

Anterolateral Abdominal Wall And

Inguinal Region

By

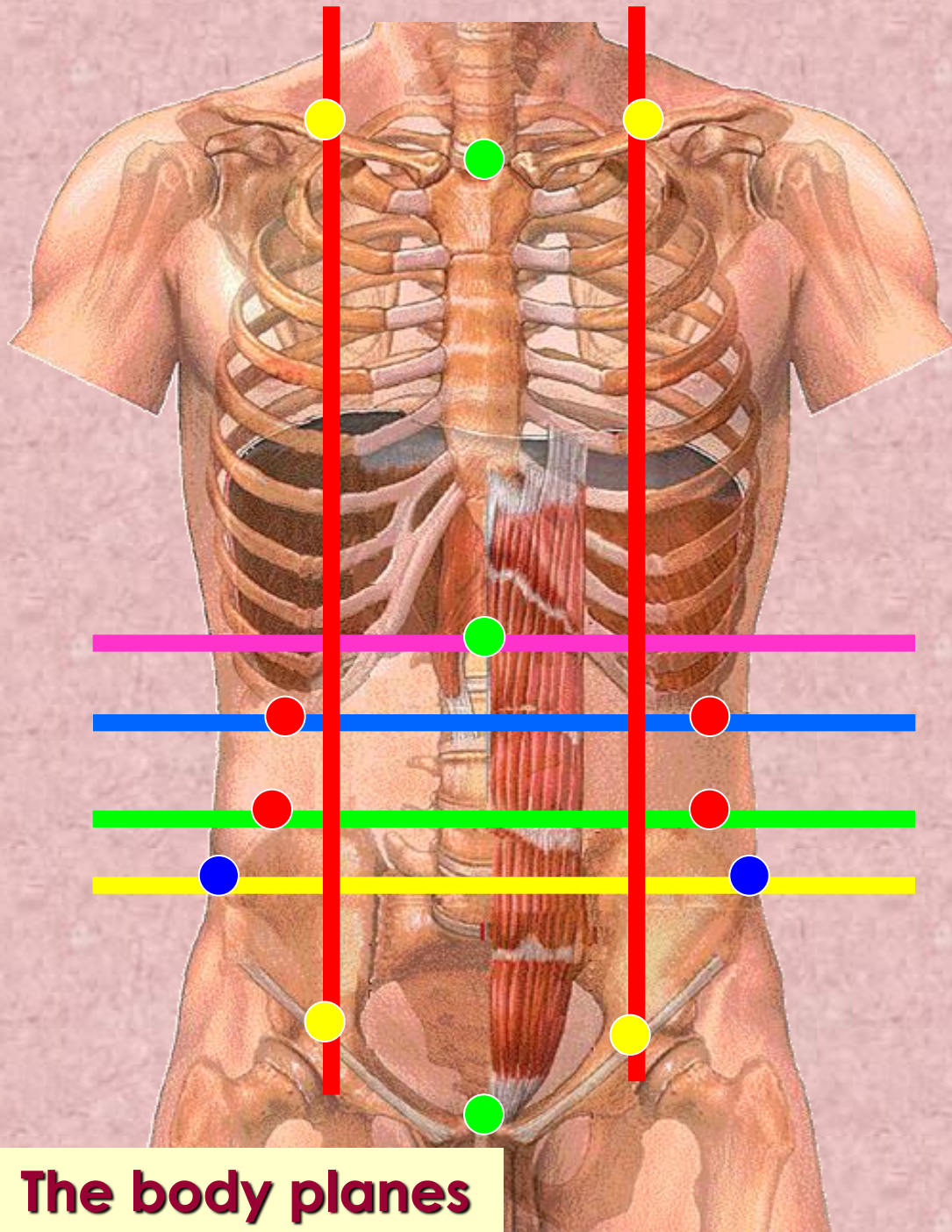
Prof. Saeed Abuel Makarem



INGUINAL REGION

- The groin or the inguinal region, extending between the **ASIS** and **pubic tubercle**.
- Surgically and anatomically, it is a very important area where structures **enter** and **exit** the abdominal cavity.
- It is a potential site for **Herniation**.
- **In fact**, the majority of all abdominal hernias, occur in this region in particular the **inguinal hernia**, which account for about **80 to 90 %** of all abdominal hernias.





