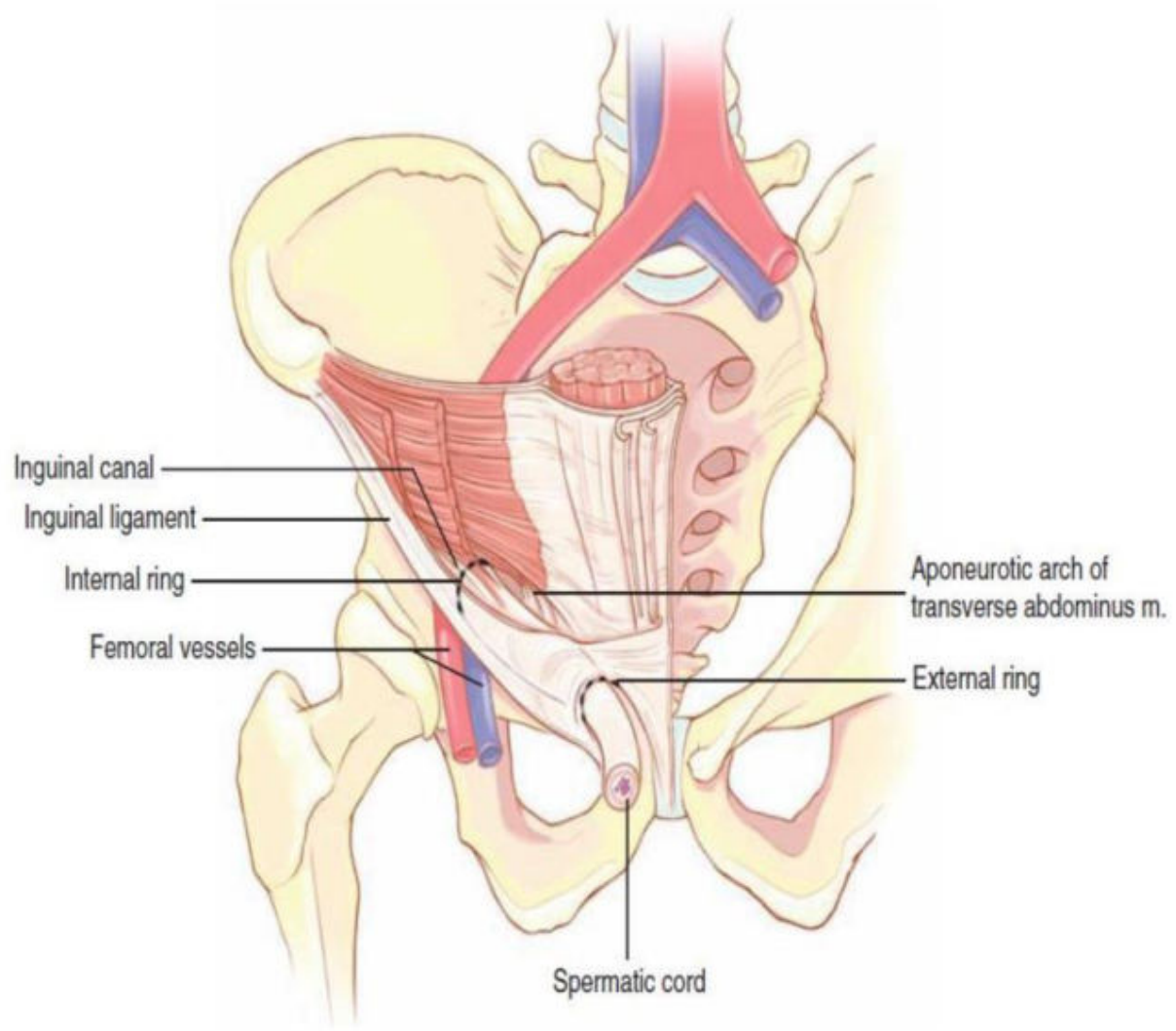
Inguinal hernia

Epidemiology

- Inguinal hernia repair is one of the most commonly performed operation.
- Approximately 75% of abdominal wall hernias occur in the groin.
- Of inguinal hernia repairs, 90% are performed in men and 10% in women.
- The incidence of inguinal hernias in males has a bimodal distribution.
  - Before the first year of age
  - After age 40
- Approximately 70% of femoral hernia repairs are performed in women; however, inguinal hernias are five times more common than femoral hernias.
- The most common subtype of groin hernia in men and women is the indirect inguinal hernia

