



AFOQQ

SUNMARY
ANATOMY
M.E.G.A

محمد أيمن أبو مشايخ

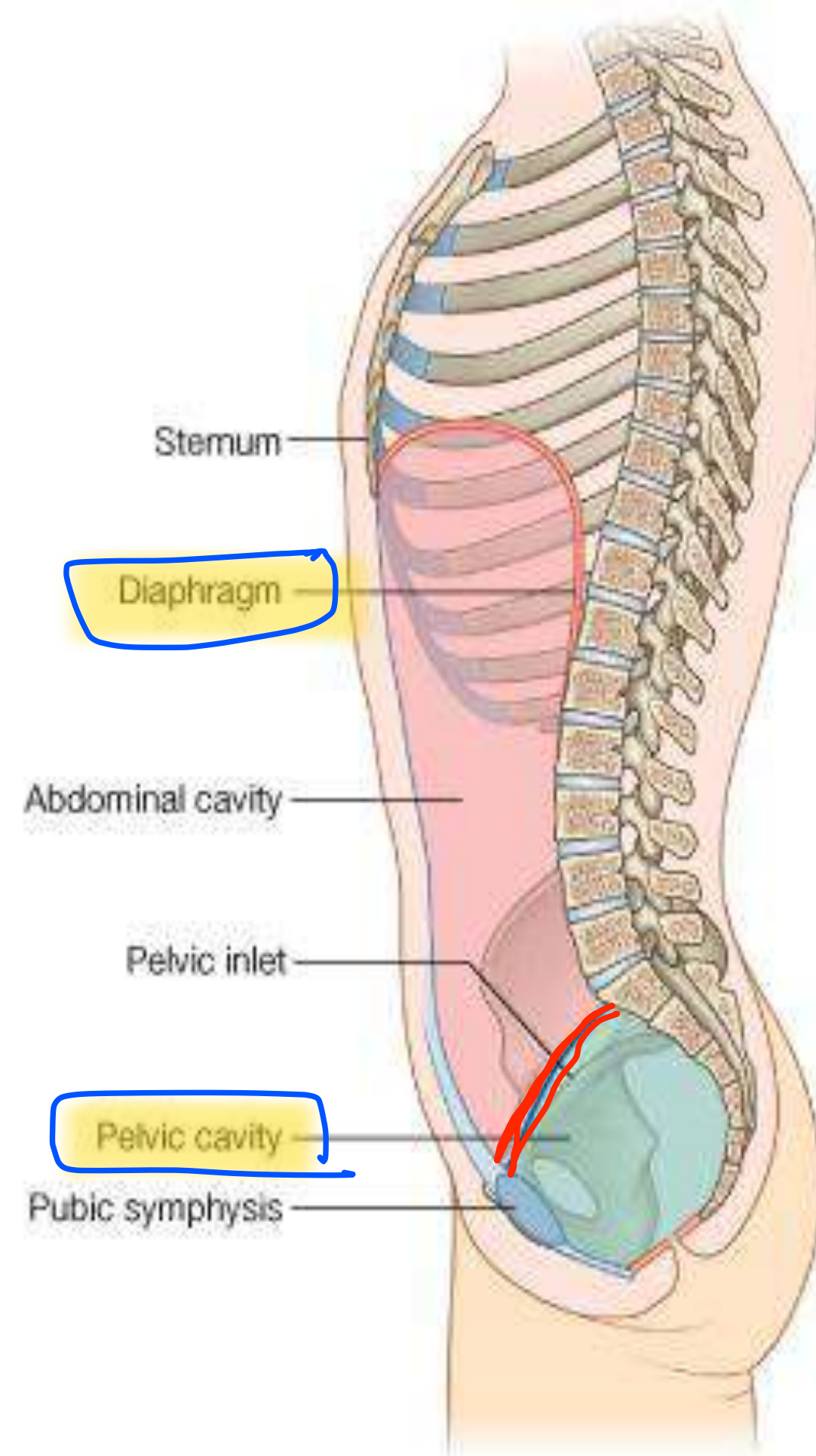
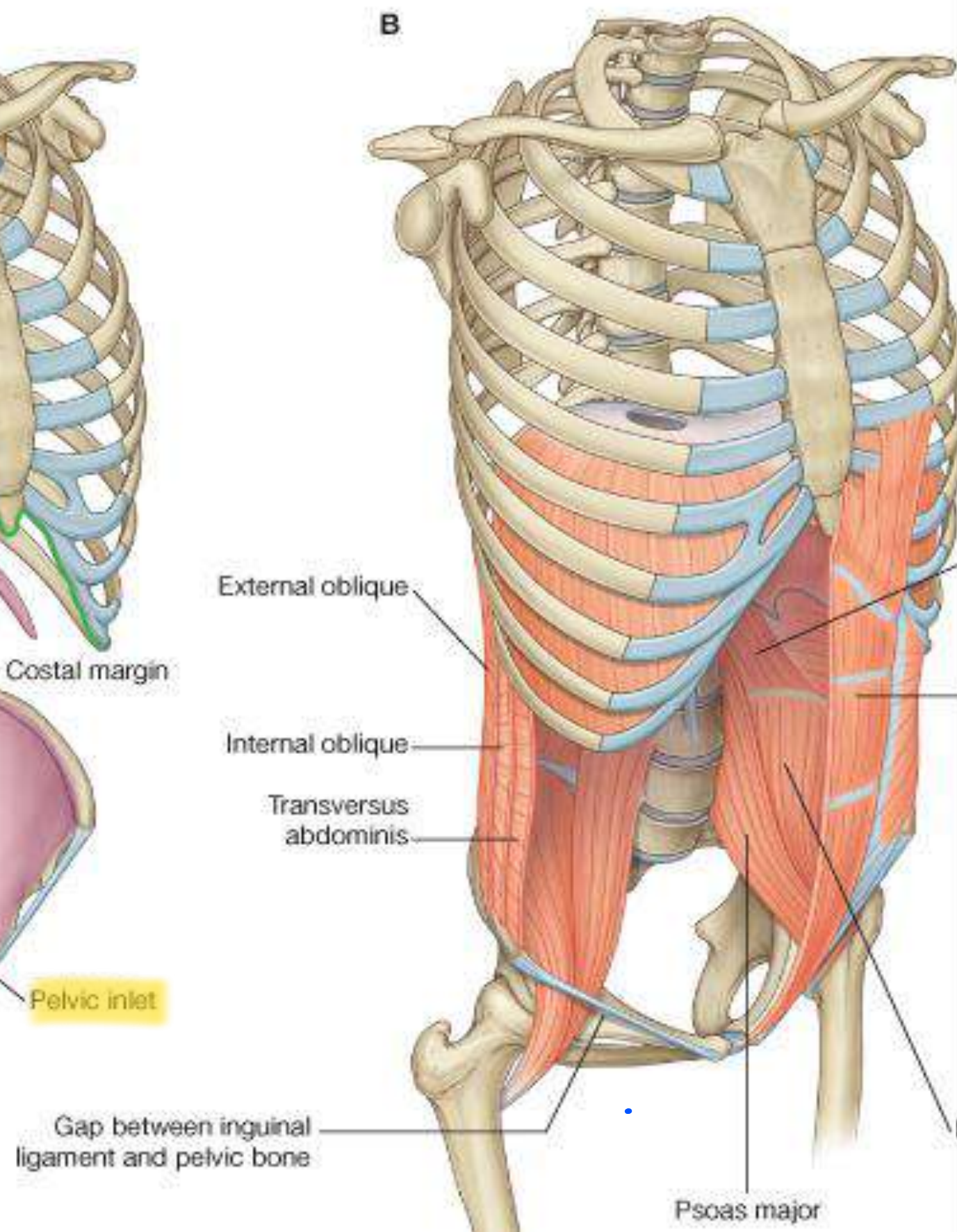
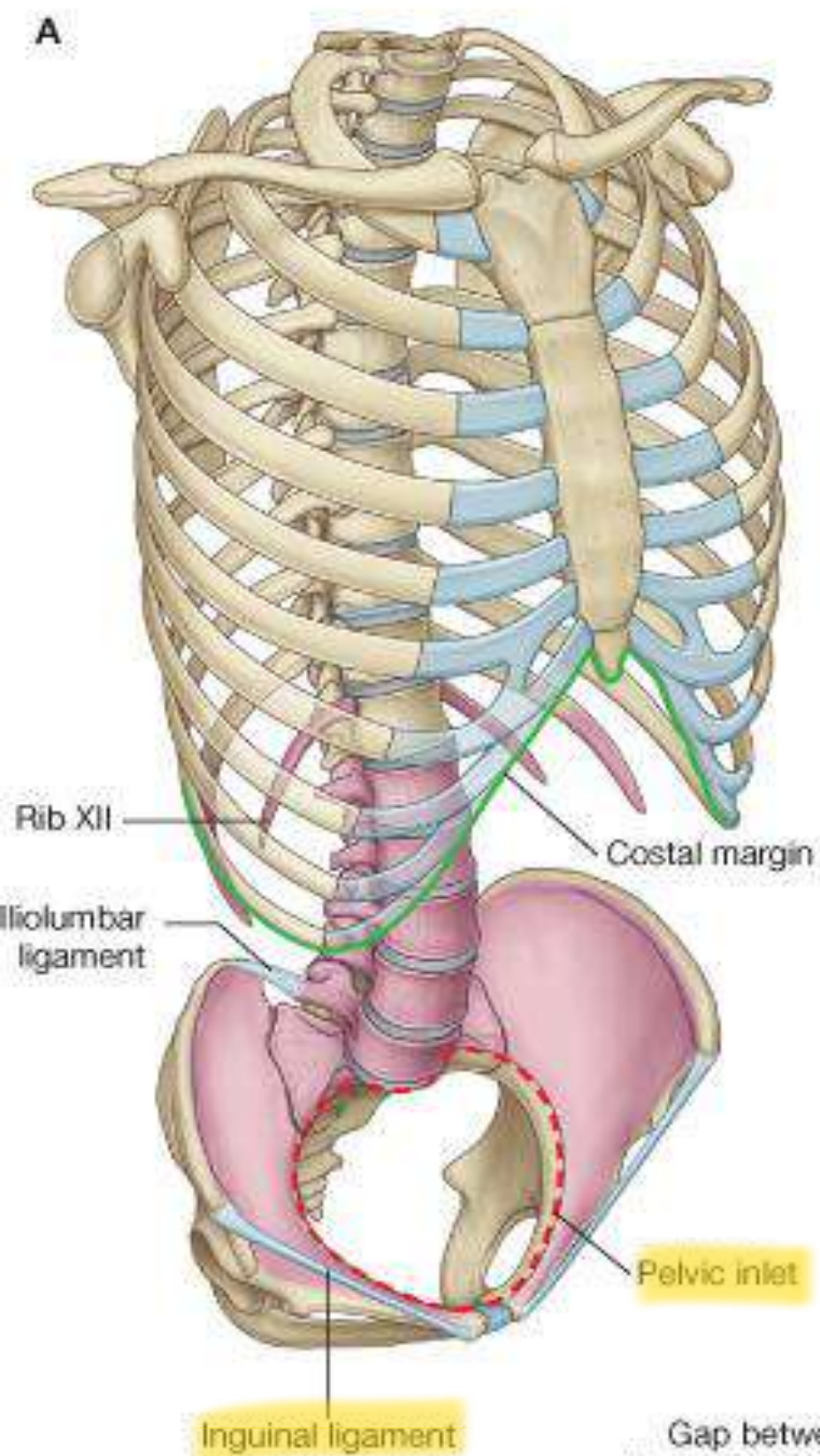
Abdomen

* بين الصدر abdomen و throat
• ناصب الصدر diaphragm
* قاع الحوض pelvis في ناصب.

- The region of the trunk that lies between the diaphragm above and the inlet of the pelvis below.

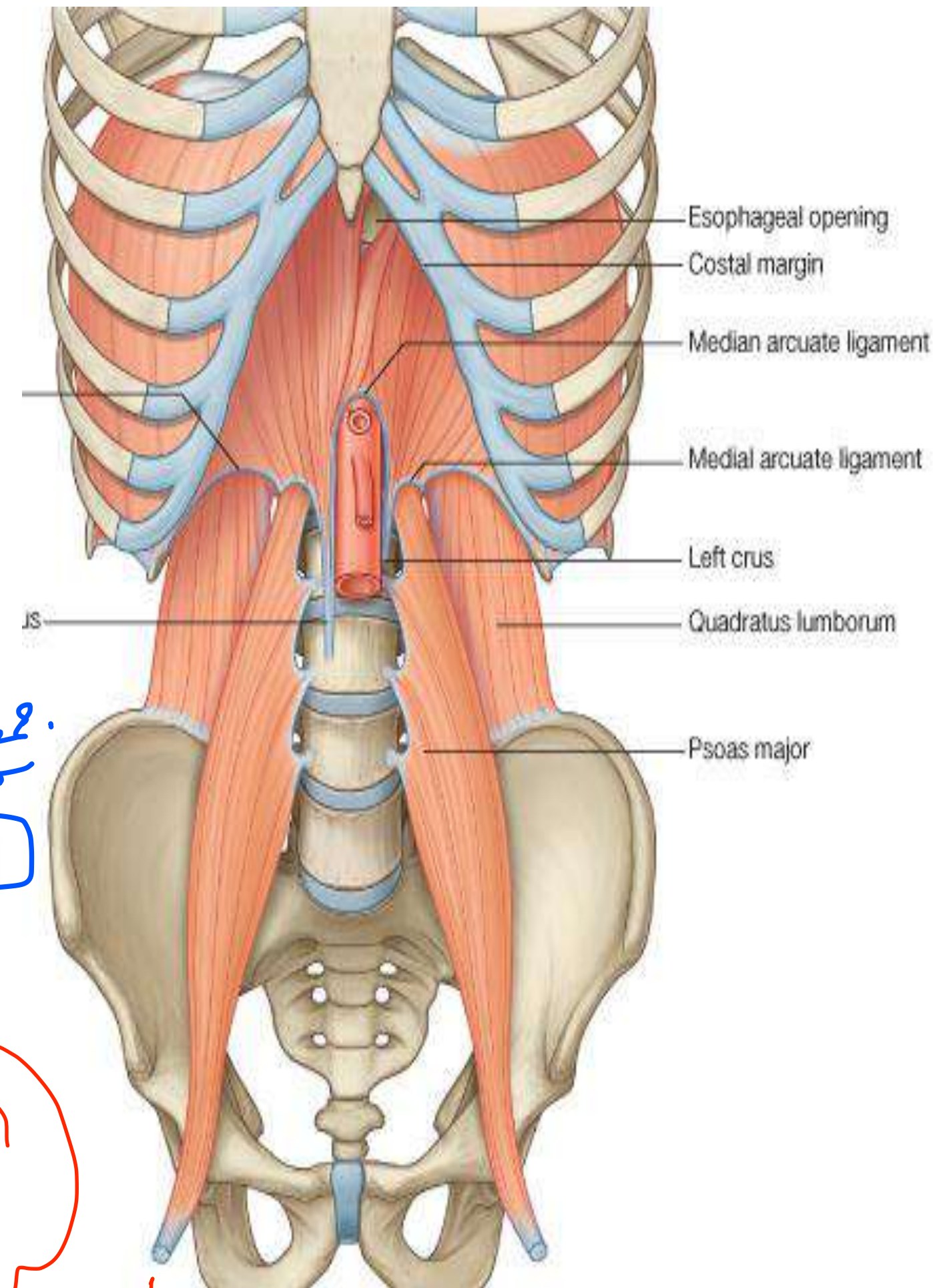
Outlet

↓
ال abdomen
cavity من جوف
pelvis حوض
تحتية



Structure of the abdominal wall

- **Superiorly** diaphragm separates the abdomen from the chest.
- **Inferiorly** The abdomen is continuous with the pelvis.
- **Anteriorly** anterior abdominal wall (جدار البطن الأمامي)
- **Posteriorly** abdominal wall is made by the lumbar vertebrae, twelfth rib, muscles, and upper part of bony pelvis.
- Note these walls are lined by fascia and parietal peritoneum.

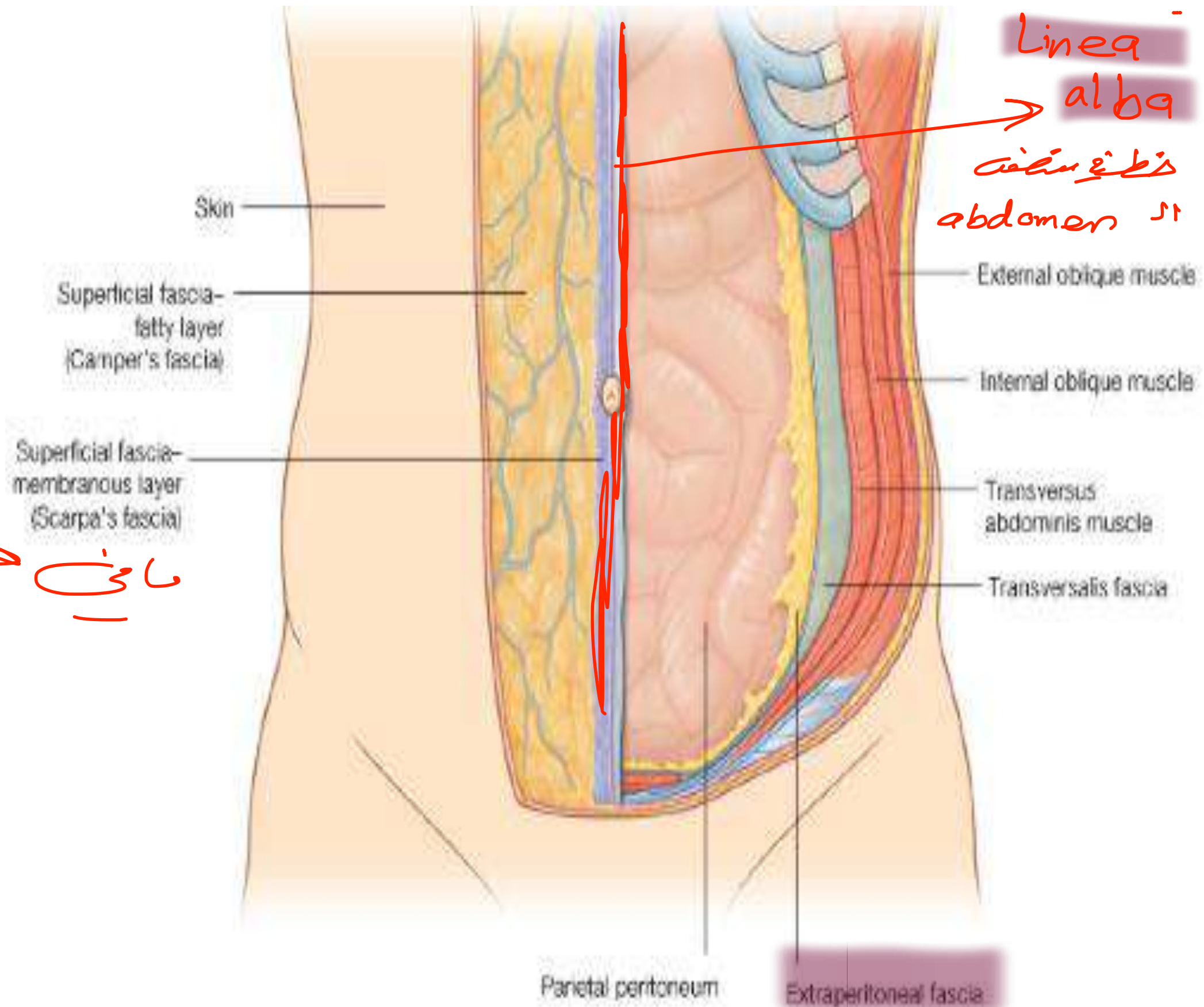


Structure of the abdominal wall

= 9 layers

ANTERIOR ABDOMINAL WALL

- ① skin
- ② superficial fascia
- ③ ~~deep fascia~~ muscles
- ④ Extra-peritoneal fascia (fatty layer)
- ⑤ parietal peritoneum



Anterior abdominal wall

شعر ملتزم باللوحة

① SKIN

بصدر أو عرق الـ skin

- The skin is loosely attached to the underlying structures Except at the umbilicus, where it is tethered to the scar tissue of linea alba.

لـ ندبة

تough.

الخط الذي
بالفوق في الـ
abdomen

xiphoid

nerv: T10

- Umbilicus lies at level of L3-L4, Half way between Xiphoid and Symphysis pubis.



xiphosternal joint

منطقة، لمعة

aorta

خط في البطن
في L3-L4 إلى بطنية تحت الـ umbilicus مع الـ aorta أنما

- The Natural lines of cleavage in the skin are constant and run downward and forward almost

التي تتجه
التي

Horizontally around the trunk.

أصغر:

① خيوط الكولاجين
collagen bundles

خط مع cleavage line جرح
surgical incision

بہت سی جگہ پر collagen bundles

SURGICAL INCISIONS

سurgical

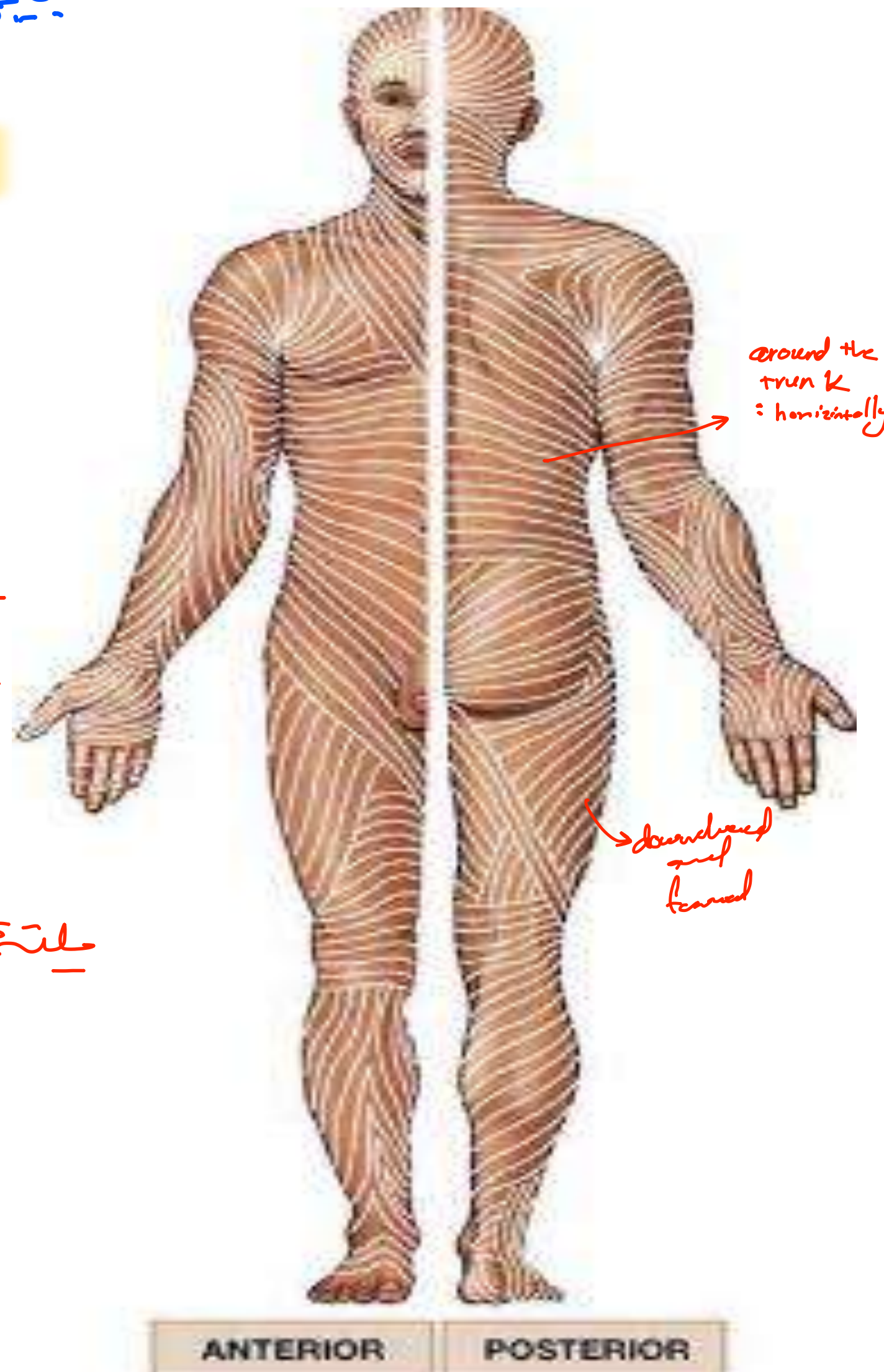
- If possible, all surgical incisions should be made in the lines of cleavage where the bundles of collagen fibers in the dermis run in parallel rows.

برہمنات آفت
Skin
تہ عذیب
القام، فیرج
میکو، ملانہ
lines of
cleavage.

نہا تبش
cleavage line
بمقطع صاف
bundles
collagen
میگر
scar.

An incision along a cleavage line will heal as a narrow scar, whereas one that crosses the lines will heal as wide or heaped-up scars.

مکدہ
میگر



Anterior abdominal wall

Superficial Fascia

fatty layer (Camper's)

membranous layer (Scarpa's)



Superficial Fascia

Superficial Fatty layer
(Fascia of Camper)

Camper's thick

Deep Membranous layer
(Scarpa's fascia).

thin Scarpa

Anterior abdominal wall

Superficial Fascia

- **The Fatty Layer**
(Camper's fascia)

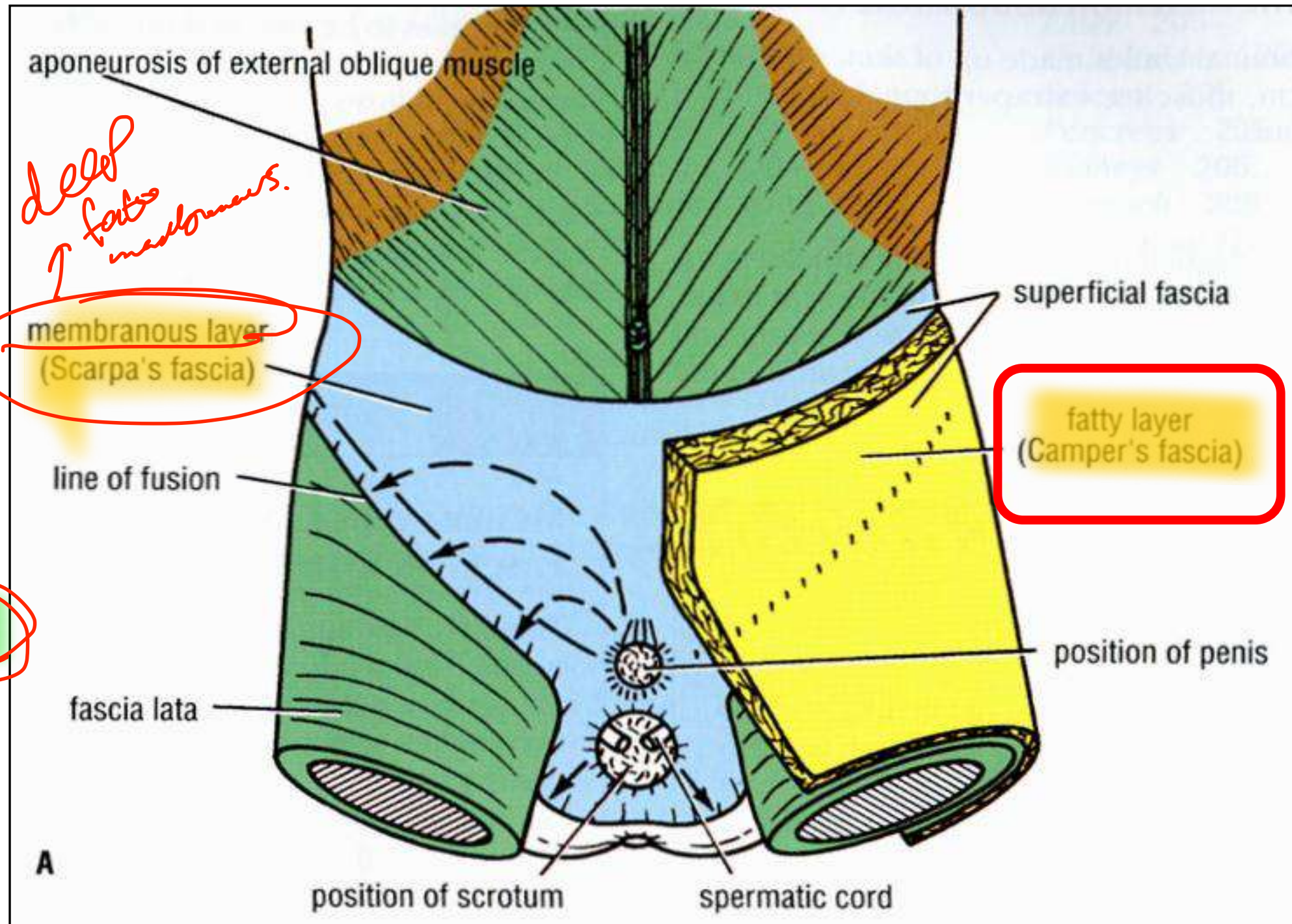
ثيكتي
نيلف
لا فز

is continuous with the superficial fat over the rest of the body and may be extremely thick (3 inches) or more in obese patients.

fat

نيلف
(a 8) cm
fine

cm



Scarpa

camper

Anterior abdominal wall

Superficial Fascia

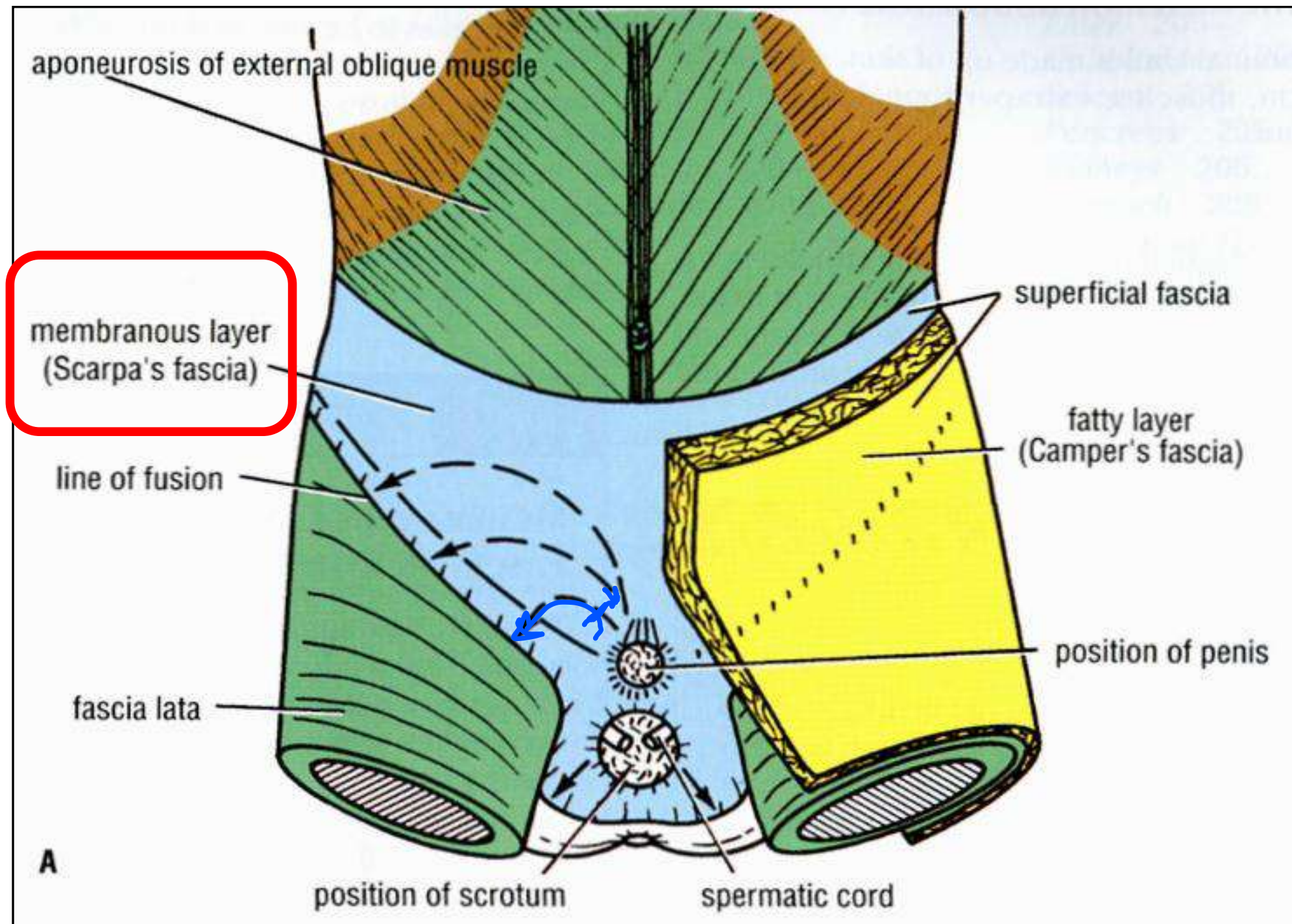
تقریباً تختی لما نطلع لونه كده هيا موجوده في الـ fat الى جال الـ umbilicus وازلك lateral بتروح غس على الـ fat الى جال الـ back و الـ thorax عند الـ umbilicus كبلوه شبه حدة . عند الـ umbilicus كبلوه membrane دافعي

Membranous Layer

(Scarpa's fascia) *تختف / تقل عند الجنب*

is thin and fades out laterally and above, where it becomes continuous with the superficial fascia of the back and the thorax, respectively.

على التوالي



تتركز تحت الـ umbilicus

Anterior abdominal wall

Superficial Fascia

■ Inferiorly, the Membranous layer

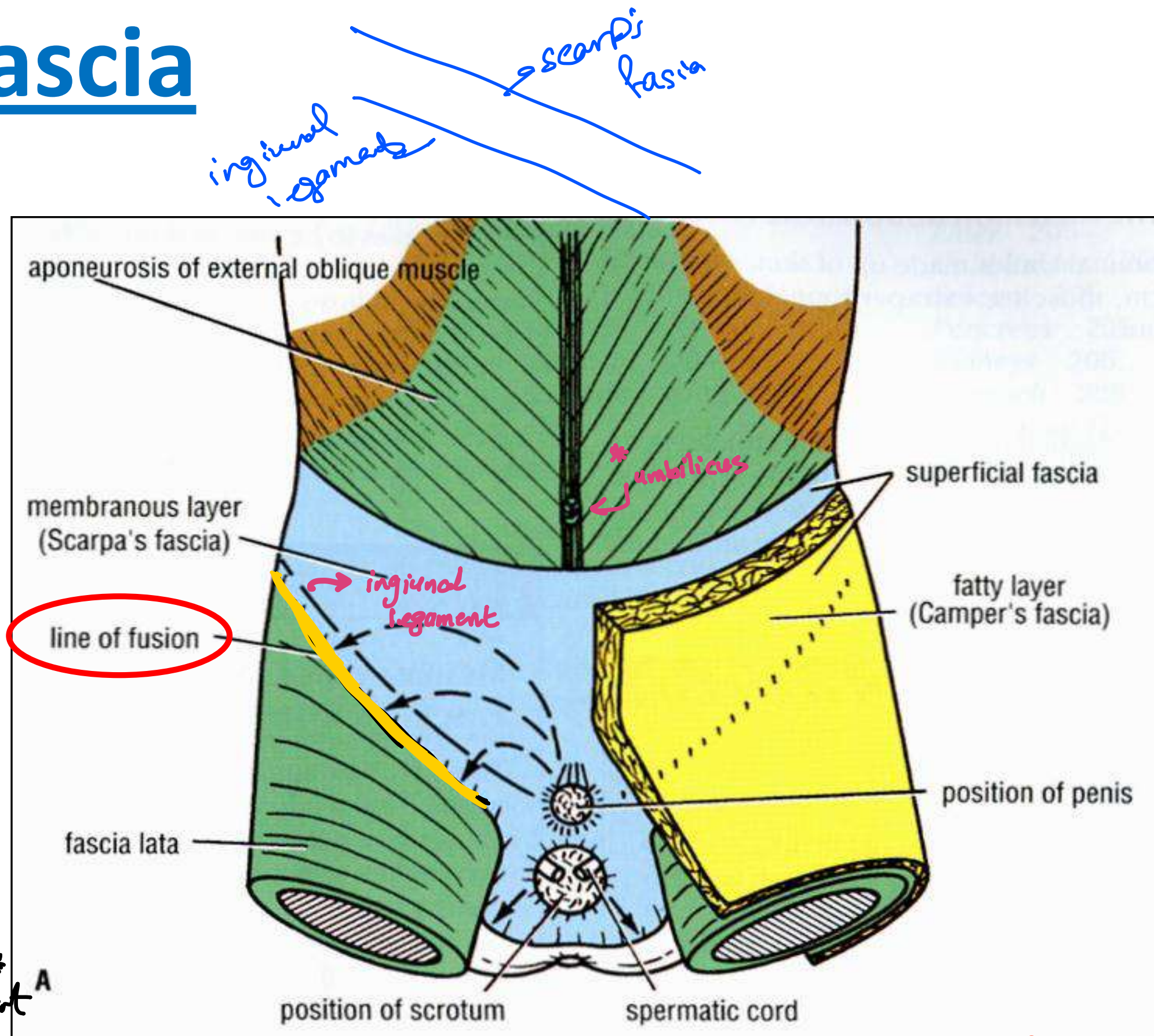
Scarpa's

passes onto the front of the thigh,

where it fuses with the Deep Fascia

one Finger Breadth

below the inguinal ligament.



بما يتزك أكتة ل
inguinal legomert

بعض اصبع

1cm / 1.5cm

تغيرا حمارا ~ sampi

fascia (ata)

inferior lateral

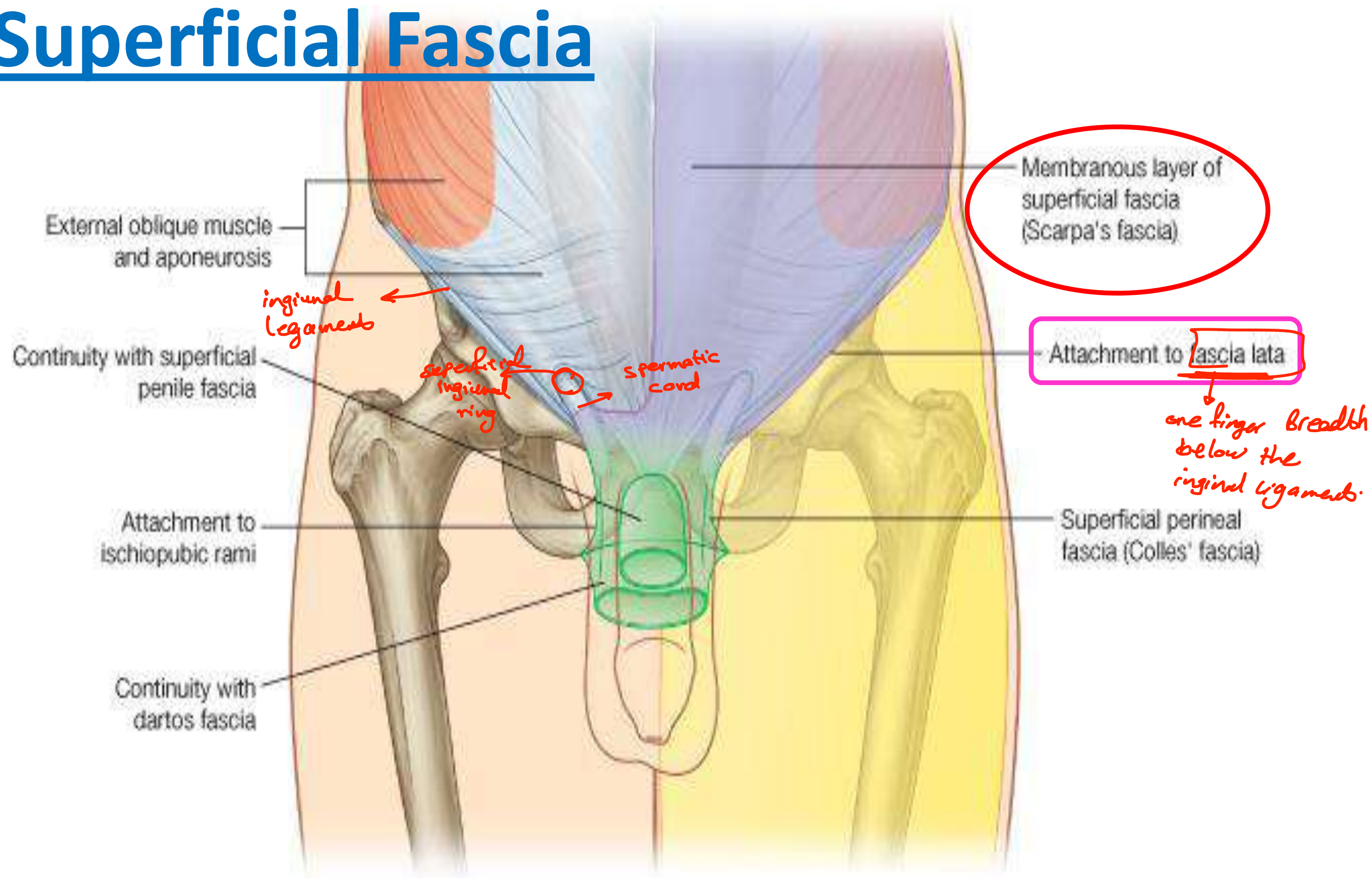
thigh fat deep fascia

منه اصبع 1 ~ ال
scarpa's fascia

abdomin ل
thigh ل
صو لذي ليفل
ع ل

Anterior abdominal wall

Superficial Fascia

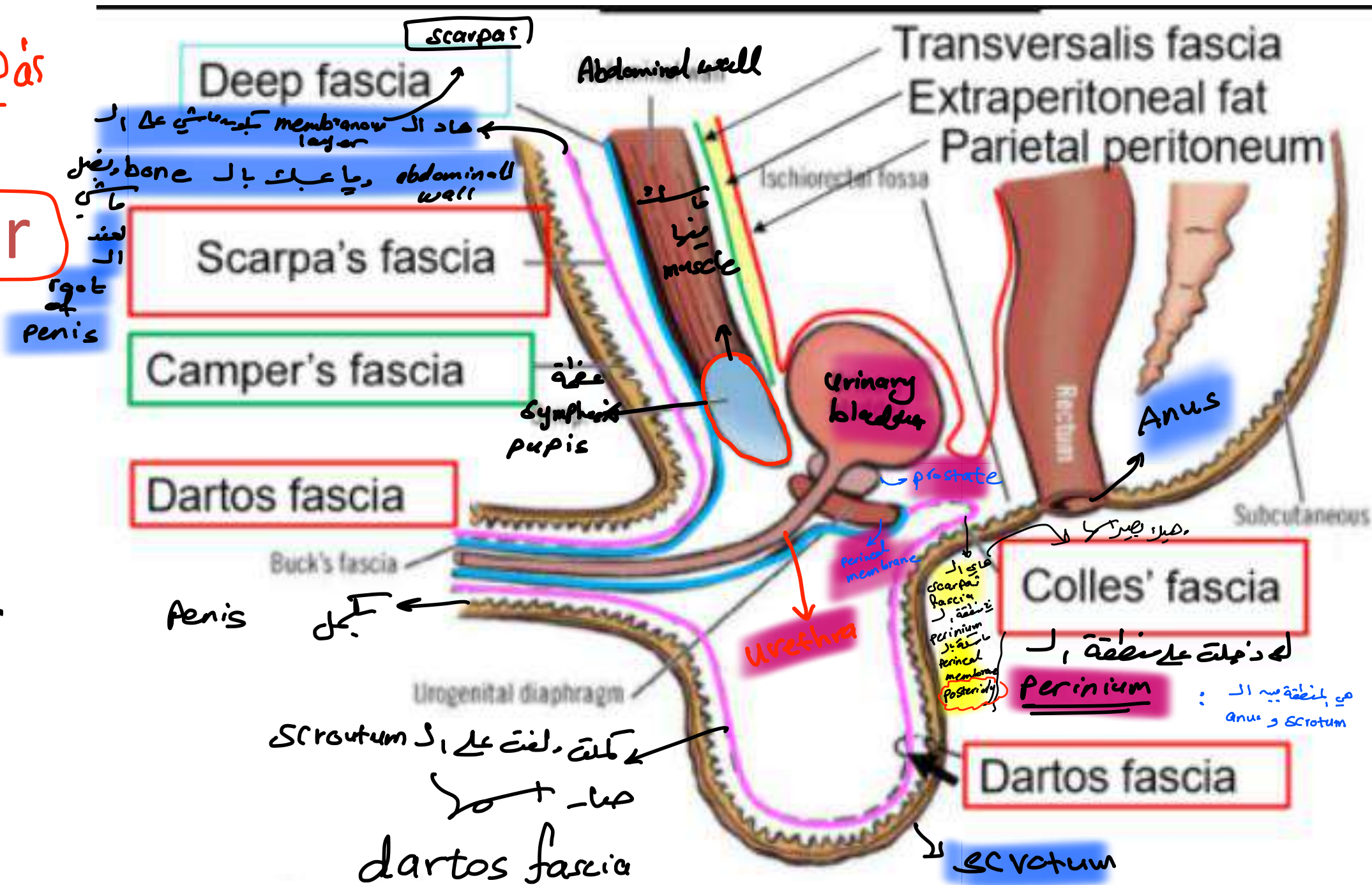


Anterior abdominal wall

Superficial Fascia

المقطع : sagittal

In the **midline inferiorly**, the **Membranous layer** of fascia is not attached to the **pubis** but forms a **tubular sheath** for the penis (or clitoris).



من هنا لوها في
من هنا penis مع تخرج
urine على هي المنطقة
lower part of abd

Anterior abdominal wall

Superficial Fascia

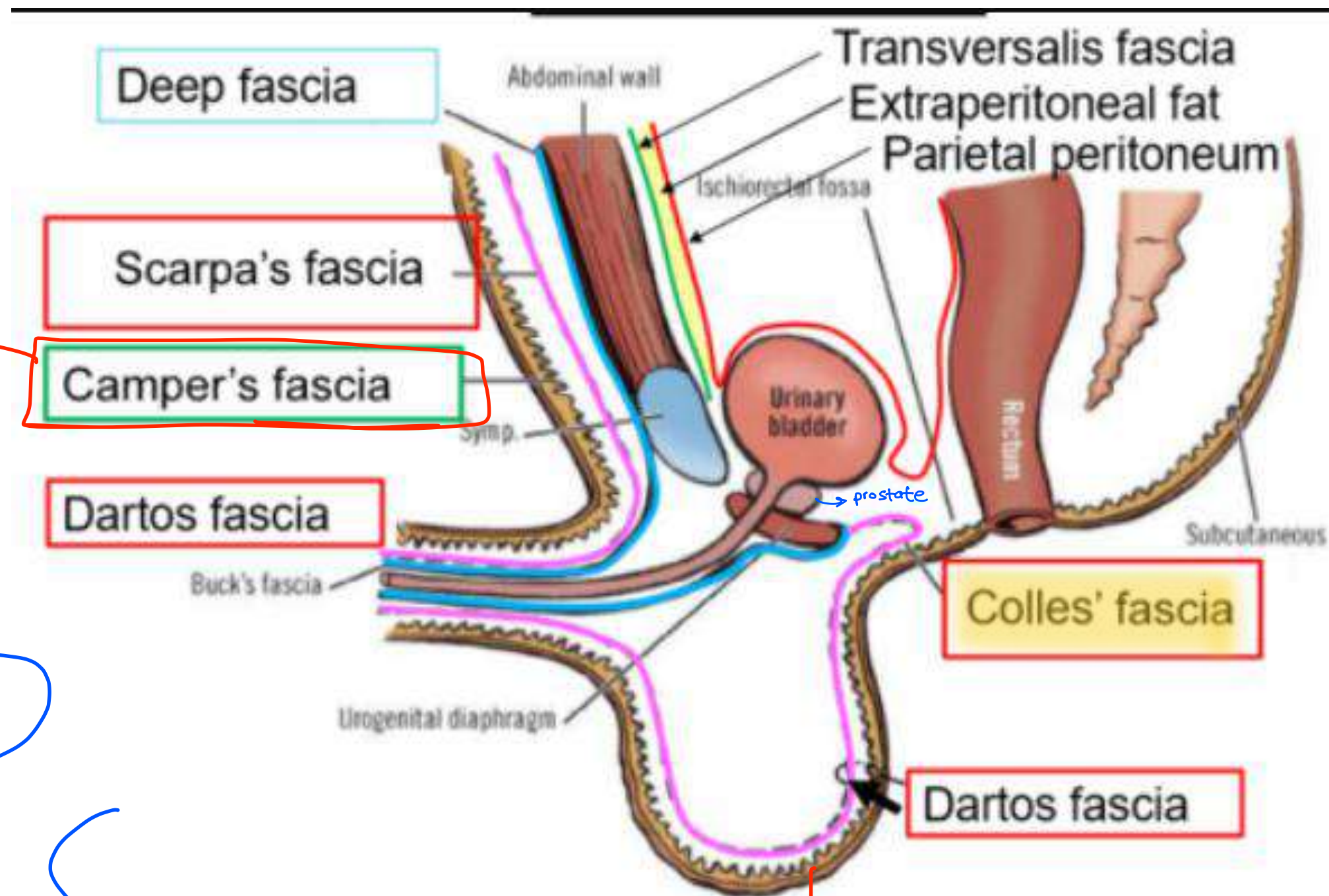
- Below in perineum, it enters the wall of scrotum (or labia majora).

تحقیق قومه ال
Peins

- From there it passes to be attached on each side to the margins of the pubic arch; it is here referred to as

Colles' fascia.

Pubic arch

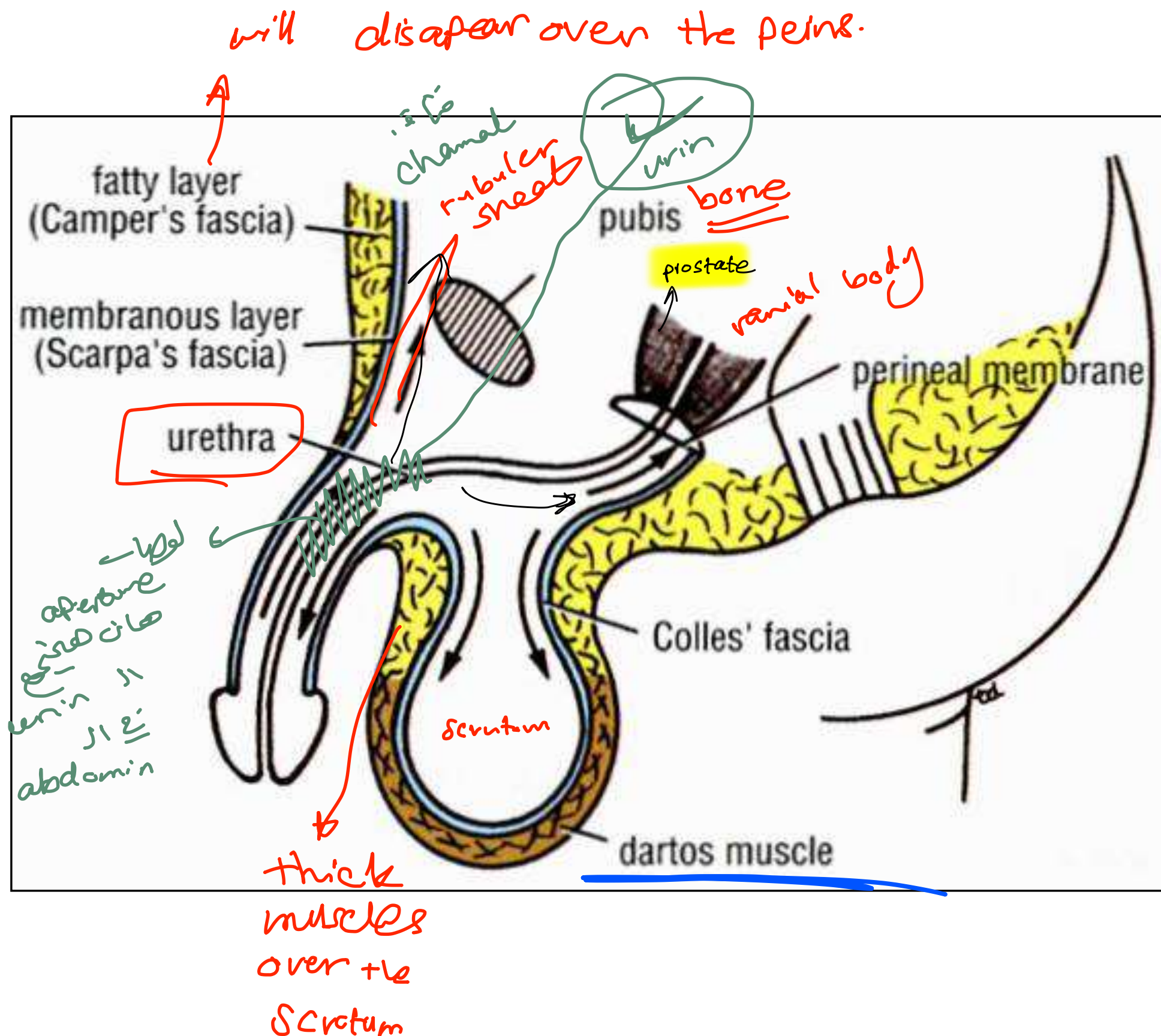


dartos muscle

Anterior abdominal wall

Superficial Fascia

- Posteriorly, it fuses with the perineal body and the posterior margin of the perineal membrane.



ظاهرة

GENERAL APPEARANCES OF ABDOMINAL WALL

قابلية

■ The normal abdominal wall is soft and pliable and undergoes inward and outward excursion with respiration.

حركة

شكل بطني

يضع لتوسع كبير

■ The Contour: is subject to considerable variation and depends on the tone of its muscles and the amount of fat in the subcutaneous tissue.

حركة السطح

■ Well-developed muscles or an abundance of fat can prove to be a severe obstacle to the palpation of the abdominal viscera.

