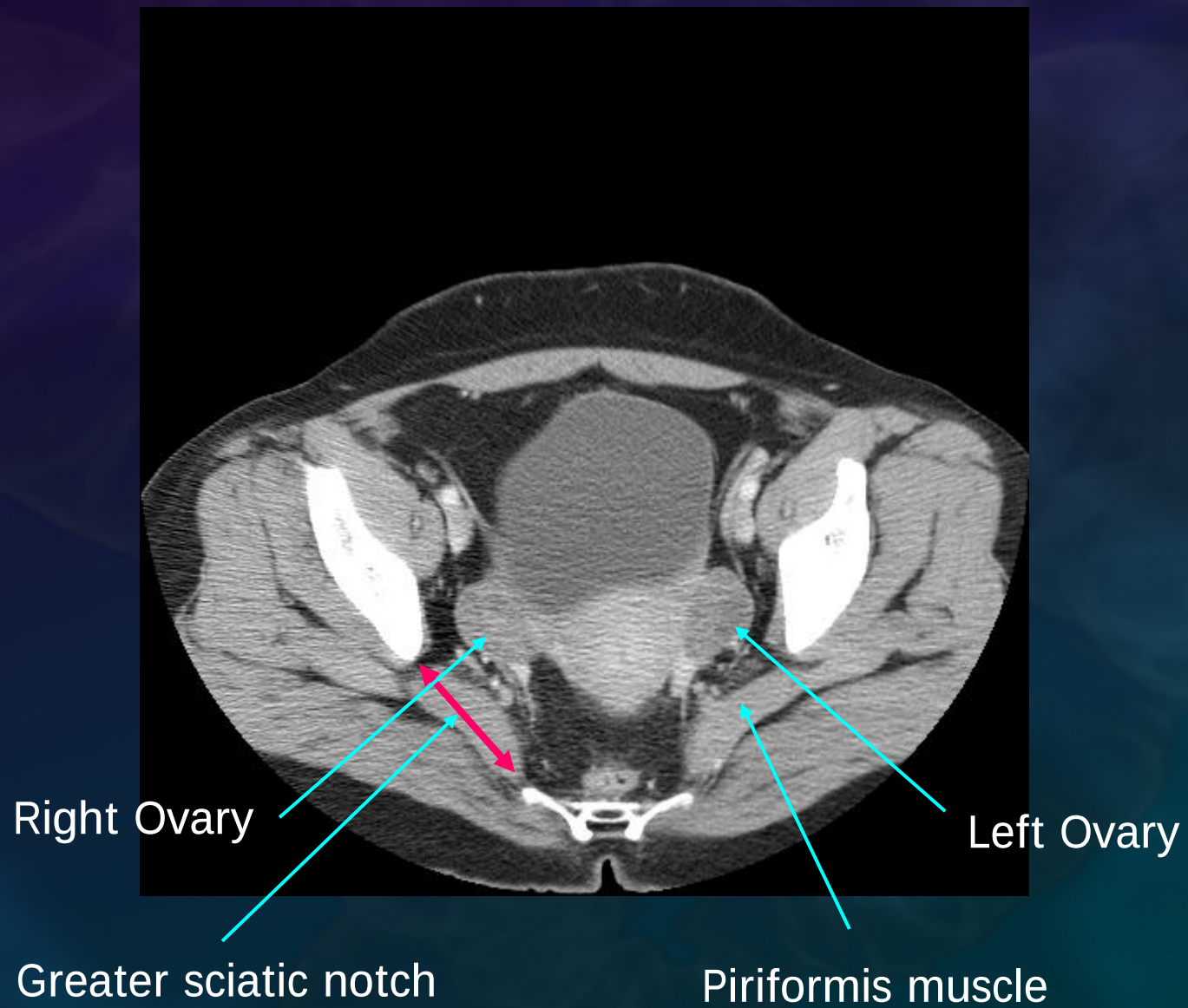


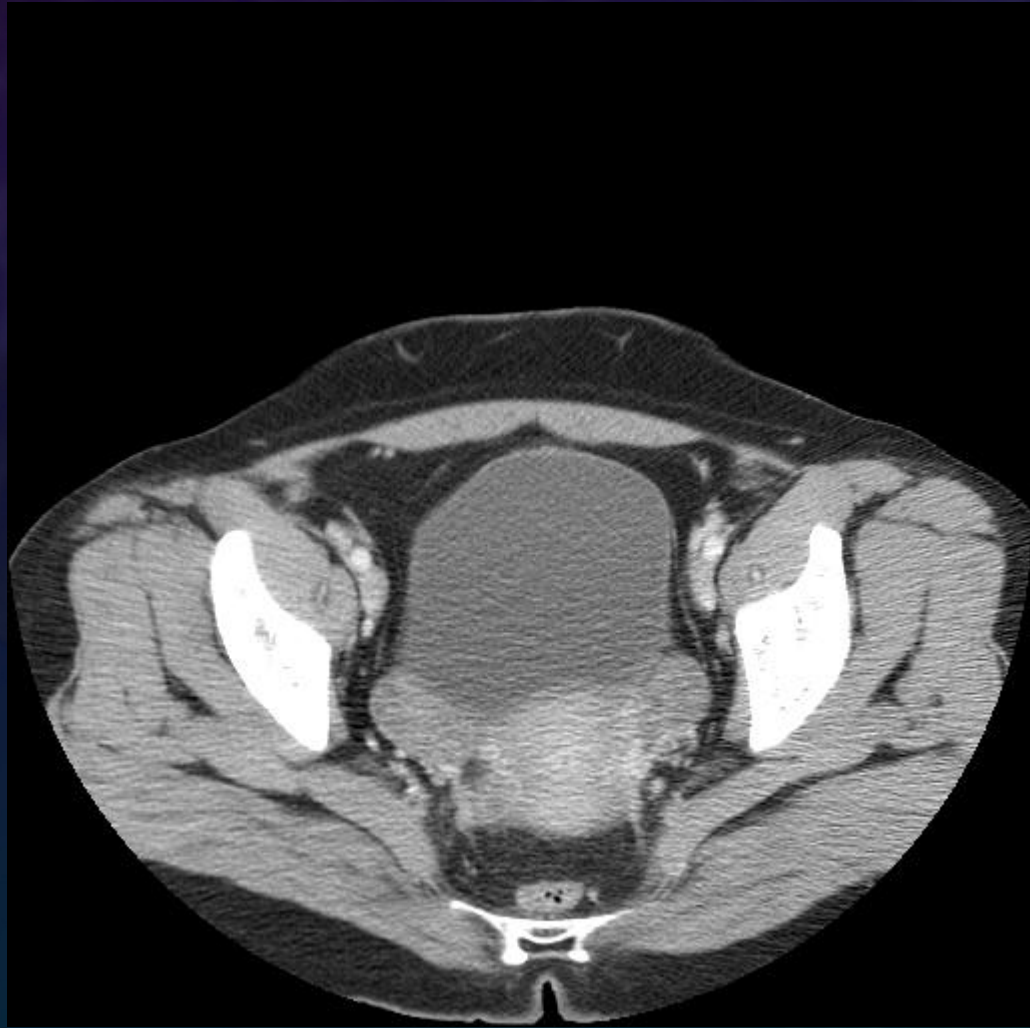
Round Ligament

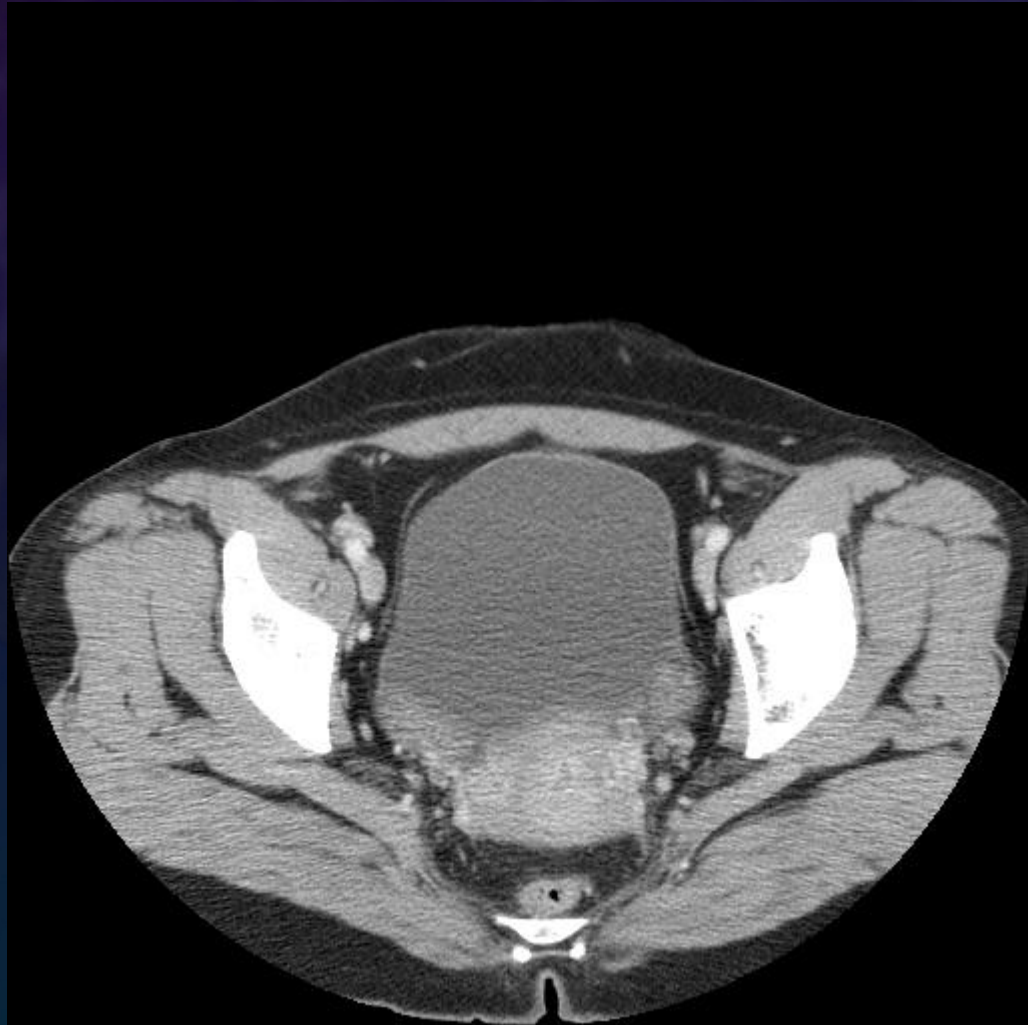


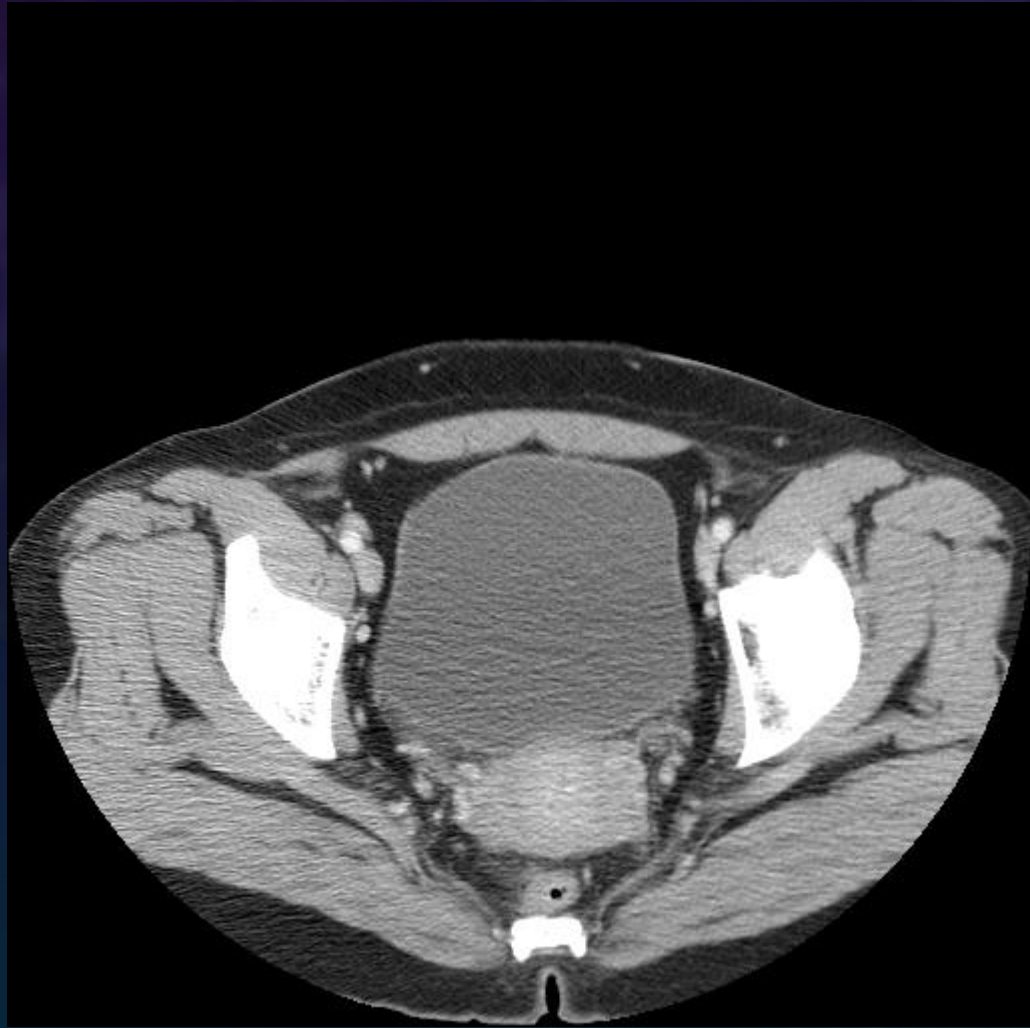
Greater sciatic notch

Piriformis muscle











Cervix











Vaginal Vault



















Hysterectomy (ovaries retained)





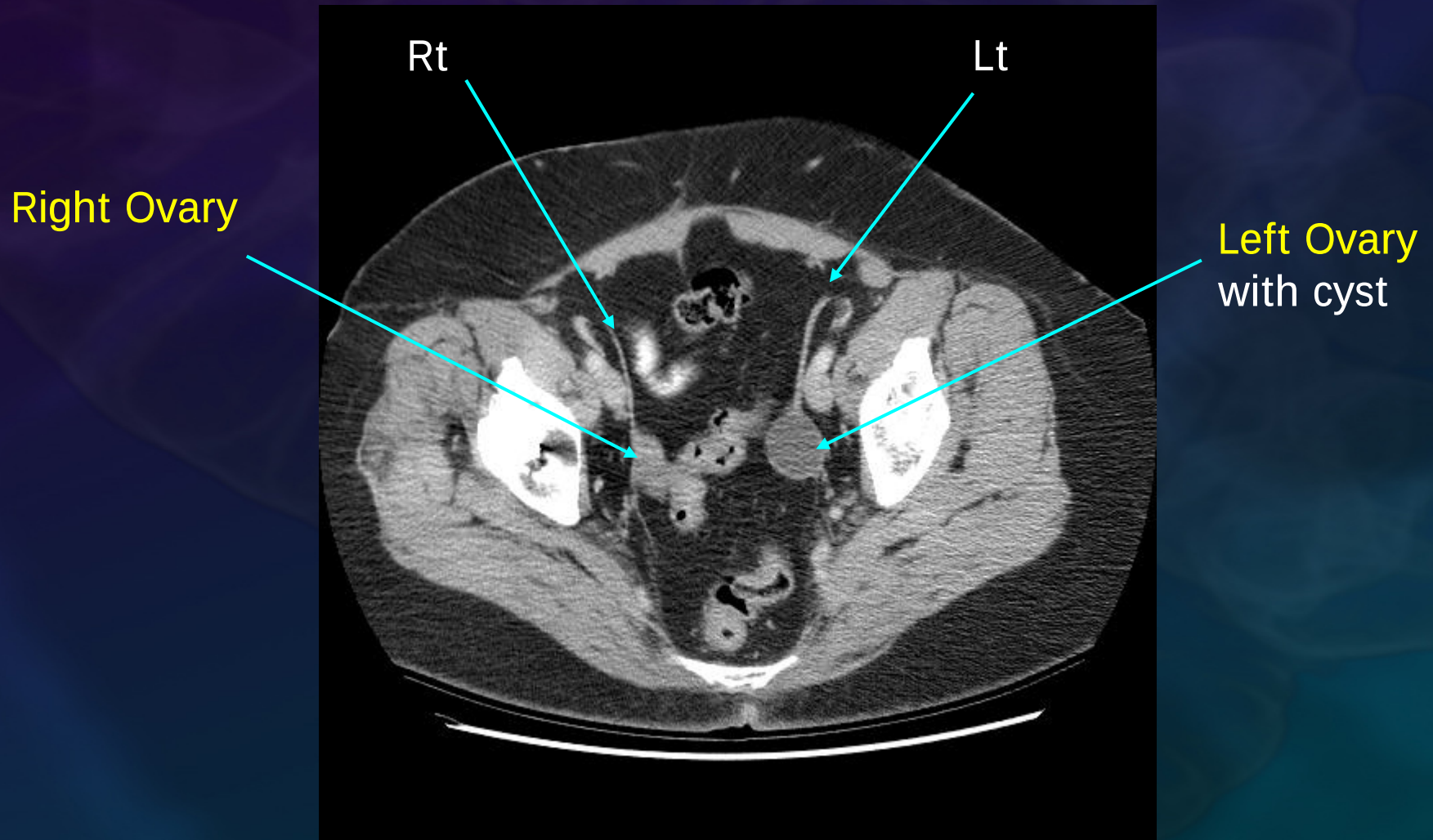






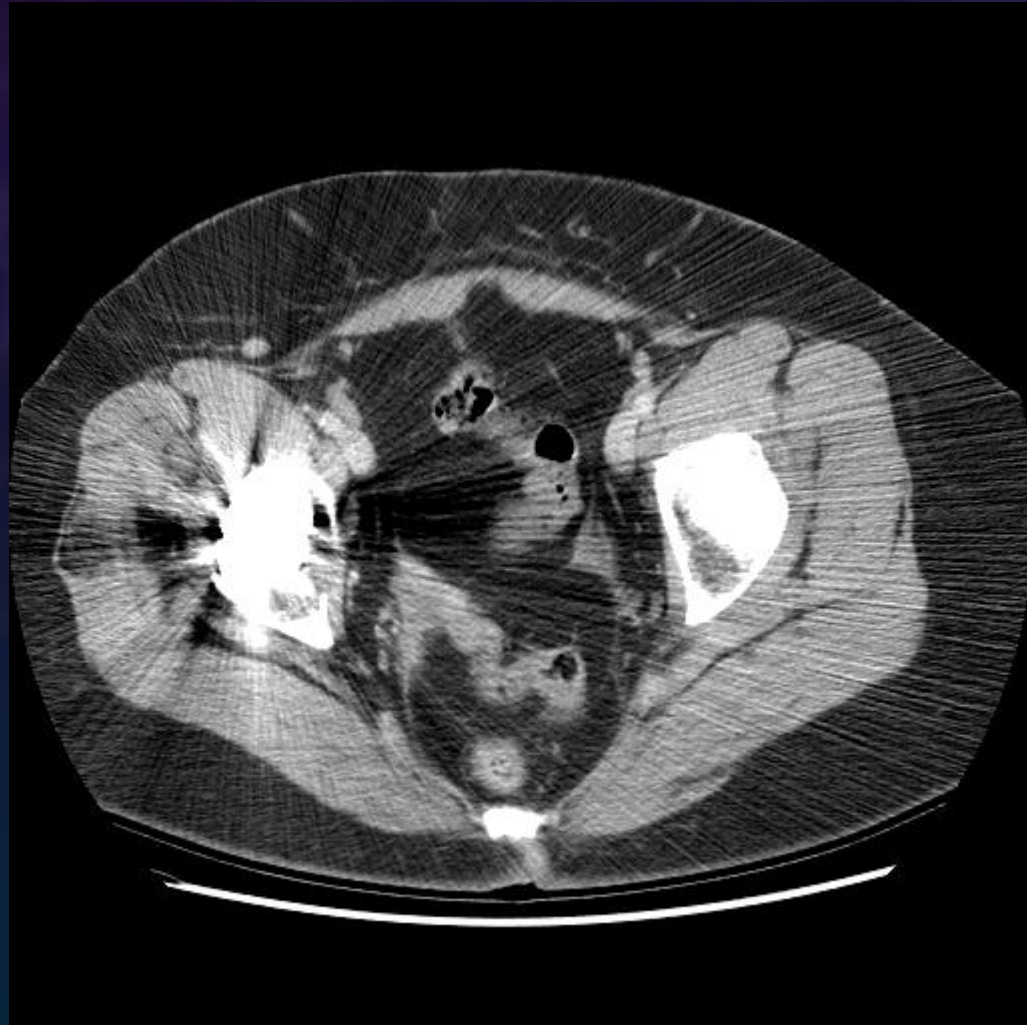


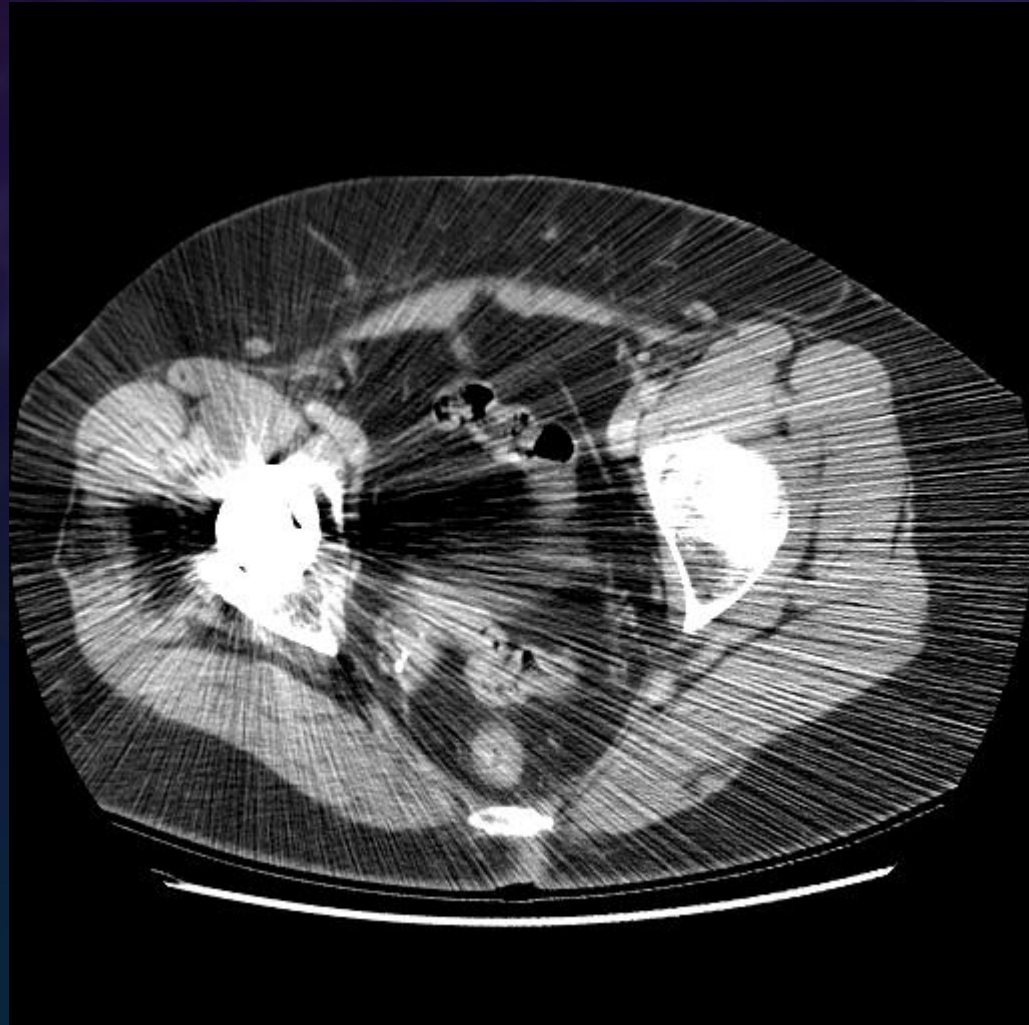
Round Ligaments

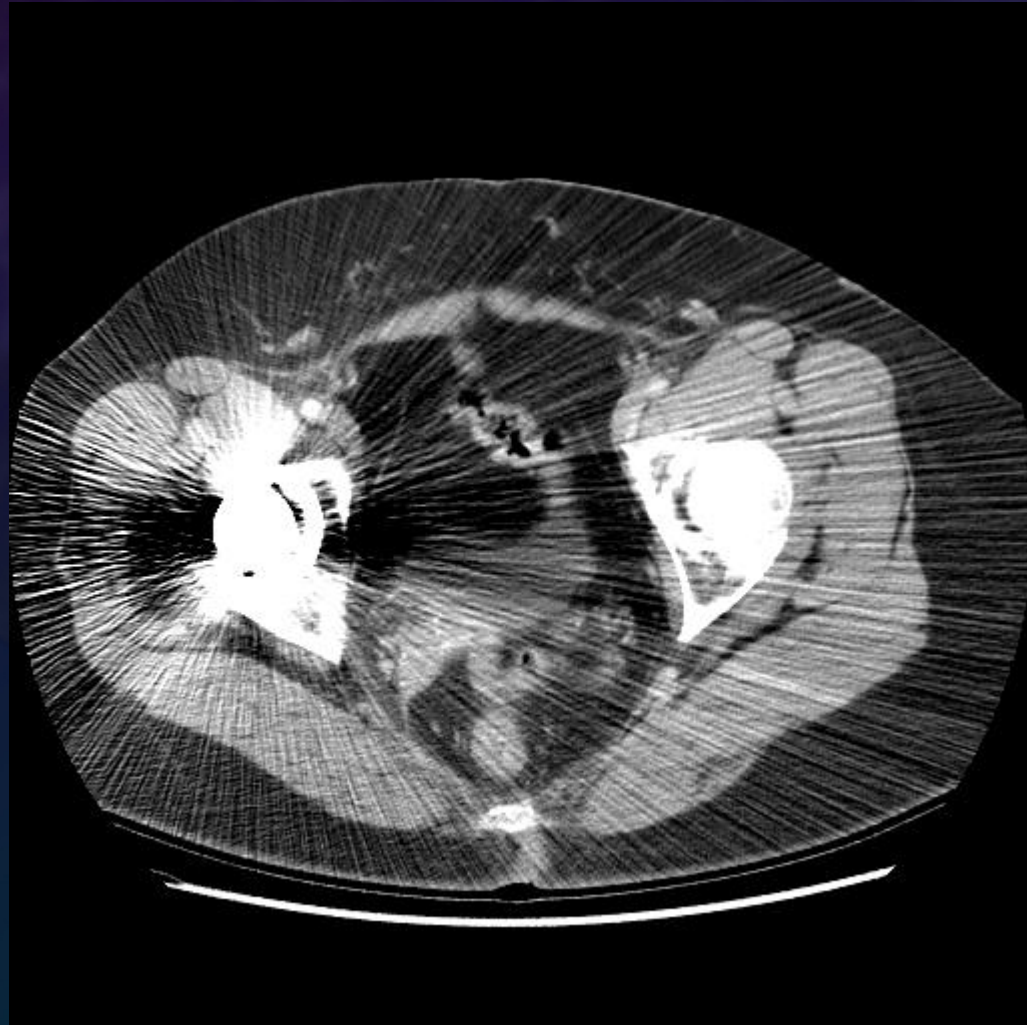


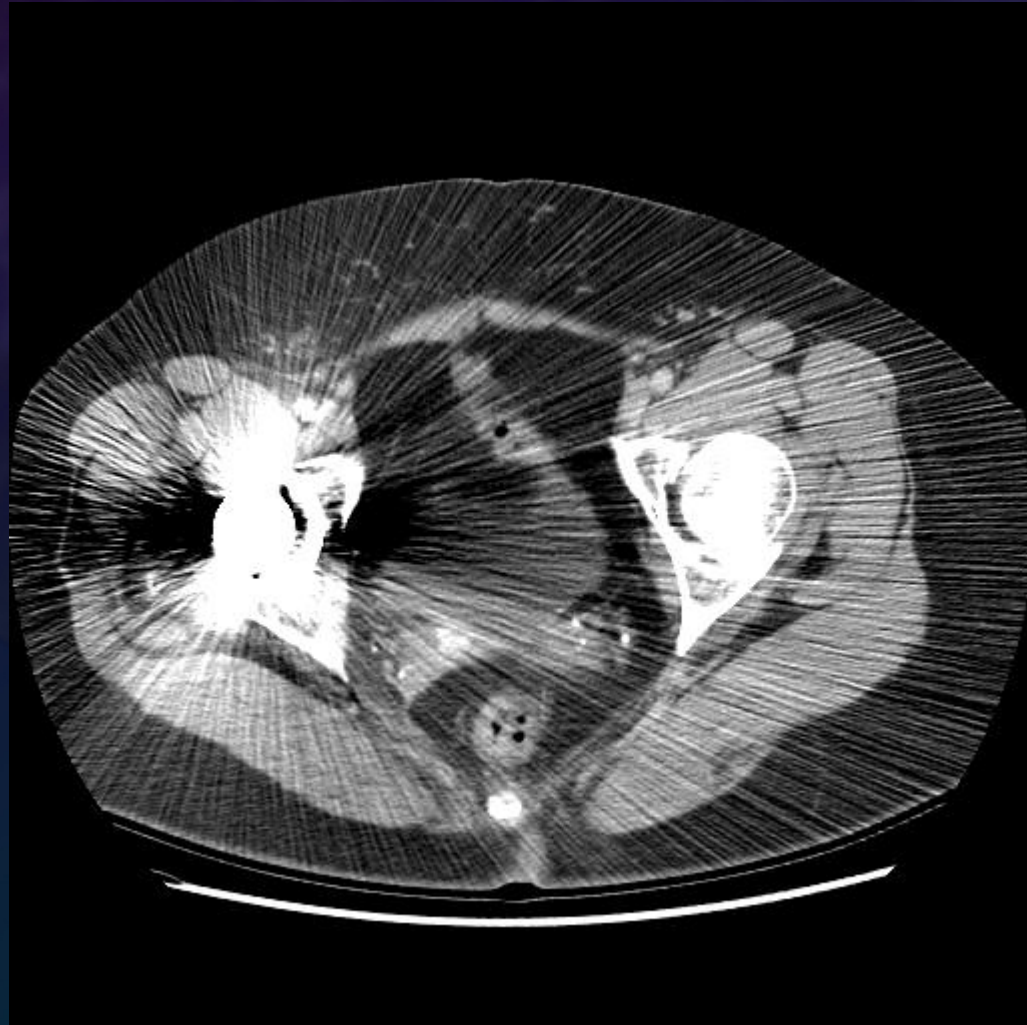
Round ligament:- Often useful as a guide to ovarian location