The transpyloric plane

It is a transverse line drawn

midway between

The suprasternal notch

& The symphysis pubis

The subcostal plane

It is a transverse line drawn between

the lowest points of the costal margin

The supracrestal plane

It is a transverse line drawn between

the highest points of the iliac crests

The intertubercular plane

a transverse line drawn between

the 2 tubercles of the 2 iliac crests

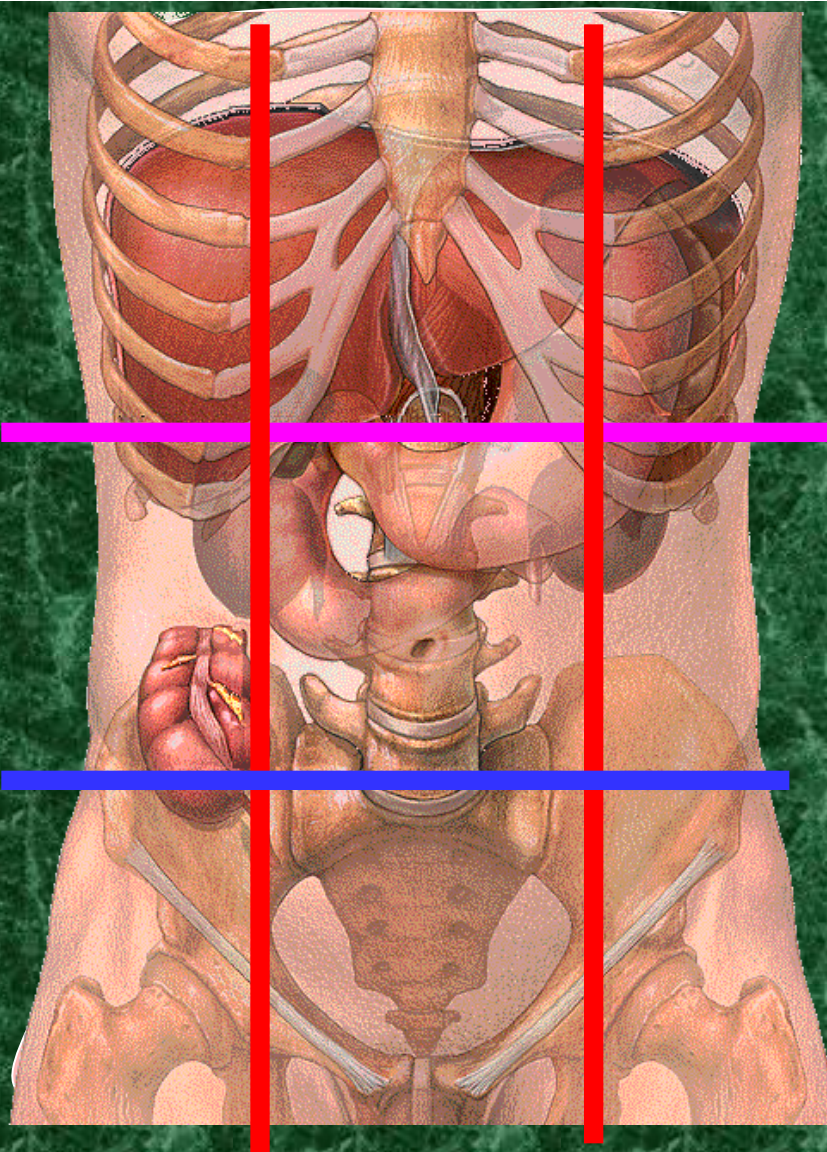
The lateral vertical plane

A vertical line drawn from

the midclavicular point

to the midinguinal point

The body planes



The **anterior abdominal wall**

is divided into

9 regions by

2 transverse lines

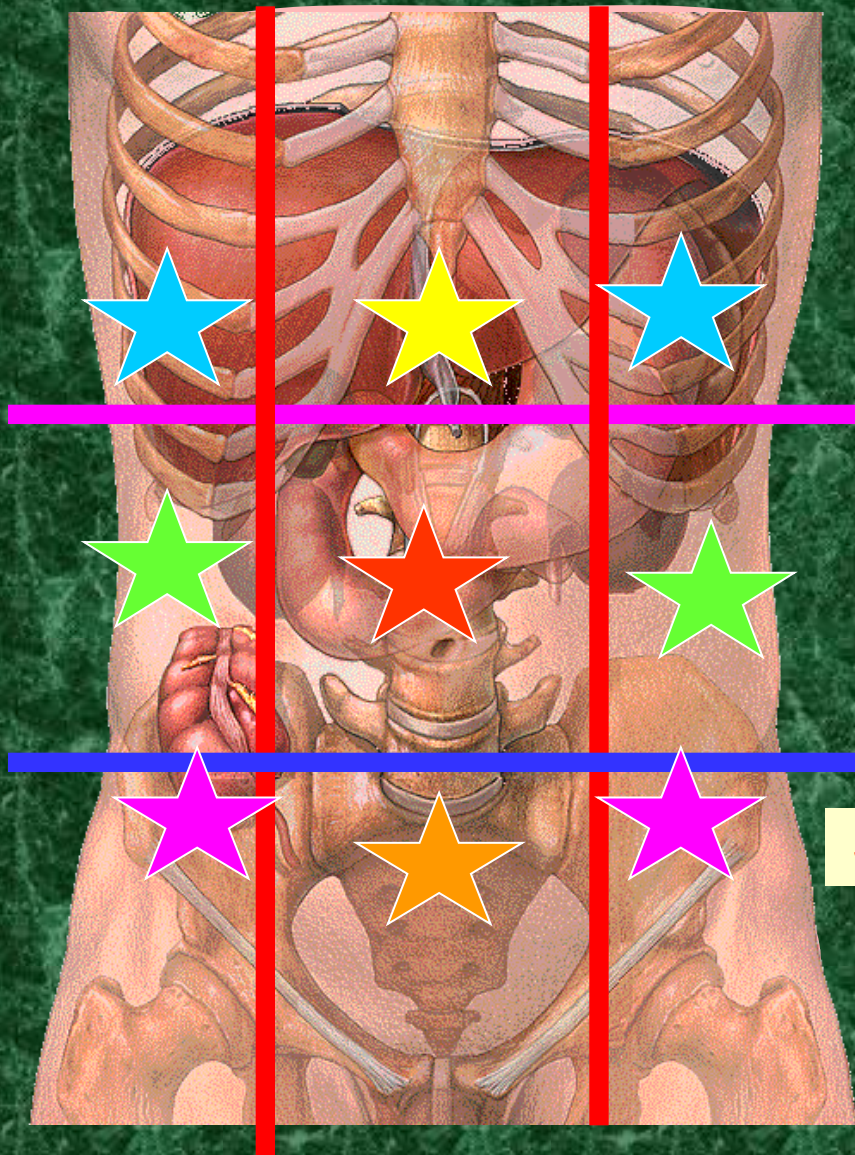
The **transpyloric plane**

&The **intertubercular plane**

**The Rt. & Lt.
lateral vertical planes**

and **2 vertical line**

divisions of the abdomen



The 9 regions are

3 in the middle

From above downward

Epigastrium

Umbilical

Hypogastrium

3 on the right side & 3 on the left side

From above downward

Rt. & Lt. Hypochondrium

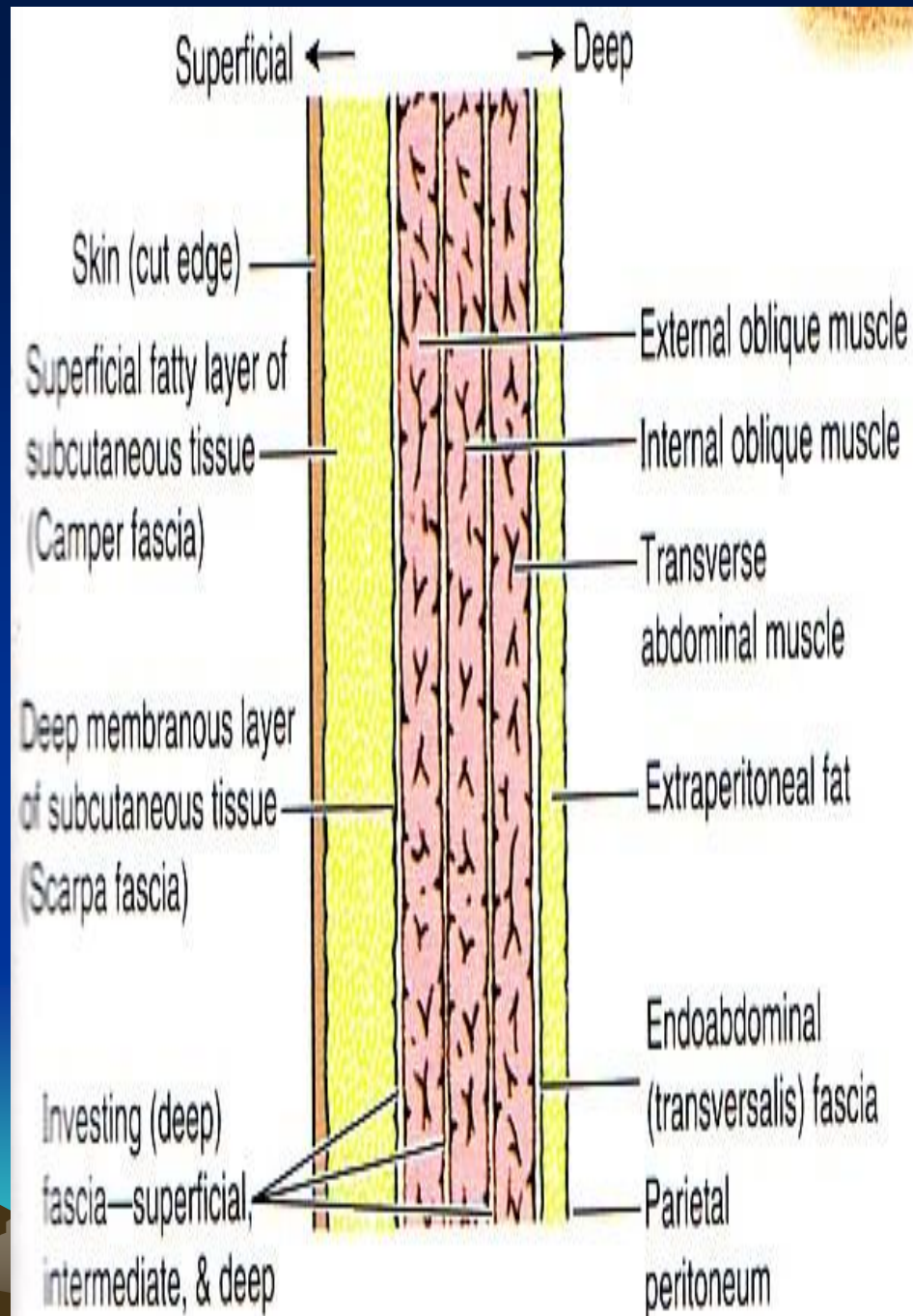
Rt. & Lt. Lumbar region

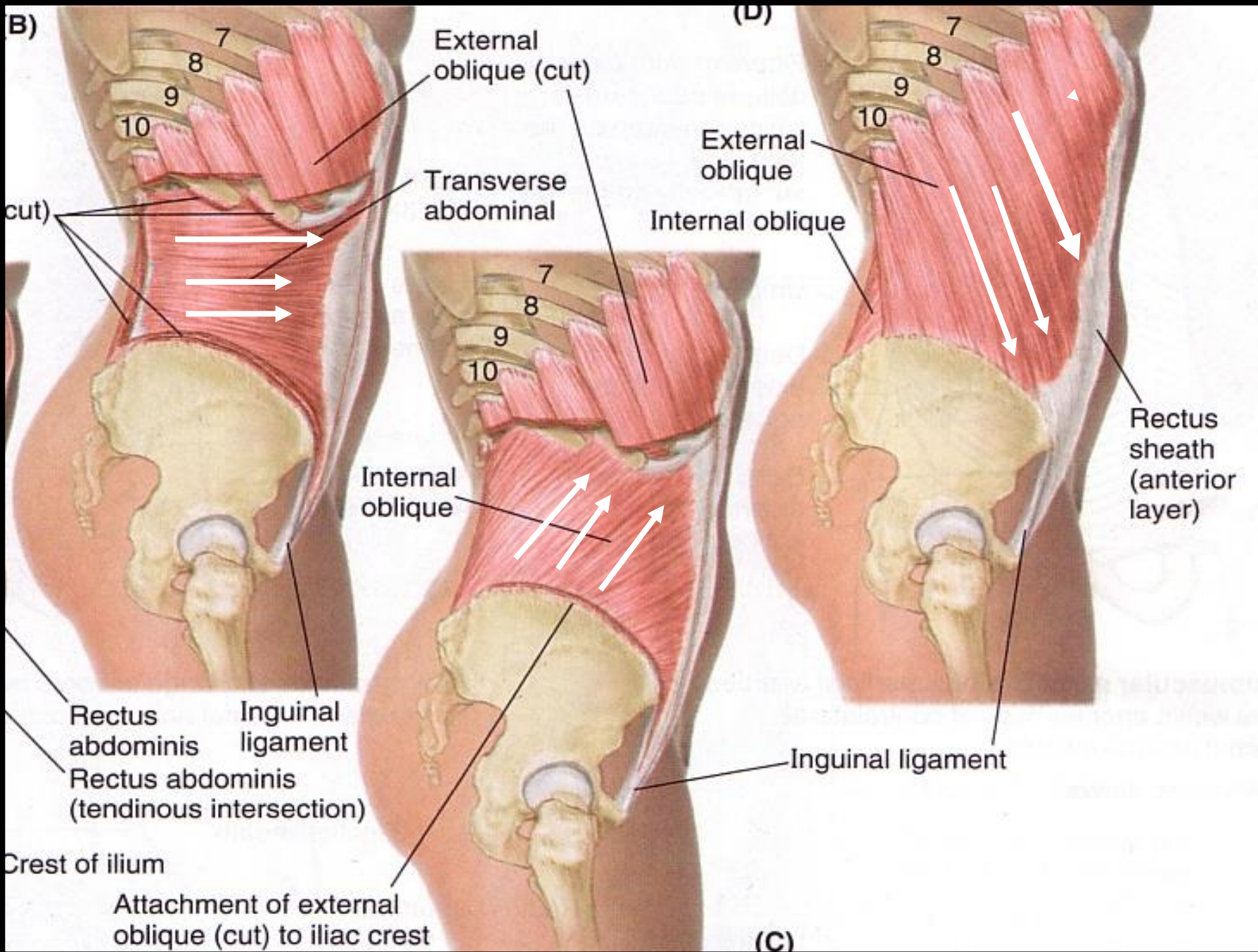
Rt. & Lt. Iliac region

Divisions of the abdomen

Layers of anterolateral abdominal wall

- 1- **Skin.**
- 2- **Superficial fascia:**
 - a- Superficial fatty layer (**Camper's fascia**).
 - b- Deep membranous (**Scarp's fascia**).
- NO DEEP FASCIA**
- 4- **Muscular layers:**
 - a. External oblique.
 - b. Internal oblique.
 - c. Transversus abdominis.
- 5- **Fascia transversalis.**
- 6- **Extra peritoneal fatty tissue**
- 7- **Parietal peritoneum.**





External Oblique

Origin:

Outer surface of lower 8 ribs.

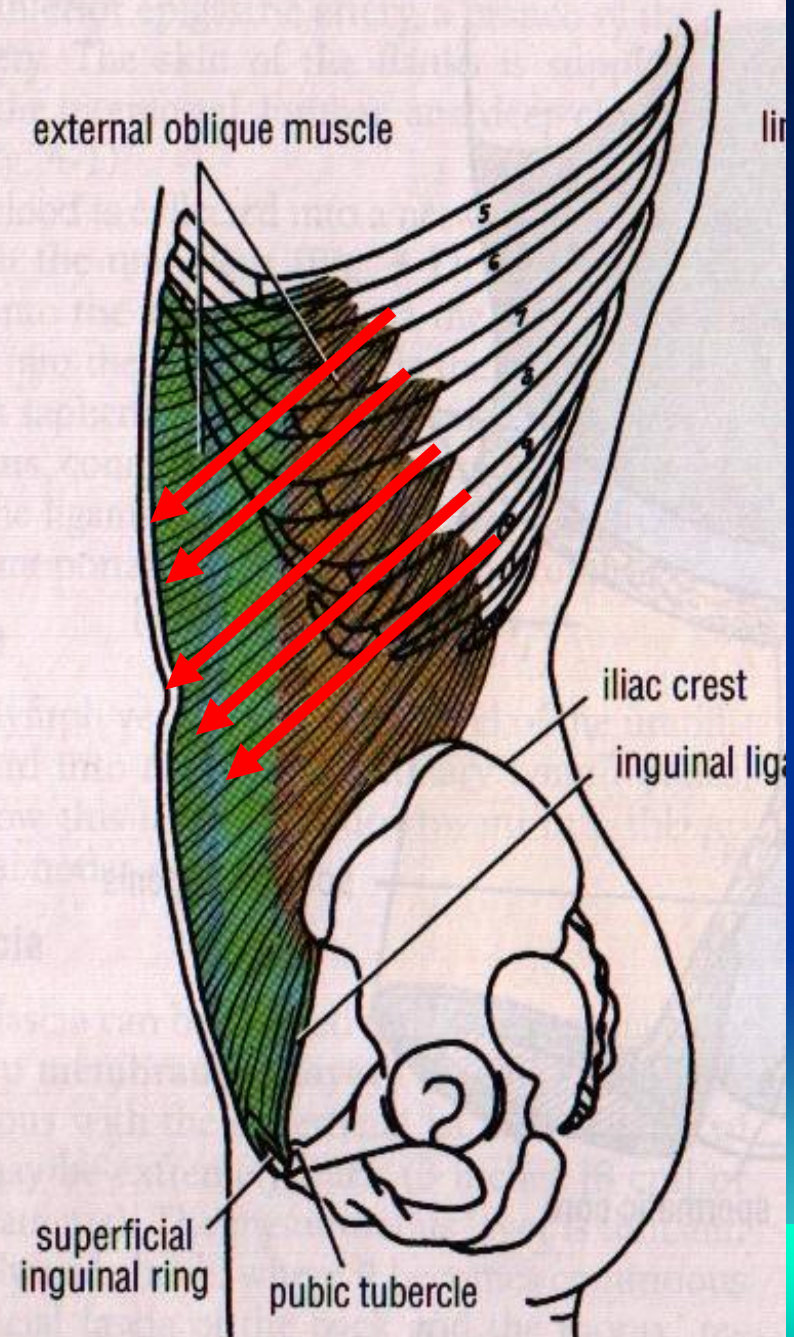
Direction of its fibers:

Downward, Forward, and Medially.

Insertion:

Xiphoid process,
Linea alba,
Symphysis pubis
Pubic crest,
Pubic tubercle,
ASIS.

Anterior 1/2 of outer lip of iliac crest.



Intercrural fibers

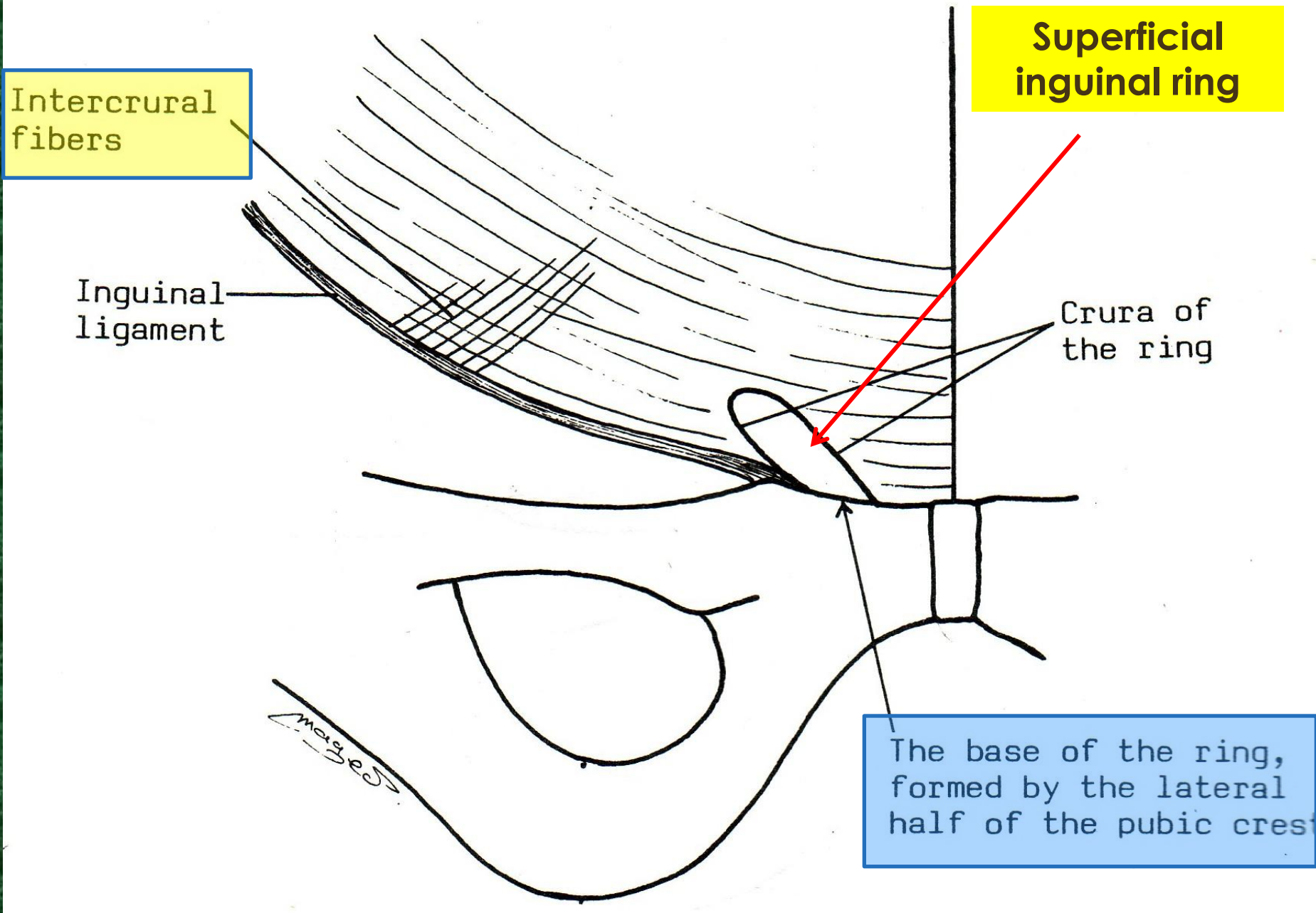
Inguinal ligament

Superficial inguinal ring

Crura of the ring

The base of the ring, formed by the lateral half of the pubic crest

May 2015



Anterior superior
iliac spine

Inguinal ligament

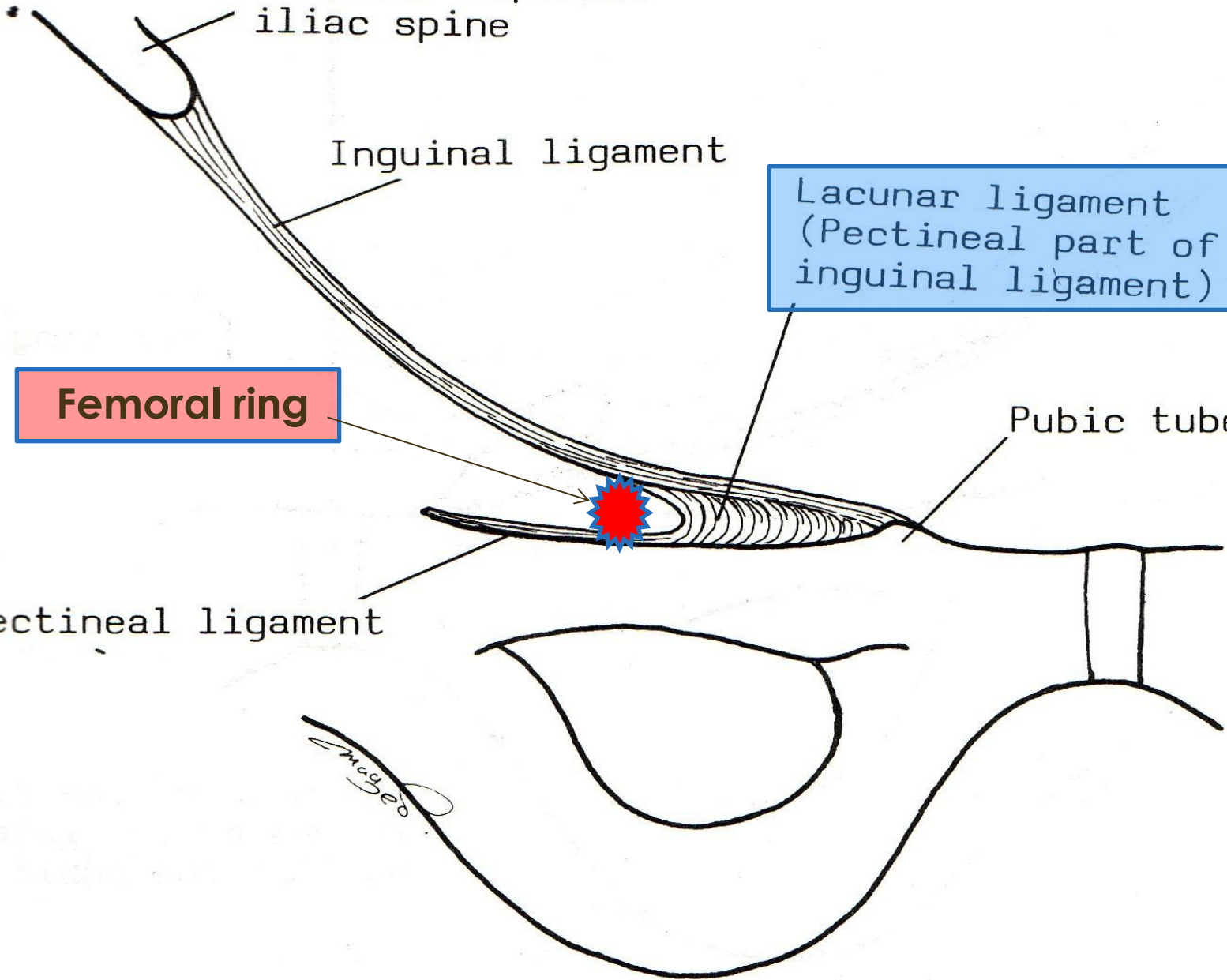
Lacunar ligament
(Pectineal part of
inguinal ligament)

