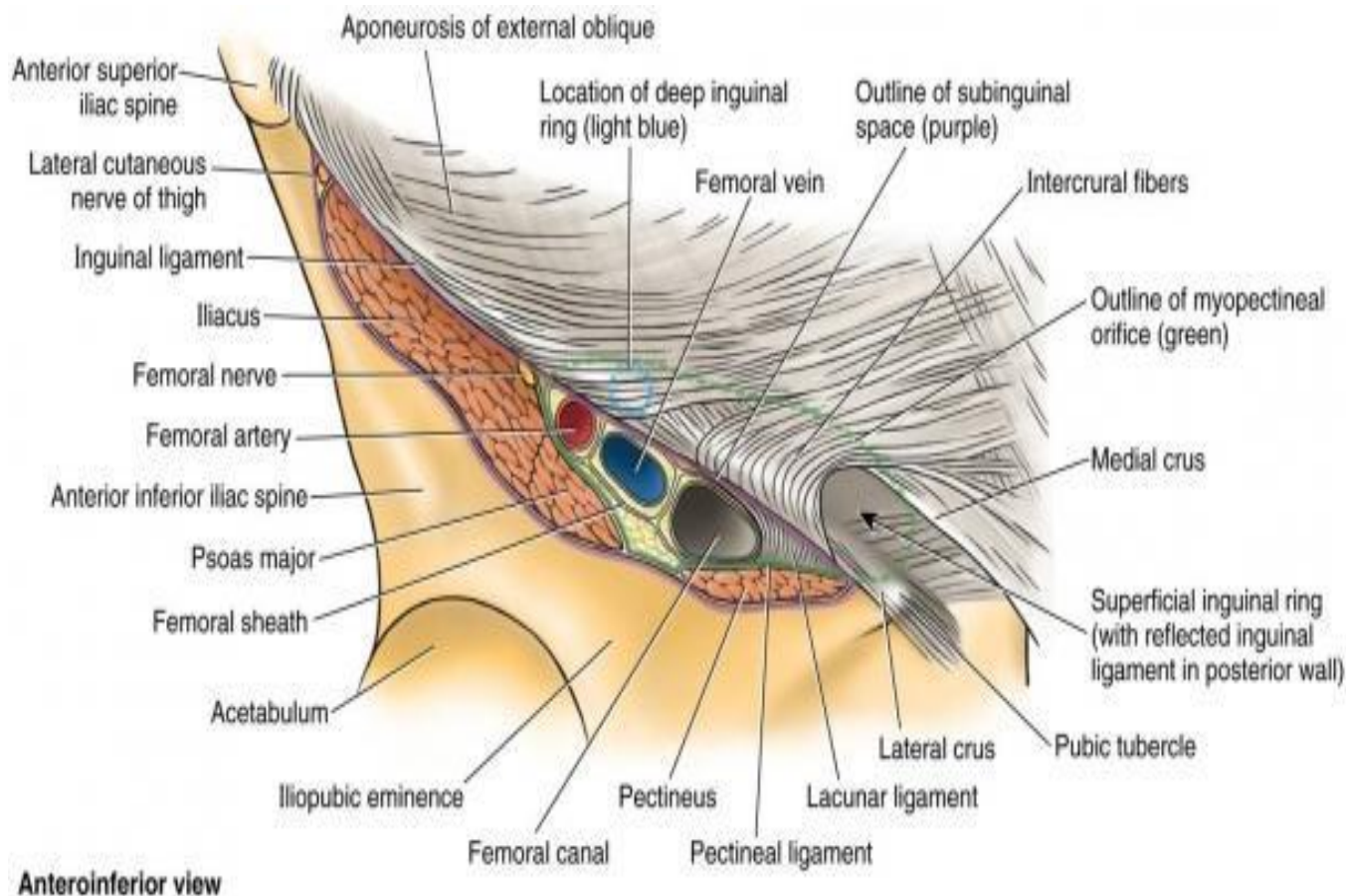
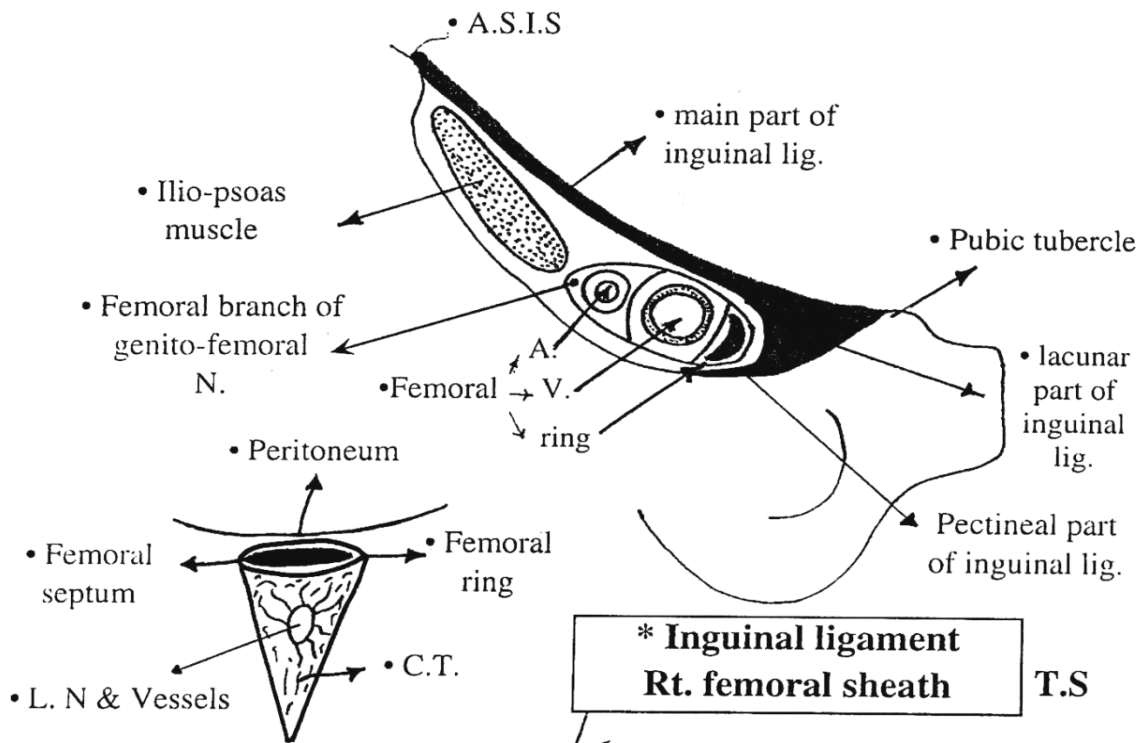