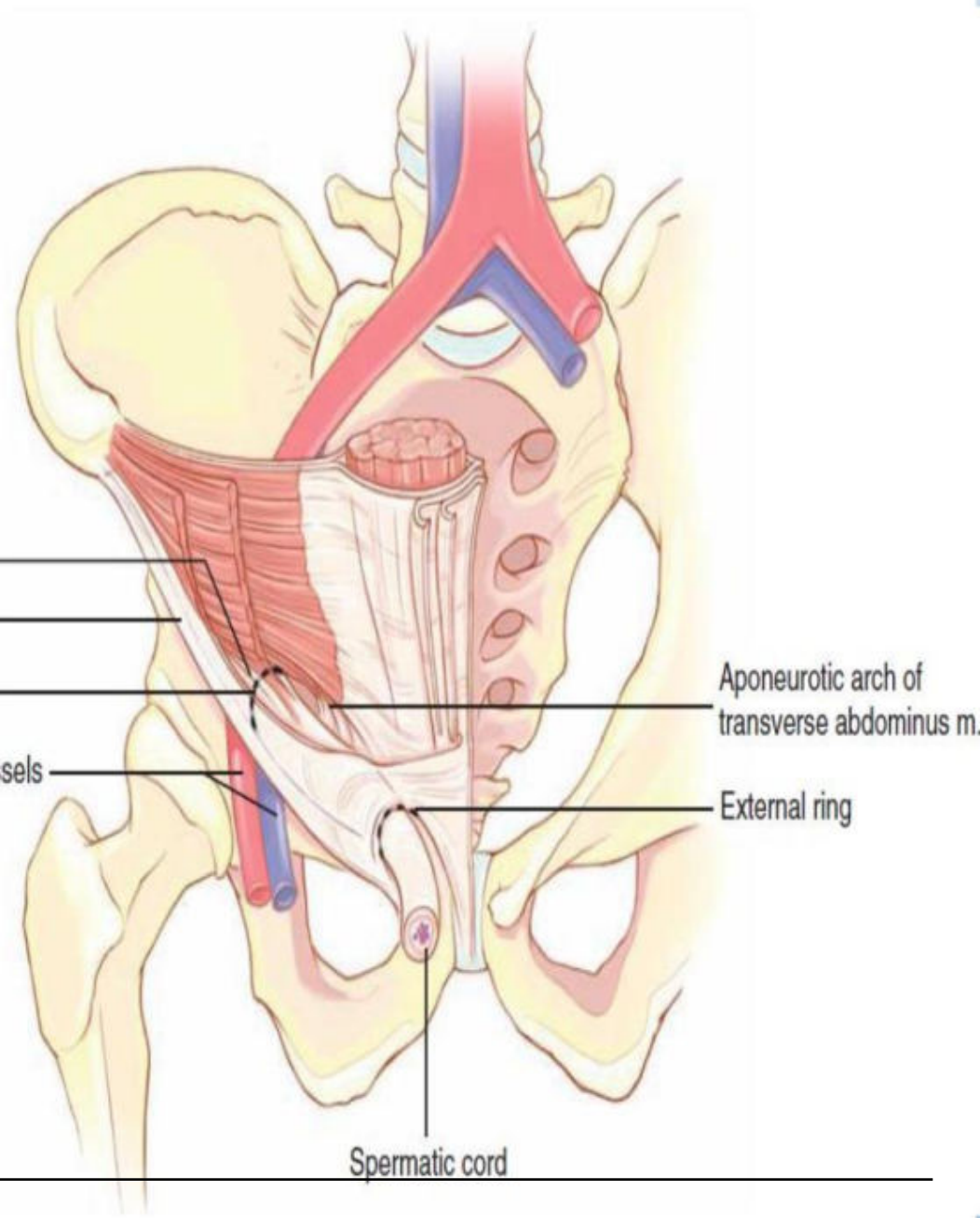
Anatomy

- 4- to 6 cm-long
- Anterior portion of the pelvic basin
  - Spermatic cord:
    - Three arteries
    - Three veins
    - Two nerves
    - Pampiniform venous plexus
    - Vas deferens



Anatomy

- Anterior
  - External oblique aponeurosis
- Lateral
  - Internal oblique muscle
- Posterior
  - Transversalis fascia and transversus abdominus muscle
- Superior
  - Internal oblique muscle
- Inferior
  - Inguinal ligament