Femoral ring

Pubic tubercle

Pectineal ligament

Magee

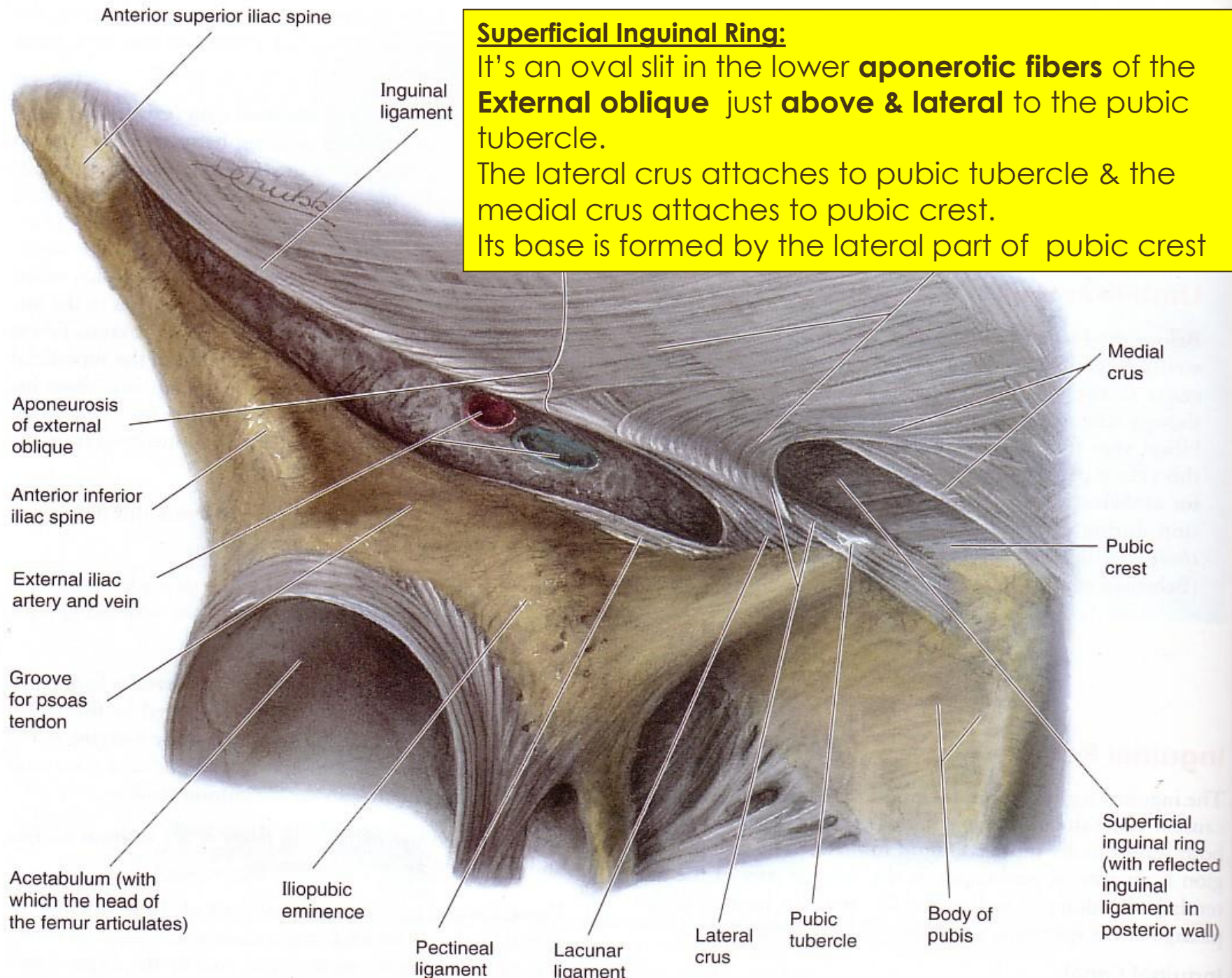


Superficial Inguinal Ring:

It's an oval slit in the lower **aponeurotic fibers** of the **External oblique** just **above & lateral** to the pubic tubercle.

The lateral crus attaches to pubic tubercle & the medial crus attaches to pubic crest.

Its base is formed by the lateral part of pubic crest



Internal Oblique

Origin:

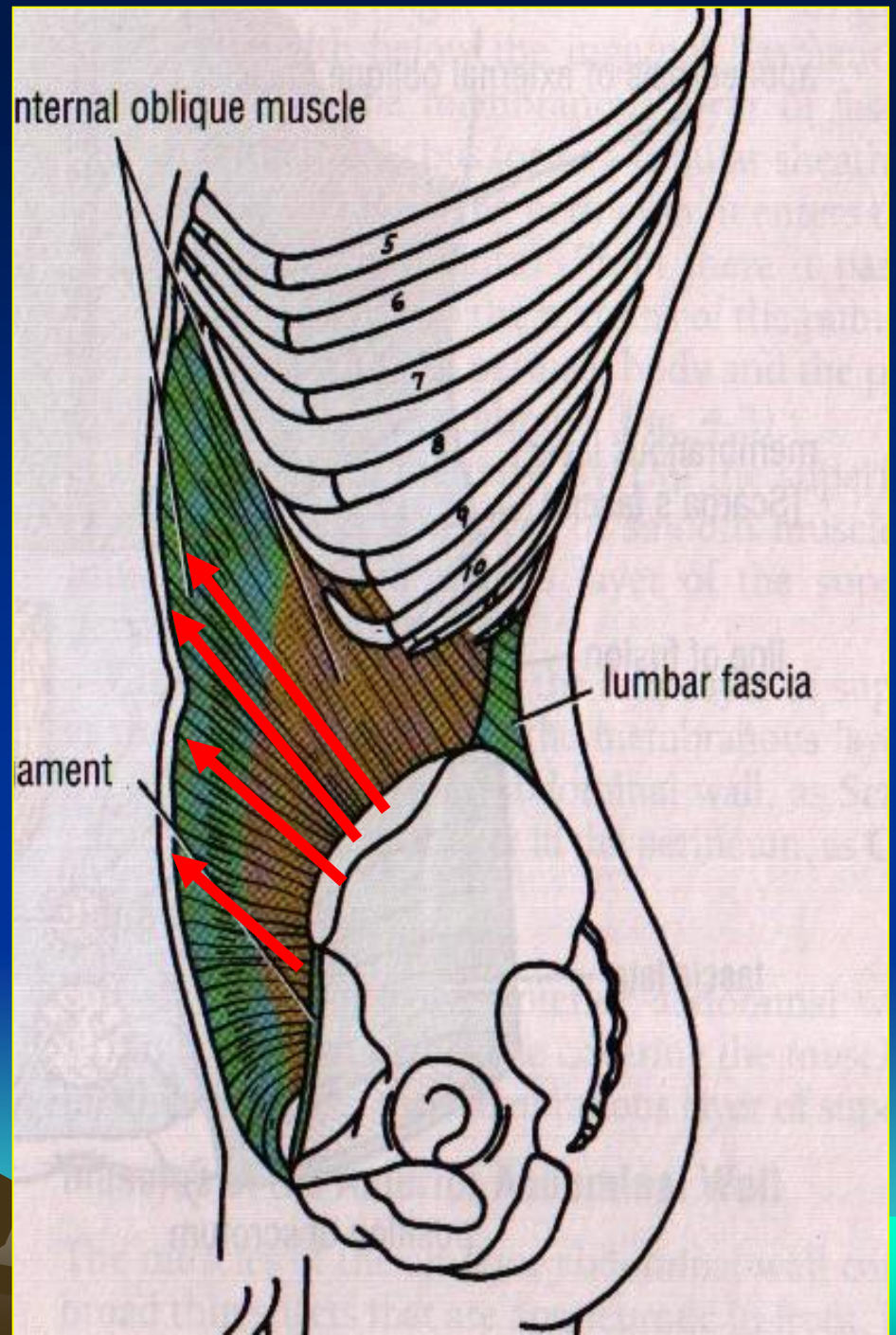
- Lateral 2/3 of inguinal ligament,
- Anterior 2/3 of iliac crest,
- Lumbar fascia.

Direction of its Fibers:

upward forward and medially
(at right angle with the fibers of external oblique).

Insertion:

- Lower 3 ribs and their costal cartilages,
- Xiphoid process,
- Linea alba,
- Pubic crest and
- Pectineal line.



Transversus Abdominis

Origin:

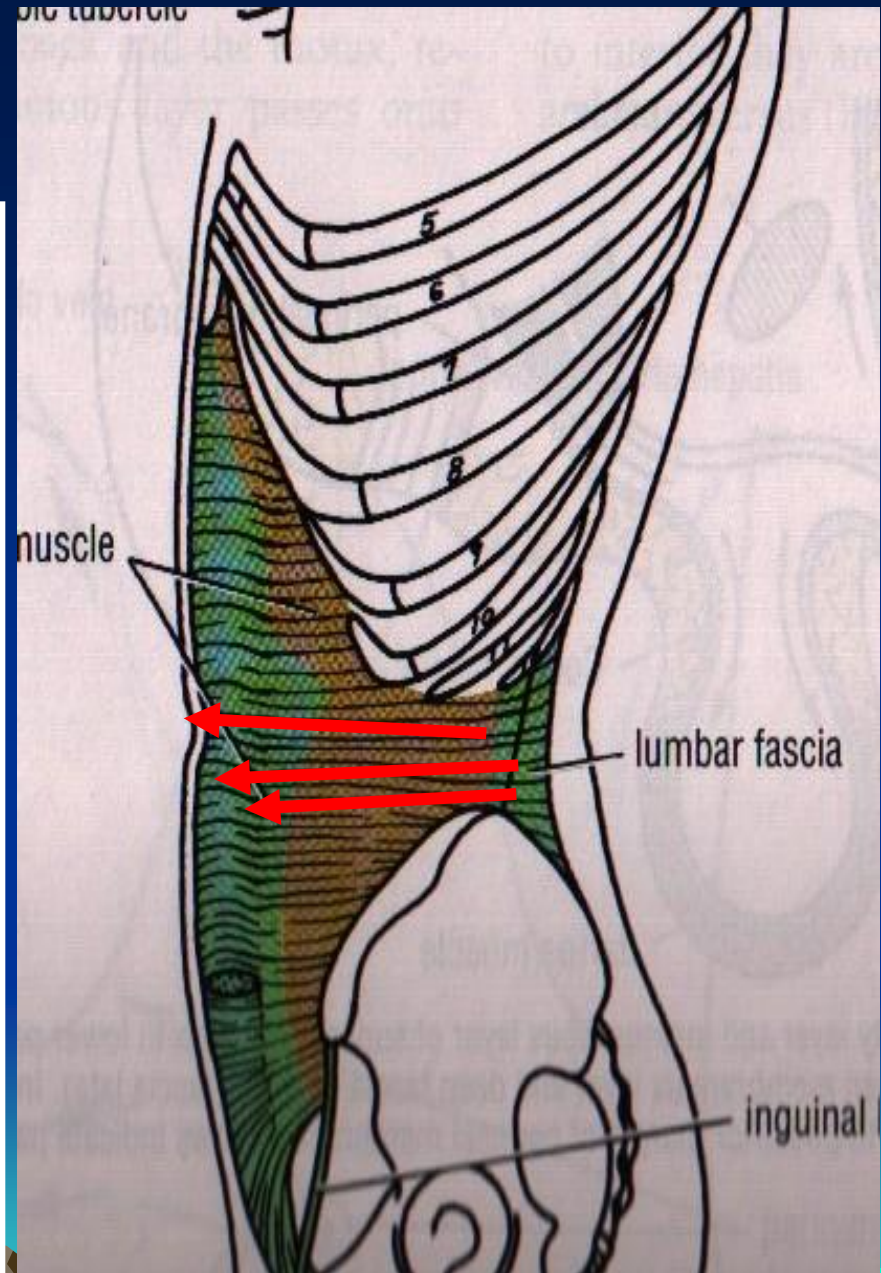
- Lateral 1/3 of inguinal ligament,
- Anterior 2/3 of inner lip of iliac crest,
- Lumbar fascia and
- Lower 6 costal cartilages.

Direction of its fibers:

- Horizontally.

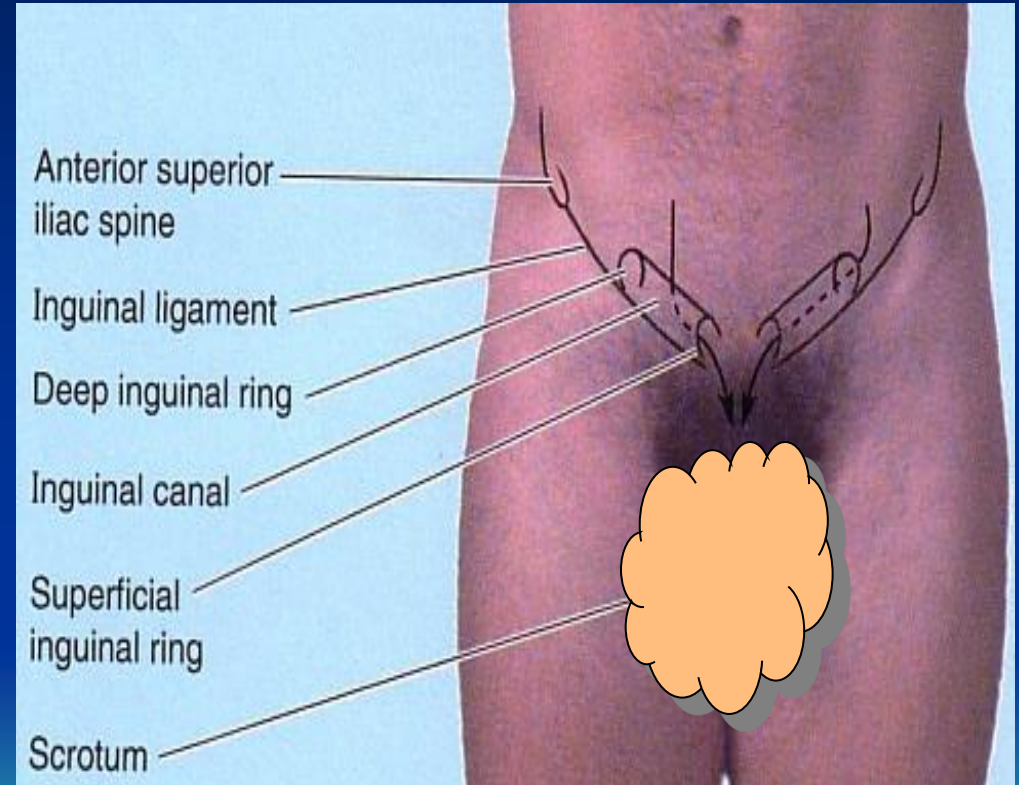
Insertion:

- Xiphoid Process,
- Linea alba,
- Pubic crest, and
- Pectineal line.