# INGUINAL LIGAMENT

\* Formed of 4 parts:

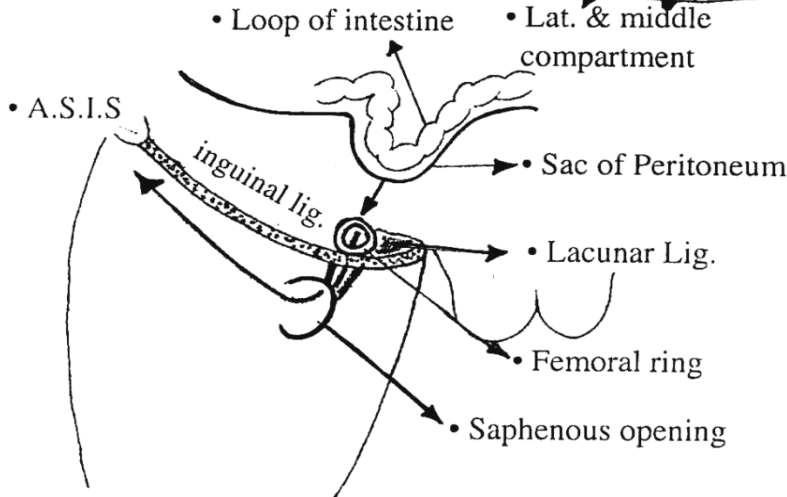
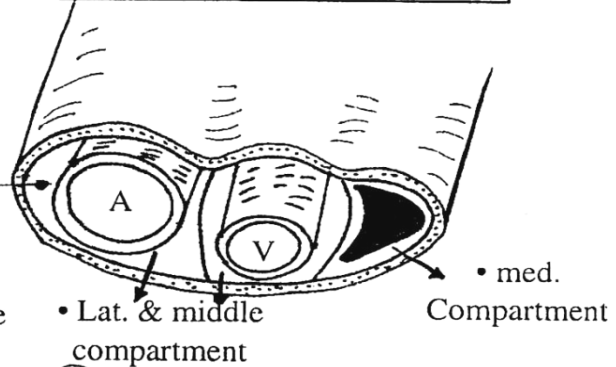
1. **Main part:** (Poupart's ligament) is the lower part of external oblique aponeurosis infolding upwards & backwards and extending between A.S.I.S. and pubic tubercle. It has an upper concave surface and a lower convex surface .
2. **Lacunar ligament:** (Gimbernath's ligament ) is a triangular ligament occupies the intervals between medial part of the main part of inguinal ligament and medial part of pectineal line . It has **apex** (attached in pubic tubercle) , **upper border** (attached to inguinal ligament), **lower border** (attached to medial part of pectineal line) and sharp free crescentic **base** (form the med. border of femoral ring ).
3. **Pectineal ligament :** (Cooper's lig.) Attached to pectineal line.
4. **Reflected part of inguinal ligament :** forces the medial 1/4 of the posterior wall of inguinal canal. It runs upwards & medial behind the spermatic cord to become attached into the linea alba.



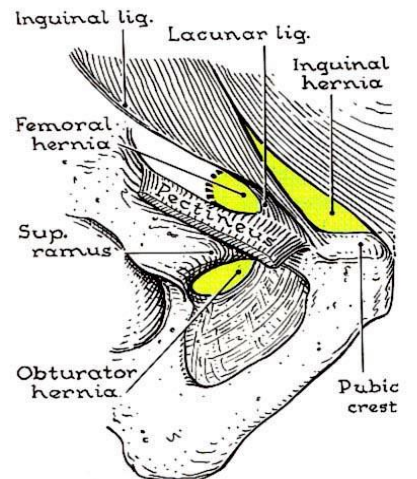


**Femoral Canal**

- Femoral branch of genito-femoral N.