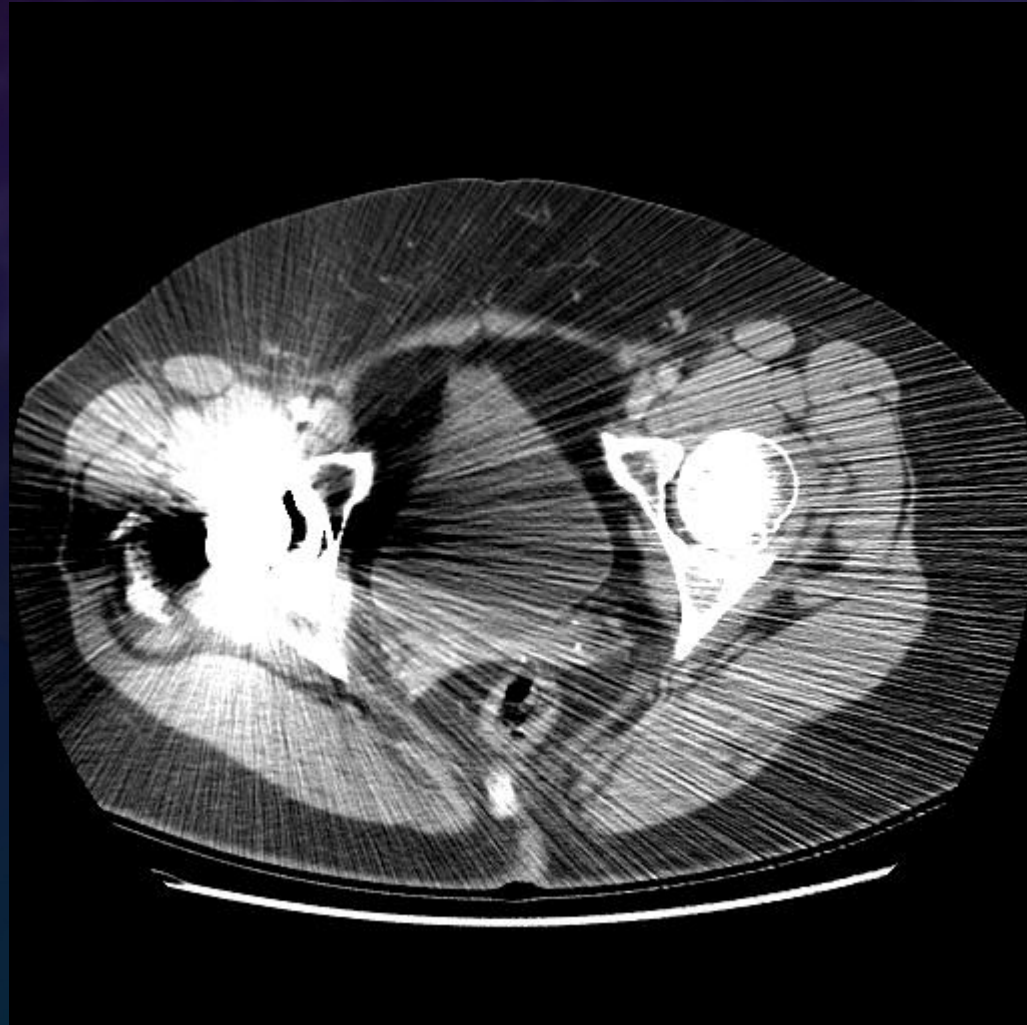


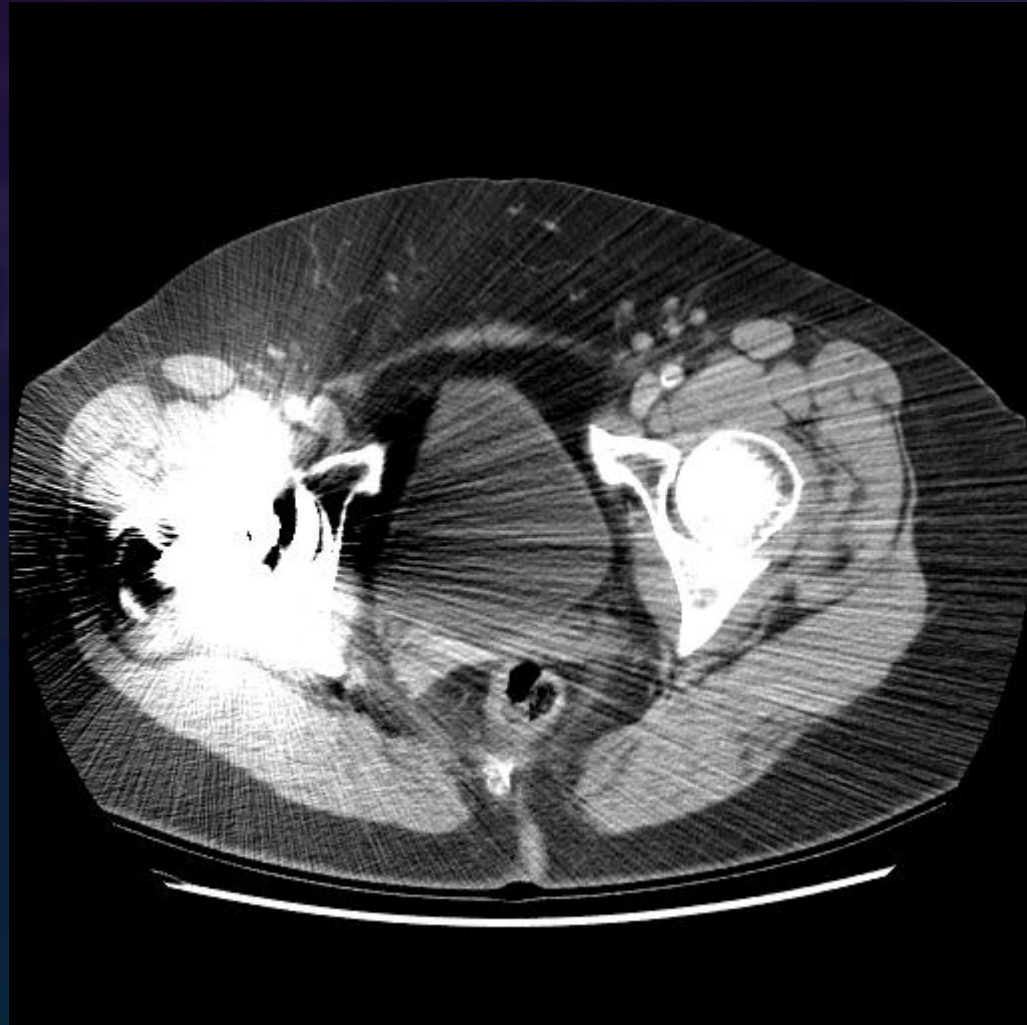


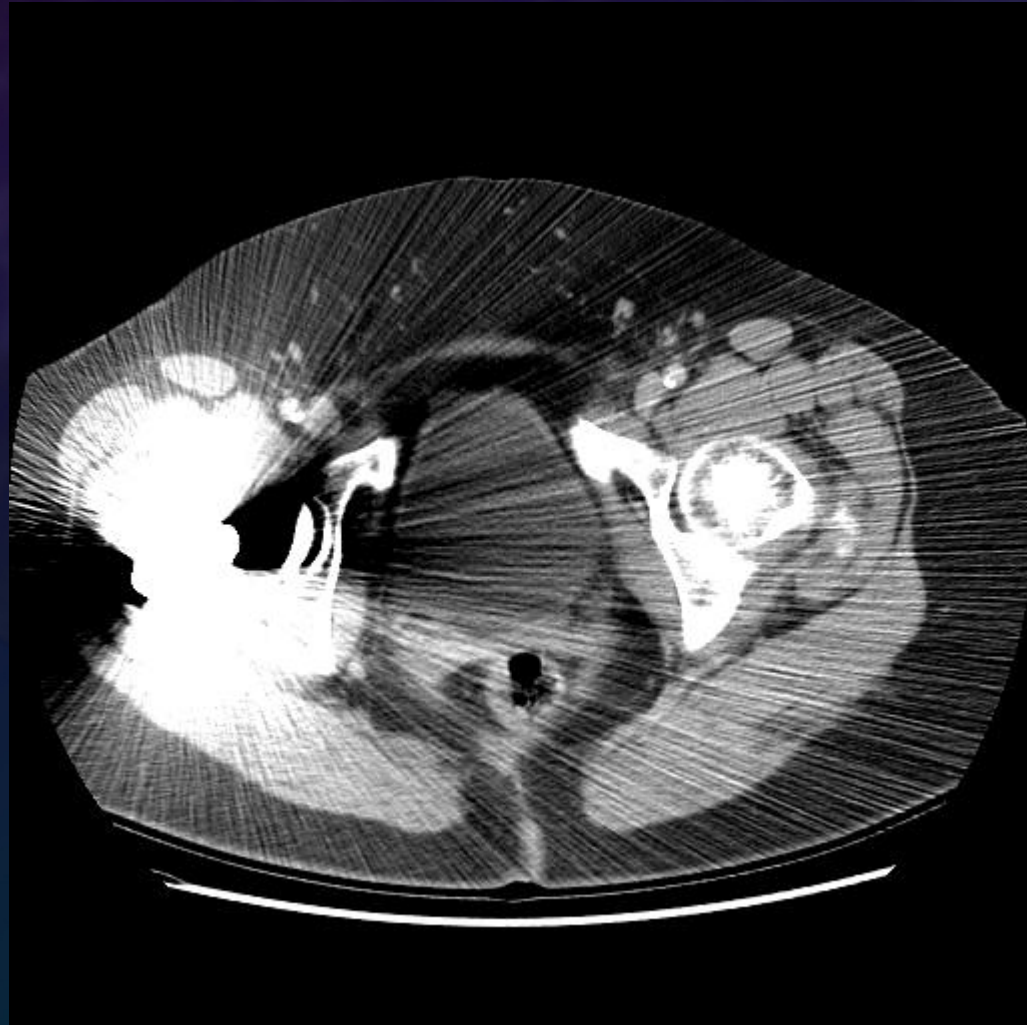








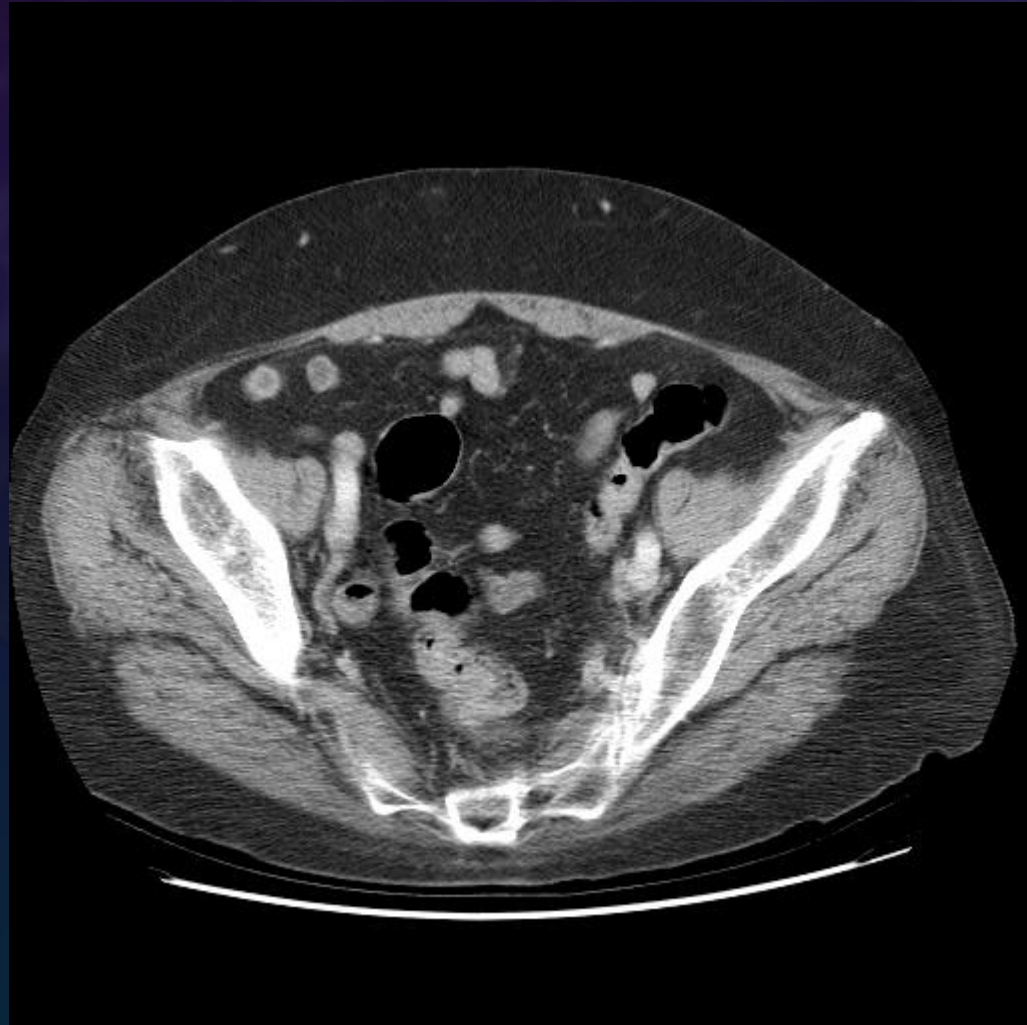


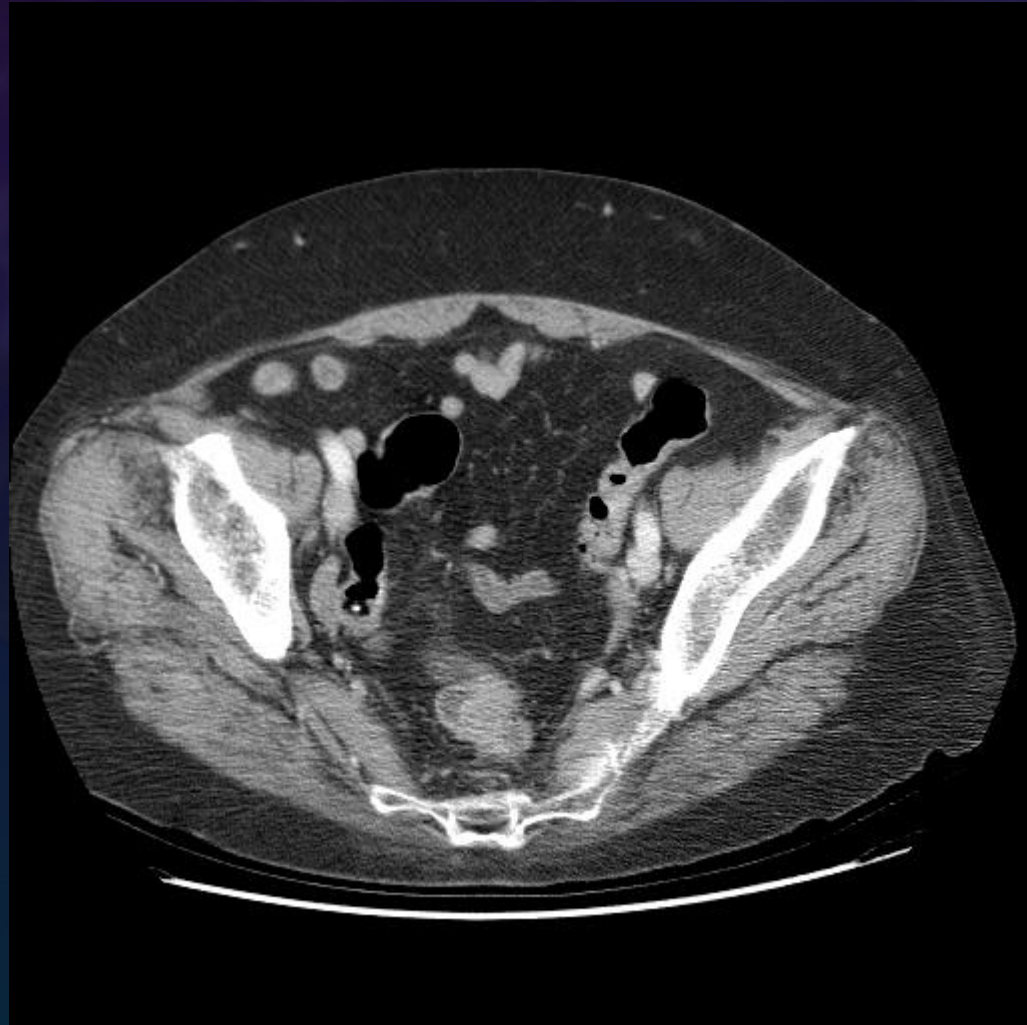


65 year old – small ovaries

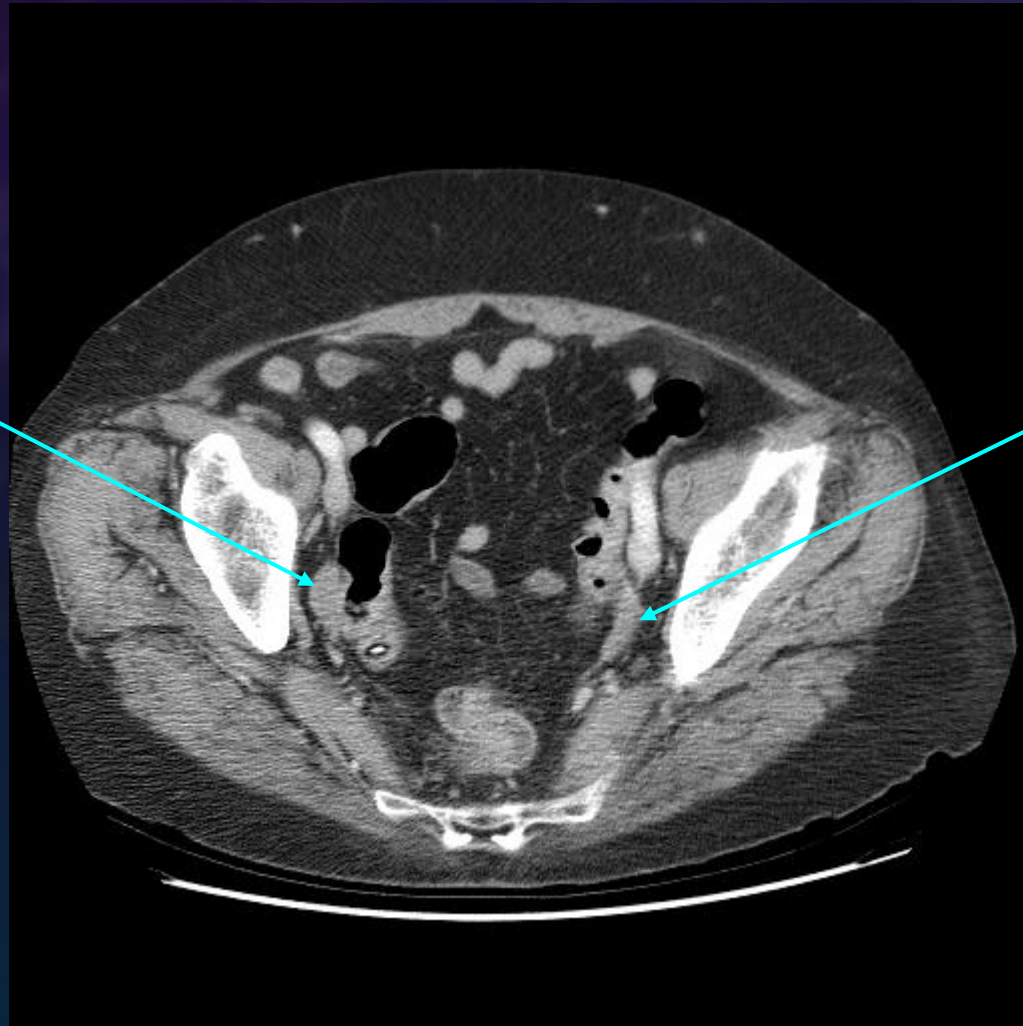






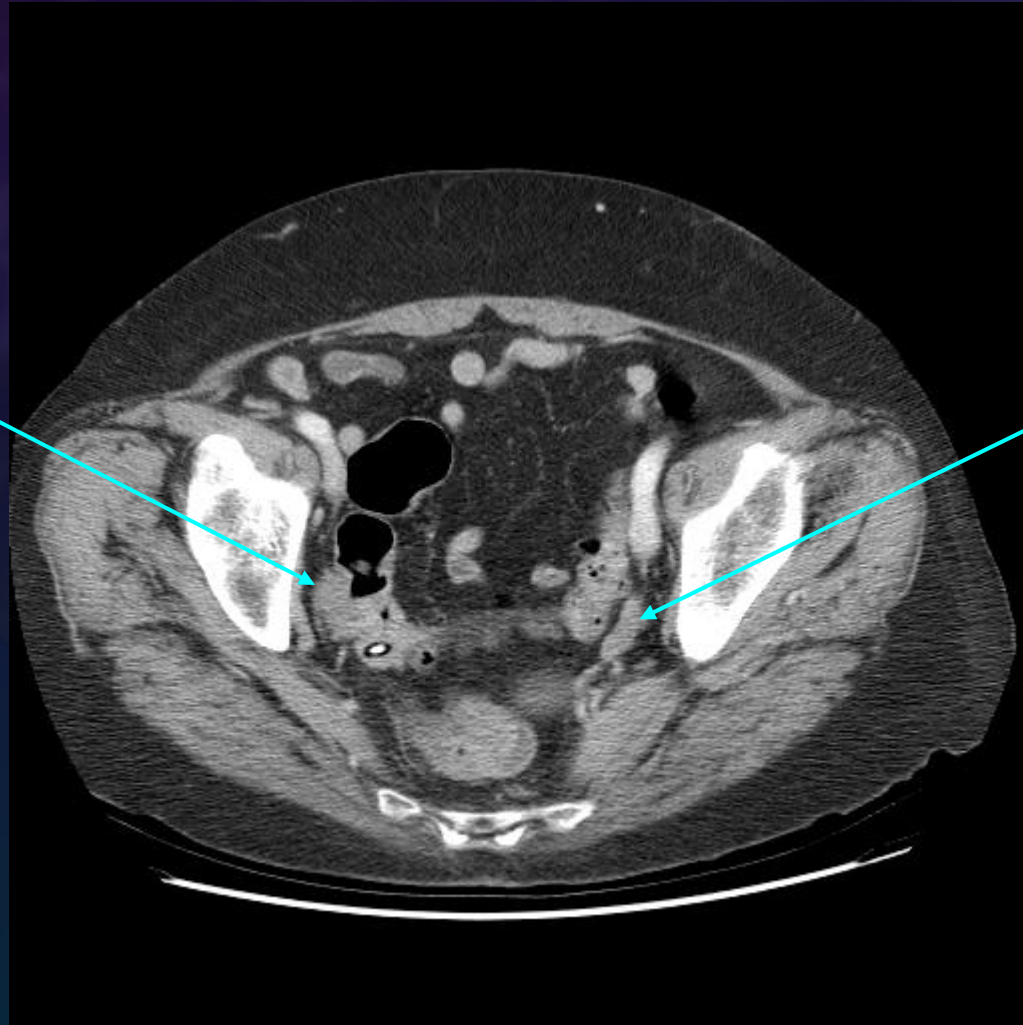


Right Ovary



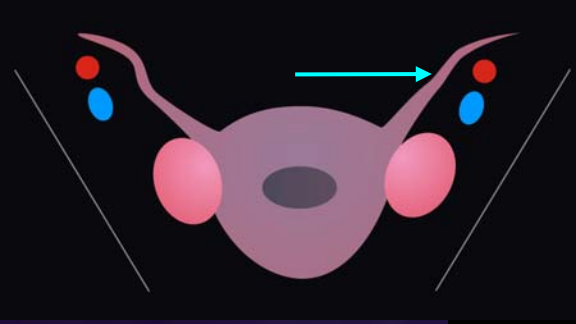
Left Ovary

Right Ovary

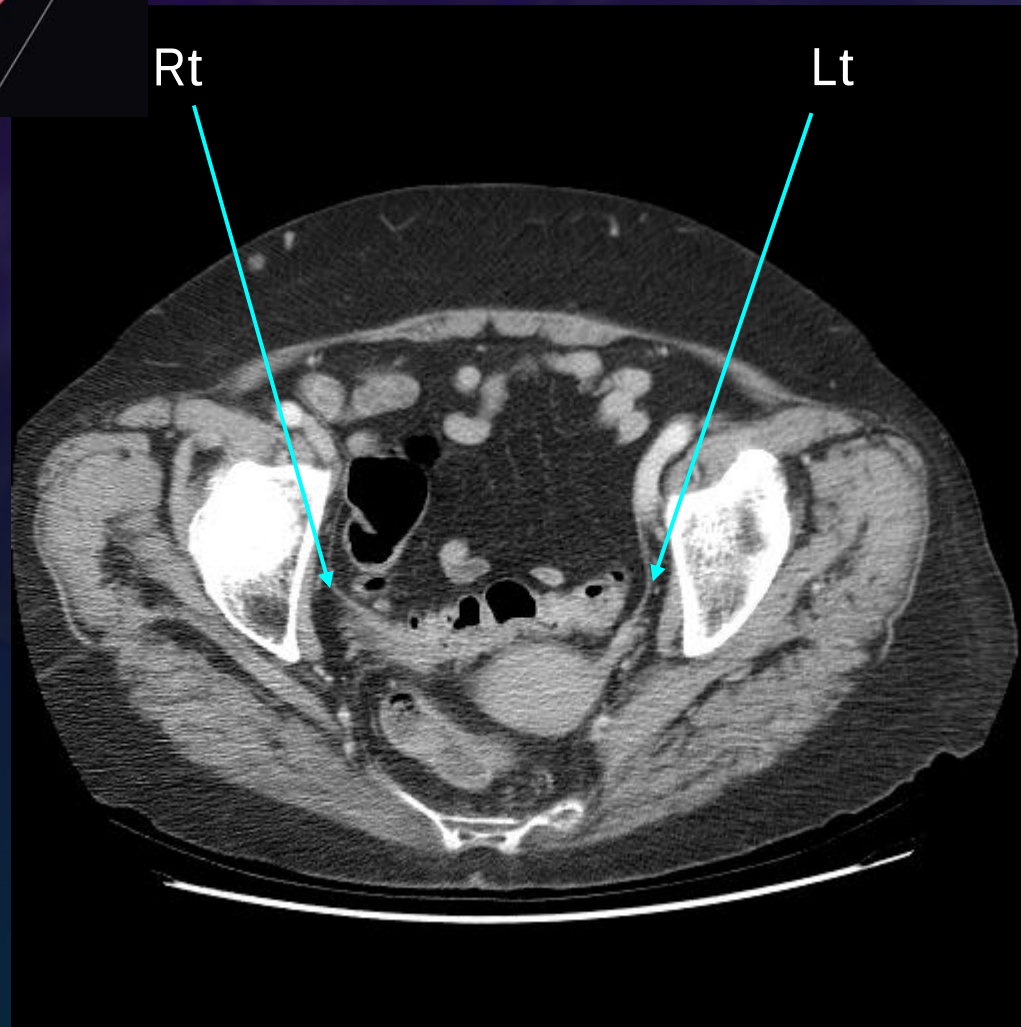


Left Ovary





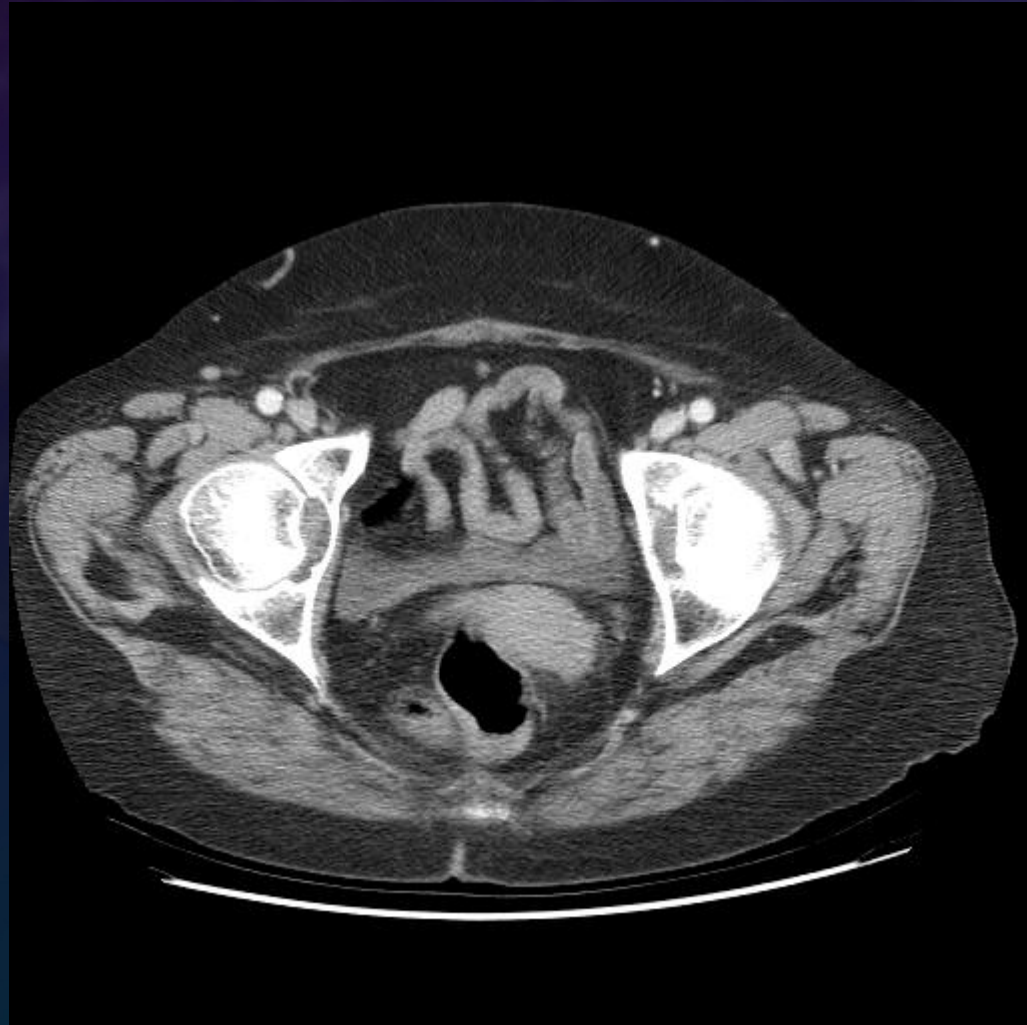
Round Ligaments









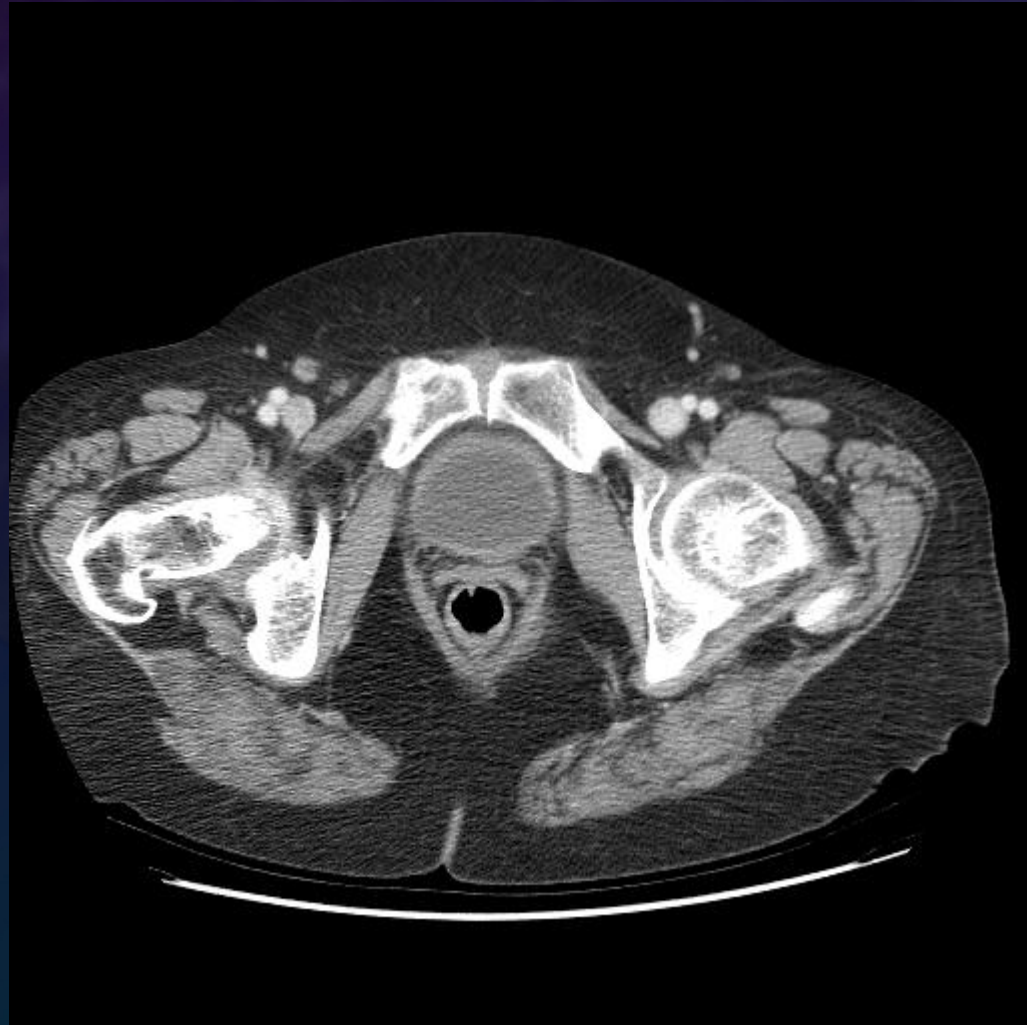


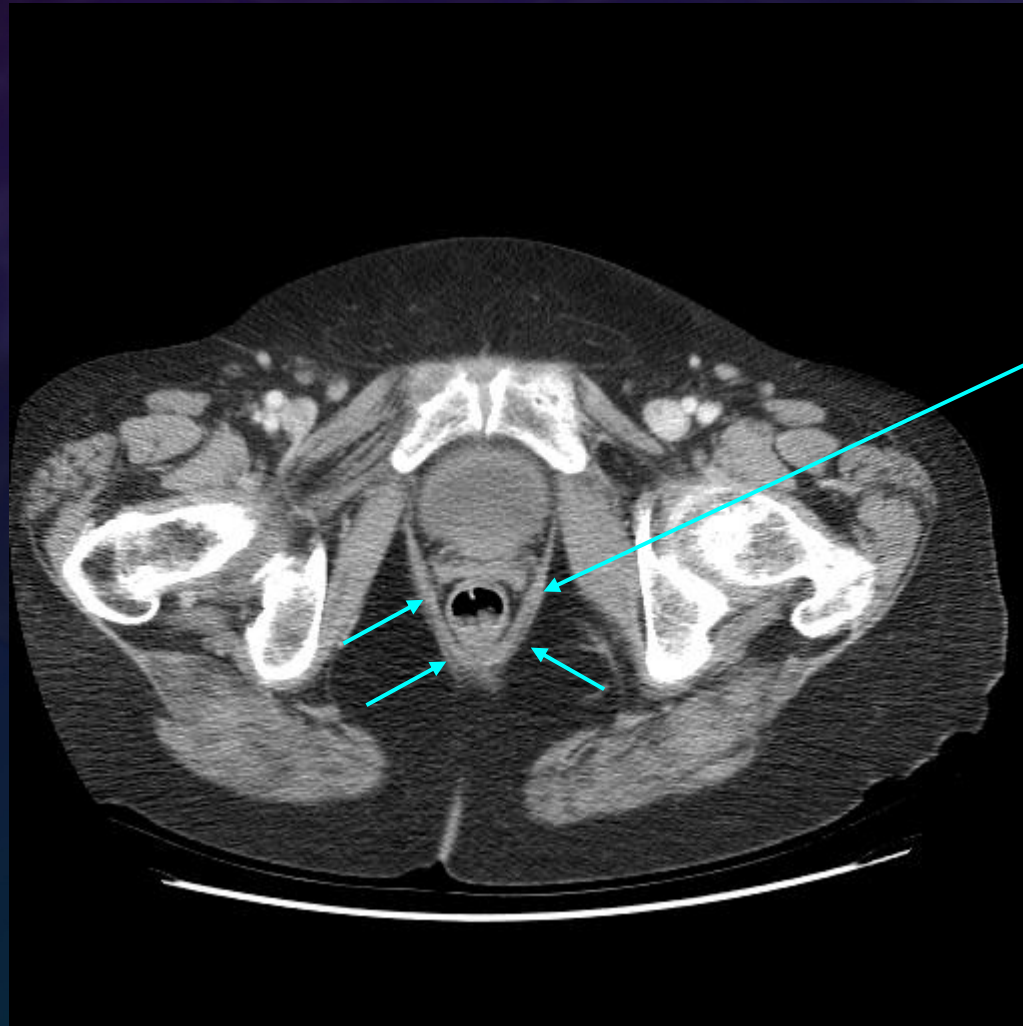




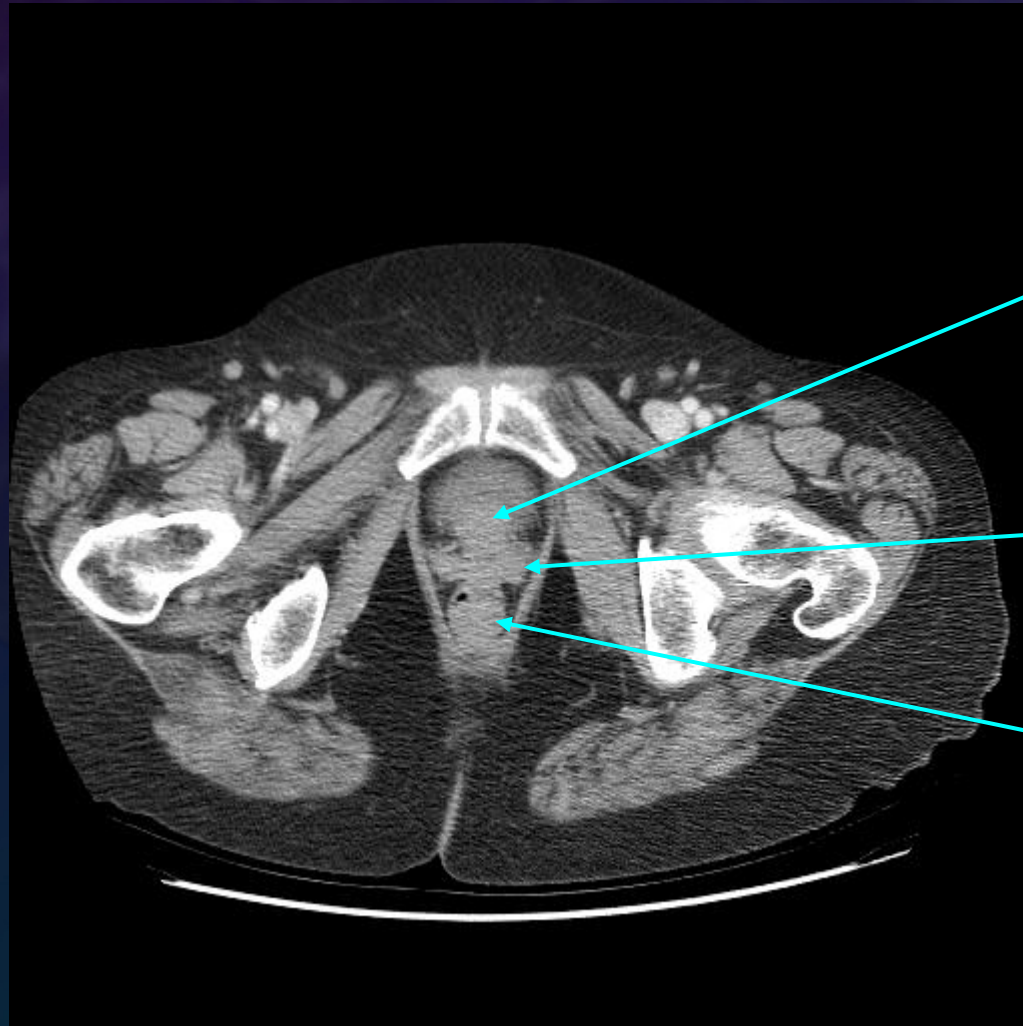








Levator Ani



Urethra

Vagina

Rectum



Right ovarian cyst