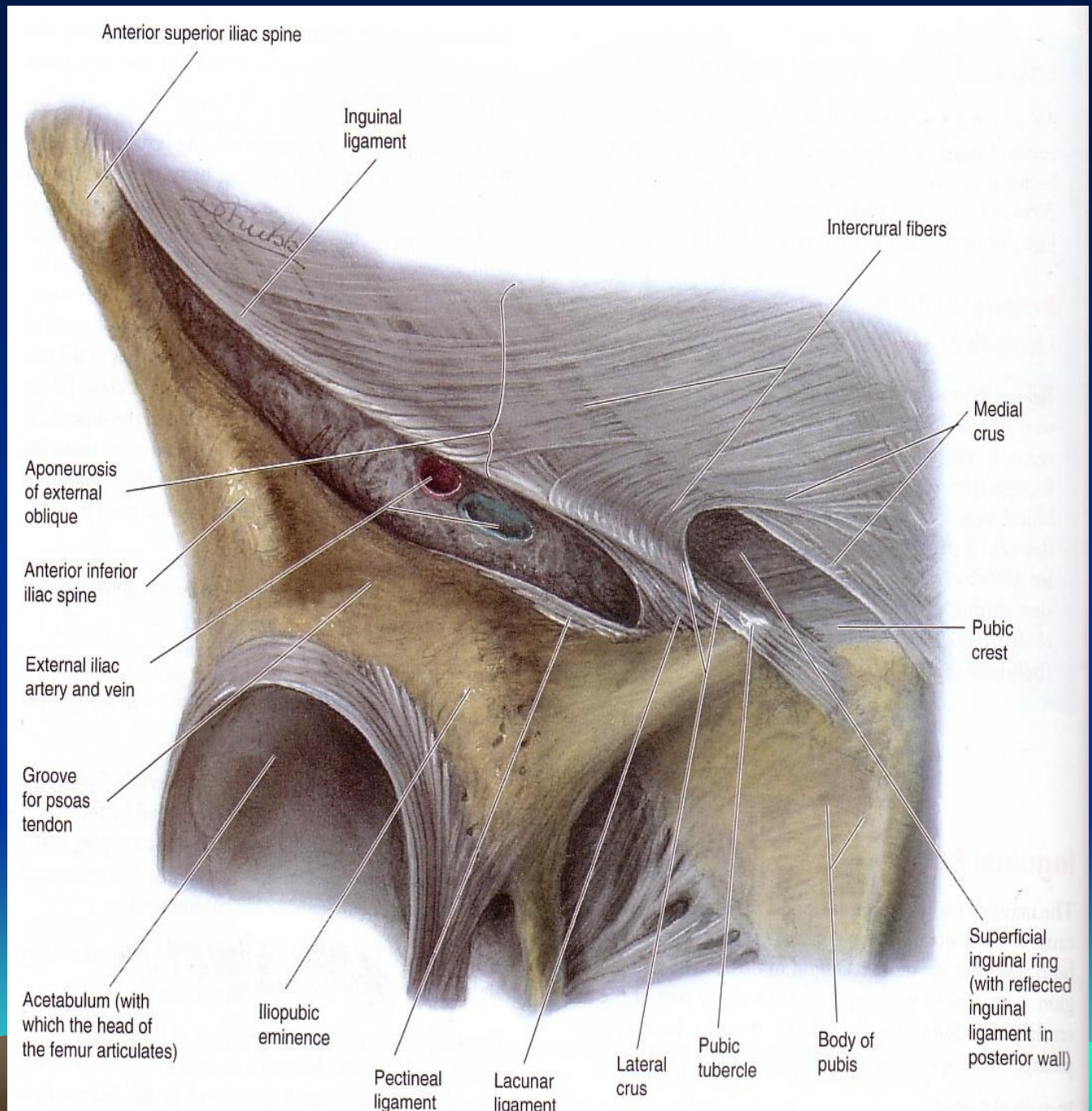
INGUINAL CANAL

- It is an oblique intramuscular passage in the lower medial part of the **Anterior Abdominal Wall**.
- It runs just above and parallel to the medial half of the **inguinal ligament**.
- Its length is about 2 inches (5 cm), long in adult.
- Its gives a passage for the **spermatic cord** in male, or **round ligament** of the uterus in female.
- Also it gives a passage for the **ilioinguinal nerve** in both sexes.
- It connects between the superficial and deep inguinal rings.



Superficial Inguinal Ring

- It's an oval slit in the lower aponeurotic fibers of the **external oblique** just above & lateral to pubic tubercle.
- The lateral crus attaches to pubic tubercle & the medial crus attaches to pubic crest.



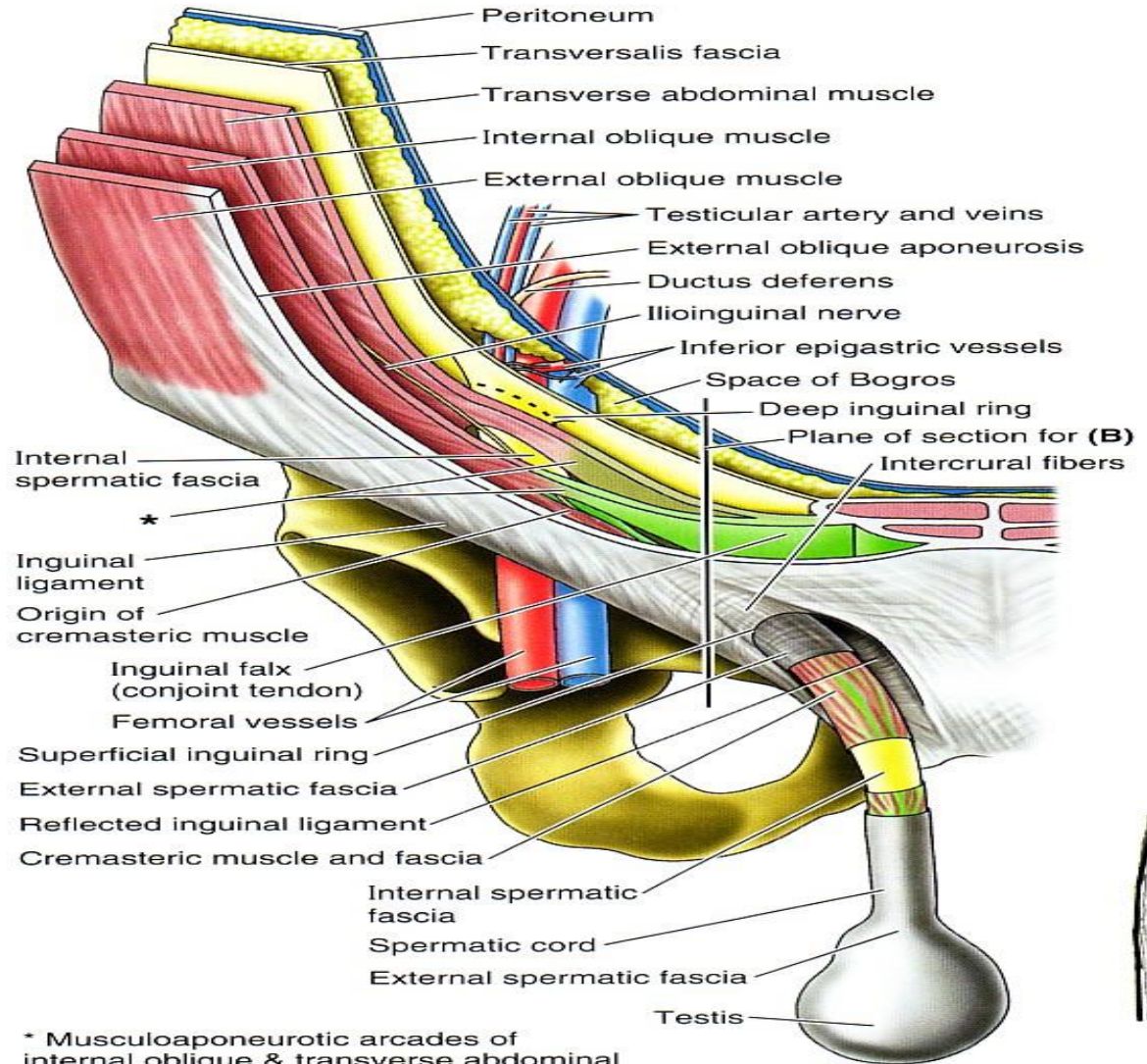
Deep Inguinal Ring

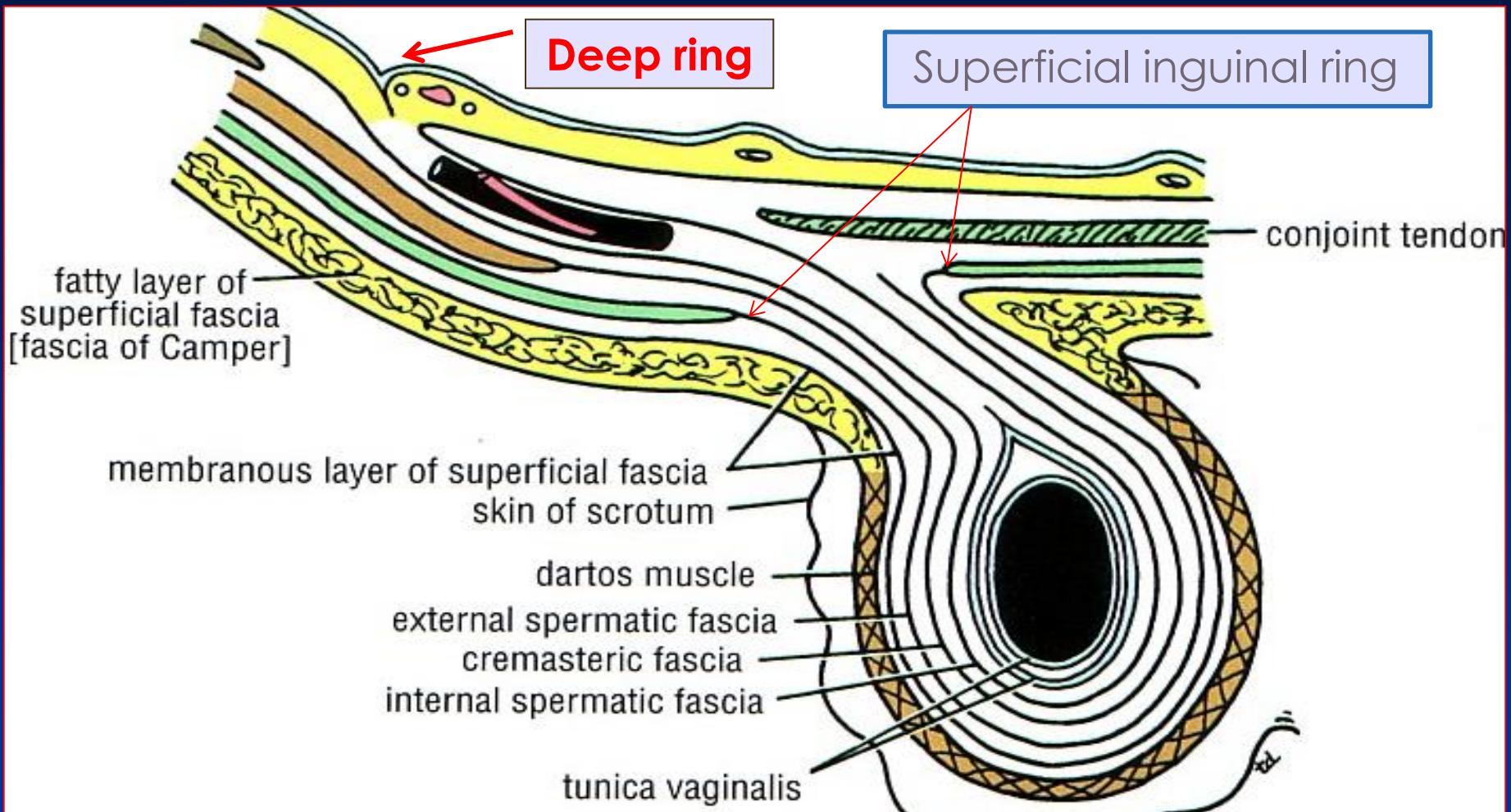
It is an opening in the **fascia transversalis** 1 cm above the middle of the inguinal ligament (**midpoint of inguinal ligament point**)