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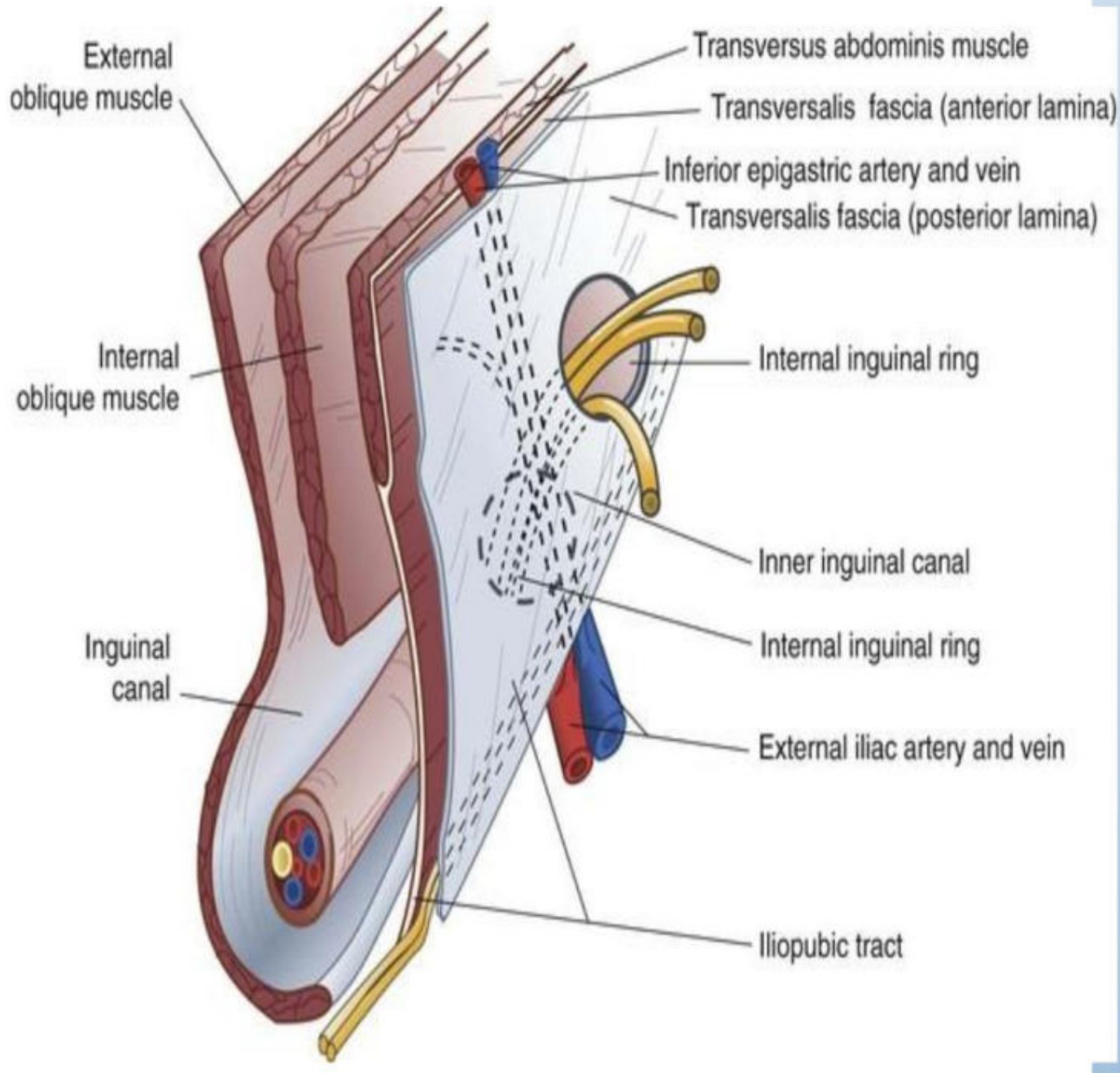
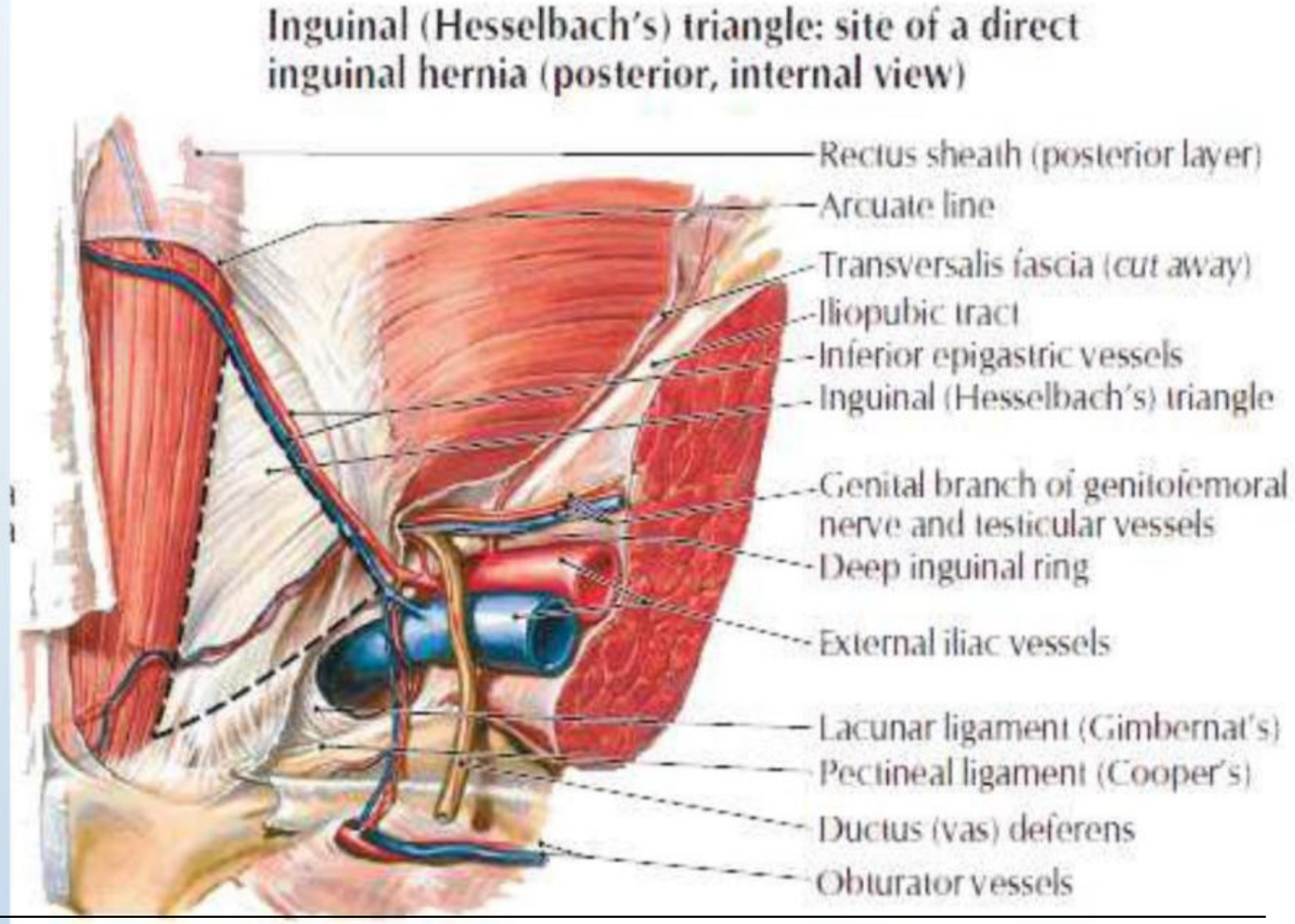


Anatomy

Other structure :

- **Iliopubic tract**:
  - An aponeurotic band that begins at the anterior superior iliac spine and inserts into Cooper's ligament from above.
- **lacunar ligament** (ligament of Gimbernat)
- **Cooper's ligament** (pectineal)
- **Conjoined tendon**