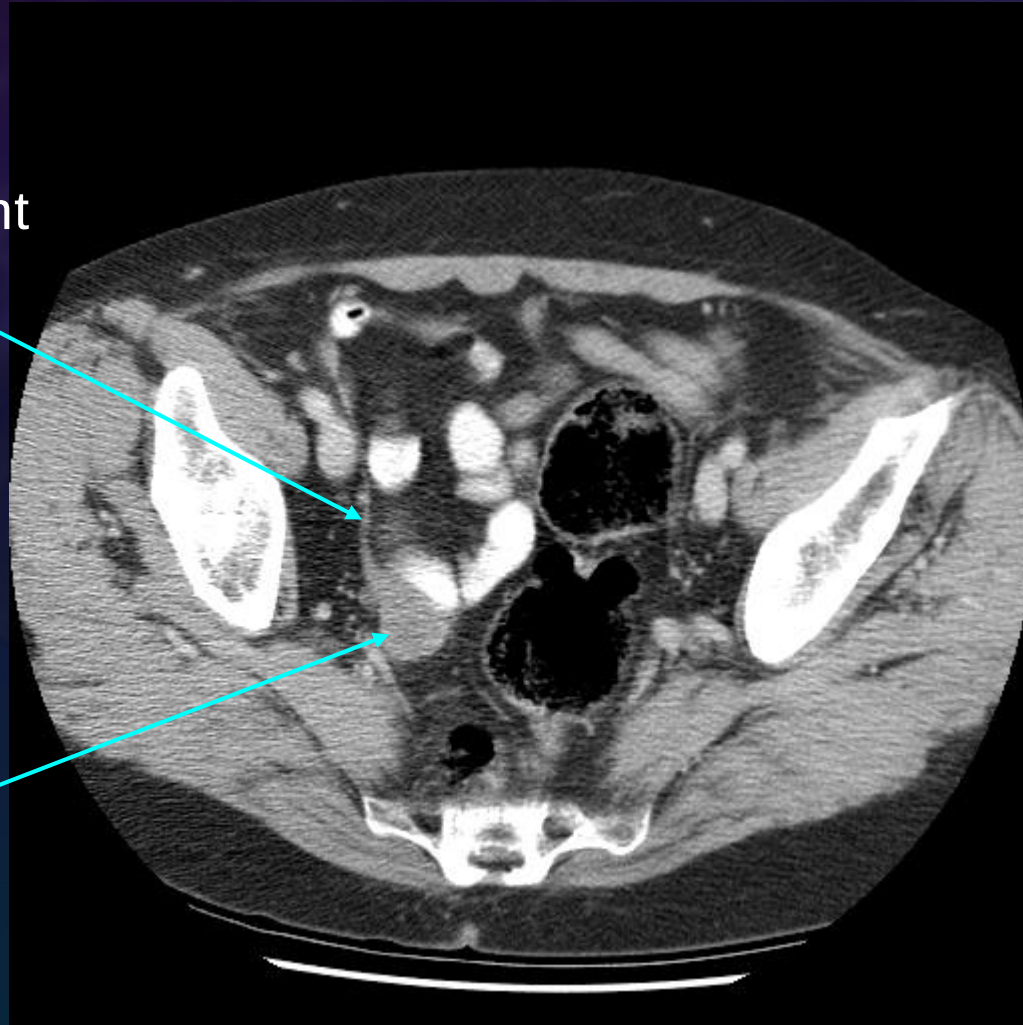






Round Ligament

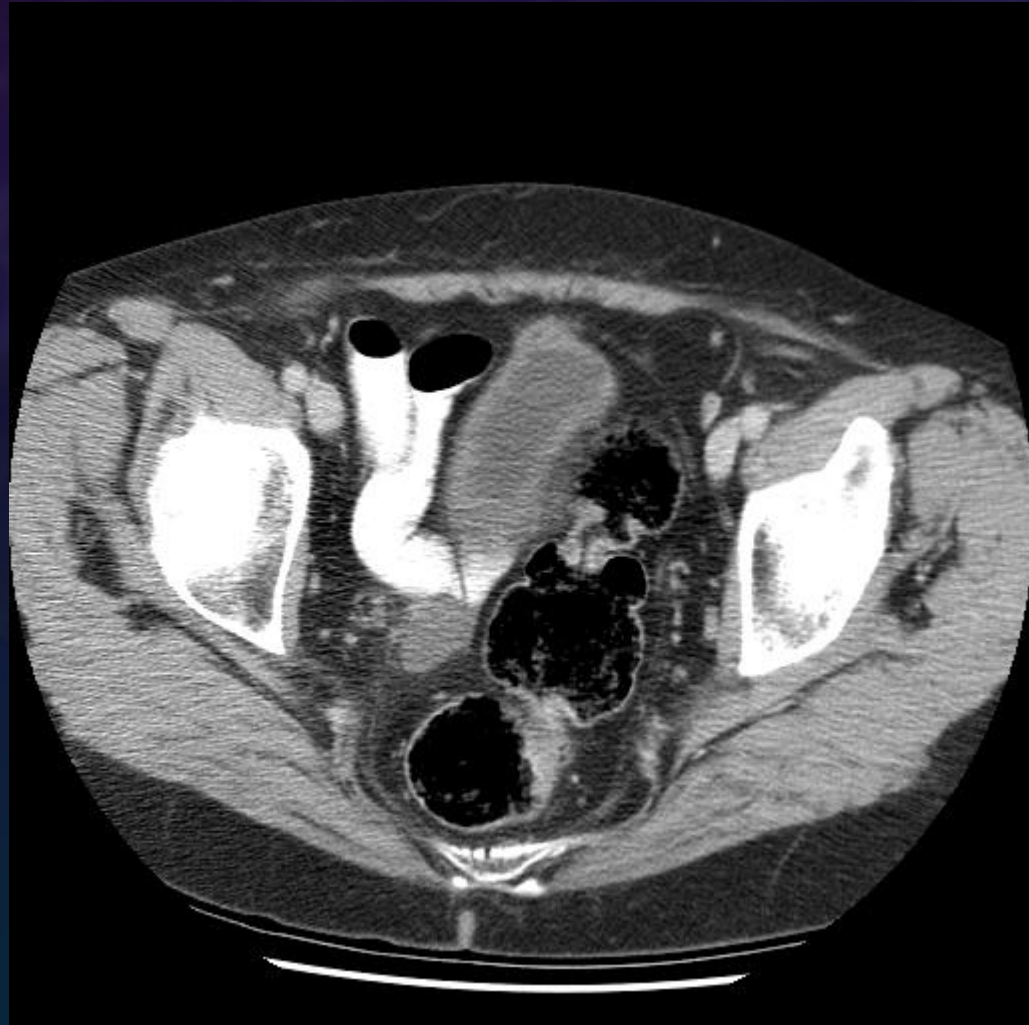
Right Ovary

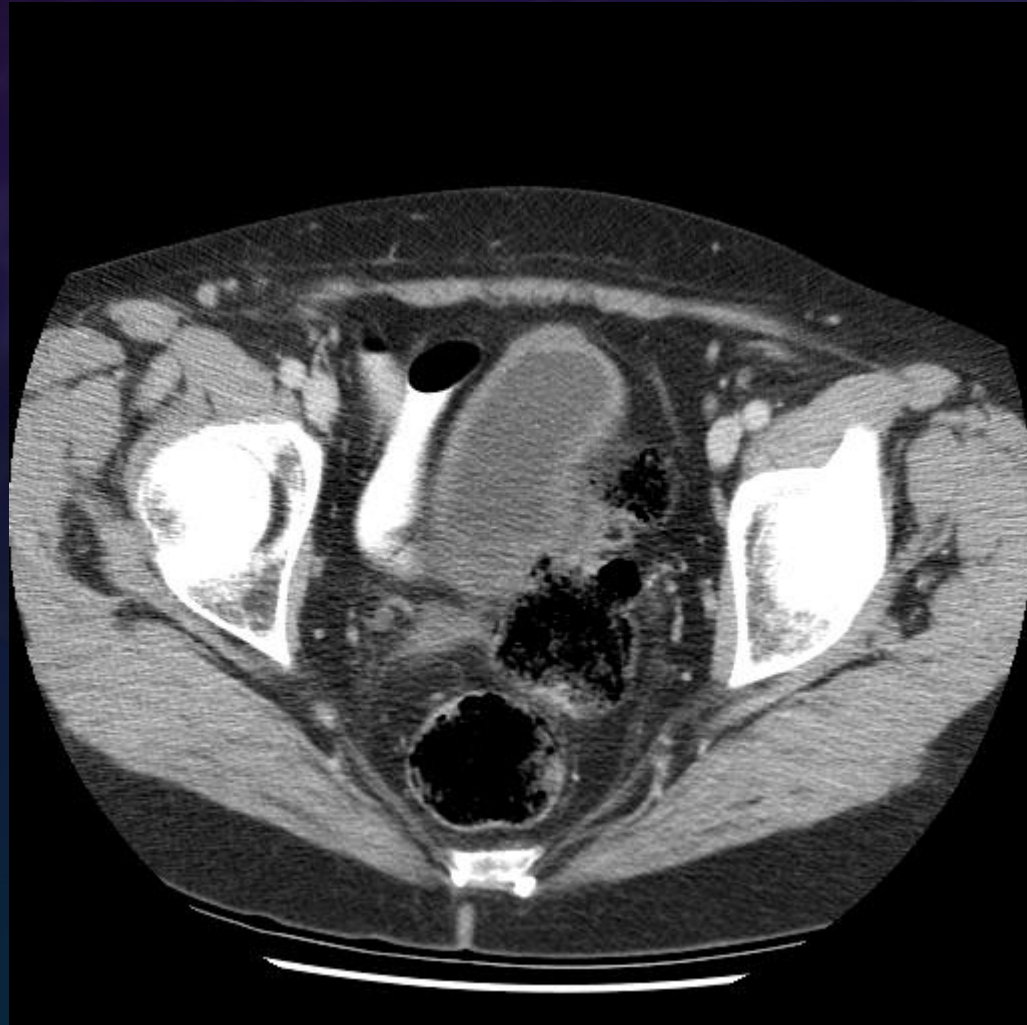




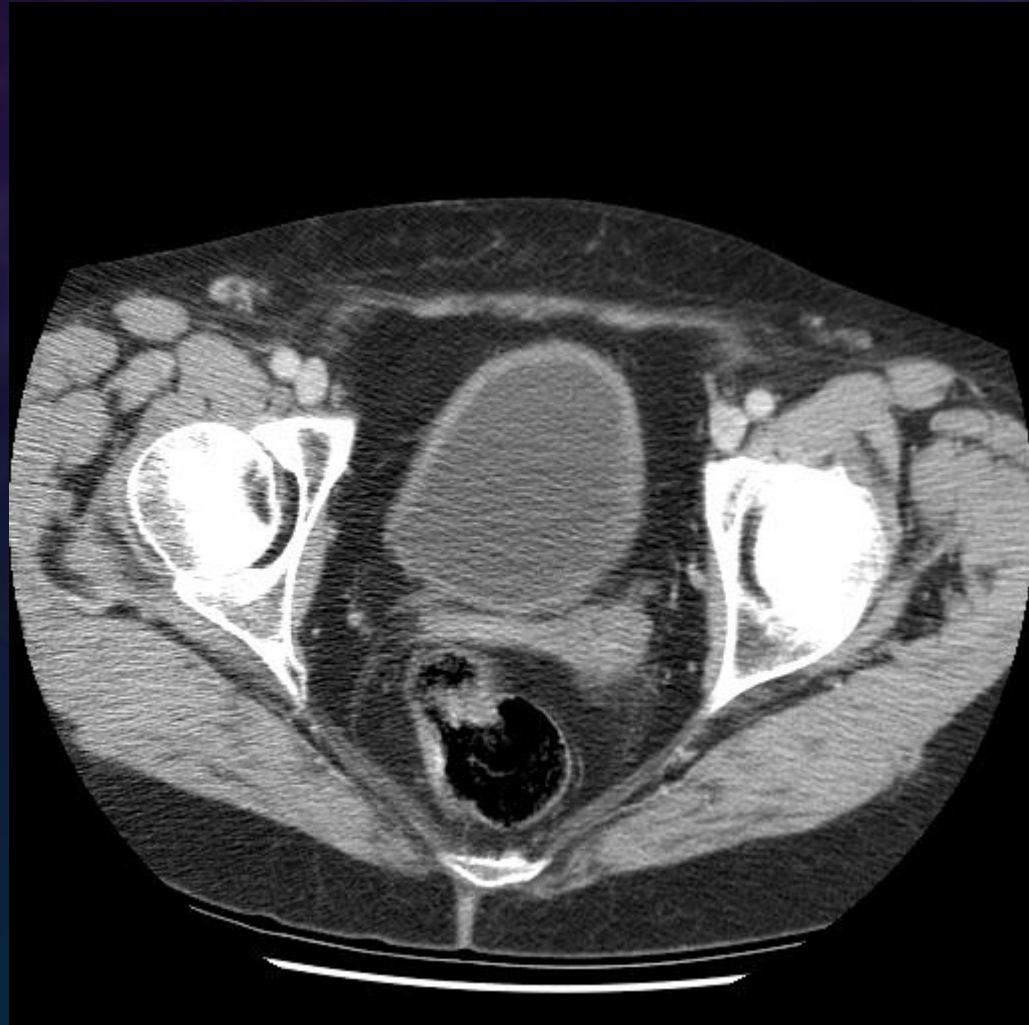
Cyst















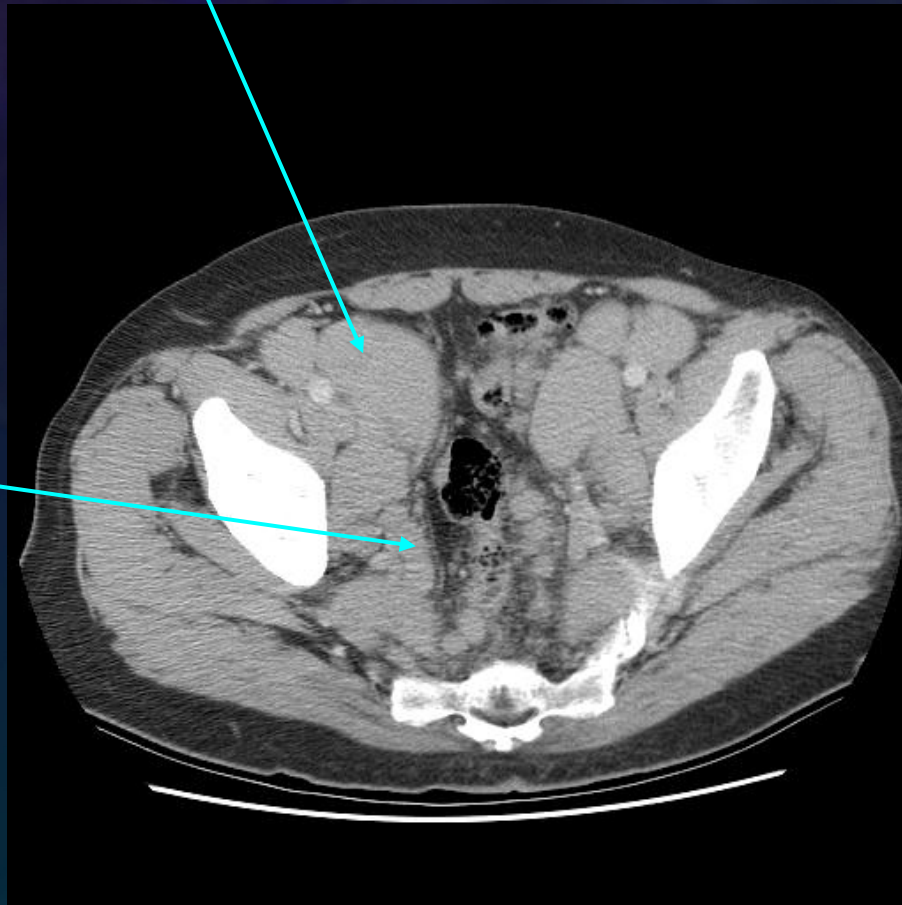




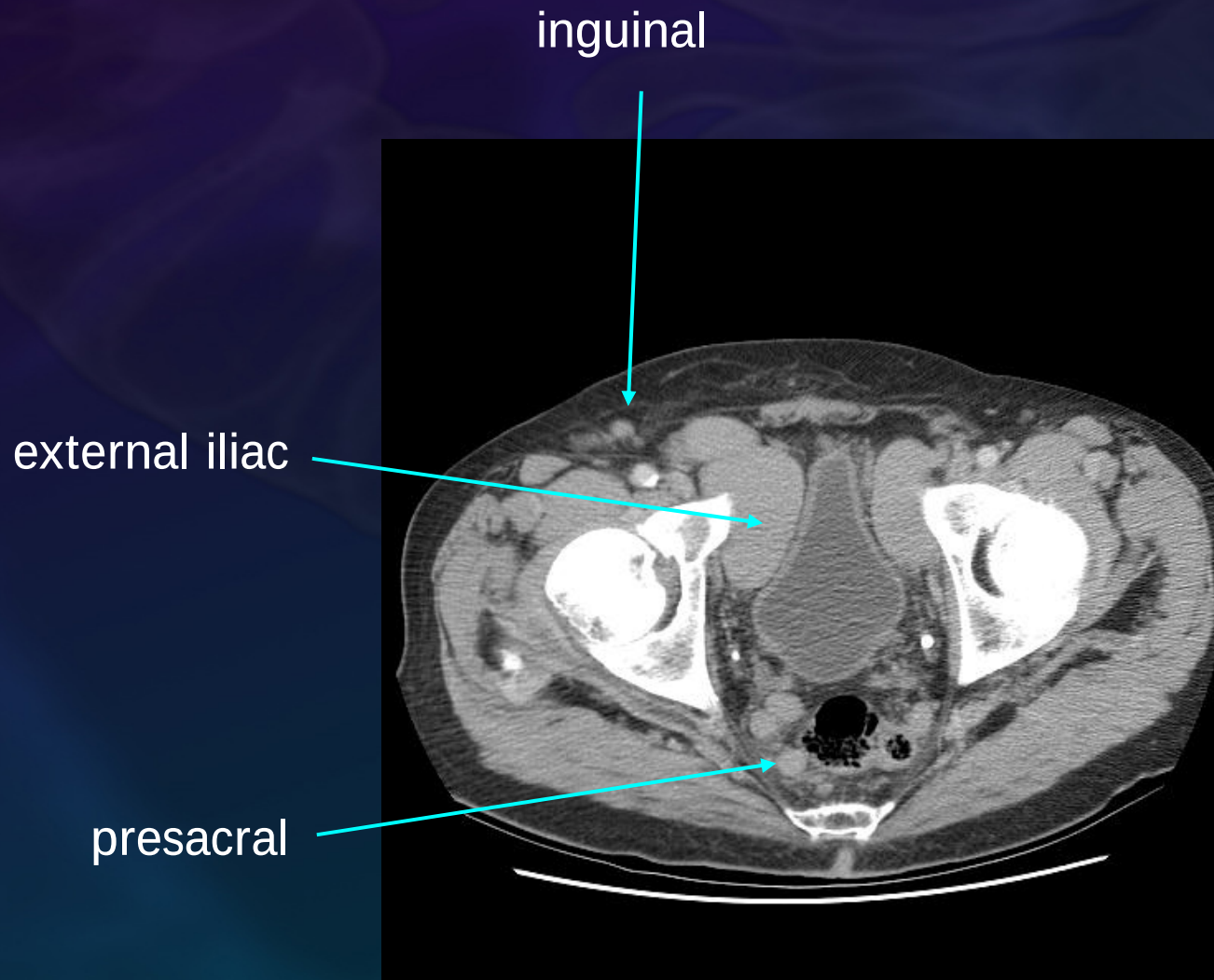
Pelvic lymphadenopathy: example

external iliac

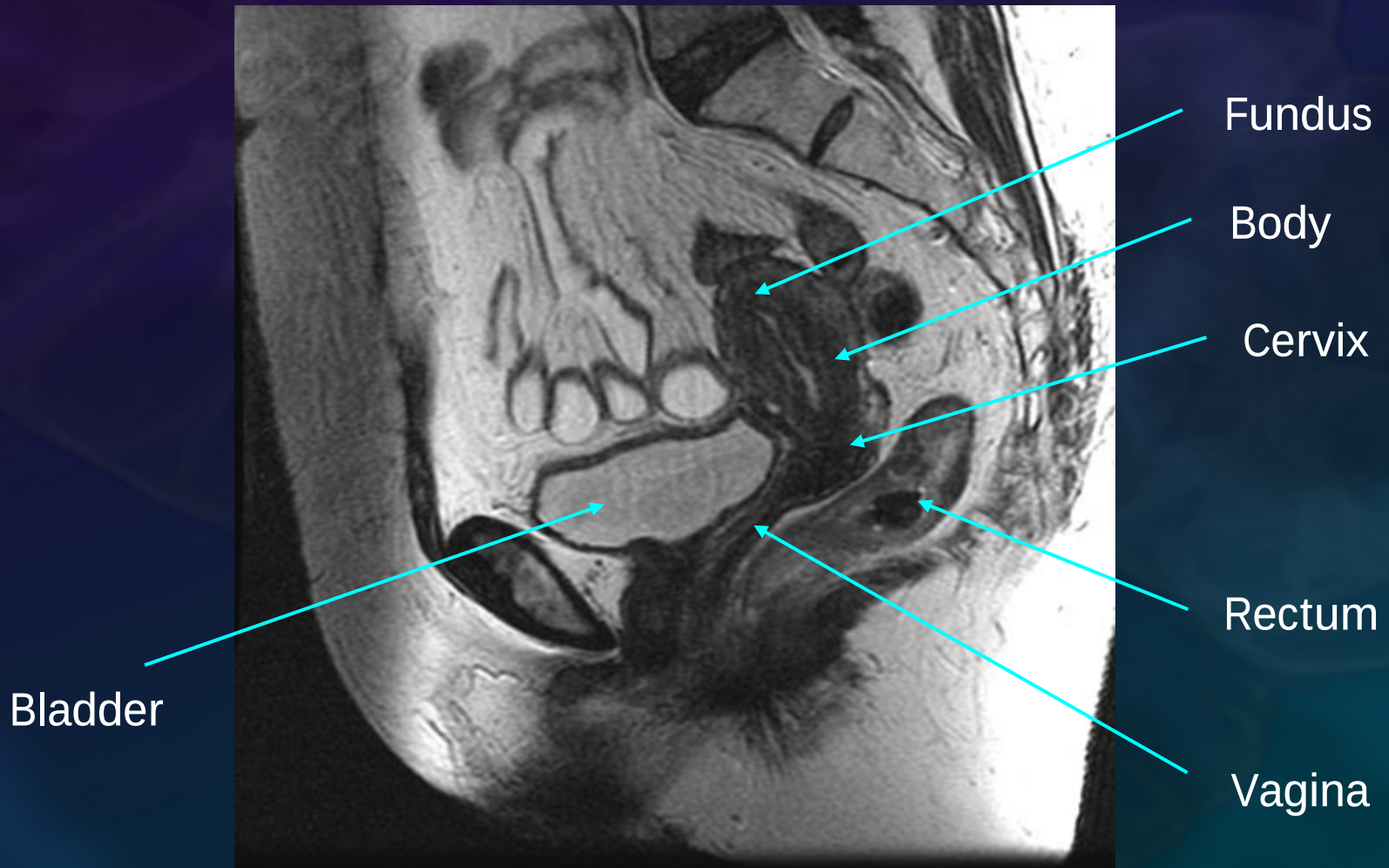
internal iliac
and pelvic
side wall



Pelvic lymphadenopathy

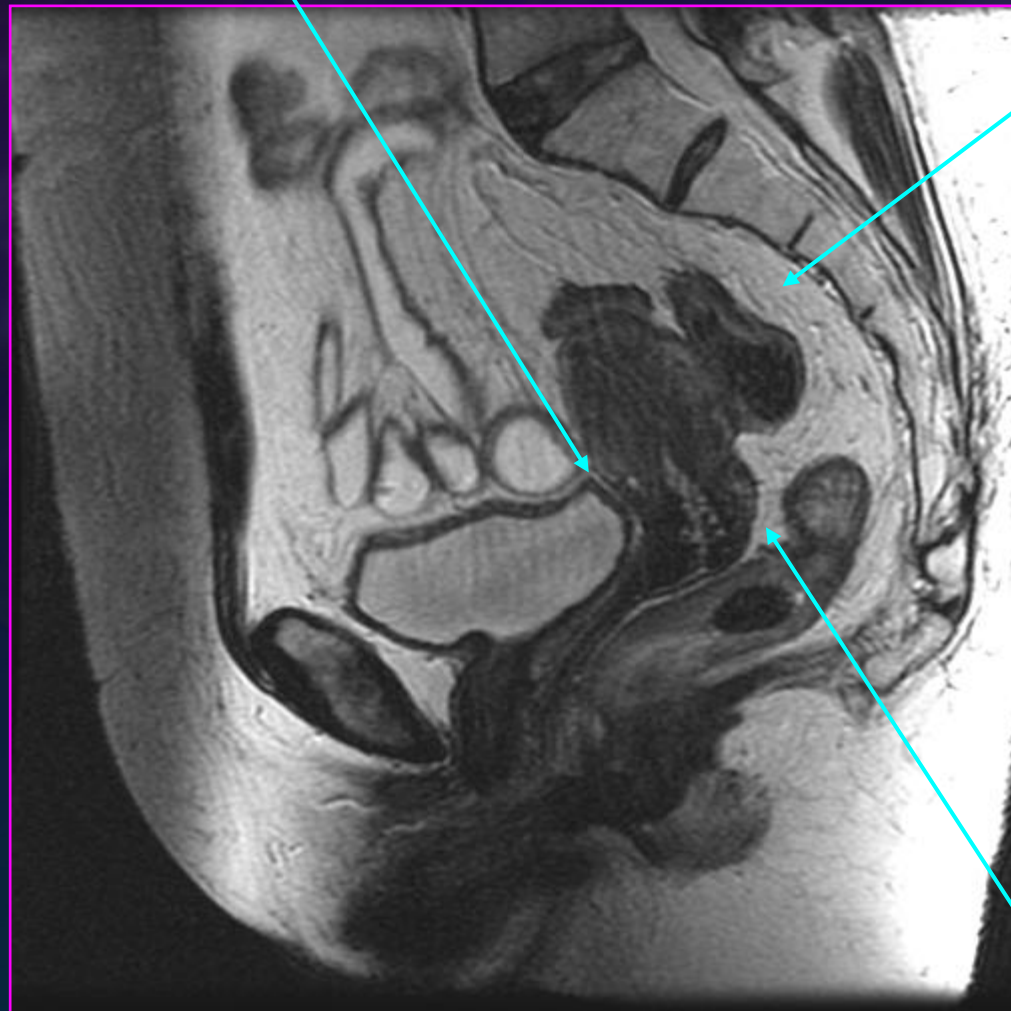


MRI Correlation: Sagittal Female



T2-Weighted Sequences (Water and fat are bright)

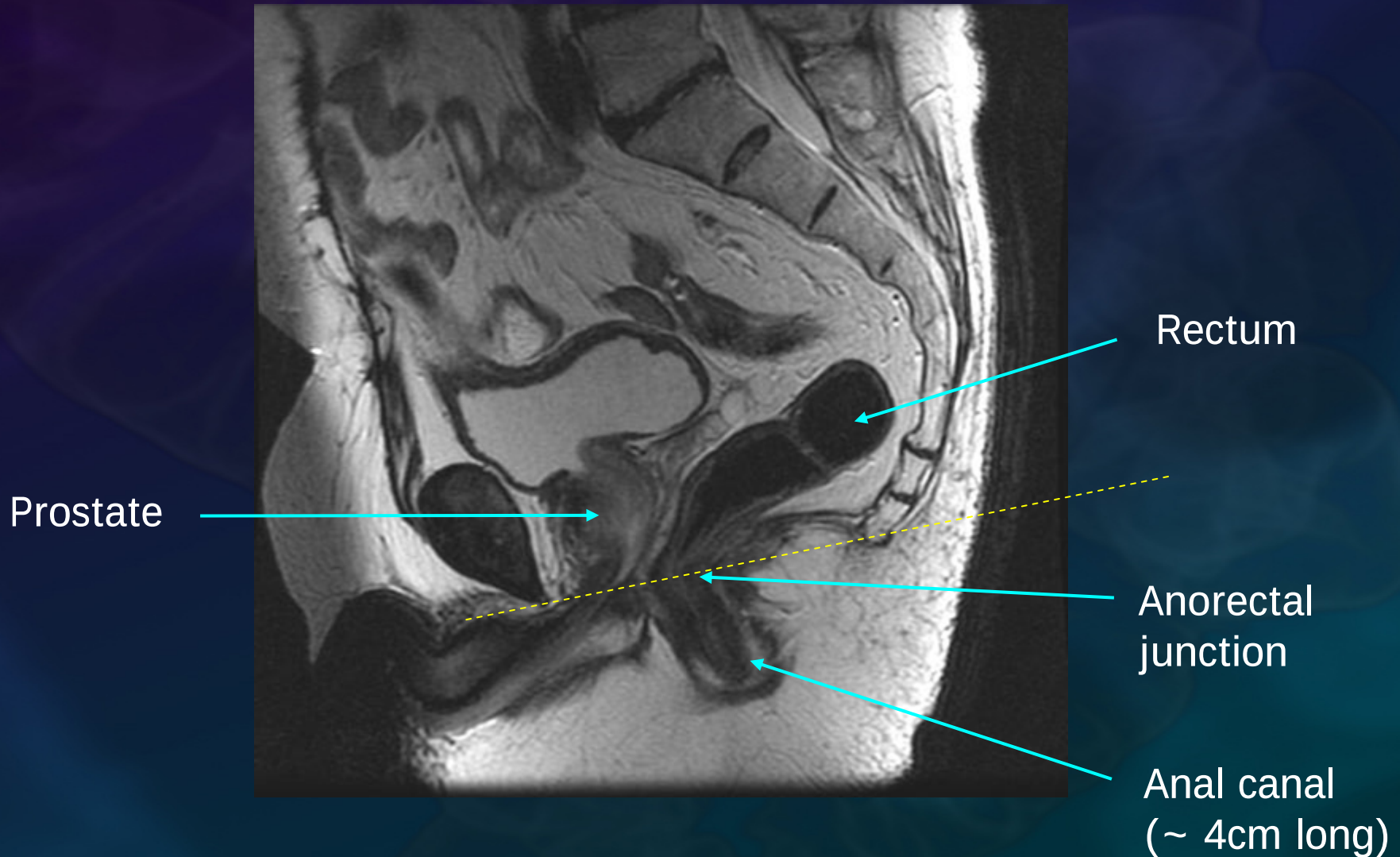
Vesicouterine Pouch

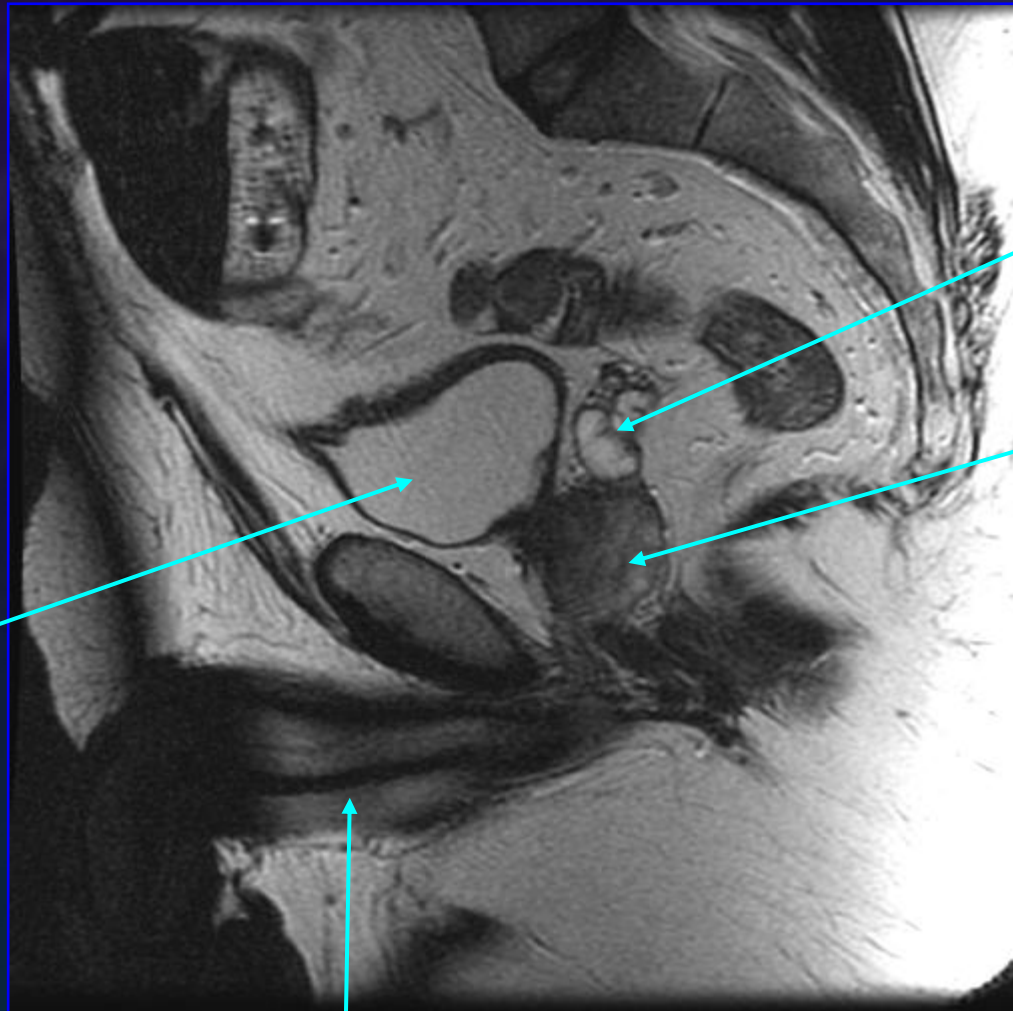


Presacral
Space

Rectouterine Pouch (Pouch of Douglas)