It lies lateral to the inferior epigastric vessels

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2 / ABDOMEN

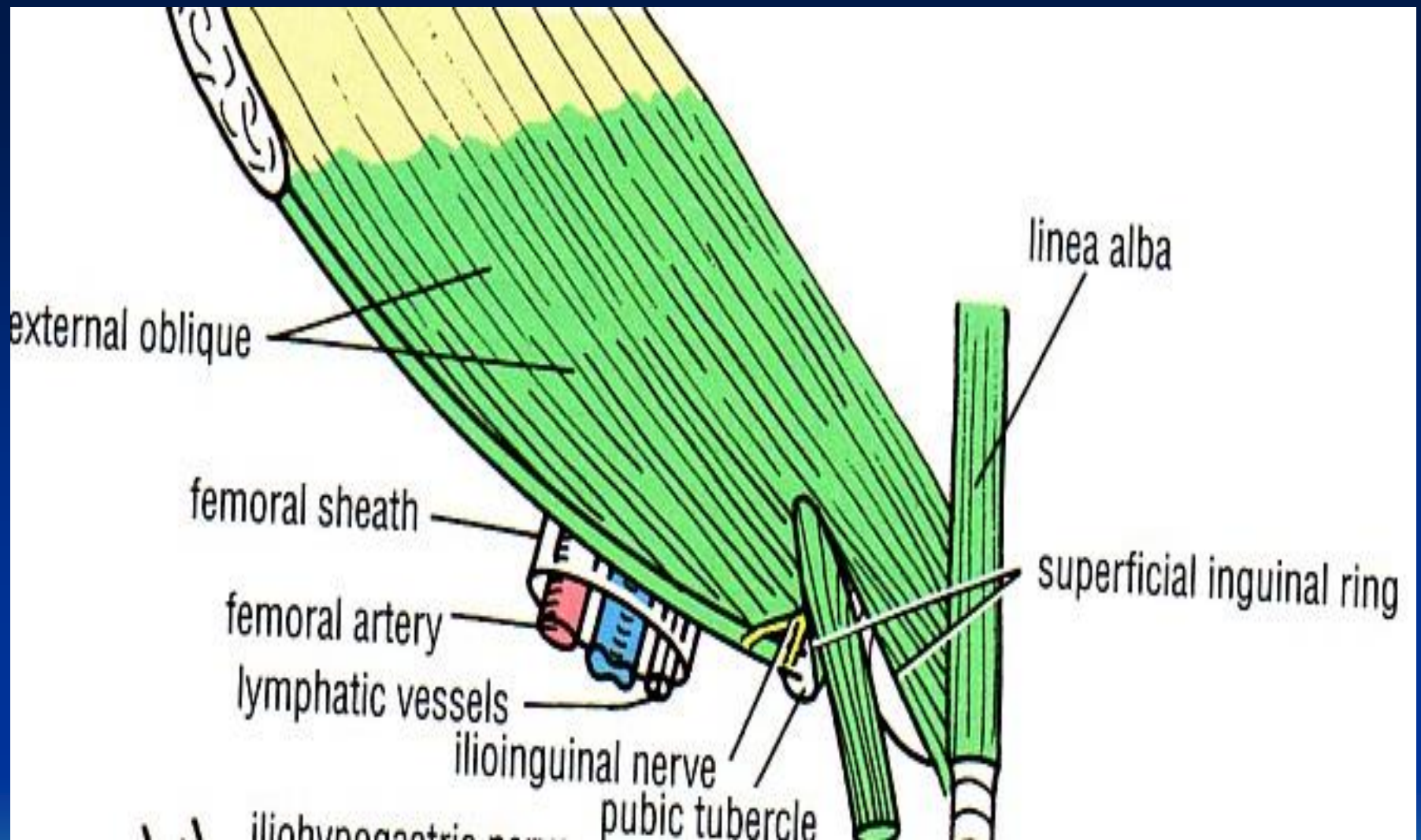




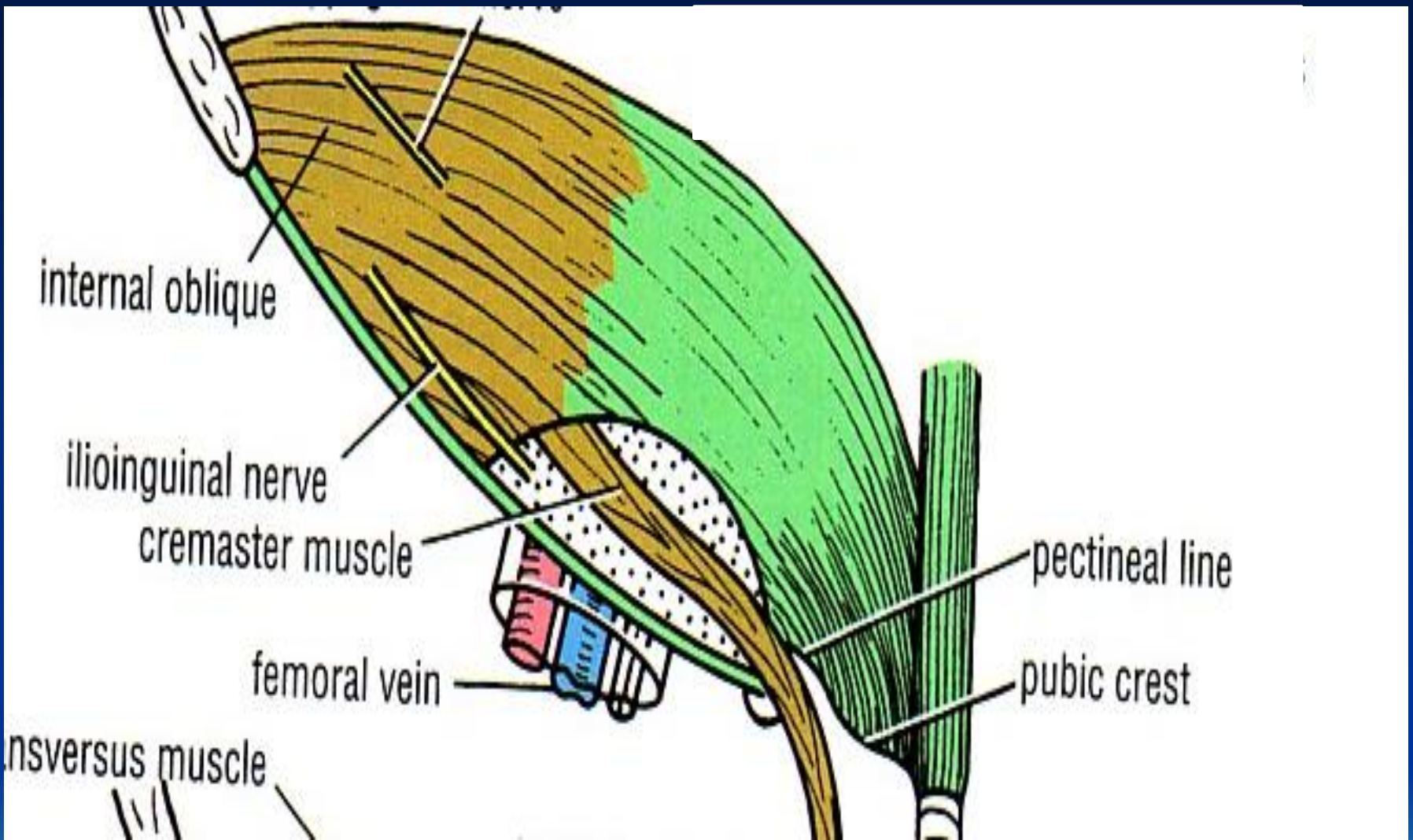
INGUINAL CANAL

Anterior. Wall: External oblique along whole length
Internal oblique along lateral half.

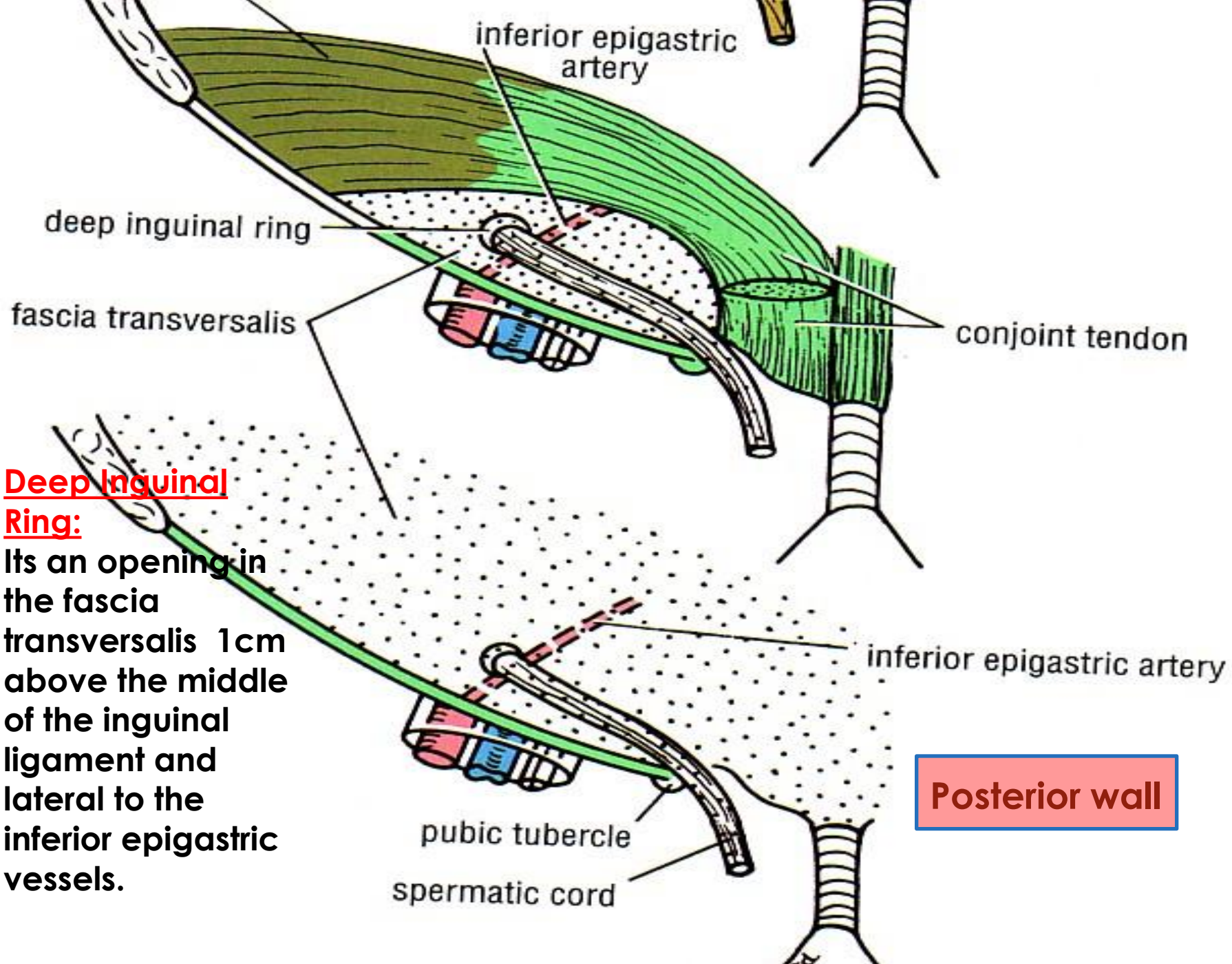
Posterior. Wall: Fascia Transversalis along whole length.
Conjoint tendon along the medial part.
Reflected ligament along the medial part.



Ant. Wall: External oblique along whole length



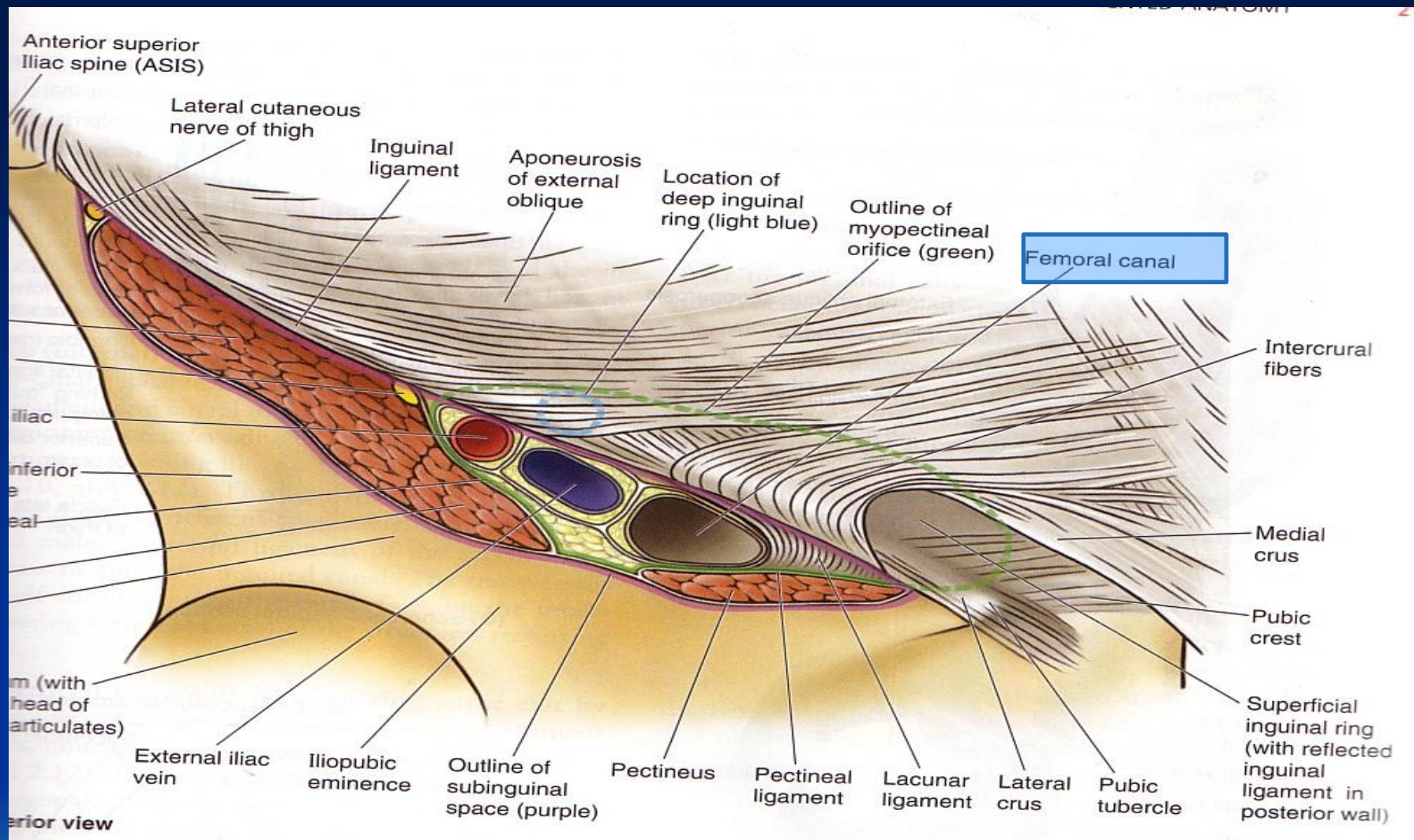
Anterior wall: Internal oblique along lateral half.



Deep Inguinal Ring:

Its an opening in the fascia transversalis 1cm above the middle of the inguinal ligament and lateral to the inferior epigastric vessels.

Posterior wall



Floor: Inguinal ligament supported medially by the Lacunar ligament.

Roof: Arching lower fibers of internal oblique.

Boundaries of the Inguinal canal

Ant. Wall: External oblique along whole length
Internal oblique along lateral half.

Post. Wall: Fascia transversalis along whole length.
Conjoint tendon along the medial half.
Reflected ligament along the medial part.

Floor: Inguinal ligament supported medially by the
Lacunar ligament.

Roof: Arching lower fibers of internal oblique.



MECHANICS

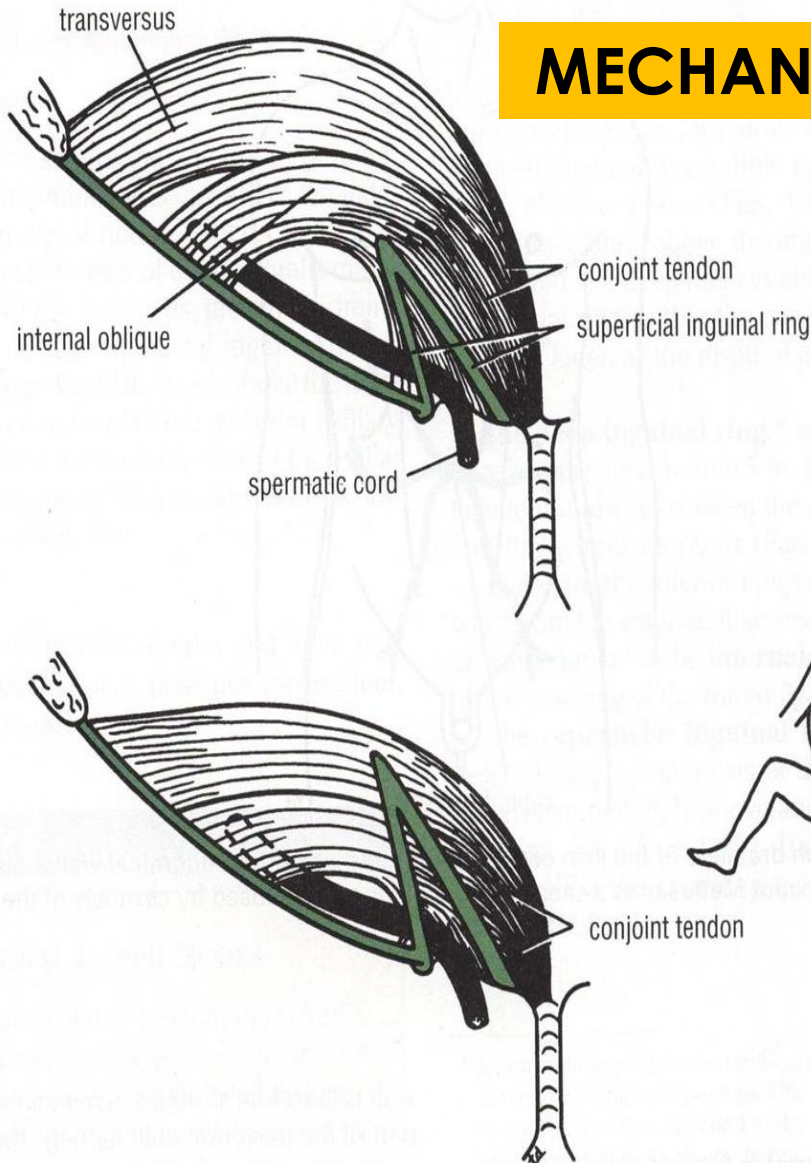


Figure 4-20 Action of the muscles on the inguinal canal. Note that the canal is "obliterated" when the muscles contract. Note also that the anterior surface of the thigh protects the inguinal region when one assumes the squatting position.