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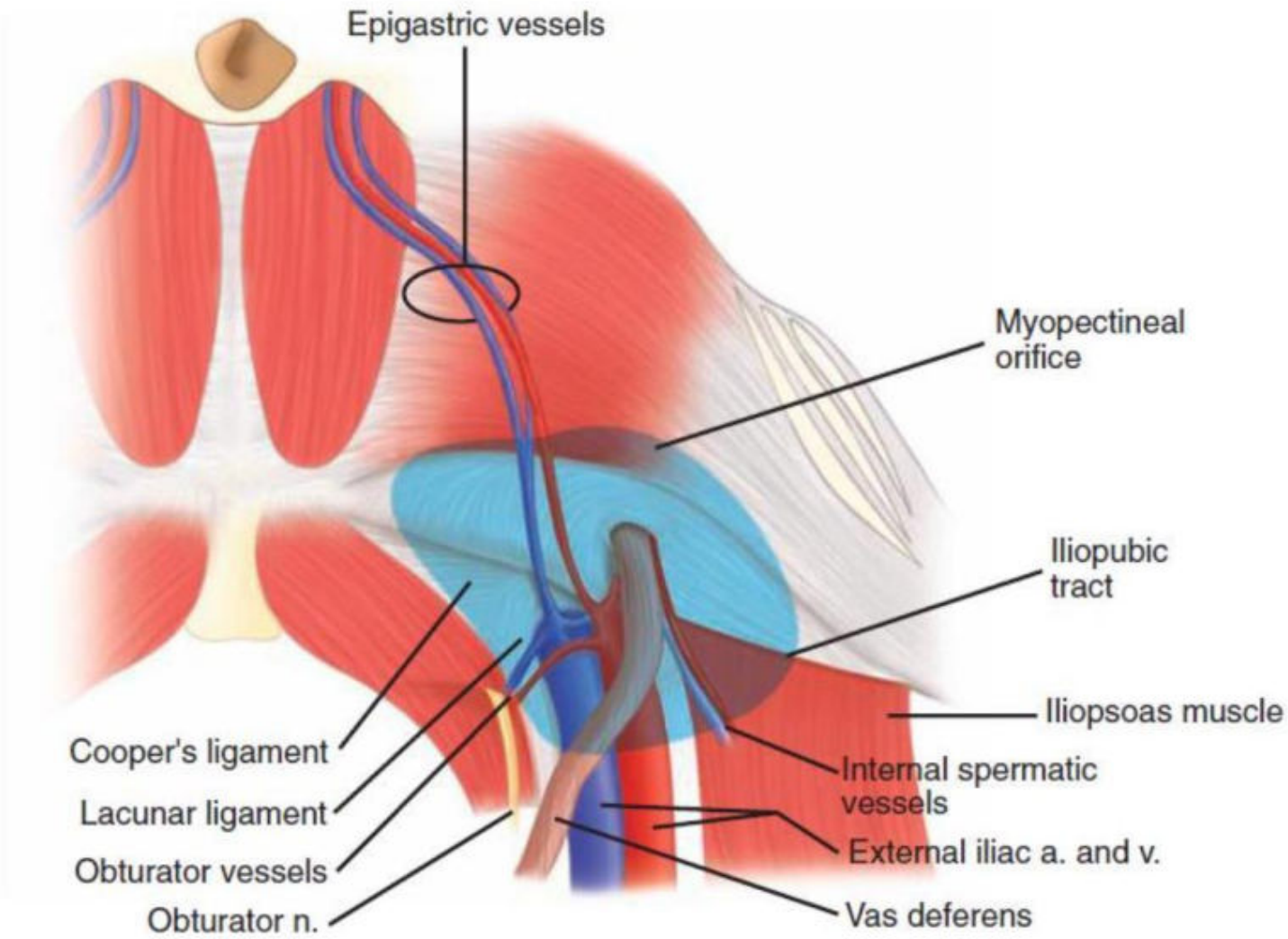
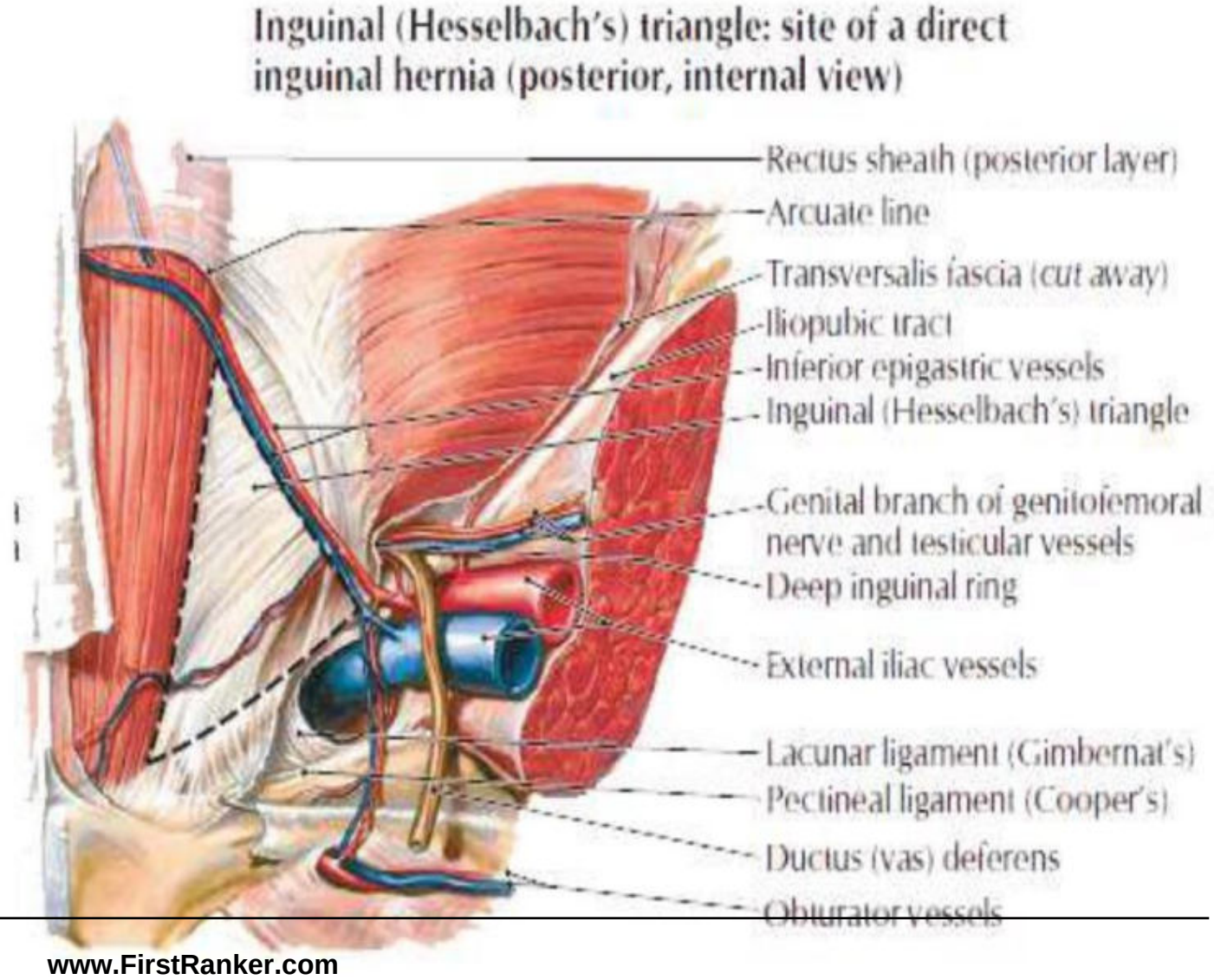