عقبة

Abdominal Contour

Abdominal profiles



Flat



Rounded



Scaphoid



Protuberant

Symphysis pubis Costal margin

Flat

Scaphoid

Rounded

Protuberant

کند و بمایه

مفنه

CLINICAL SIGNIFICANCE OF MEMBRANOUS LAYER OF SUPERFICIAL FASCIA

- It is important clinically because beneath it is a potential closed space that does not open into the thigh but is continuous with the superficial perineal pouch via the penis and scrotum.

فascia lata

perineum جزء

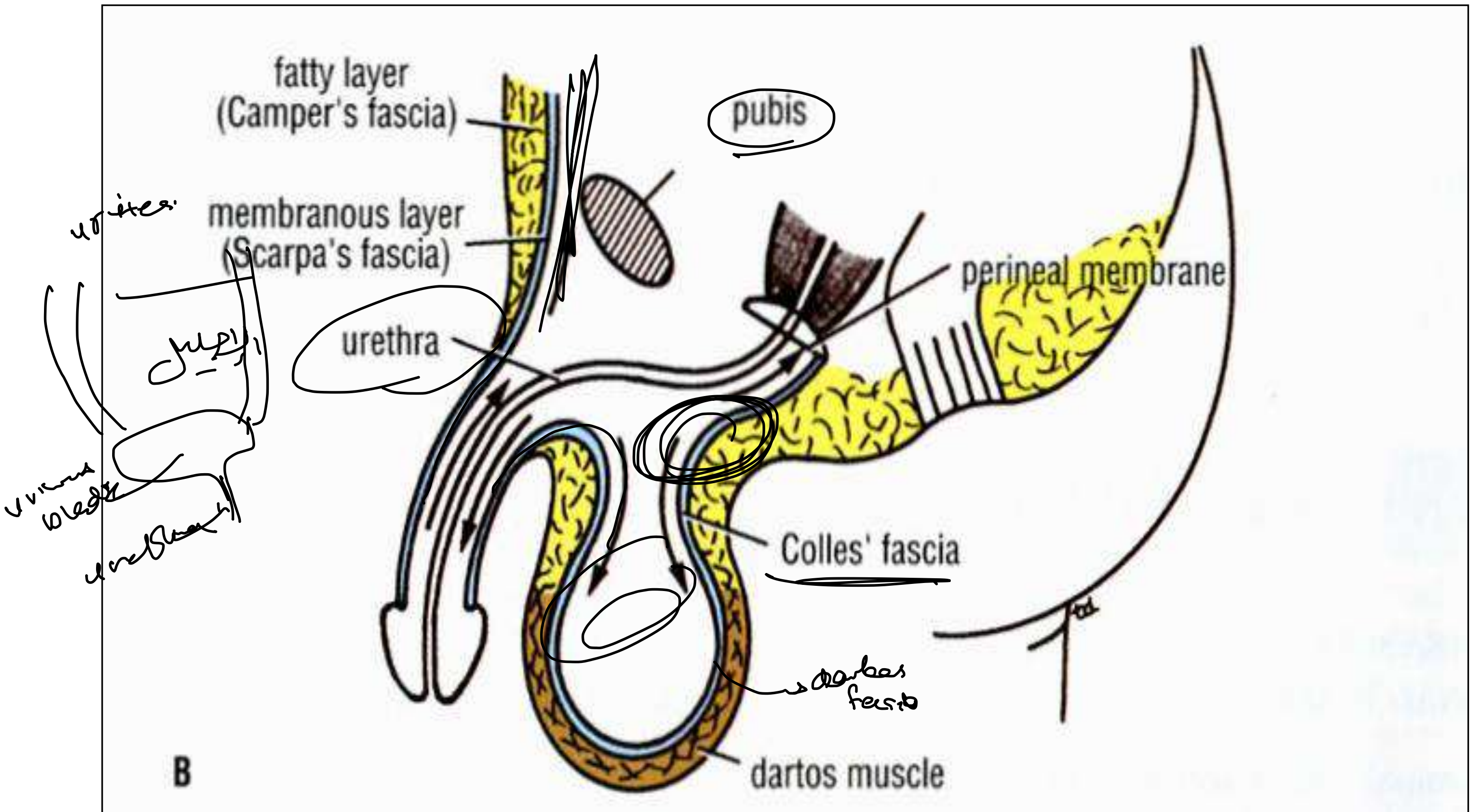
penis جايه

- Rupture of the penile urethra may be followed by extravasations of urine into the Scrotum, Perineum and Penis and then up into the lower part of the anterior abdominal wall deep to the membranous layer of fascia.

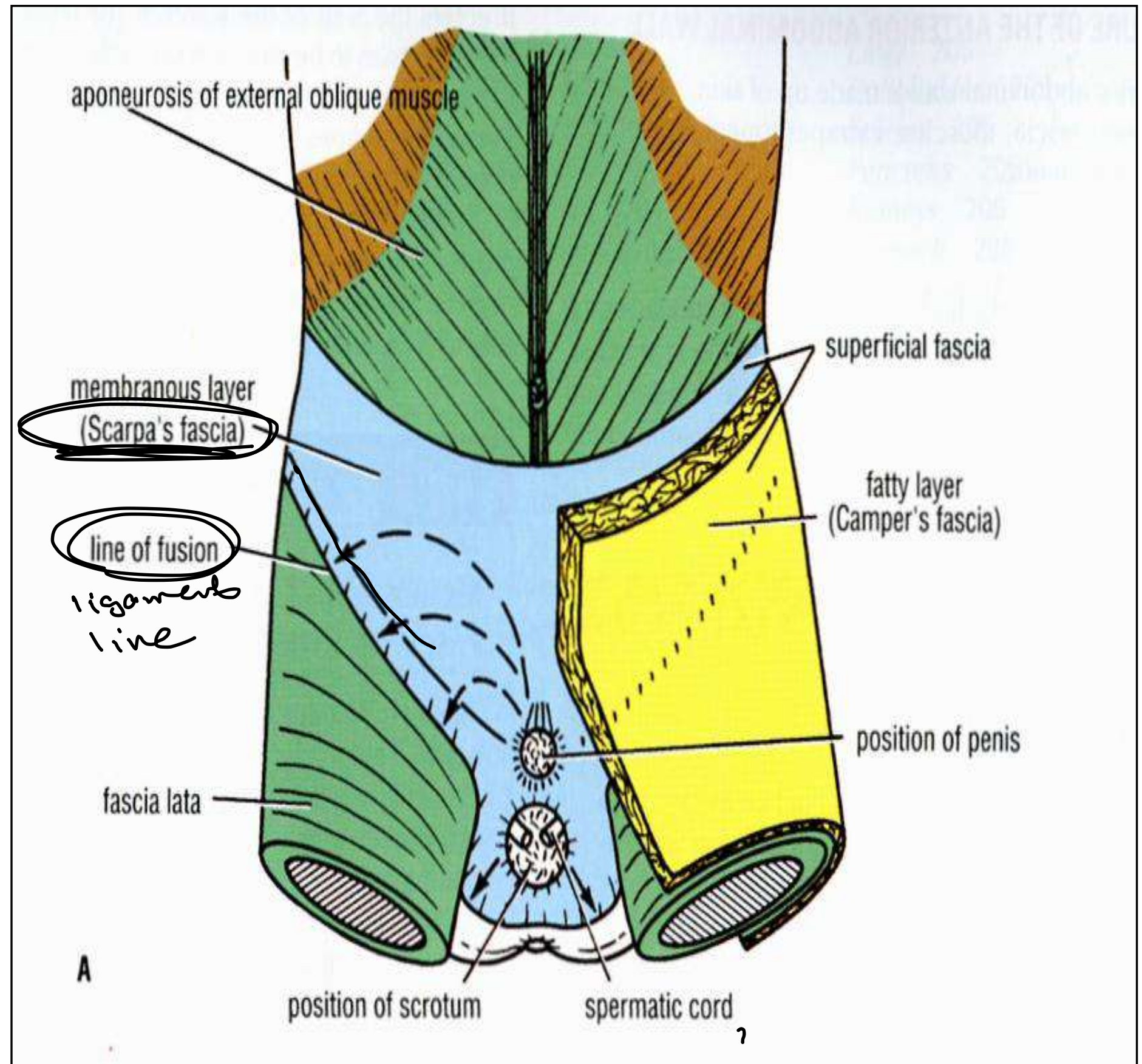
NOTE

* نسيان بطلع جاي urine جاي
scarpa's fascia جايه abdominal cavity
fascia lata جايه thigh جاي

MEMBRANOUS LAYER OF SUPERFICIAL FASCIA AND THE EXTRAVASATION OF URINE

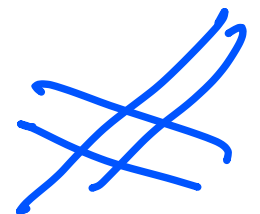


- The urine is excluded from the thigh because of the attachment of the fascia to the fascia lata.



Deep Fascia (NO deep Fascia??)

- The deep fascia in the anterior abdominal wall is merely a thin layer of connective tissue covering the muscles; it lies immediately deep to the membranous layer of superficial fascia.



Muscles of Anterior Abdominal Wall

* لينة الجسم oblique
نصف اتجاه ال fiber جاي بيل

Muscles of Ant. Abd. Wal

External oblique

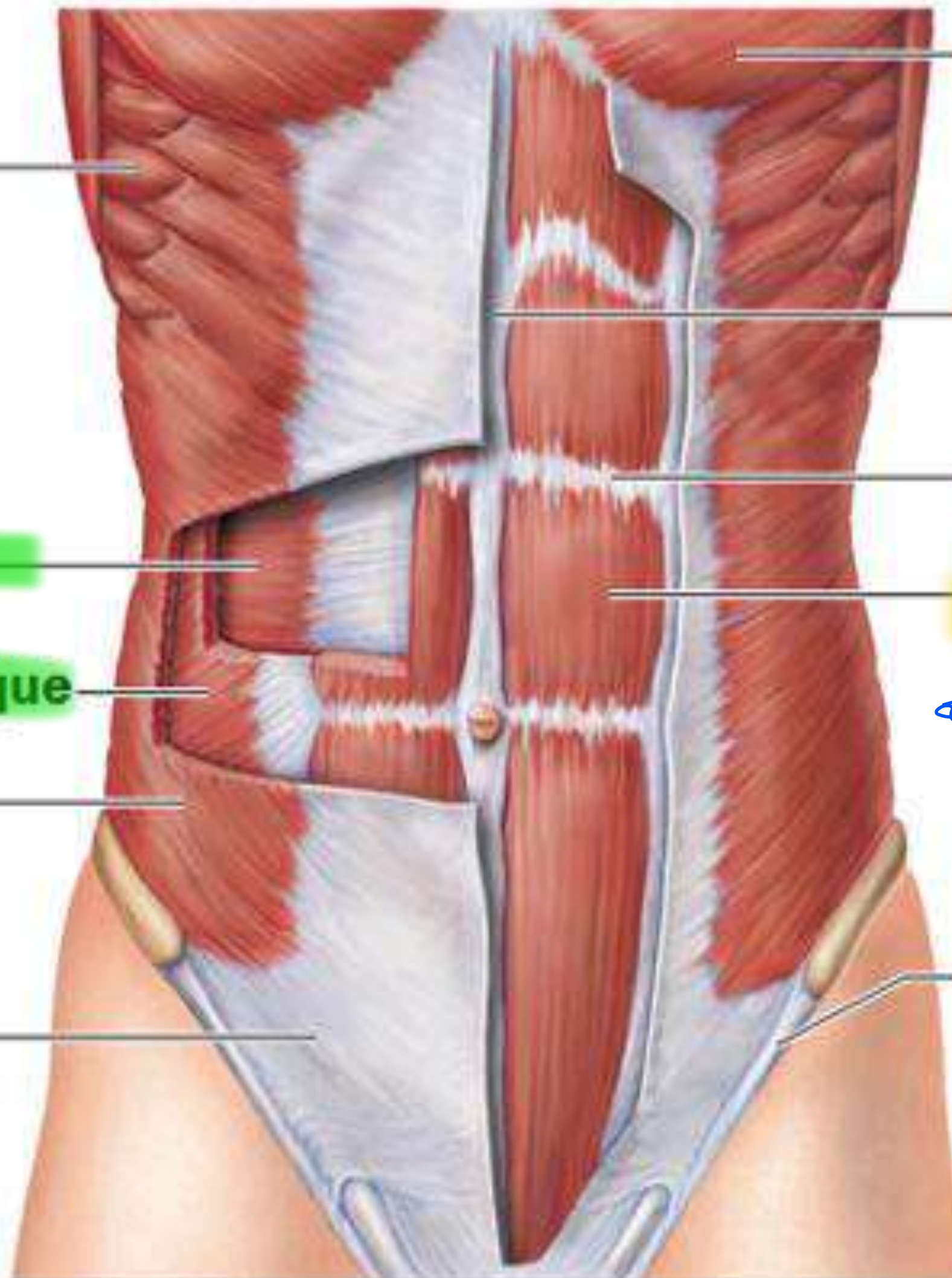
Internal oblique

Transversus abdominis

oblique fiber

In addition to the Rectus Abdominis in the midline, a small muscle called Pyramidalis

نصف عند اصل



Serratus
anterior

Pectoralis major

خط ابيض
لونه
aponeurosis

Linea alba

Tendinous
intersection
Rectus
abdominis

شريط

aponeurosis: strong
fibrous sheet

Transversus
abdominis

Internal oblique

External
oblique

Aponeurosis
of the external
oblique

Inguinal ligament
(formed by free
inferior border of
the external oblique
aponeurosis)

8

2

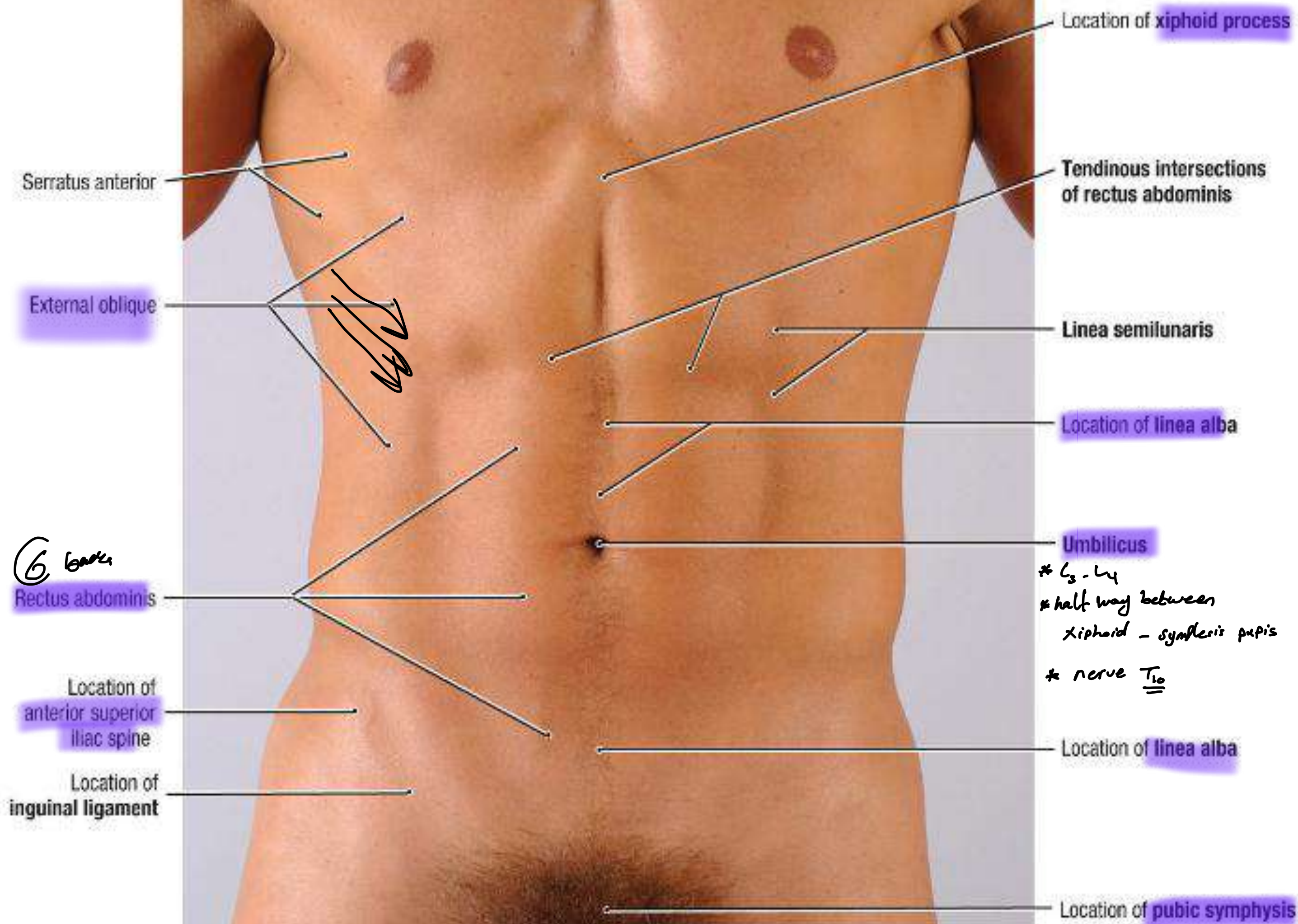
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Note: :

* كل عضلة لها tendon
لما تكون العضلة عريضة sheath
يسمى aponeurosis

↓
هو fibrous sheath قوي
flat
تكون العضلة لحمية fleshy
بعد ما يصير لها aponeurosis
aponeurosis لحمية بعد خ aponeurosis لحمية
بجملته الانتفاخ جزء أبيض يسمى
Linea alba

* ليش لونه أبيض ؟
لأنه aponeurosis



Serratus anterior

Location of xiphoid process

Tendinous intersections of rectus abdominis

External oblique

Linea semilunaris

6 bands
Rectus abdominis

Location of linea alba

Location of anterior superior iliac spine

Umbilicus

* L₃-L₄
* half way between xiphoid - symphysis pubis
* nerve T₁₀

Location of inguinal ligament

Location of linea alba

Location of pubic symphysis

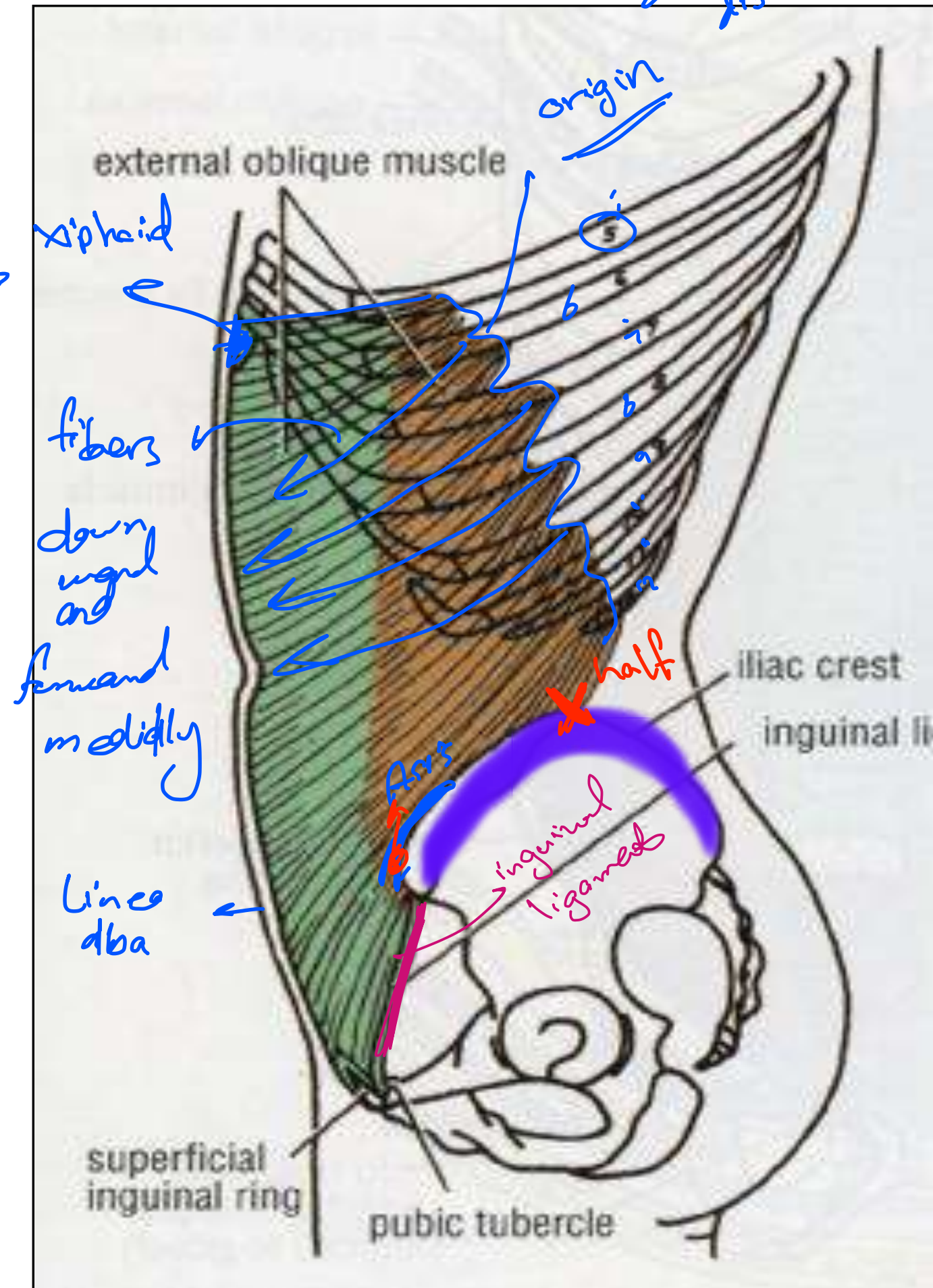
Anterior View

External Oblique Muscle

عرضية ورقية اي لينة

- Is a broad, thin muscular sheet.
- Origin: From the outer surfaces of the lower 8 ribs by Fleshy Digitations.
(5-12) 8 خضرة ribs
- Fibers runs Downward, Forwards and Medially.
- Inserted: by a broad aponeurosis into the:
Strong fibrous sheath
 - Xiphoid process.
 - Linea alba.
 - Pubic crest.
 - Pubic tubercle.
 - ASIS. (Anterior Superior Iliac spine)
 - Anterior half of the iliac crest (Fleshy).

outer surfaces of lower 8 ribs by fleshy digitations



Note:

iliac Crest

يوجد بها نقطة هي

the most prominent part

في قمة الـ Hib

هي المنطقة التي يا آية
تعلق عليها الحزام

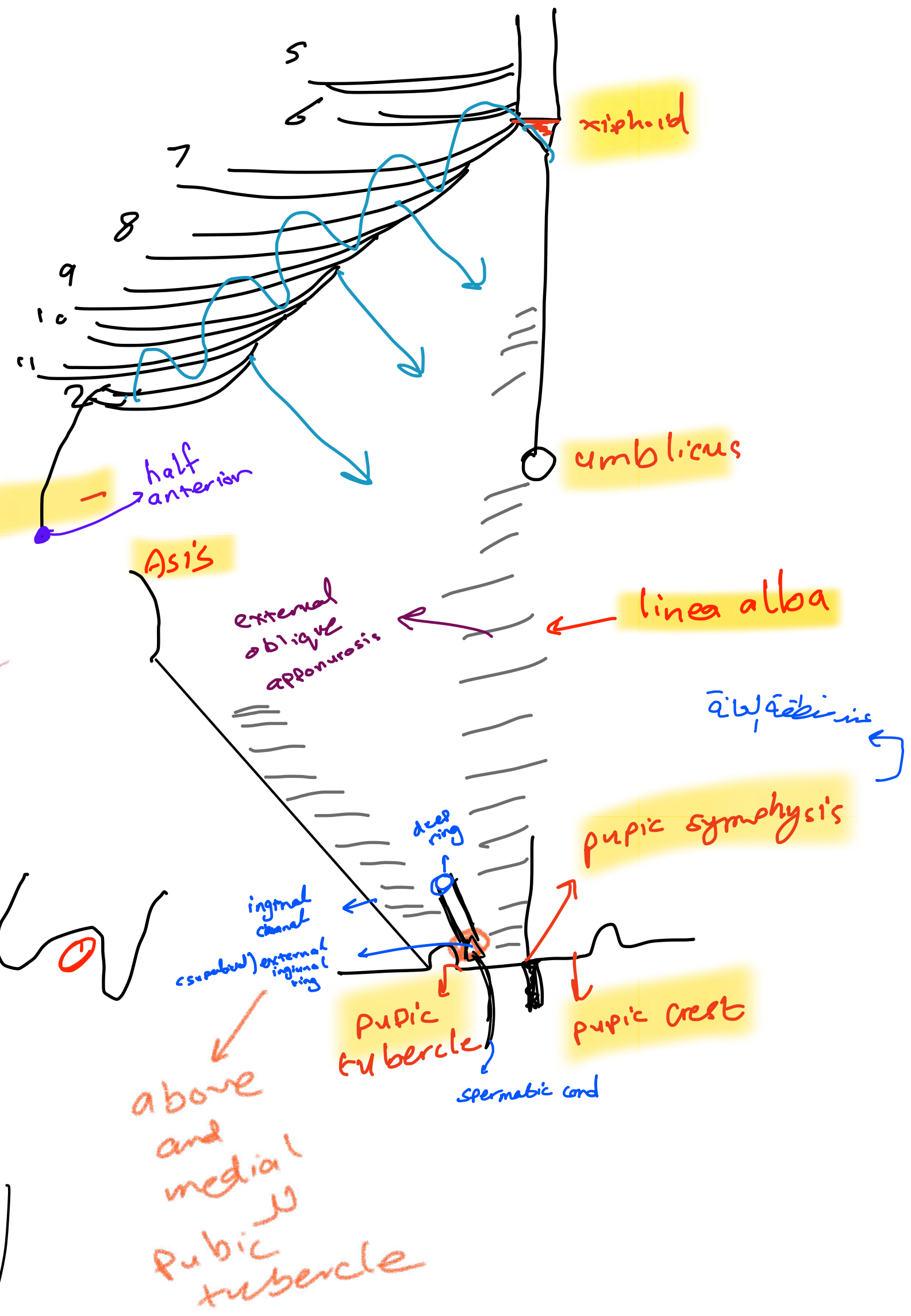
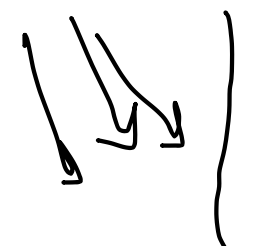
تسمى

Anterior superior iliac spine (ASIS)

التي

fibrous

downward
forward
medial



وعلى قمة الـ (hip)
iliac

Hib bone

Note:

في أشياء يتطالع به الـ abdomen
دندك على الـ scrotum
لأنها تكون حلقة باشي طالع
فوه هوا spermatic cord
الحضية هـ علم لا سبريولو جي
هي يتكلمو أ. ت. في البطن ثم تنزل
كيف اختبرتم الـ abdominal wall
لعمري طريقه خفاة

above
and
medial
pubic
tubercle

Notes :-

* ويره موجوده ال external inguinal ring
 له فاخته ال external oblique aponeurosis

* defect triangular

in

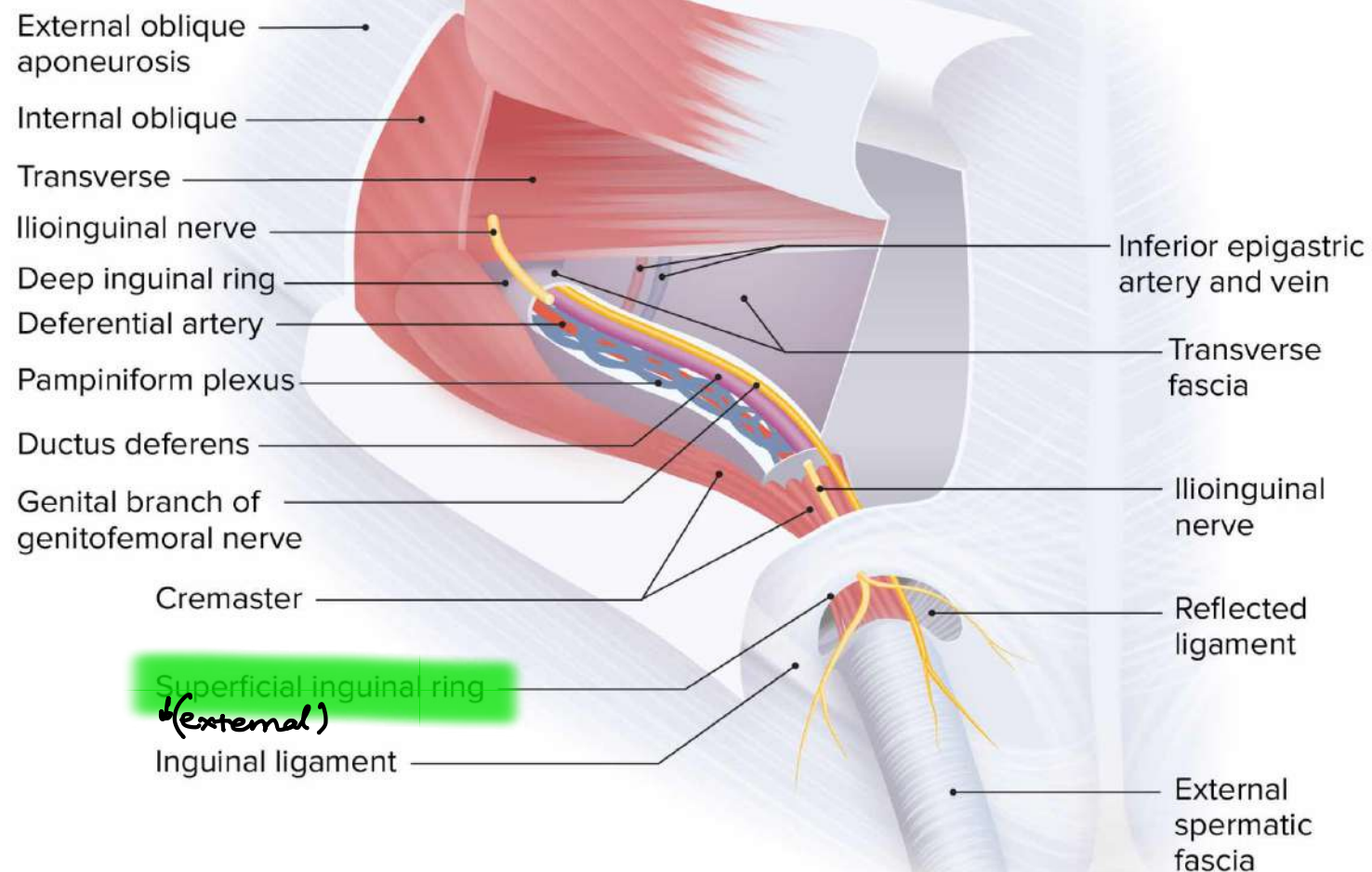
external oblique aponeurosis

* وعلاقه ال external inguinal ring
 ال pubic tubercle ال superior and medial

IS

* عند ال female فاخته spermatic cord

لذلك يقابلها round ligament of the uterus.

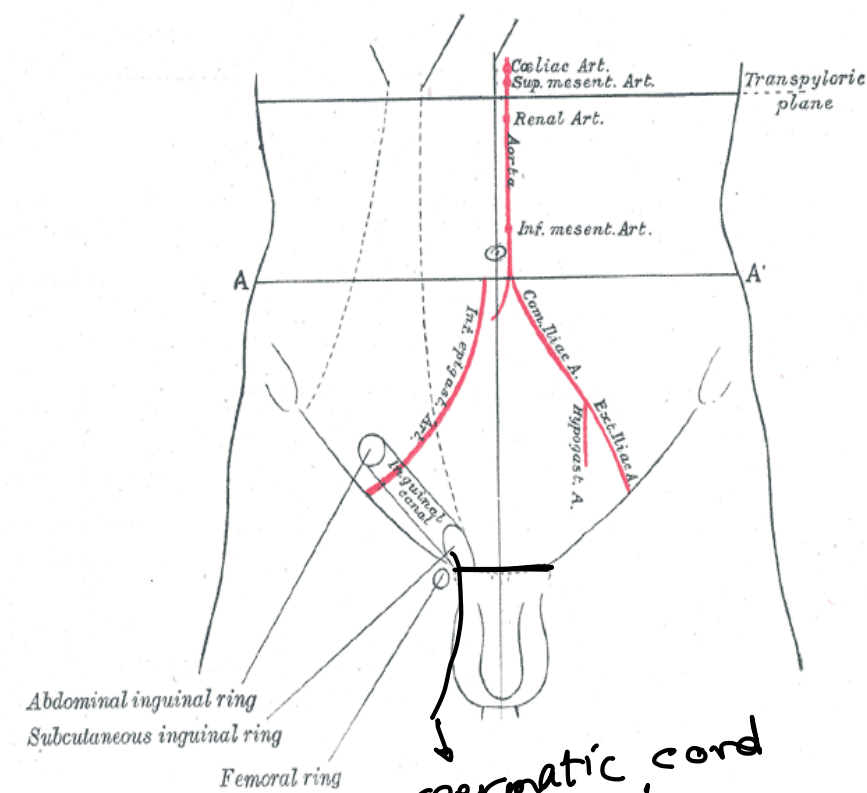


كل شيء من ال female يقابلها عند ال male

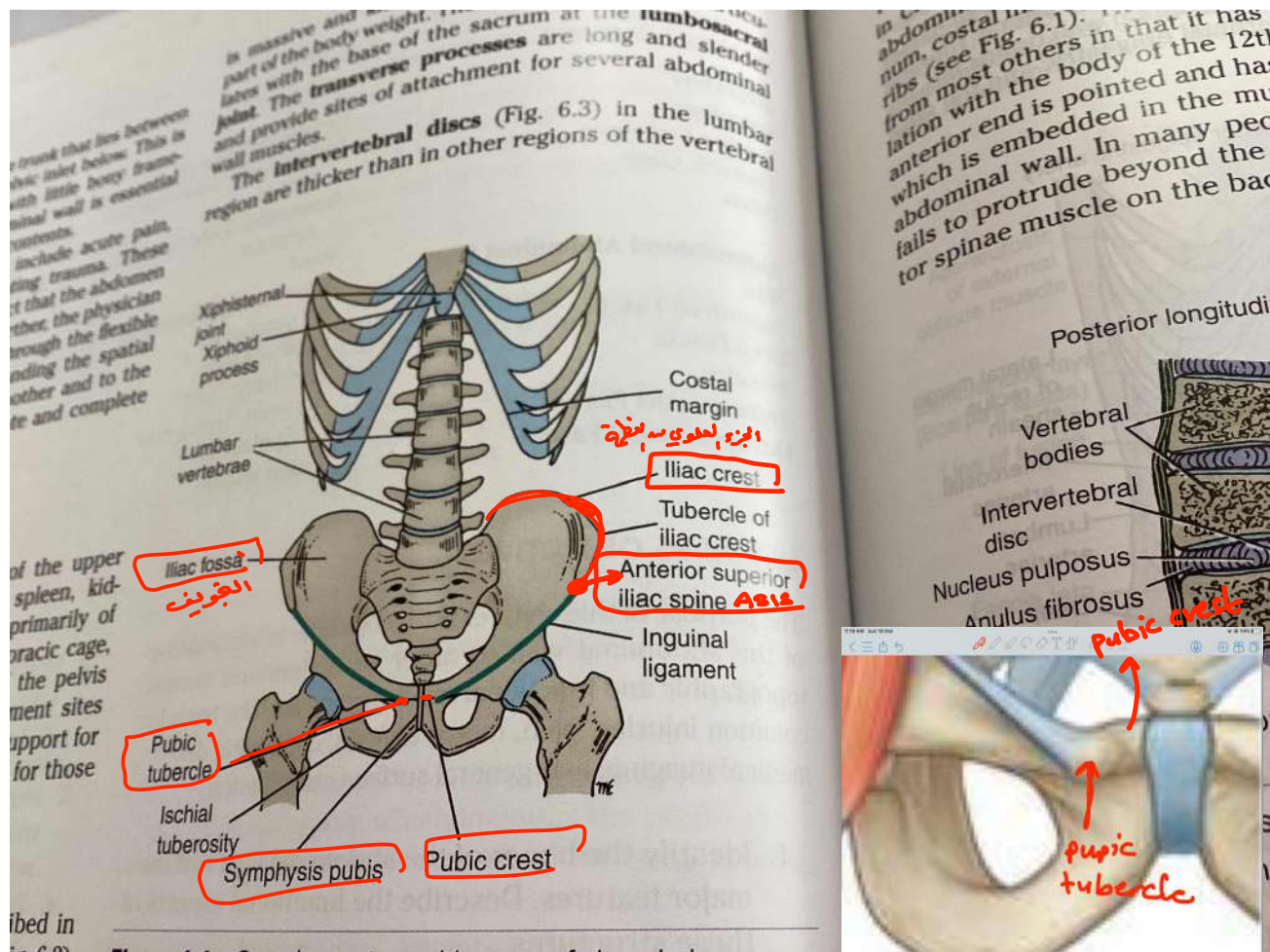
spermatic cord → round ligament

scrotum → labia majora

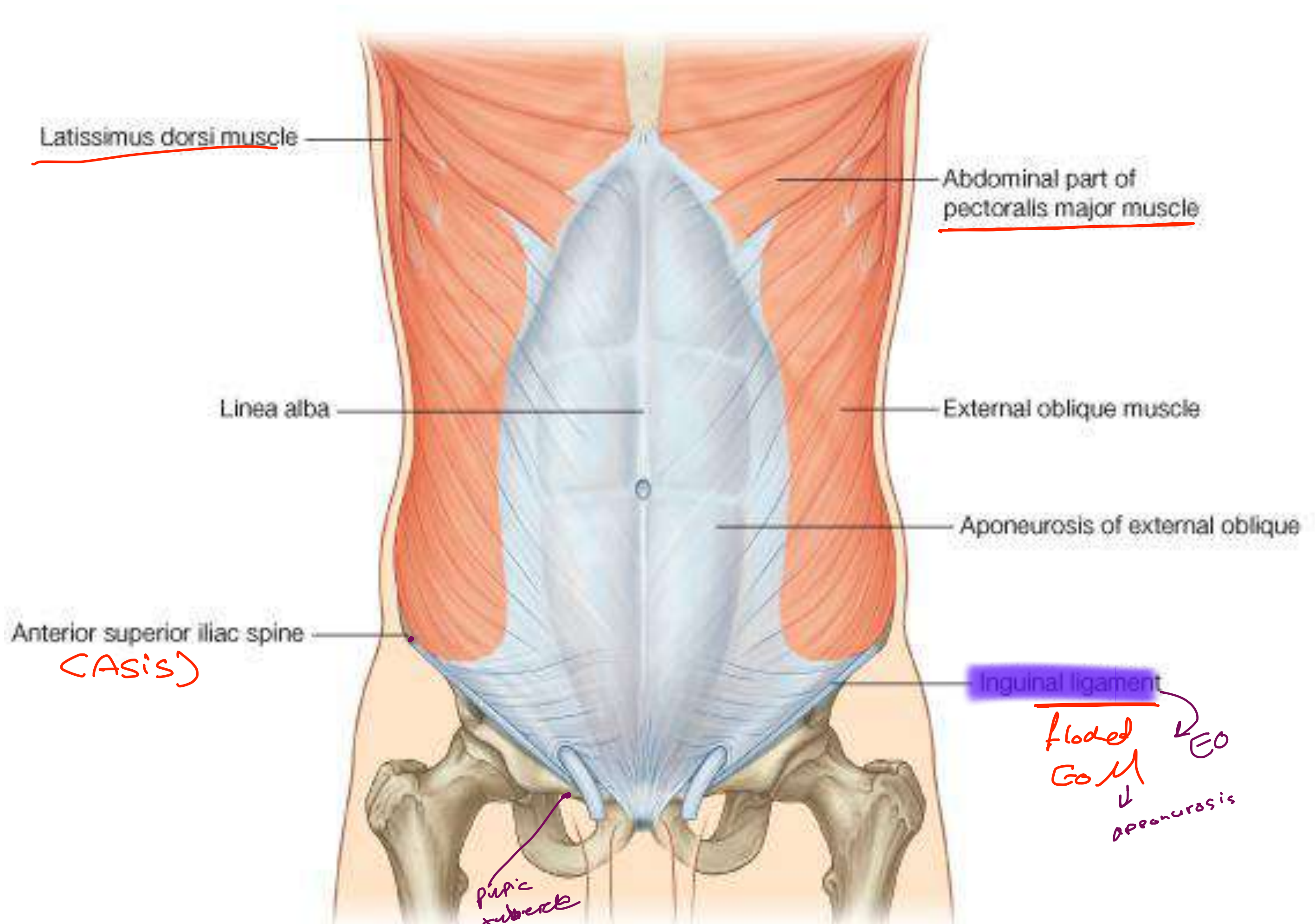
penis → clitoris

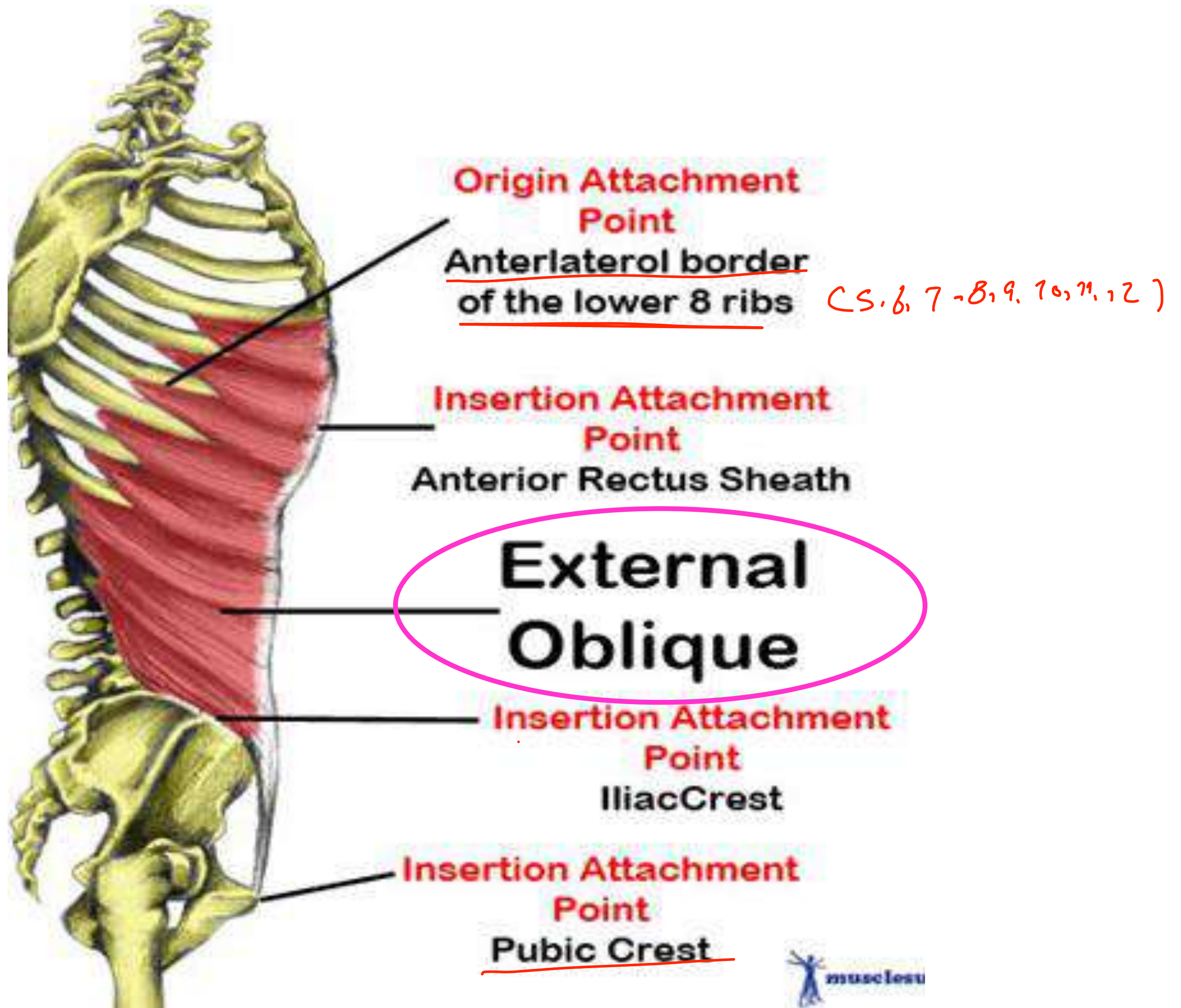


testis ال spermatic cord
 يصل blood supply ال
 +
 ماء خال من sperm (vas deference)



External Oblique Muscle

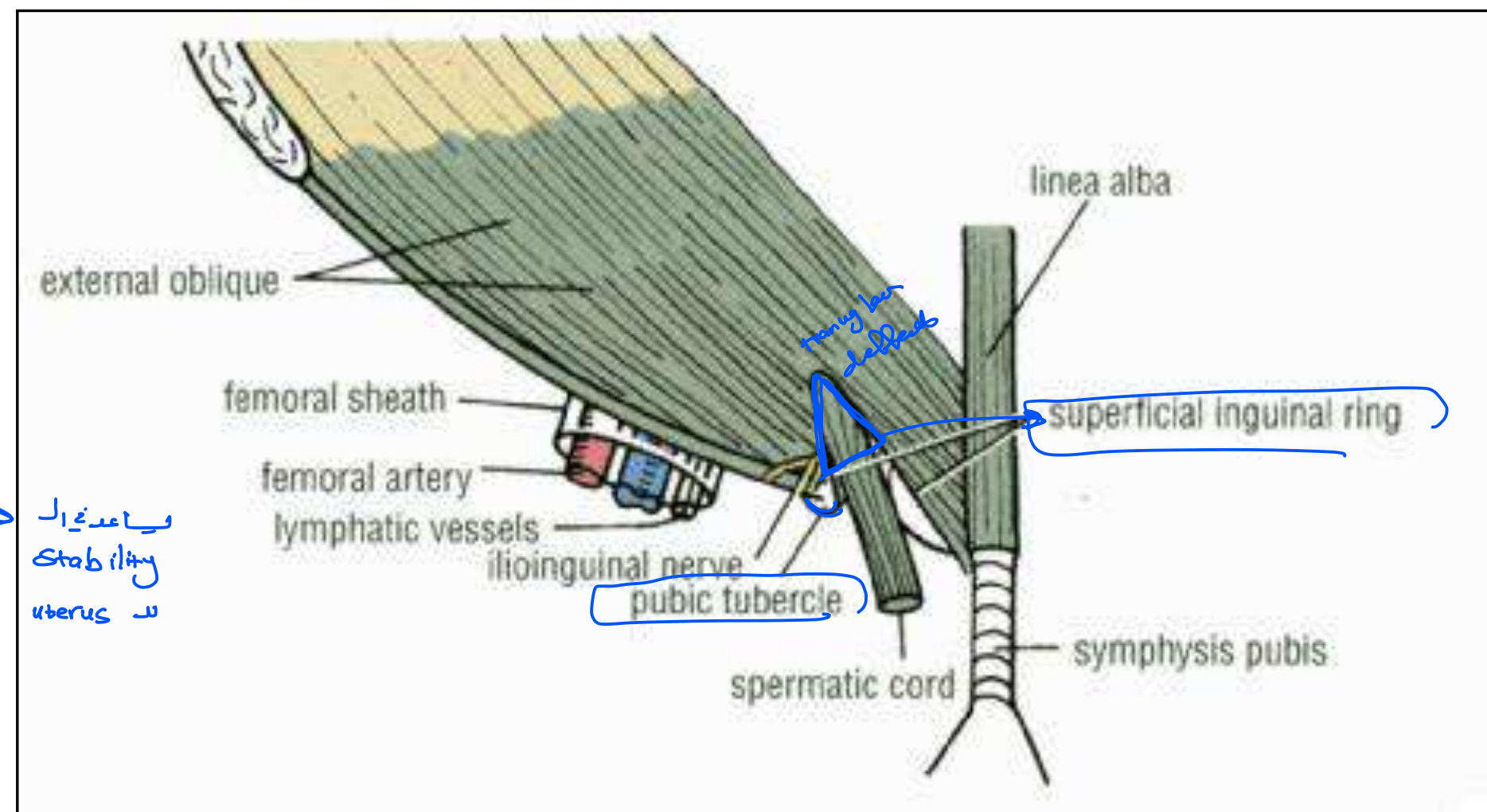
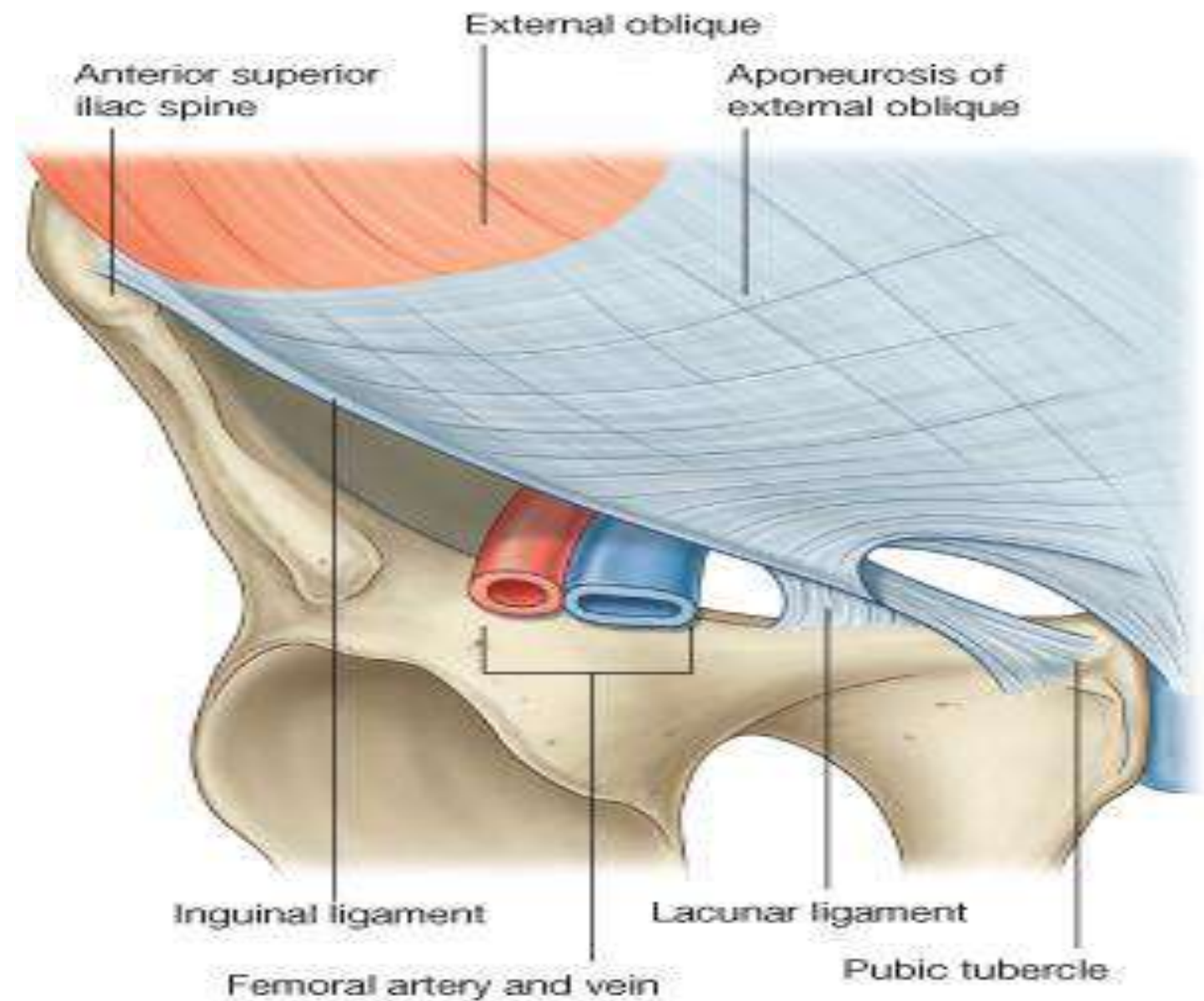




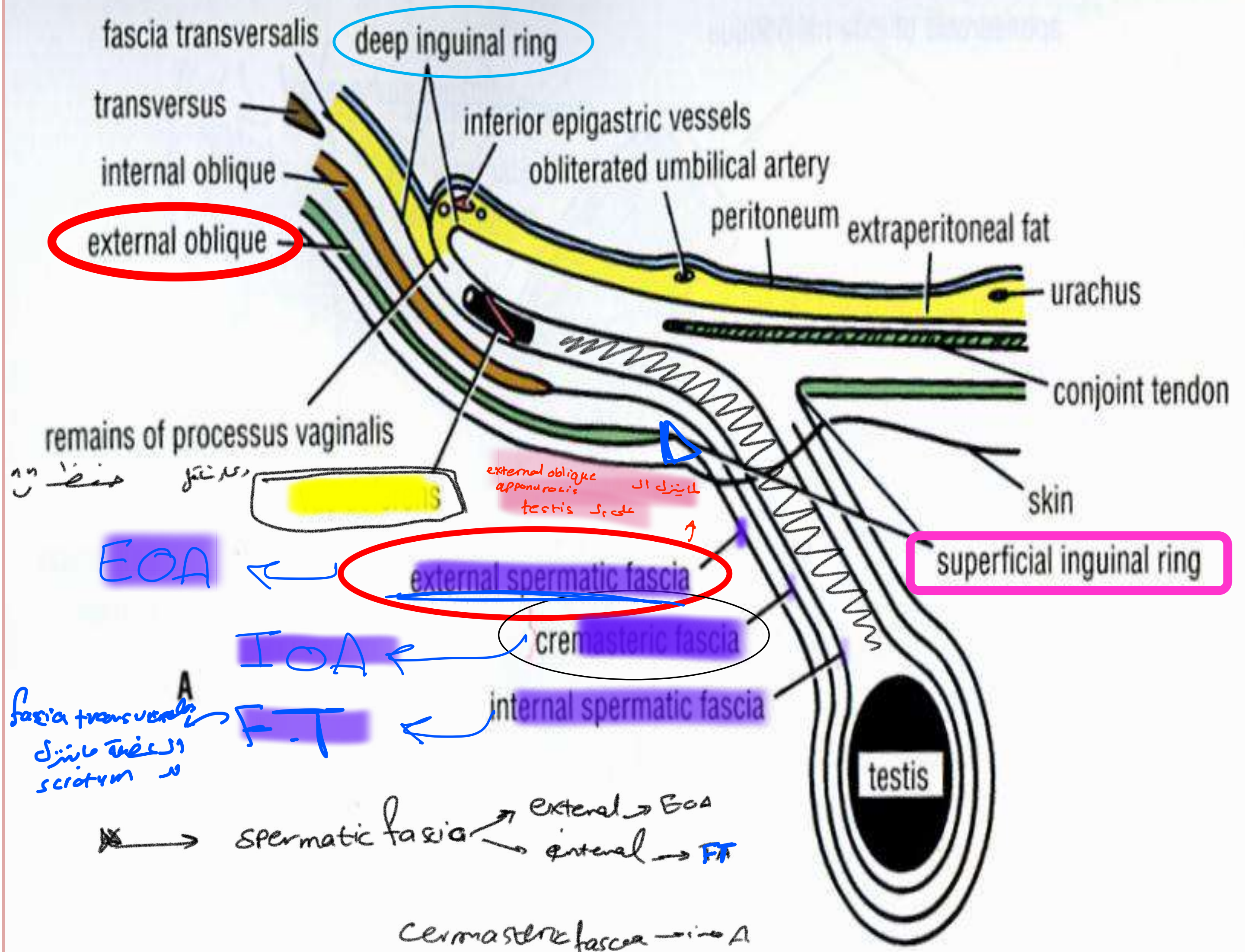
Superficial (External) Inguinal Ring :

- is a **Triangular** shaped defect in the external oblique aponeurosis lies immediately above and medial to the Pubic Tubercle.