MRI Correlation: Sagittal Male





Bladder

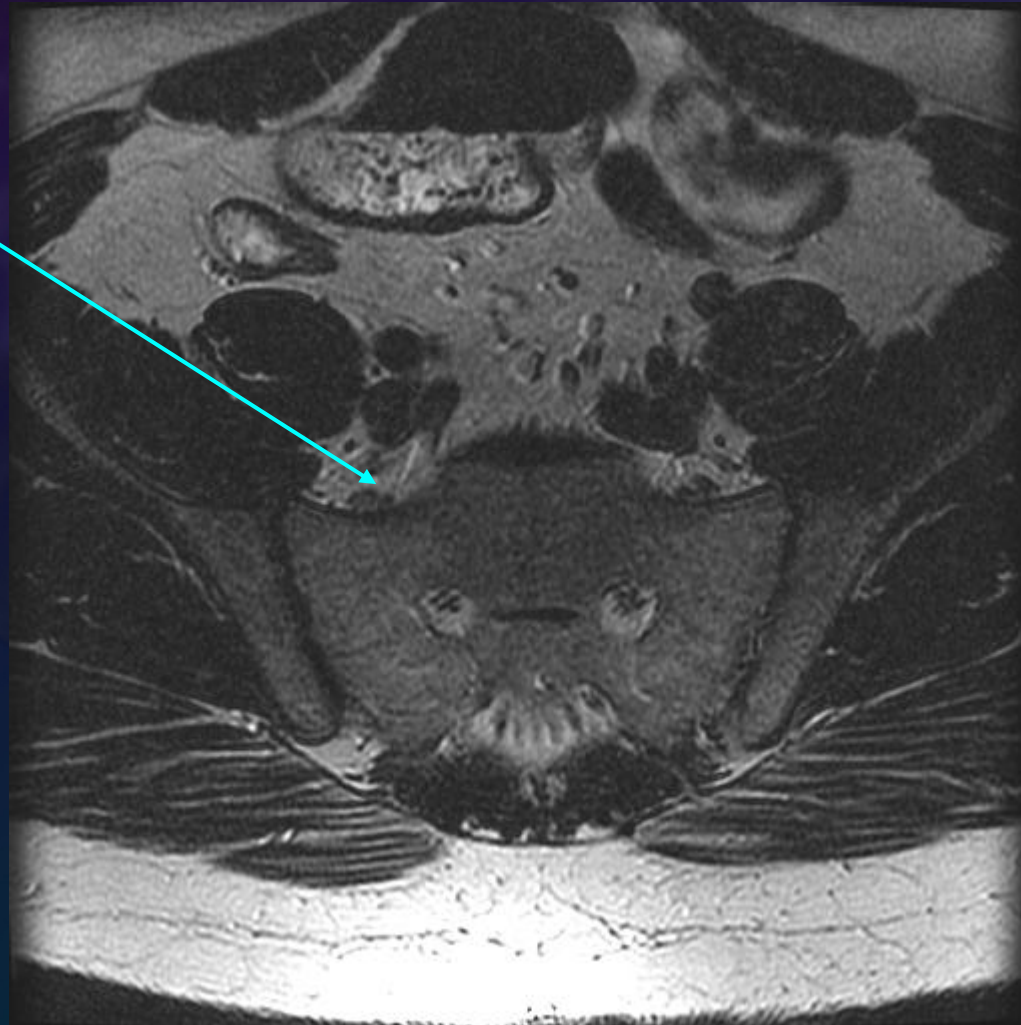
Seminal
Vesicle

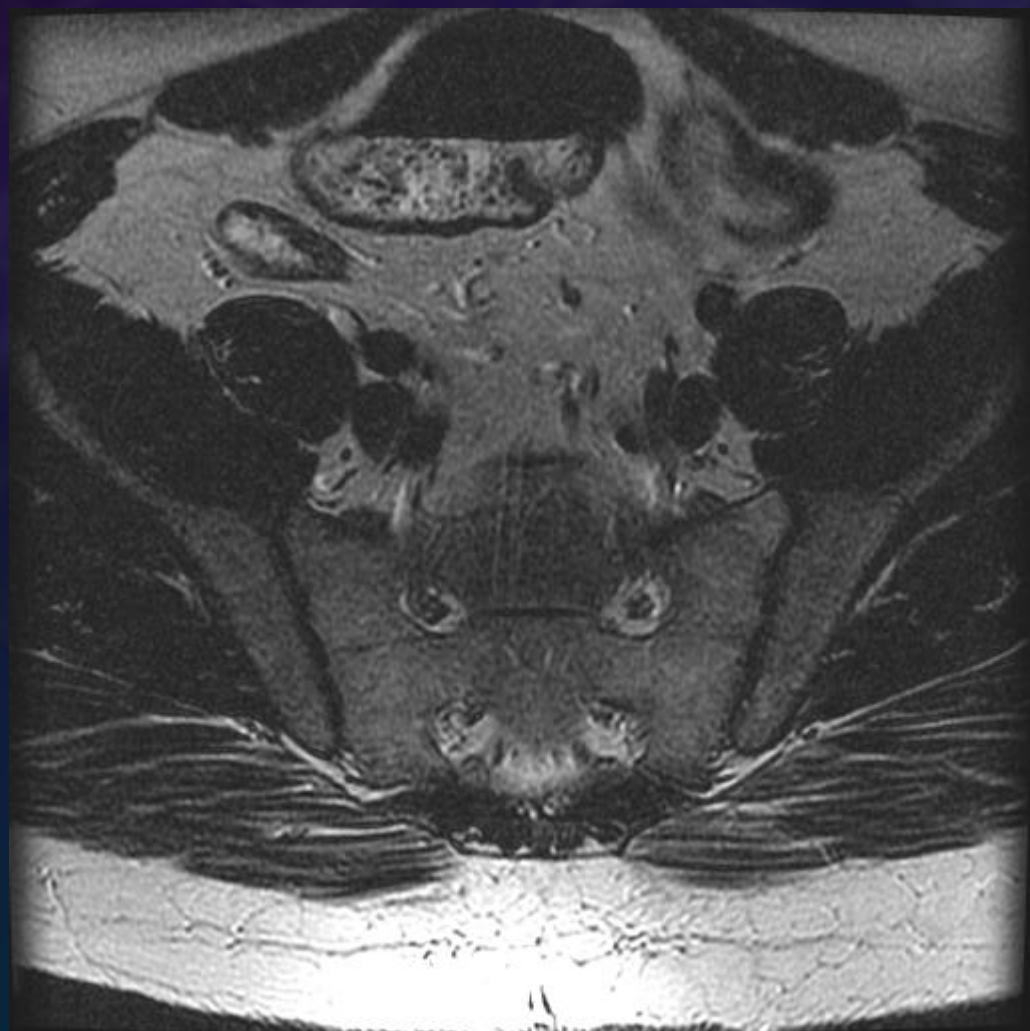
Prostate

Urethra

MRI Correlation: Axial Male

Lumbosacral
Trunk

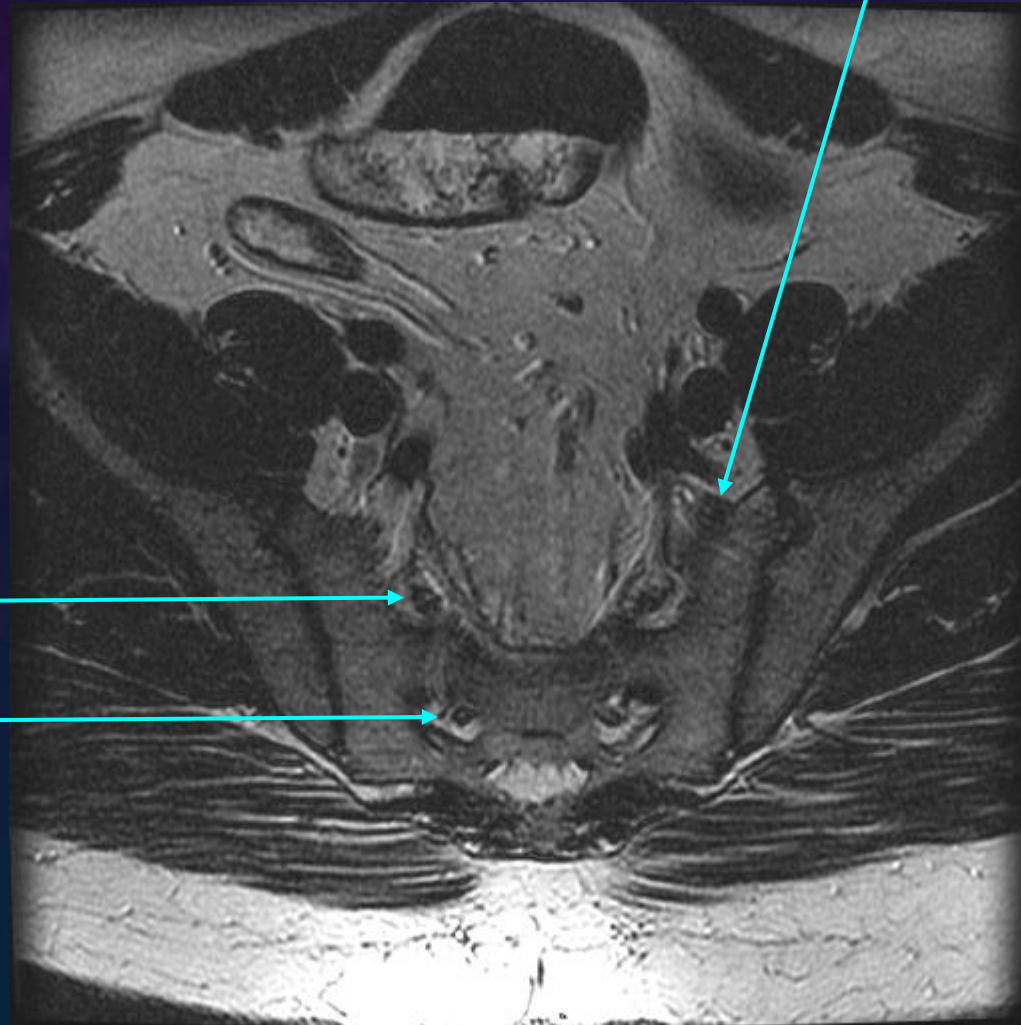


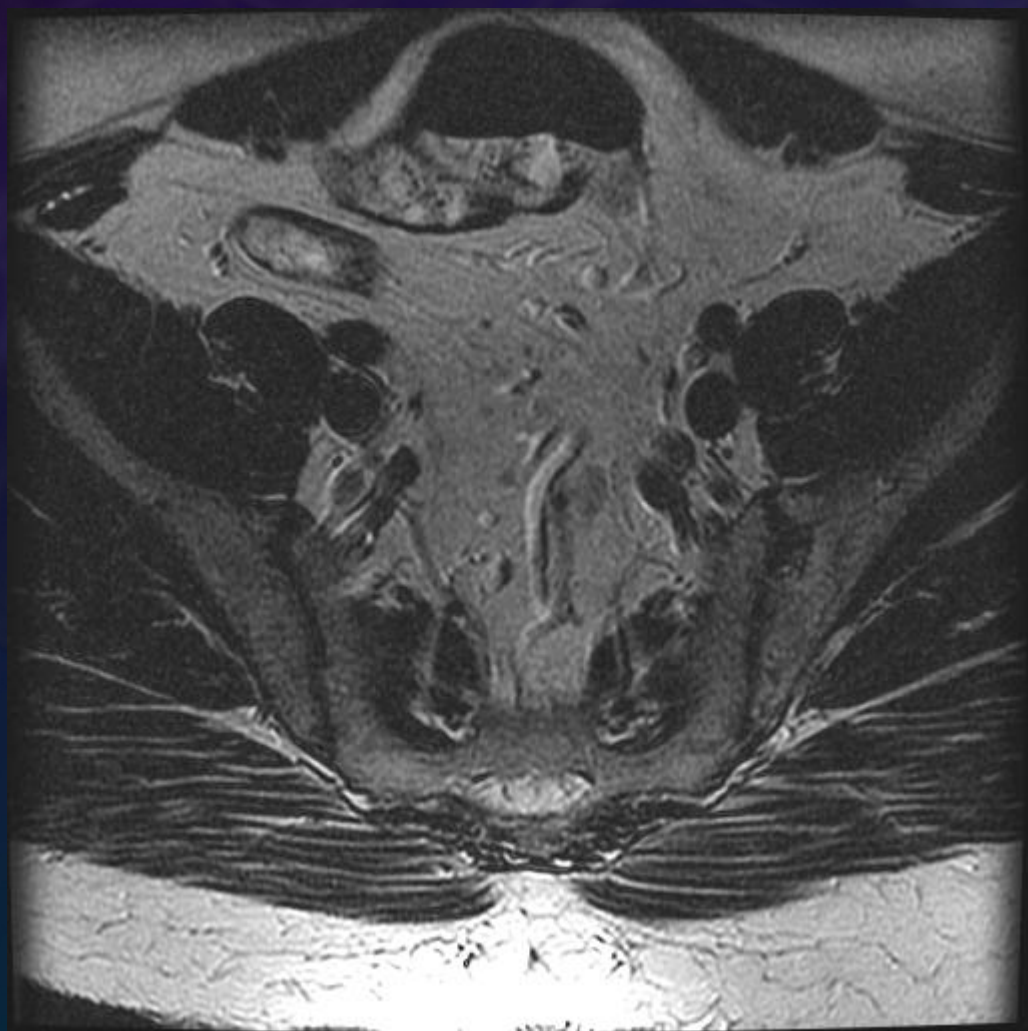


Lumbosacral Trunk

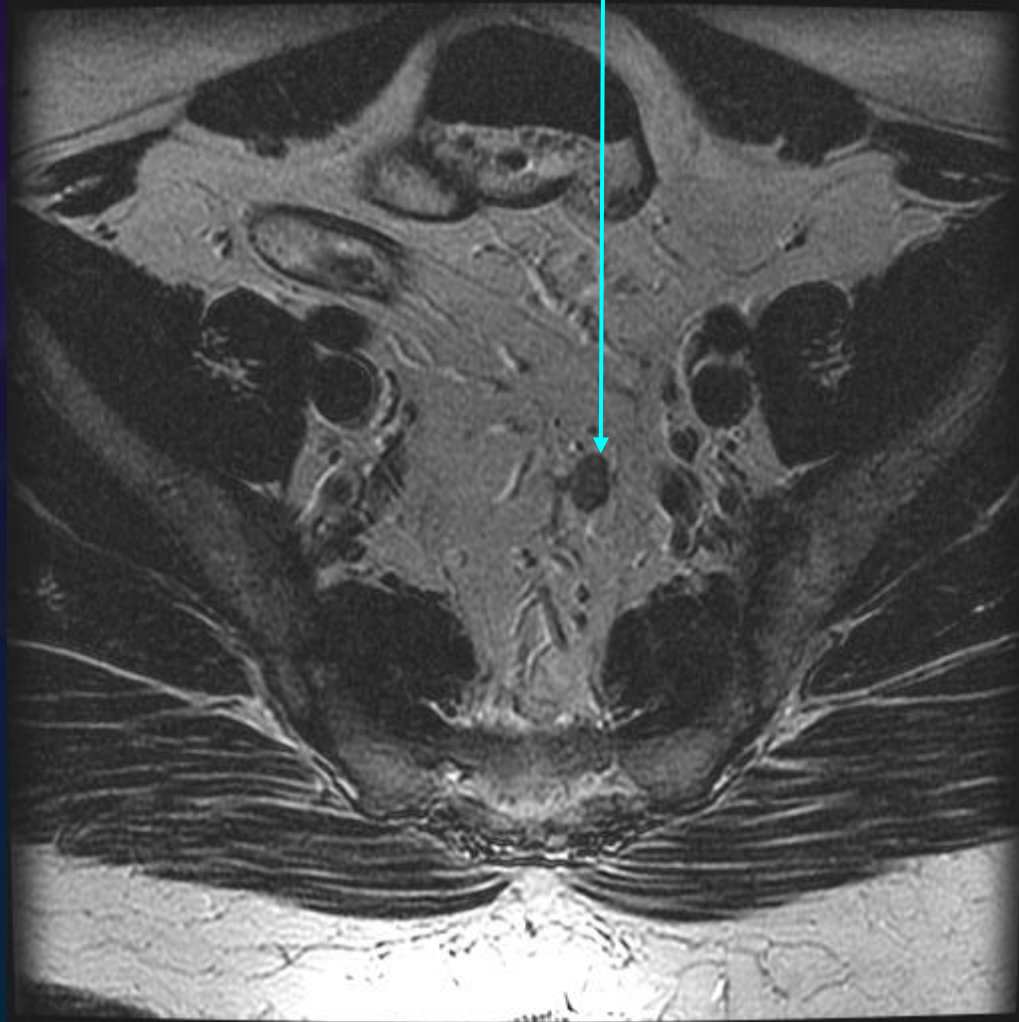
S1
Foramen

S2
Foramen

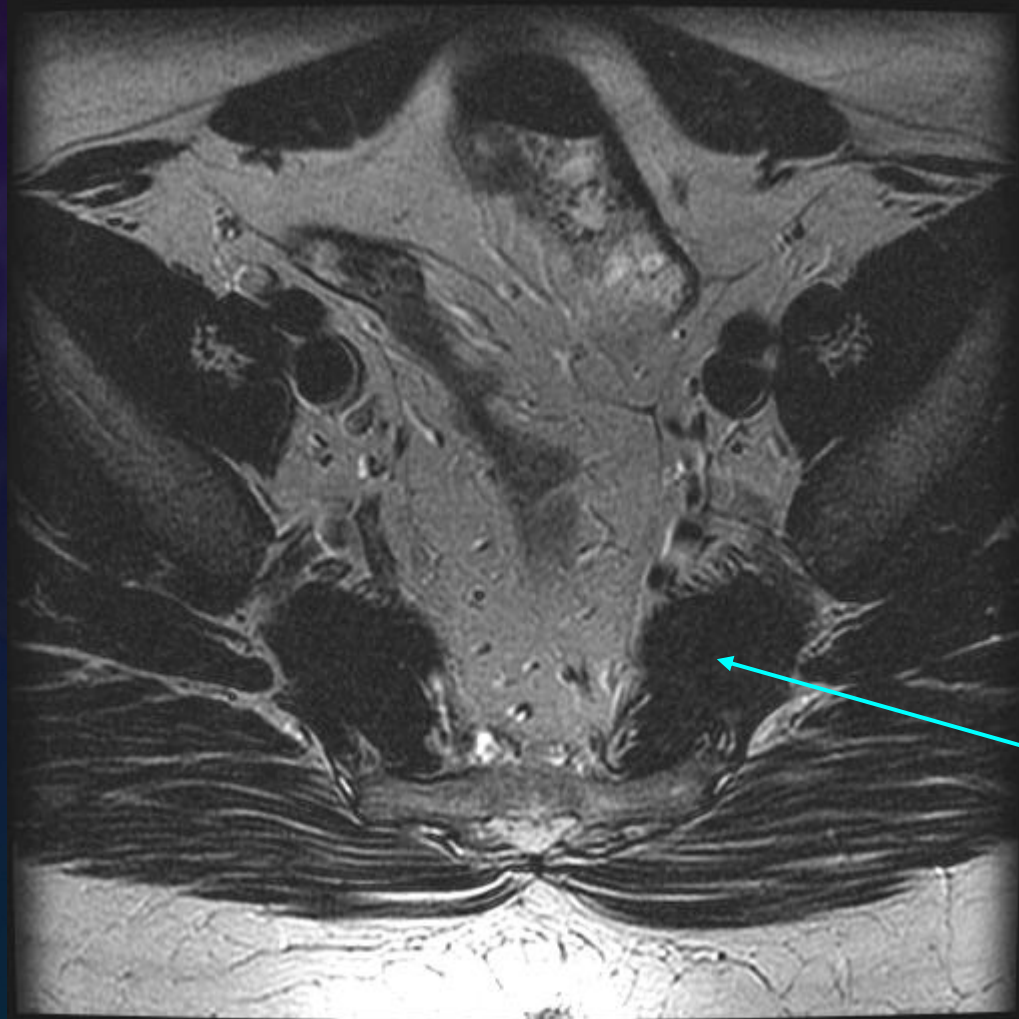




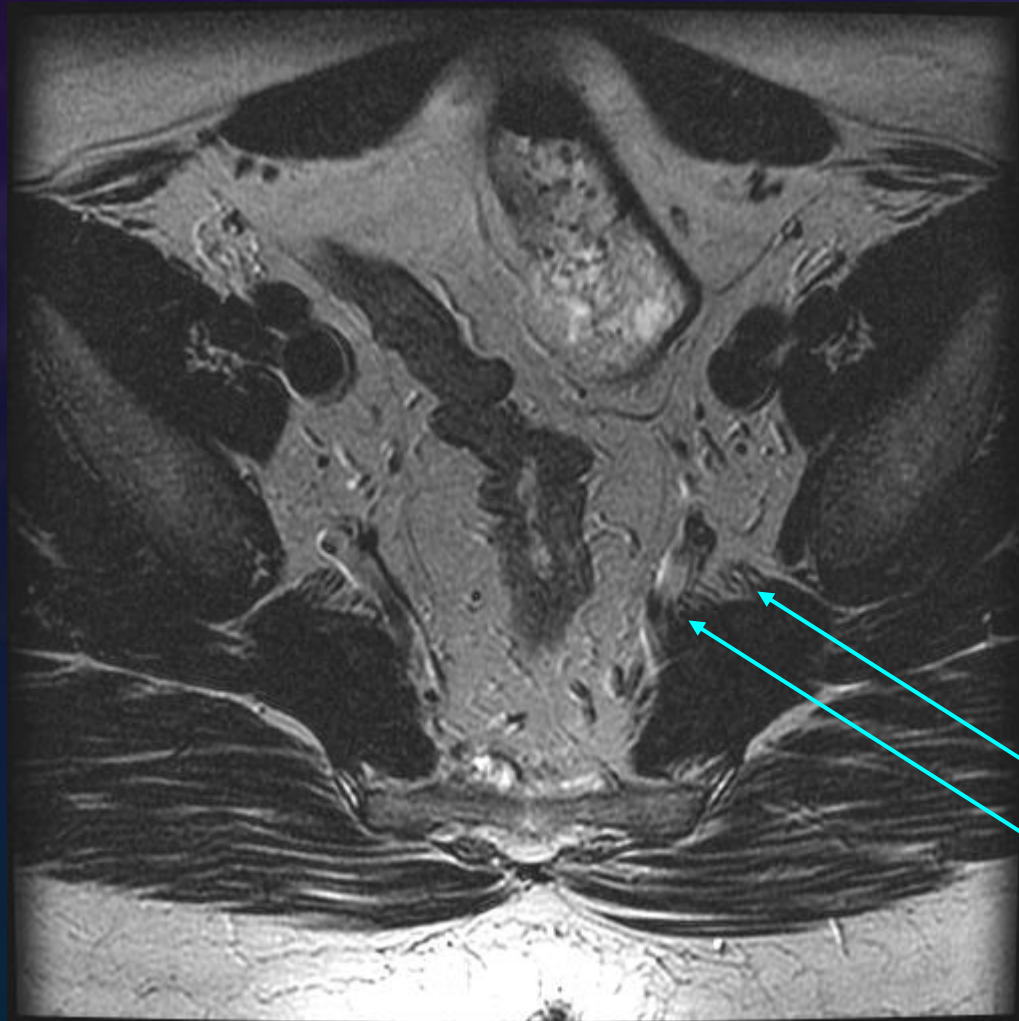
Presacral Lymph Node





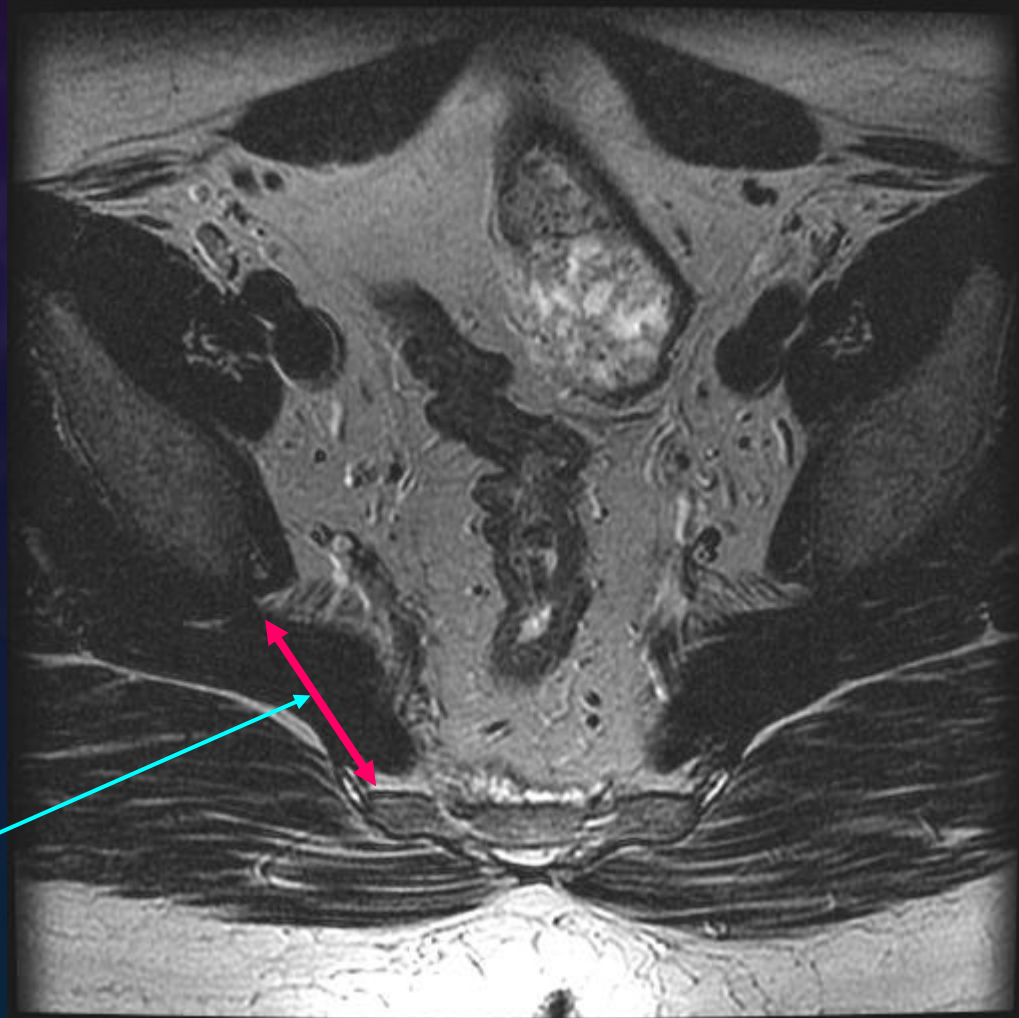


Piriformis
muscle



Sacral Plexus

Greater
Sciatic Notch



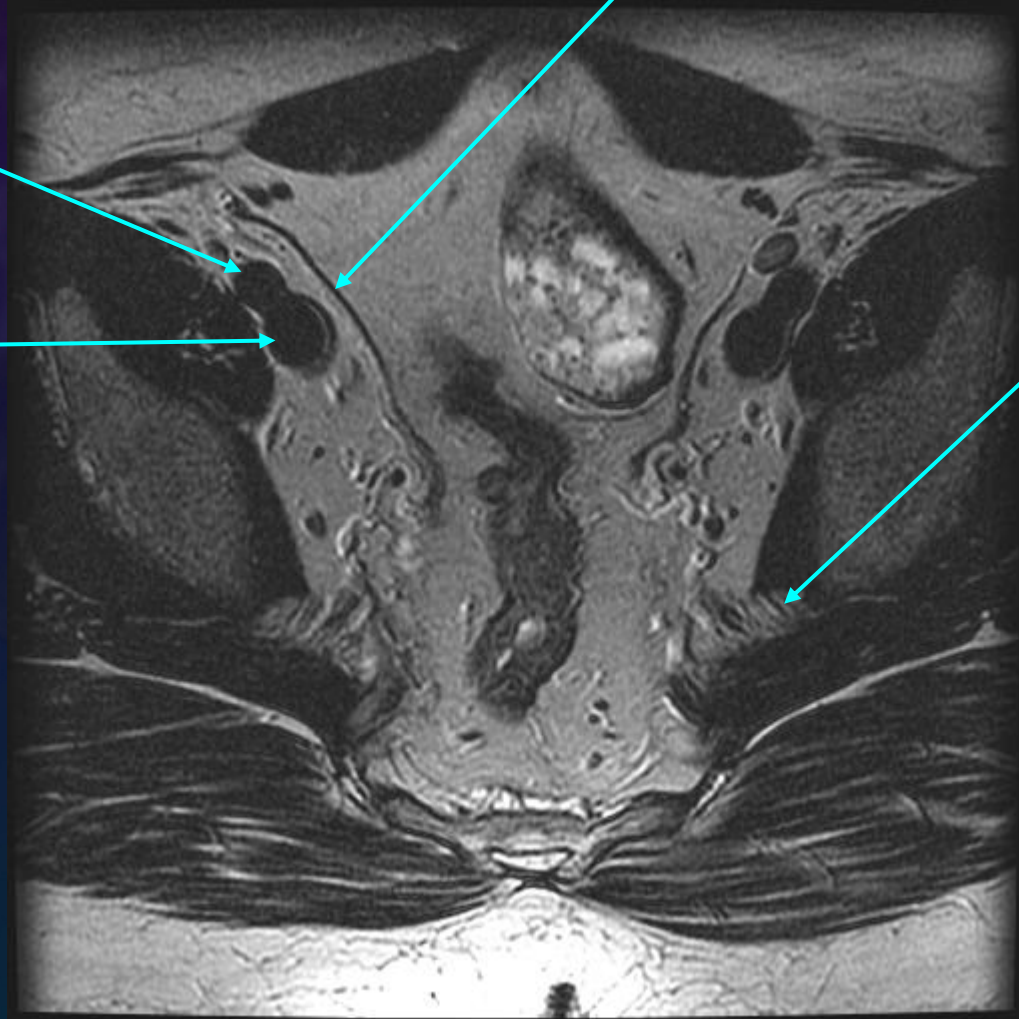