The inguinal canal is a potential **weak point** in the anterior abdominal wall. But it possesses protective mechanisms

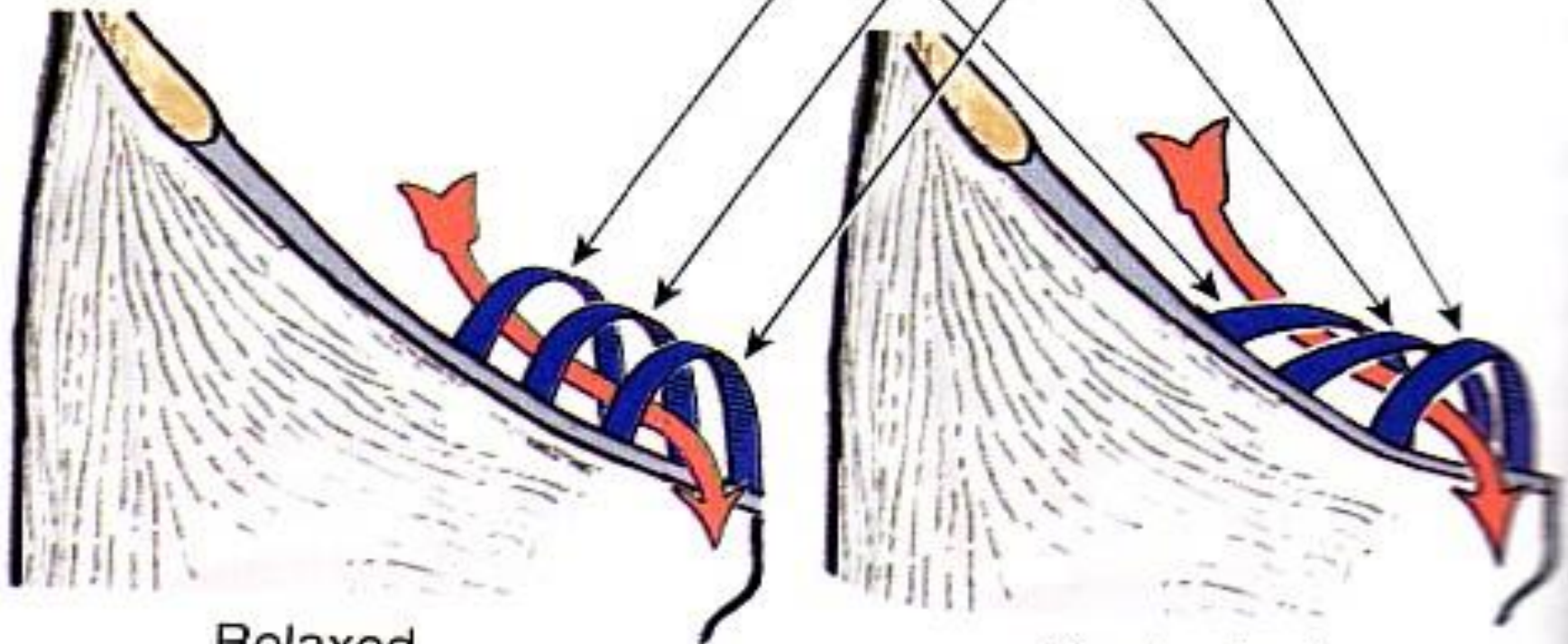
Protective mechanisms

- Oblique trajectory.
- Anterior wall reinforced laterally by the internal oblique in front of the deep ring.
- Posterior wall reinforced medially by the conjoint tendon behind the superficial ring.
- On coughing and straining (micturition and defecation) the arching lower fibers of the internal oblique and transversus abdominis contract and flatten the roof of the canal, compressing its content.
- In great straining (defecation and parturition), the person naturally assumes **squatting position**, in which the anterior abdominal wall is protected by the thighs.

Shutter Mechanism

Musculoaponeurotic arcades of

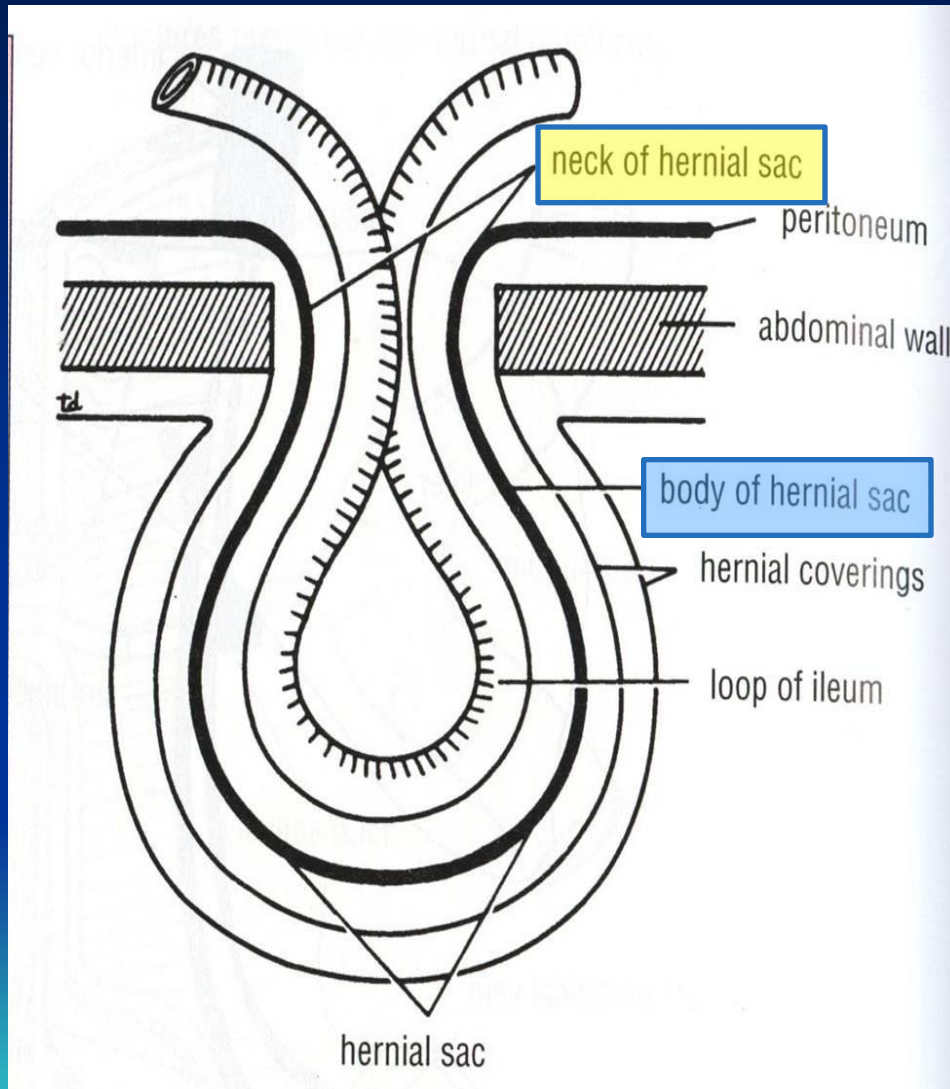
Internal oblique
Superficial inguinal
Transverse abdominal



Relaxed

Contracted

ABDOMINAL HERNIAS



DEFINITION

- A protrusion of part of the abdominal contents outside of the abdomen.

PARTS

1. Hernial sac.
2. Contents of the sac.
3. Coverings of the sac.

HERNIAL SAC

- It is a pouch of peritoneum (diverticulum)
- It has a **neck** and a **body**.

HERNIAL CONTENT

- Any mobile structure from the abdominal cavity usually loop of intestine or part of greater omentum.

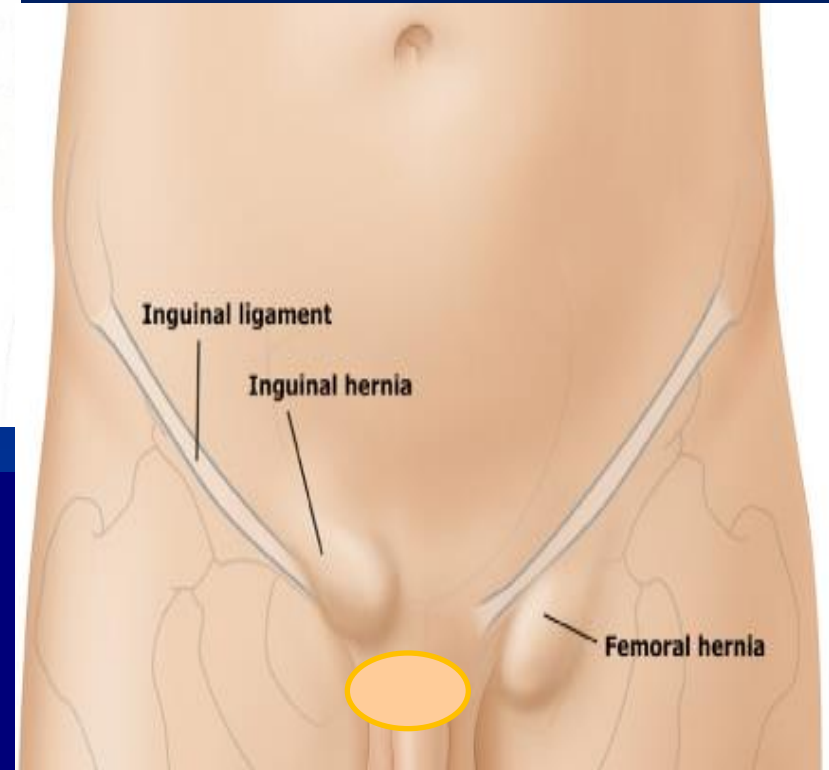
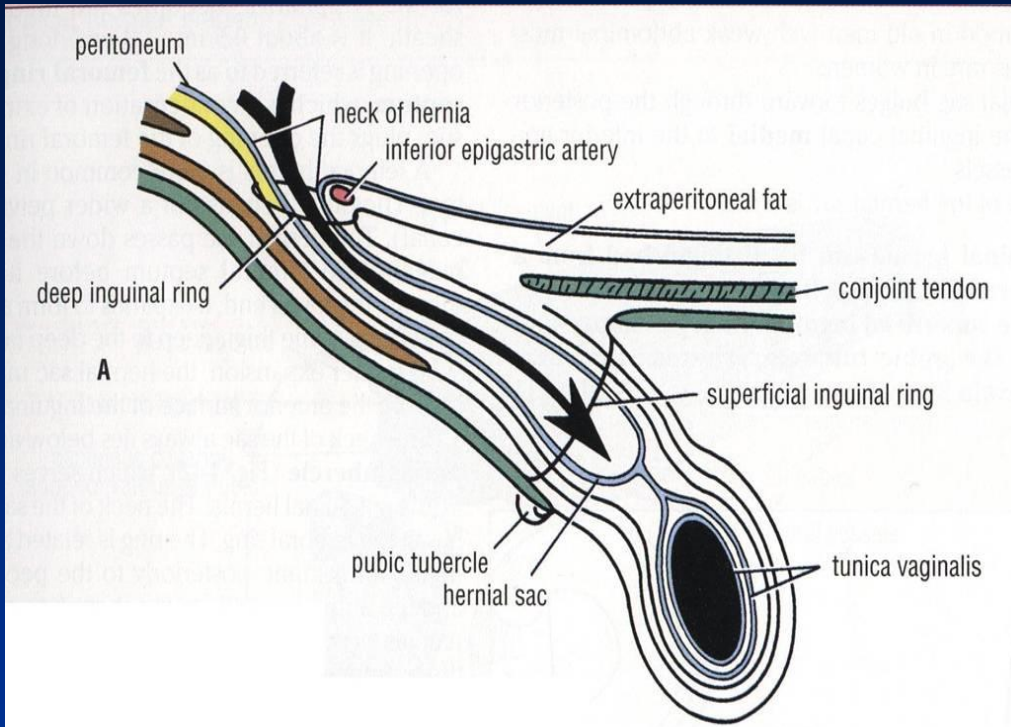
HERNIAL COVERINGS

- Formed by the layers of abdominal wall.

TYPES OF ABDOMINAL HERNIAE

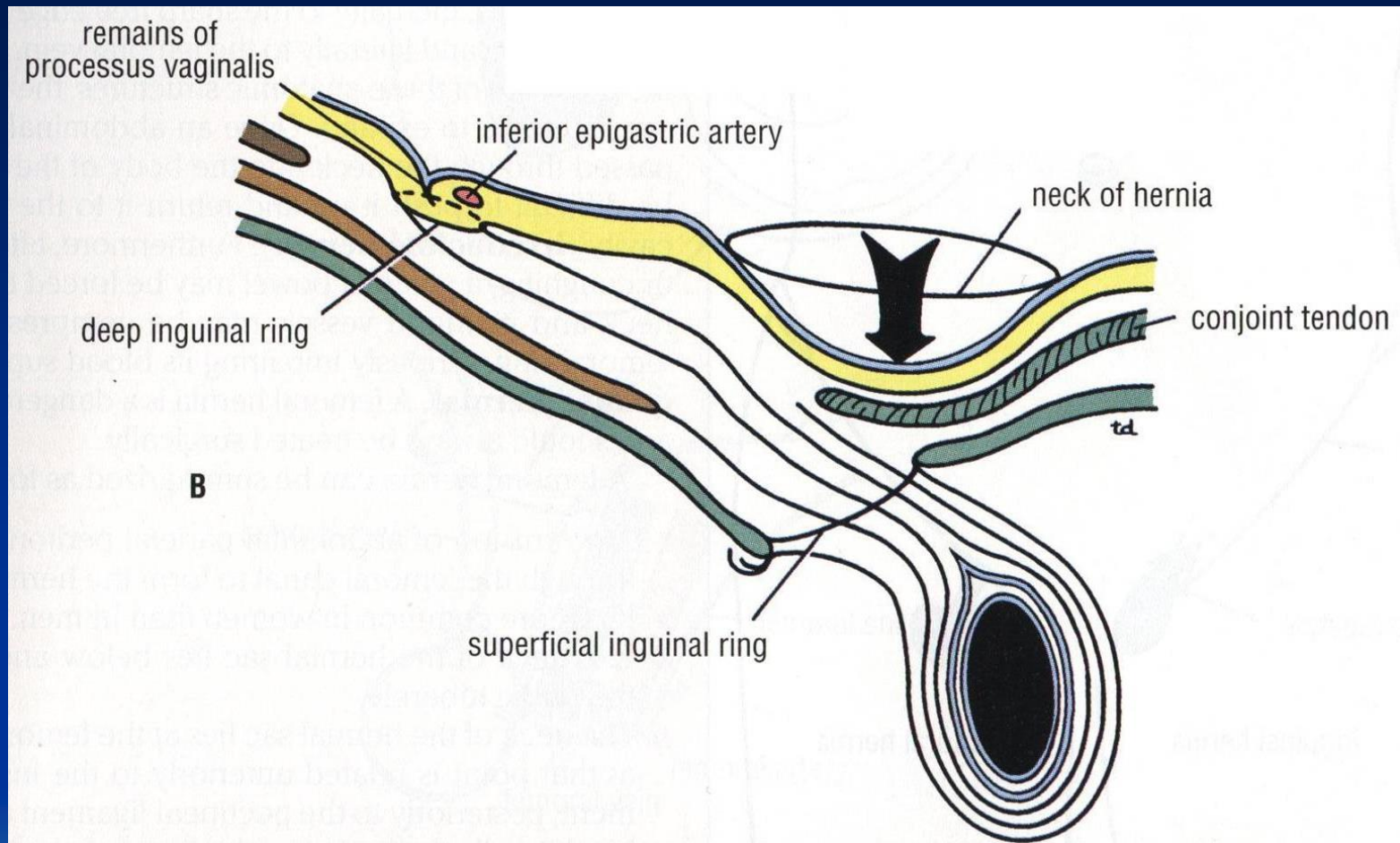
- Inguinal- most common- (indirect or direct).
- Femoral.
- Umbilical (congenital or acquired).
- Epigastric.
- Separation of the two recti abdominis muscles.
- Hernia of linea semilunaris (Spigelian hernia).
- Internal hernia.