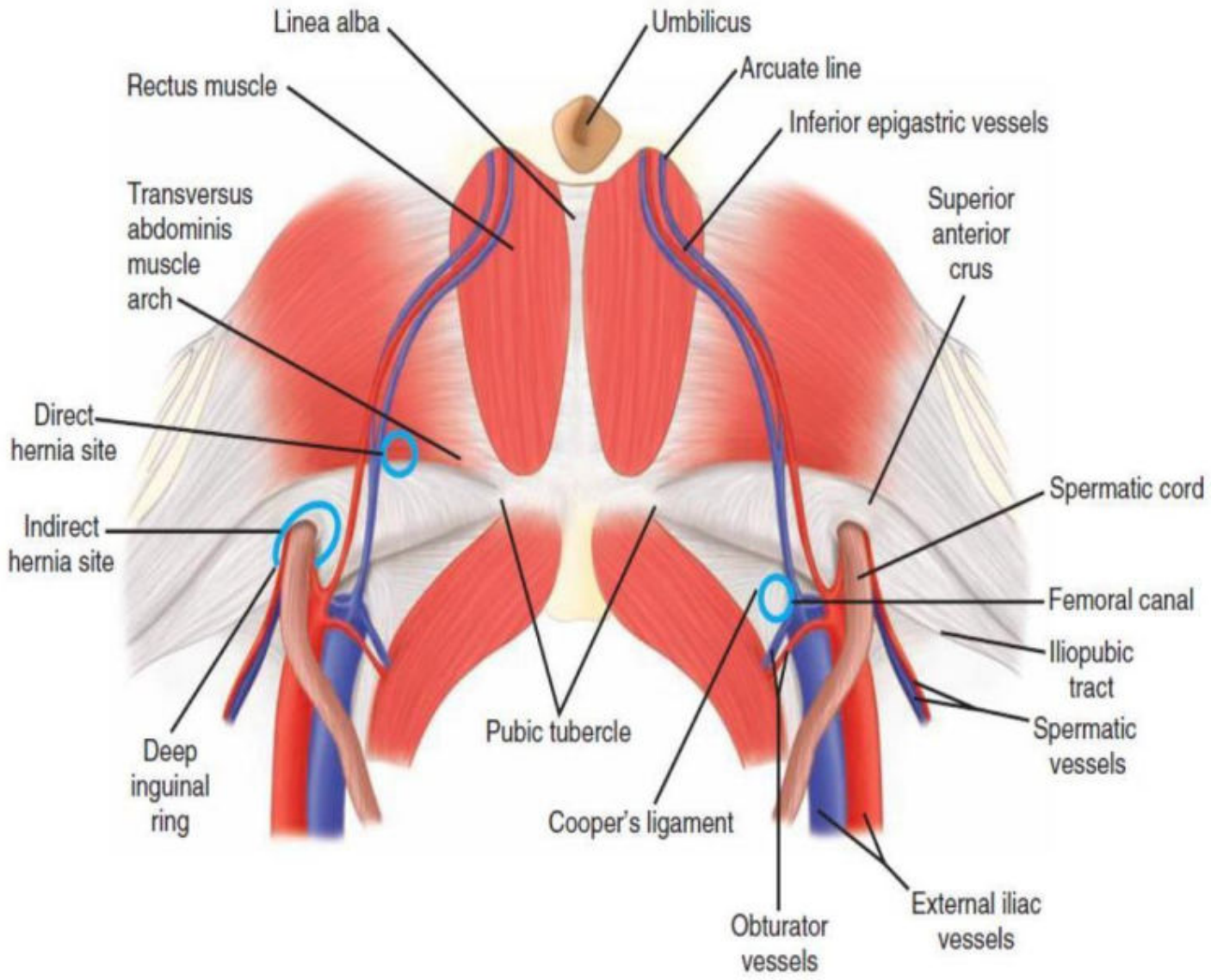
HESSELBACH'S TRIANGLE

- Medial aspect of Rectus abdominis muscle
- Inferior epigastric vessels
- Inguinal ligament