- It transmits the Spermatic Cord (or Round ligament of the uterus) in females.



male
female
Sperms
testes
Blood supply
uterus
Stabilizing
uterus



- Between the anterior superior iliac spine and the pubic tubercle the lower border of the aponeurosis is folded backward on itself, forming **Inguinal ligament**

افرن صوا عباة من EOA على fold
ASIS → P.T

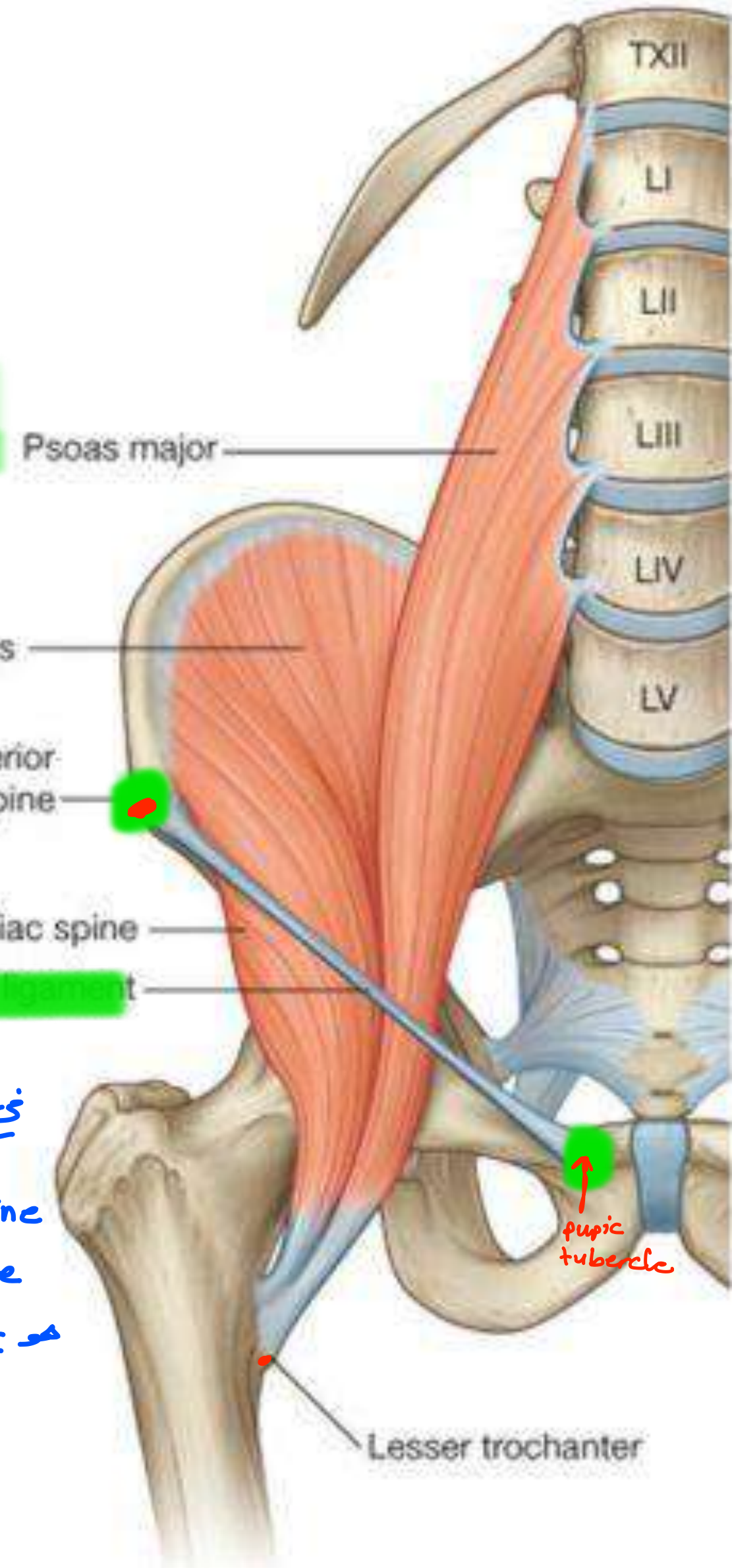
- From the medial end of inguinal ligament, the **lacunar ligament** extends backward and upward to the pectineal line on the superior ramus of the pubis.

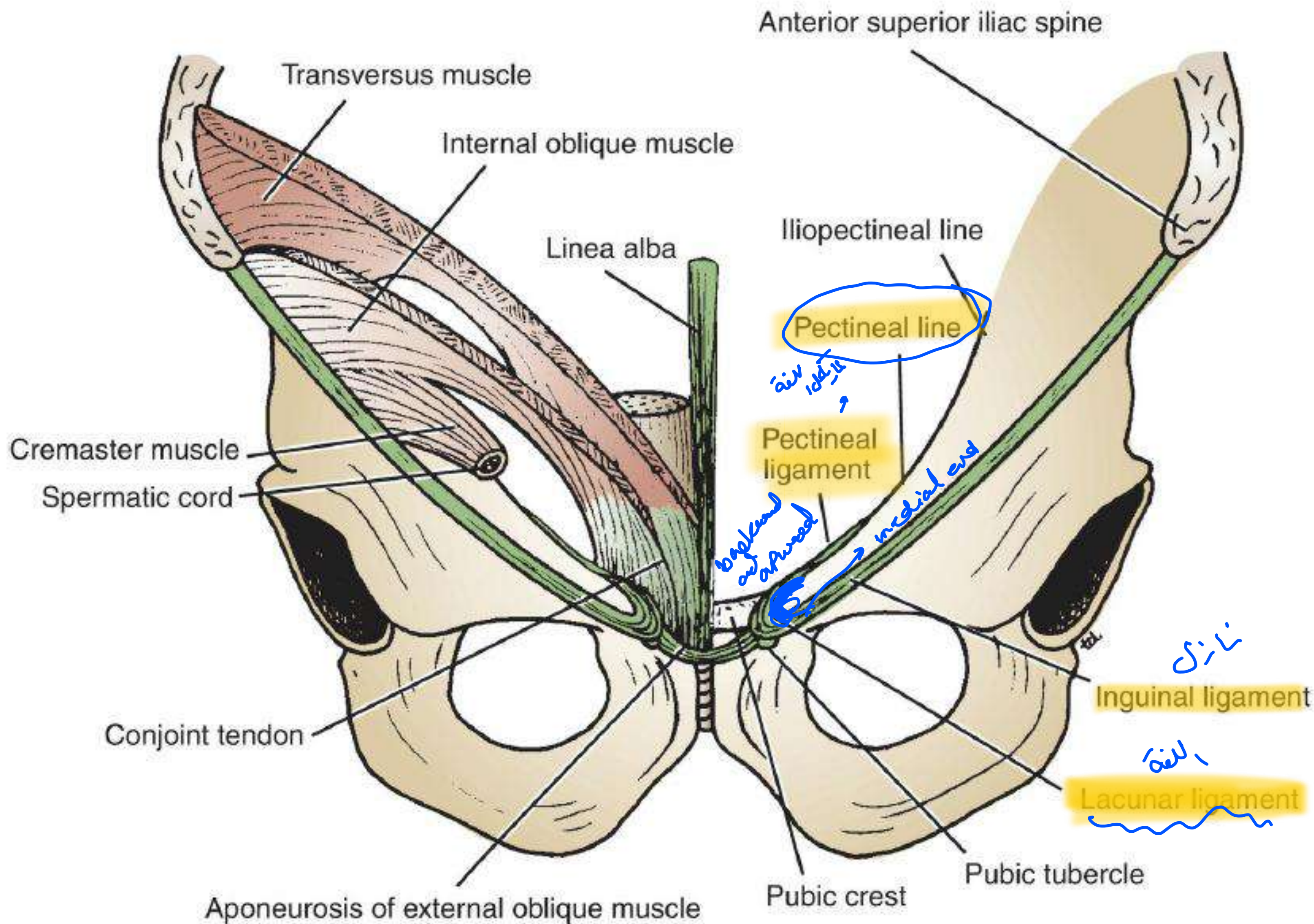
هو كبر لفافل
بين ال
abdominal
wall
ال
thigh
بعد ما يرفف
اضبع بقية

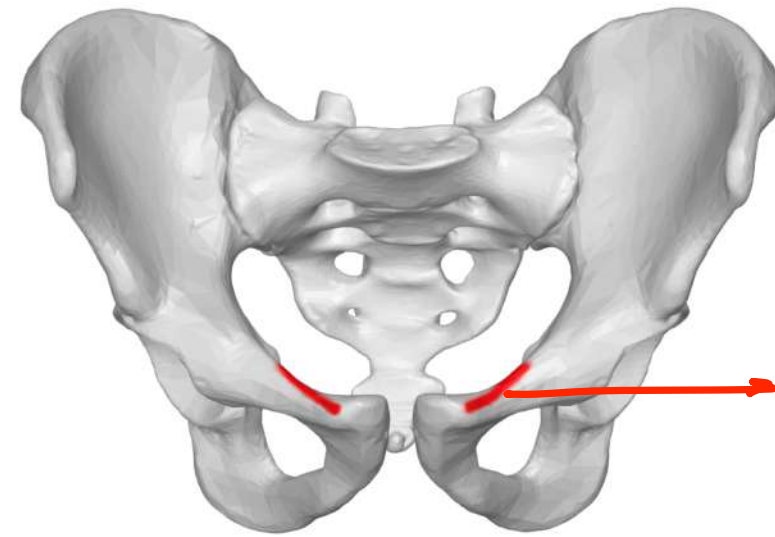
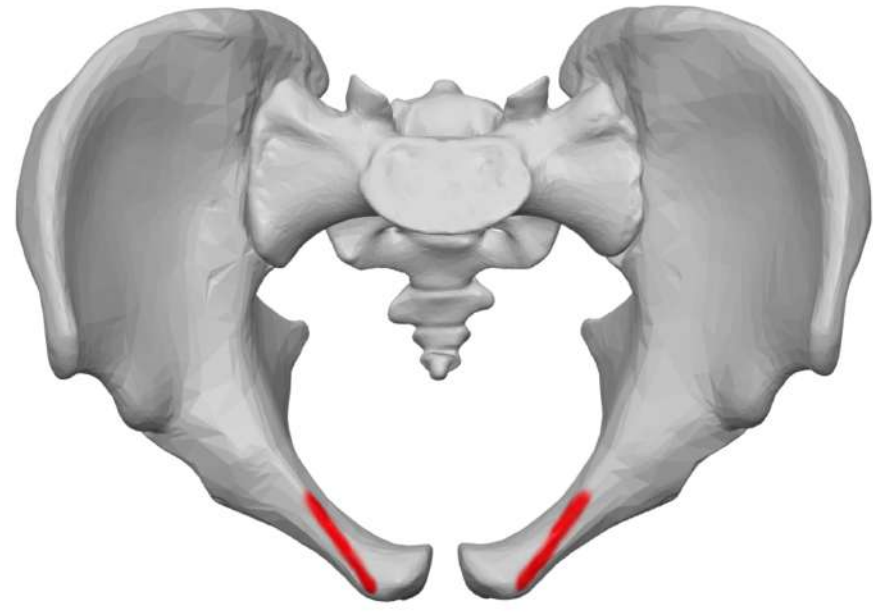
fan lota

في وبار ال
Pubic tubercle
line
Pectineal line

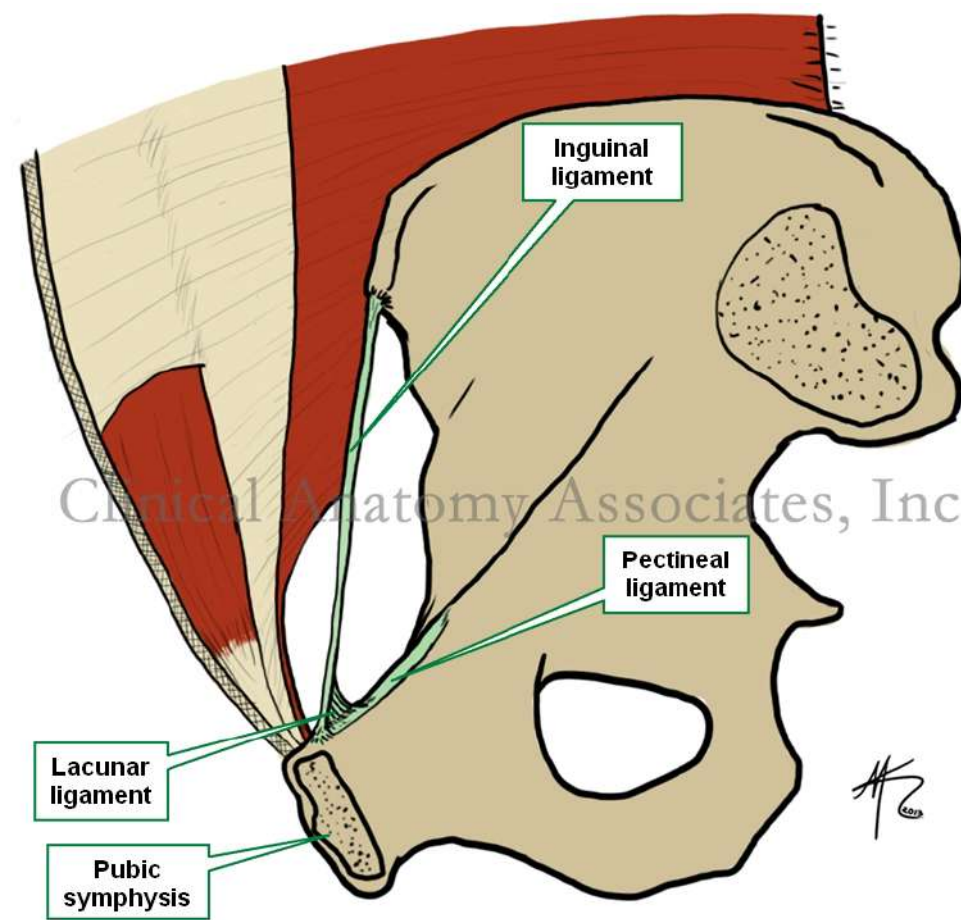
هو برون في ال
Hib bone







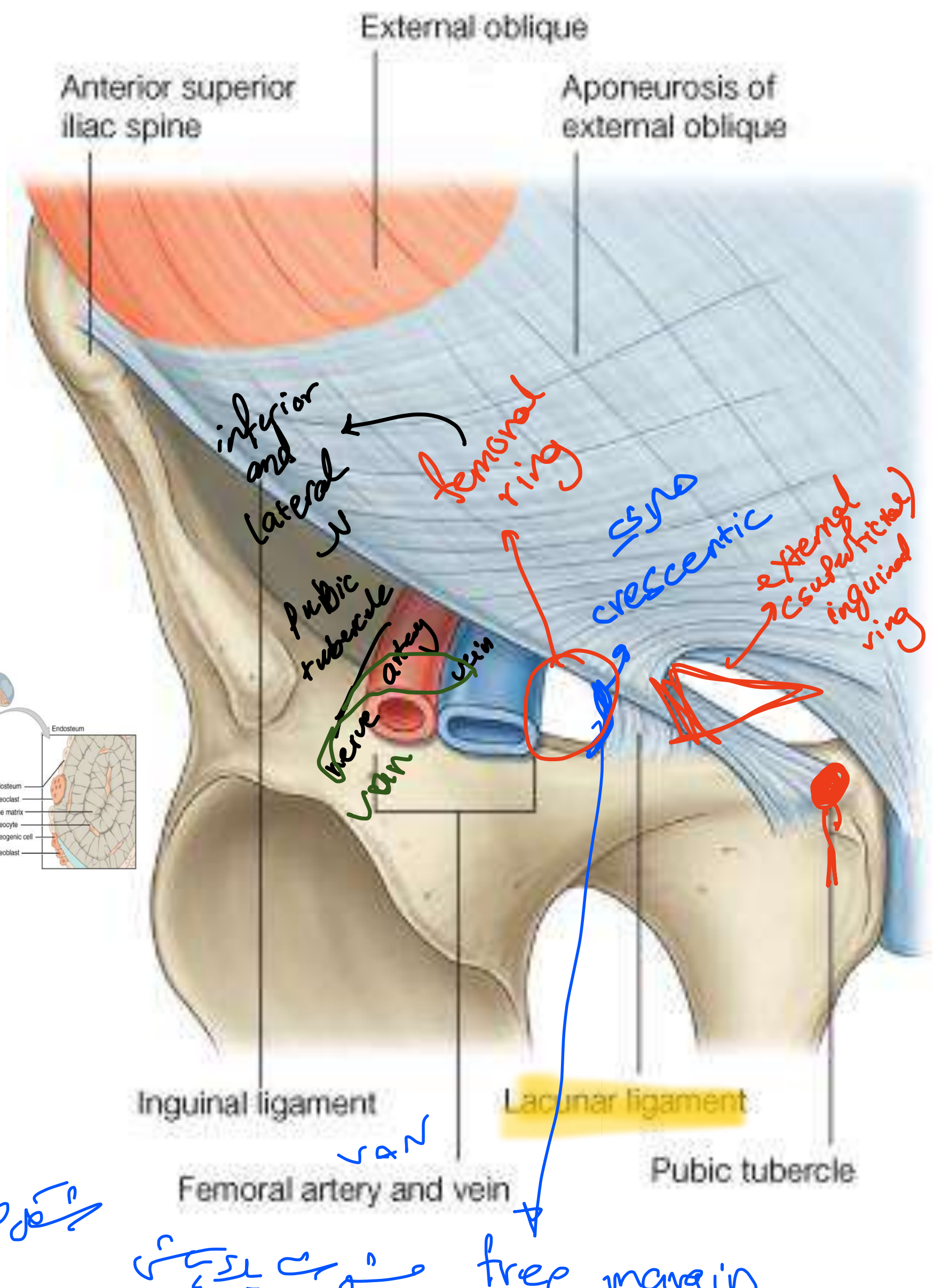
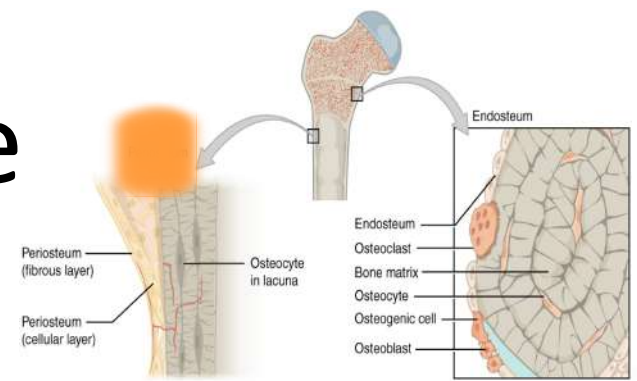
→ pectineal Line

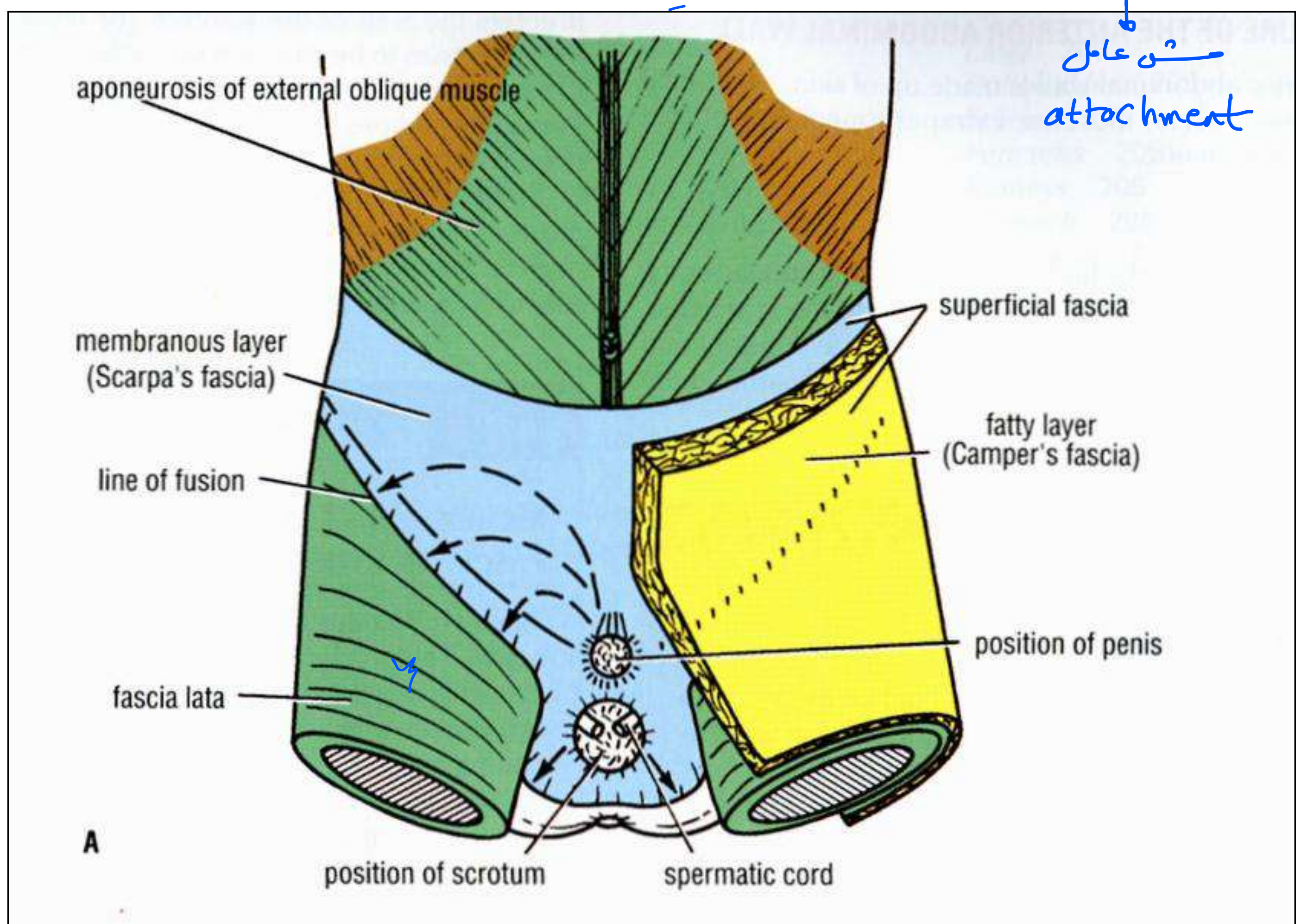


■ The sharp, free
 crescentic edge of the
 lacunar ligament forms
 the Medial Margin of
 the Femoral ring .

medially = Lacunar ligament
 Laterally : femoral vein

■ On reaching the
 pectineal line, the
 lacunar ligament
 becomes continuous
 with a thickening of the
 periosteum called the
 pectineal ligament.





- To the **inferior rounded border** of the **inguinal ligament** is attached the **deep fascia** of the thigh, the **Fascia Lata**.

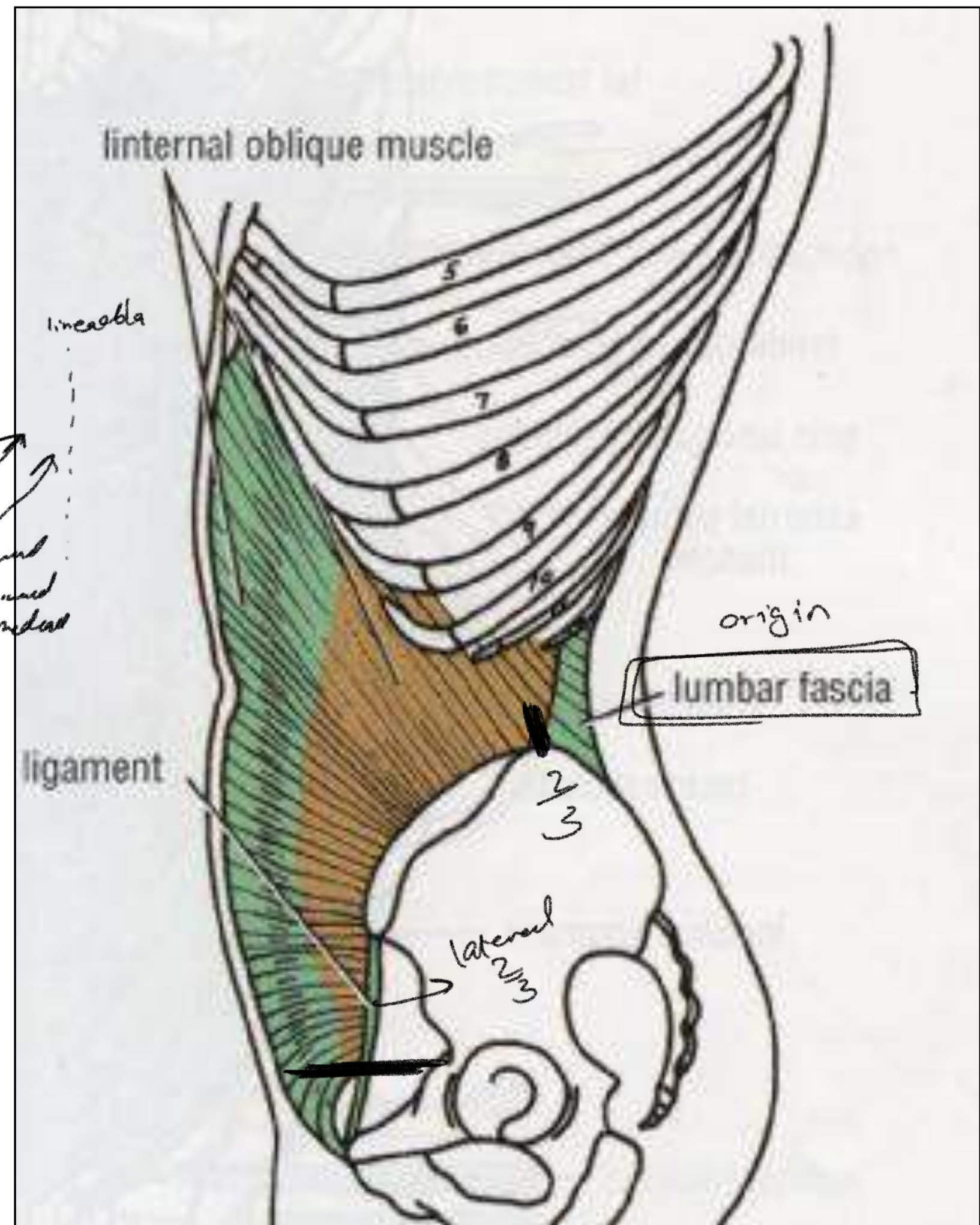
Internal Oblique muscle

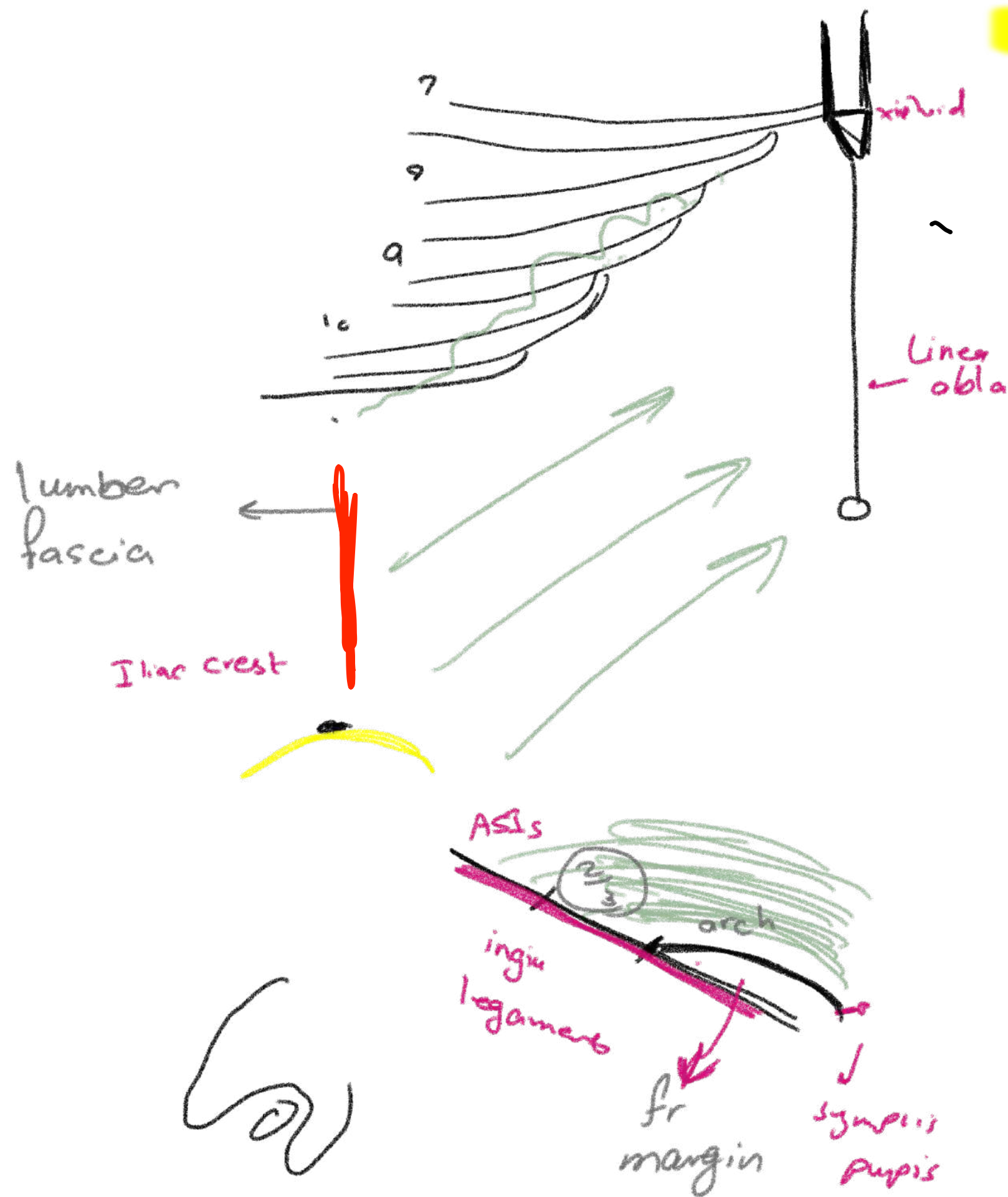
- A broad, thin, muscular sheet that lies Deep to the external oblique;
سنية عريضة
superficial

- Its fibers run *Upward Forward and Medially*
من اصله
الطرف الداخلي
الطرف العلوي

Origin:

- Lumbar fascia.
- Anterior 2/3 of iliac crest.
- Lateral 2/3 of inguinal ligament.





Origin:

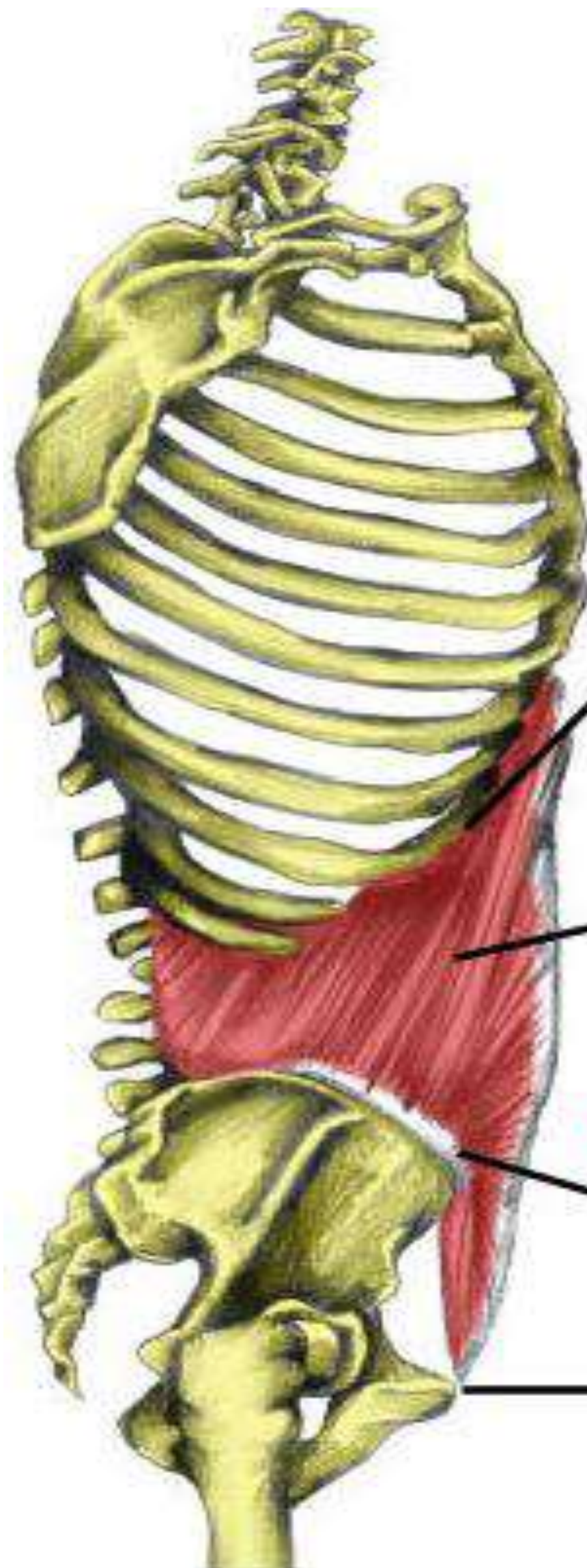
- * Lumbar fascia
- * $\frac{2}{3}$ Iliac crest Anteriorly
- * $\frac{2}{3}$ Lateral inguinal ligament

Insertion:

- * Xiphoid
- * Lower border 3-4 lower ribs
- * Linea alba
- * Symphysis pubis

Fibres run:

- * upward, forward and medially



Insertion Attachment Point

Costal Cartilage
of the
8th to 12th Ribs

lower border

ribs

**Internal
Oblique**

Origin Attachment Point

Iliac Crest

Insertion Attachment Point

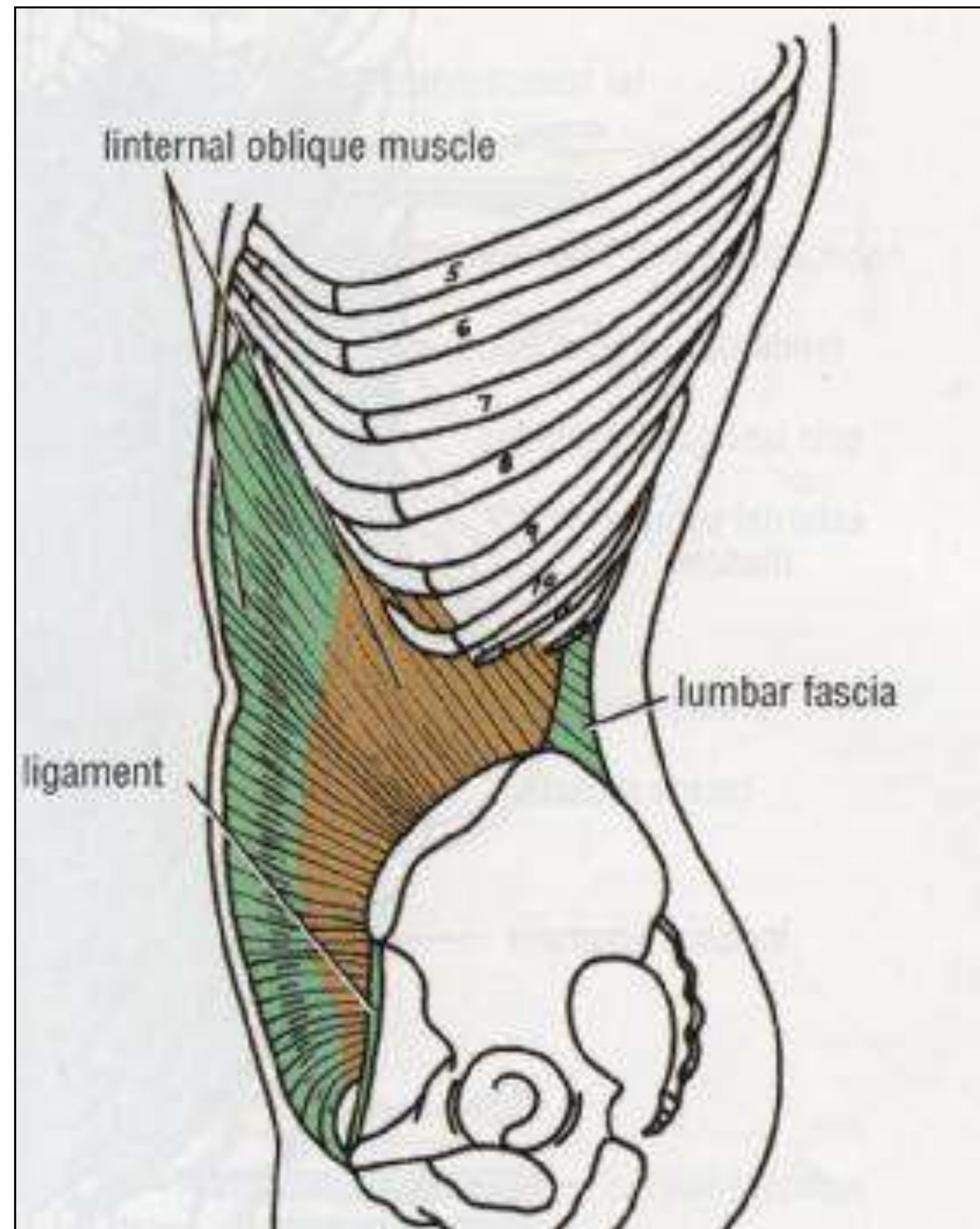
Pubic Crest

Internal Oblique muscle

The muscle is Inserted
into:

upward فیکو - نورہ لٹیا
outer surface بی 6 external 11
origin Lower border of the
lower 3 - 4 ribs (Fleshy
fibers) rib 9, 8

- Xiphoid process
- Linea alba
- Symphysis pubis.



deltoid muscle

pectoralis major muscles

serratus anterior muscle

latissimus dorsi muscle

linea alba

external oblique aponeurosis

external oblique muscle

rectus sheath

umbilicus

external intercostal muscles

rectus abdominis muscle

tendinous inscription

internal oblique muscle

Downward forward and medially

inguinal ligament

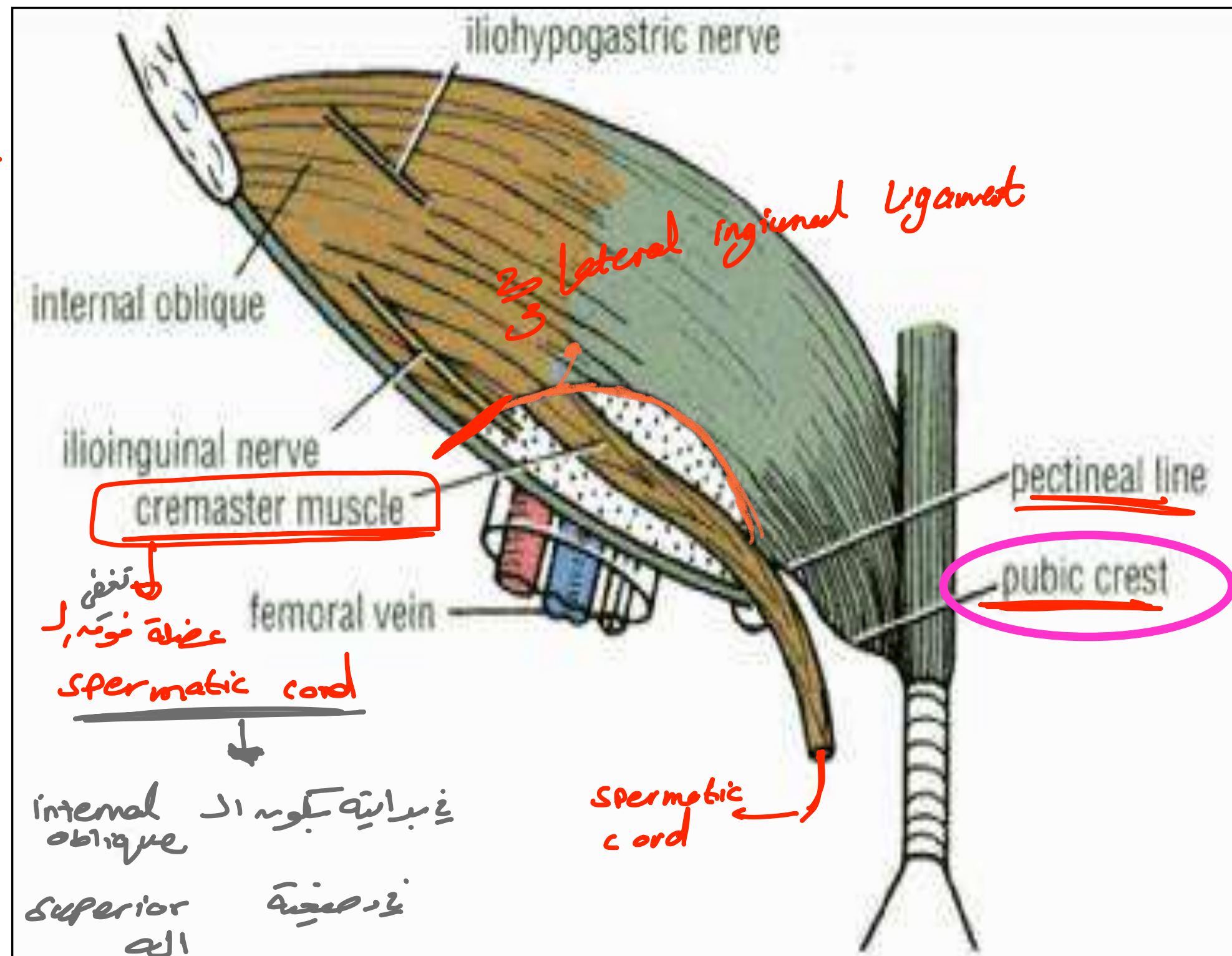
external oblique
aponeurosis

upward forward and medially

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Internal Oblique muscle

■ It has a lower free border that arches over (Roof) the spermatic cord (or round ligament of the uterus) and then descends behind (posterior) it to be attached to the pubic crest and the pectineal line.



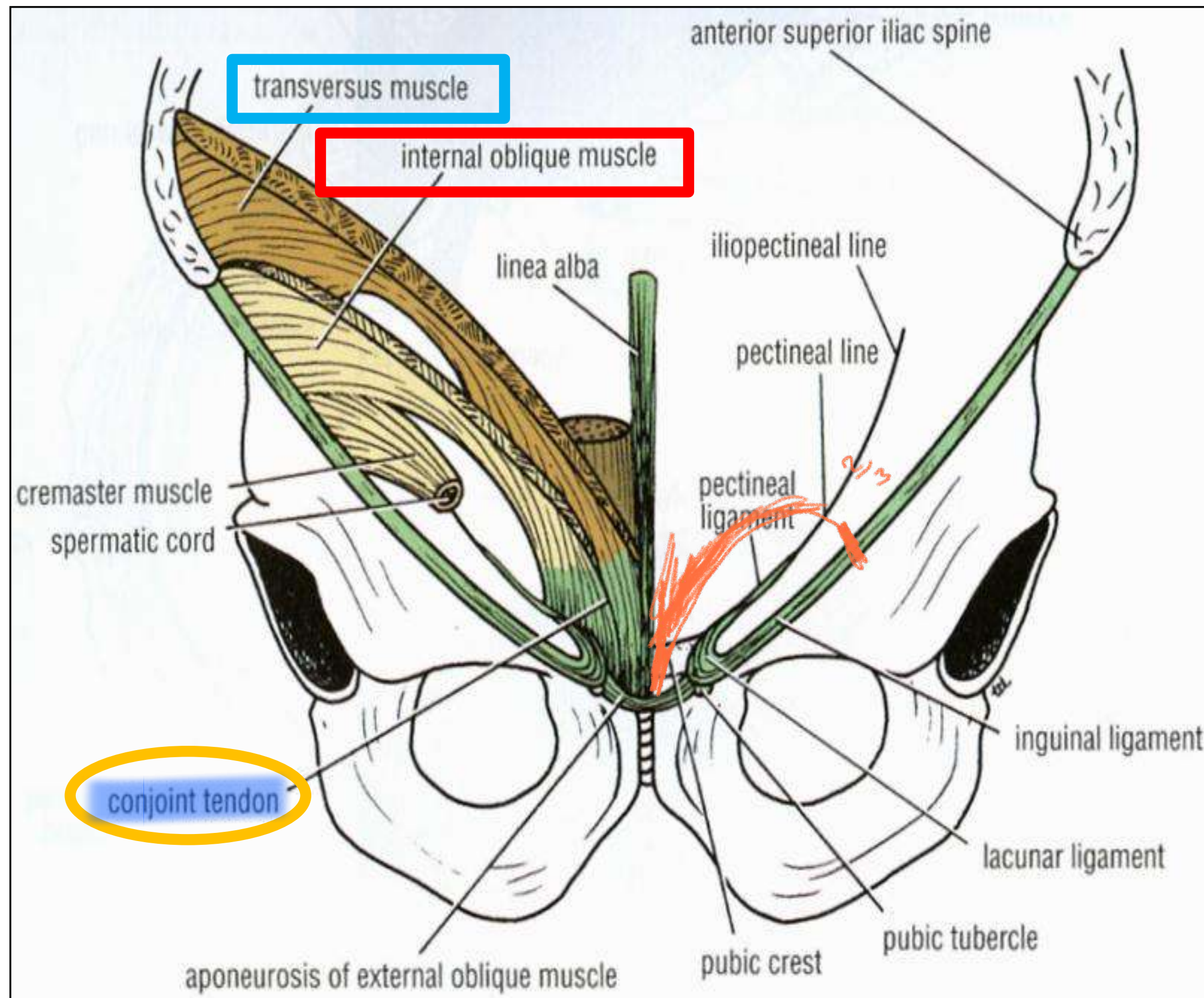
بعد من بصير الحشوي قدرا
بالقاي الـ arch (IOM)
بـكـر Posterior

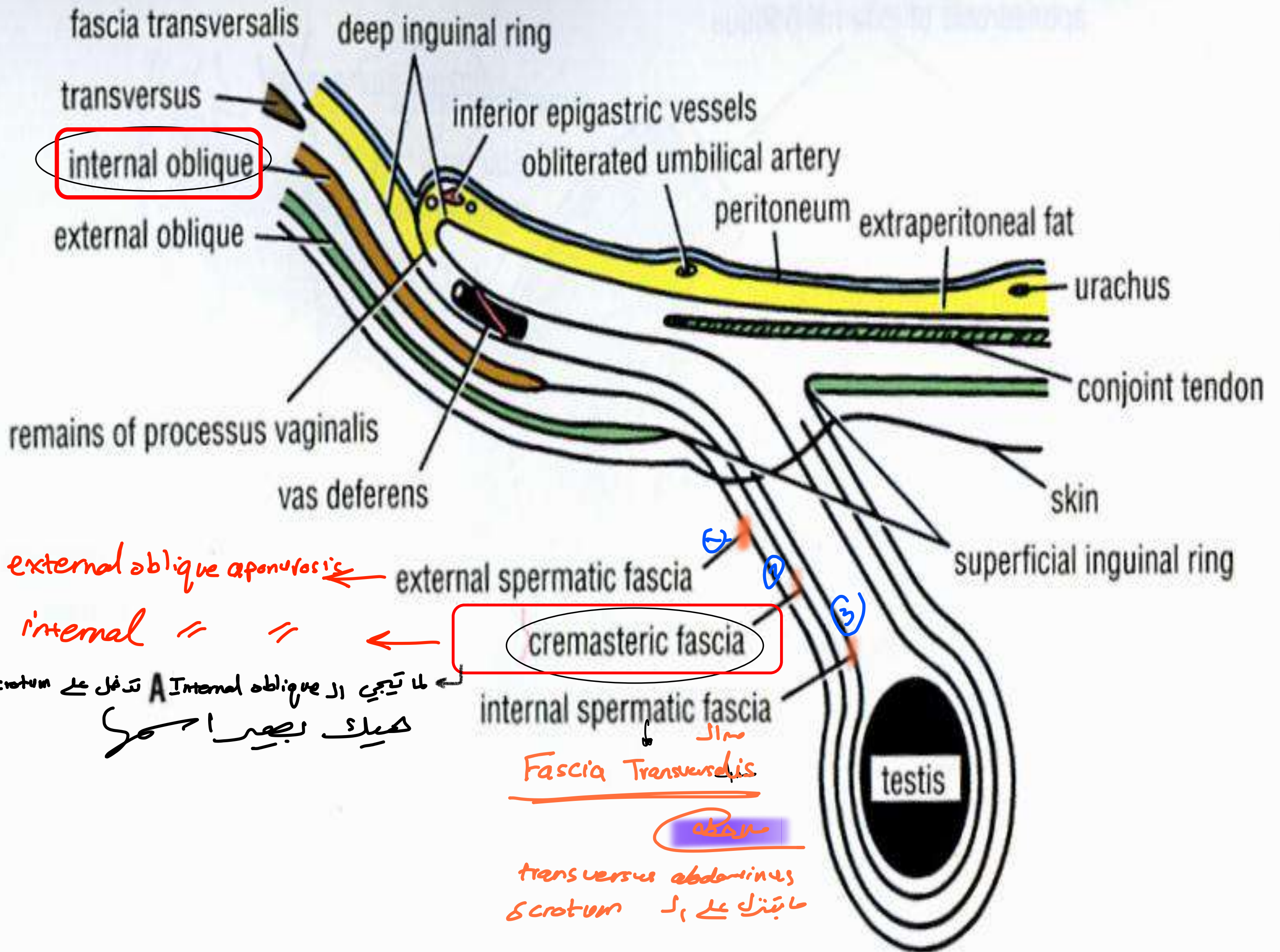
Near their [↗] Internal oblique muscle

insertion, the lowest tendinous fibers are joined by similar fibers from the transversus abdominis to form the **Conjoint Tendon**.

The conjoint tendon is attached medially to the linea alba, but it has a lateral

free border. (margin)
and inferiorly to the pubic crest.