INDIRECT OR (OBLIQUE) INGIUINAL HERNIA



- Most common form of hernia.
- **Origin:** congenital.
- 20 x more **common in males.**
- 30 % bilateral.
- More common on the **right side, WHY?**
- More common in children and young adults.
- Located inside the **remains of processus vaginalis.**
- It's extend depends on the state of obliteration of the processus vaginalis.
- Enters the inguinal canal **lateral to the inferior epigastric vessels.**
- Hernial sac lies **above and medial** to the pubic tubercle
- May extend down to the scrotum or (labium majus)

DIRECT INGIUINAL HERNIA



- 15 % of inguinal herniae
- Common in old men with weak abdominal wall, rare in women.
- Hernial sac bulges through the posterior wall of the inguinal canal **medial** to the inferior epigastric vessels
- The neck of the hernial sac is **wide**

FEMORAL HERNIA

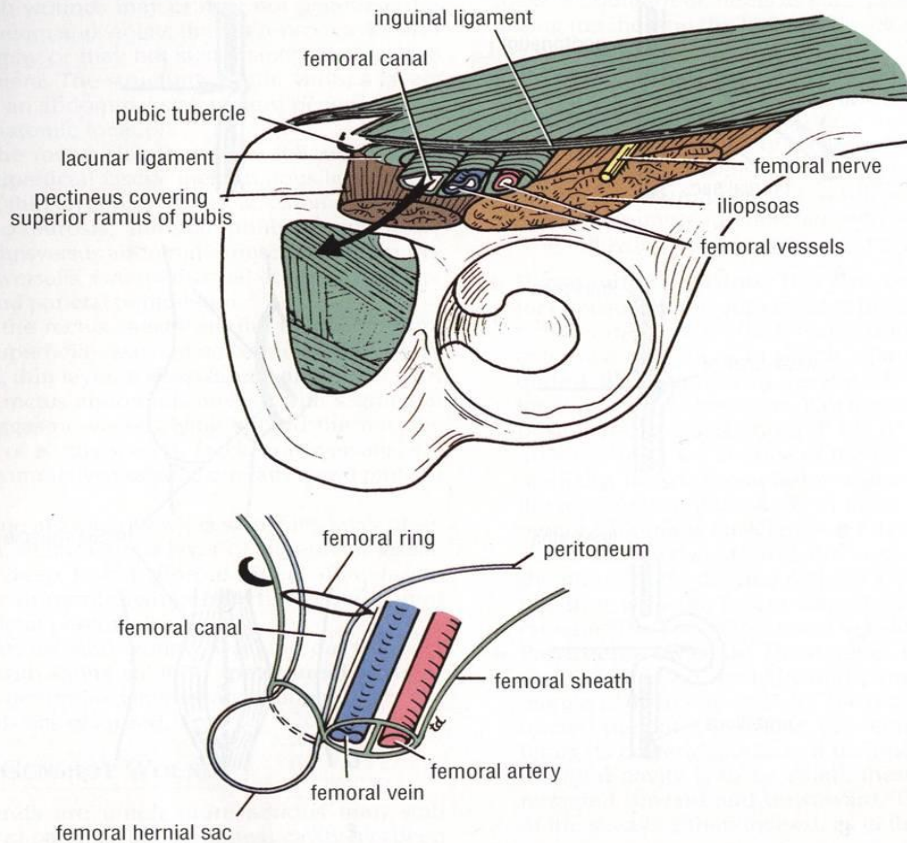


Figure 4-43 The femoral sheath as seen from below. Arrow emerging from the femoral canal indicates the path taken by the femoral hernial sac. Note relations of the femoral ring.

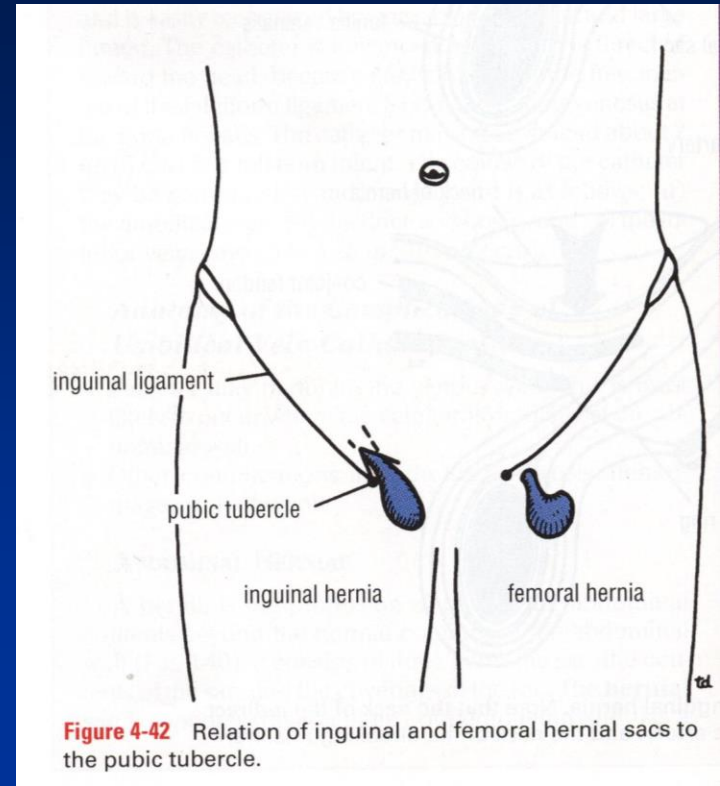


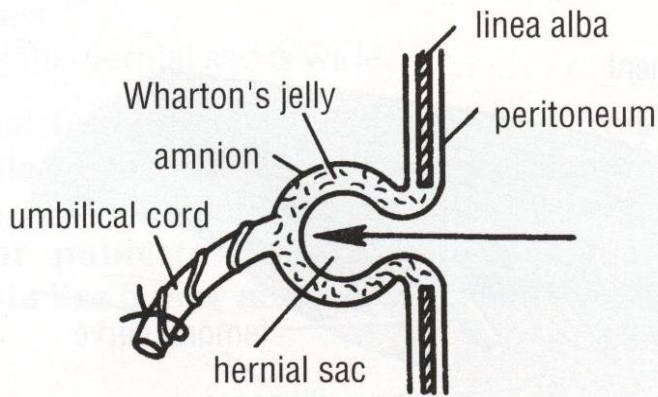
Figure 4-42 Relation of inguinal and femoral hernial sacs to the pubic tubercle.

- The hernial sac descends through the femoral canal within femoral sheath.
- More common in women.
- The neck of the sac lies below and lateral to the pubic tubercle.
- The neck of the sac is narrow and lies at the femoral ring.
- Because of the narrow neck, it is often **irreducible** and may become **strangulated**.

UMBILICAL HERNIAE

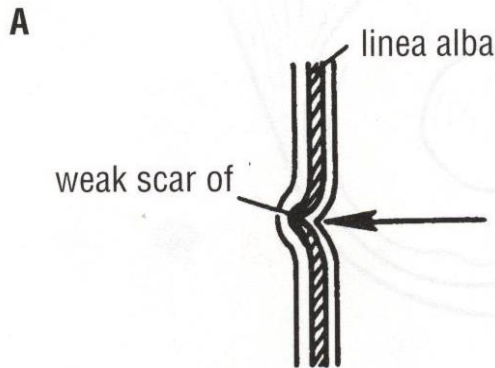
CONGENITAL UMBILICAL HERNIA

- Caused by failure of part of the midgut loop to return to the abdominal cavity during fetal development.



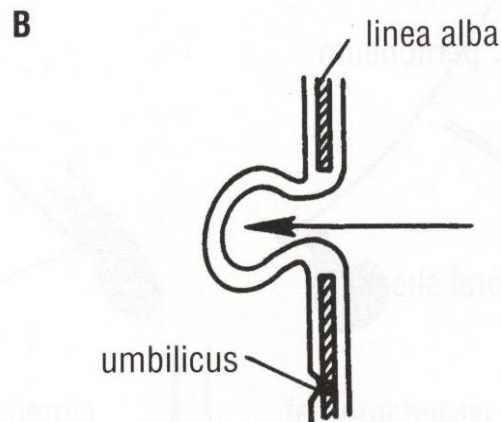
ACQUIRED INFANTILE UMBILICAL HERNIA

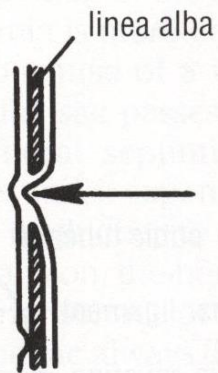
- Small hernia caused by a weakness of the umbilical scar at linea alba.
- Occurs in children and often disappears without treatment.



ACQUIRED UMBILICAL HERNIA OF ADULTS

- A paraumbilical hernia.
- Caused by a weakness of linea alba in the region of the umbilicus.
- More common in women especially with repeated pregnancy.



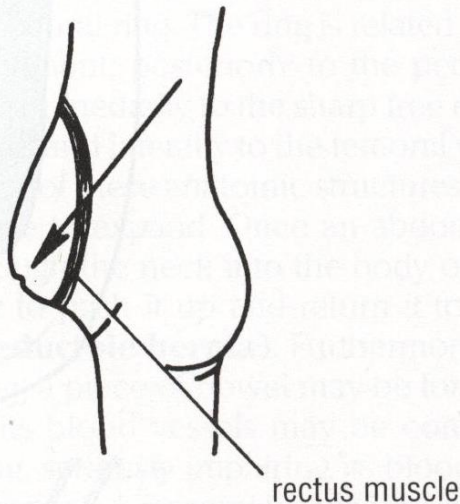


EPIGASTRIC HERNIA

- Occurs through the widest part of linea alba
- Usually a small hernia
- Common in middle-aged manual workers

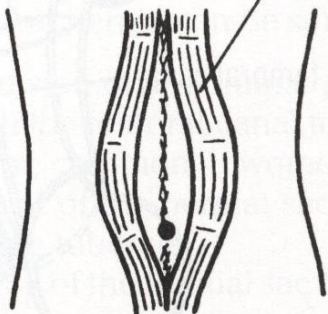
SEPARATION OF THE RECTI ABDOMINIS

- The hernial sac lies between the medial margins of the 2 recti
- Common in elderly multiparous women.
- Caused by a weakness of the recti muscles.



INCISIONAL HERNIA

- **A postoperative complication**
- **Large hernial sac**
- **Causes:**
 - damage to segmental nerve supplying the muscles of the anterior abdominal wall
 - postoperative infection with necrosis of the muscles