External Iliac Vessels

Vas Deferens

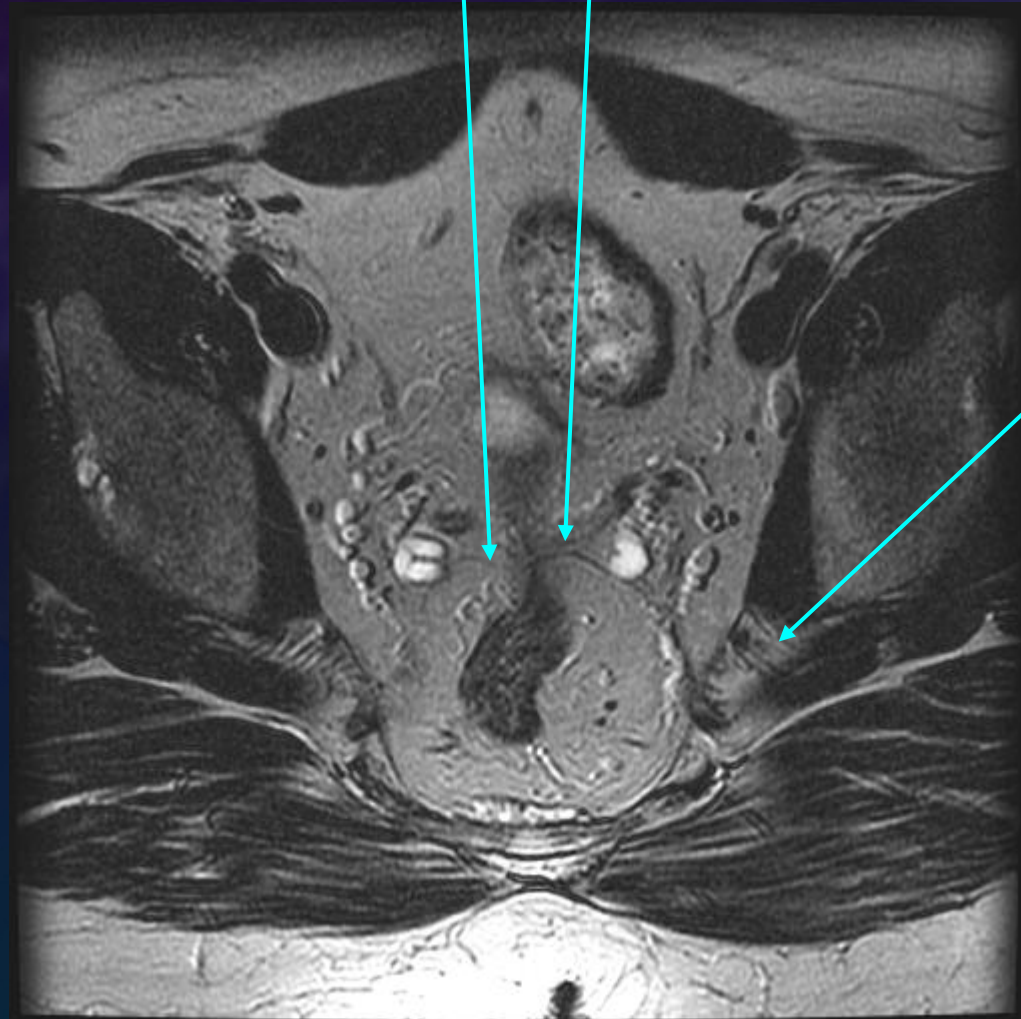
Artery

Vein

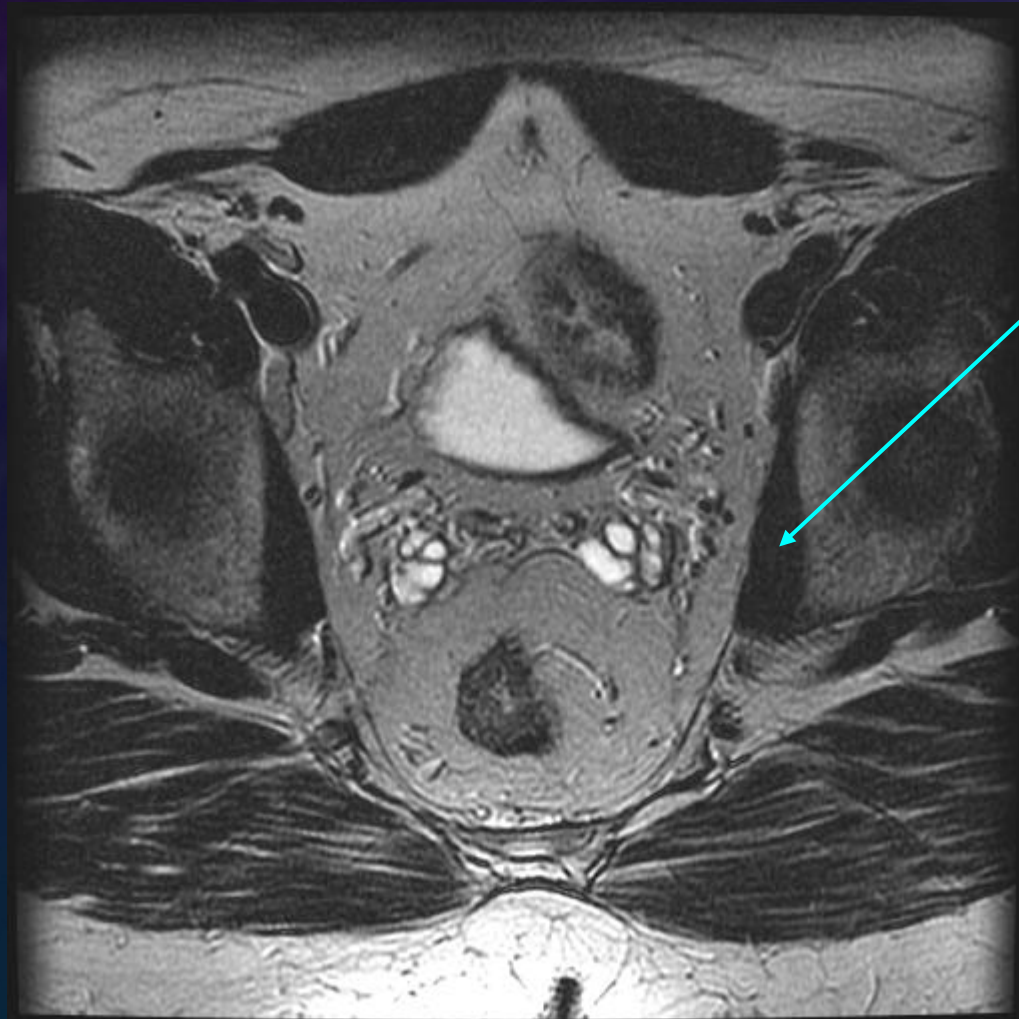
Sciatic Nerve



Peritoneal Reflection



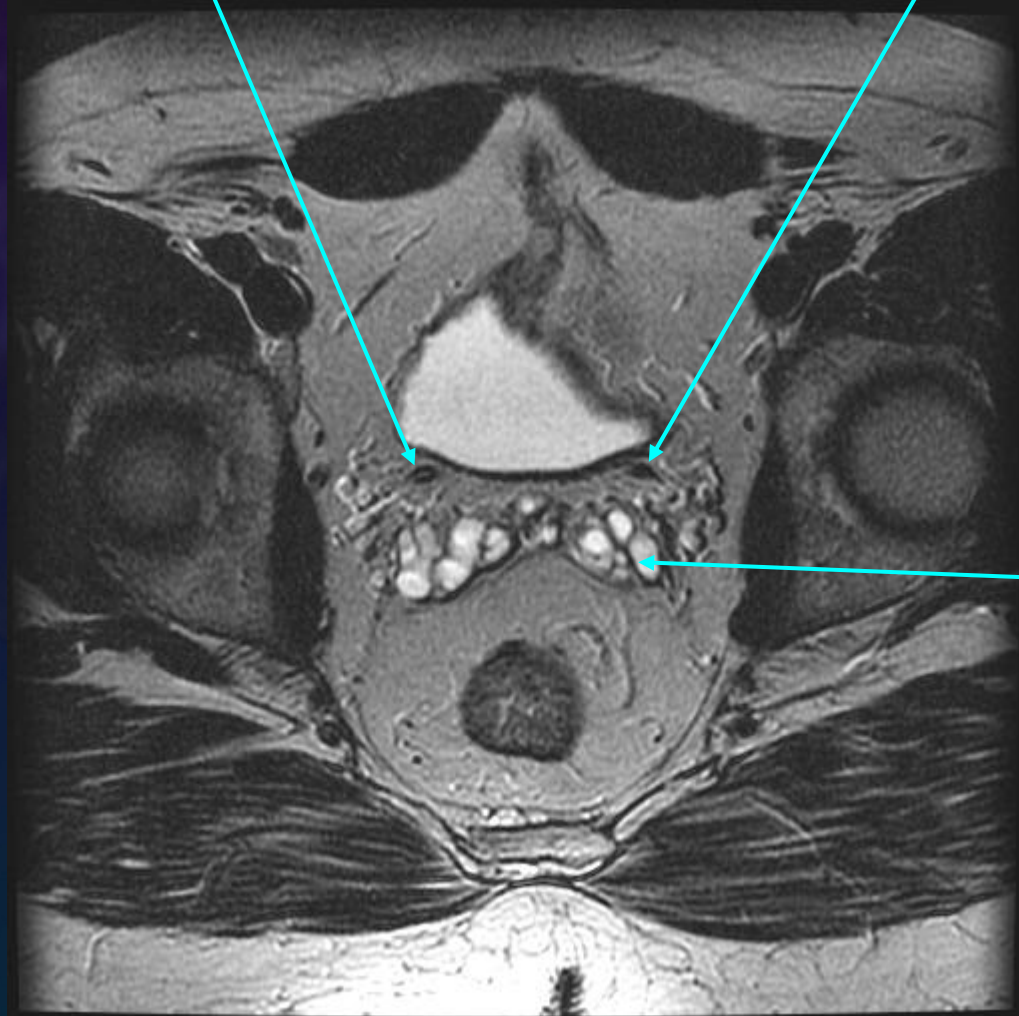
Sciatic Nerve



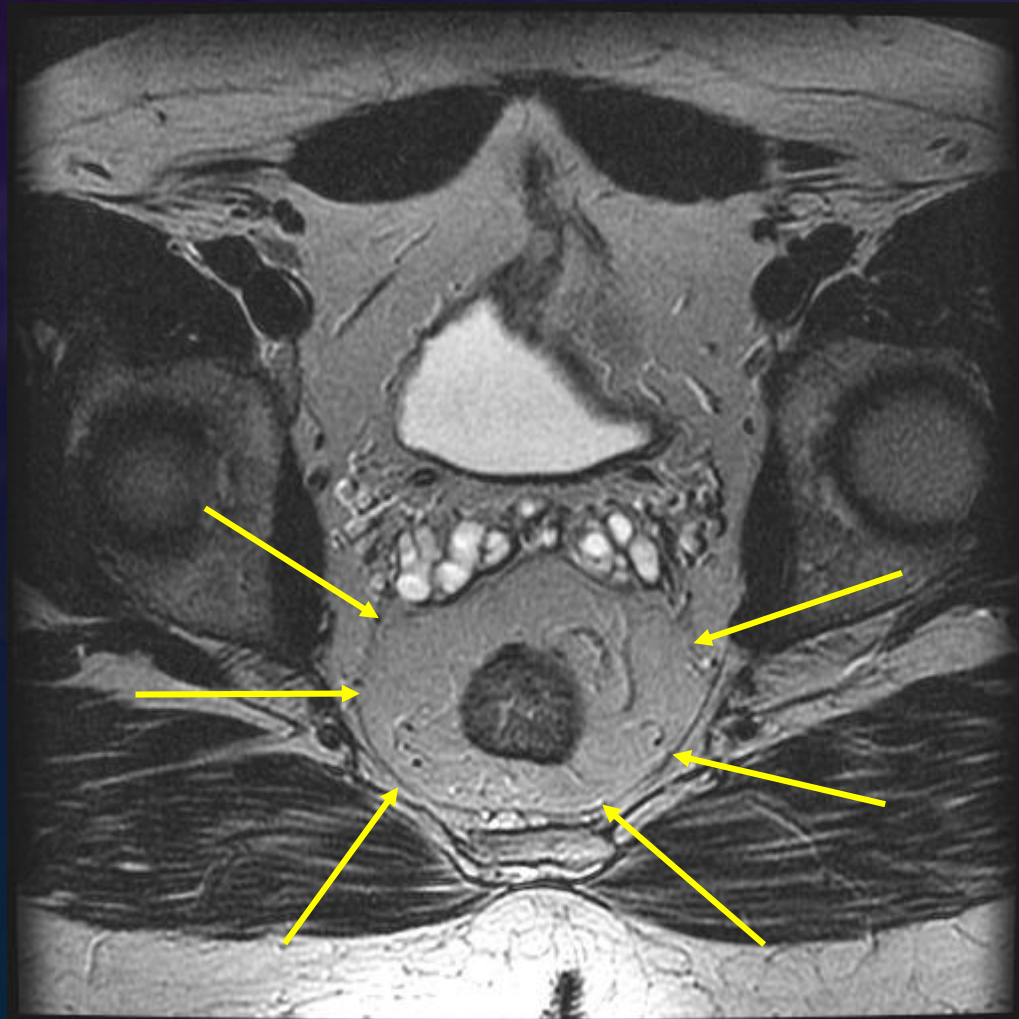
Obturator
Internus

Right Ureter

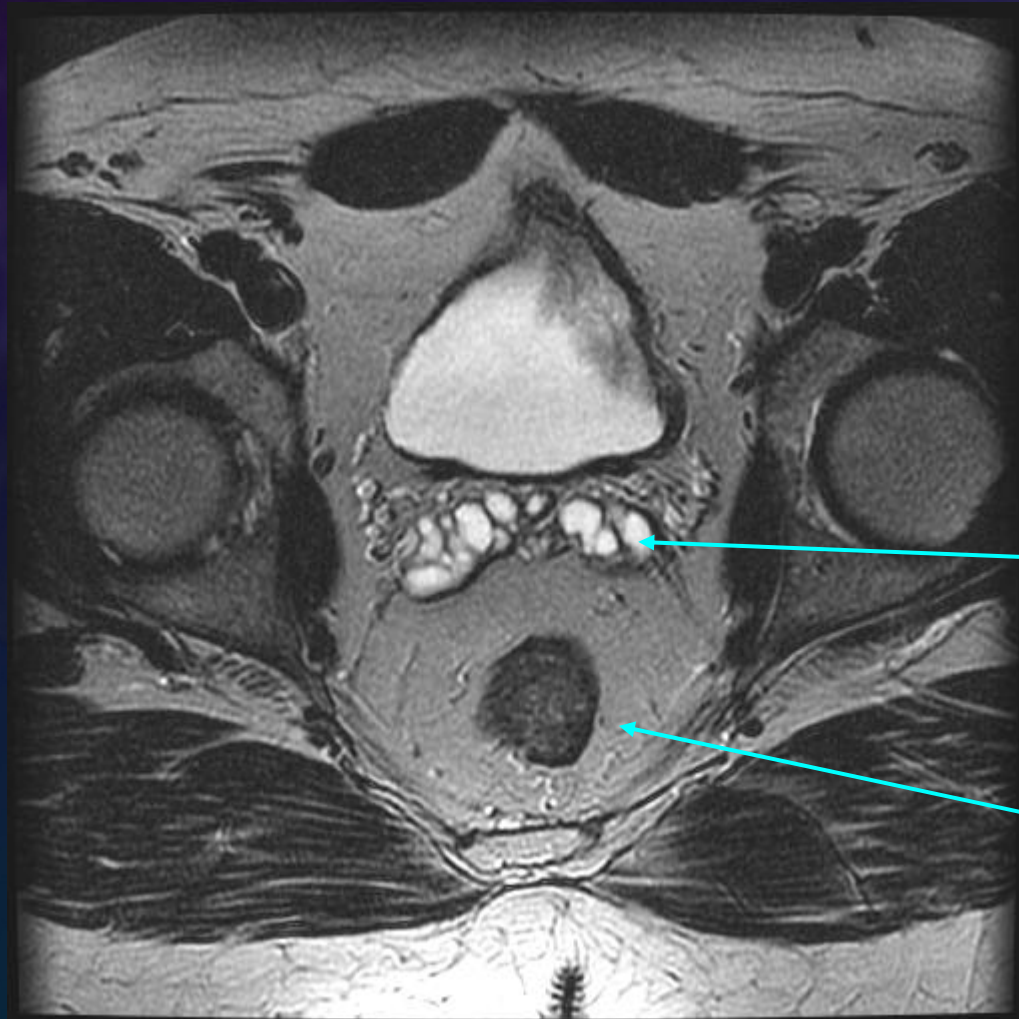
Left Ureter



Seminal
Vesicles

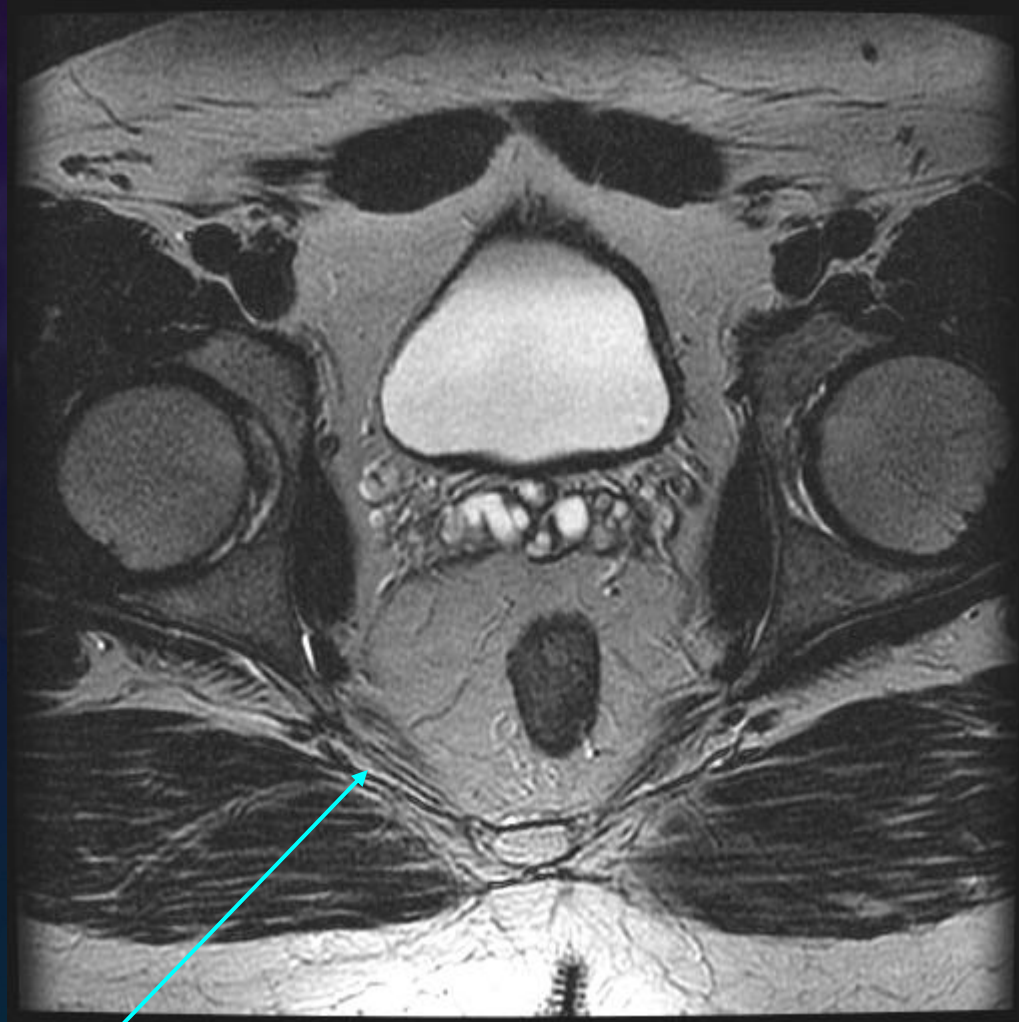


Mesorectal Fascia

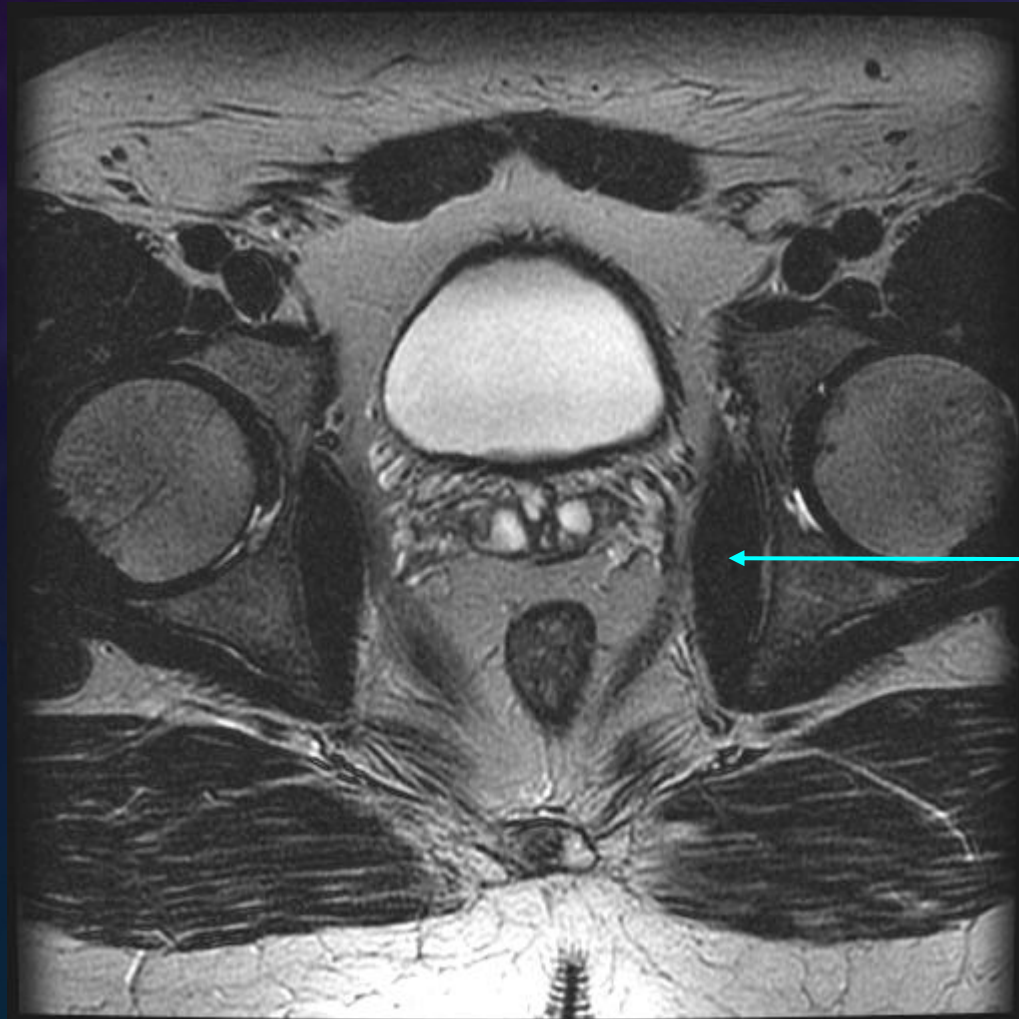


Seminal
Vesicles

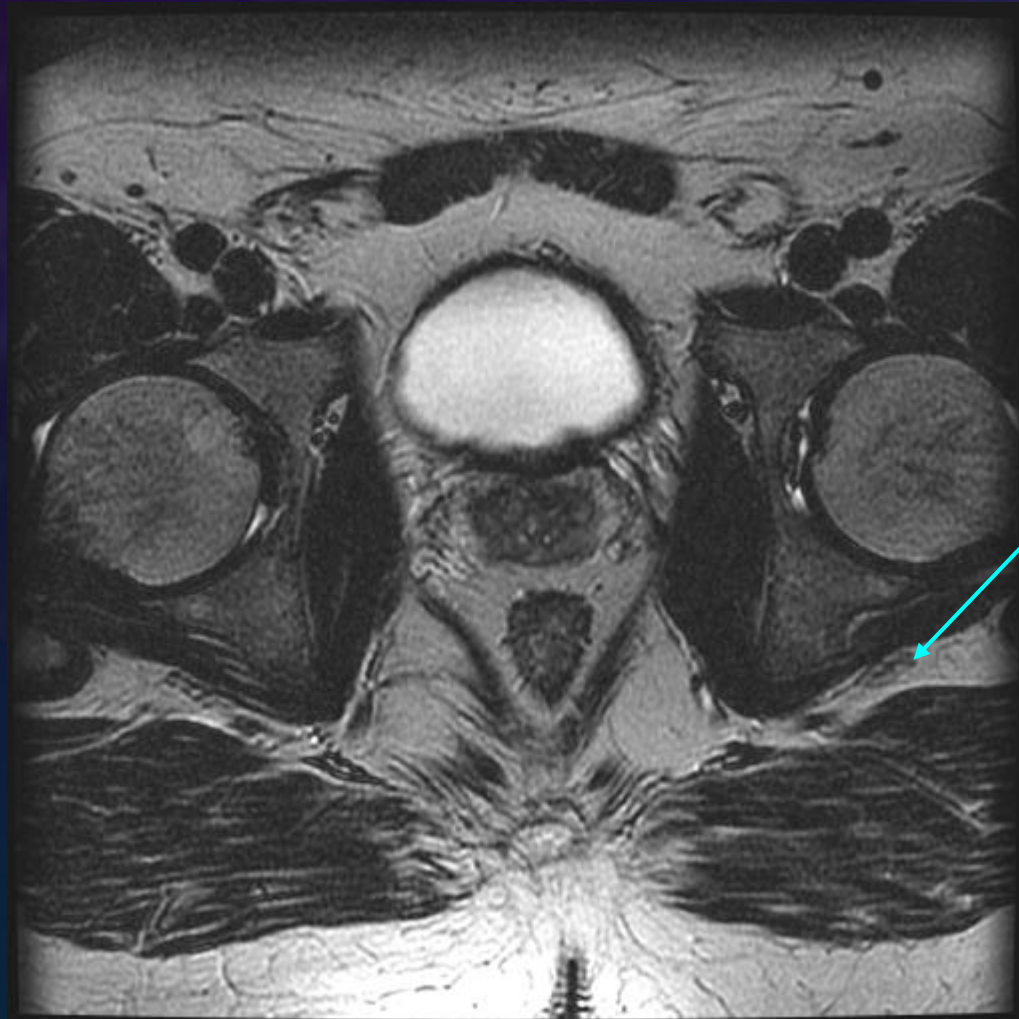
Mesorectal
Fat



Sacrospinous and Sacrotuberous Ligaments



Obturator