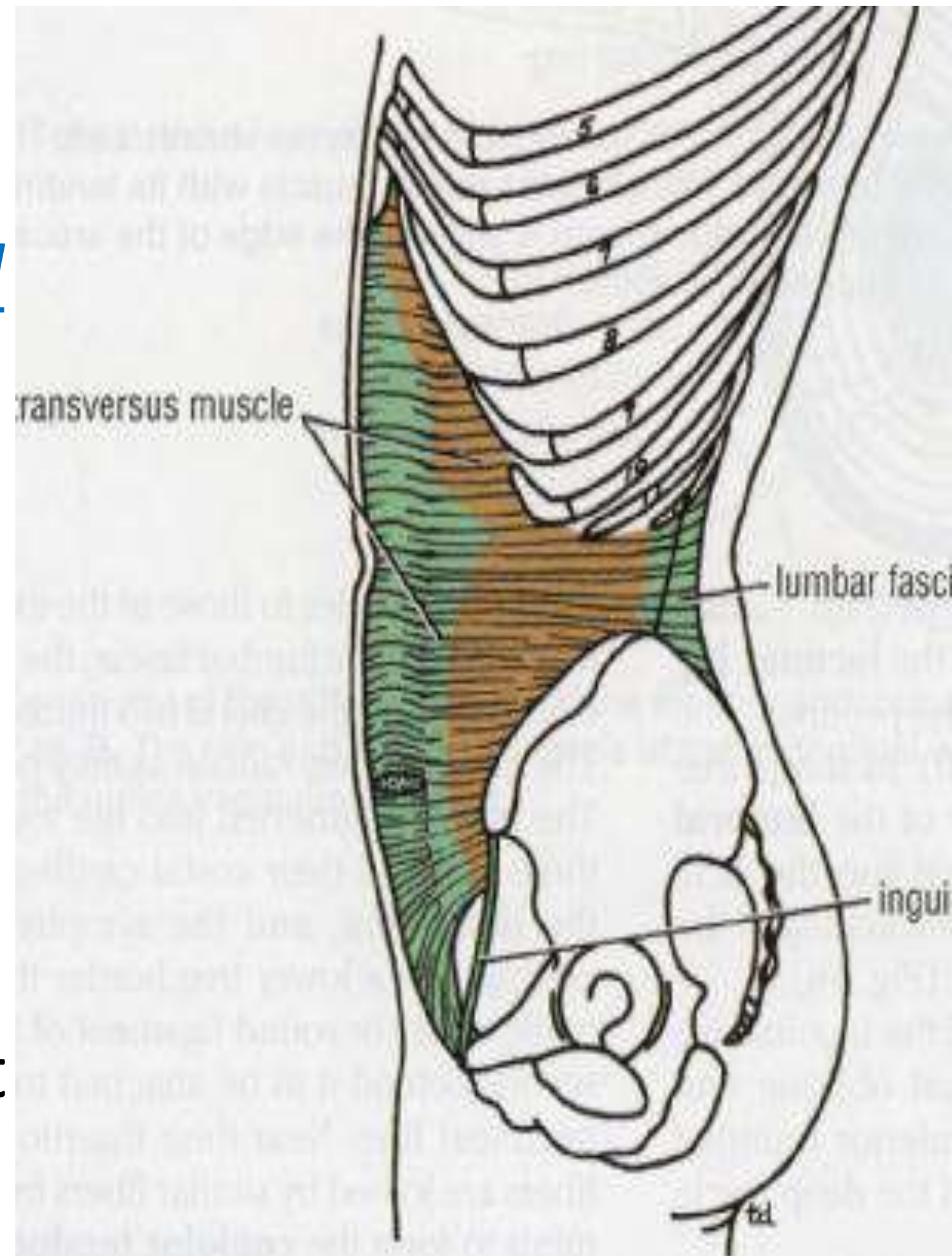
Transversus abdominis muscle

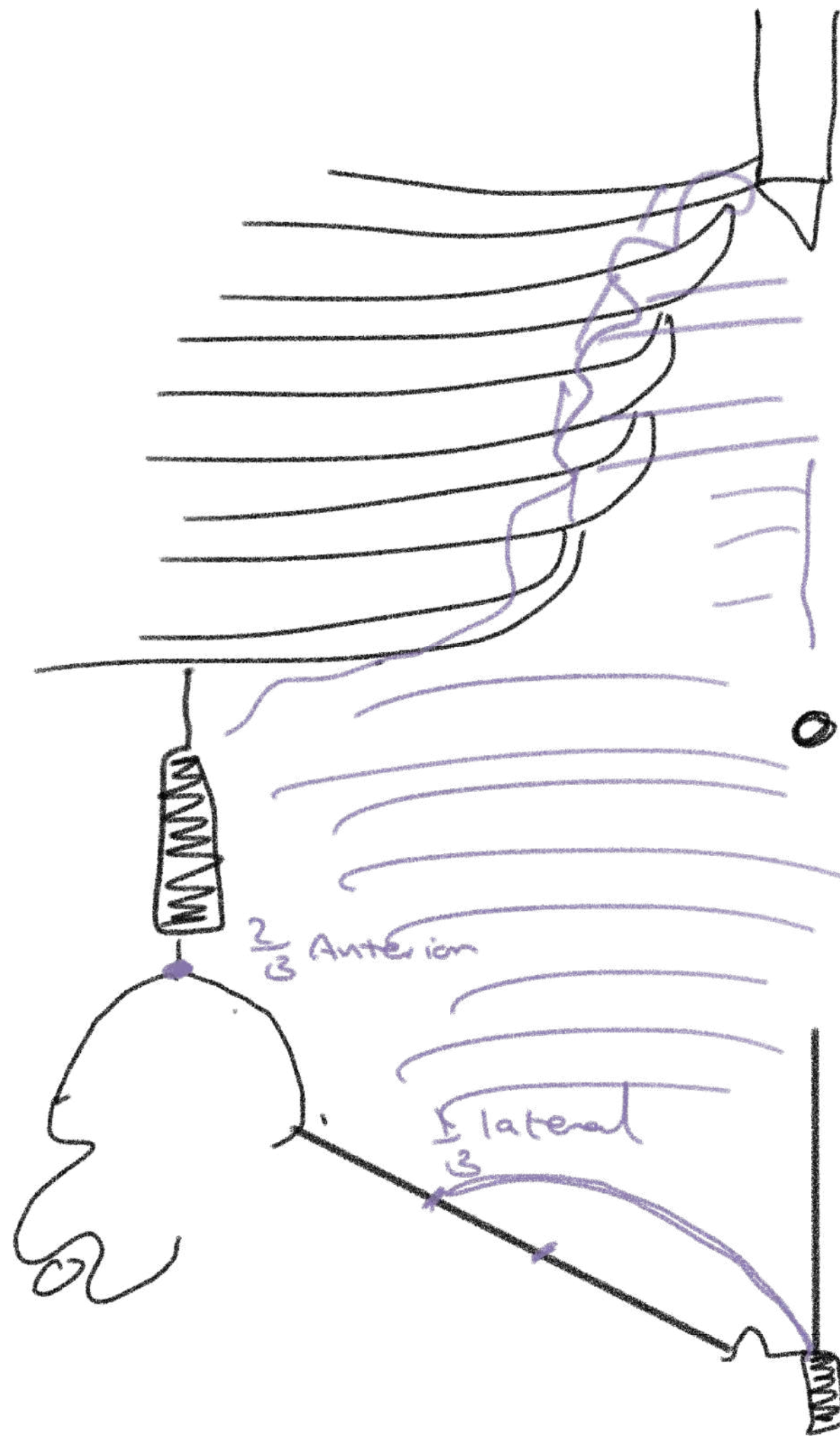
- A thin sheet of muscle that lies deep to internal oblique & its fibers run Horizontally Forward

external: outer surface lower 8 ribs
internal: lower border 3-4 ribs
insertion

- **Origin:**
- ✓ Deep surface of lower 6 costal cartilages (interdigitating with the Diaphragm).
- ✓ Lumbar fascia. → internal
- ✓ Anterior 2/3 of iliac crest.
- ✓ Lateral 1/3 of inguinal ligament

↓
1/3





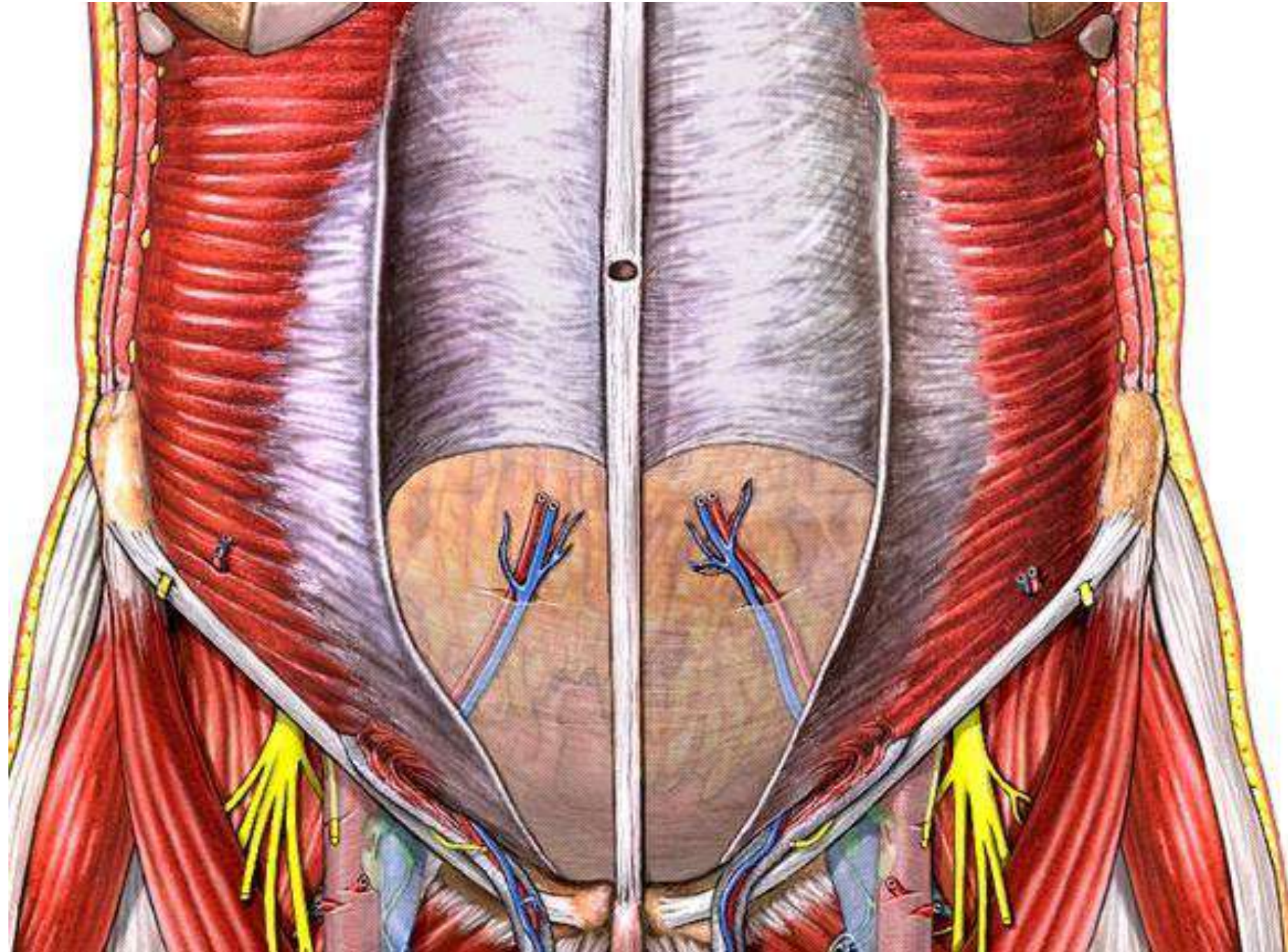
origin:

- * Lumber fascia
- * $\frac{2}{3}$ Anterior of iliac crest
- * $\frac{1}{3}$ Lateral inguinal ligament
- * Deep surface of lower 6 costal cartilages

insertion:

- * Symphysis pubis
- * Xiphoid
- * Linea alba

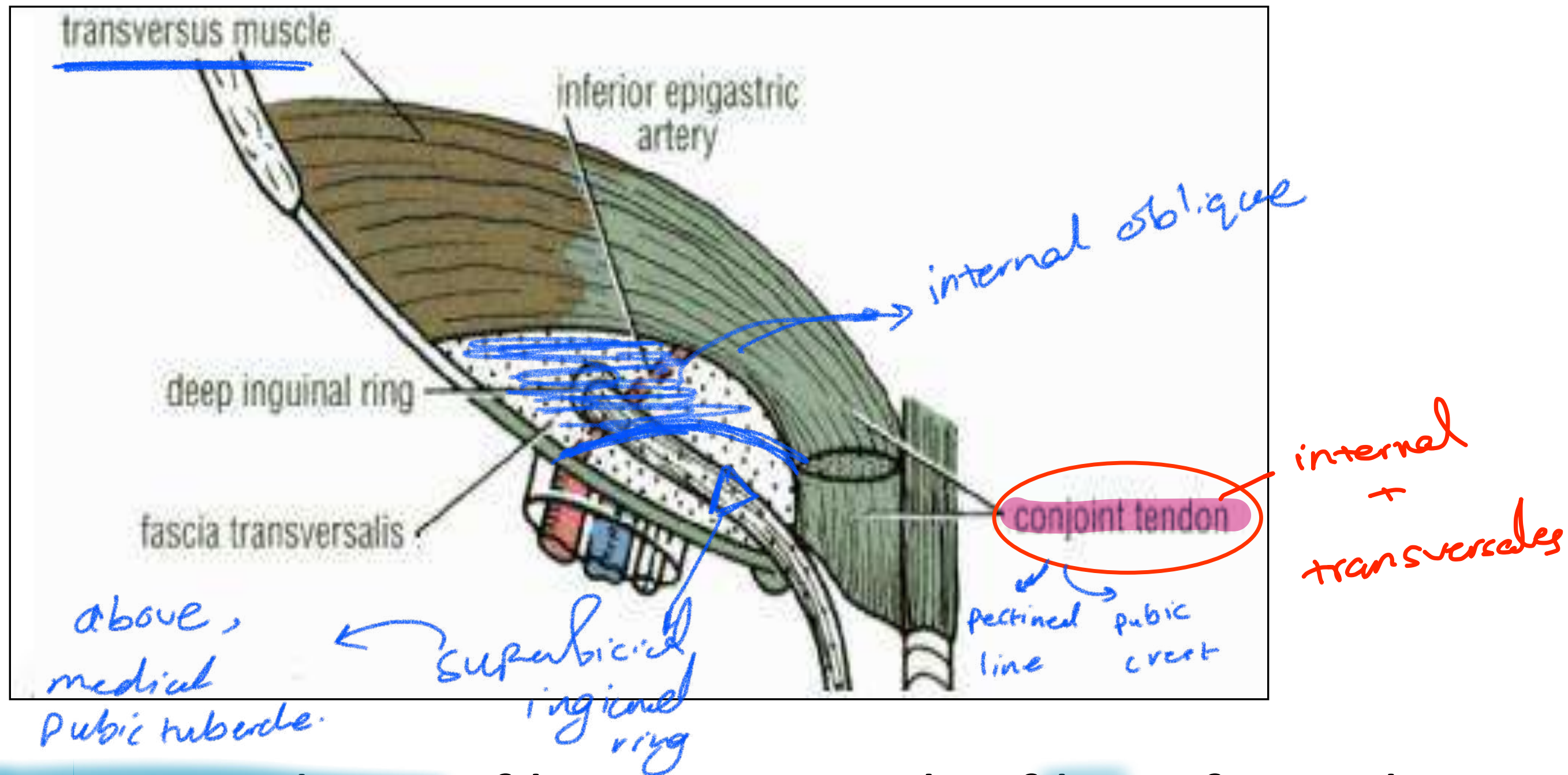
Transversus abdominis muscle



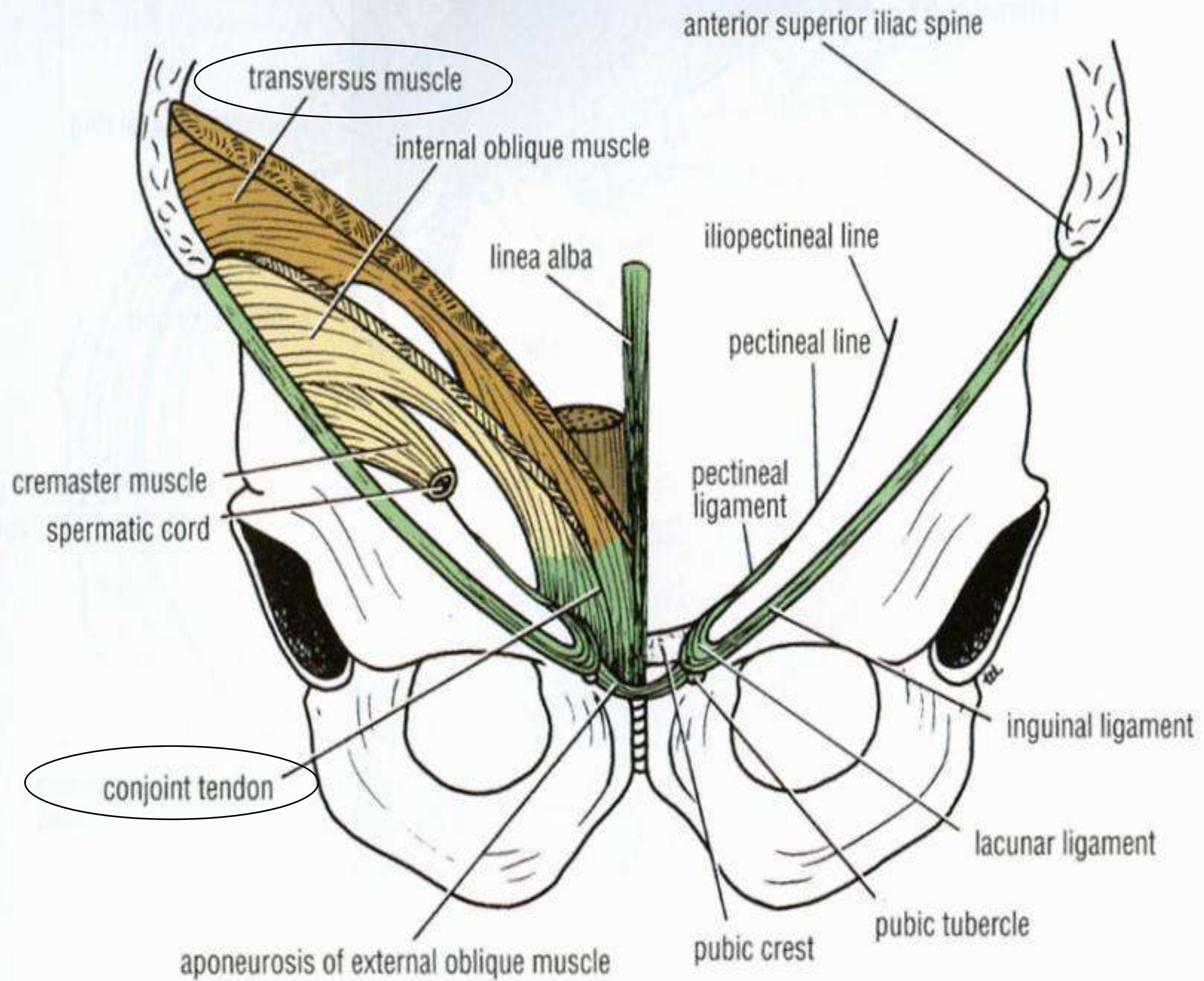
The muscle is *Inserted* into:

Xiphoid process, linea alba & symphysis pubis.

Transversus abdominis muscle



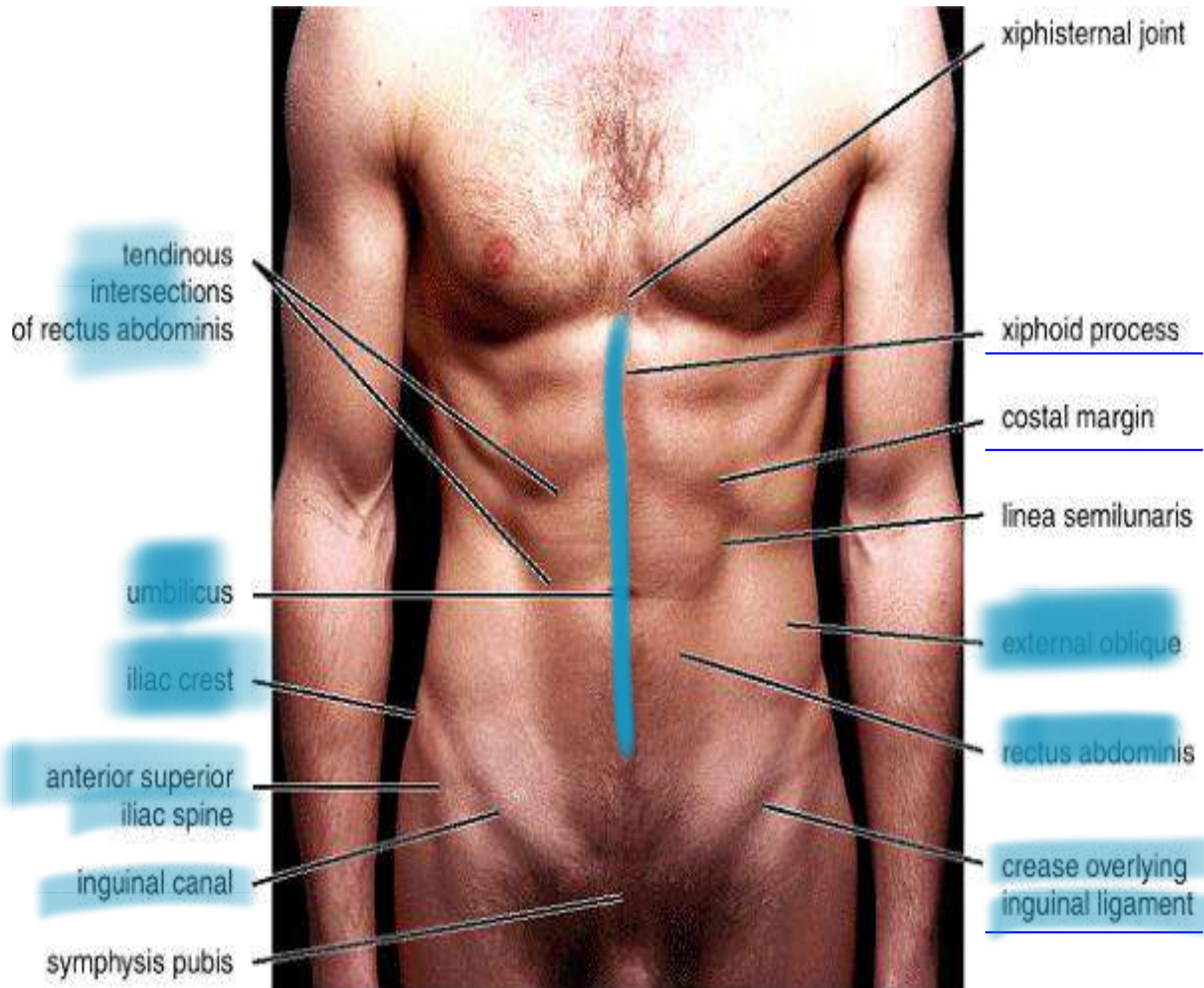
- The **lowest tendinous** fibers join similar fibers from the **internal oblique** to form the **conjoint tendon**, which is fixed to the **pubic crest** and the **pectineal line**.



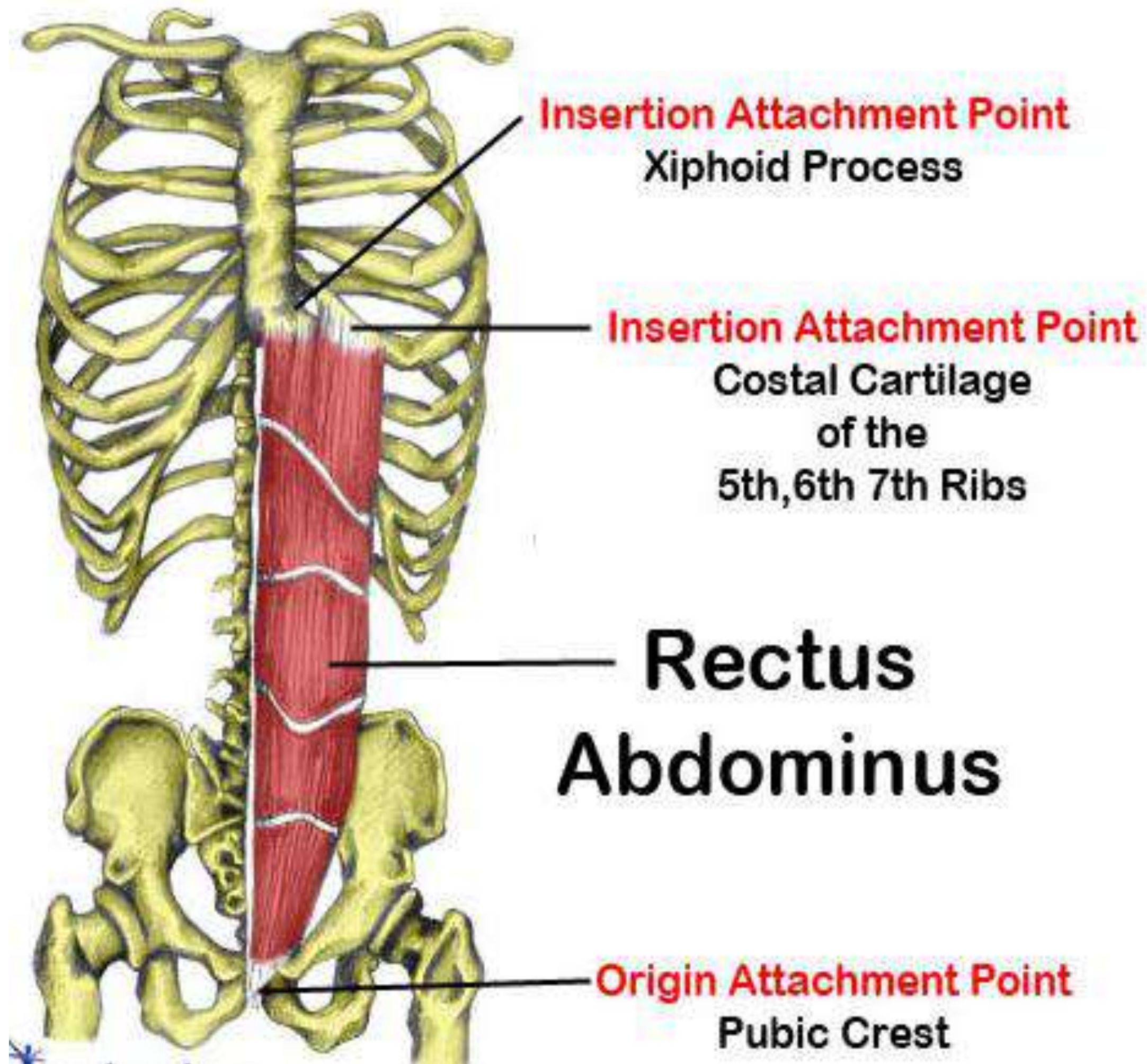
Rectus abdominis muscle

- A long strap muscle that extends along the whole length of the anterior abdominal wall, it is broader above and lies close to the midline below, being separated from its fellow by linea Alba.

5-4
299800



Rectus abdominis muscle



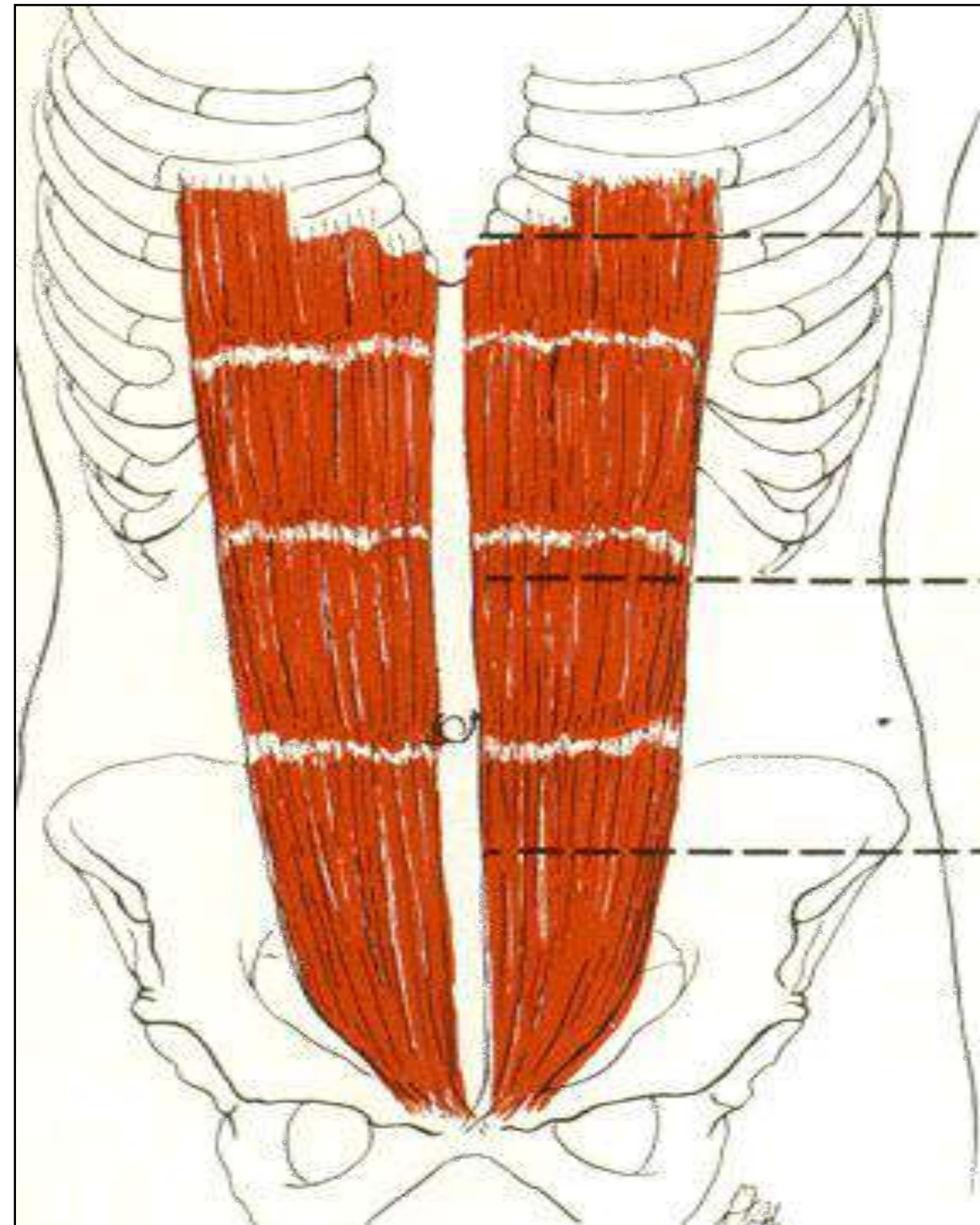
Rectus abdominis muscle

مستقيم

- **Origin:** by two heads, from the front of Symphysis Pubis and from Pubic Crest. ②

- **insertion:** into 5-6-7 costal cartilage and the xiphoid process.

Side
transversus
abdominis
↓ deep surface
origin: lower 6 costal
cartilages

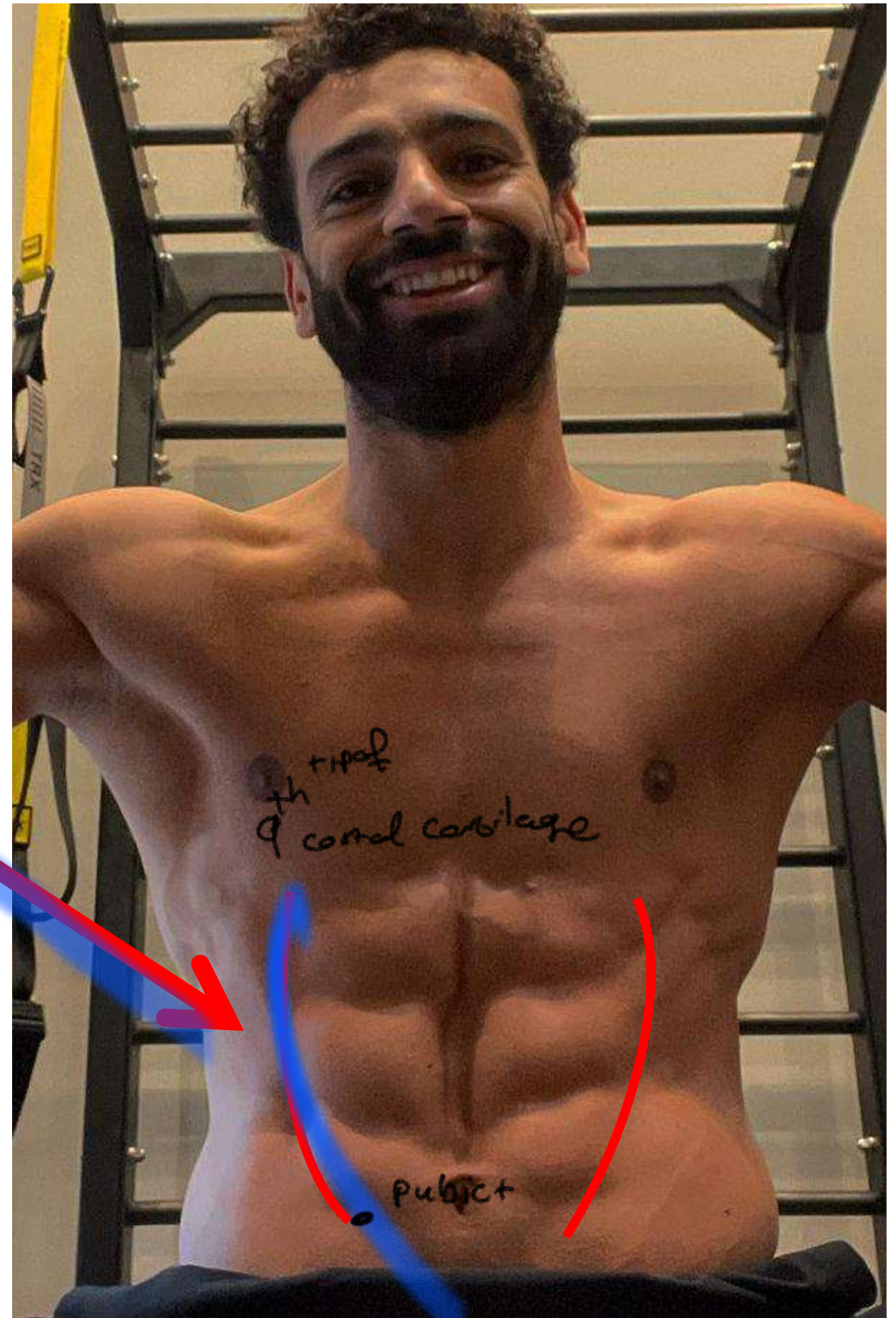


Rectus abdominis muscle

- When it contracts, its ^{border} lateral margin forms a curved ridge that can be palpated and often seen and is termed : ^{الحد الجانبي} rectus abdominis muscle.

Linea Semilunaris

This extends from the ^{قبة} tip of the ninth costal cartilage to the pubic tubercle.
من قبة الحجاب الحاجز إلى نتوء عانة



Rectus abdominis muscle

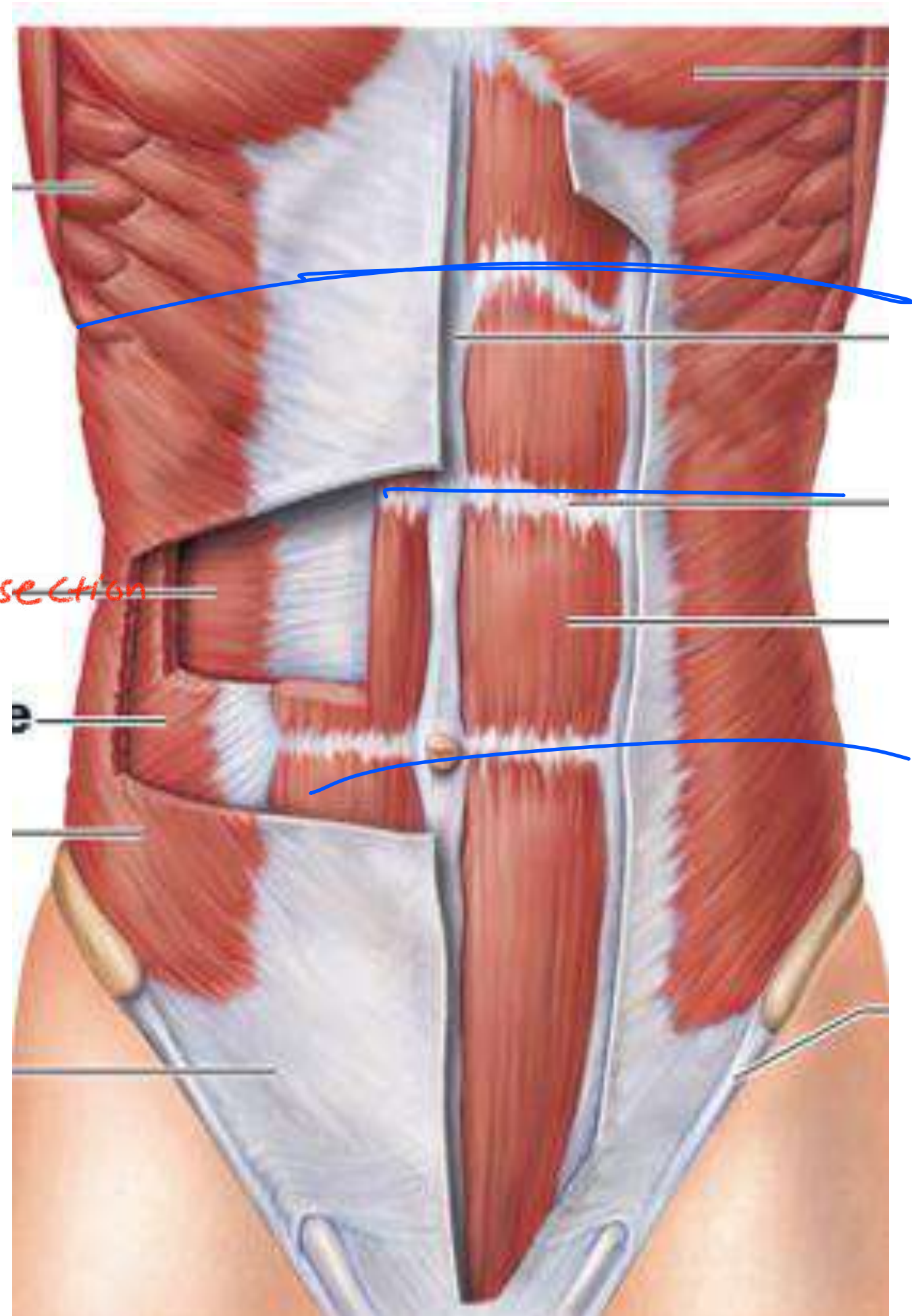
- The Rectus Abdominis muscle is divided into distinct segments by three transverse

Tendinous Intersections

at the :

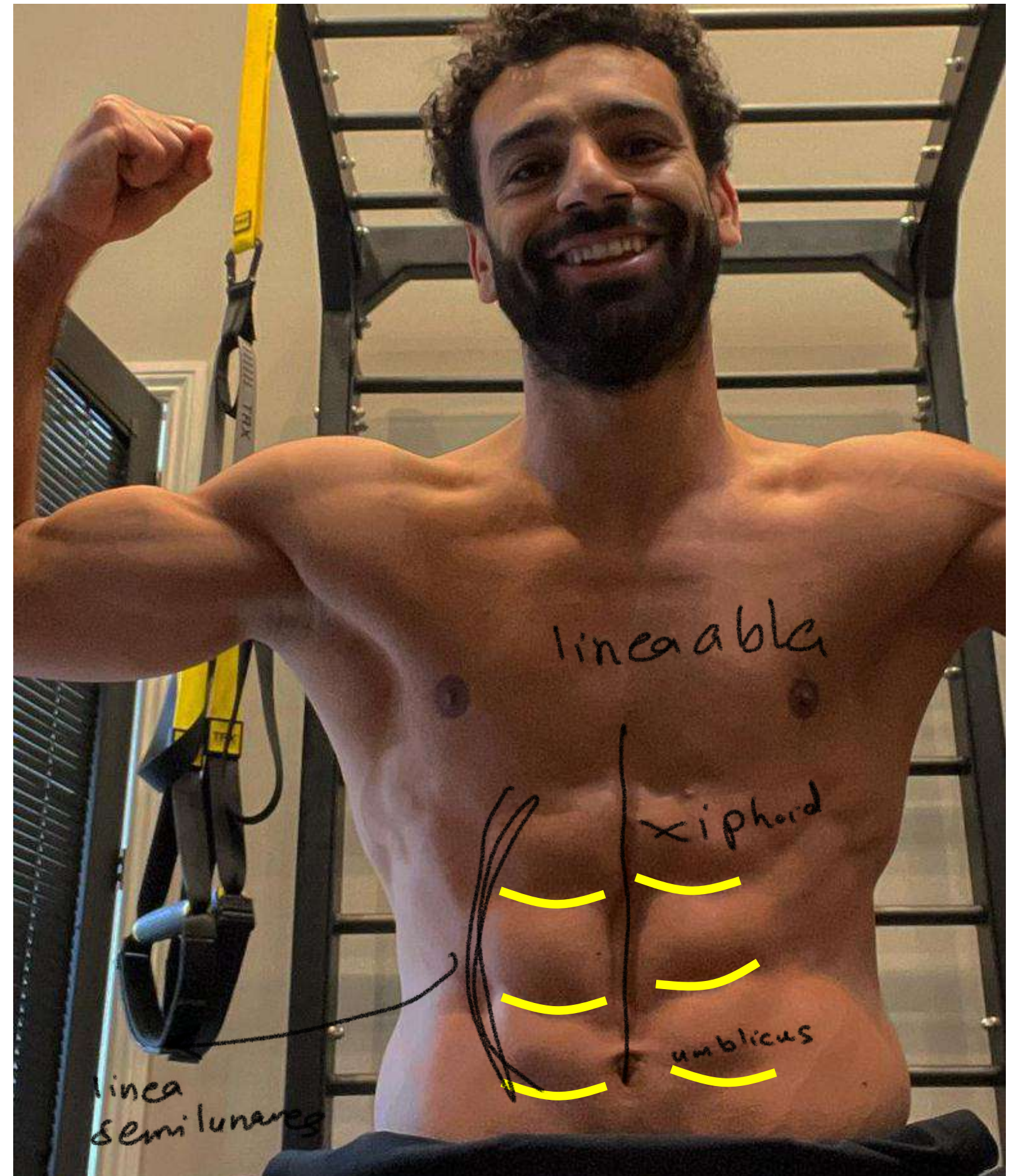
- Xiphoid process.
- Umbilicus.
- One halfway between these two.

3 tendinous intersection



Rectus abdominis muscle

- The Rectus Abdominis muscle is divided into distinct segments by three transverse *Tendinous Intersections* at the :
 - Xiphoid process.
 - Umbilicus.
 - One halfway between these two.



مُسَلِمَة كَبِيرَة

Pyramidalis muscle

- It is **often absent**, it arises by its base from the anterior surface of the pubis and is inserted into the linea alba.

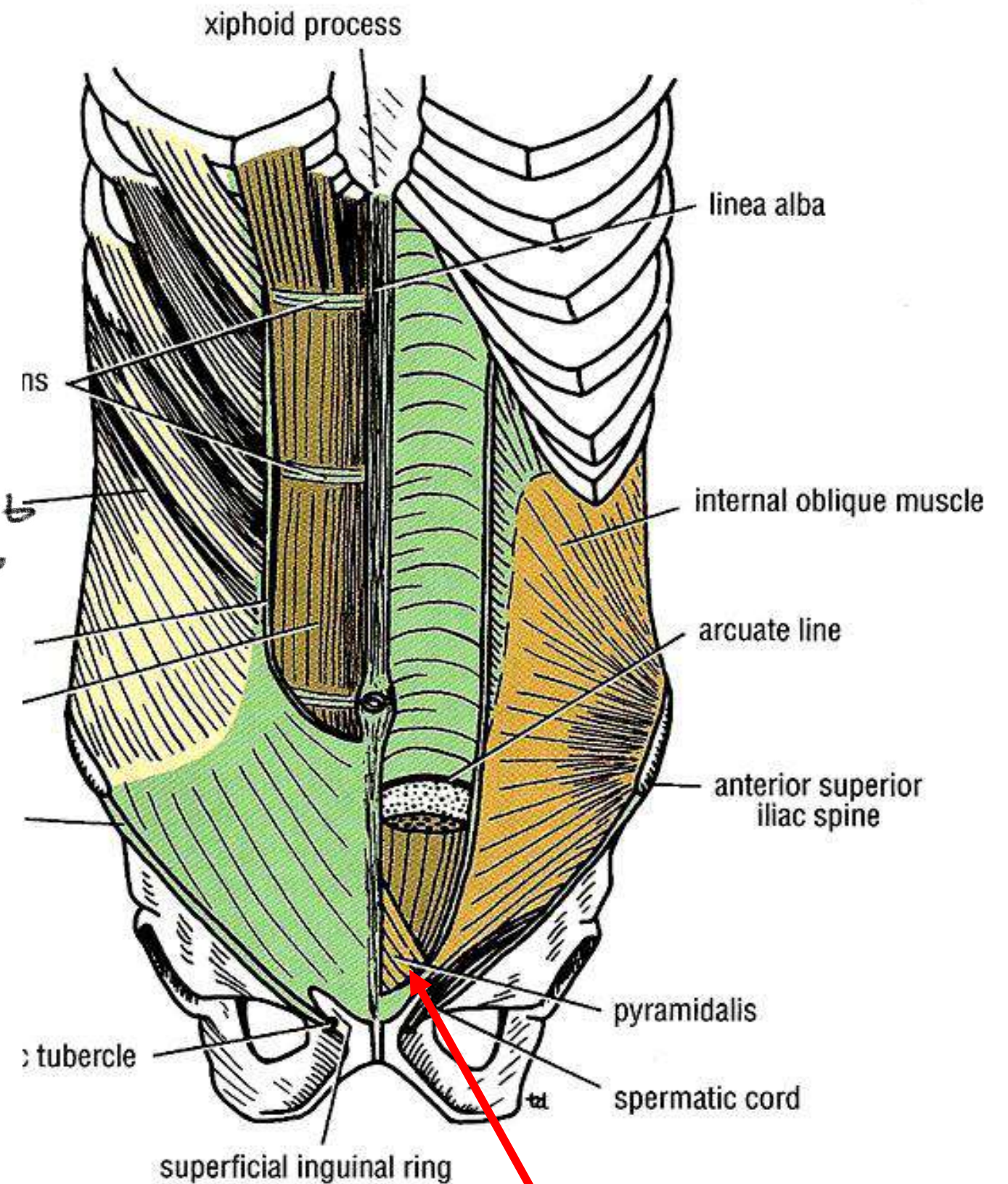
origin

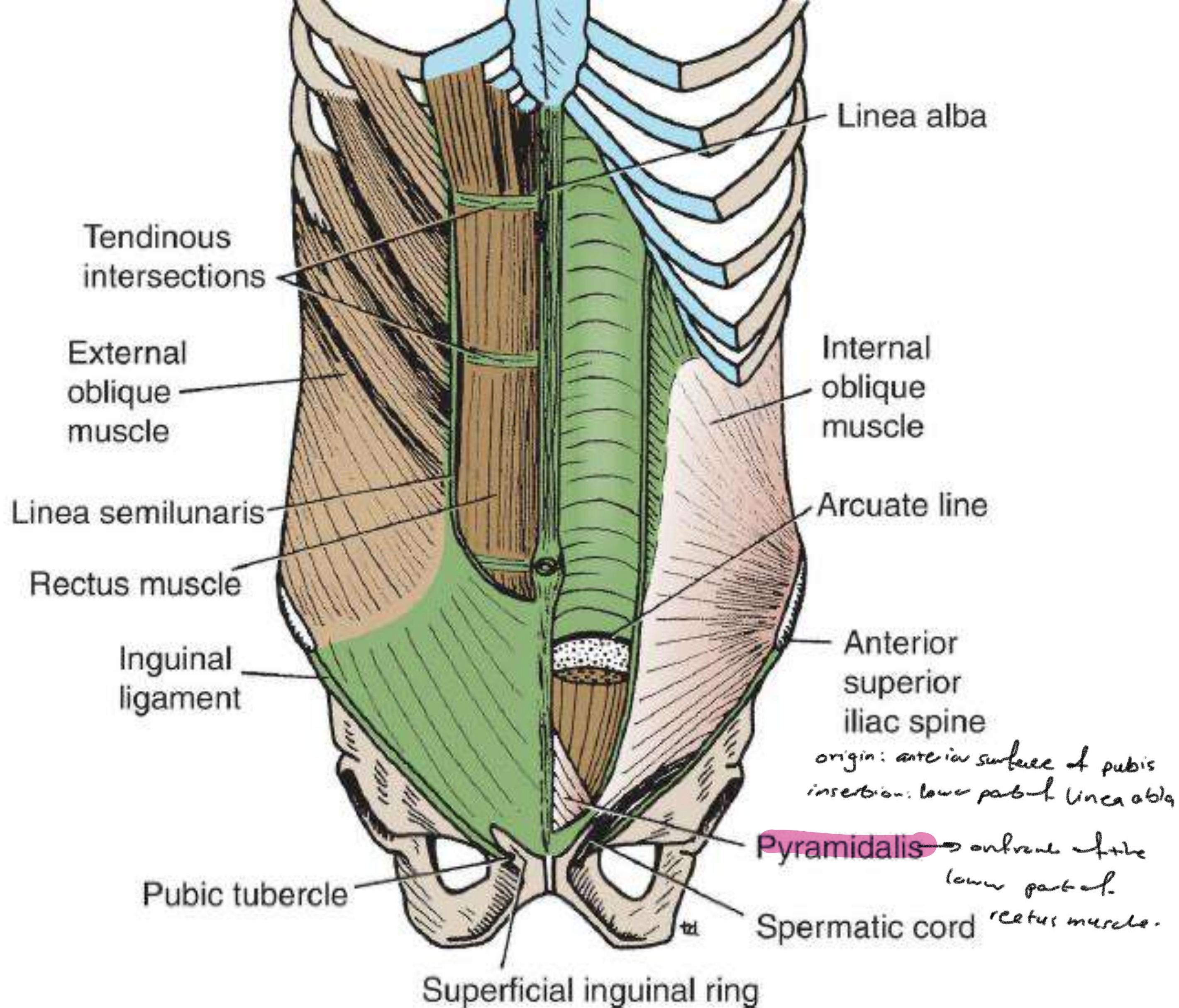
the lower part

- It lies in front of the lower part of the rectus abdominis.

تَعْرِيفٌ عَلَى تَبَيُّنٍ

- It stretches the linea alba





Rectus sheath

مِشِي نِيَه
rectus abdominis muscle
نِشِي نِيَه
nerves

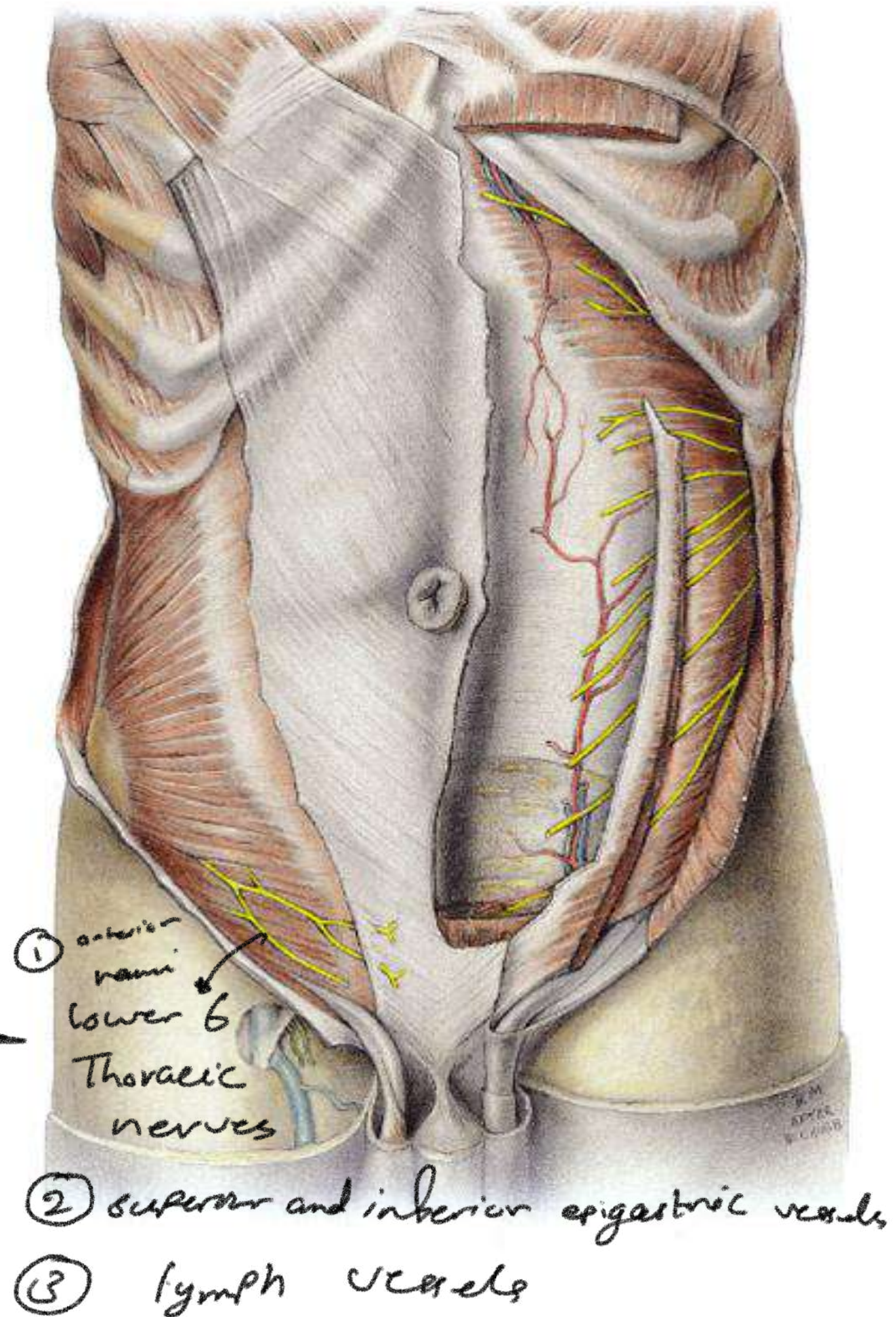
+ is a long fibrous sheath that encloses Rectus abdominis muscle and Pyramidalis muscle (if present).

+ It is formed mainly by the aponeurosis of the three lateral abdominal muscles.

EOM EOM TA

+ contains the:

- Anterior rami of lower 6 thoracic nerves.
- Superior and inferior epigastric vessels.
- lymph vessels.



Rectus sheath



Starts from linea semilunaris in both sides.