**\* Pathway Of Femoral Hernia \***

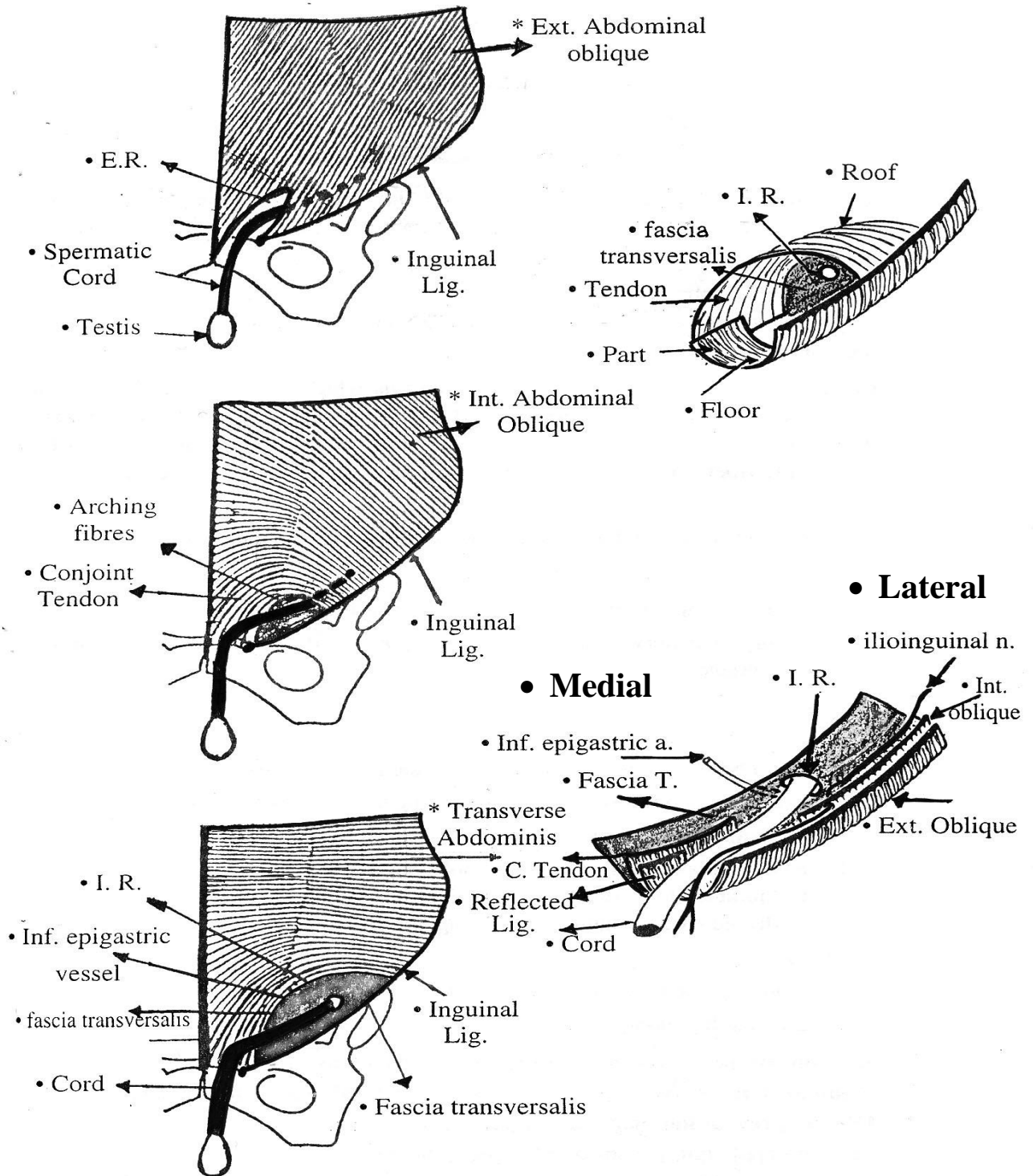


Three hernial sites

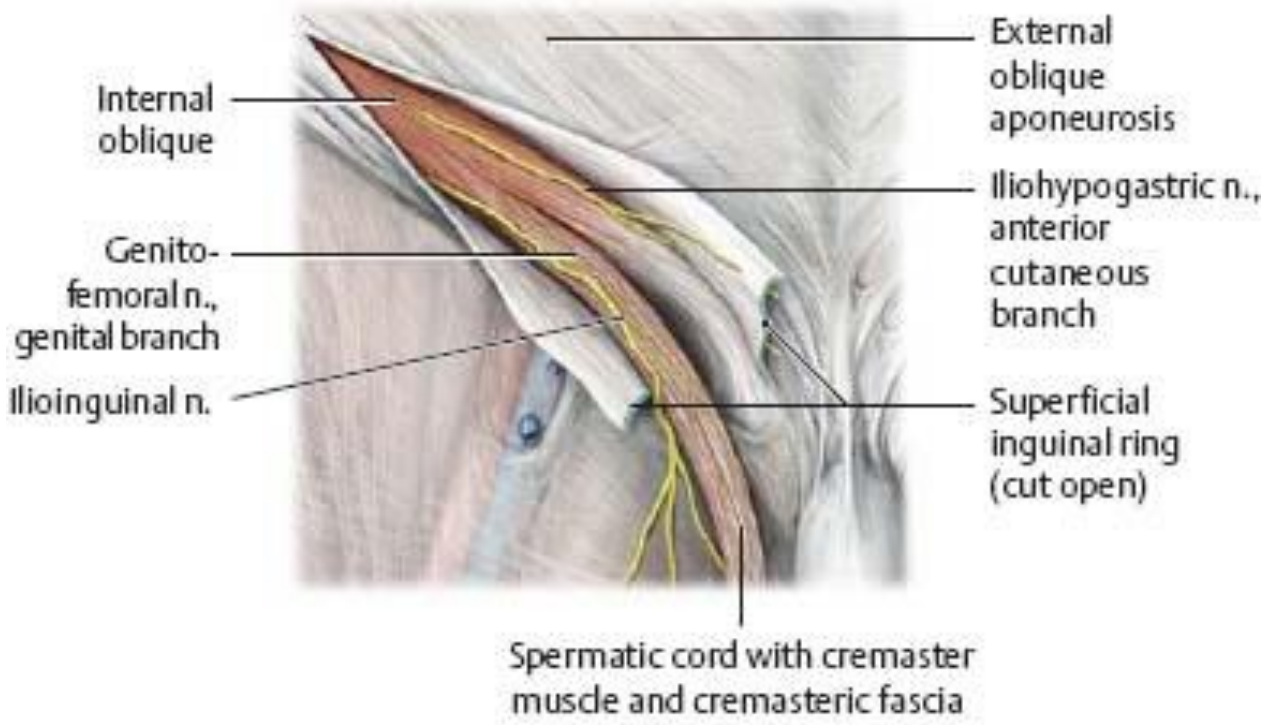
## INGUINAL CANAL

- \* It is an oblique passage in the lower part of muscles of anterior abdominal wall. It lies just above the medial 1/2 of inguinal ligament
- \* It is wider in males.
- \* **Begins:** At the *deep (internal) inguinal ring* which is an oval opening in the fascia transversalis, 1/2 inch above the mid-inguinal point, just lateral to inferior epigastric vessels. It sends an extension around the spermatic cord called internal spermatic fascia.
- \* **Ends:** At the *superficial (external) inguinal ring* which is a triangular opening in the external abdominal oblique aponeurosis. It lies above and lateral to pubic crest. Its base is the pubic crest and it has a medial crus and a lateral crus which are attached by intercrural fibers. It sends an extension around the spermatic cord called external spermatic fascia.
- \* **Length:** 1 1/2 inches (4 cm) .