Internus

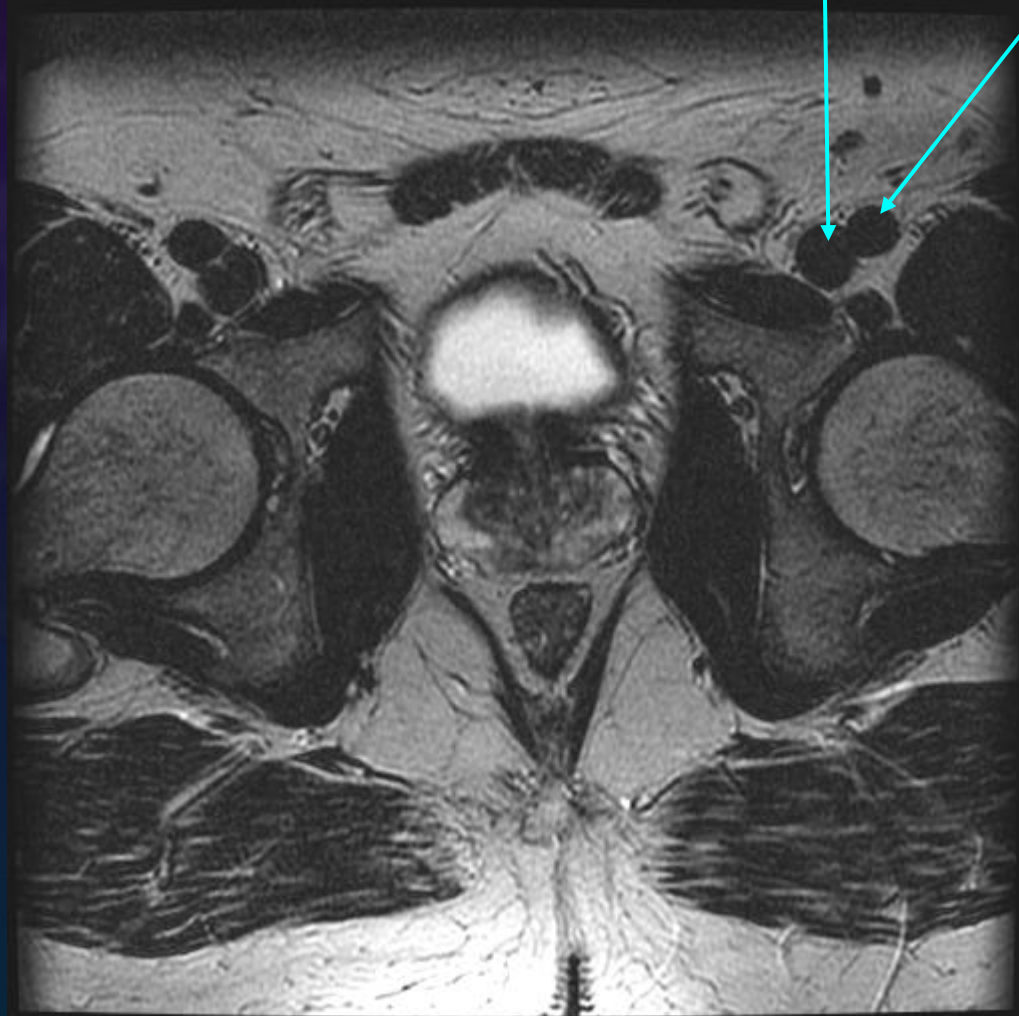


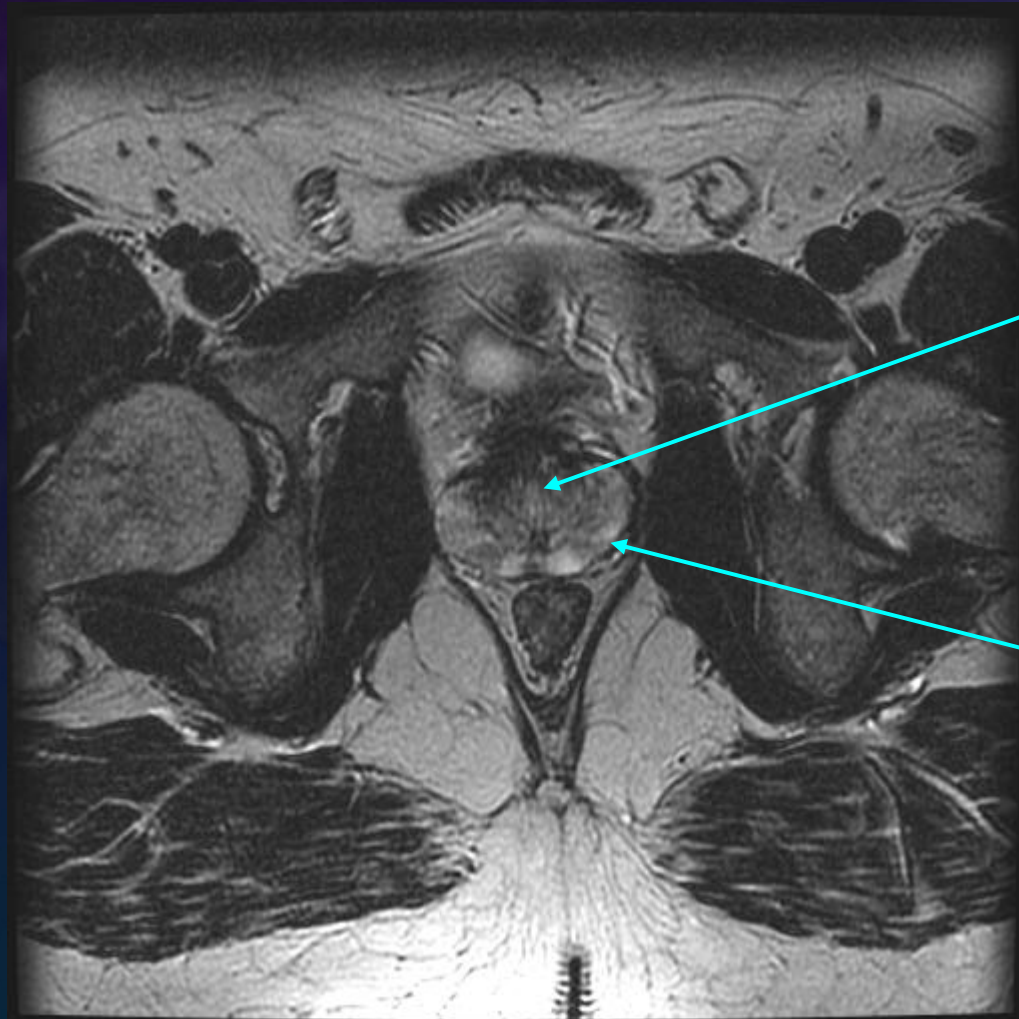
Sciatic Nerve

Common Femoral Vessels

Vein

Artery

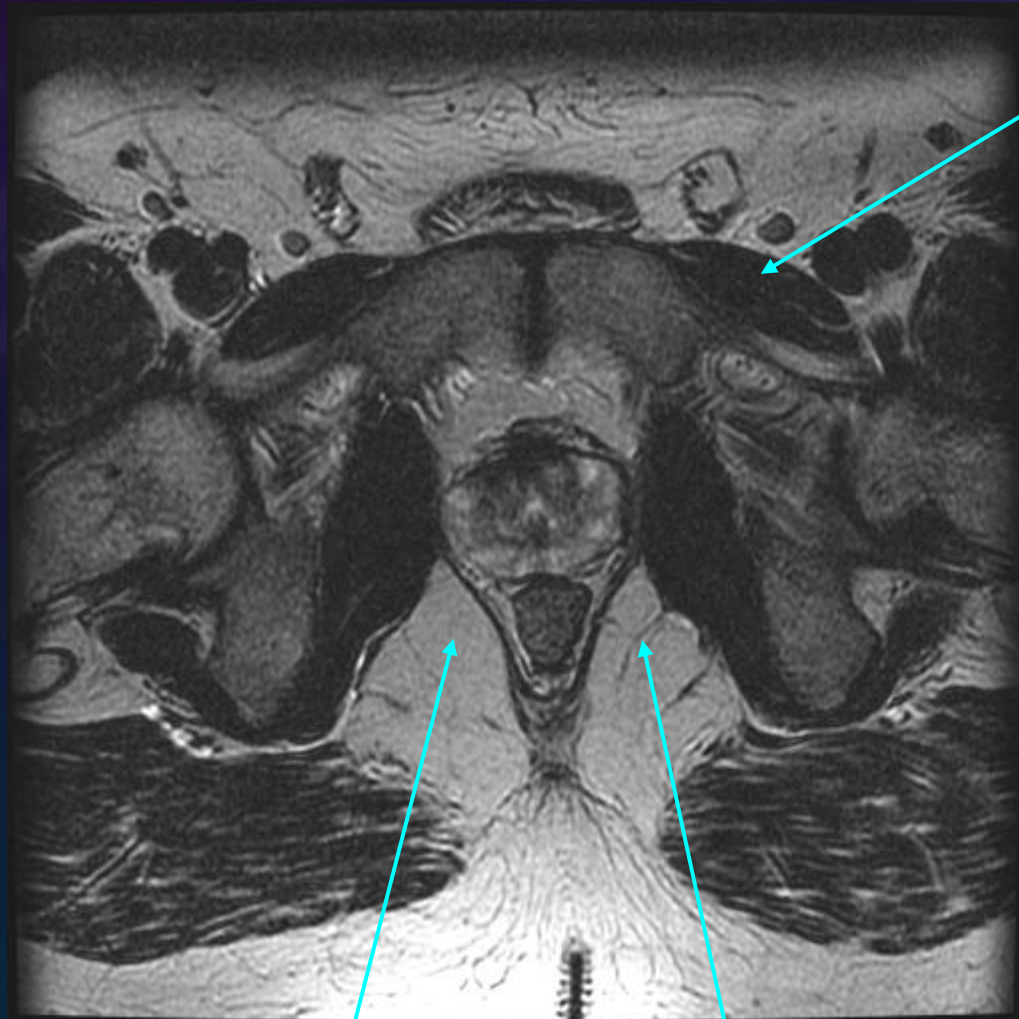




Prostate

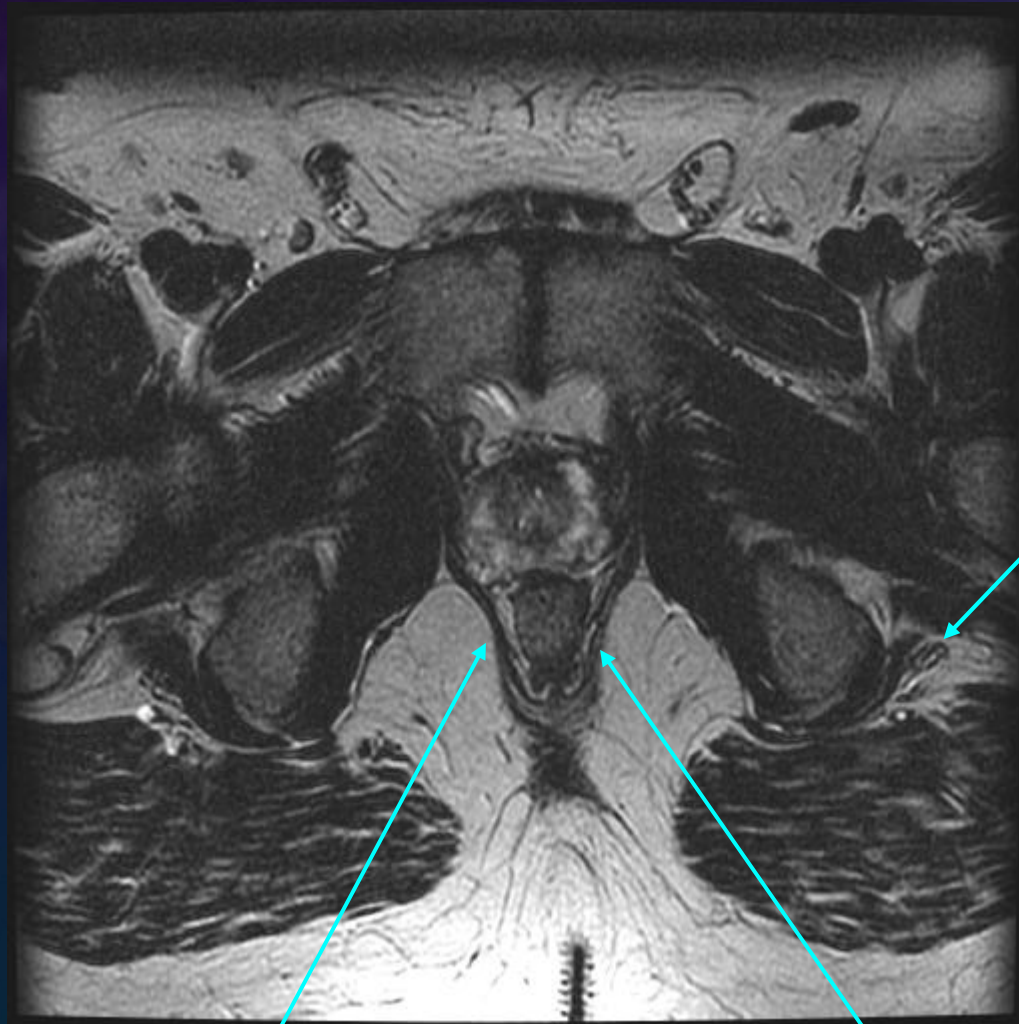
Central zone

Peripheral
zone



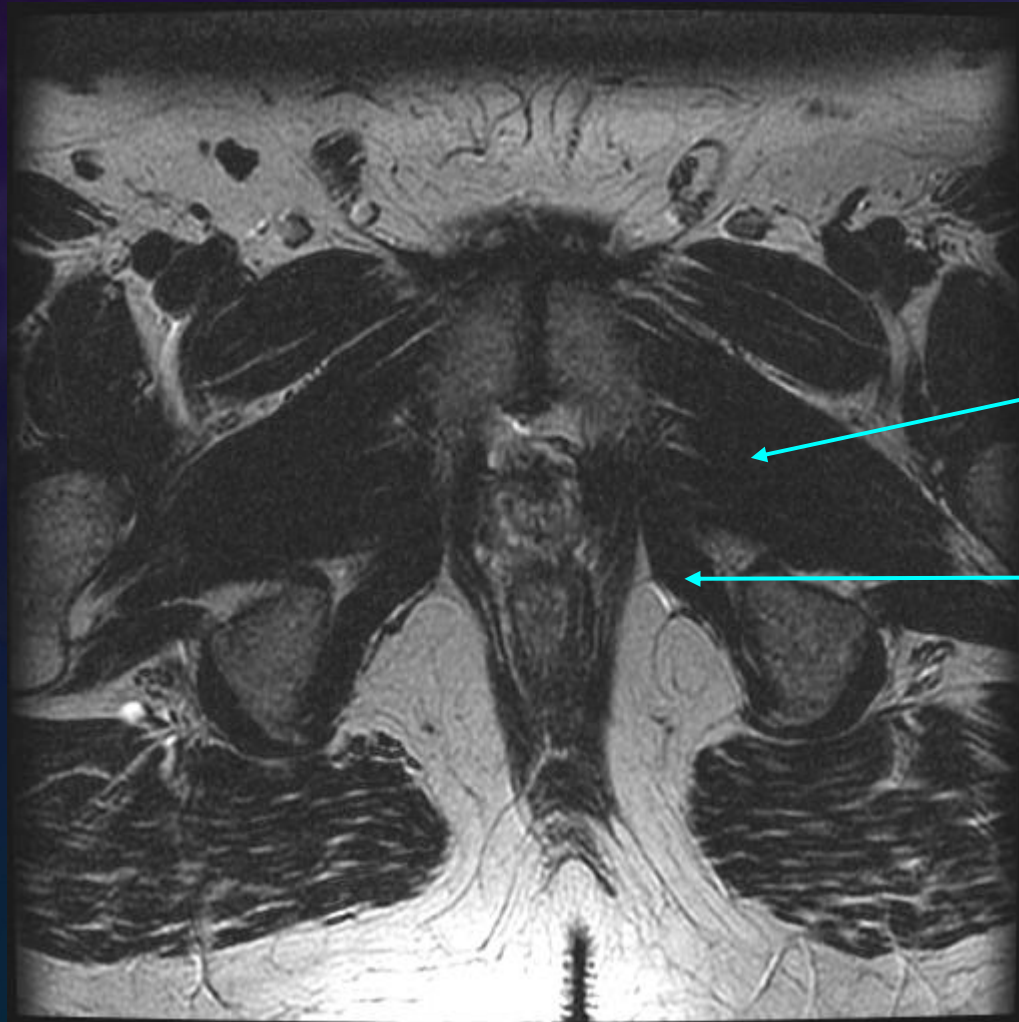
Pectineus

Ischiorectal fossa (contains fat)



Sciatic Nerve

Levator Ani



Obturator
Externus

Obturator
Internus



Sciatic Nerve





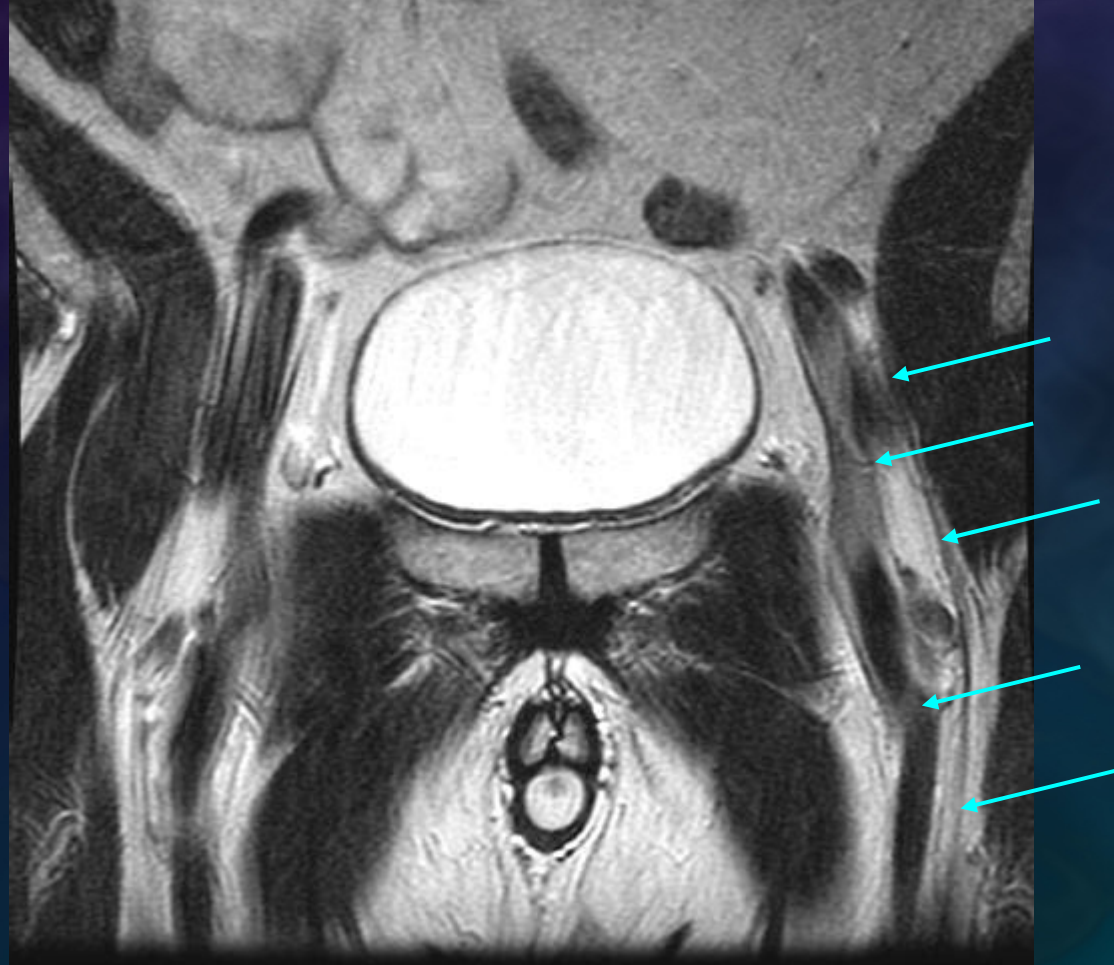








MRI Correlation: Coronal Male



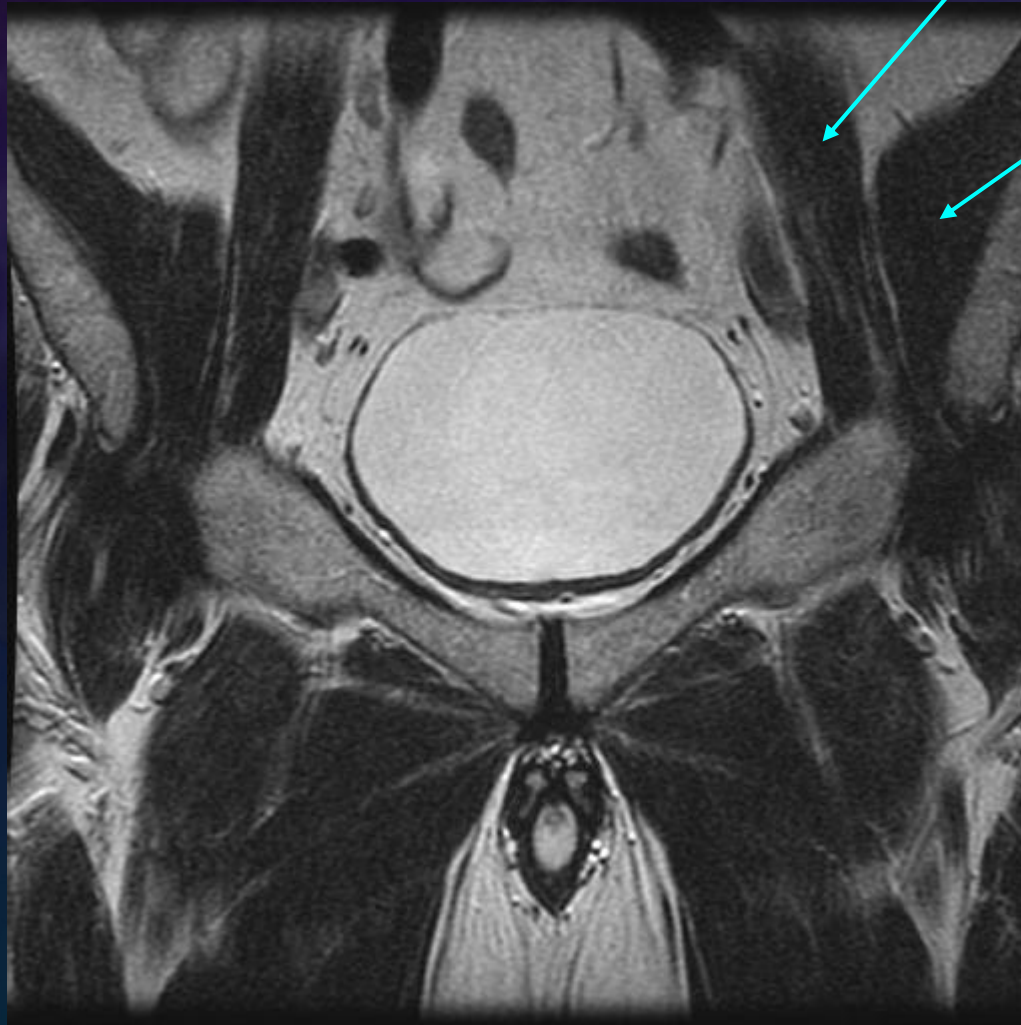
External iliac and
common femoral vessels