نصف

Splits into 2 parts:

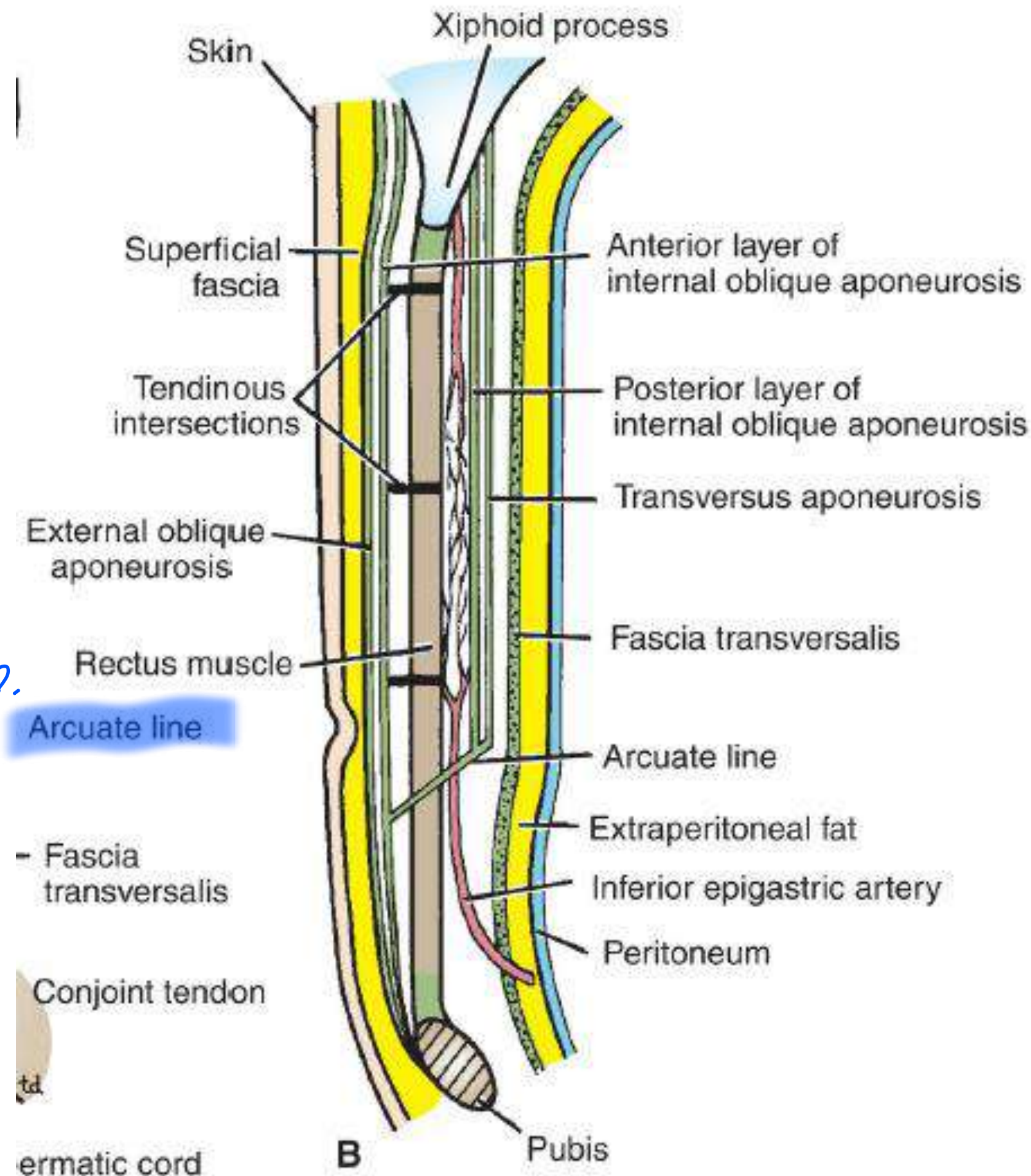
- Ant. to rectus abdominis

■ Ext. oblique + $\frac{1}{2}$ of internal oblique

- Post. to rectus abdominis

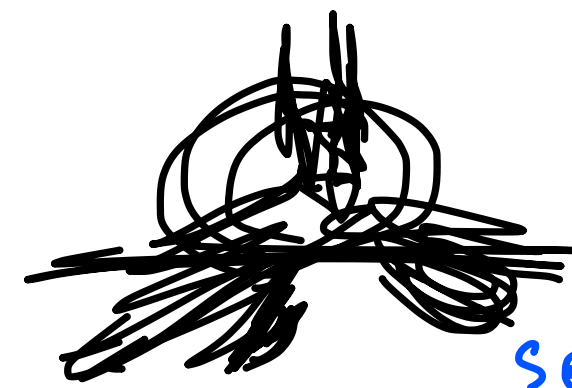
■ Transverses + $\frac{1}{2}$ of internal oblique

الخط العريض



Rectus sheath

Rectus muscle

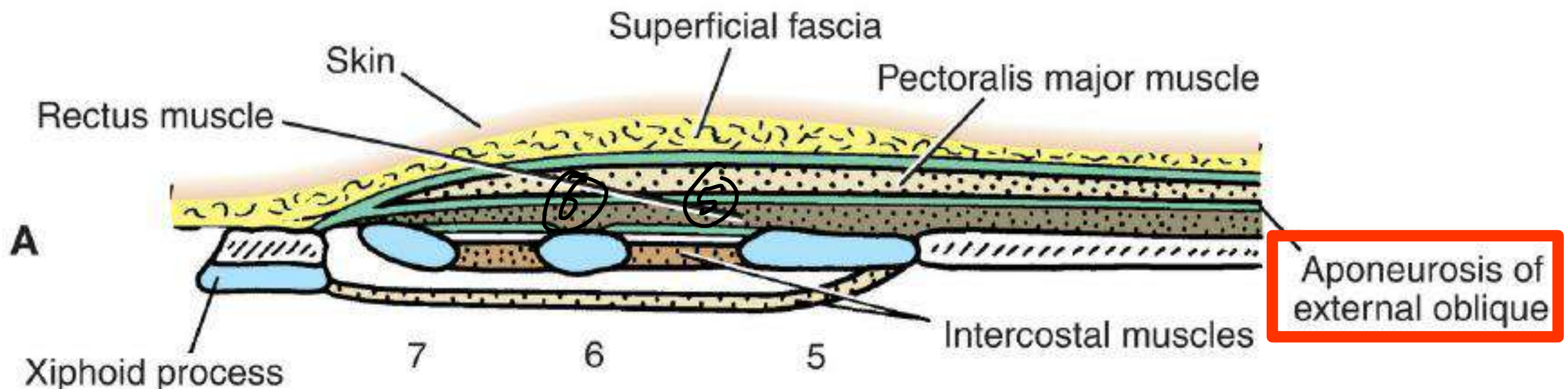


ليشرب المثلث
← origin
outer surface
rib 5
costal cartilage

Above the costal margin:

Anterior wall is formed by the aponeurosis of the External Oblique.

Posterior wall is formed by the thoracic wall (5th, 6th, 7th costal cartilages and intercostal spaces).



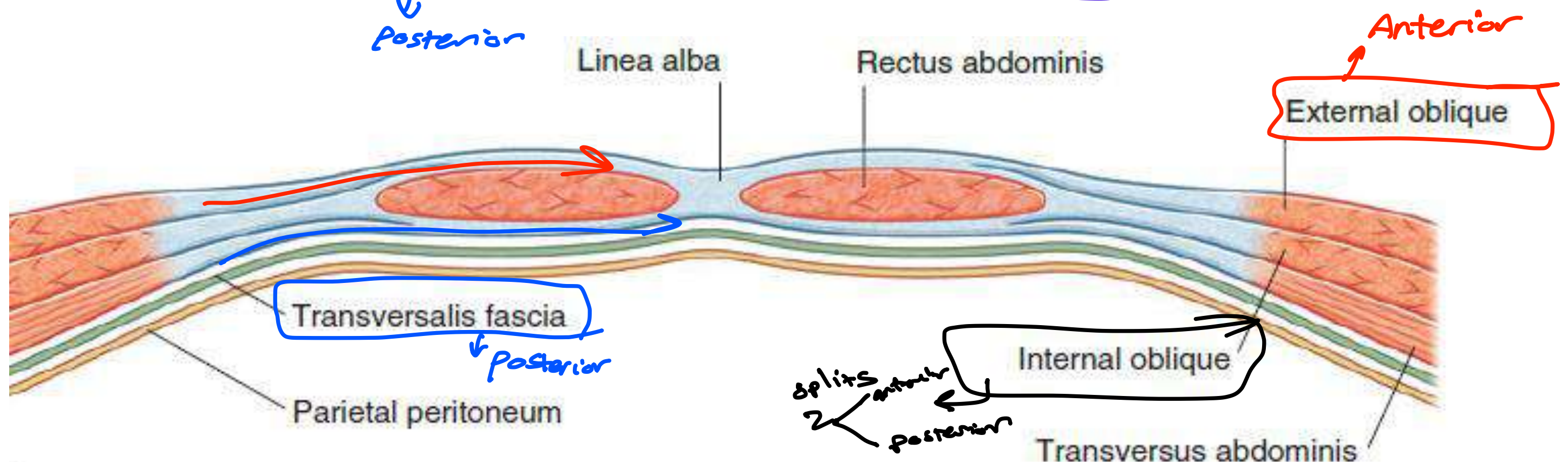
Rectus sheath

 Between costal margin and level of ASIS

❑ Internal Oblique aponeurosis Splits to enclose the rectus muscle;

❑ External oblique aponeurosis is directed in front of the muscle,

❑ Transversus aponeurosis is directed behind the muscle.

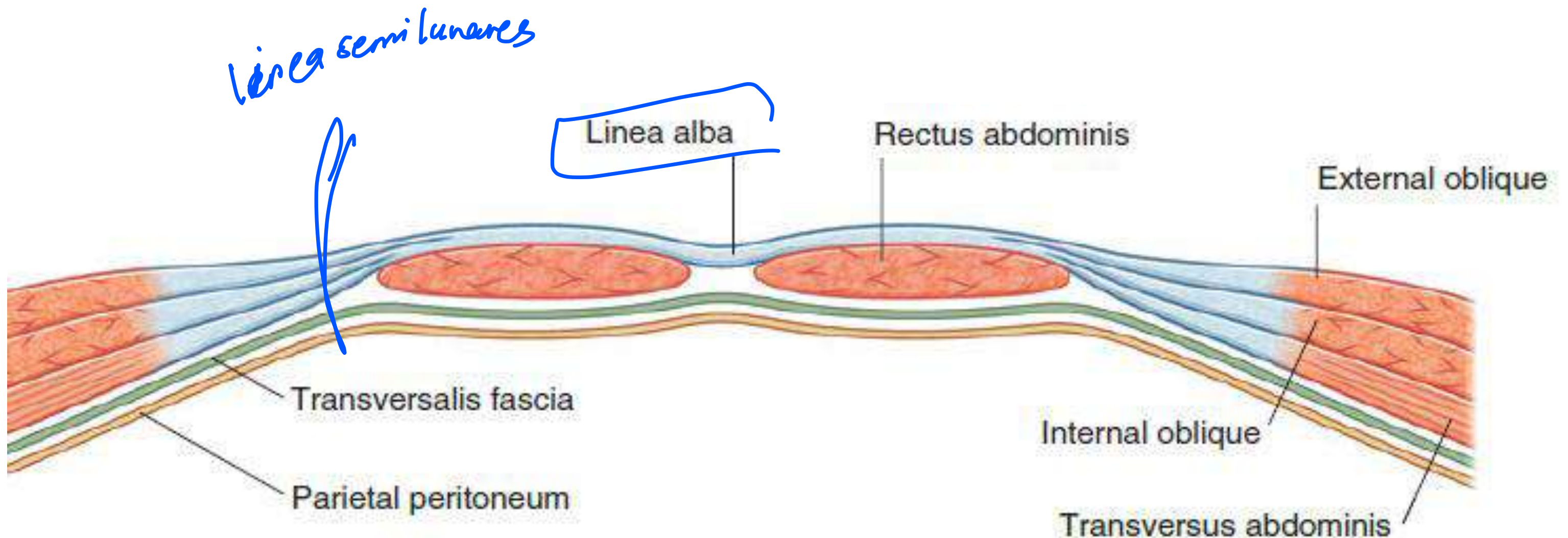


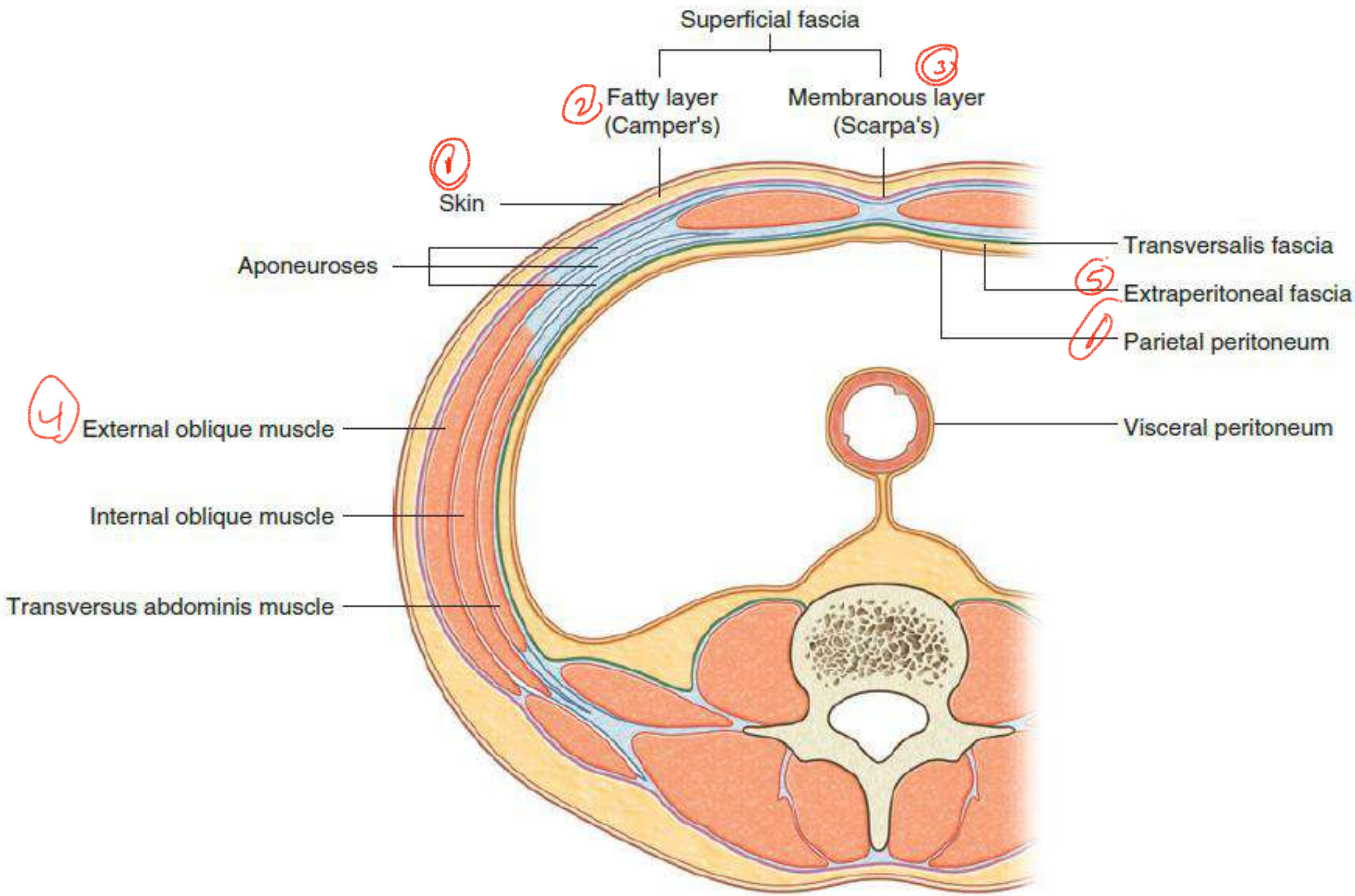
Rectus sheath

 Between level of ASIS and Pubis:

EOA
↑
IOA
↑
TA

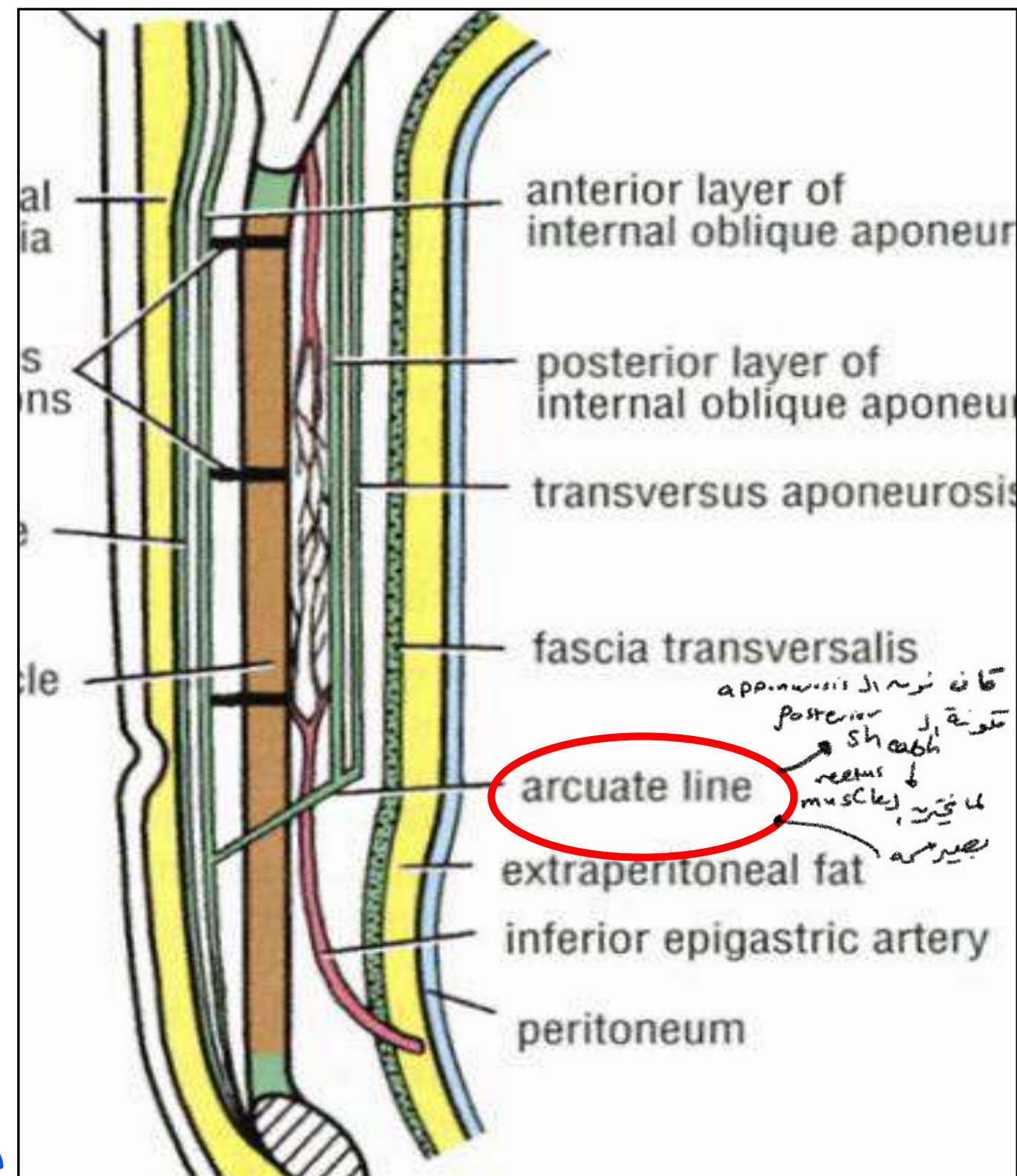
- Anterior wall by the aponeurosis of all three muscles.
- Posterior wall is **absent**, and the rectus muscle lies in contact with the fascia transversalis.



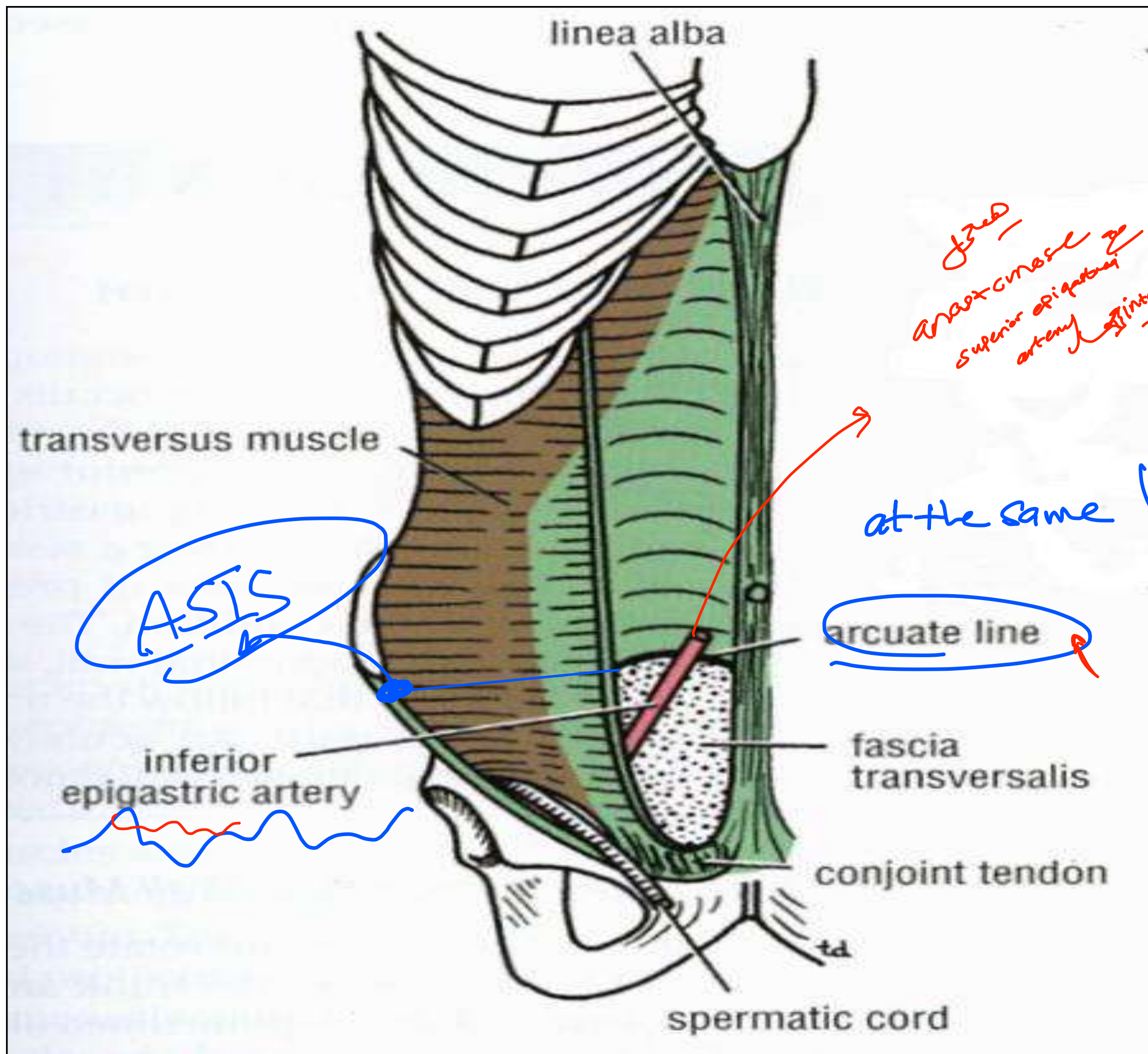


✚ It should be noted that where the aponeurosis forming the posterior wall pass in front of the rectus at the level of the anterior superior iliac spine, the posterior wall has a free, curved lower border called the **Arcuate line**

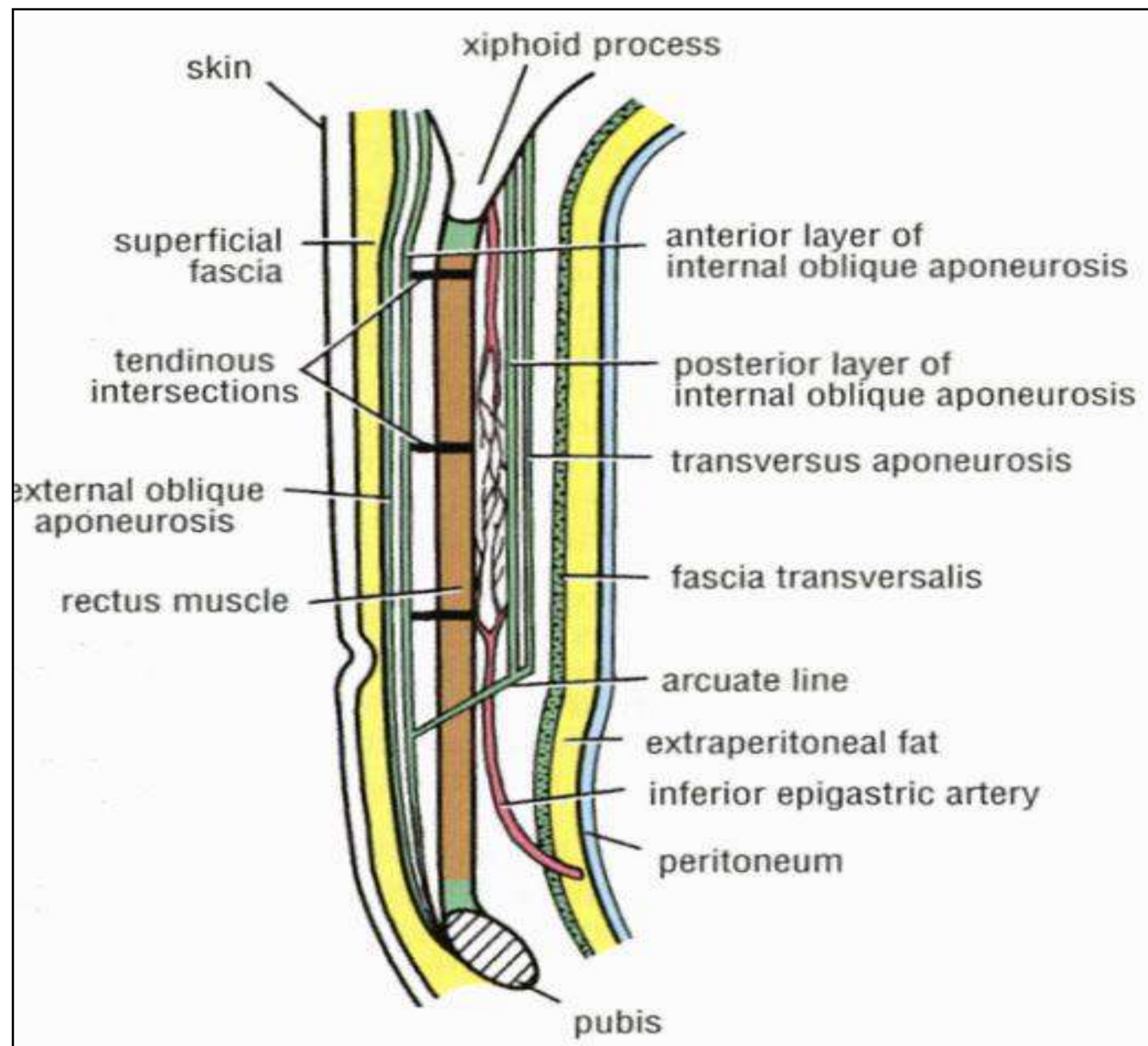
✚ At this site, the **Inferior Epigastric Vessels** enter the rectus sheath and pass upward to Anastomose with the **Superior Epigastric Vessels**.



1st part
Internal → subcutaneous
Thoracic



■ The Posterior wall of the rectus sheath is Not attached to the rectus abdominis muscle. The anterior wall is firmly attached to it by the muscle's Tendinous Intersections.



✗

تجمع دموي / نزيف

CLINICAL: HEMATOMA OF RECTUS SHEATH

L = Blood collection

حالة غير شائعة
= rare

■ It is uncommon but Important, since it is often overlooked.

■ It occurs most often on the right side below the level of the umbilicus.

↓
تحت
مستوى
السرة
inferior
epigastric
artery /
vein
↑
superior

أكثر تعرضاً لآفة فينج

■ The source of the bleeding is the Inferior epigastric vein or, more rarely, Inferior epigastric artery.

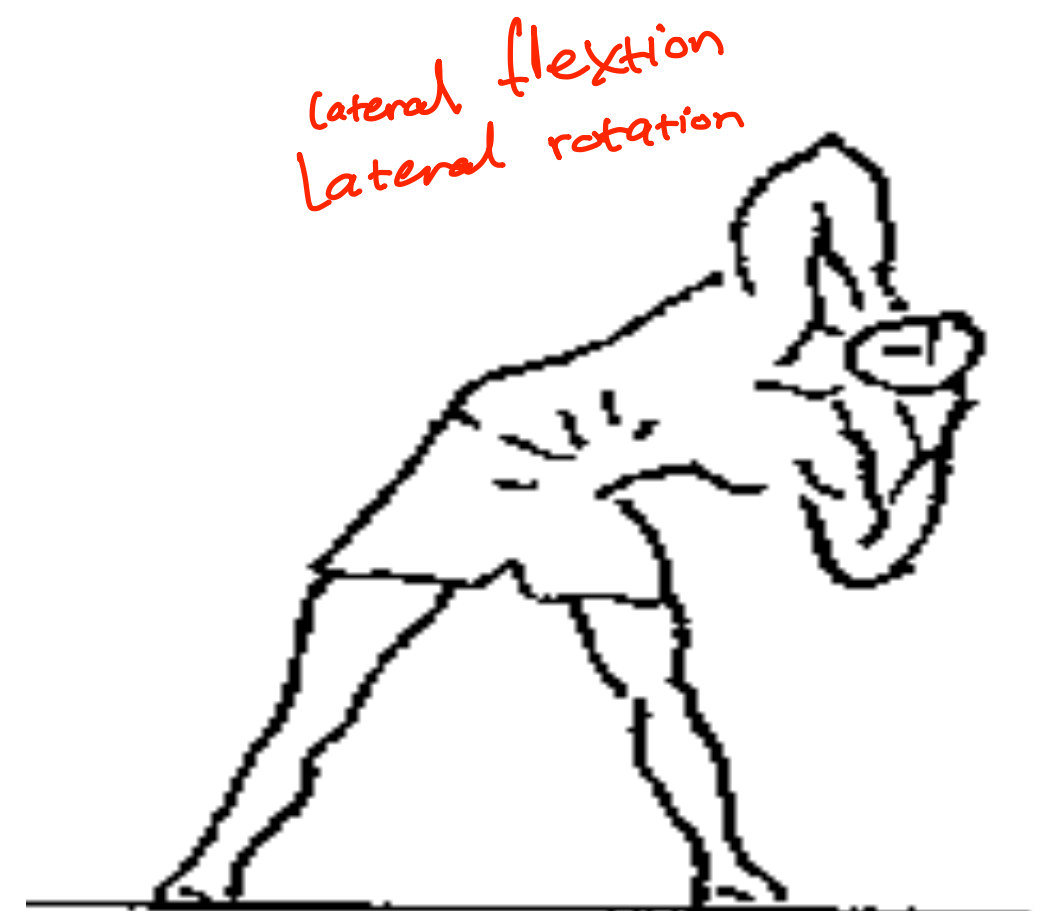
■ History of trauma, pregnancy, anticoagulants.

من طبعه، في السرة
نقص سيولة الدم
حتى تفكك جدار الأوعية



Action of Anterior Abdominal Wall Muscles

- The Oblique Muscles laterally Flex and Rotate the trunk.
- The Rectus Abdominis Flexes the trunk and stabilizes the pelvis, and the pyramidalis keeps the linea alba taut during the process.



Accessory muscles of respiration

diaphragm

*عضلات مساعدة في التنفس

Action of Anterior Abdominal Wall Muscles

- They assist diaphragm during Inspiration by relaxing as the diaphragm descends so that the abdominal viscera can be accommodated.
abdominal organs.
- The muscles assist in the act of Forced Expiration that occurs during coughing and sneezing by pulling down the ribs and sternum. Their tone plays an important part in supporting and protecting the abdominal viscera.
تساعد في التنفس
- By contracting simultaneously with the diaphragm, with the glottis of the larynx closed, They Increase The Intra-Abdominal Pressure and help in micturition, defecation, vomiting, and labour.
لا تنفس
تساعد في التنفس
تزيد الضغط
تبول
تبراز
تقيء
تولد

Nerve Supply of Anterior Abdominal Wall Muscles

بعد ١٠ intercostal بين costal margin

■ The **obliques and transversus abdominis** muscles are supplied by the **lower six thoracic nerves** and the **iliohypogastric** and **ilioinguinal nerves** (L1).

ilium

لـ ٦ تـ ١٢ تـ intercostal لنال sternum

■ The **Rectus** Muscle(lower six thoracic nerves) .

■ The **pyramidalis** (The twelfth thoracic nerve).

سـ ١٢ تـ

T₁₂

Anterior Abdominal Wall Muscle



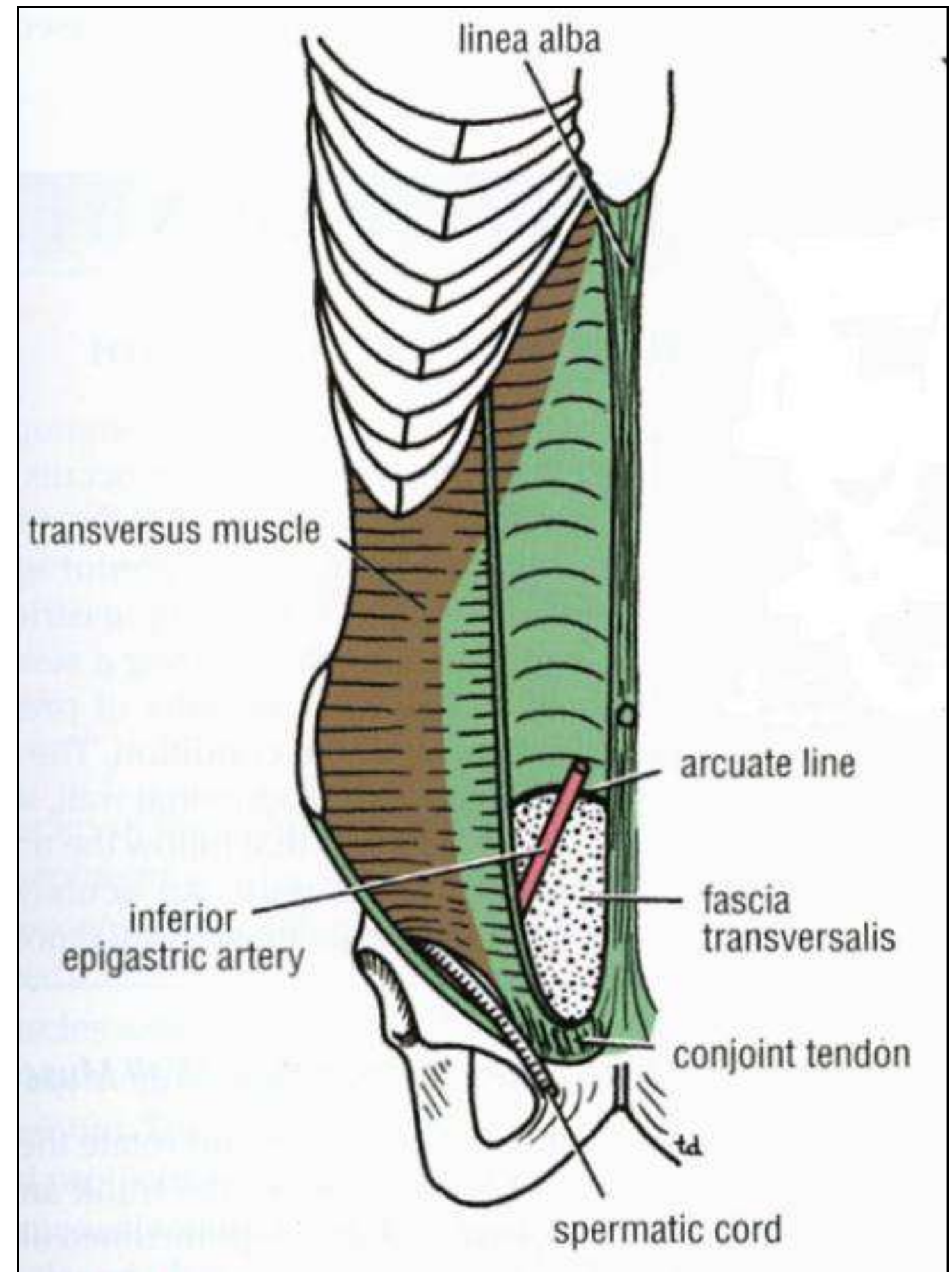
Muscle	Origin	Insertion	Innervation	Function
External oblique	Muscular slips from the outer surfaces of the lower eight ribs (ribs V to XII)	Lateral lip of iliac crest; aponeurosis ending in midline raphe (linea alba)	Anterior rami of lower six thoracic spinal nerves (T7 to T12) + L ₁ <i>iliohypogastric nerve and ilioinguinal nerve</i>	Compress abdominal contents; both muscles flex trunk; each muscle bends trunk to same side, turning anterior part of abdomen to opposite side
Internal oblique	Thoracolumbar fascia; iliac crest between origins of external and transversus; lateral two-thirds of inguinal ligament	Inferior border of the lower three or four ribs; aponeurosis ending in linea alba; pubic crest and pectineal line	Anterior rami of lower six thoracic spinal nerves (T7 to T12) and L ₁	Compress abdominal contents; both muscles flex trunk; each muscle bends trunk and turns anterior part of abdomen to same side
Transversus abdominis	Thoracolumbar fascia; medial lip of iliac crest; lateral one-third of inguinal ligament; costal cartilages lower six ribs (ribs VII to XII)	Aponeurosis ending in linea alba; pubic crest and pectineal line	Anterior rami of lower six thoracic spinal nerves (T7 to T12) and L ₁	Compress abdominal contents
Rectus abdominis	Pubic crest, pubic tubercle, and pubic symphysis	Costal cartilages of ribs V to VII; xiphoid process	Anterior rami of lower seven thoracic spinal nerves (T7 to T12)	Compress abdominal contents; flex vertebral column; tense abdominal wall
Pyramidalis	Front of pubis and pubic symphysis	Into linea alba	Anterior ramus of T ₁₂	Tenses the linea alba

Fascia Transversalis

posterior rectus.

- Is a thin layer of fascia that lines the transversus abdominis muscle and is continuous with a similar layer lining the diaphragm and iliacus muscle.

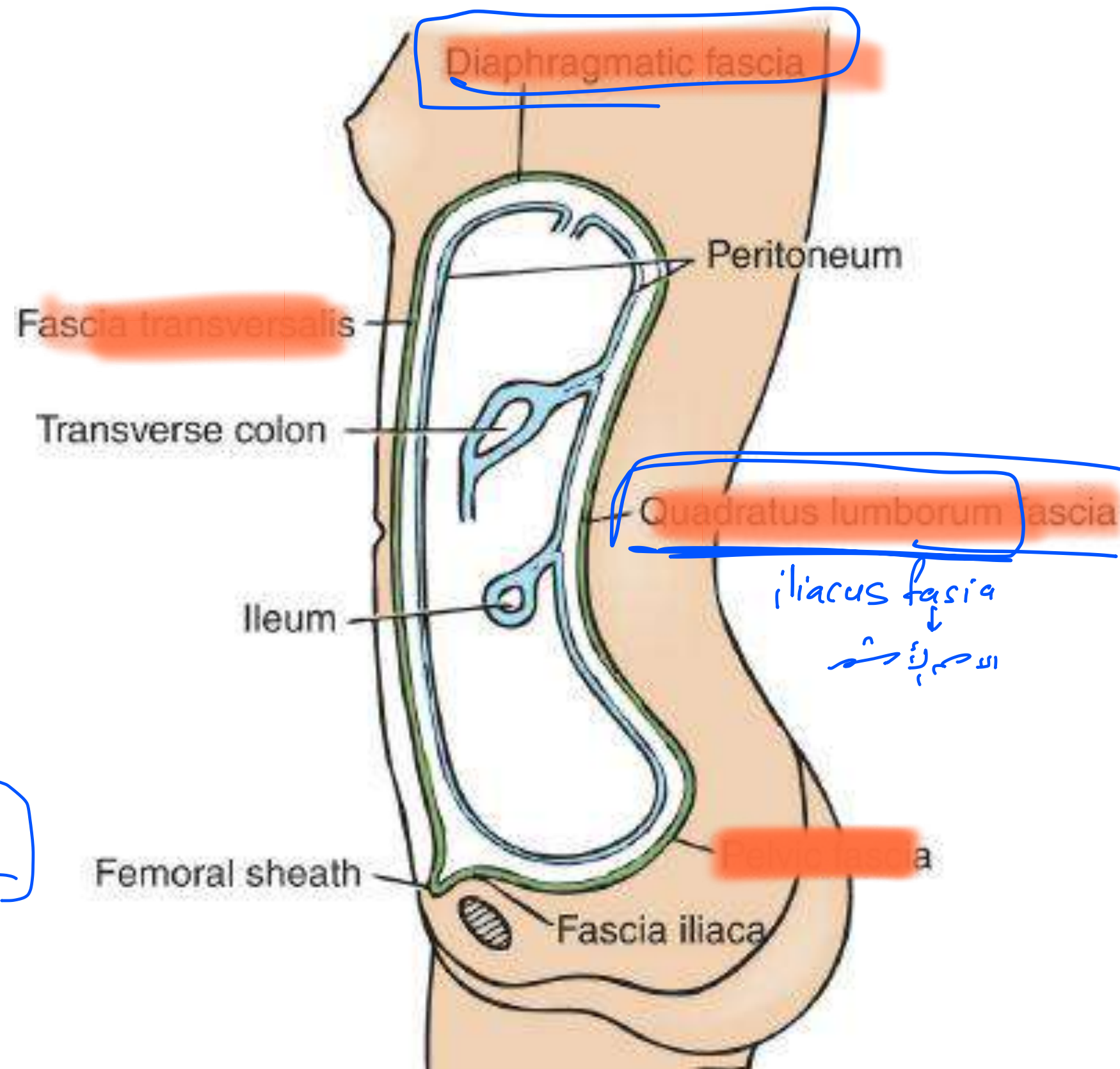
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dura m.
m



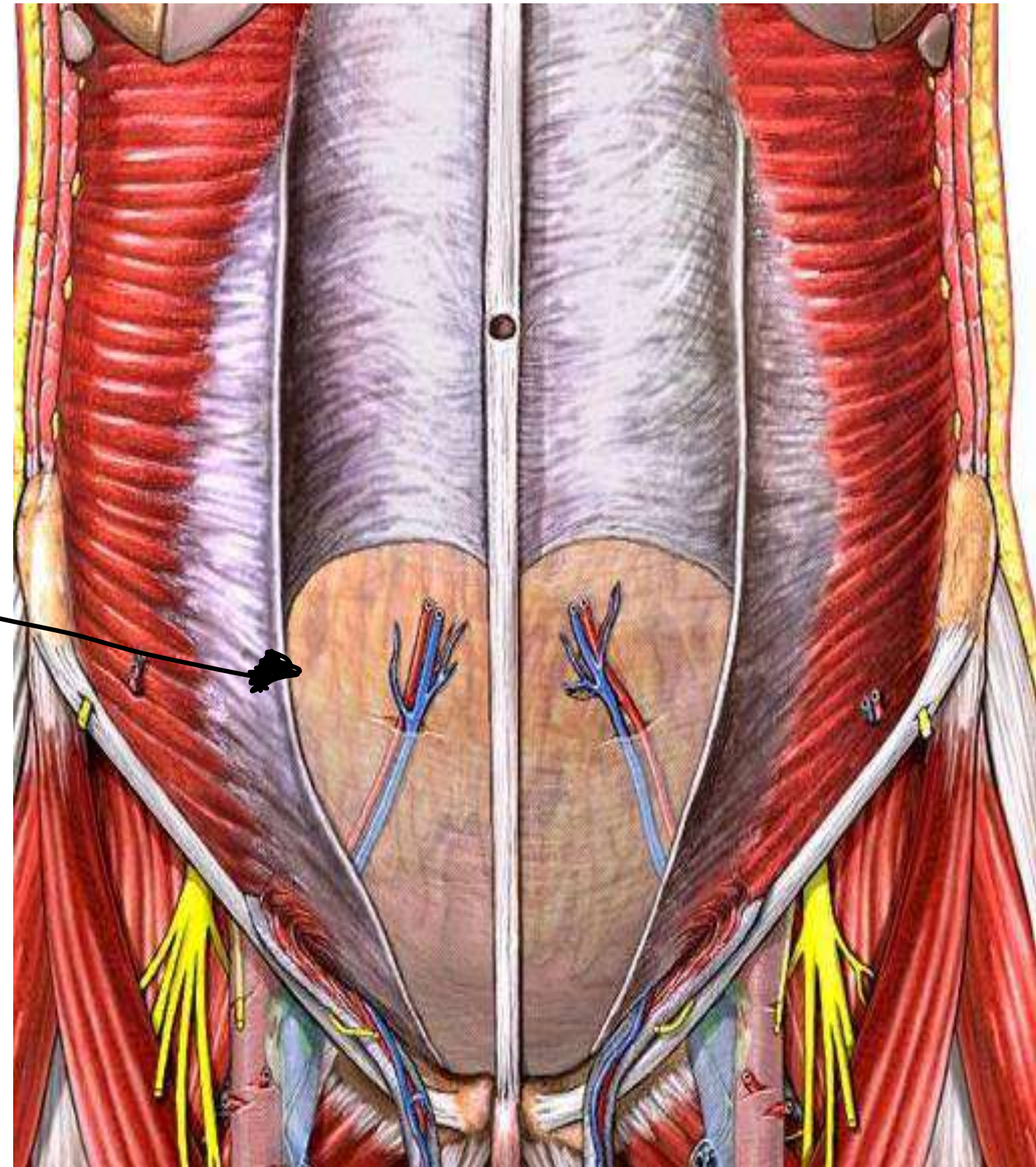
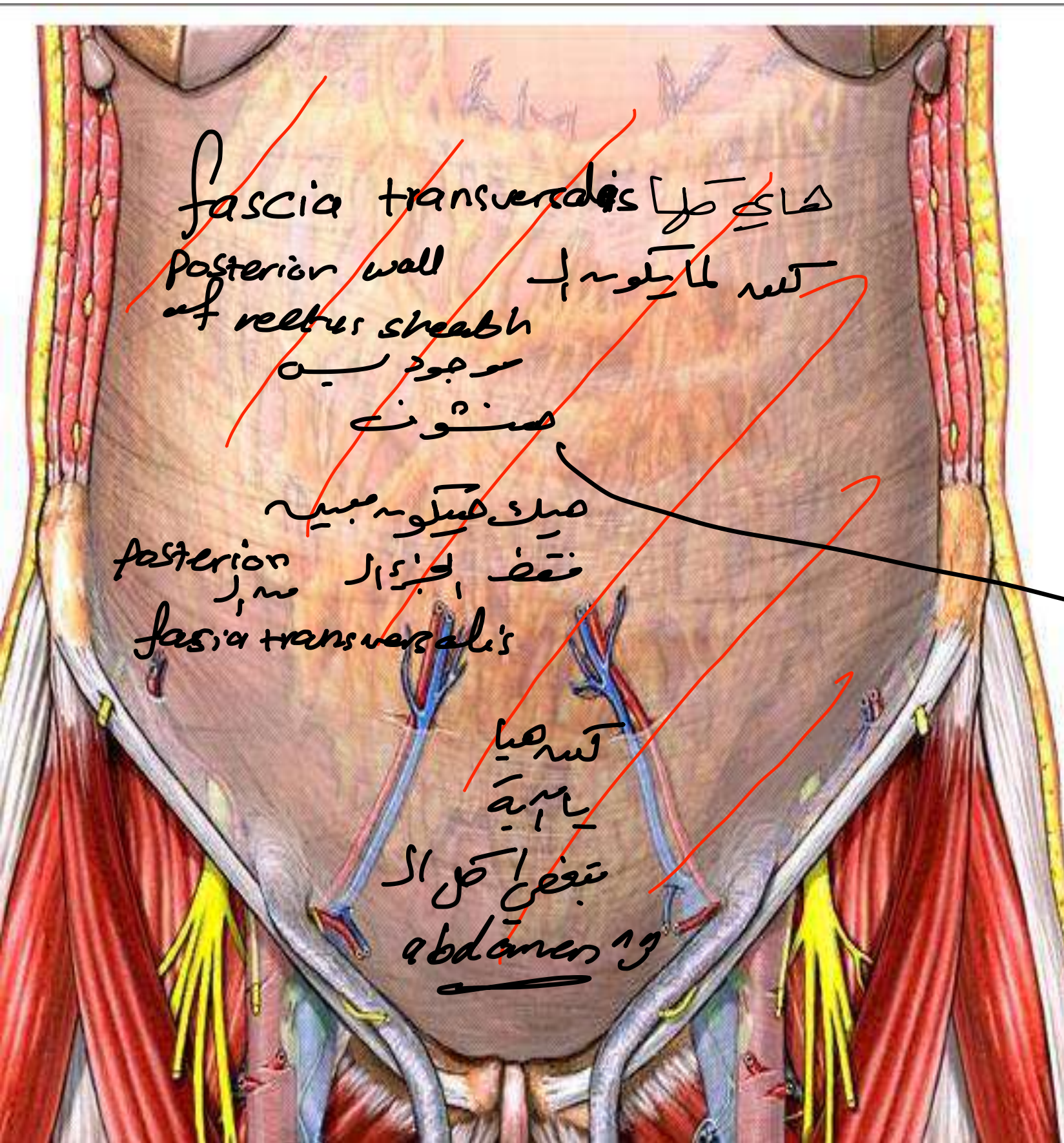
Fascia Transversalis

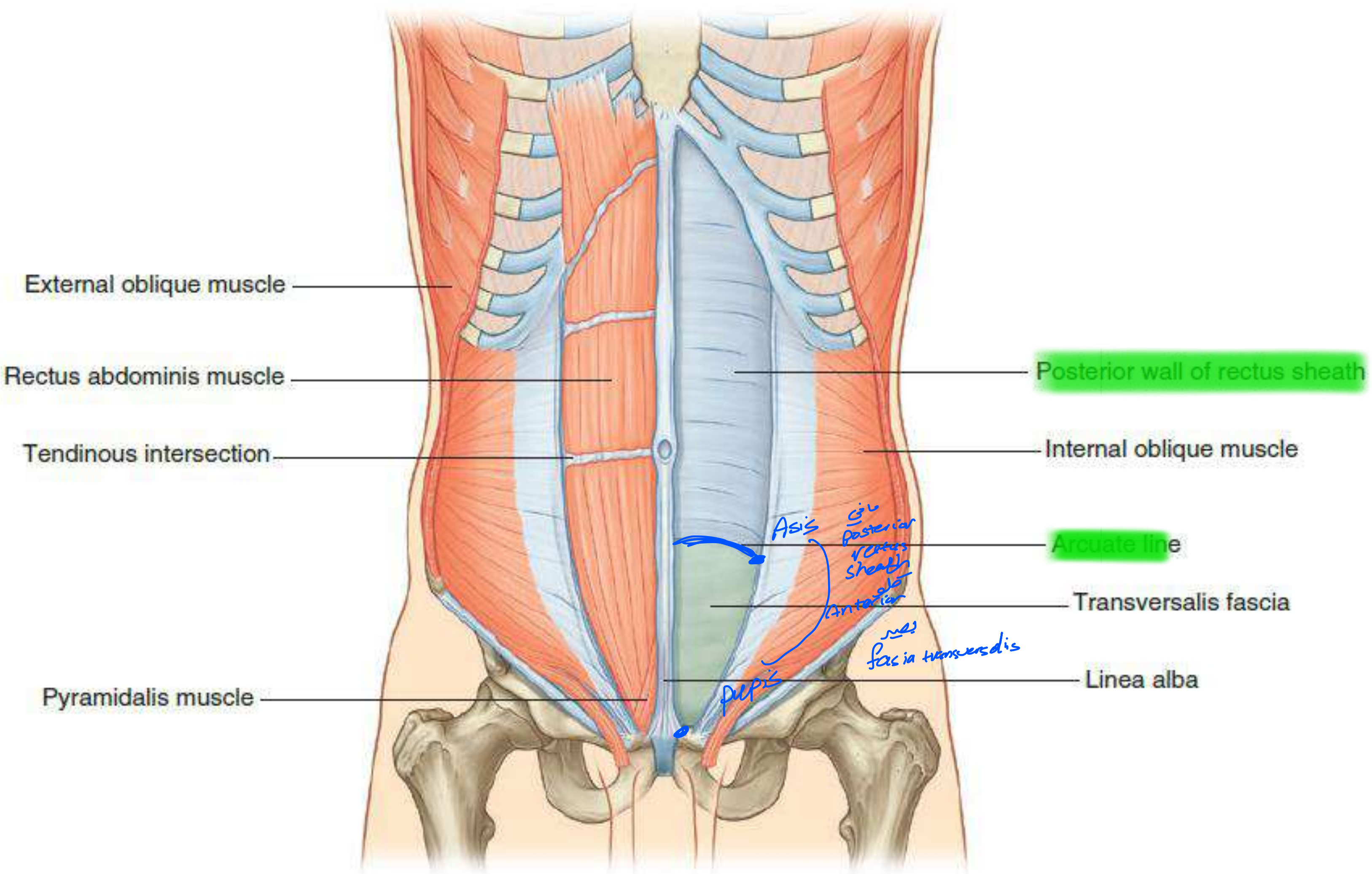
■ Fascia Transversalis,
Diaphragmatic
Fascia, Iliacus Fascia ,
& Pelvic fascia

form one continuous
lining to the
abdominal and pelvic
cavities.