- \* **Direction:** Downwards, forwards & medially.
- \* **Contents:**
  1. *Spermatic cord* in male or round ligament of uterus in female.
  2. *Ilio-inguinal nerve* which pierces the internal oblique to enter the canal then passes below the spermatic cord then pass through the superficial inguinal ring to supply the adjoining skin.
- \* **Boundaries:**
  - a. **Ant. wall:**
    1. *Ext. oblique aponeurosis* along the whole length of the canal.
    2. *Lower fibers of internal oblique* along the lateral 1/2 of the canal.
  - b. **Post. Wall:**
    1. *Fascia transversalis*: Along the whole length.
    2. *Conjoint tendon*: Along the medial 1/2 of the canal.
    3. *Reflected part of inguinal* ligament: Along the med. 1/4 of the canal.
  - c. **Floor:**
    1. Upper concave surface of *inguinal* ligament along whole length of the canal.
    2. *Lacunar* ligament along the medial part of the canal.

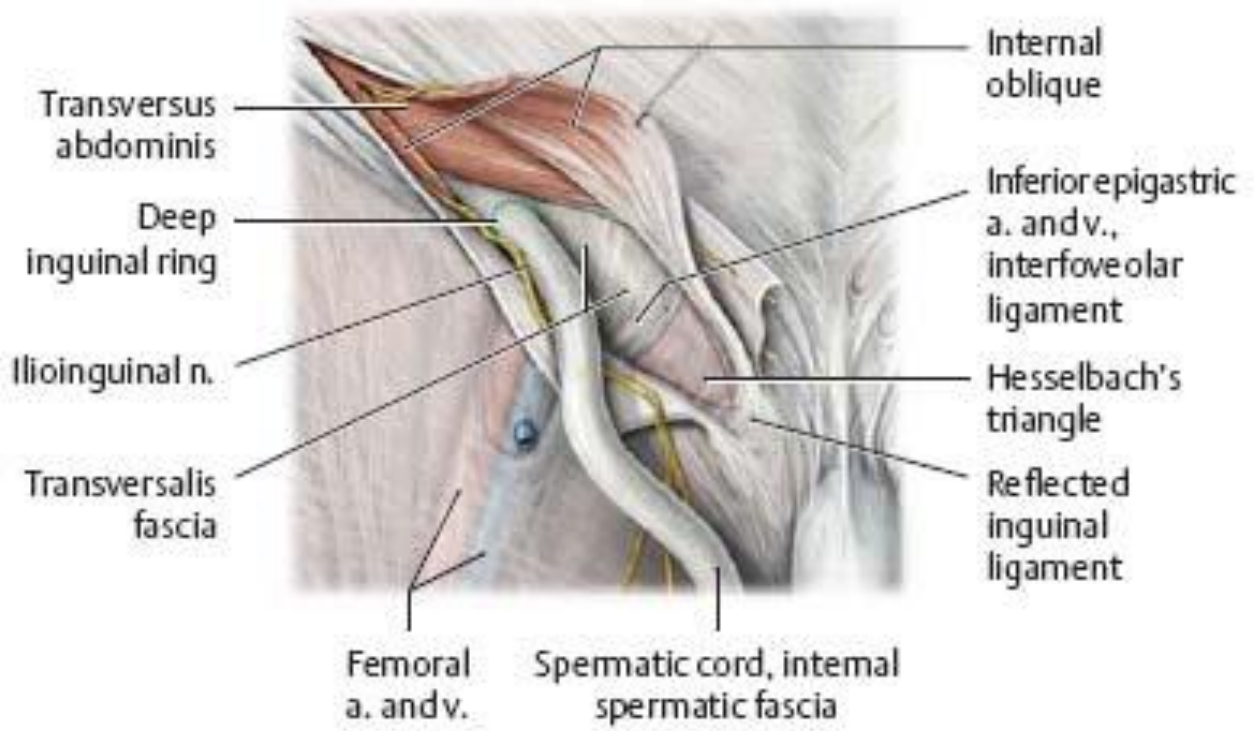
**d. Roof:** Arched lower fibres of internal oblique & transversus abdominis.