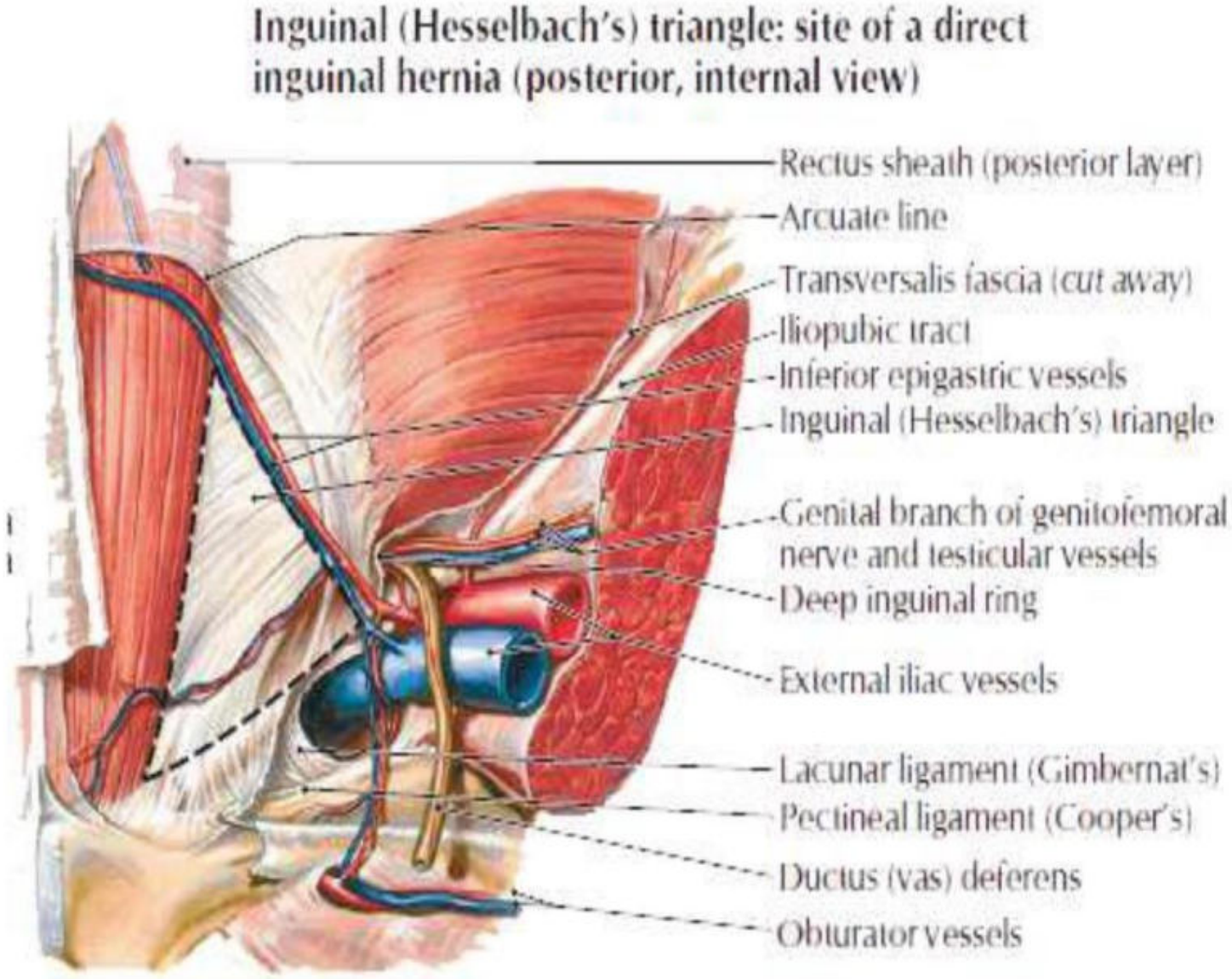
Subtypes

- Direct hernia
- Indirect hernia
- Femoral hernia



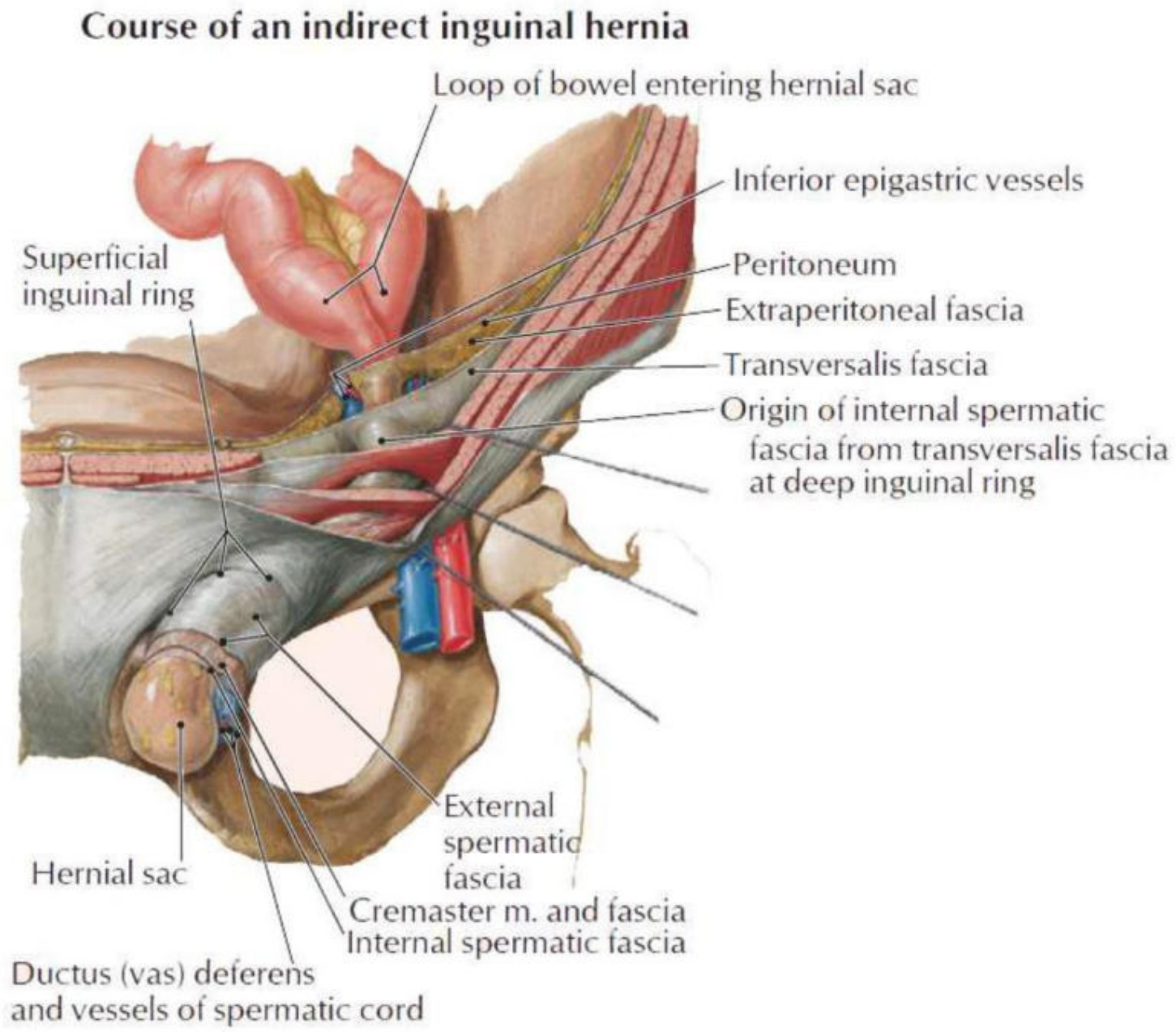
Direct hernia

Direct hernias protrude medial to the inferior epigastric vessels, within Hesselbach's triangle.