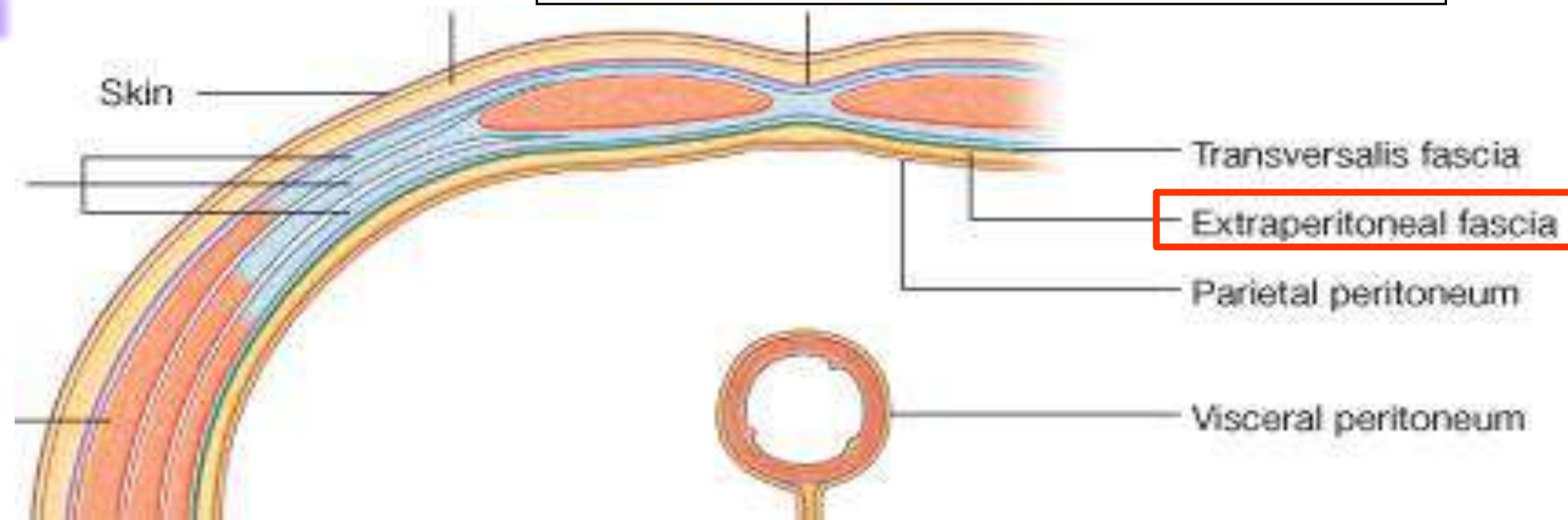
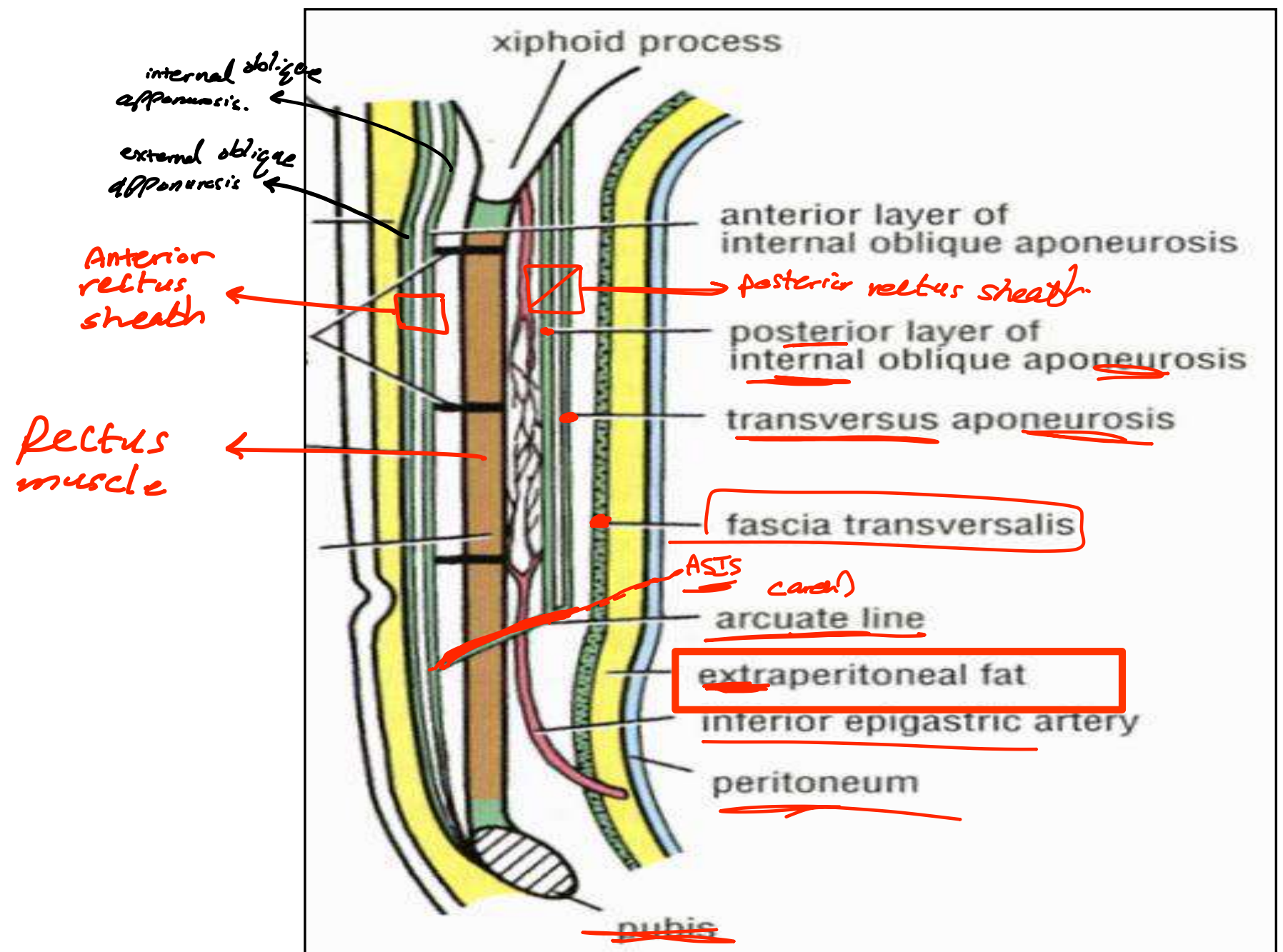
Fascia Transversalis





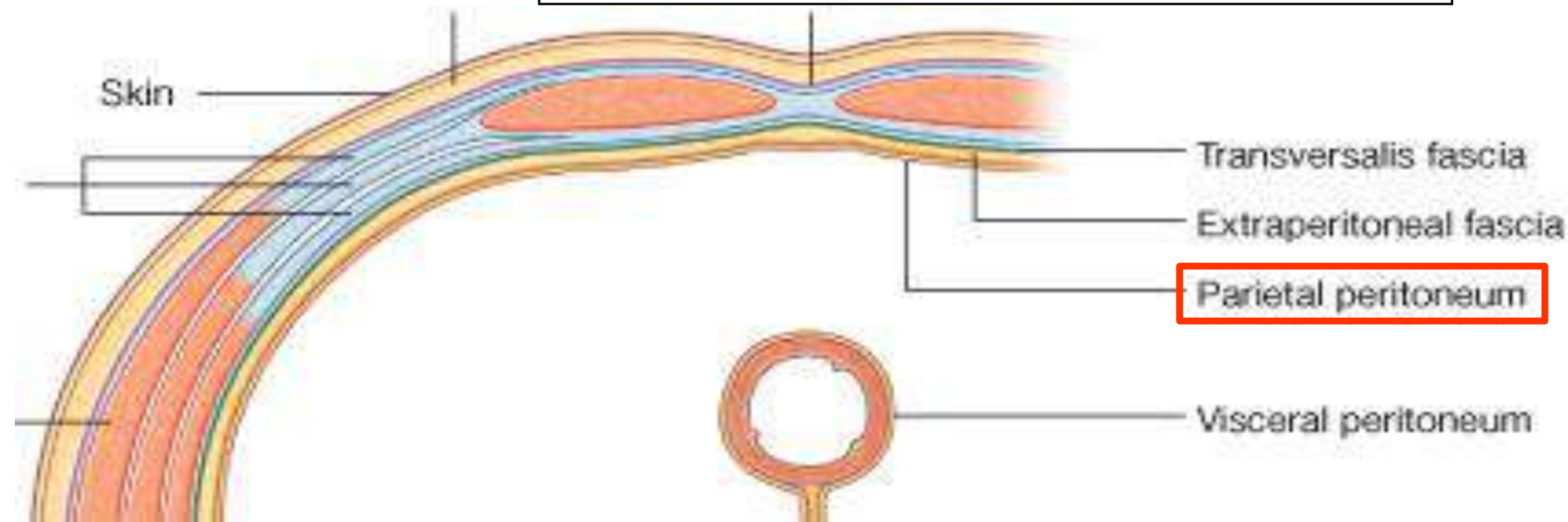
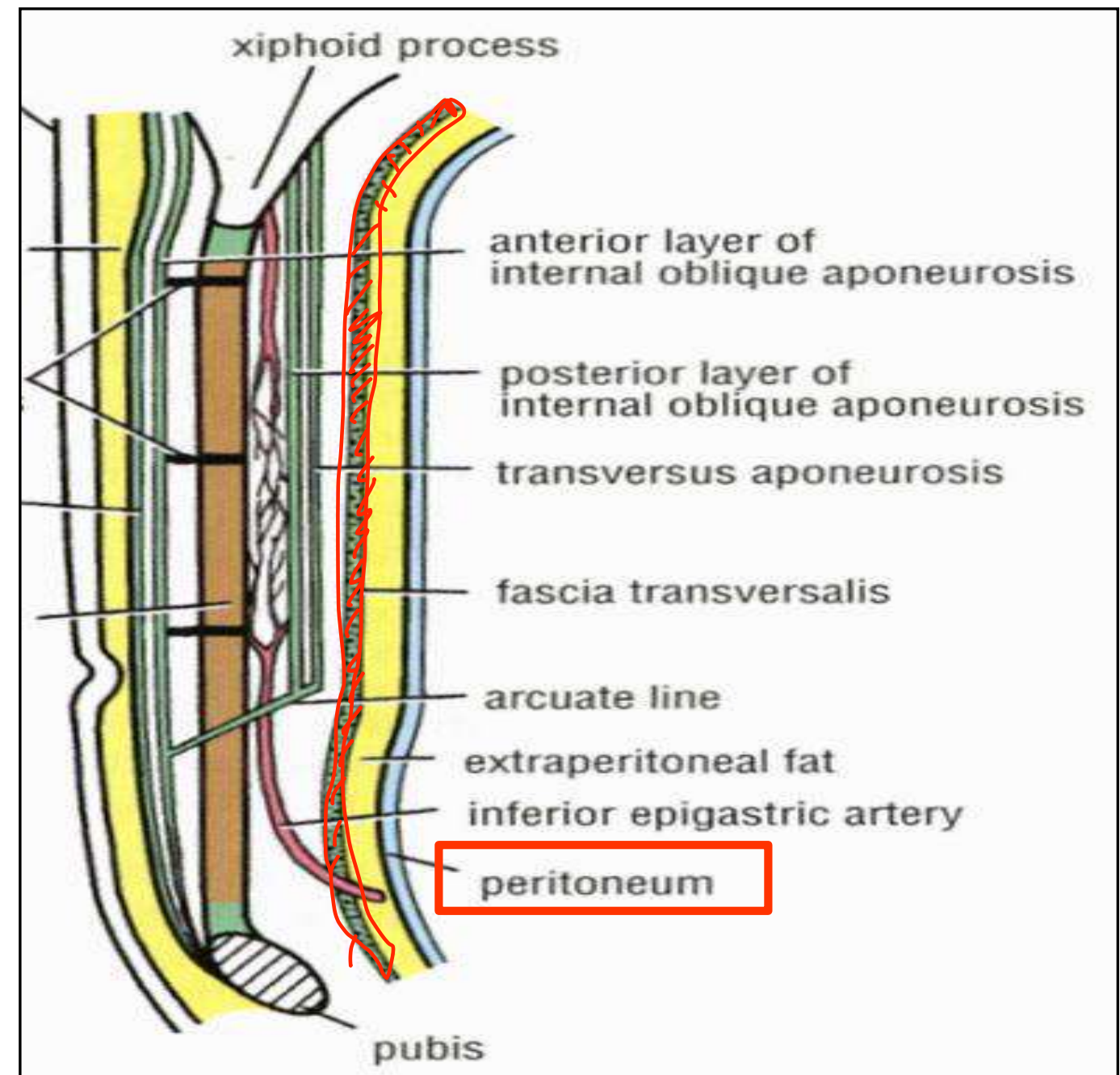
* Extraperitoneal Fat

- It is a thin layer of connective tissue that contains a variable amount of fat and lies between fascia transversalis and the parietal peritoneum.

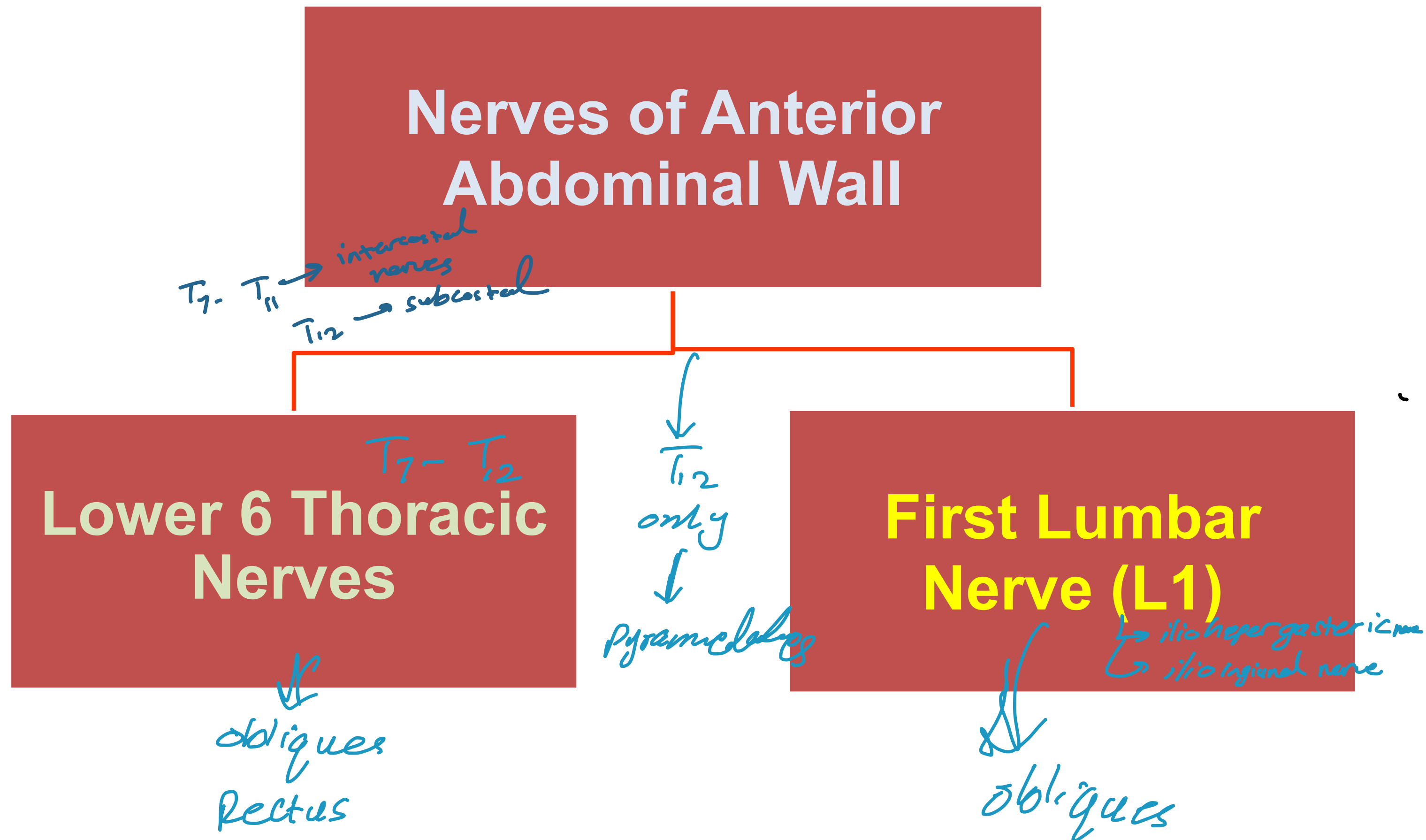


Parietal Peritoneum

+ This is a thin serous membrane and is continuous below with the parietal peritoneum lining the pelvis.

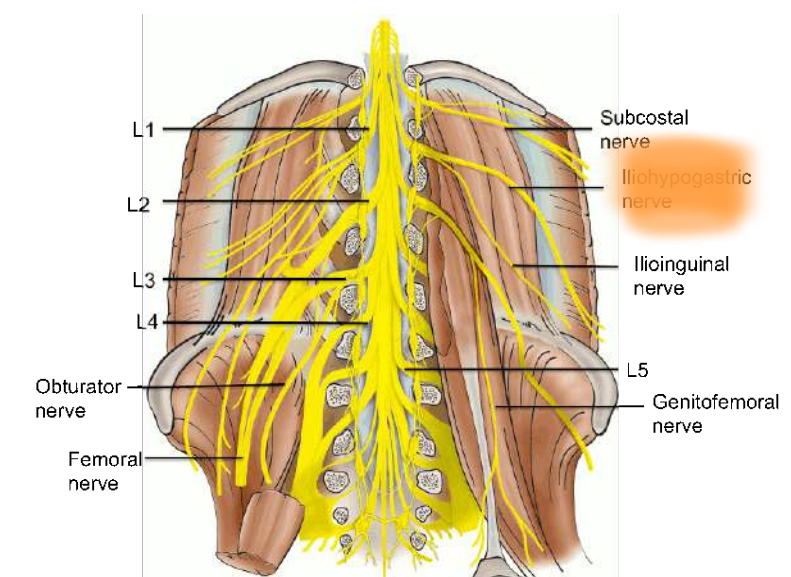
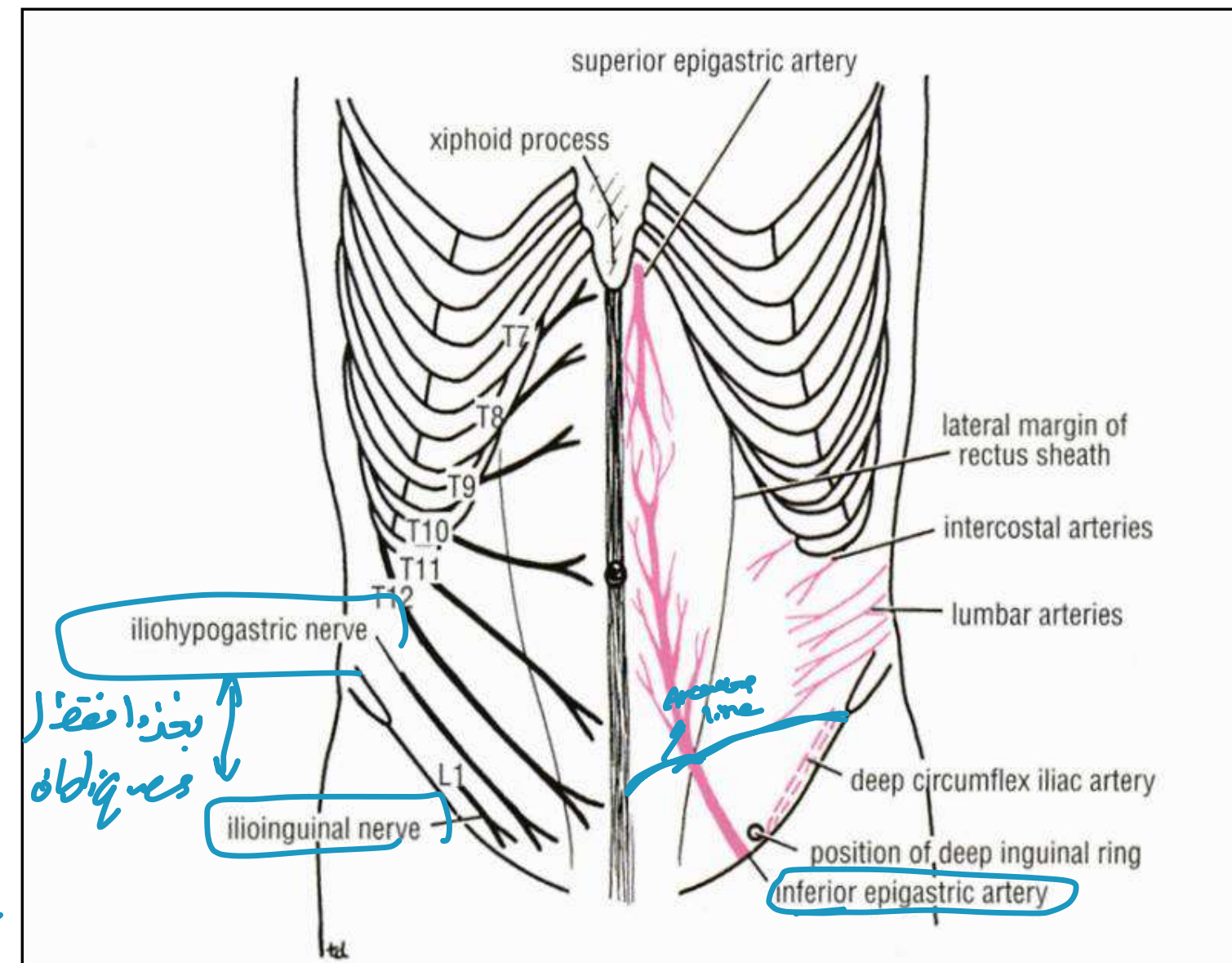


Nerves of Anterior Abdominal Wall



Nerves of Anterior Abdominal Wall

- The anterior rami of the lower six thoracic nerves. $T_7 - T_{12}$
- The first lumbar nerve (L1)
(Iliohypogastric and Ilioinguinal nerves).
- They supply the skin of the anterior abdominal wall, the muscles, and the parietal peritoneum.
- They pass forward in the interval between the internal oblique and the transversus muscles.

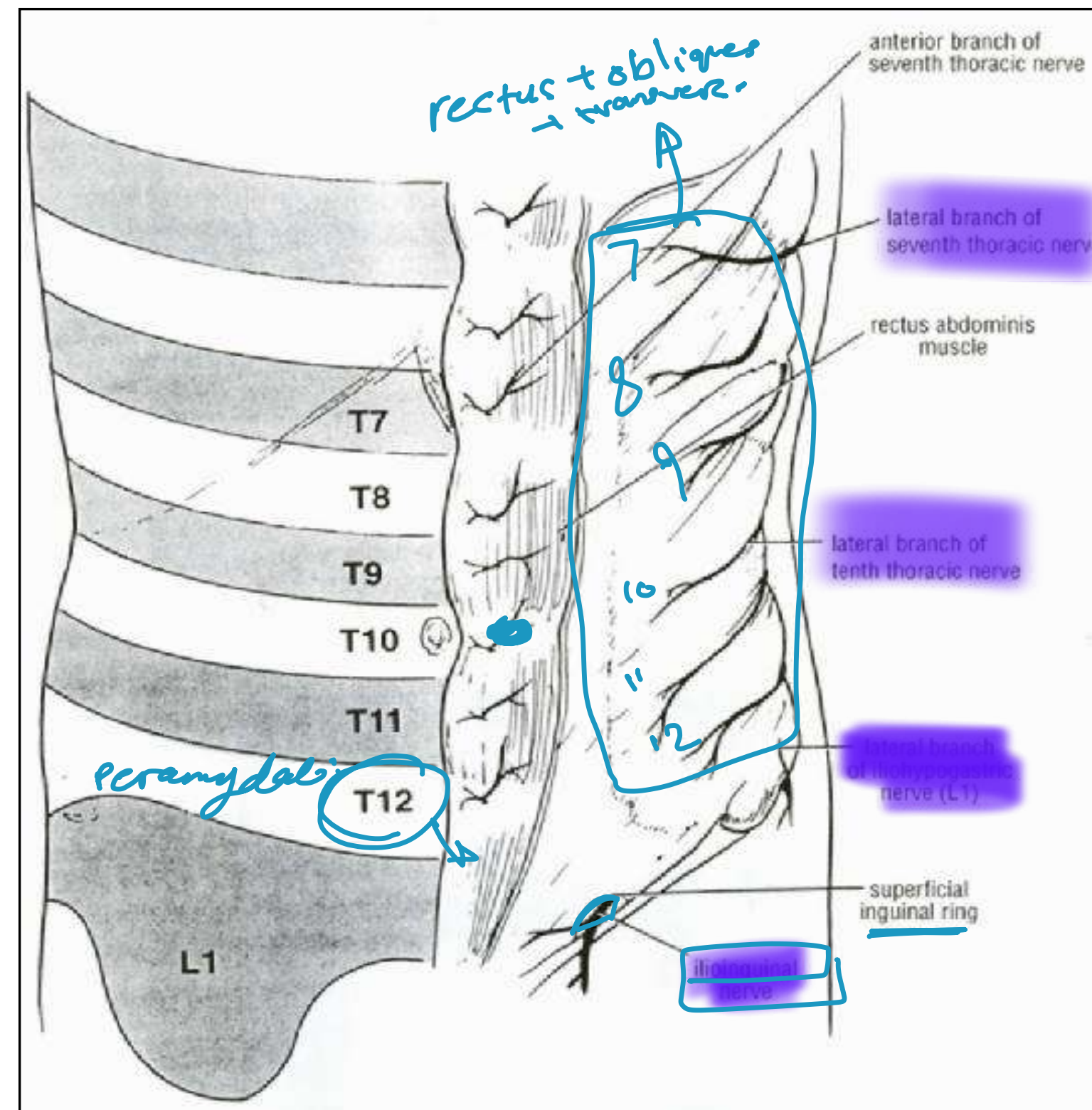


* Nerves of Anterior Abdominal Wall

between internal & transverses → Lateral 3 muscles
 (T7-T12) → pierce the posterior wall of rectus sheath → rectus muscle

+ The lower six thoracic nerves ^{تفترق} pierce the posterior wall of the rectus sheath to supply the rectus muscle and the pyramidalis (T12 only).

+ They ^{تنتهي} terminate by ^{تخترق} piercing the anterior wall of the sheath and supplying the skin.



Dermatomes of Thorax & Abdomen

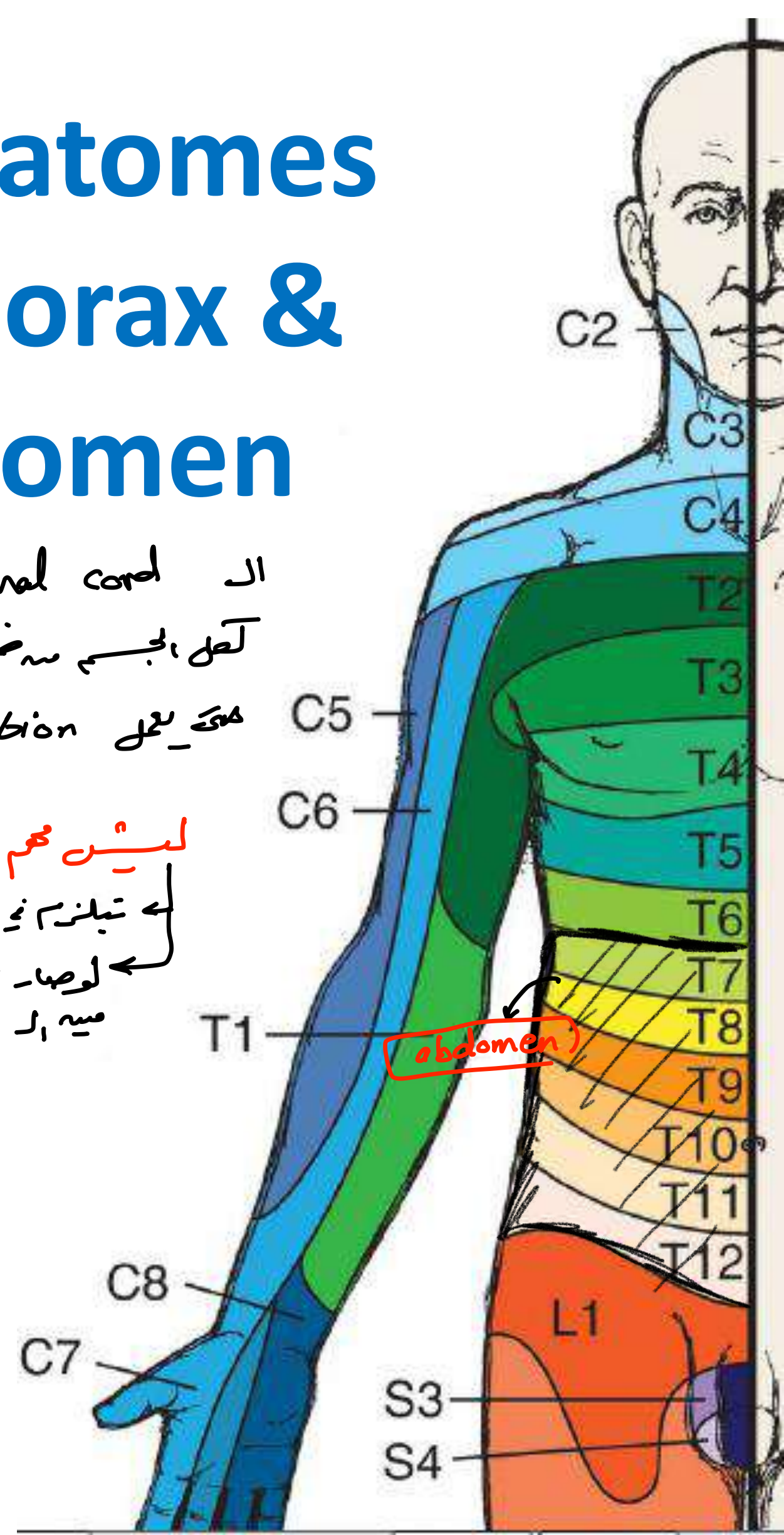
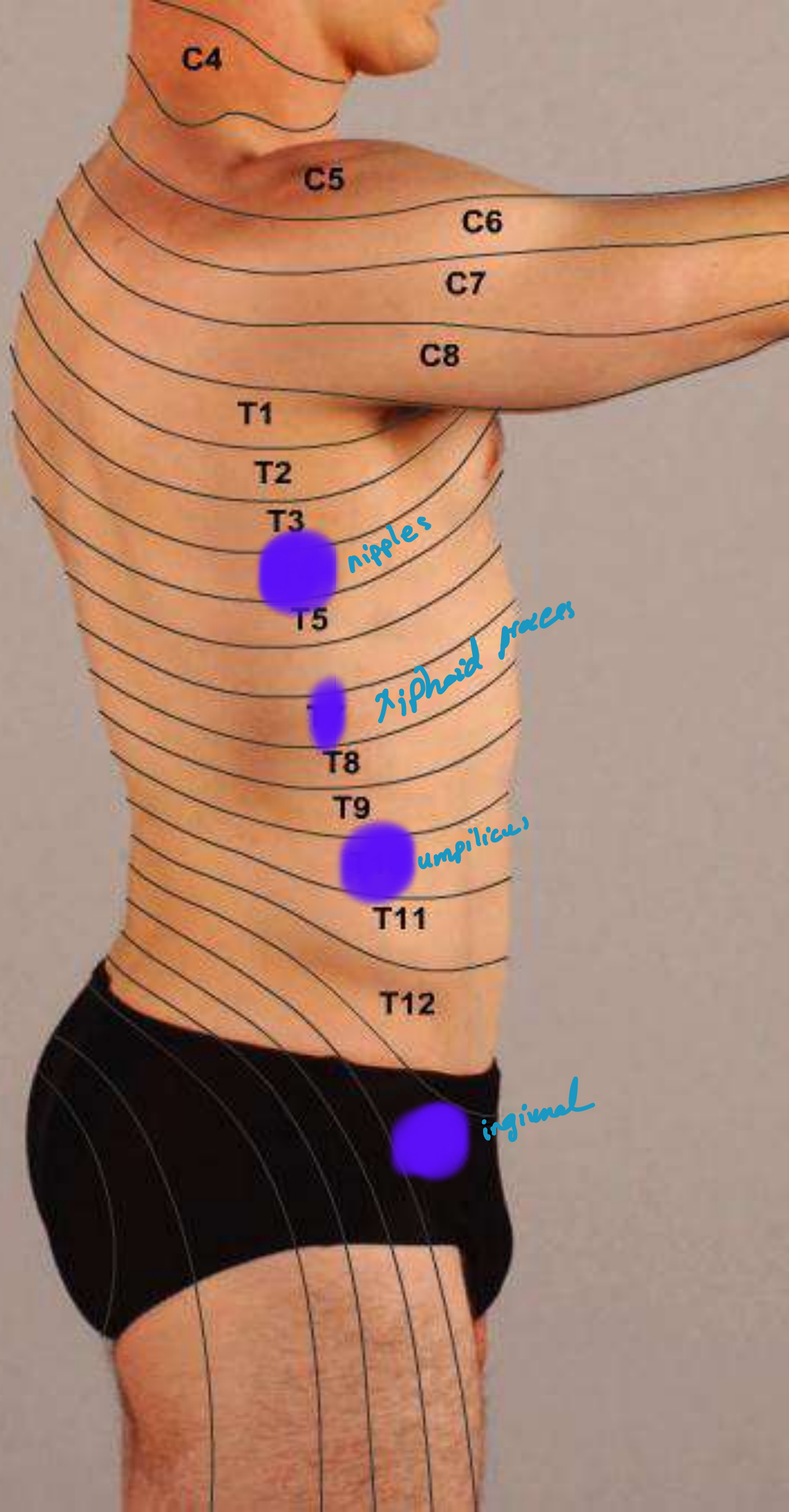
ال spinal cord سے بیٹھنے والے nerves
 کو جس سے جسم پر آواز
 ملتا ہے۔ sensation

سینے میں نعرہ؟

تباہی مچا رہا ہے

لوہا جرح اُپر

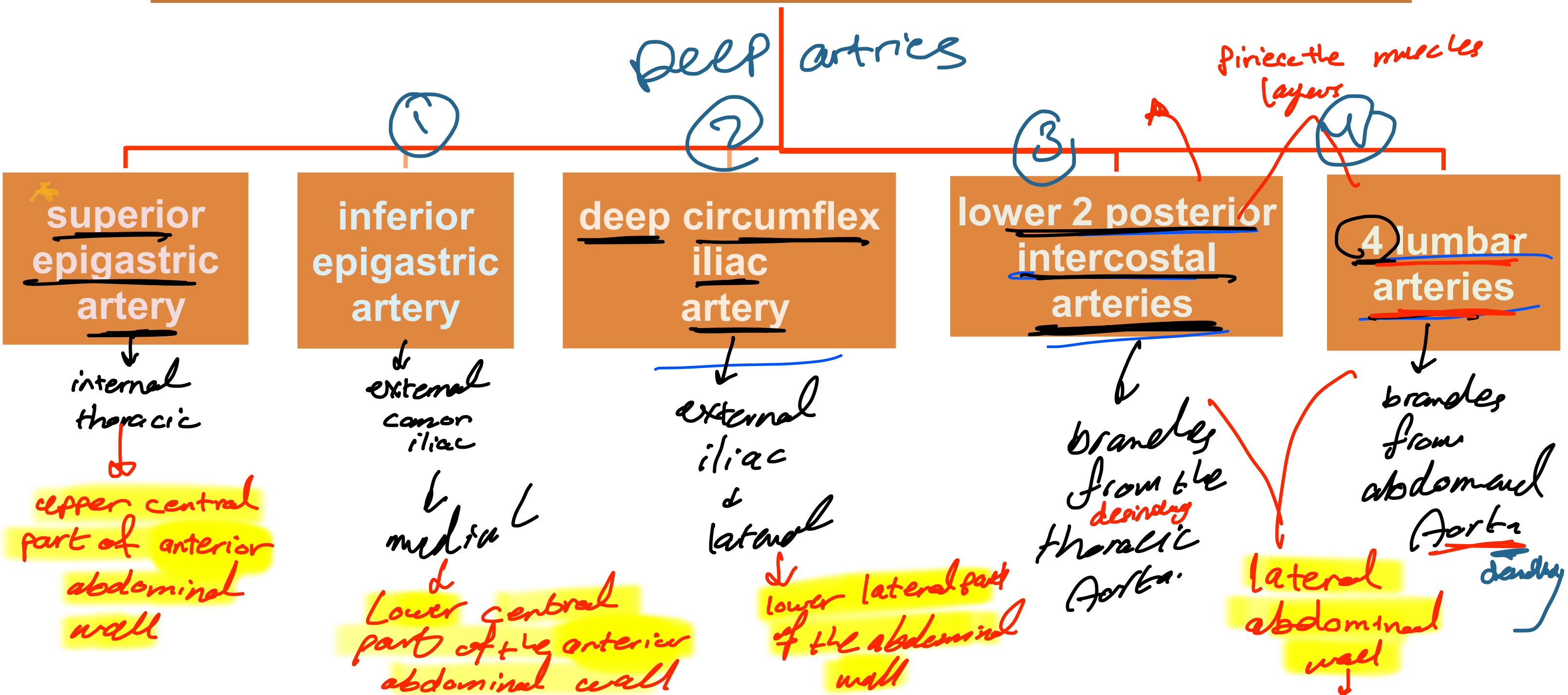
نہیں آواز nerve سے



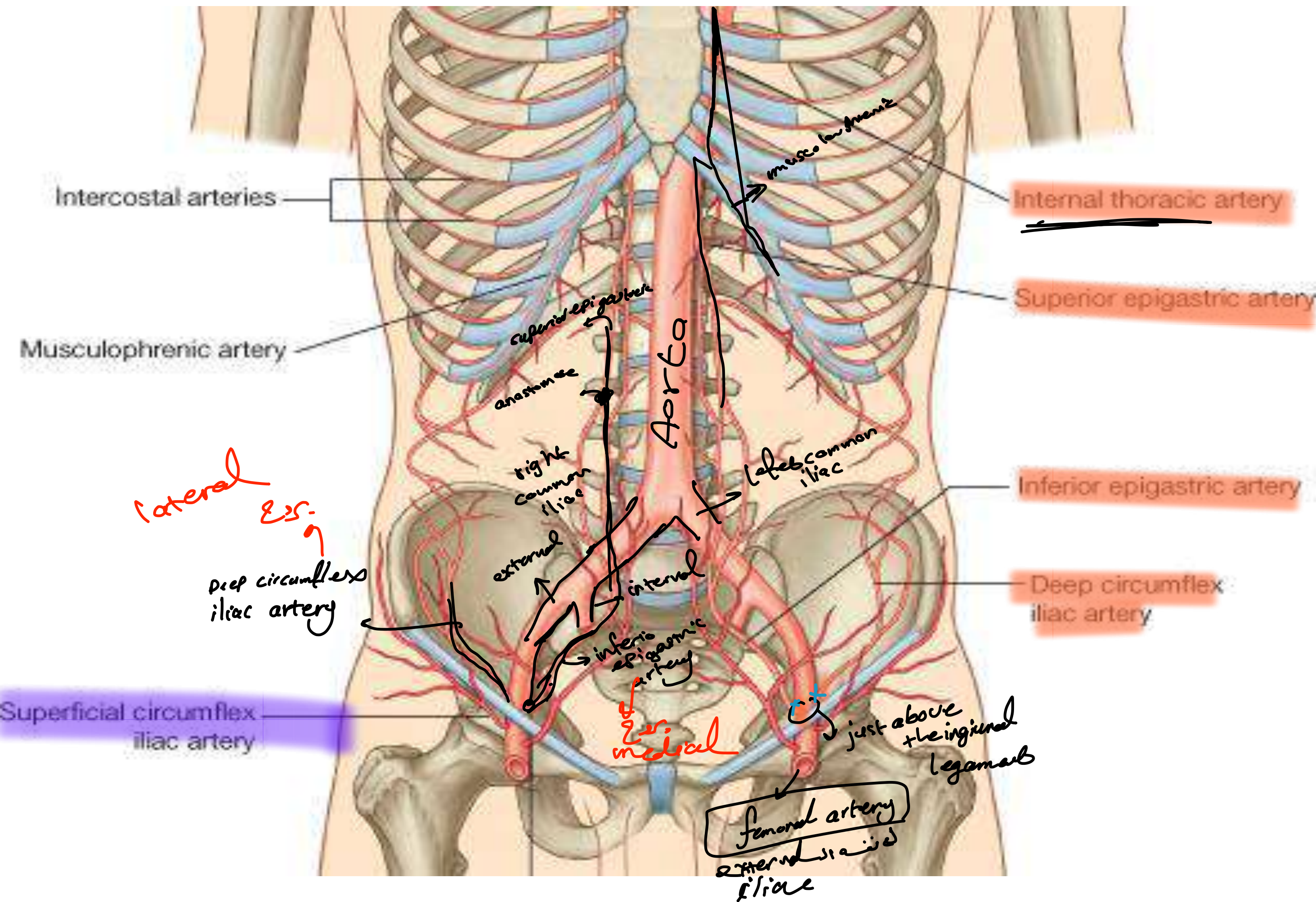
* Deep:

femoral {
 → superficial
 → ~~superf~~ external hum

Arteries of Anterior Abdominal Wall



Lower سينف

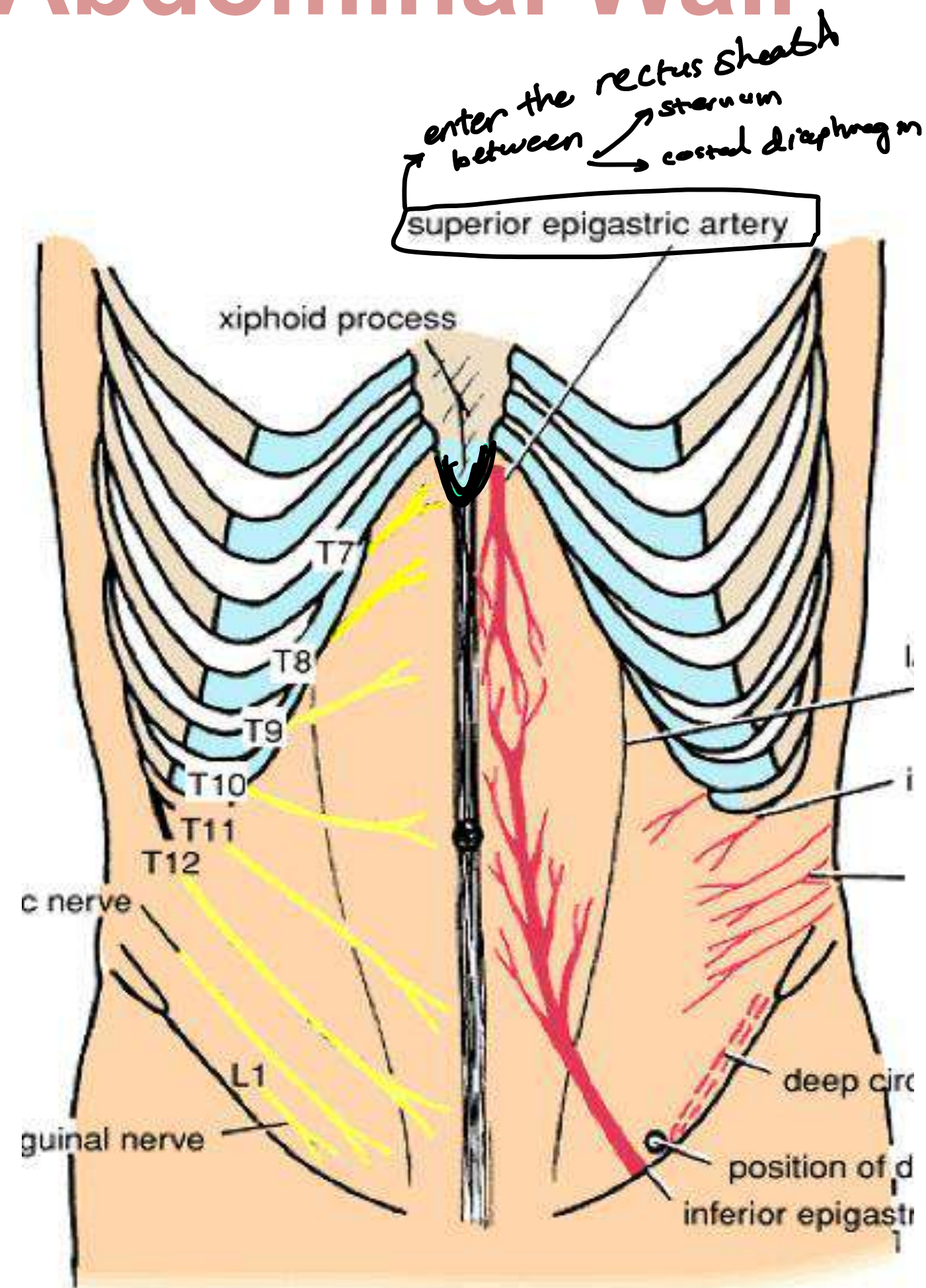


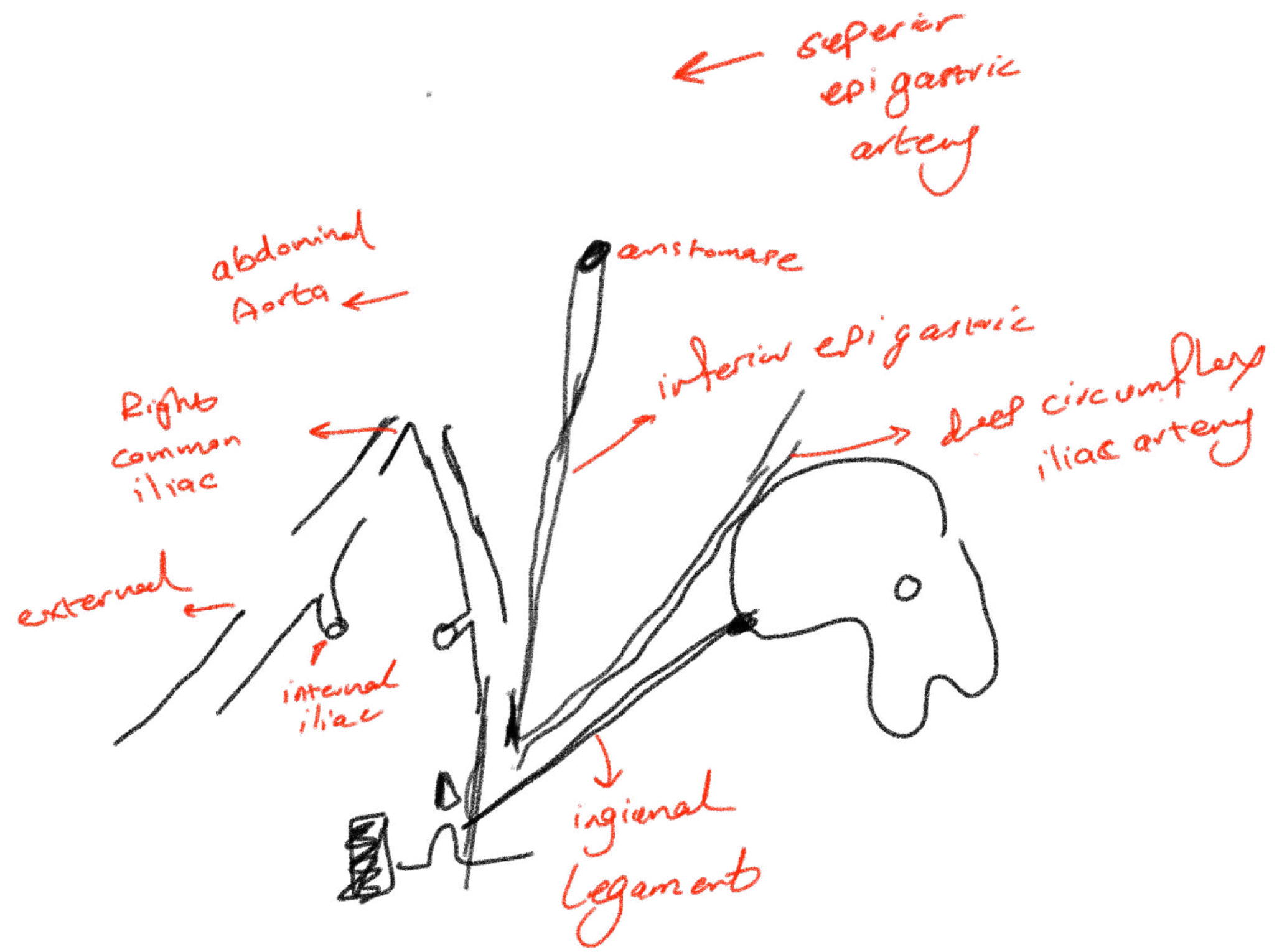
Arteries of Anterior Abdominal Wall

Superior Epigastric Artery,

❖ one of the terminal branches of the Internal Thoracic Artery, enters the upper part of the rectus sheath between the sternal and costal origins of the diaphragm.

❖ It descends behind the rectus muscle, supplying the central part of anterior abdominal wall, and anastomosis with the inferior epigastric artery.

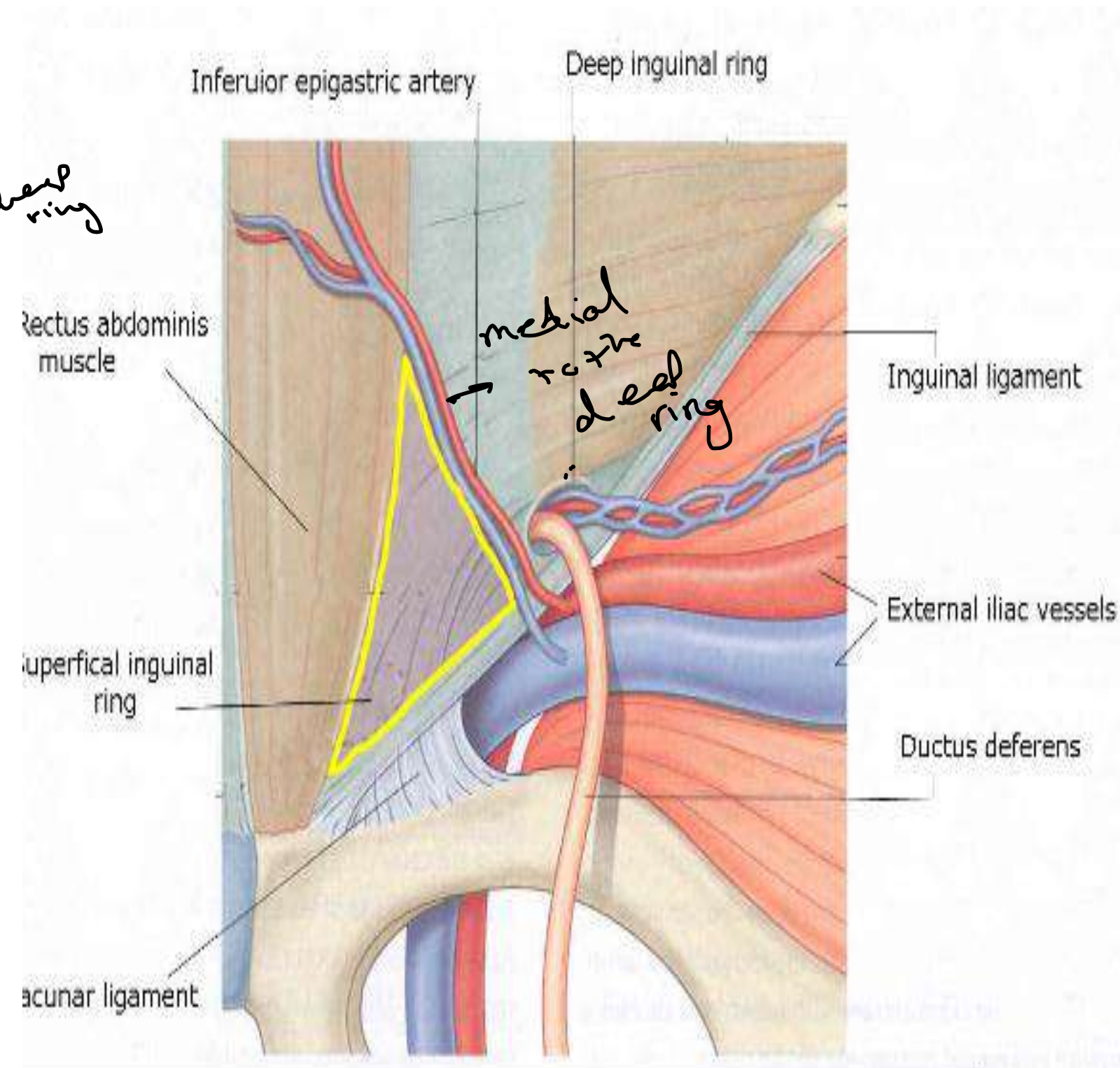




Arteries of Anterior Abdominal Wall

■ Inferior epigastric artery

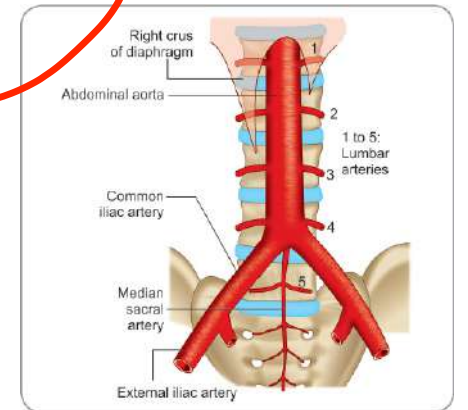
- ❖ is a branch of External Iliac Artery just above the inguinal ligament. It runs upward and medially along the side of the Deep Ring.
- ❖ It pierces the fascia transversalis to enter the rectus sheath anterior to the arcuate line.
- ❖ It ascends behind the rectus muscle, supplying the **lower central part of the anterior abdominal wall**, and anastomose with the superior epigastric artery.



Arteries of Anterior Abdominal Wall

inferior epigastric
فسي ال

+ Deep circumflex iliac artery is a branch of the External iliac artery just above the inguinal ligament. It runs upward and laterally toward the ASIS and then continues along the iliac crest, It supplies lower lateral part of the abdominal wall.