**\* Boundaries of inguinal canal \***

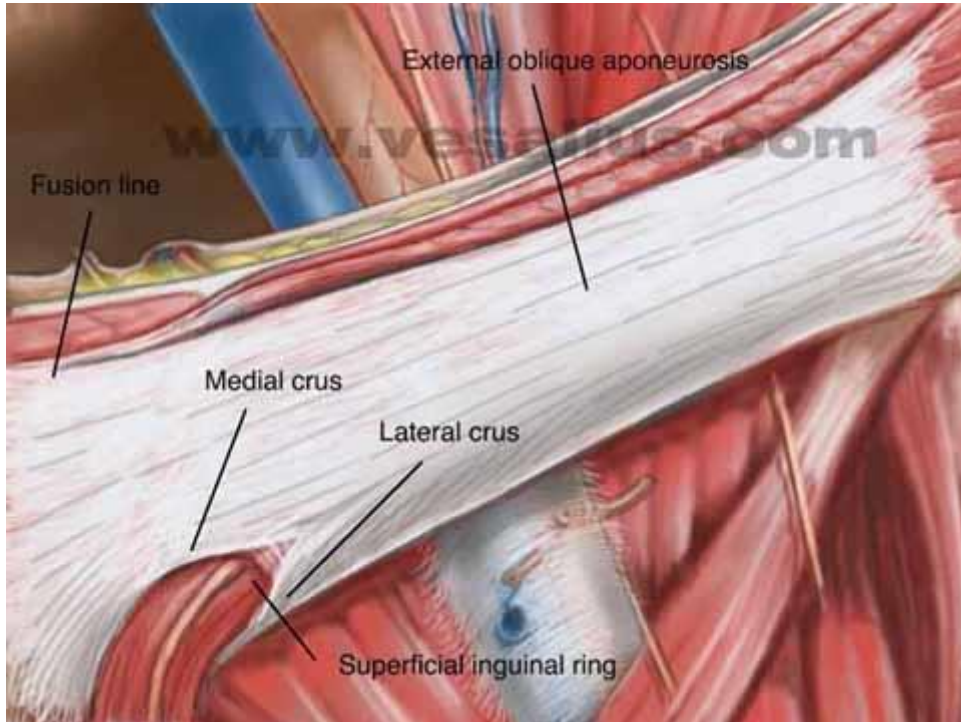


A *Divided:* External oblique aponeurosis.

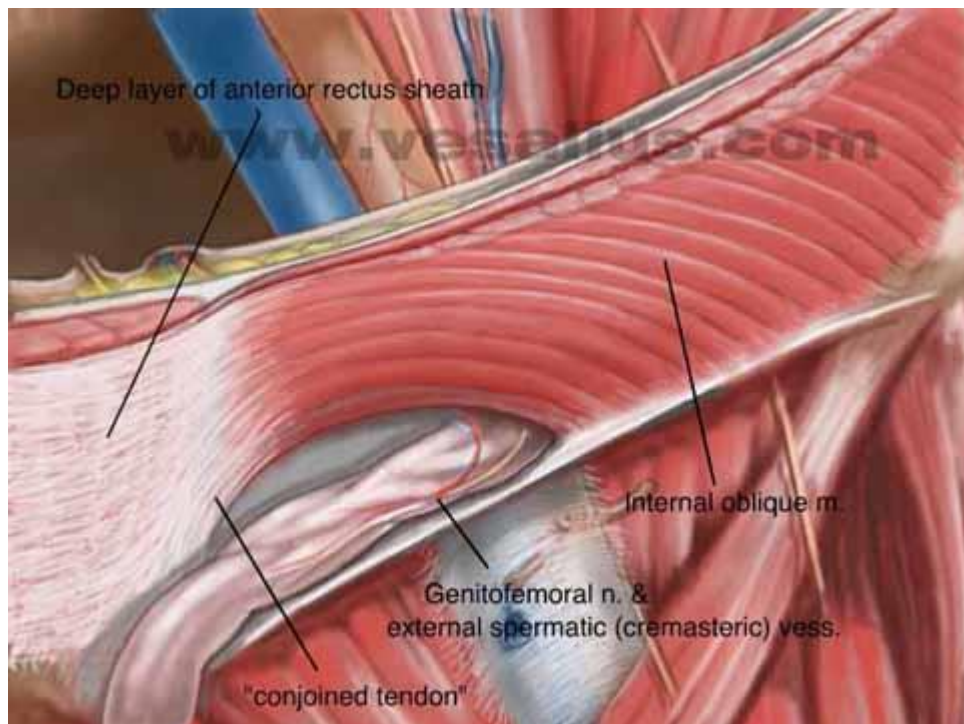


B *Divided:* Internal oblique and cremaster.