Psoas

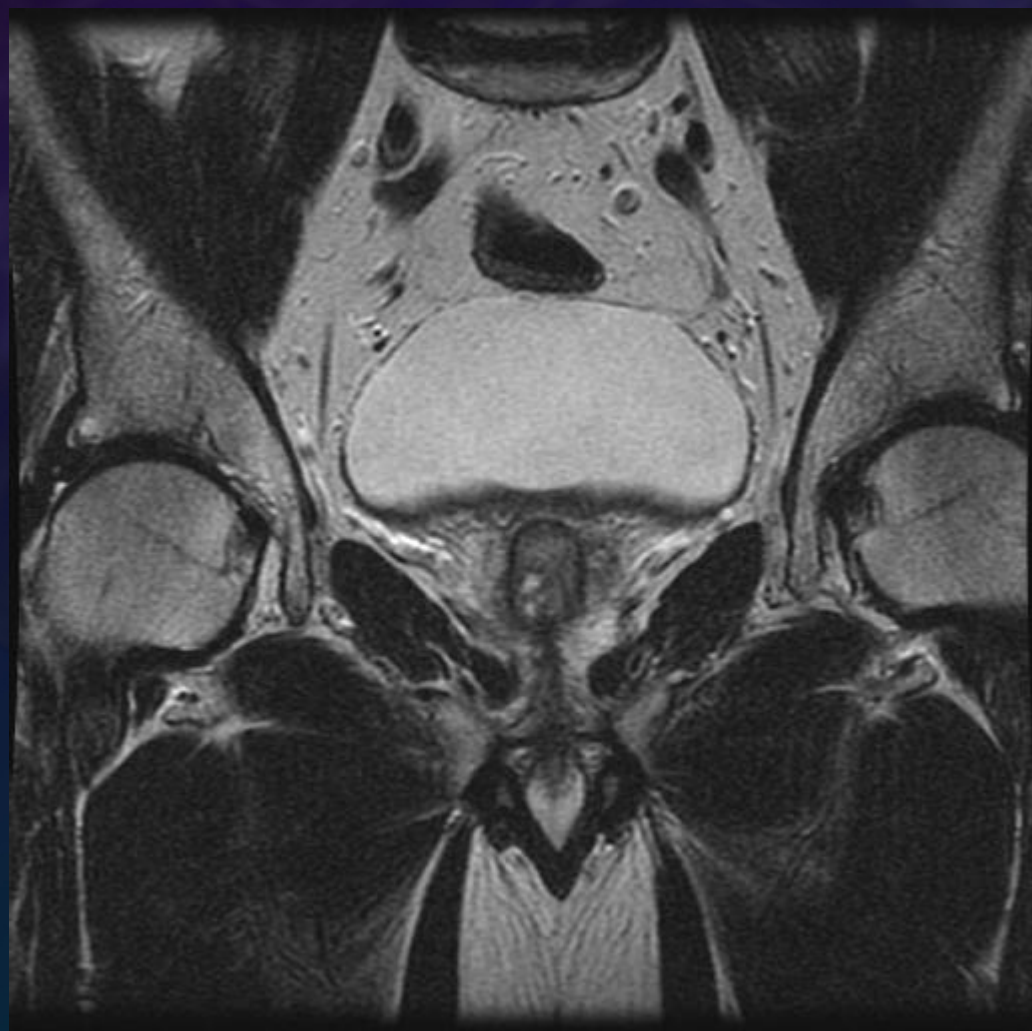
Iliacus



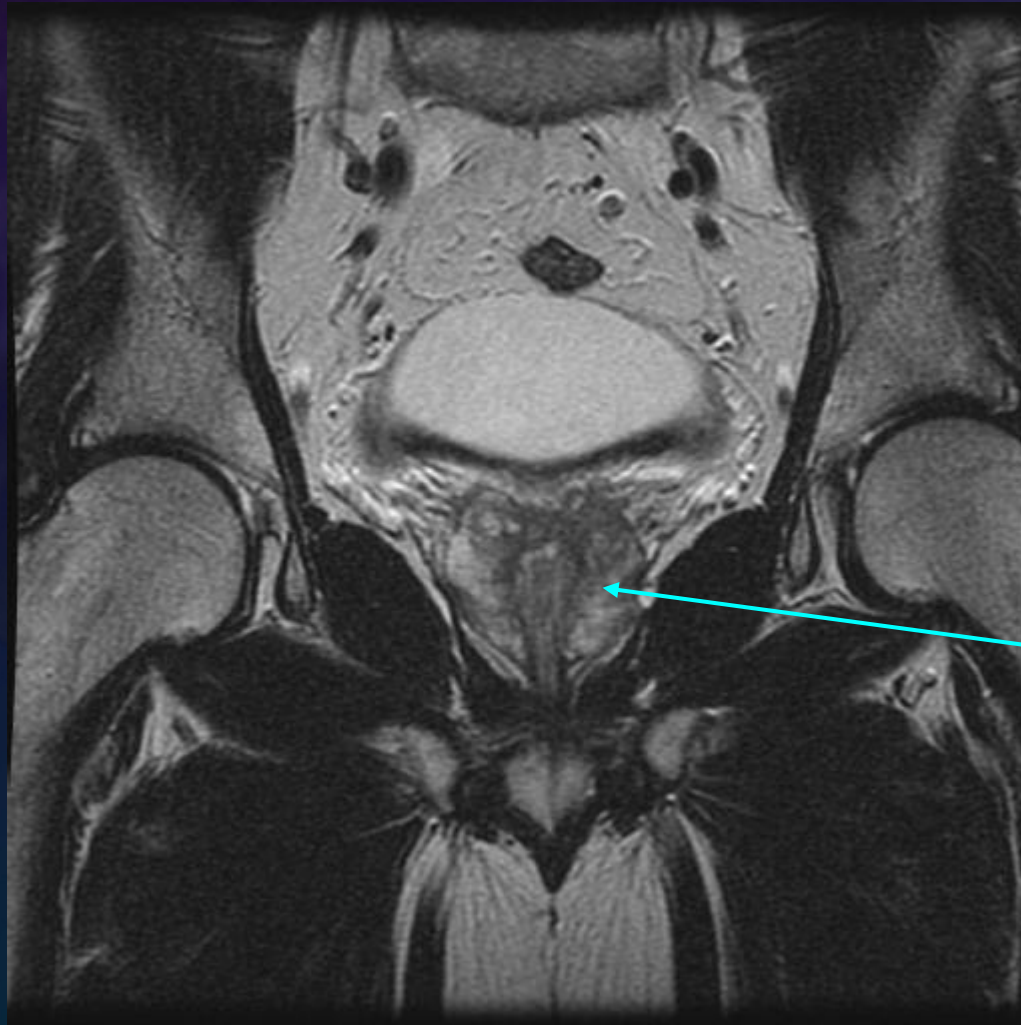




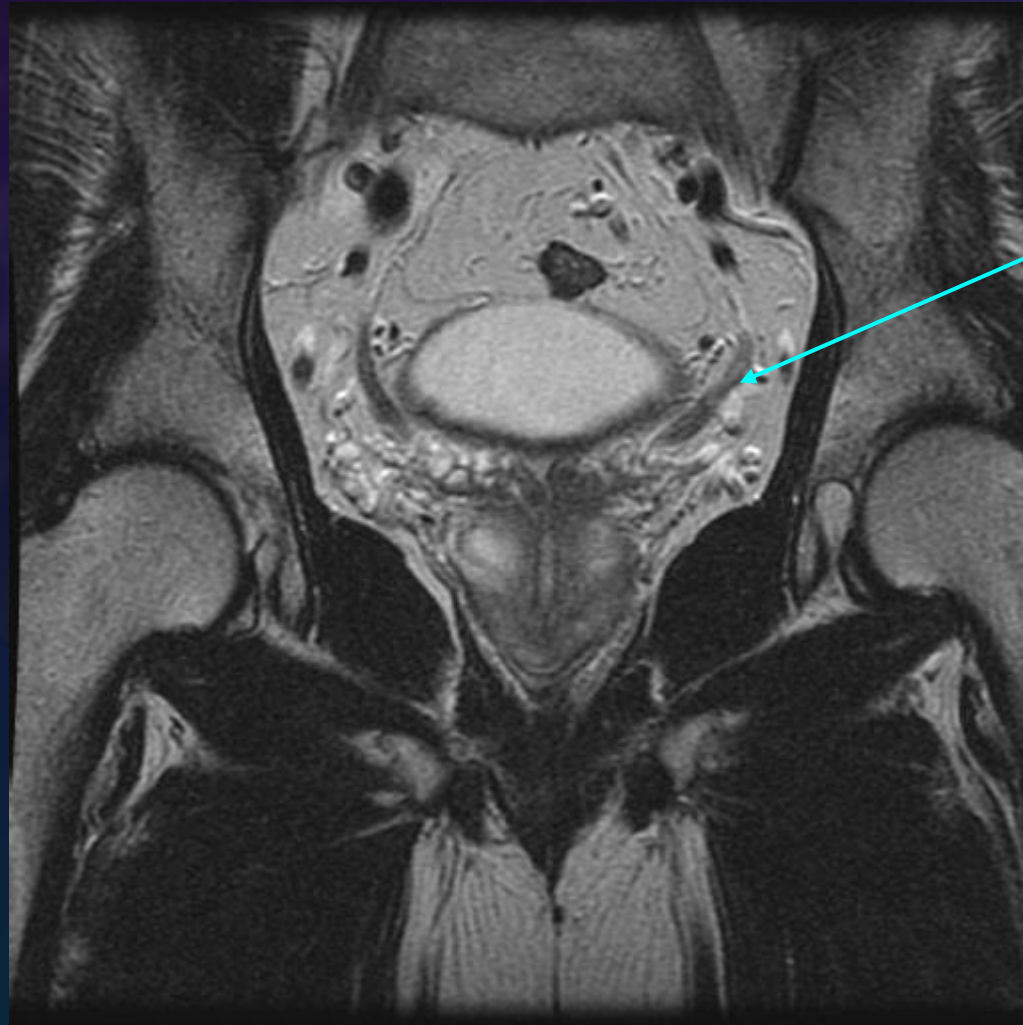








Prostate

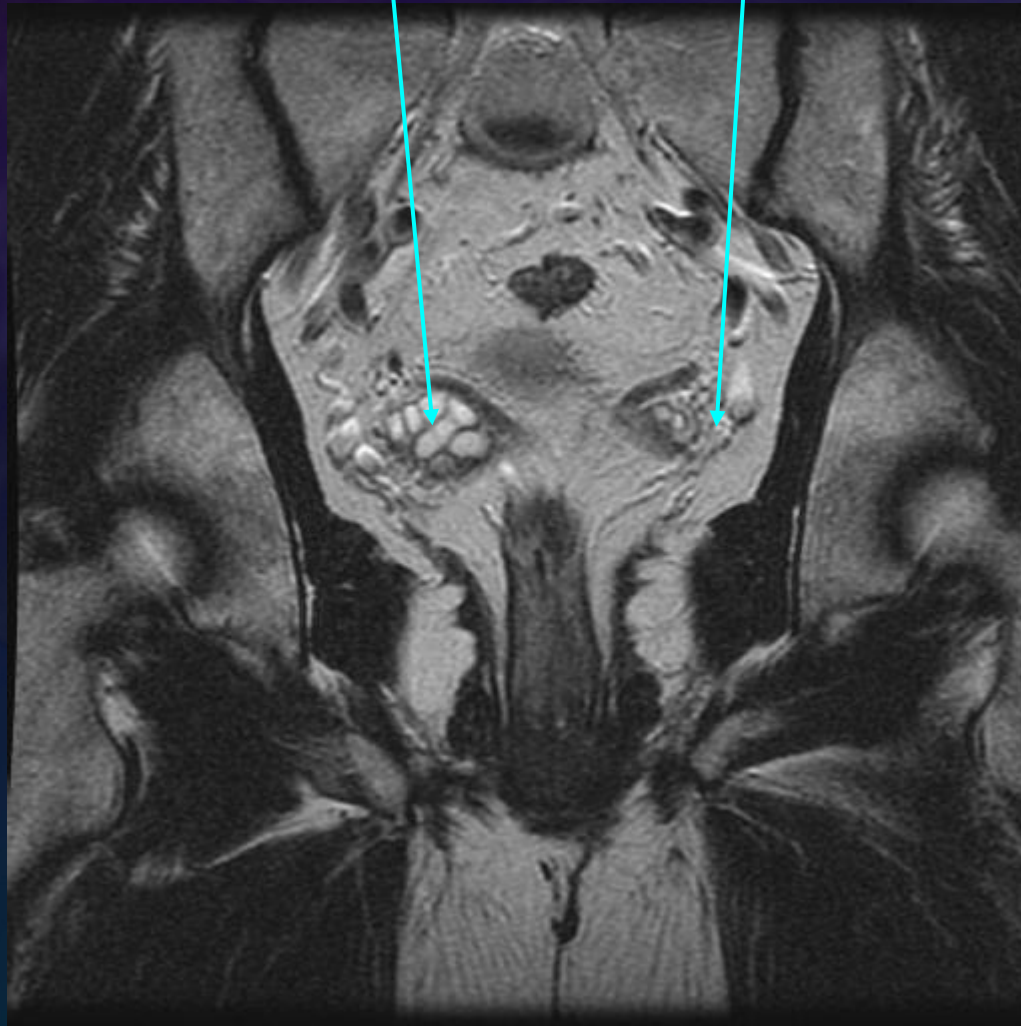


Left Ureter

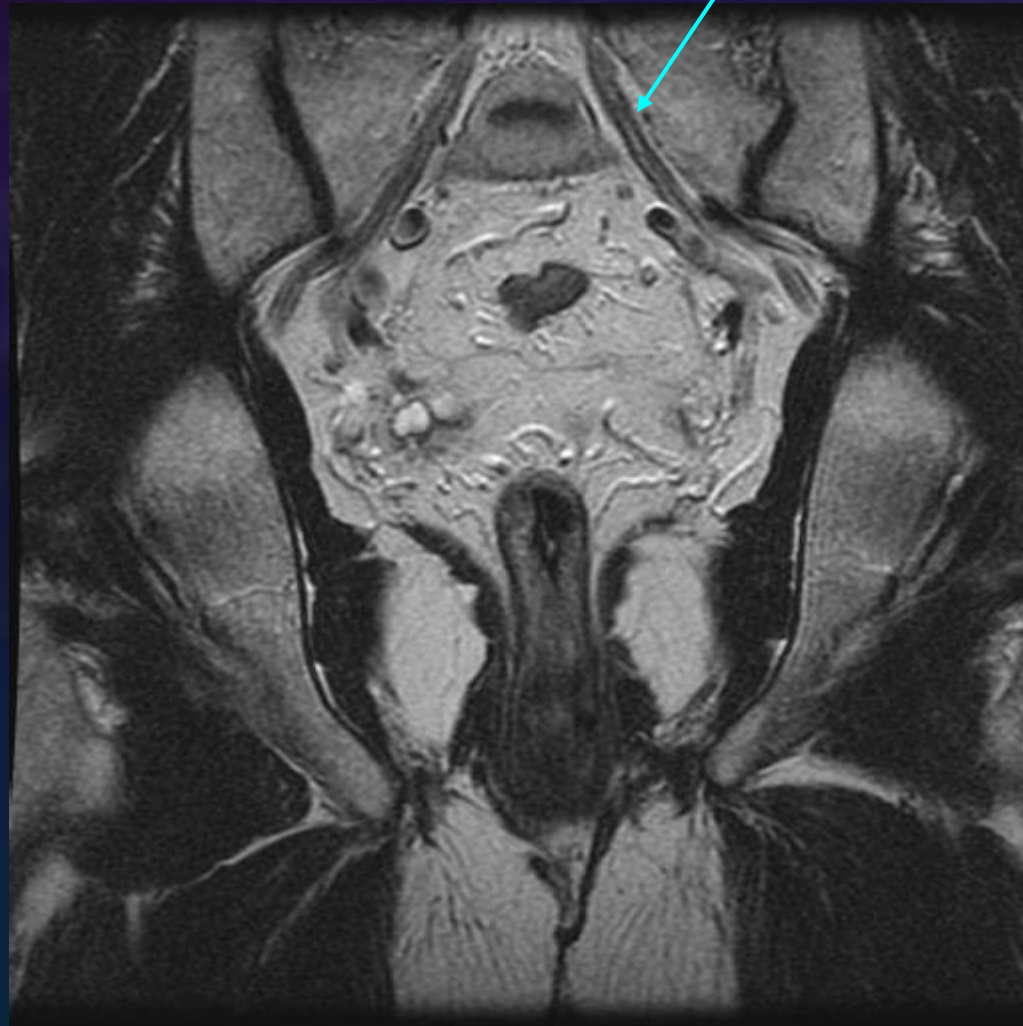
Vas Deferens: Rt and Lt



Seminal Vesicles

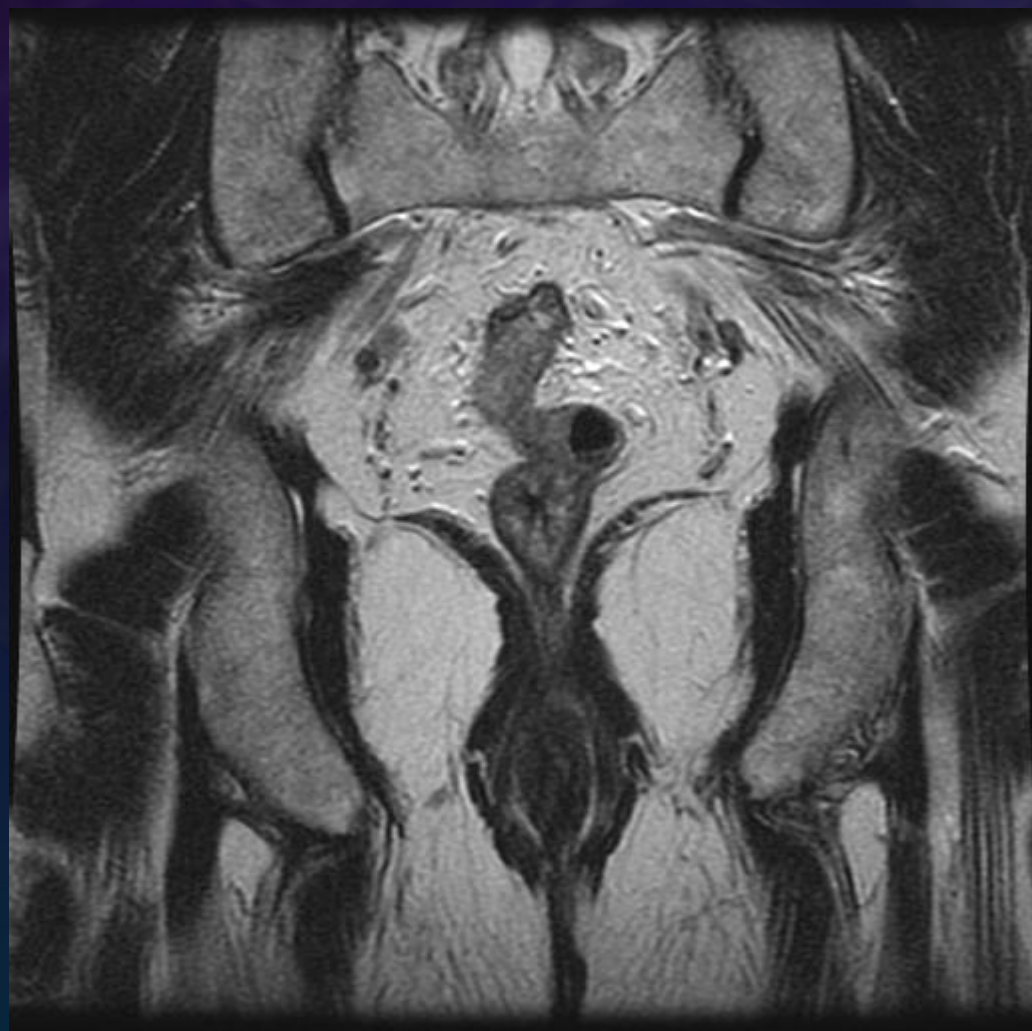


Lumbosacral Trunk

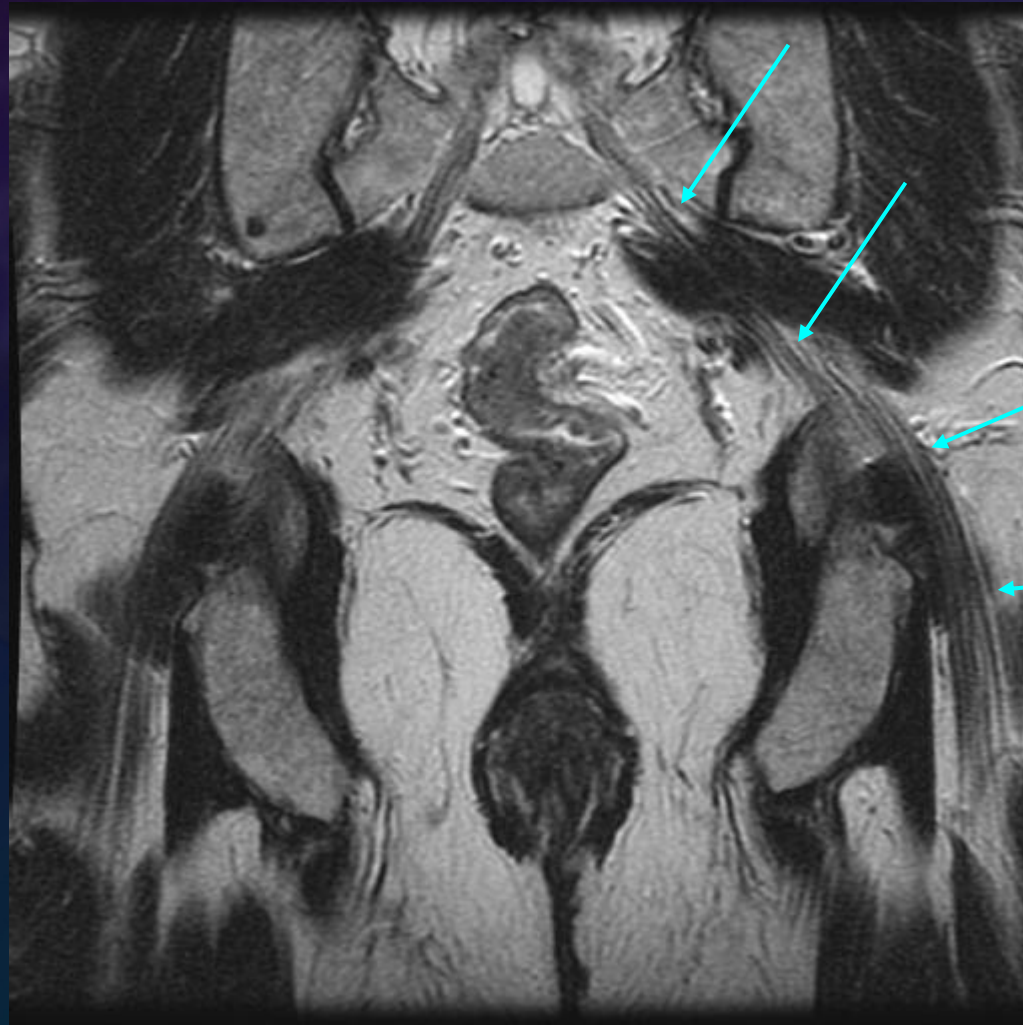


Lumbosacral Trunk





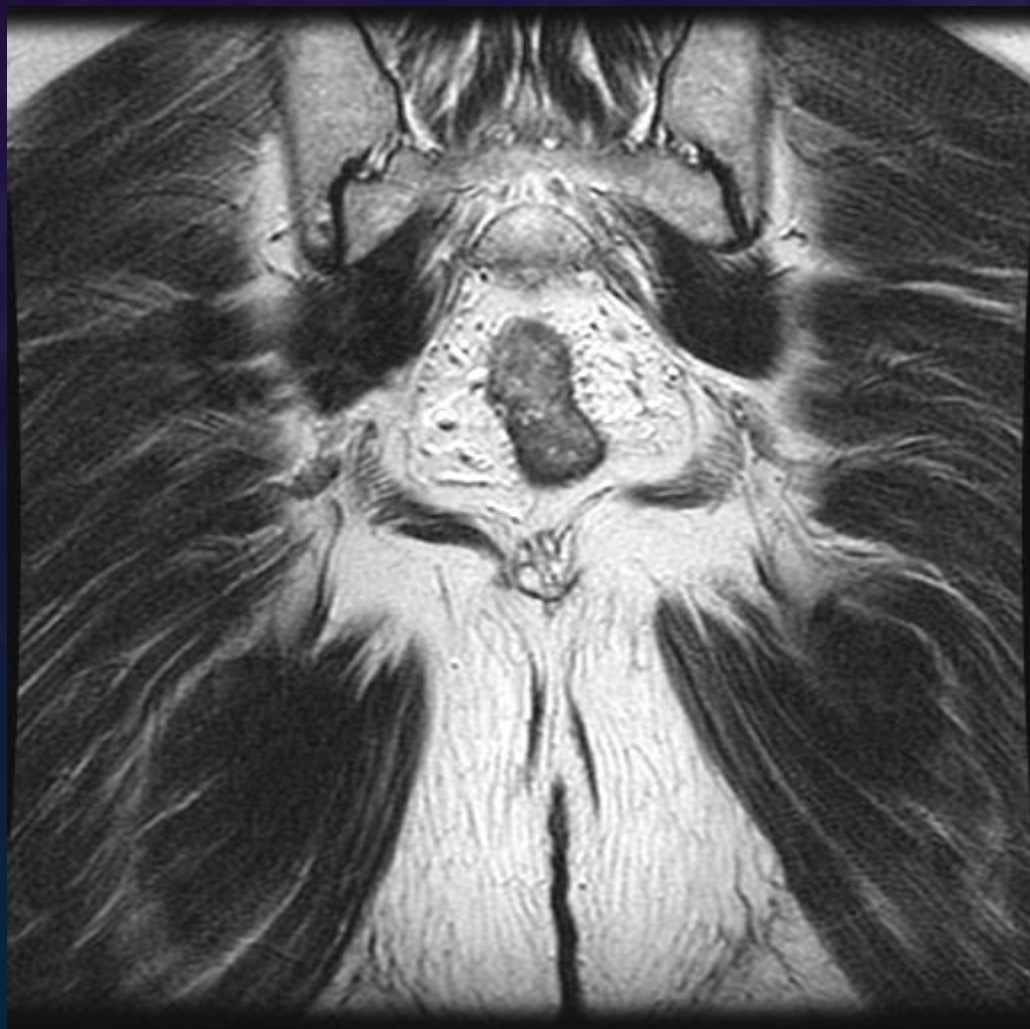
Lumbosacral Trunk and Sciatic Nerve

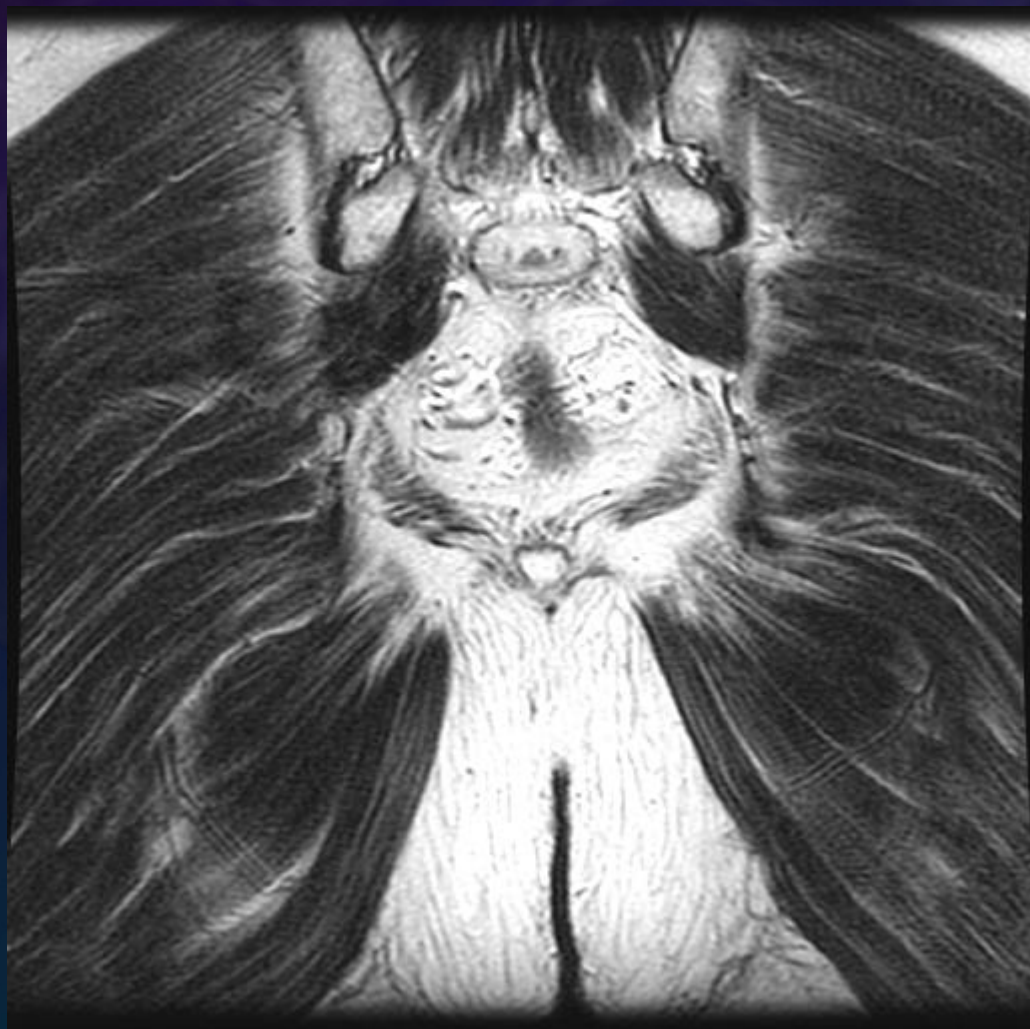


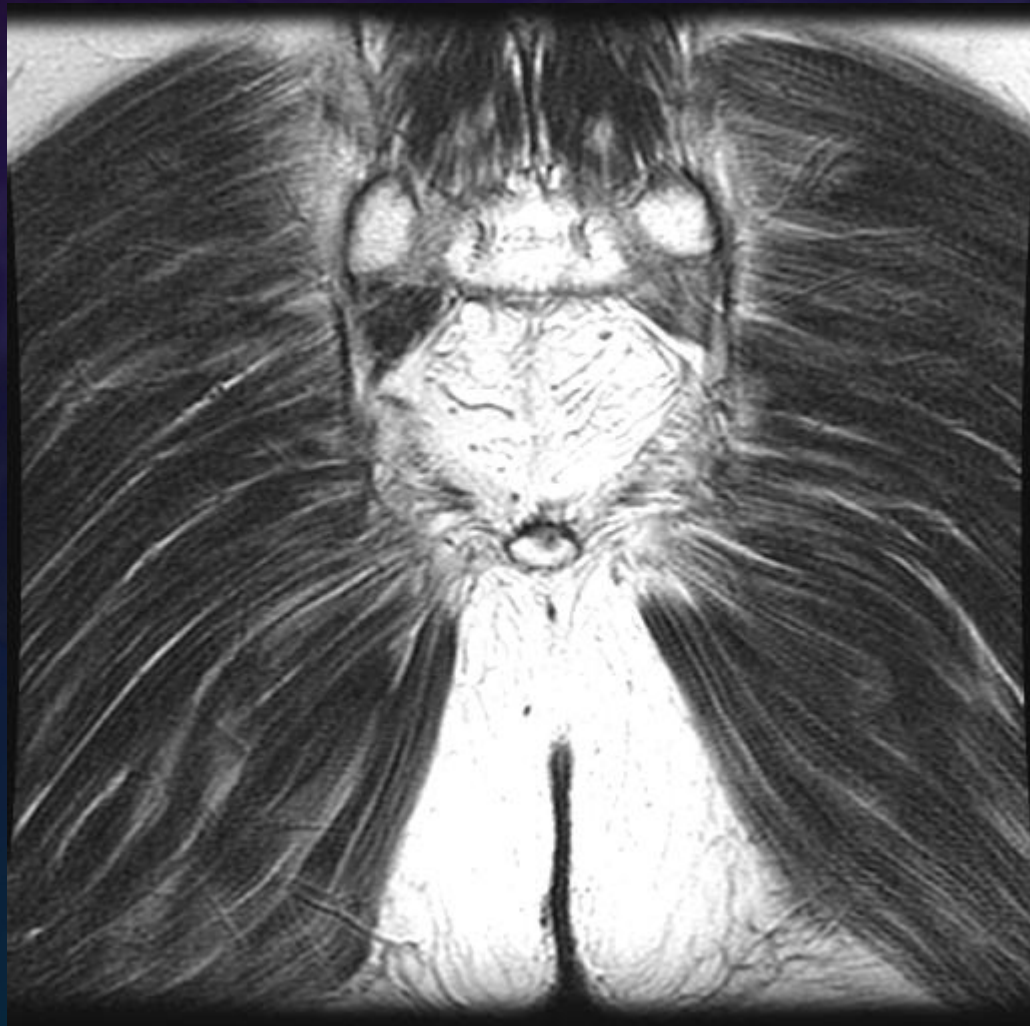












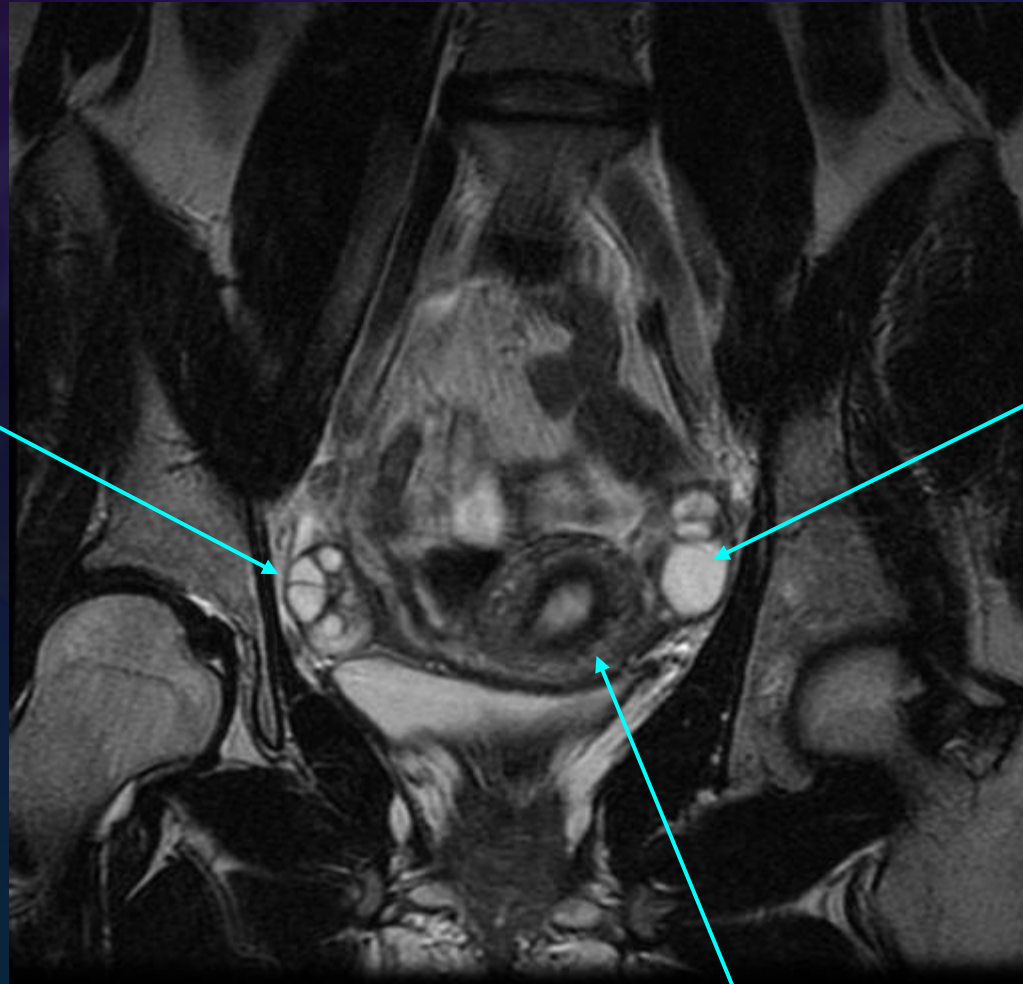






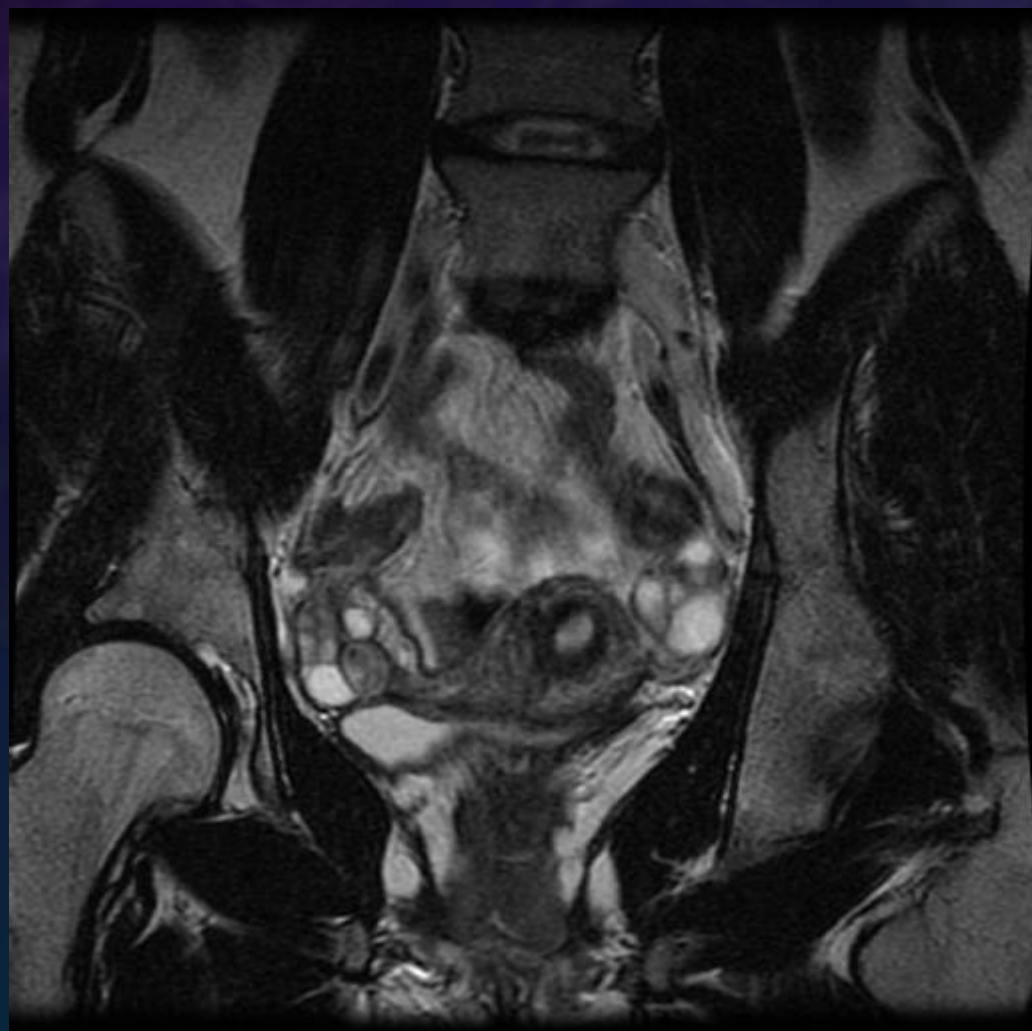
MRI Correlation: Coronal Female

Right
Ovary



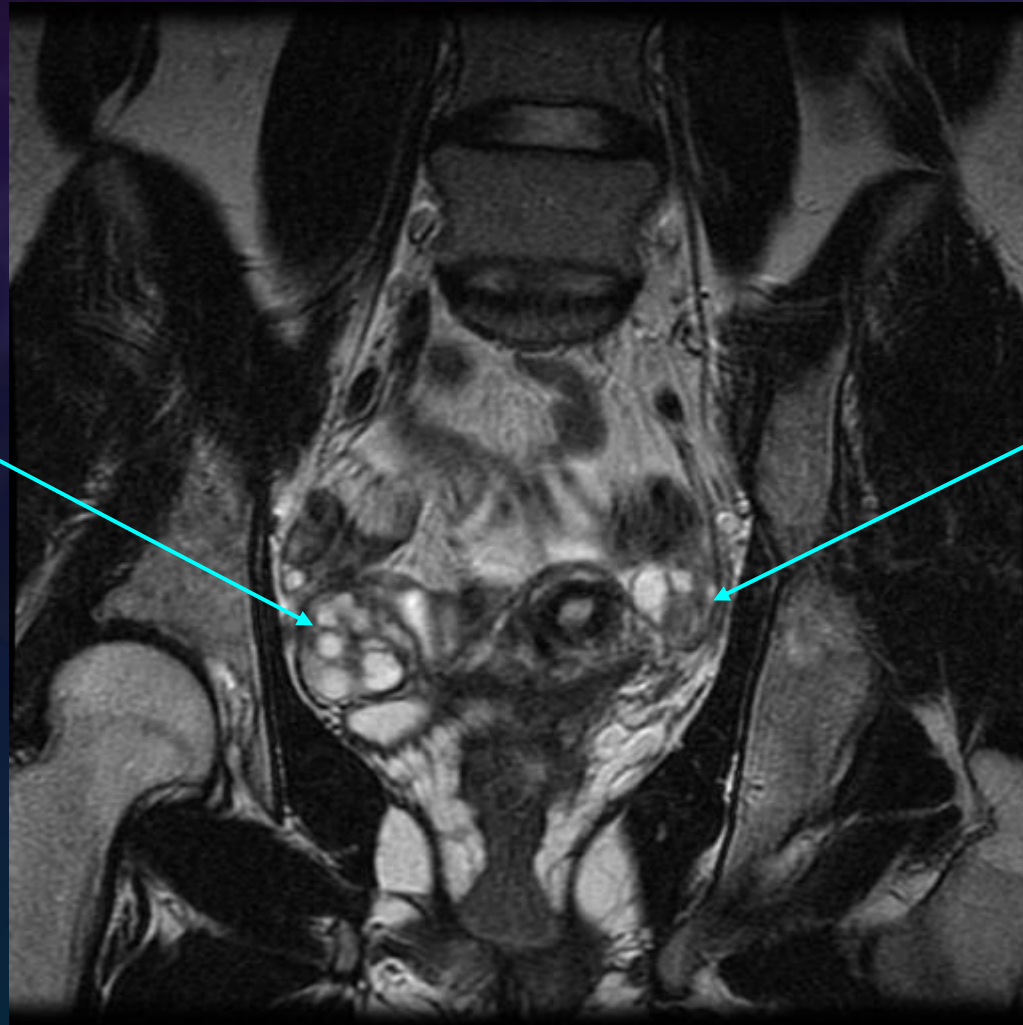
Left
Ovary

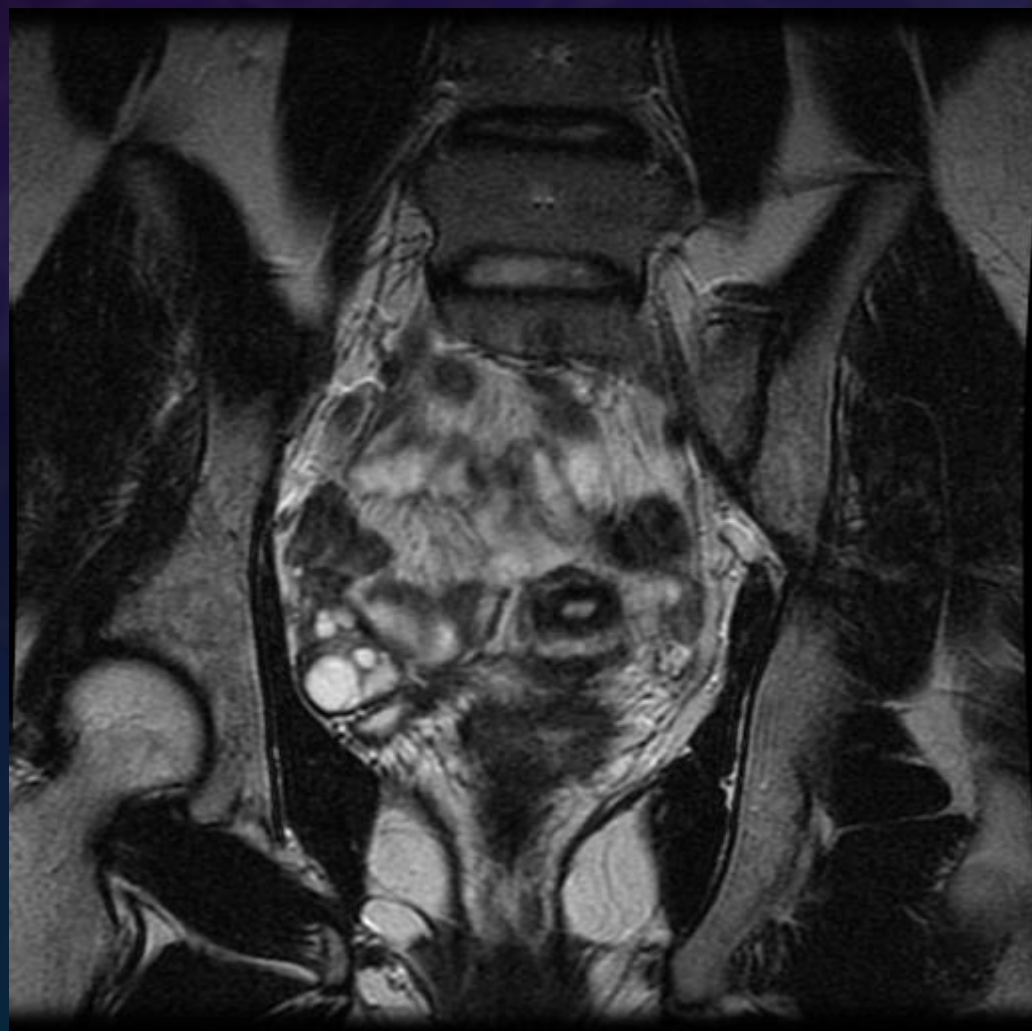
Uterus

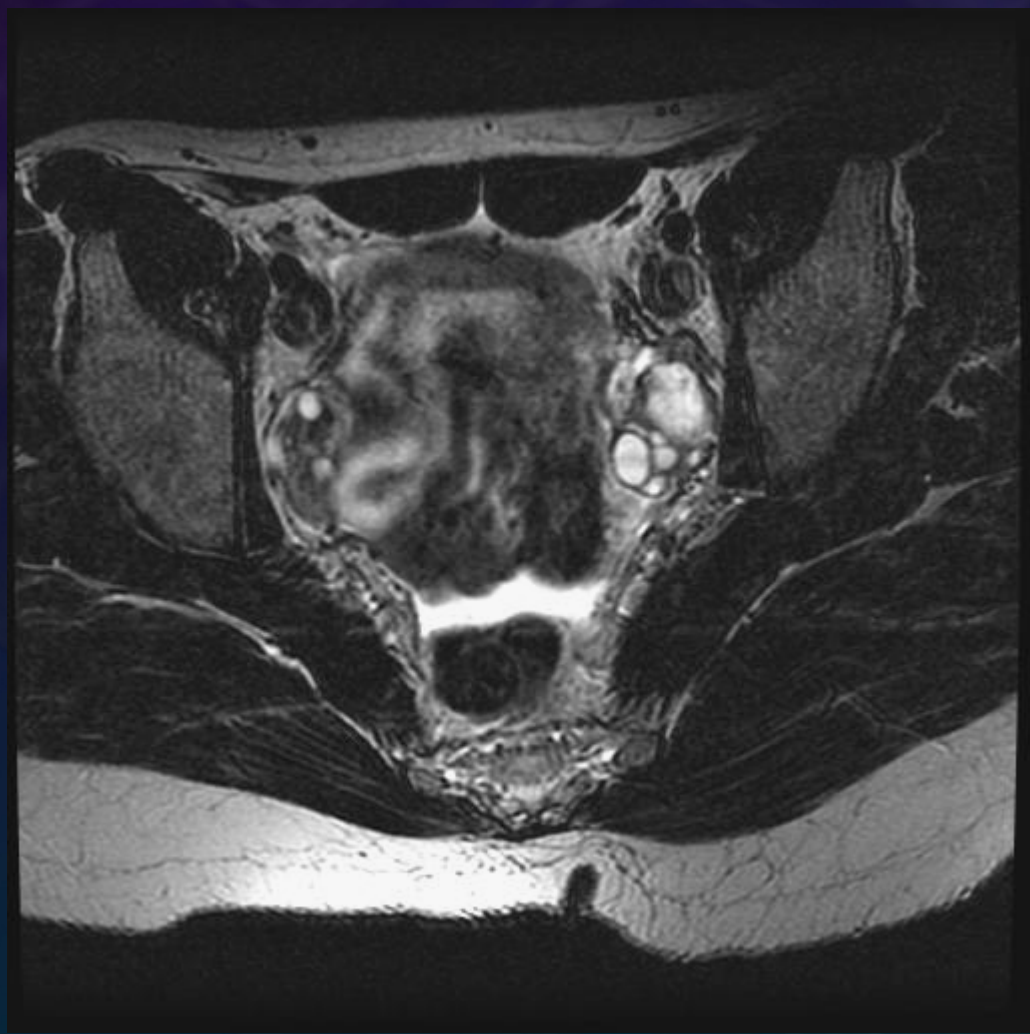


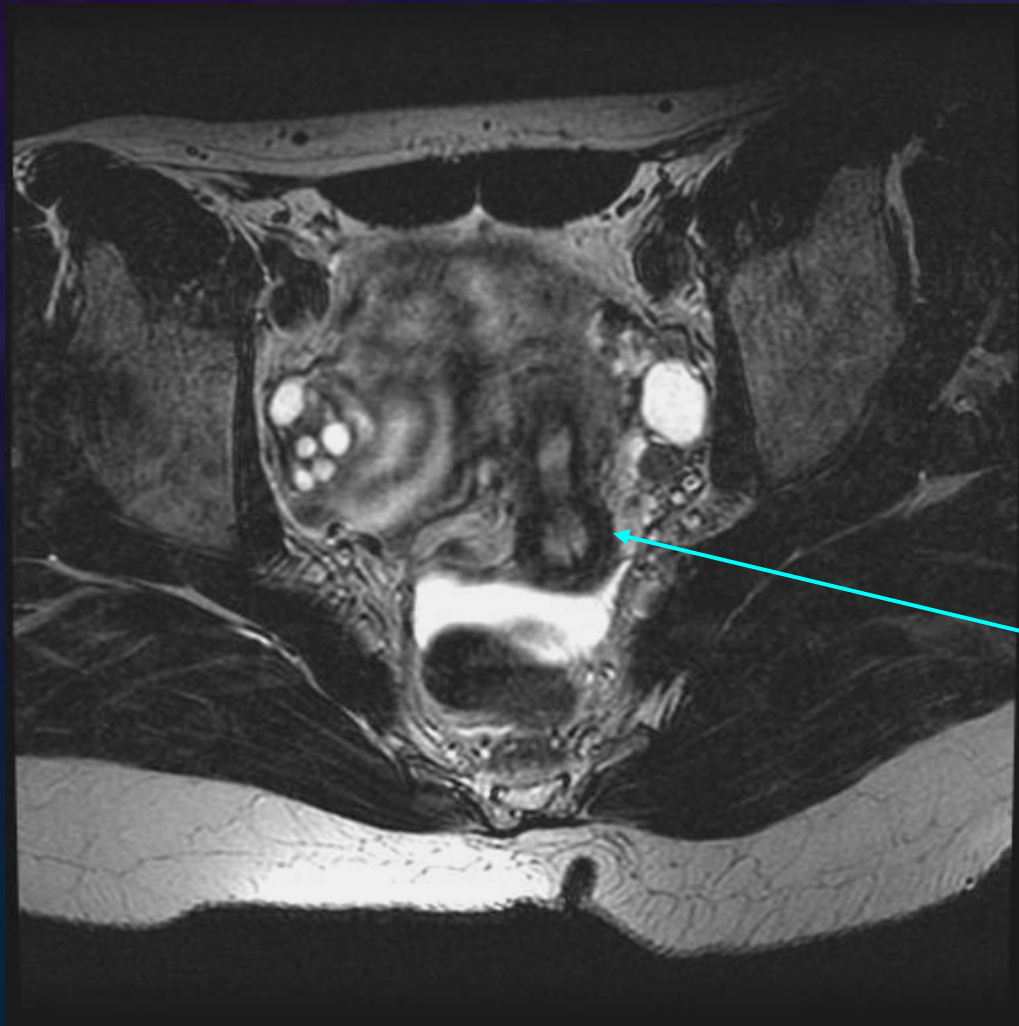
Right