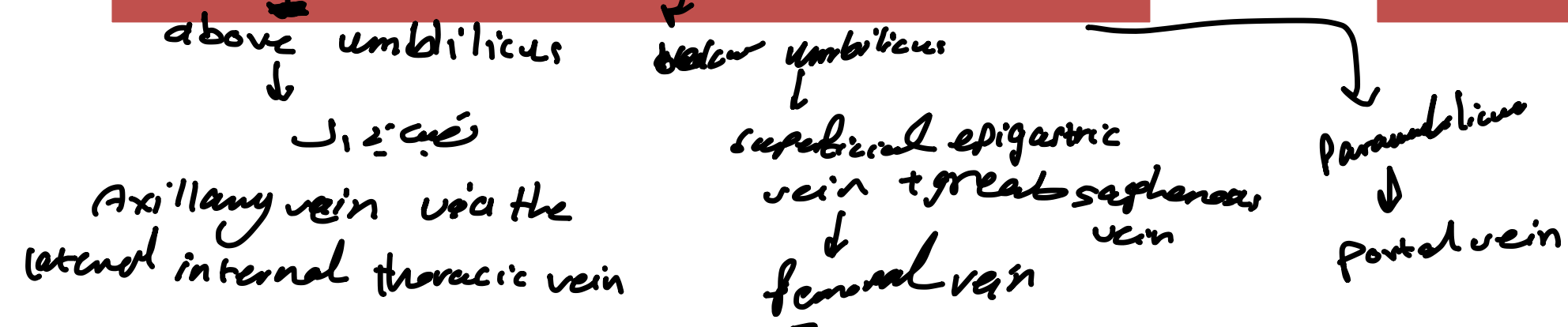


+ Lower 2 posterior intercostal arteries, branches of descending thoracic aorta, and 4 lumbar arteries, branches of the Abdominal Aorta, pass forward between muscle layers and supply lateral part of abdominal wall

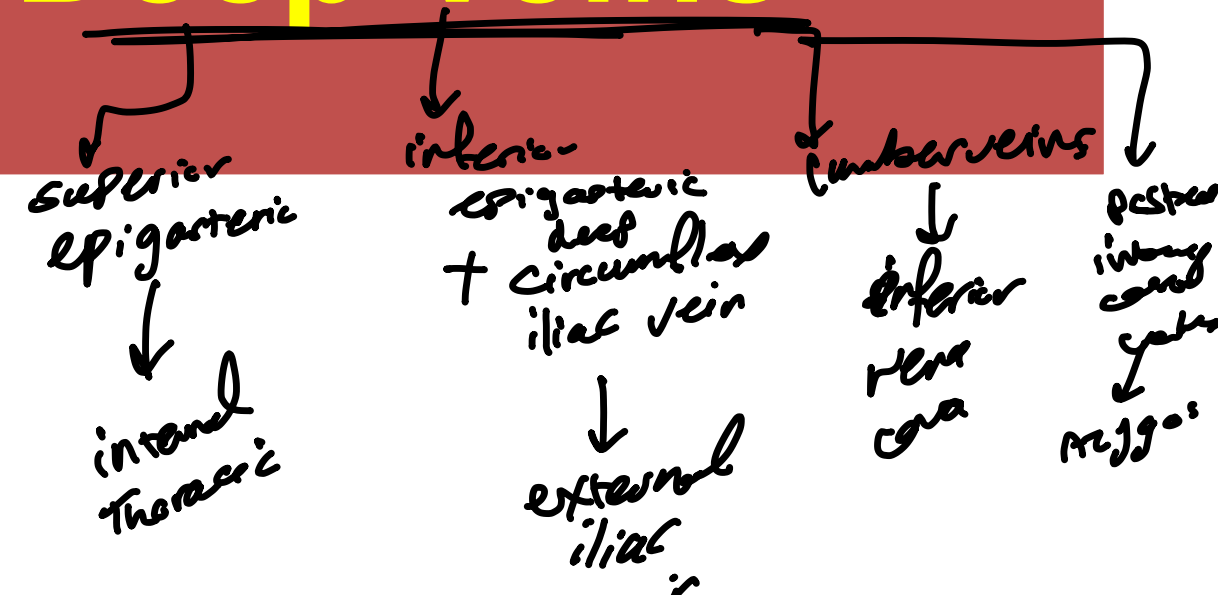
Veins of Anterior Abdominal Wall

Veins of the Anterior Abdominal Wall

Superficial Veins



Deep Veins



Superficial Veins

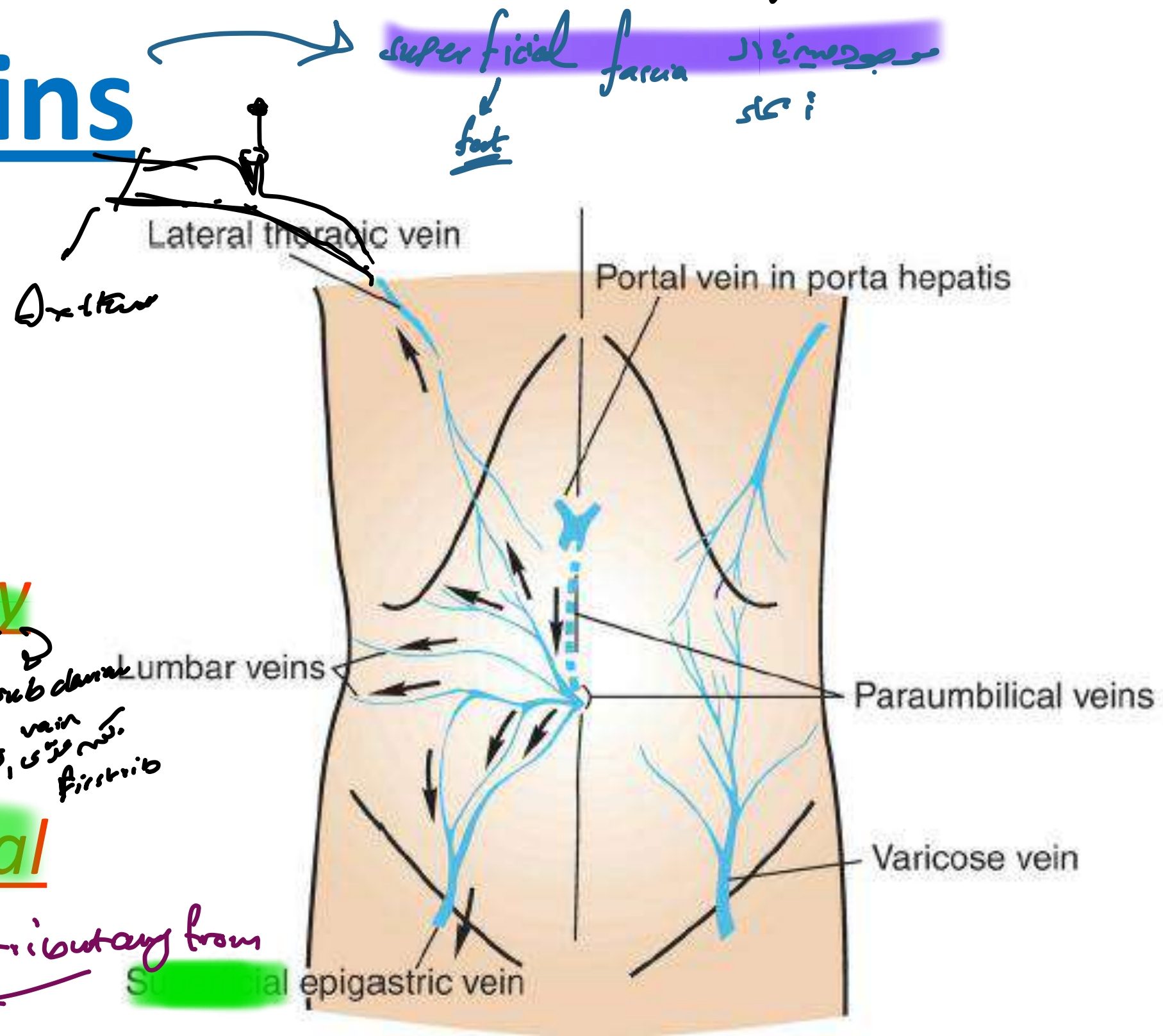
Form a network that radiates out from the umbilicus.

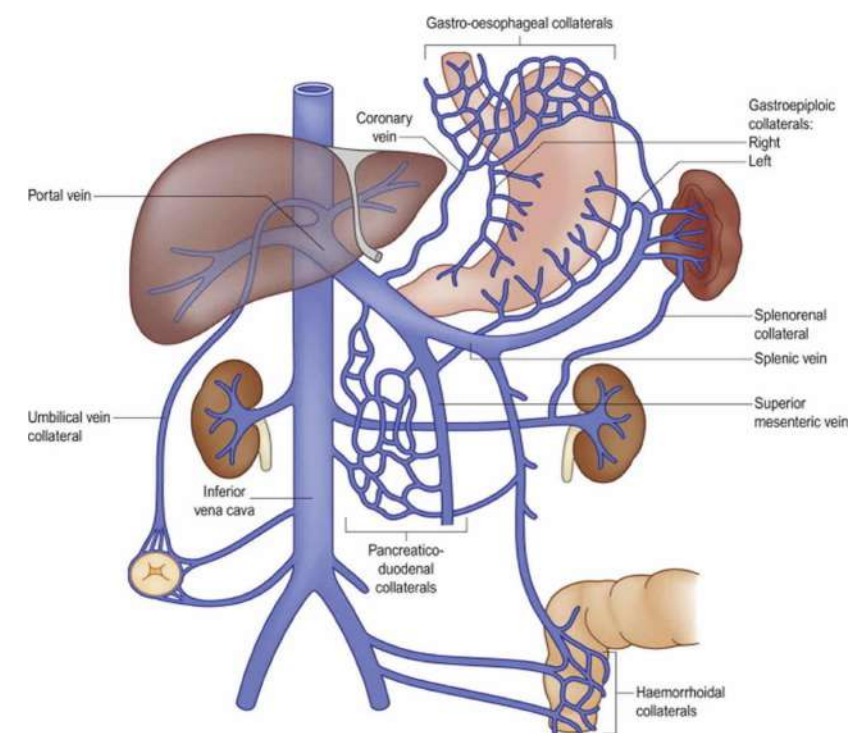
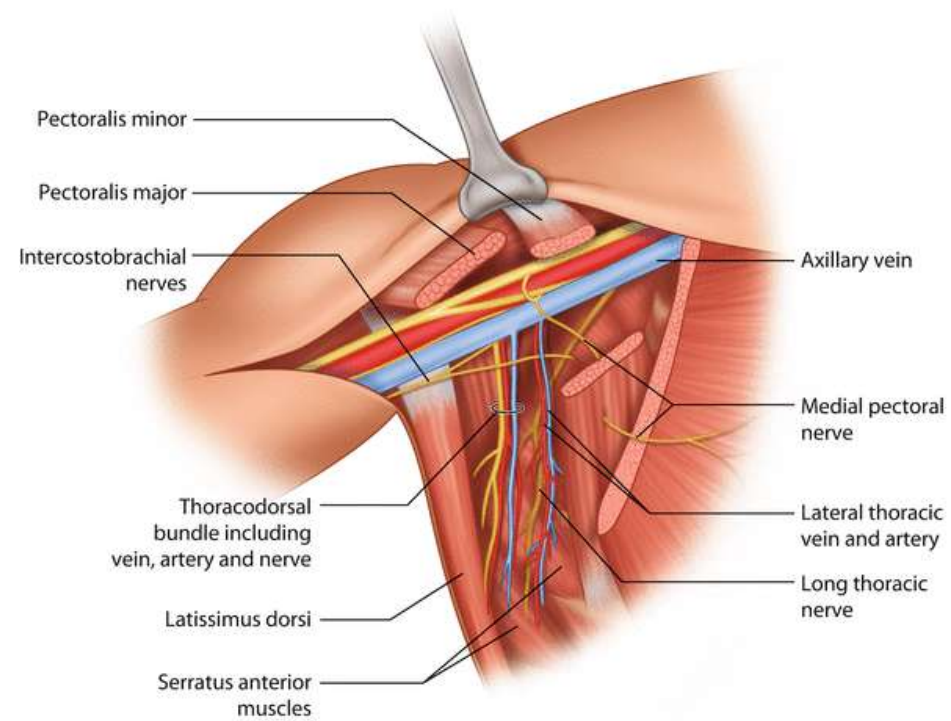
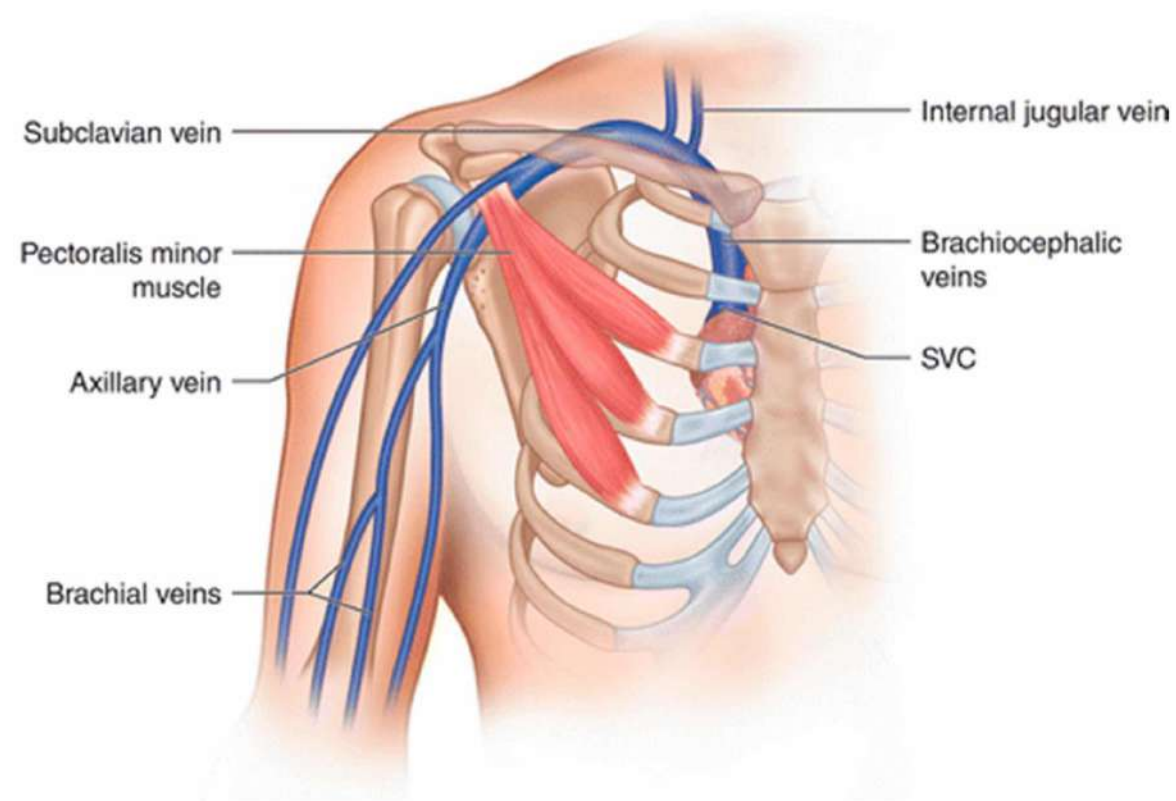
Above, the network is drained into the Axillary vein via the lateral thoracic vein.

Below, into the Femoral vein via the superficial epigastric and great saphenous veins. *in the leg*

A few small veins (paraumbilical veins), connect the network through the umbilicus and along the ligamentum teres to the portal vein.

This forms porto - systemic venous anastomosis.





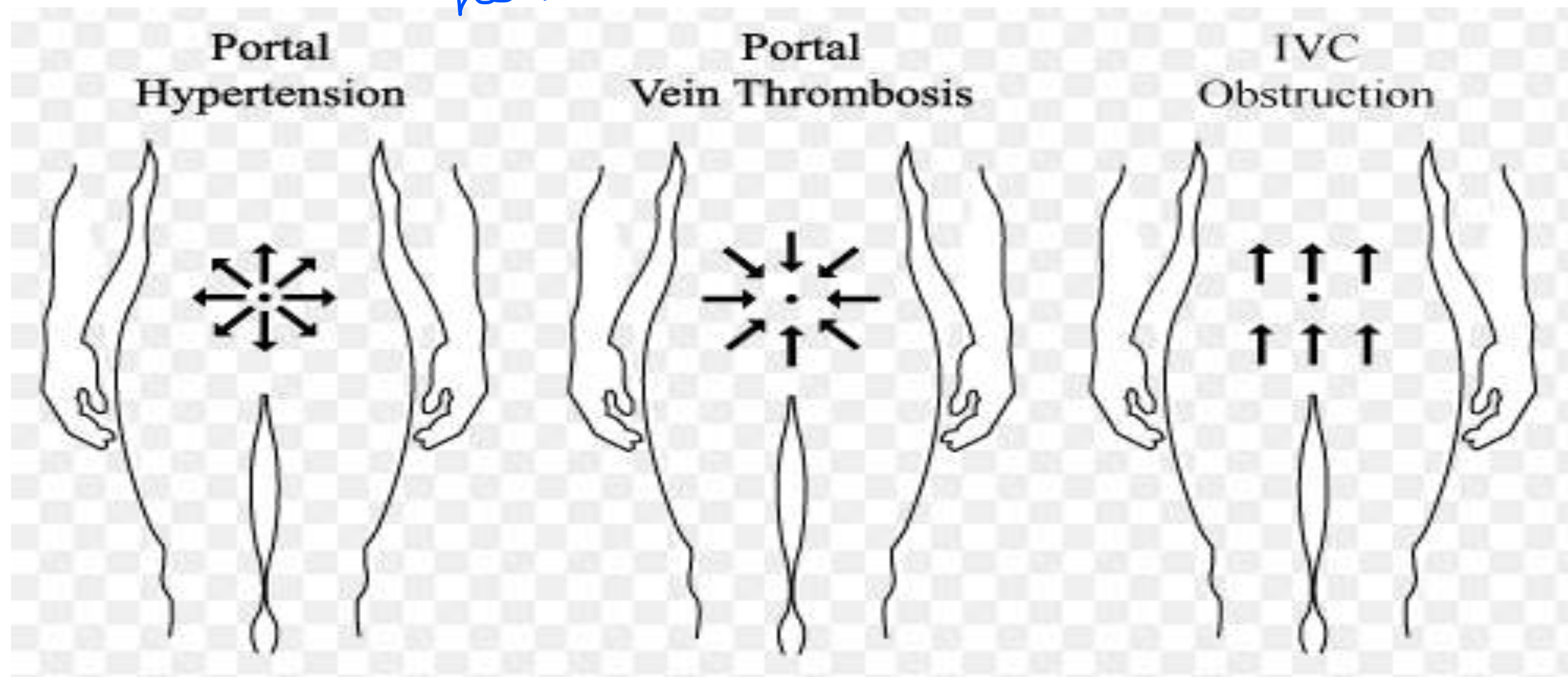
Deep Veins

- ① ■ Superior epigastric vein : drain into the Internal thoracic vein
- ② ■ Inferior epigastric & deep circumflex iliac veins, drain into External iliac veins. ③
- ④ ■ The posterior intercostal veins drain into the Azygos Veins, and the lumbar veins drain into the inferior vena cava. ⑤

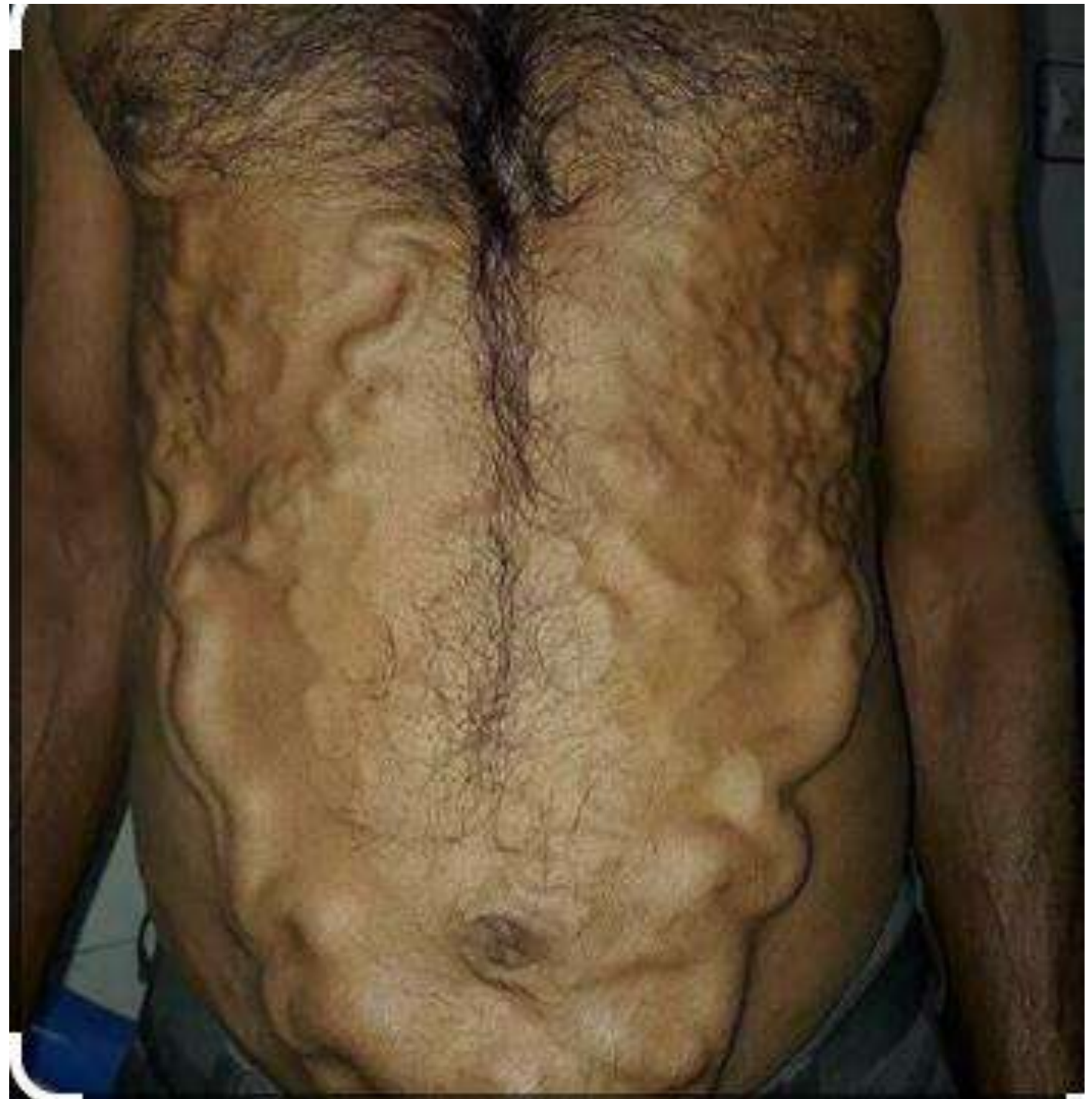
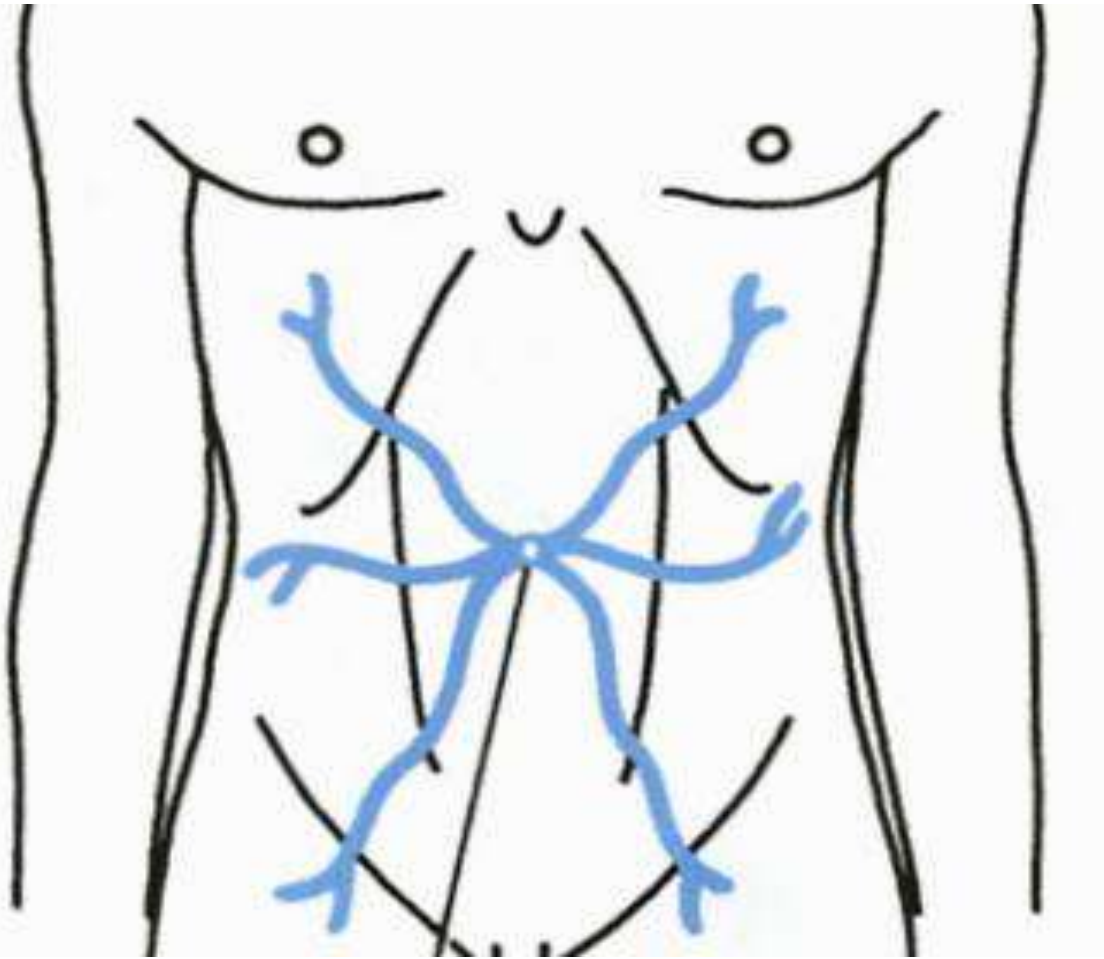
Clinical: PORTAL VEIN OBSTRUCTION

↳ (paraumbilical vein)

- In cases of portal vein obstruction, the superficial veins around the umbilicus and the paraumbilical veins become grossly distended. ← منتفخ جدار
- The distended subcutaneous veins radiate out from the umbilicus, producing in severe cases the clinical picture referred to as caput medusae. ← منزعج



Clinical: PORTAL VEIN OBSTRUCTION



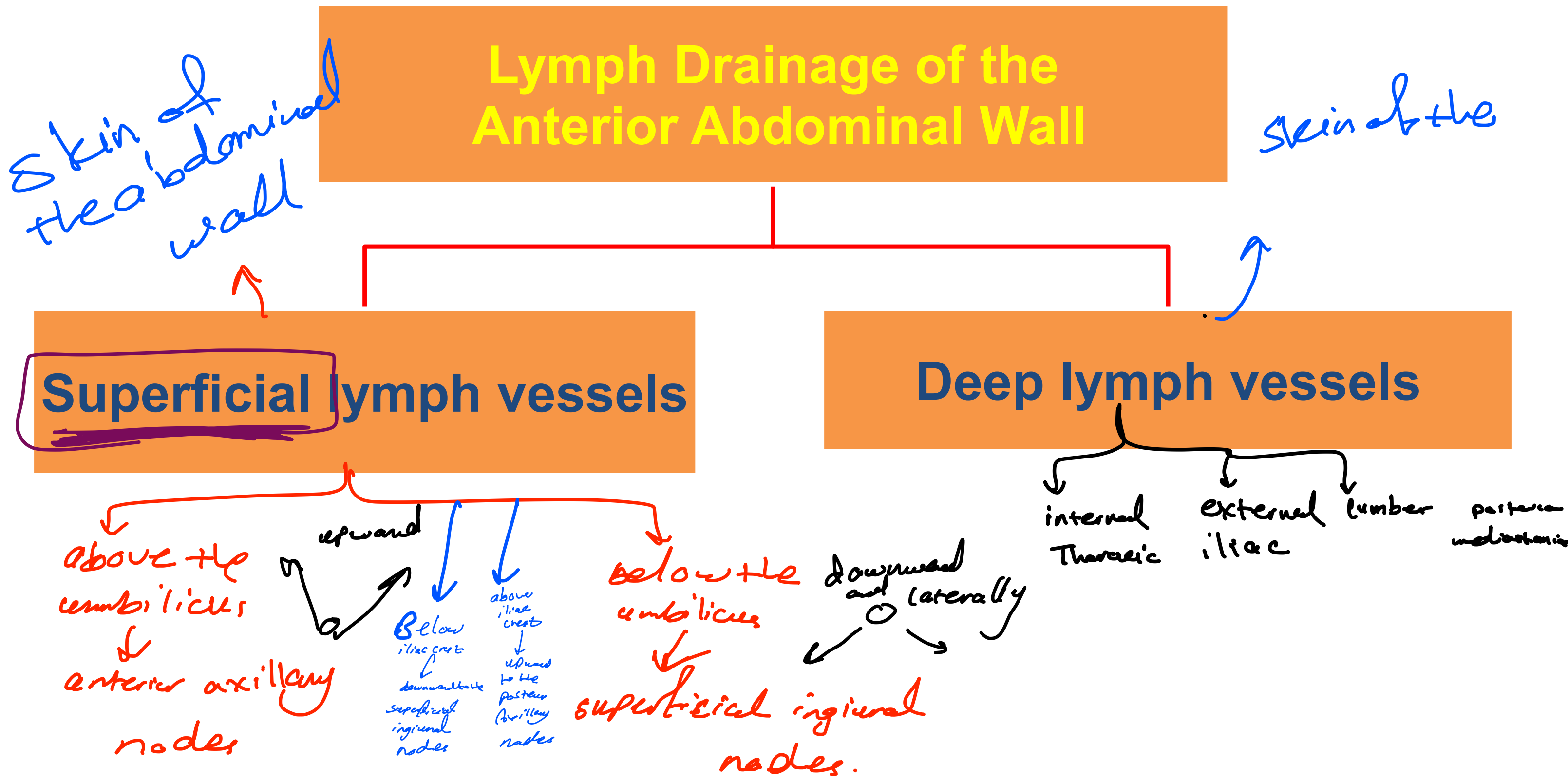
Clinical: CAVAL OBSTRUCTION

↓
→ superficial epigastric vein below
→ internal thoracic vein.
↓
above

- If the superior or inferior vena cava is obstructed, the venous blood causes distension of the veins running from the anterior chest wall to the thigh.
- The *lateral thoracic vein* anastomoses with the *superficial epigastric vein*, a tributary of the great saphenous vein of the leg. In these circumstances, a tortuous varicose vein may extend from the axilla to the lower abdomen



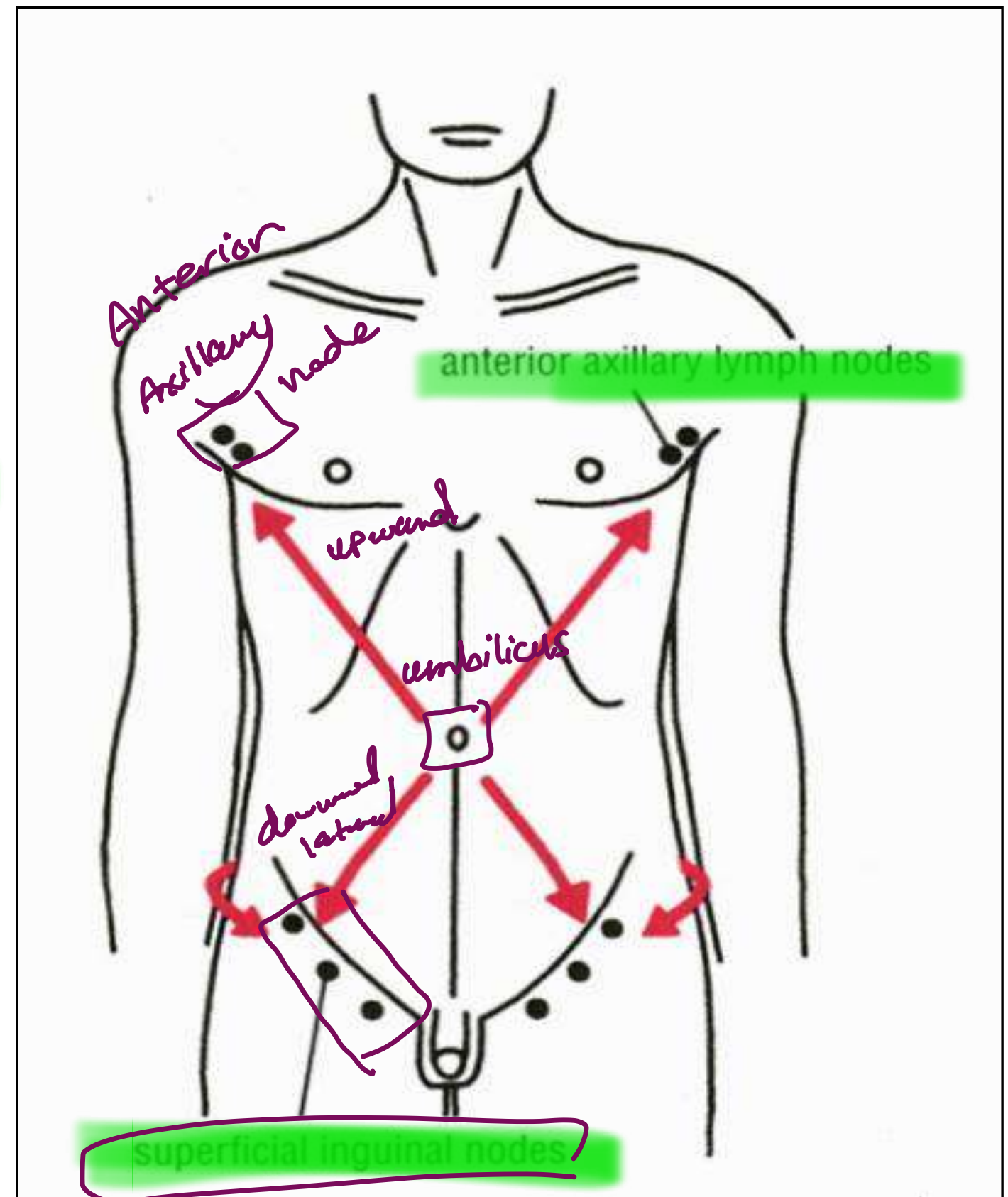
Lymph Drainage of Anterior Abdominal Wall



Superficial Lymph Vessels

الخصب

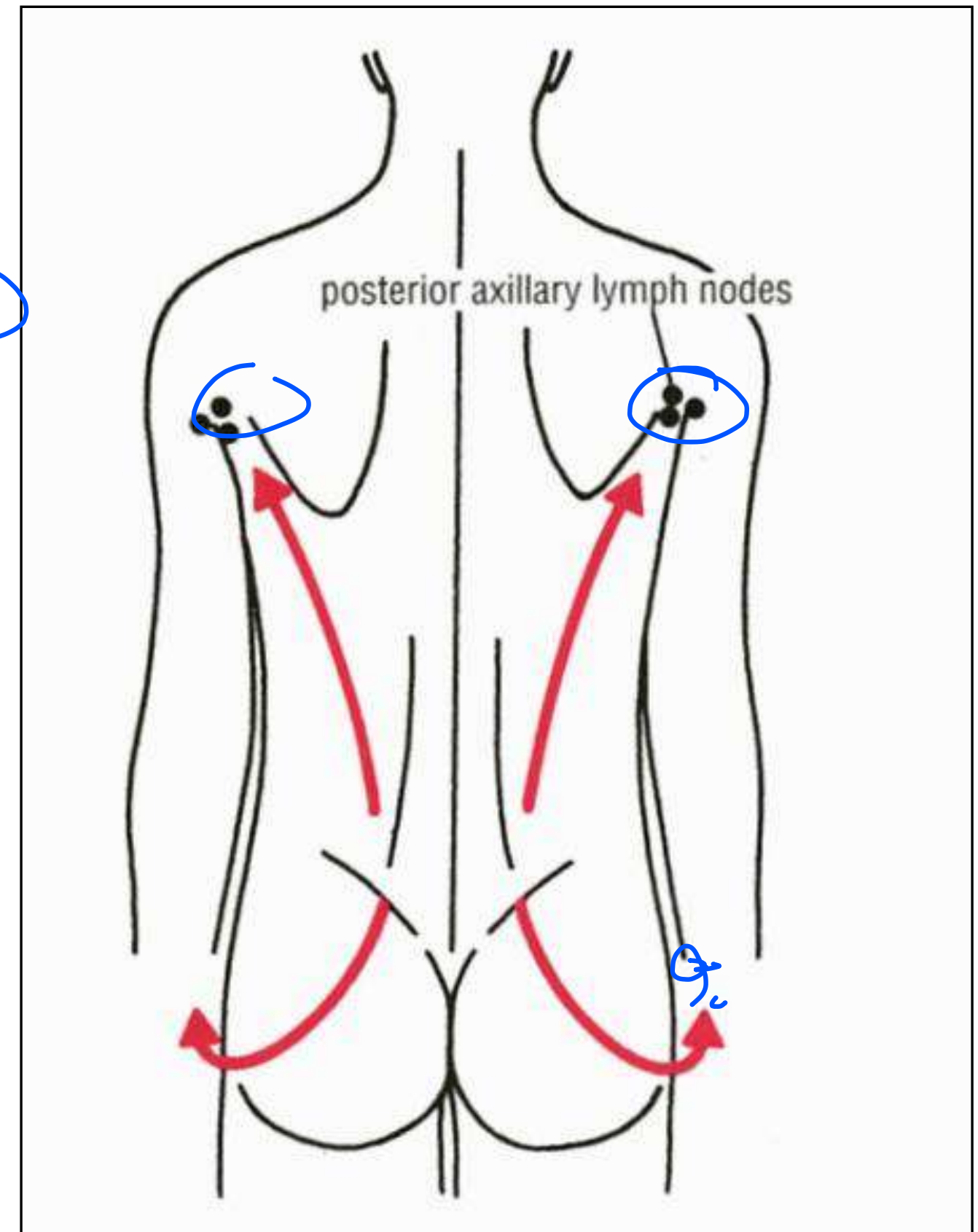
- The lymph drainage of the skin of the anterior abdominal wall above the level of the umbilicus is upward to Anterior Axillary Nodes.
- Below the level of the umbilicus, the lymph drains downward and laterally to Superficial Inguinal Nodes.



Superficial Lymph Vessels

■ The lymph of the skin of the back above the level of the iliac crests is drained upward to Posterior Axillary Nodes

■ Below the level of the iliac crests, it drains downward to Superficial Inguinal Nodes



Deep Lymph Vessels



The Deep lymph vessels follow the

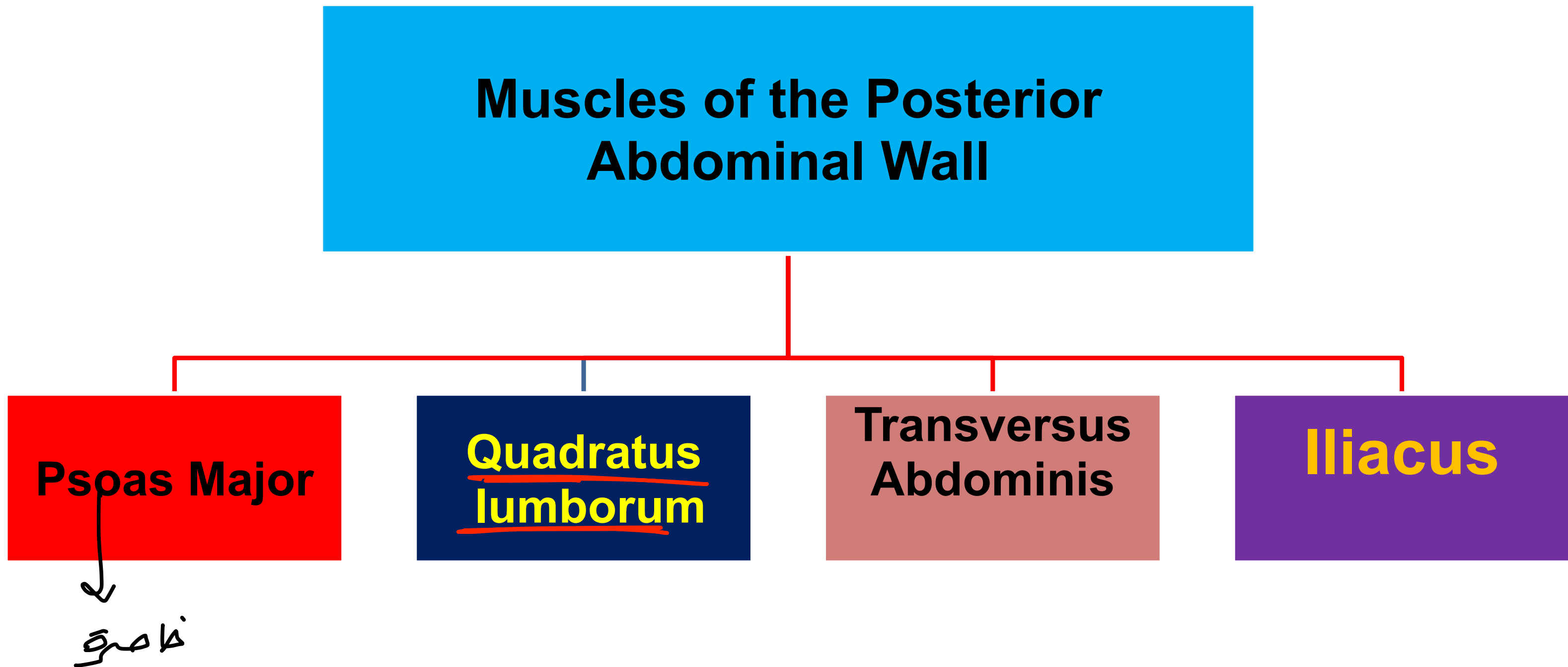
arteries and drain into the internal

thoracic, external iliac, posterior

mediastinal, and para-aortic (lumbar)
nodes.

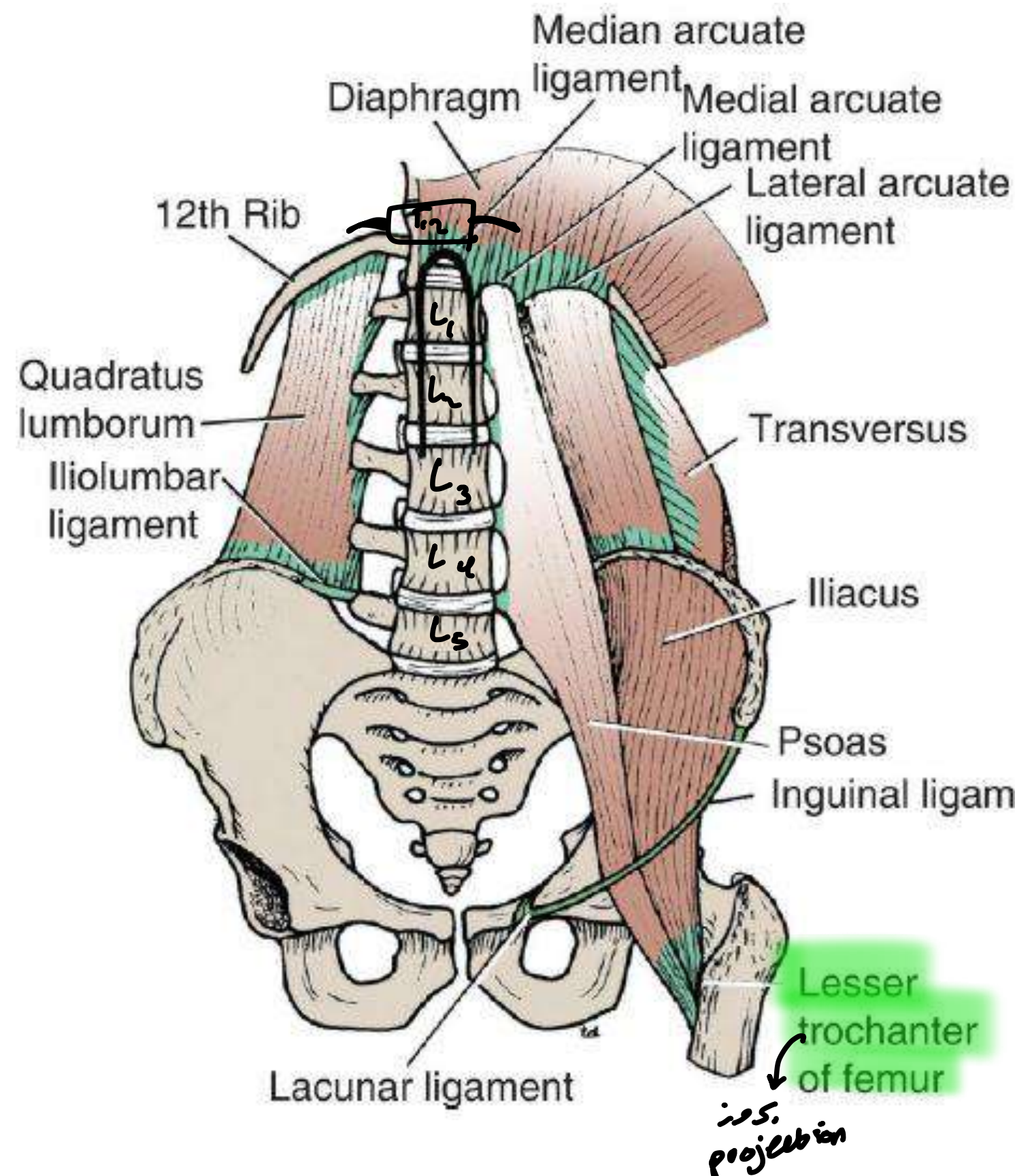
iliac nodes

Muscles of Posterior Abdominal Wall



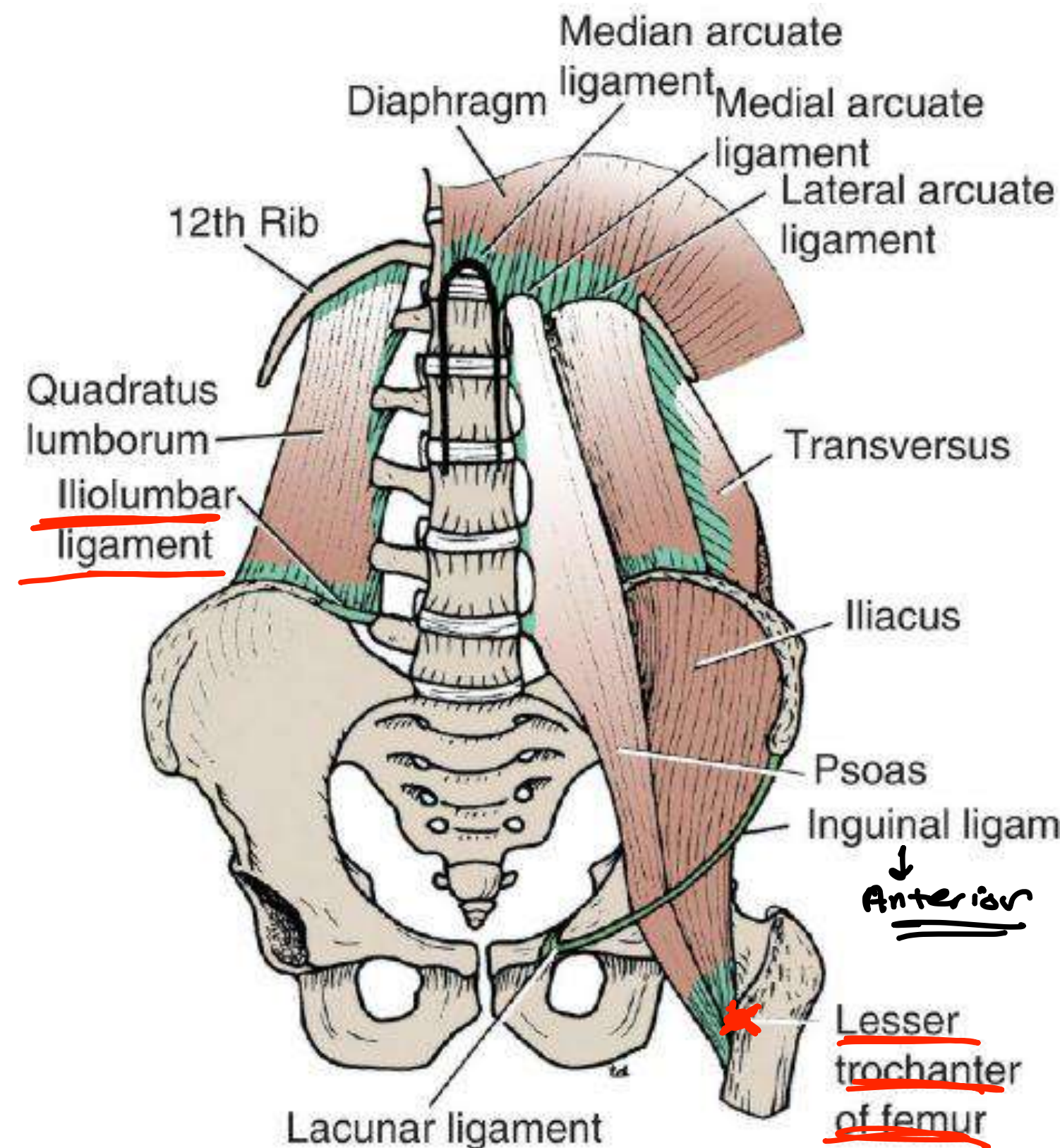
Psoas Major muscle

- Arises from :
 - Roots of transverse processes of all lumbar vertebra. $L_1 - L_5$
 - Sides of the vertebral bodies, and the intervertebral discs.
 - Twelfth thoracic to the fifth lumbar vertebrae.
- The fibers run downward and laterally and leave the abdomen to enter the thigh by passing behind (posterior to) the inguinal ligament.
- The muscle is inserted into the lesser trochanter of the femur.



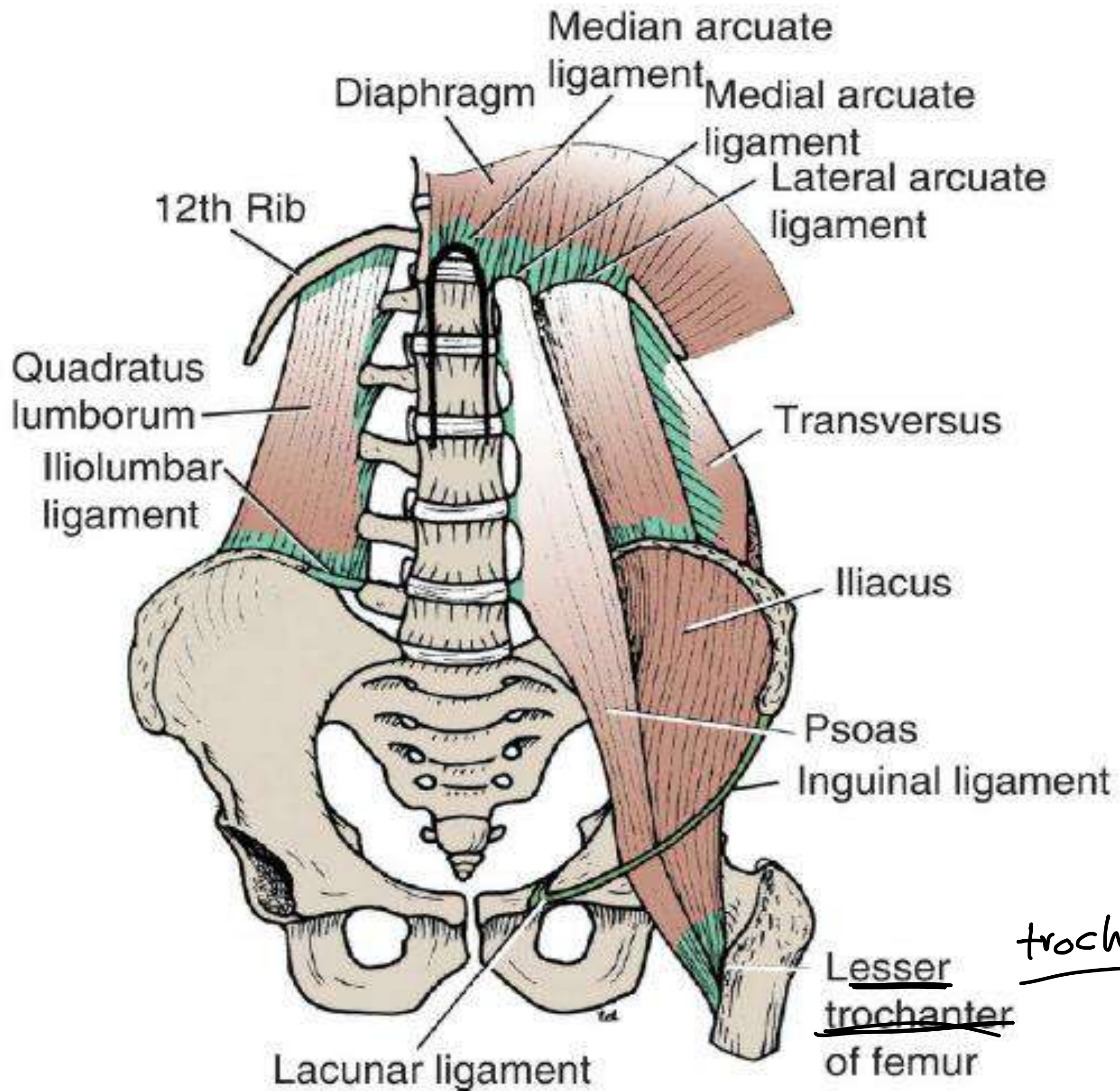
Psoas Major muscle

- It is enclosed in a fibrous sheath that is derived from the **lumbar fascia**. The sheath is thickened above to form the **Medial arcuate ligament**.
- Nerve supply by lumbar Plexus
- **Action** : flexes the thigh at the hip joint on the trunk; or if the thigh is fixed, it flexes the trunk on the thigh, as in sitting up from a lying position.