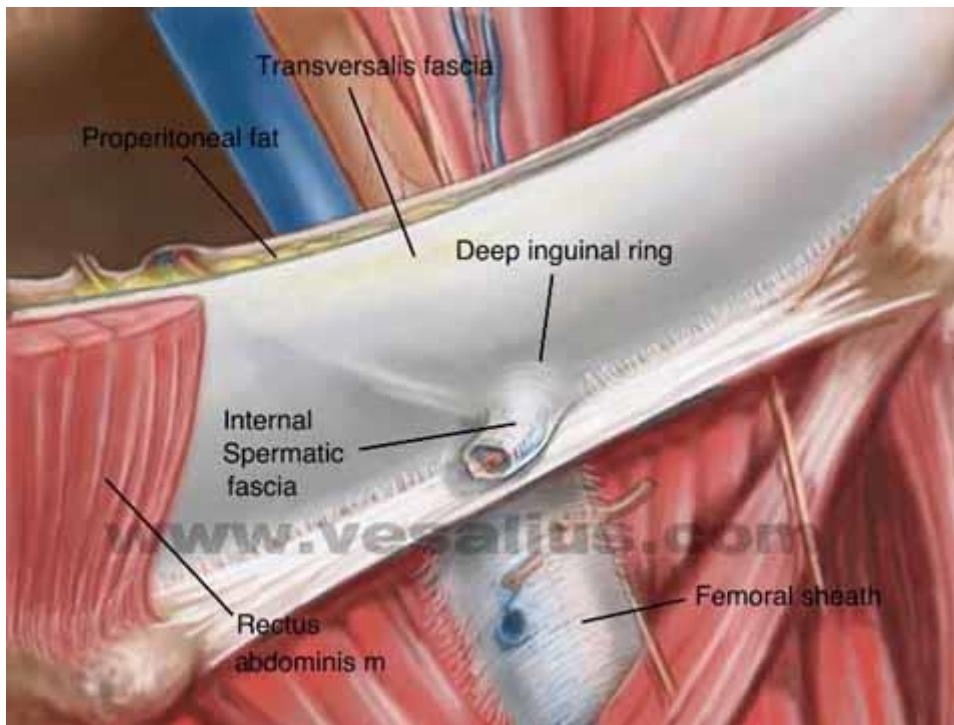
**\* Inguinal canal at operation \***



**\*External abdominal oblique aponeurosis & external inguinal ring\***



**\*External abdominal oblique aponeurosis is removed to show inguinal canal\***



**\*External abdominal oblique apponeurosis & internal abdominal oblique are removed to show fascia transversalis and internal inguinal ring\***

★ *Applied anatomy:-*

**A) Inguinal canal is a weaker area due to:**

- a. The muscles are **aponeurotic** which are weaker than fleshy parts.
- b. Internal oblique & transversus abdominis **arch** above the spermatic cord.
- c. The spermatic cord passes between the layers of the abdominal wall.
- d. Presence of internal inguinal & external inguinal **rings**.

**B) This weakness is normally compensated by the following mechanisms:**

- 1) **Shutter mechanism:** During standing, coughing or straining, contraction of lower fibers of internal abdominal oblique which has a triple relation to the spermatic cord & inguinal canal leading to closure of the inguinal canal around the spermatic cord.
- 2) **Valvular mechanism:** The inguinal canal is oblique thus the internal ring and external ring are not on the same line.

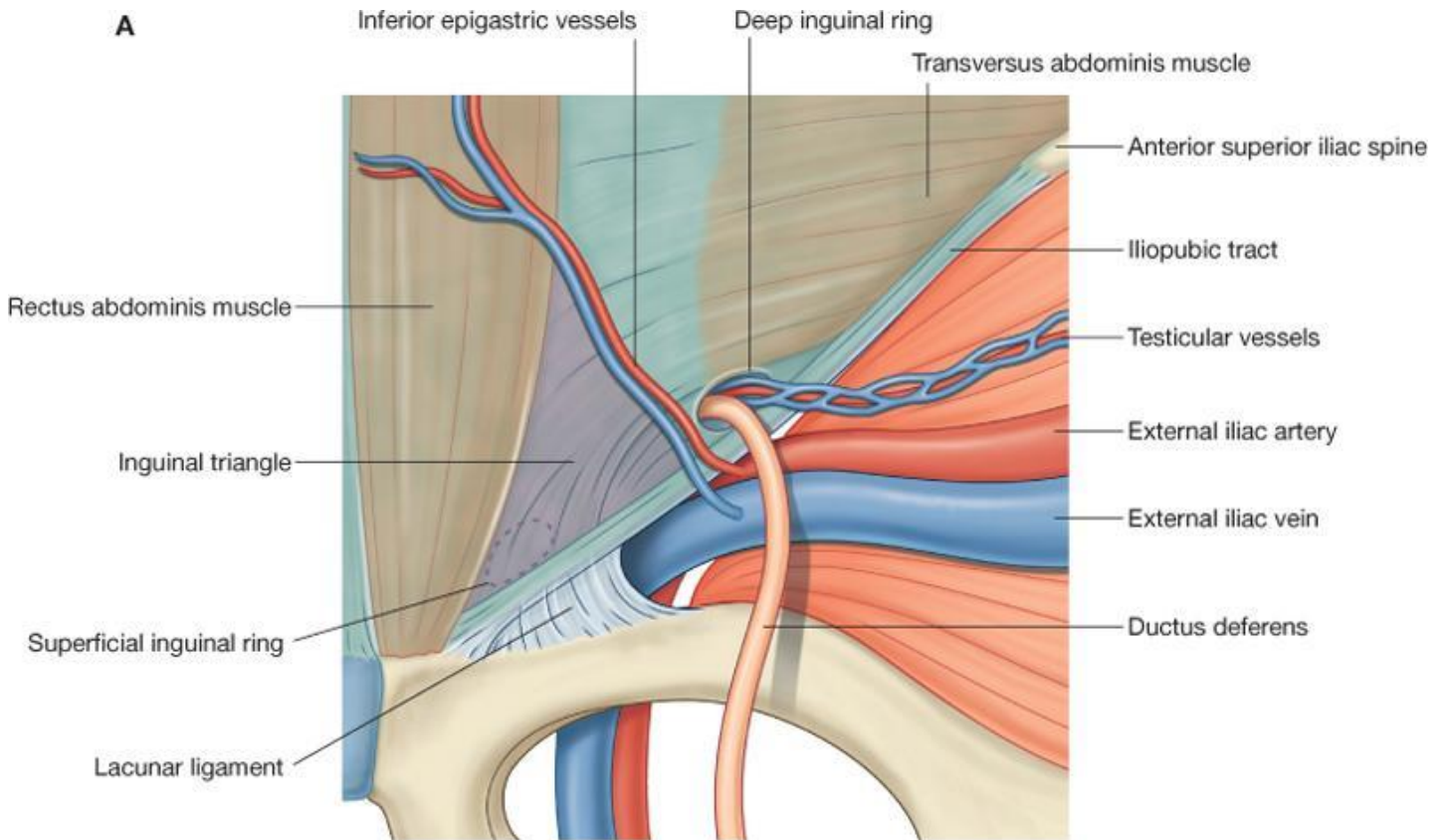
Consequently, increase intra-abdominal pressure forcing the posterior wall of the canal against the anterior wall.