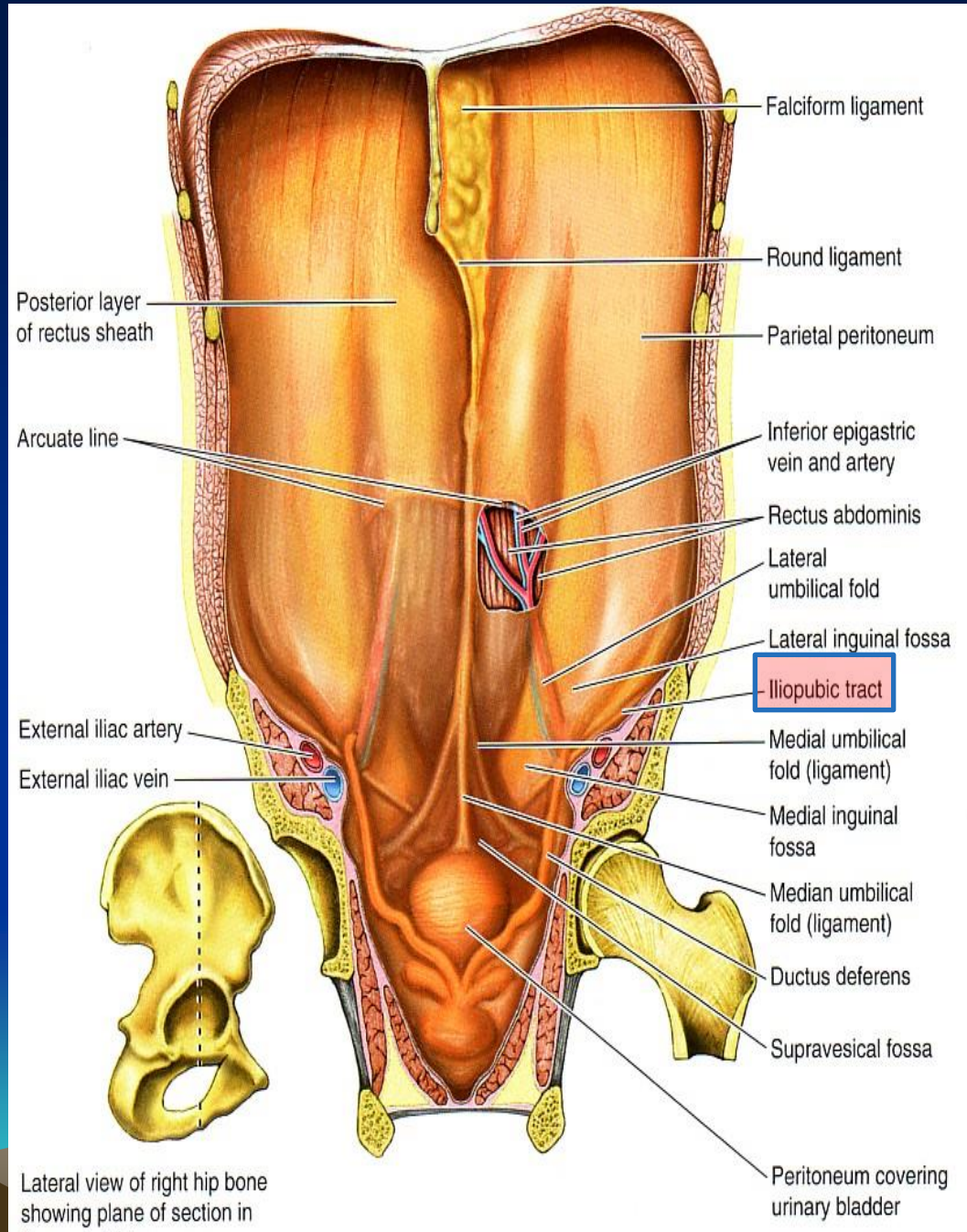


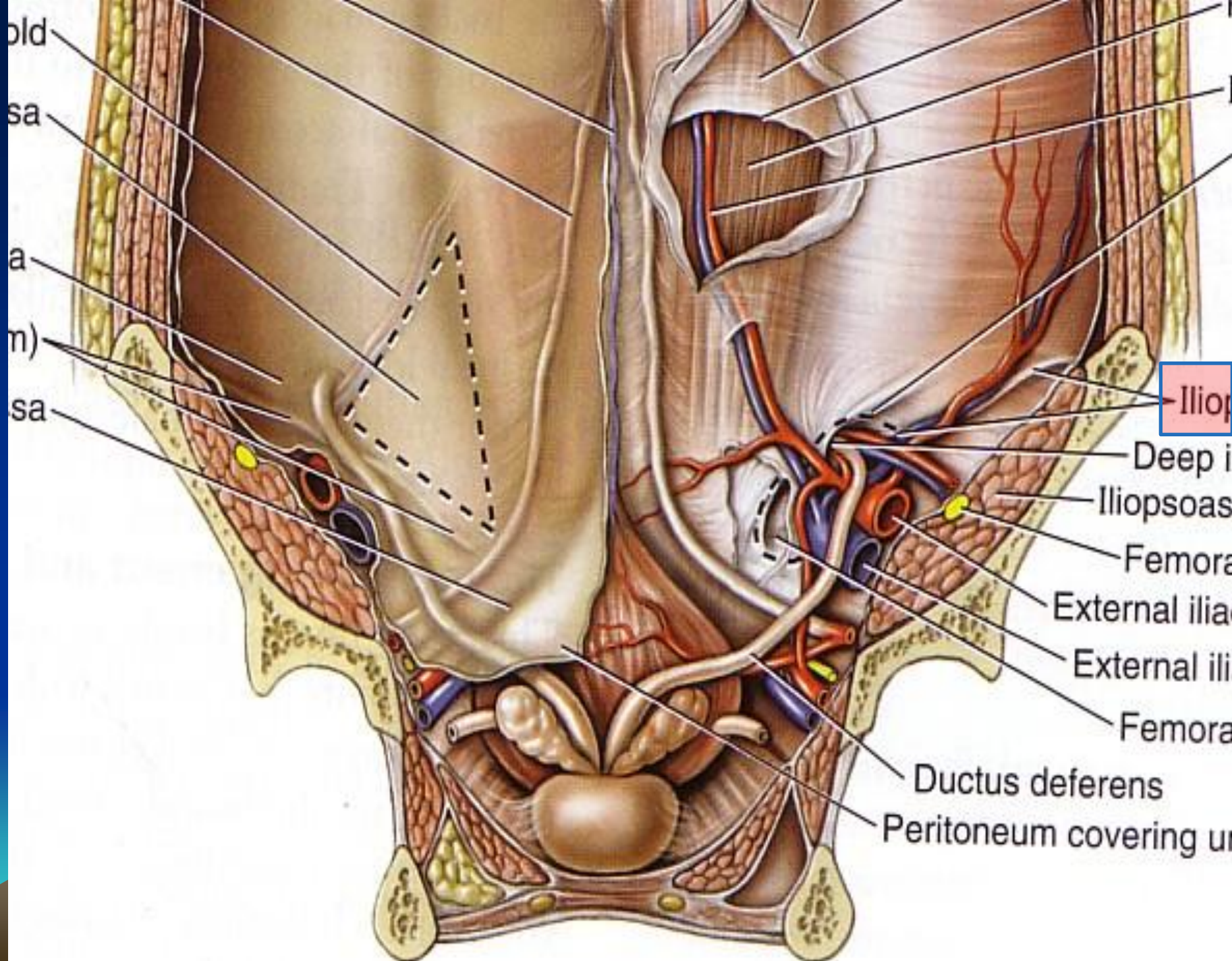
HERNIA OF LINEA SEMILUNARIS

- Spigelian hernia
- a rare type
- occurs through the aponeurosis of transversus abdominis lateral to the rectus sheath.
- Usually below the level of the umbilicus.

Iliopubic Tract

- It is the thickened inferior margin in the fascia transversalis.
- It appears as a fibrous band running deep (posterior) to the inguinal ligament.
- During laparoscopy it is seen as it span the **subinguinal space**, through which the flexors of the hip joint and the neurovascular bundle pass to the lower limb.
- The inguinal ligament and iliopubic tract form a bilaminar retinaculum which span an area of weakness in the groin called the myopectineal orifice.





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Femora

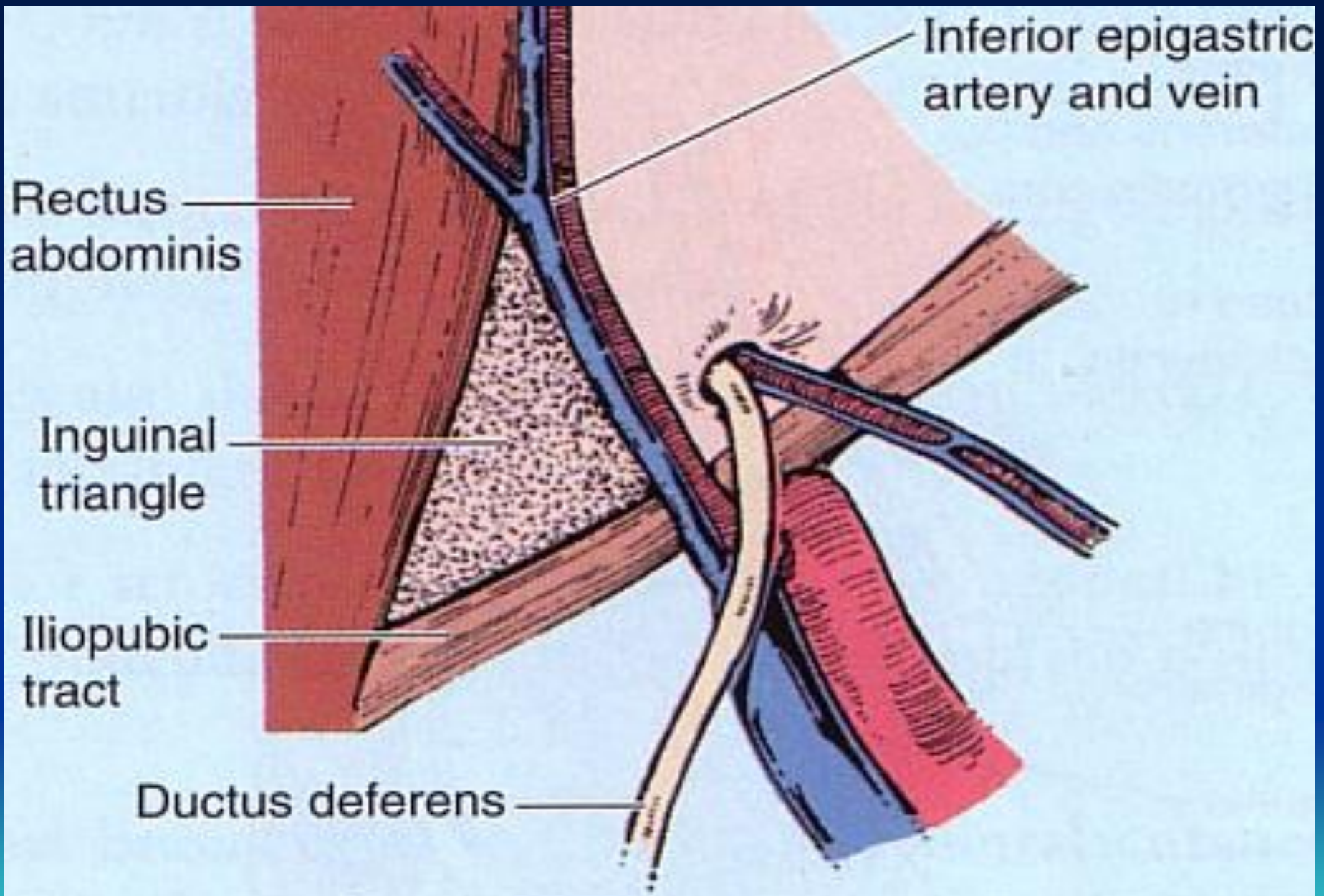
External ilia

External ili

Femora

Ductus deferens

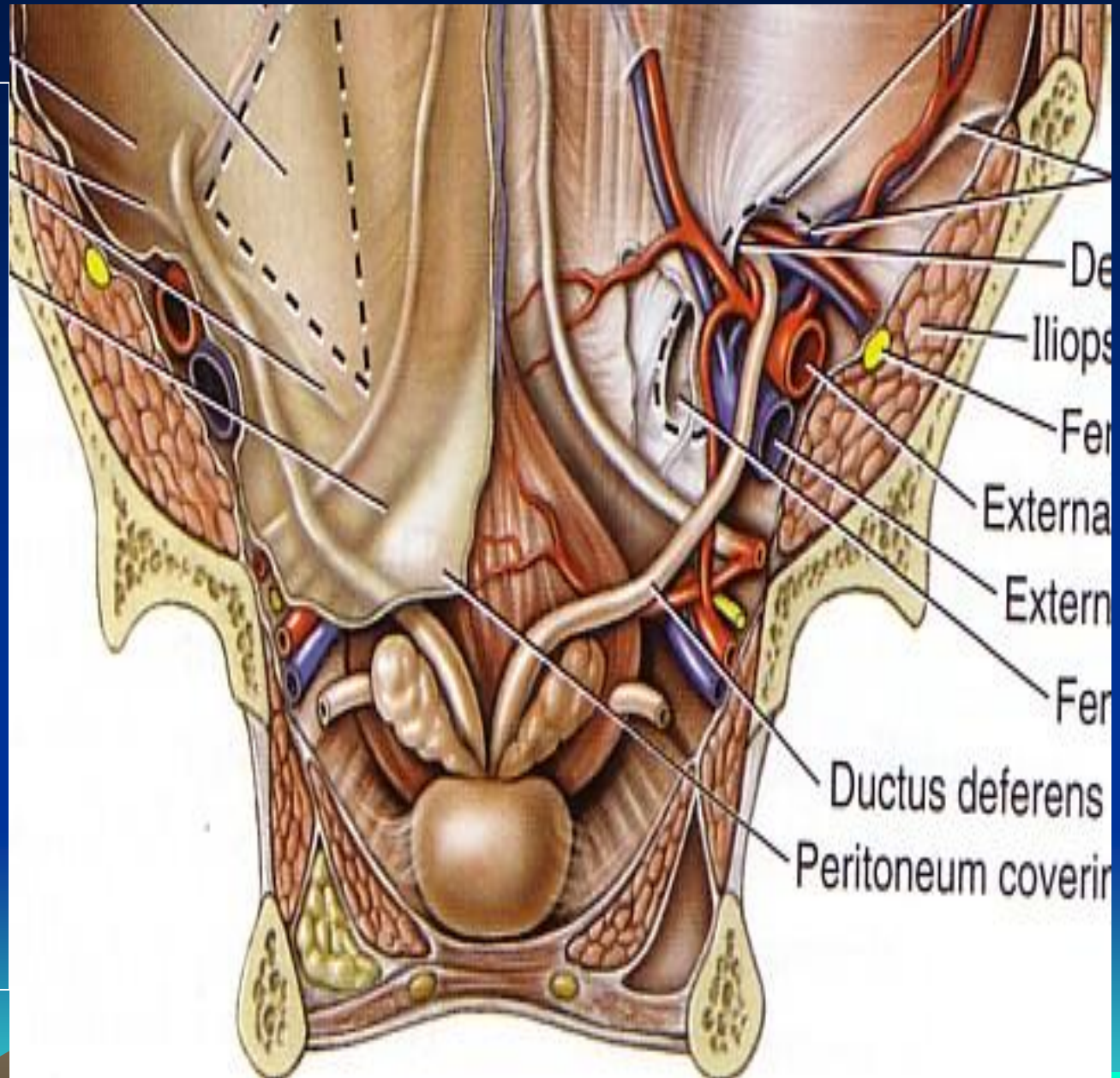
Peritoneum covering u



(B) Posterior view of anterior abdominal wall

The Iliopubic tract demarcates between, the inferior margin of the deep inguinal ring, and the superomedial margin of the femoral ring.

It is a useful landmark during laparoscopic repair of inguinal hernia.



Internal Surface of the Anterolateral Abdominal Wall

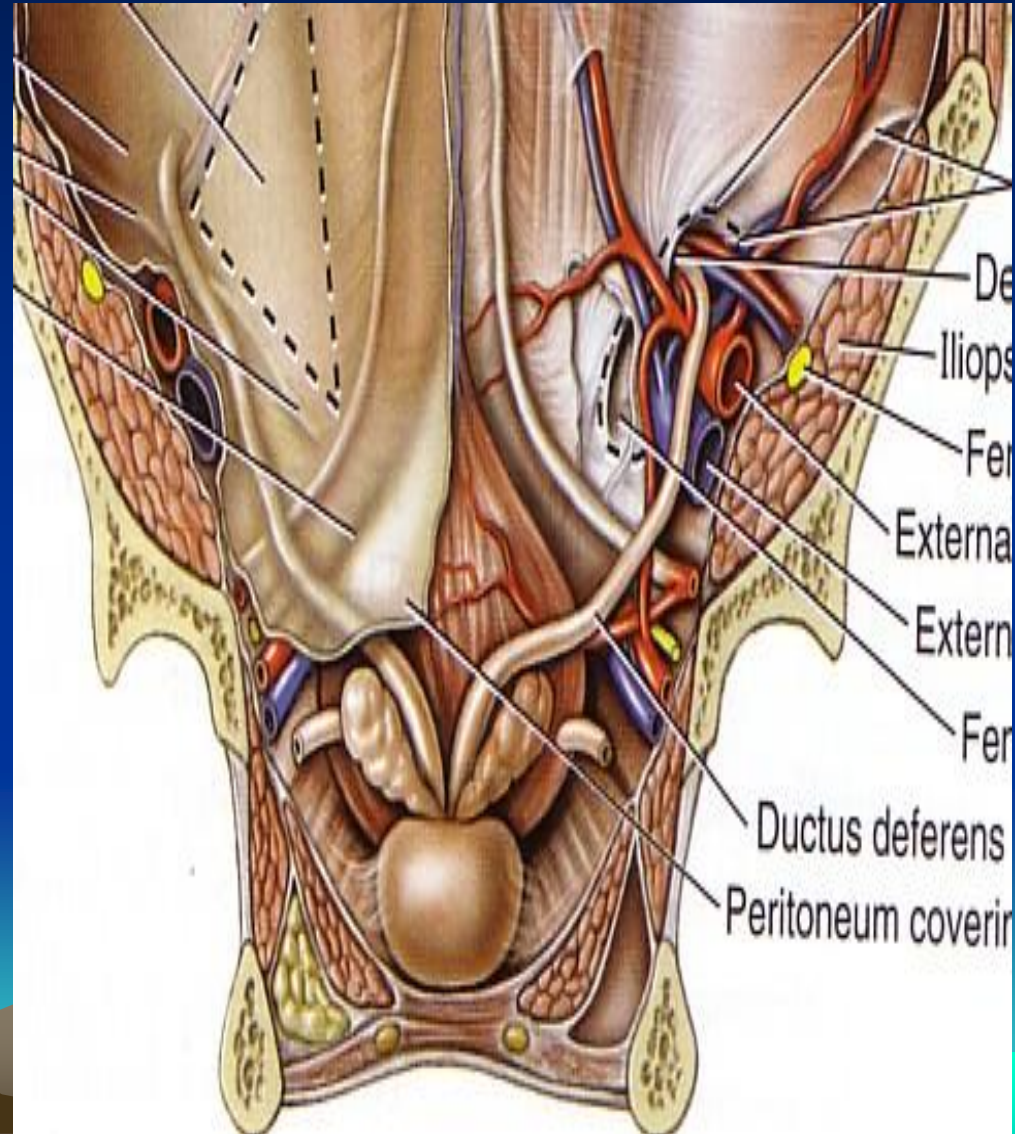
The posterior surface of the anterolateral abdominal wall is covered by fascia transversalis.

Five umbilical peritoneal folds are seen.

1- Median umbilical fold: Extends from apex of urinary bladder to umbilicus, (obliterated urachus).

2- Two medial umbilical folds: Obliterated distal part of the umbilical artery.

2- Two lateral umbilical folds: the peritoneum cover the **Inferior Epigastric vessels**, so it bleeds, if it is injured.



Fossae in between the Umbilical Folds

- Two Supravesical Fossae:

On both sides of the median umbilical fold, rare type of external supravesical hernias.

- Two Medial Inguinal Fossae:

Between medial & Lateral umbilical folds. It is also called inguinal or **Hesselbach triangle** (direct inguinal hernia)

- Two lateral Inguinal fossae:

Lateral to lateral umbilical folds (including deep inguinal ring – Indirect or oblique inguinal hernias).