Anterior

Projection
تقود



trochanter

* origin:

roots of transverse process
of lumbar vertebra
($L_1 - L_5$)

* Body vertebral

$T_{12} - L_5$

* intercostal disk

$L_4 - L_5$

* fibres run
downward and
lateral

* insertion:

lesser trochanter
of the femur

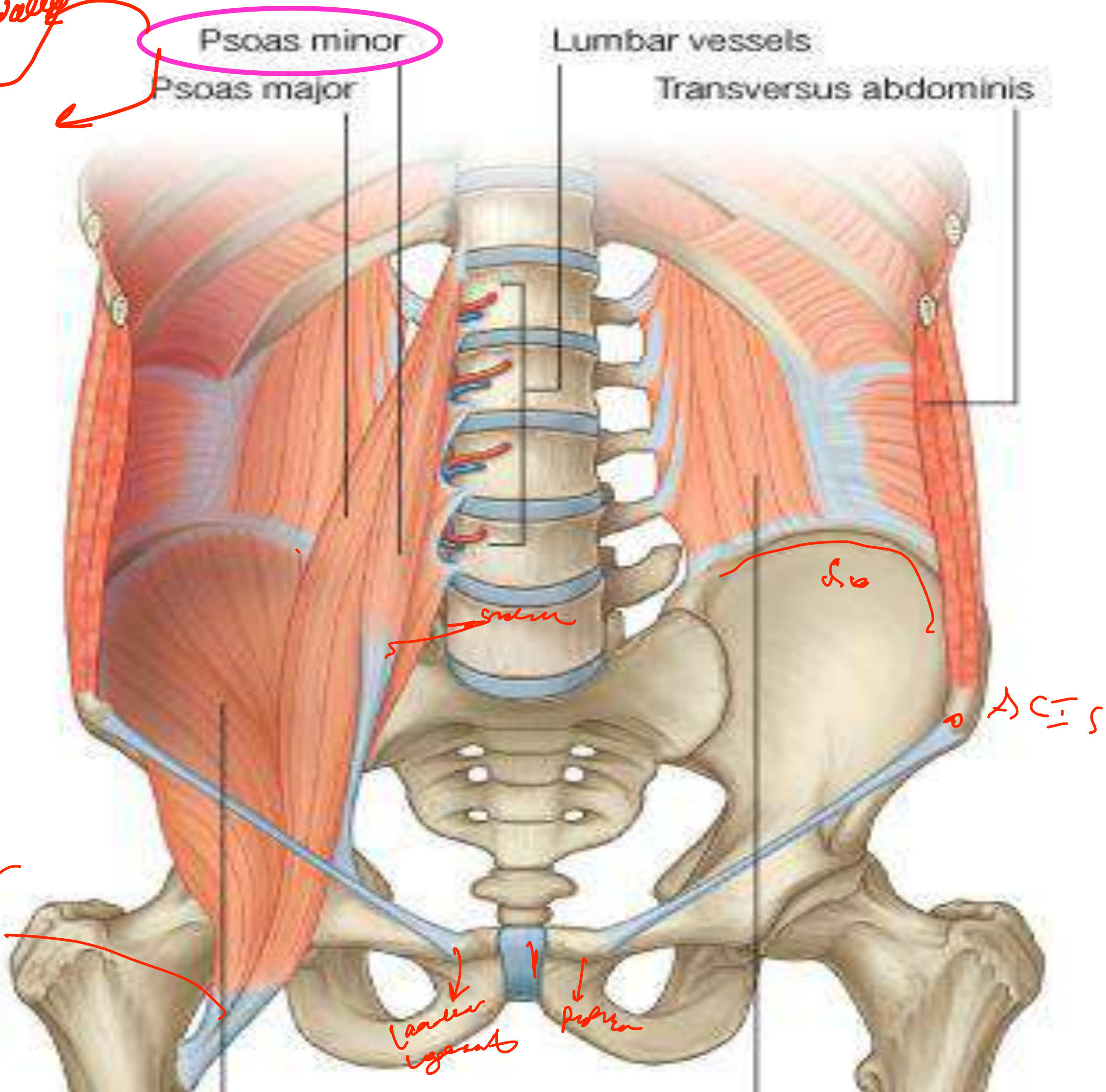


Psoas Minor muscle

It is a small muscle with along tendon that lies anterioromedially to the psoas major. It is unimportant and is absent in 40% of patients.

↓
Present in 60%

anteromedial
60%



Quadratus Lumborum Muscle

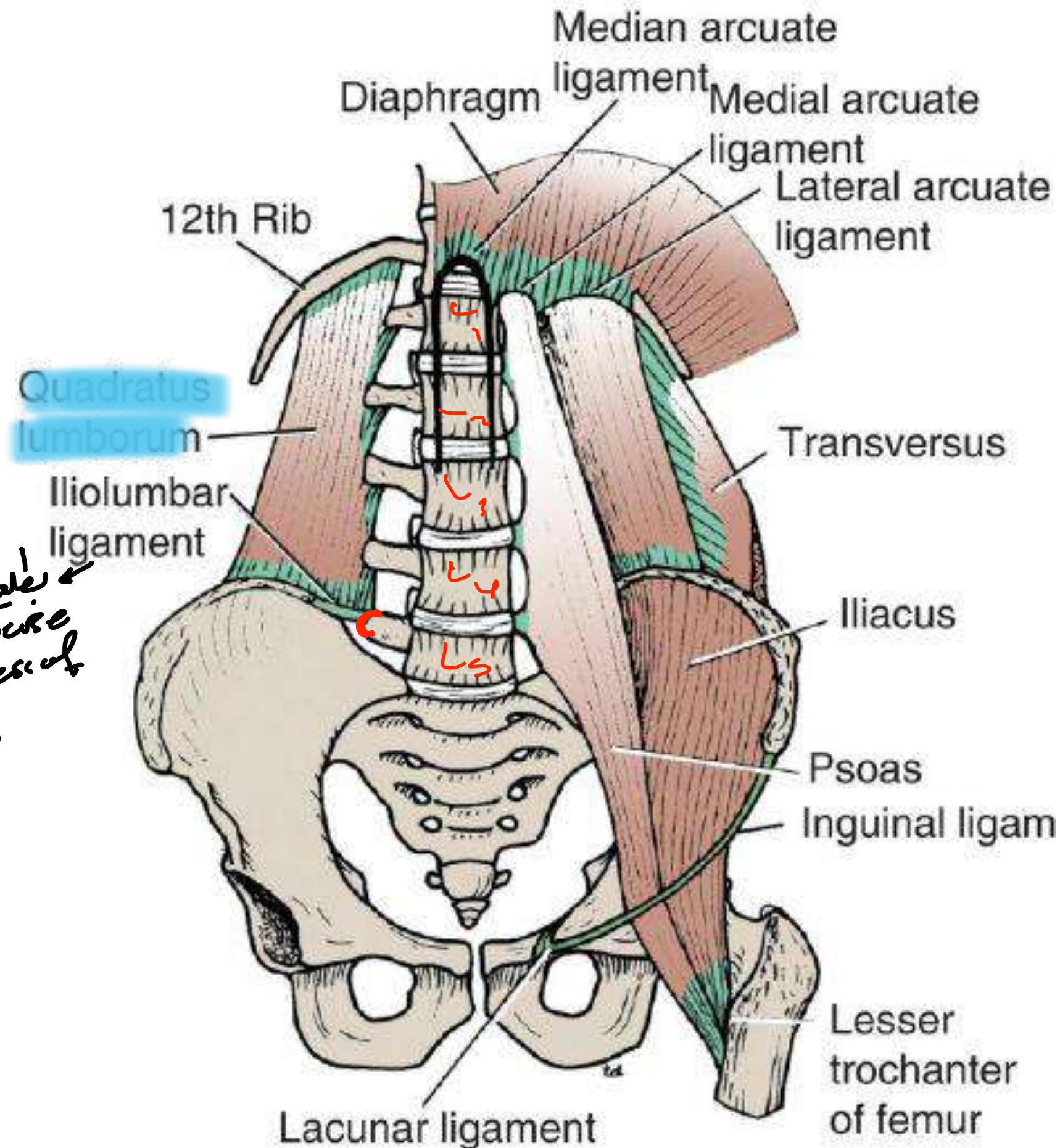
■ ^{مربعة} is a flat, quadrilateral-shaped muscle that lies alongside the vertebral column.

■ origin below from the:

- Iliolumbar ligament.
- adjoining part of iliac crest.

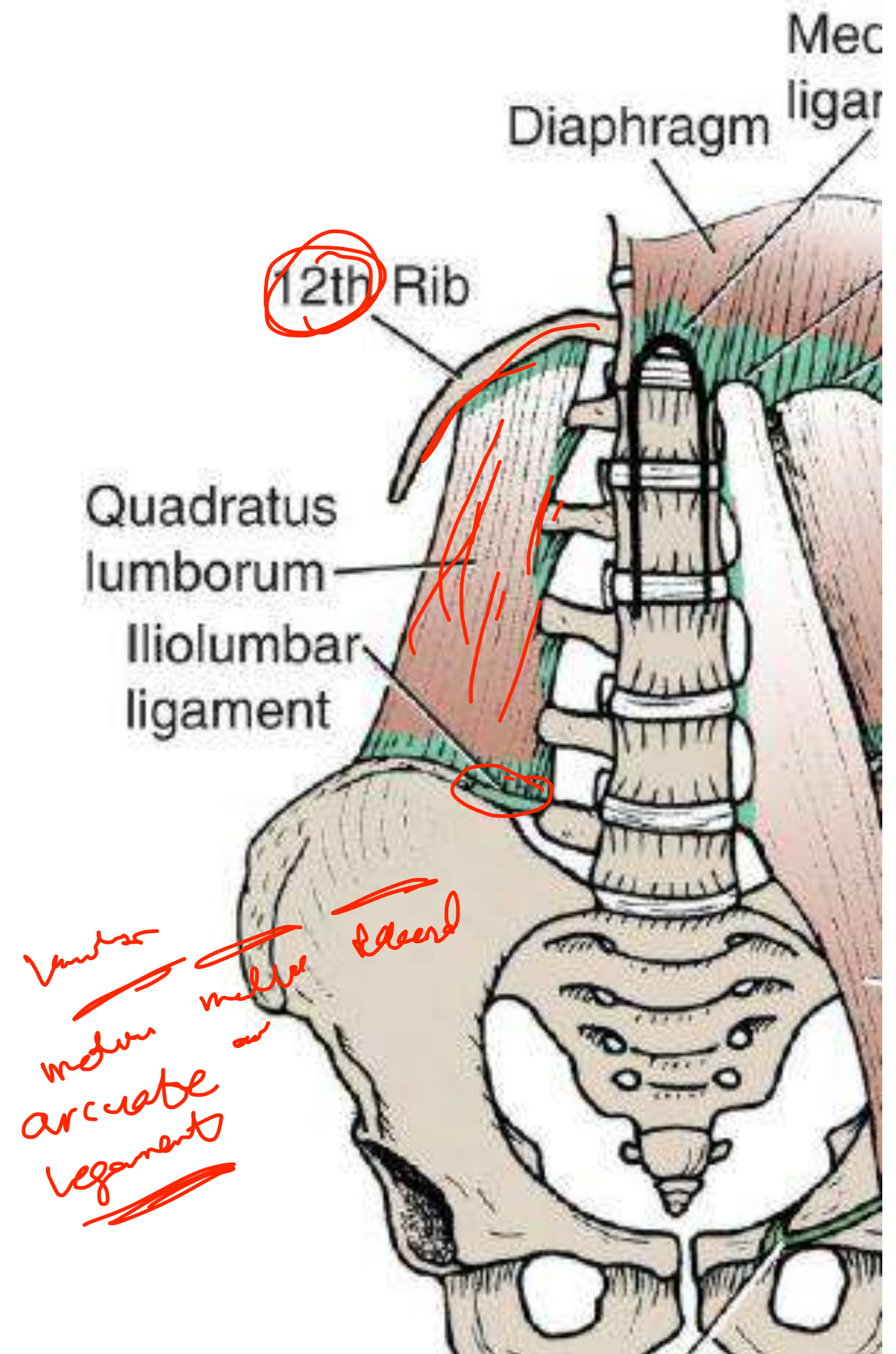
* الجزء المجاور للـ
iliolumbar ligament
من الحافة العظمية

بطن الحافة العظمية
transverse process of L5



Quadratus Lumborum Muscle

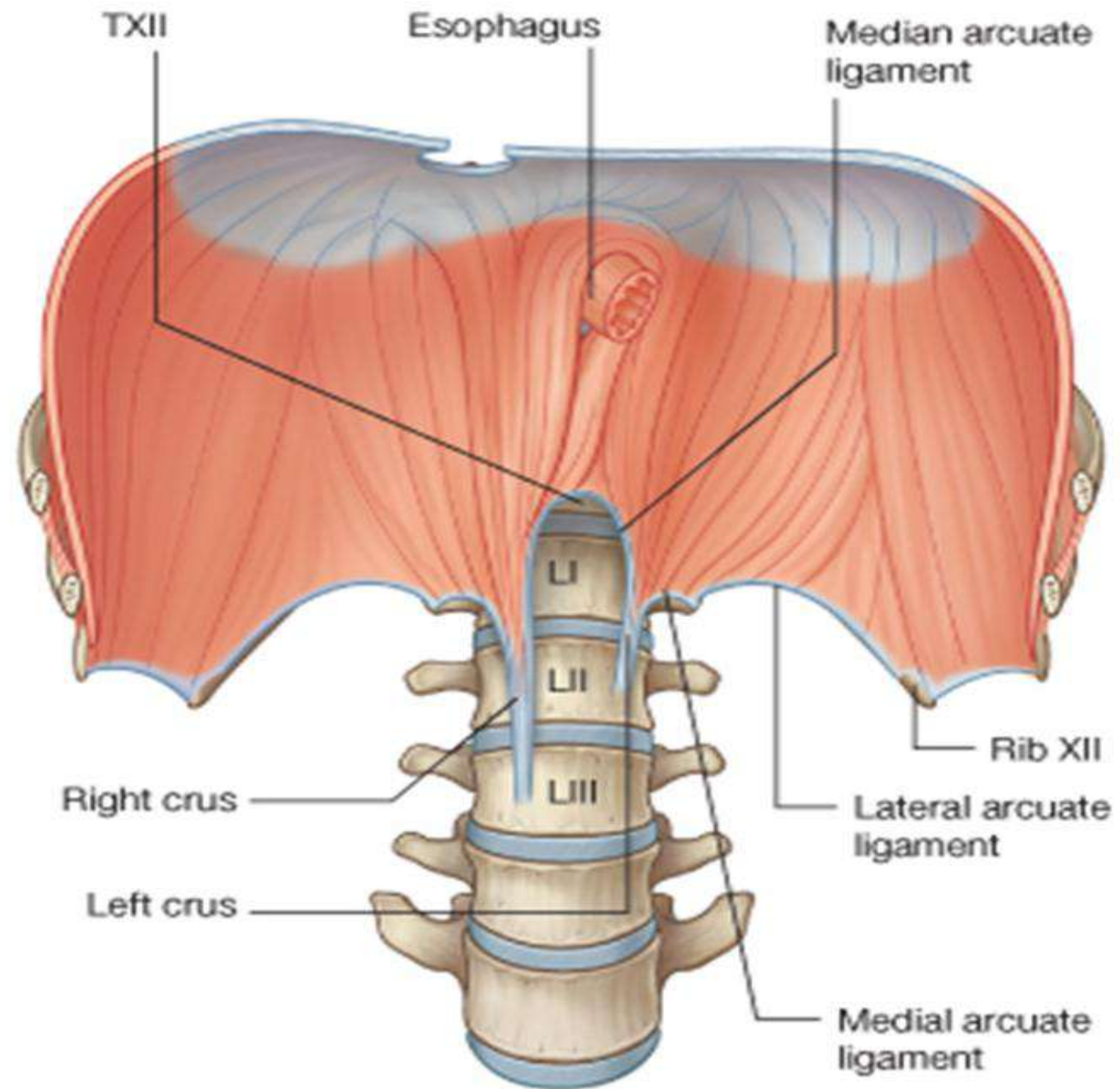
- The fibers run upward and medially
- insertion: into ^{floating}
 - lower border of the 12th rib
 - transverse processes of the upper four lumbar vertebra
_{L₁ - L₄}
- Anterior surface of the muscle is covered by lumbar fascia, which is thickened above to form the lateral arcuate ligament and below to form iliolumbar ligament



Quadratus Lumborum Muscle

- Nerve supply :
lumbar plexus.
- Action:
 - fixes or depresses the 12th rib during respiration
 - laterally flexes the vertebral column to the same side.

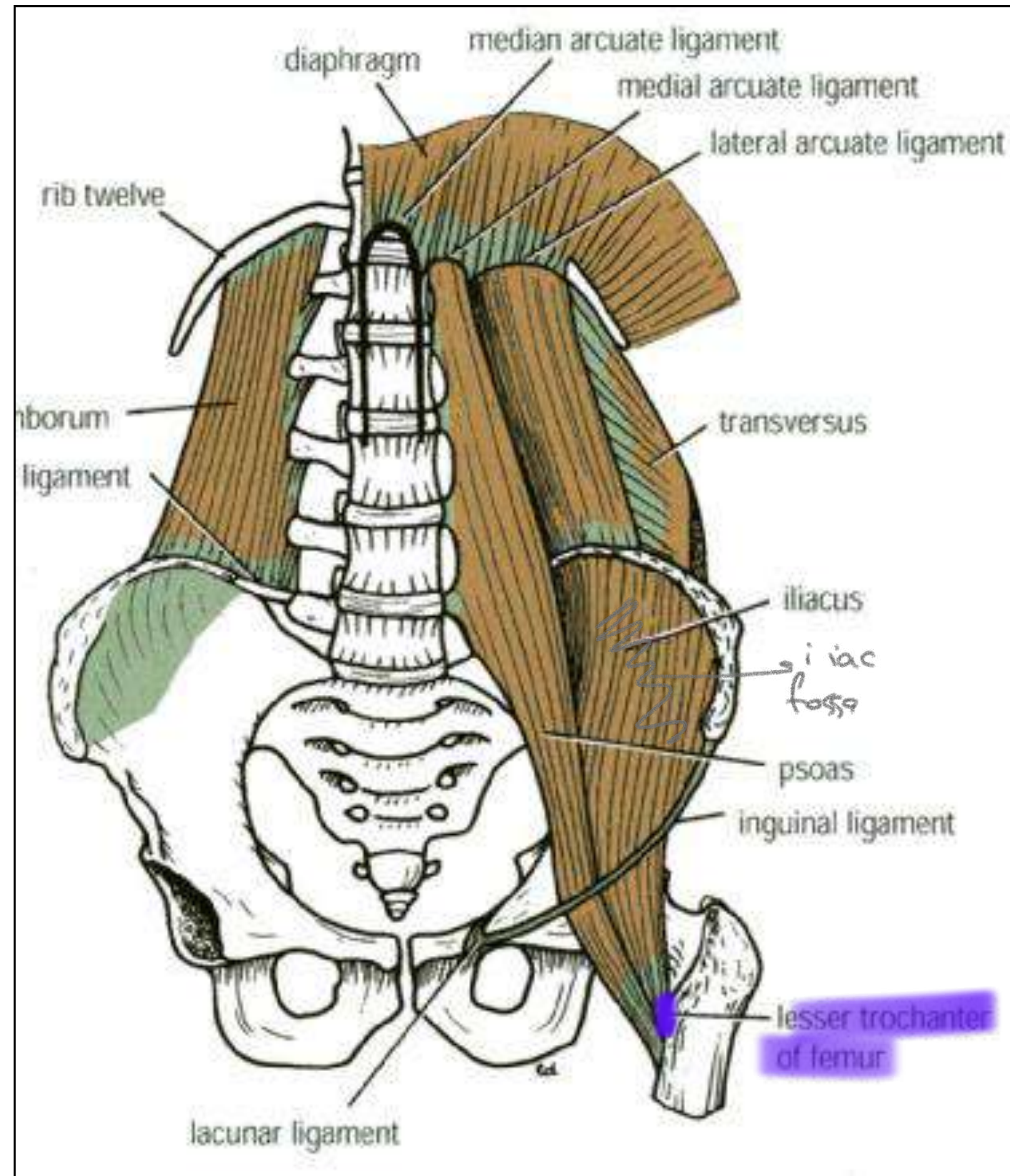
يعني لو صا - right lateral flexion -
contraction of right lateral quadratus lumborum.



iliacus muscle

رومعة

- It is fan shaped
- Origin: upper part of the iliac fossa.
- Its fibers join the lateral side of the psoas tendon to be Inserted into lesser trochanter of the femur.
پسواس ميجور موده
- The combined muscles are often referred to as the Iliopsoas (the major flexor of the thigh, or the major flexor of the trunk against the thigh)

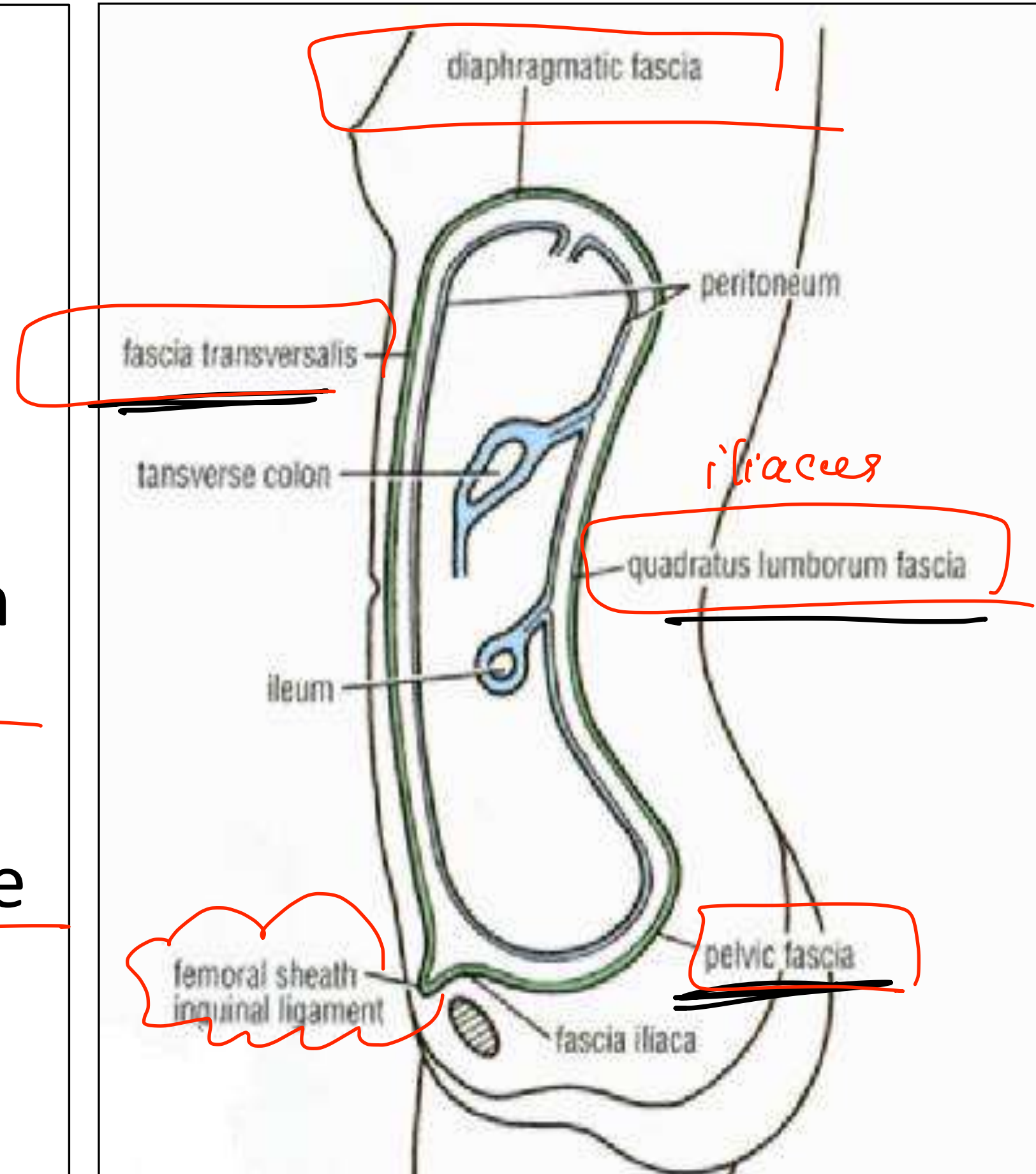


Posterior Abdominal Wall Muscles

Muscle	Origin	Insertion	Innervation	Function
Psoas major	Lateral surface of bodies of TXII and LI to LV vertebrae, transverse processes of the lumbar vertebrae, and the intervertebral discs between TXII and LI to LV vertebrae	Lesser trochanter of the femur	Anterior rami of <u>L1 to L3</u>	Flexion of thigh at hip joint
Psoas minor	Lateral surface of bodies of TXII and LI vertebrae and intervening intervertebral disc	Pectineal line of the pelvic brim and iliopubic eminence	Anterior rami of L1	Weak flexion of lumbar vertebral column
Quadratus lumborum	Transverse process of LV vertebra, iliolumbar ligament, and iliac crest	Transverse processes of LI to LIV vertebrae and inferior border of rib XII	Anterior rami of T12 and L1 to L4	Depress and stabilize rib XII and some lateral bending of <u>trunk</u>
Iliacus	Upper two-thirds of iliac fossa, anterior sacro-iliac and iliolumbar ligaments, and upper lateral surface of sacrum	Lesser trochanter of femur	Femoral nerve (L2 to L4)	Flexion of thigh at hip joint

Fascia Lining of Abdominal Walls

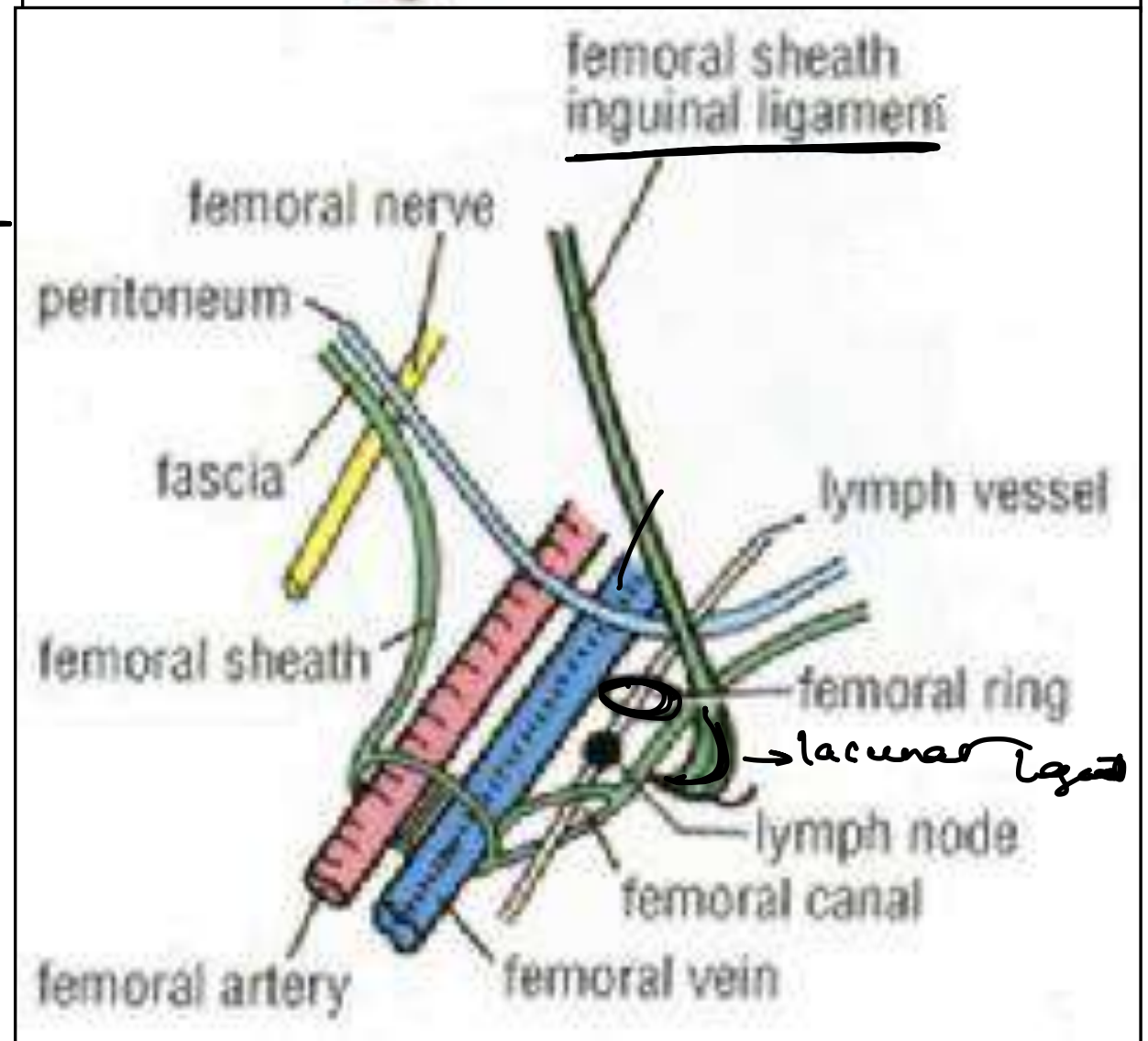
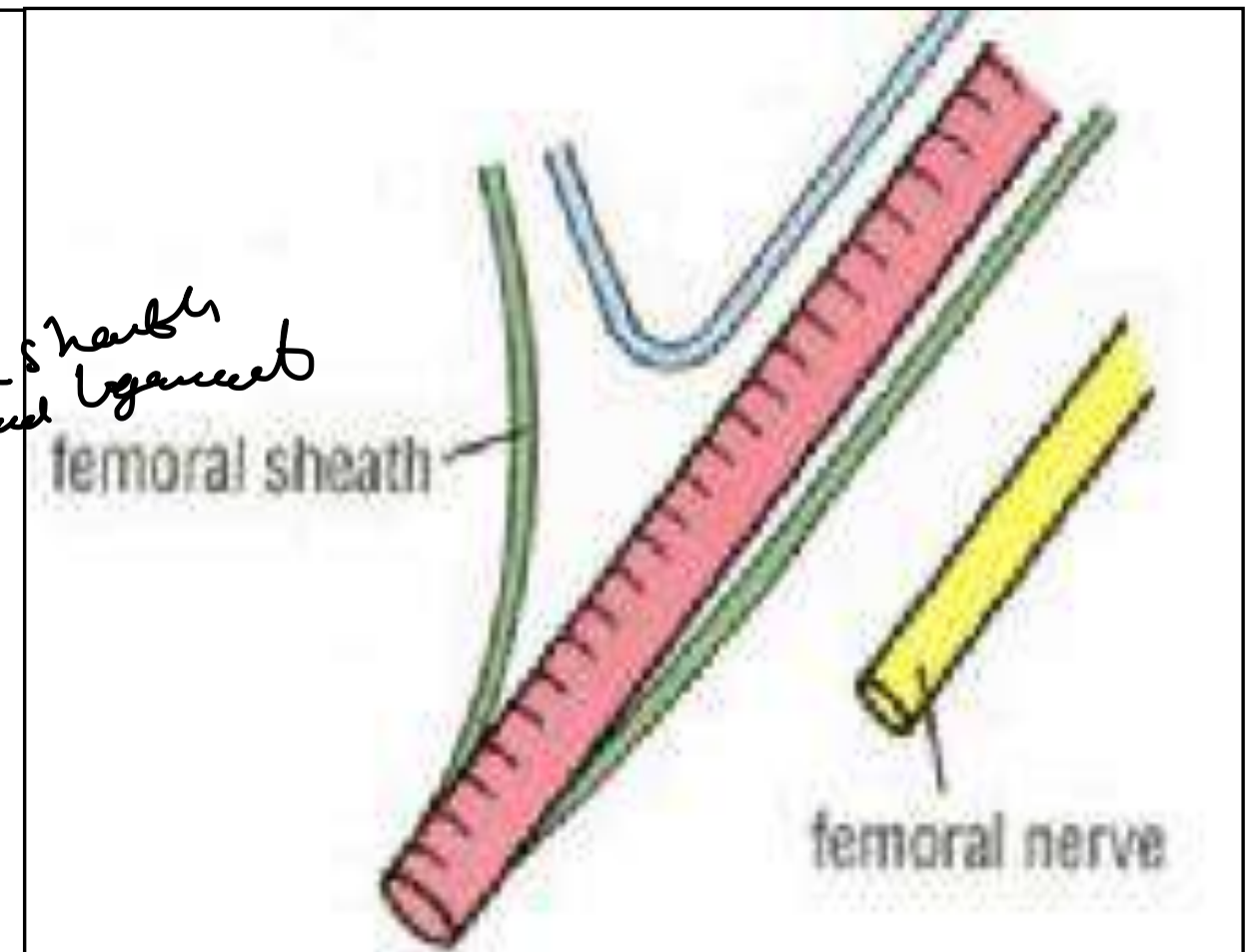
- The abdominal walls are lined by one continuous layer of connective tissue that lies between the parietal peritoneum and the muscles.
- It is continuous below with a similar fascial layer lining the pelvic walls.
- It is customary to name the fascia according to the structure it overlies.





Fascia Lining of Abdominal Walls

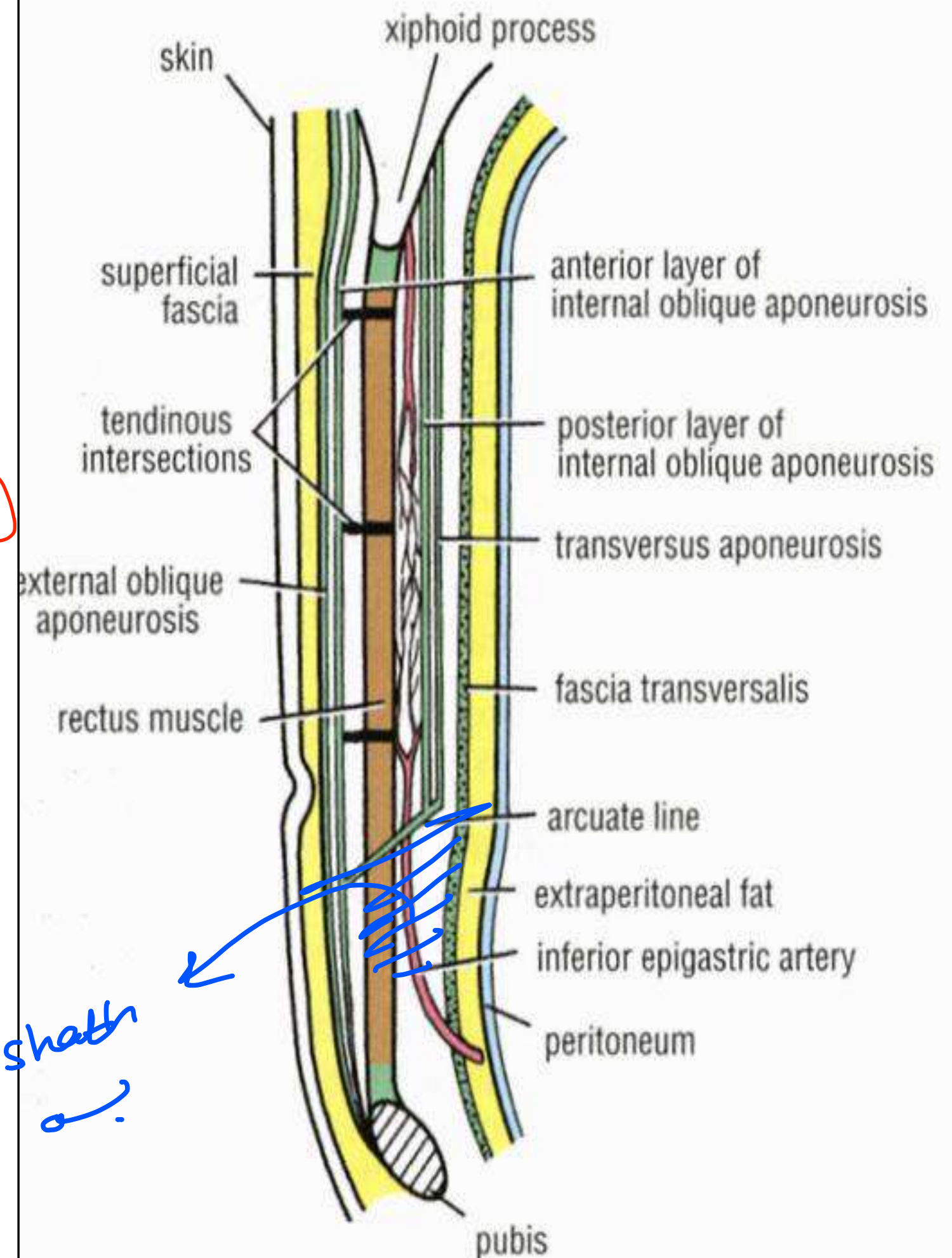
- The abdominal blood and lymph vessels lie within this fascial lining, whereas the *Principal nerves* lie outside the fascia.
- This fact is important in the understanding of the femoral sheath.
- This is simply a downward prolongation of the fascial lining around the femoral vessels and lymphatics, for about (4 cm) into the thigh, behind the inguinal ligament.
- Because the femoral nerve lies outside the fascial envelope, it has no sheath.



Fascia Lining of Abdominal Walls

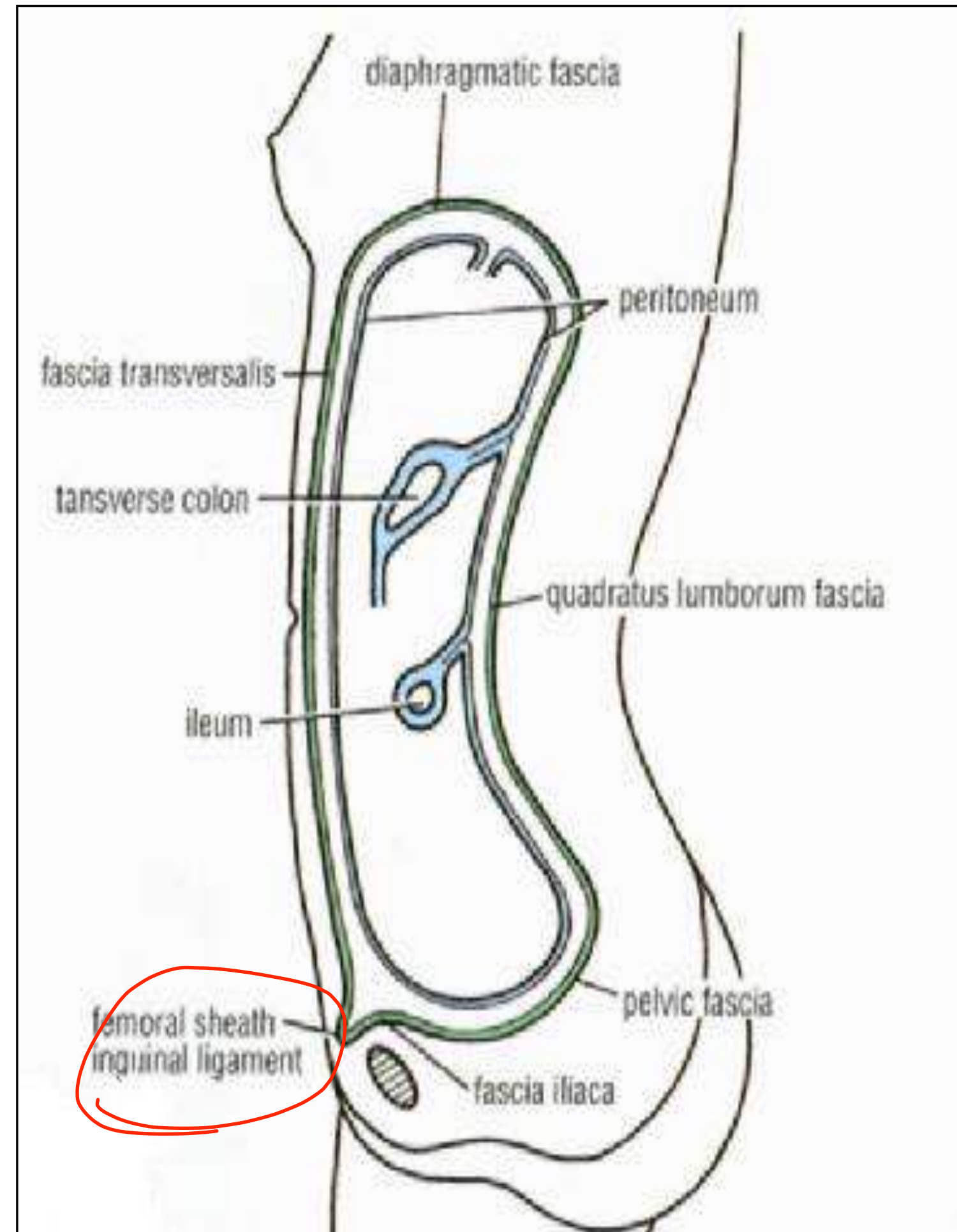
- In certain areas of the abdominal wall, the fascial lining performs particularly important functions.
- Inferior to the level of the anterior superior iliac spines, the posterior wall of the rectus sheath is devoid of muscular aponeurosis and is formed by the fascia transversalis (the deep inguinal ring) and peritoneum only.

ASIS ↑
posterior rectus sheath
fascia
line



Fascia Lining of Abdominal Walls

- The walls of the abdomen are lined with parietal peritoneum.
- This is a thin serous membrane consisting of a layer of mesothelium resting on connective tissue.
- It is continuous below with the parietal peritoneum lining the pelvis.



phrenic nerves

intestines + vessels

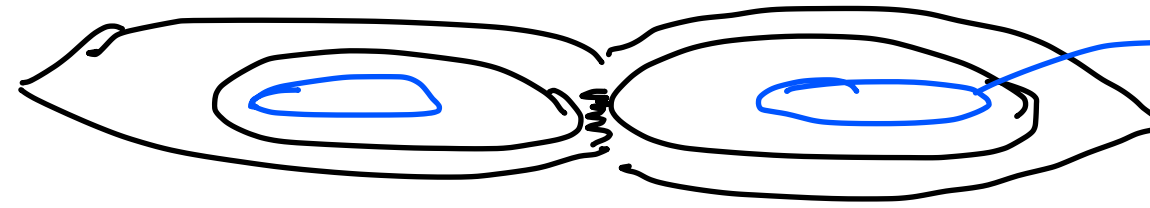
Peritoneal Lining of the Abdominal Walls

NERVE SUPPLY

- The central part of the diaphragmatic peritoneum is supplied by the Phrenic Nerves. *relate to the diaphragm*
- The peripheral part is supplied by the lower intercostal nerves.
- The peritoneum lining the anterior and posterior abdominal walls is supplied segmentally by intercostal and lumbar nerves, which also supply the overlying muscles and skin.

تجاعد

Divercation of Recti



ضامة عند كيبا
العضلة
ضامة عند كيبا



ABDOMINAL STAB WOUNDS



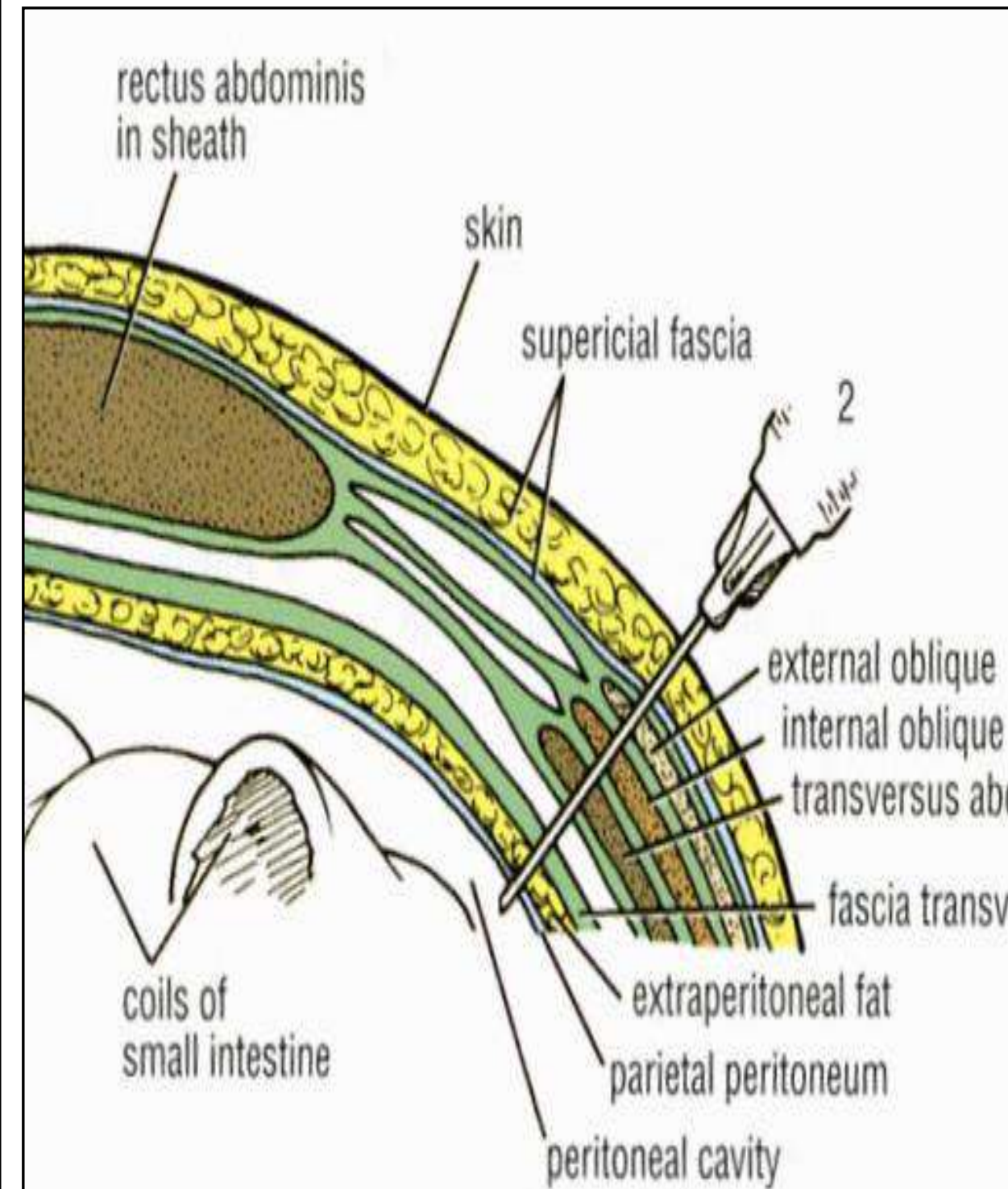
- Abdominal stab wounds may or may not penetrate the parietal peritoneum and ^{تنتهك} violate the peritoneal cavity and consequently may or may not significantly damage the abdominal viscera.
- The structures in the various layers through which an abdominal stab wound penetrates depend on the anatomic location.

ABDOMINAL STAB WOUNDS



Lateral to rectus sheath are the following:

- Skin,
- Fatty layer of superficial fascia, *↑ Camper's*
- Membranous layer of superficial fascia. *↑ Scarpa's*
- External oblique muscle or aponeurosis.
- Internal oblique muscle or aponeurosis.
- Transversus abdominis muscle or aponeurosis
- Fascia transversalis,
- Extraperitoneal fat
- Parietal peritoneum.

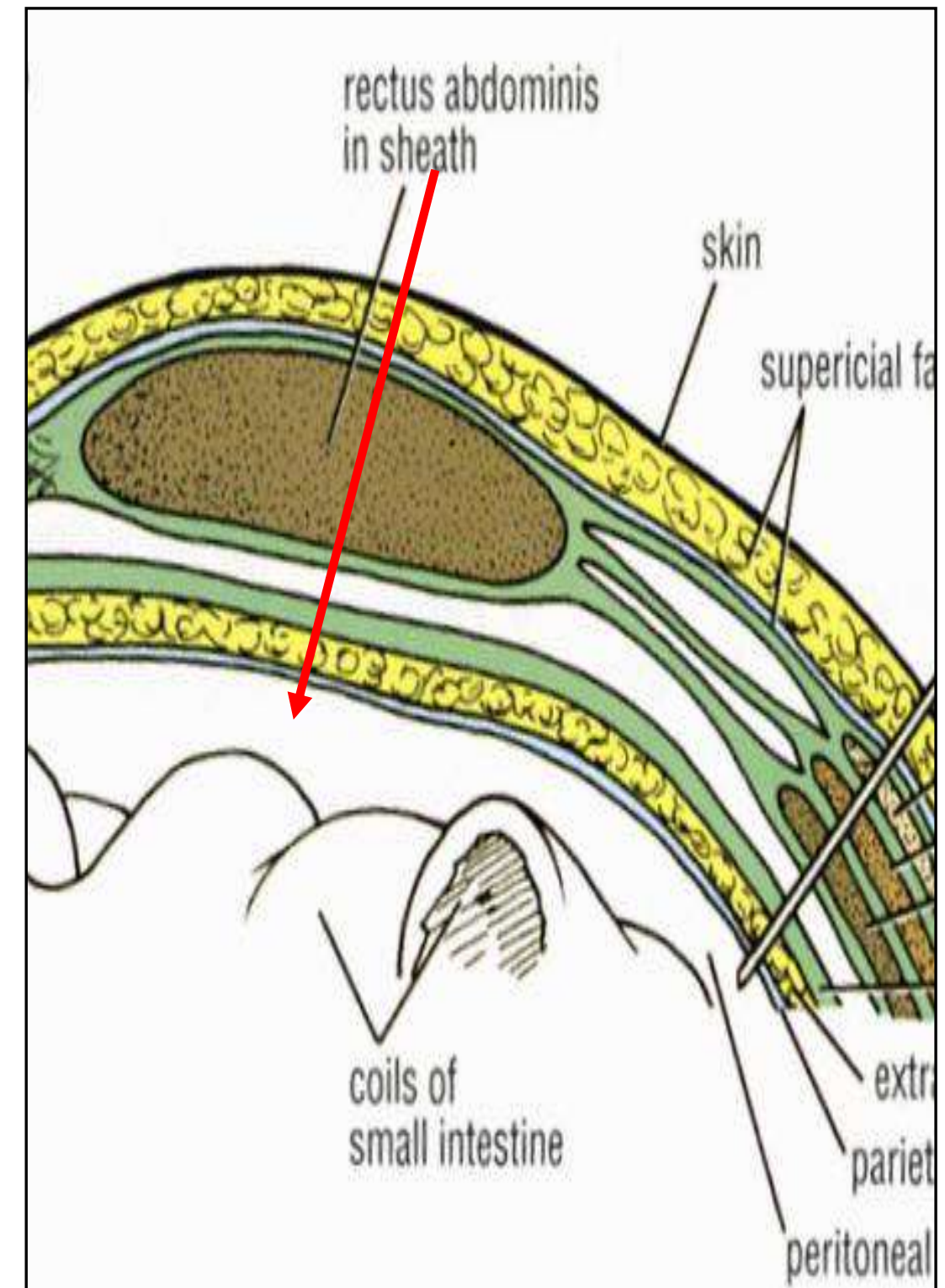


ABDOMINAL STAB WOUNDS



Anterior to rectus sheath are the following:

- Skin,
- Fatty layer of superficial fascia, *Camper's*
- Membranous layer of superficial fascia, *Scarpa's*
- Anterior wall of rectus sheath,
- Rectus abdominis muscle with segmental nerves and epigastric vessels lying behind the muscle.
- Posterior wall of rectus sheath.
- Fascia transversalis,
- Extraperitoneal fat
- Parietal peritoneum.

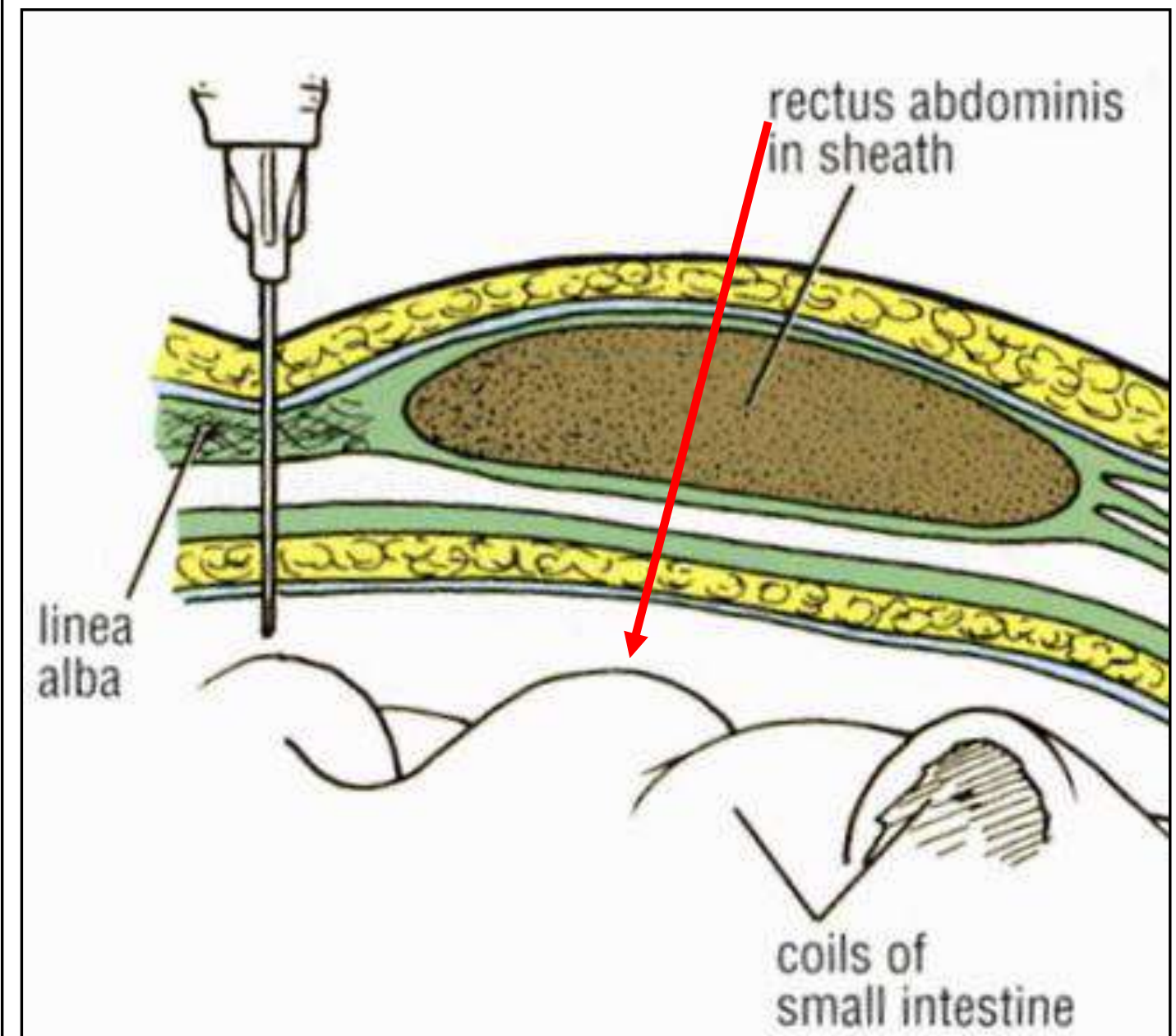


ABDOMINAL STAB WOUNDS



In the midline are the following:

- Skin.
- Fatty layer of superficial fascia,
- Membranous layer of superficial fascia,
- Fibrous linea alba.
- Fascia transversalis.
- Extraperitoneal fat
- parietal peritoneum.



#

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