- At the same time, contraction of the external oblique approximates the anterior wall of the canal to the posterior wall.
- 3) **The superficial ring** is compensated by strong part of posterior wall which is forced by the conjoint tendon and reflected part of inguinal ligament.
  - 4) **The deep ring** is compensated by strong part of anterior wall which is forced by the fleshy lower fibers of internal oblique.
  - 5) Contraction of external abdominal oblique muscle during increase intra- abdominal pressure leading to **narrowing of external ring**.
  - 6) **The intercrural fibres** prevent separation of the 2 crura of external inguinal ring.
  - 7) Cremasteric mechanism: contraction of cremasteric muscle during increased intra- abdominal pressure causes bulging of the cord into the canal and external ring leading to bulging of the canal and external ring.
  - 8) Contraction of cremasteric muscle during increased intra- abdominal pressure leading to pull the testis upwards in attempt to close external inguinal ring.
  - 9) Certain muscle fibers from transversus abdominis are attached to the fascia transversalis above the internal inguinal ring and contraction of these fibers leading to **narrowing of internal ring during** coughing or straining.

### Inguinal (Haselbach's) Triangle

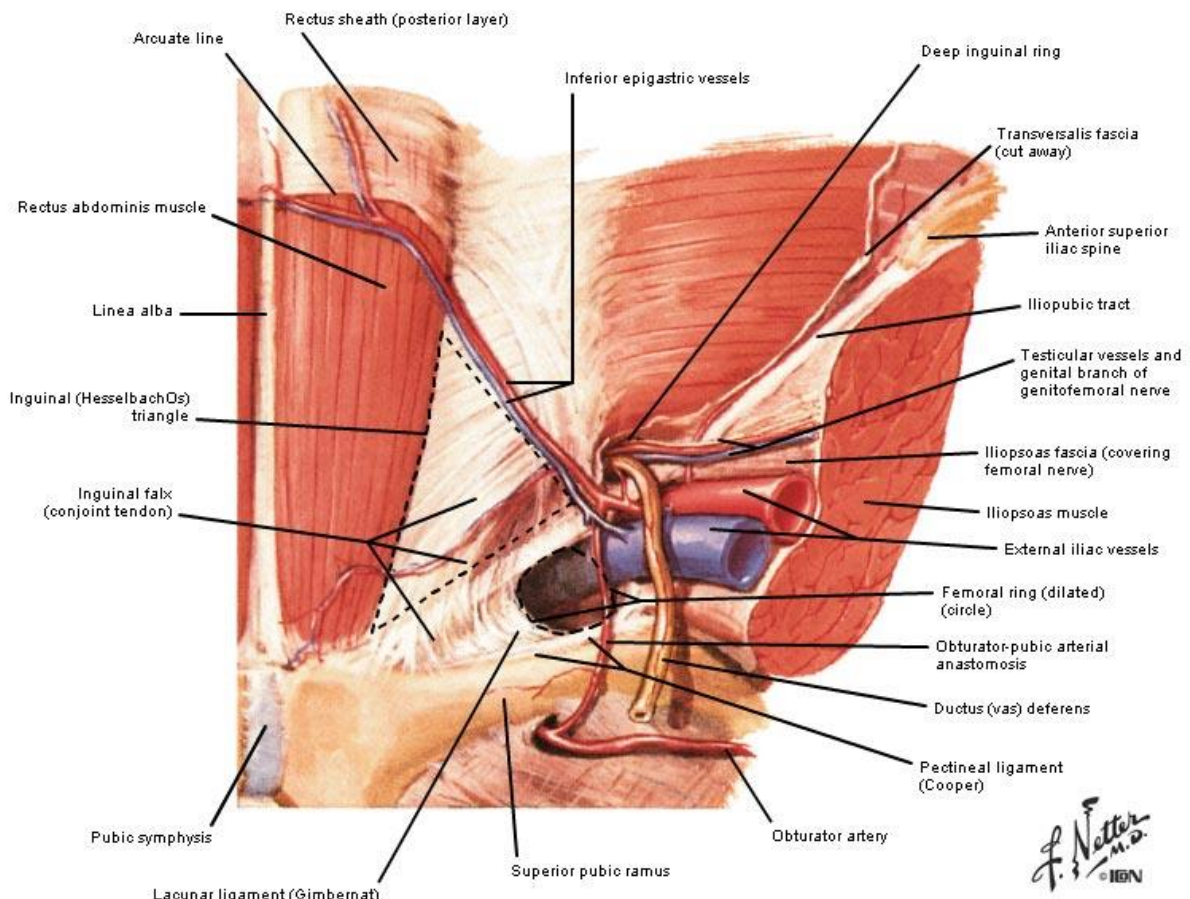
- \* It lies between inguinal ligament , lateral border of rectus abdominis and inferior epigastric vessels. Its floor is formed by fascia transversalis & forced medially by conjoint tendon & reflected part of inguinal ligament.
- \* It is divided by medial umbilical ligament into 2 *parts (med. & lat. parts)*.
- \* **Applied anatomy:** Weakness of this triangle predispose to direct inguinal hernia.