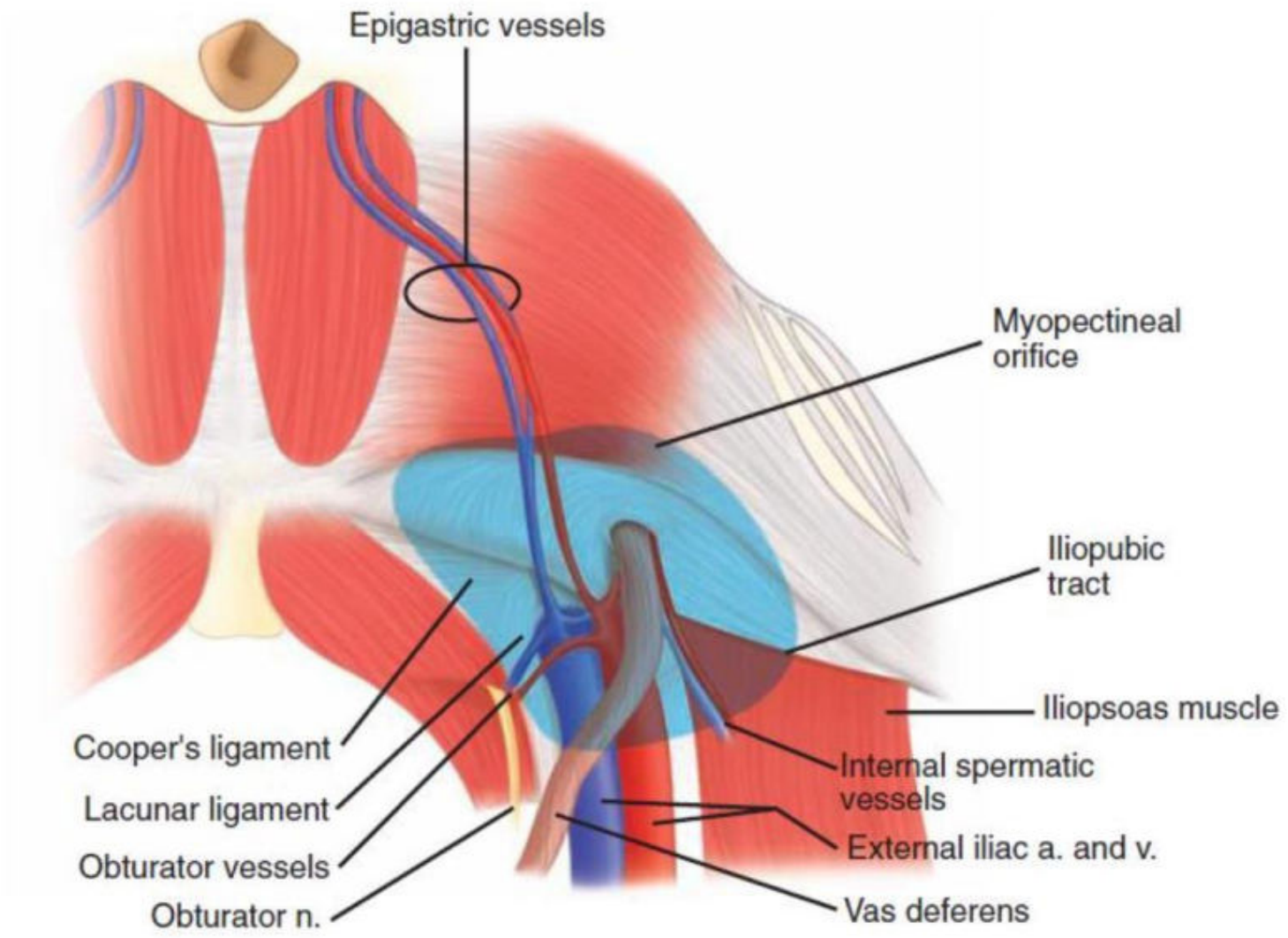
Indirect hernias

Indirect hernias protrude lateral to the inferior epigastric vessels, through the deep inguinal ring.



Femoral hernias

Femoral hernias protrude through the small and inflexible femoral ring.



Etiology

- **Acquired:**

  the best-characterized risk factor is weakness in the abdominal wall musculature

  – Chronic obstructive pulmonary disease: direct

  – increase intra-abdominal pressure