Left









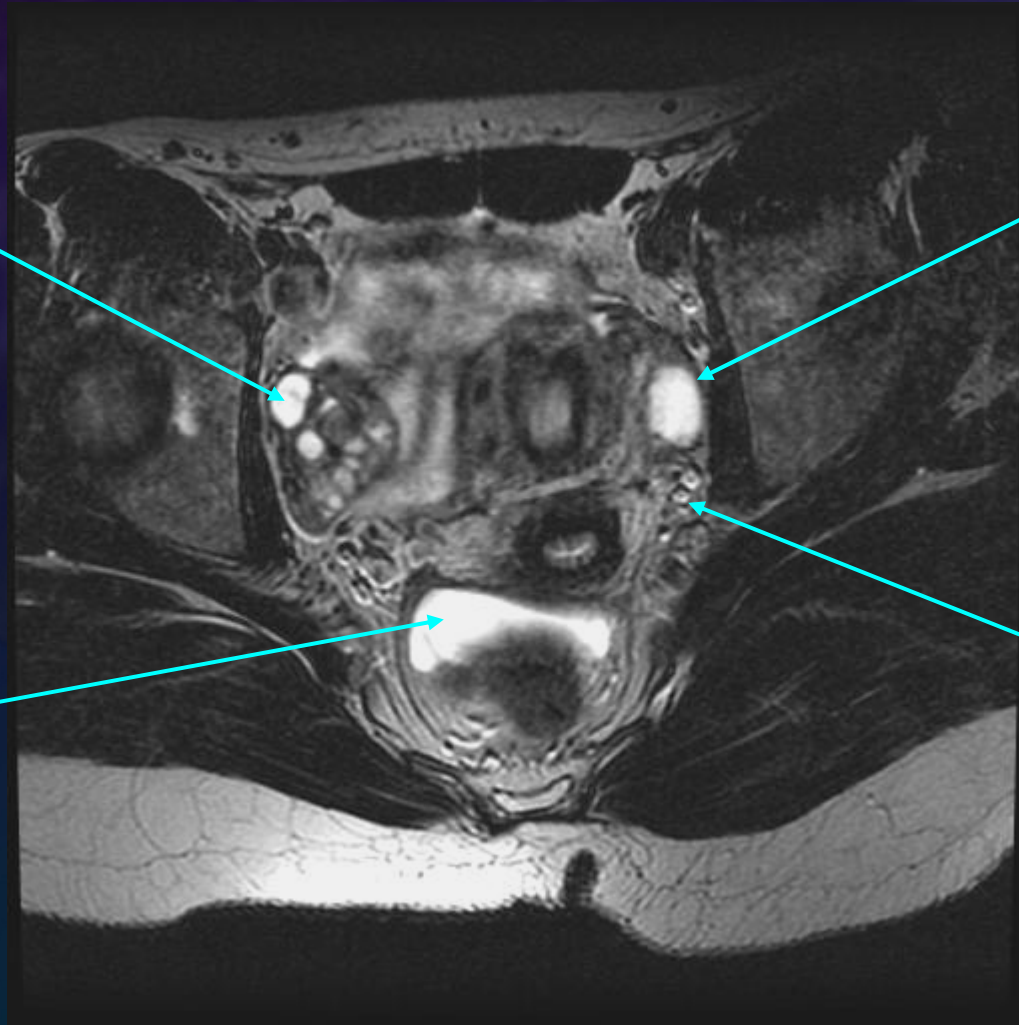
Uterus
(anteflexed)

Right
Ovary

Left
Ovary

Free fluid
in pouch
of Douglas

Pelvic
vessels
and
nerves









Summary

Landmarks: General

- Iliac and femoral vessels
 - Common, external, internal iliac
 - Common femoral
 - Axial relationships are different depending on level
 - Do not confuse with lymphadenopathy!
- Colon and rectum
- Bladder and ureters
- Muscles and bones

Summary

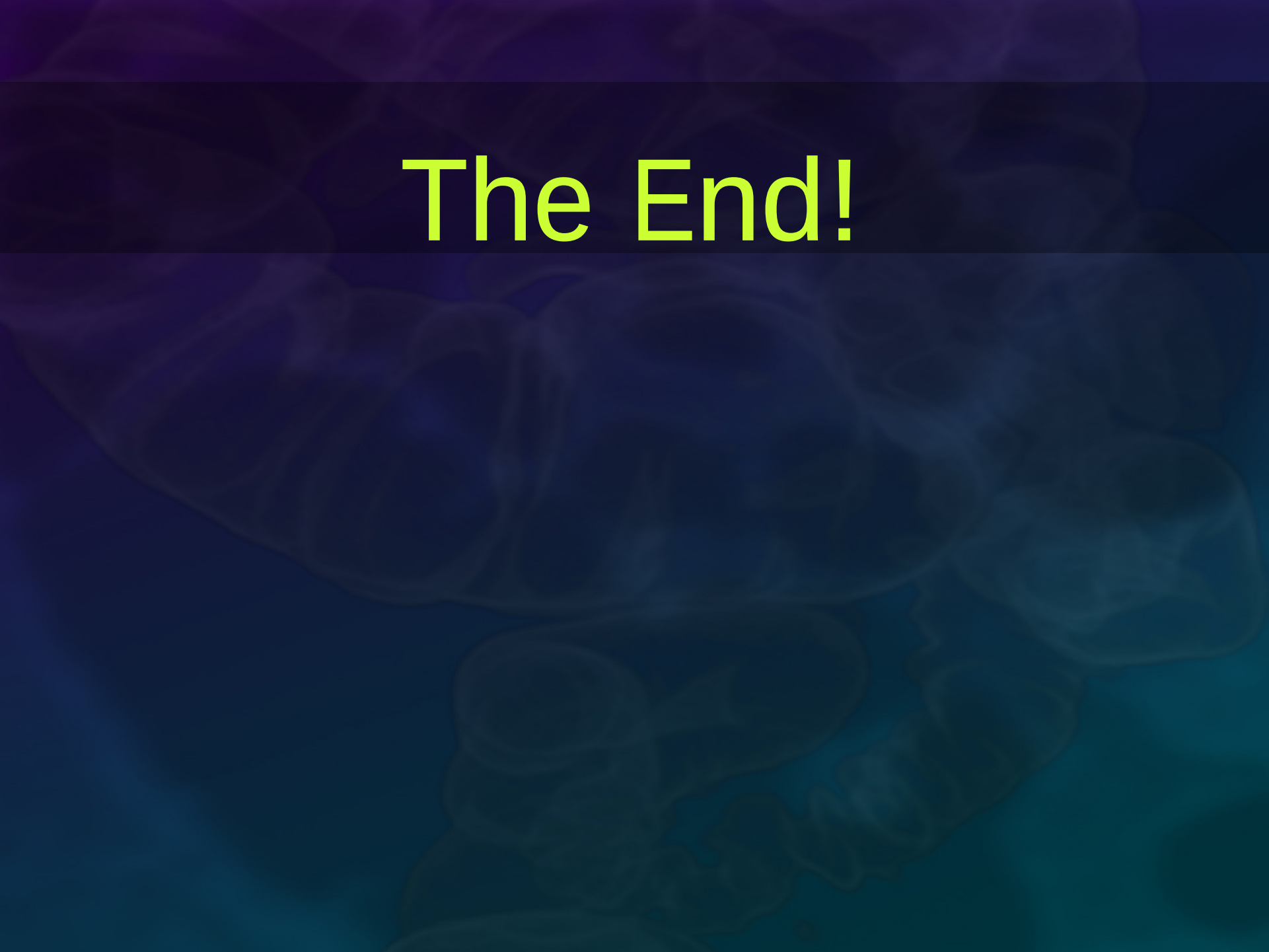
Landmarks: Male

- Prostate
 - Central and peripheral zonal anatomy visible on MRI
- Seminal vesicles
 - Fluid signal on MRI
- Vas deferens
 - Often visible on CT

Summary

Landmarks: Female

- Uterus
 - Variable orientation (anteverted, retroverted, anteflexed, retroflexed, axial)
 - Fundus, body, cervix
- Ovaries
 - Often recognisable due to follicular morphology
- Round ligament
 - Often useful as a **guide** to ovarian location



The End!