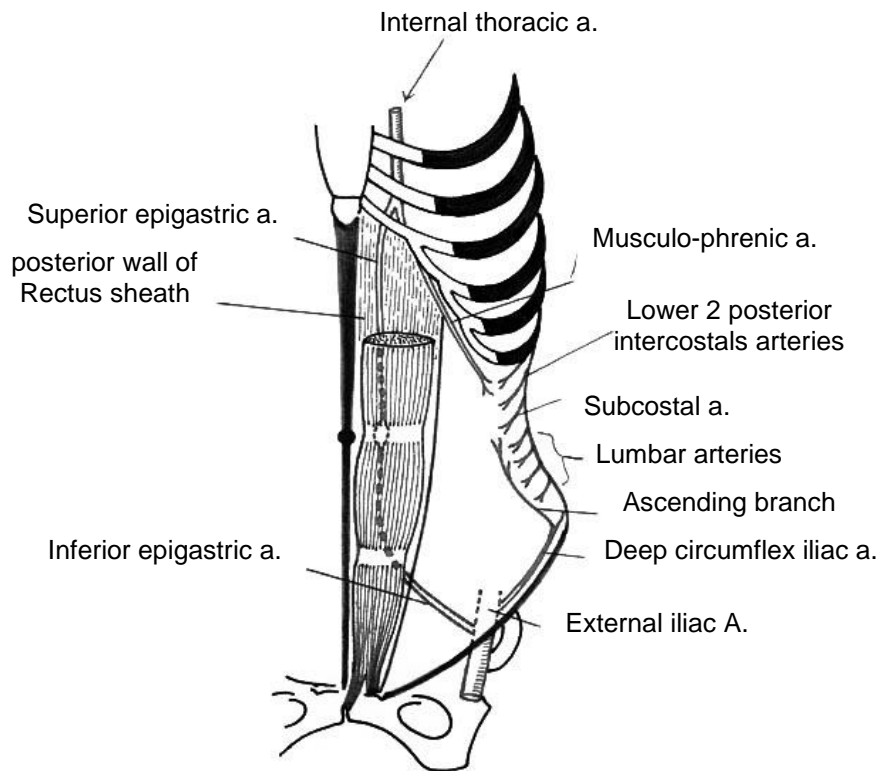


Drake: Gray's Anatomy for Students, 2nd Edition.  
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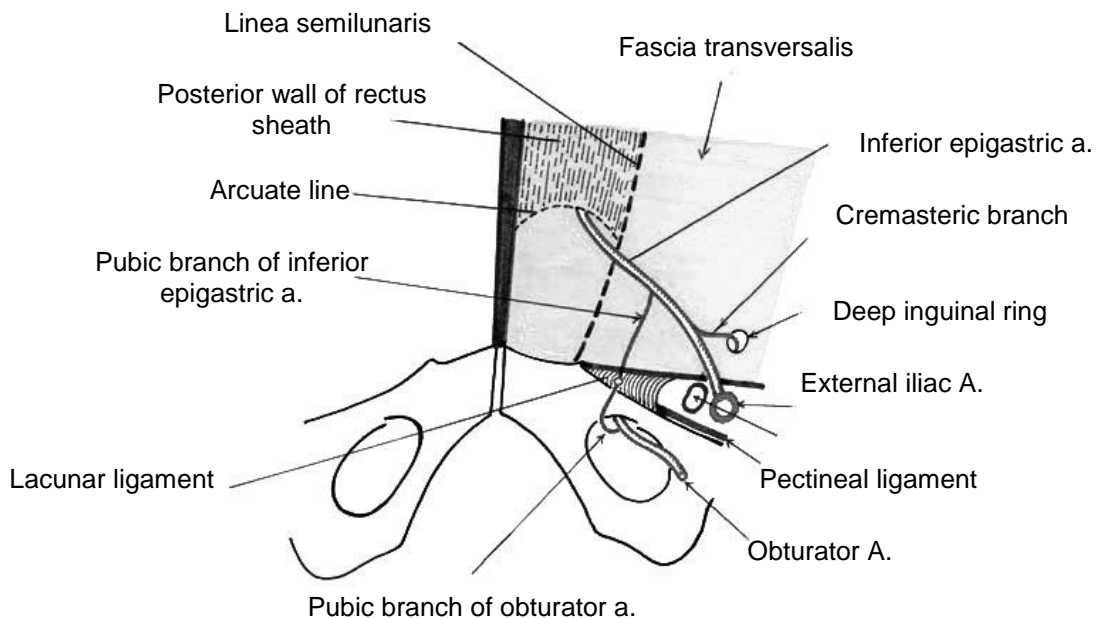
### Inguinal Region Dissection - Posterior (Internal) View



**\* Arterial supply of anterior and lateral abdominal walls \***



**Inferior epigastric A.**



**Anterior abdominal wall seen from inside the abdomen (from behind)**