  – decreased collagen fiber density in hernia patients

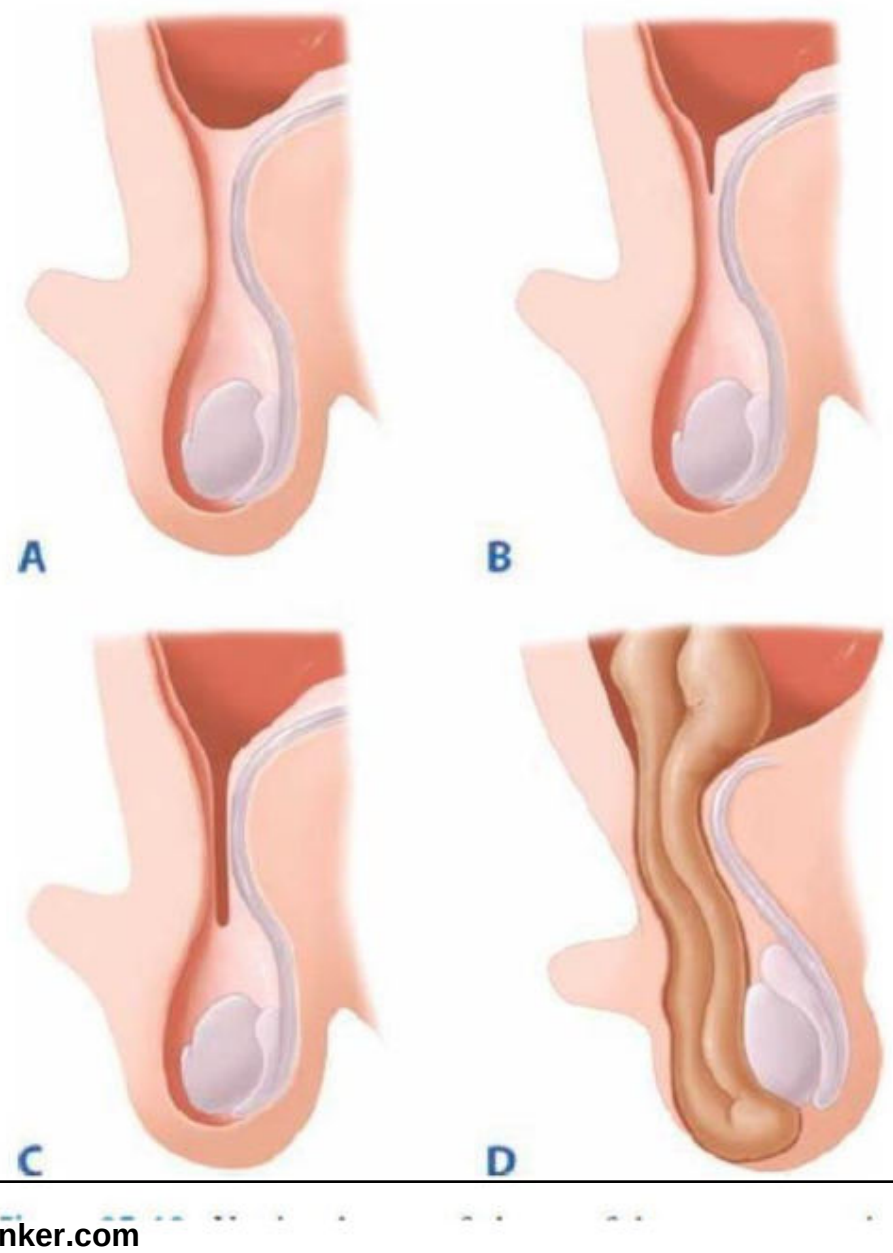
Table 37-3

Presumed causes of groin herniation

Coughing
Chronic obstructive pulmonary disease
Obesity
Straining
Constipation
Prostatism
Pregnancy
Birthweight <1500 g
Family history of a hernia
Valsalva's maneuver
Ascites
Upright position
Congenital connective tissue disorders
Defective collagen synthesis
Previous right lower quadrant incision
Arterial aneurysms
Cigarette smoking
Heavy lifting
Physical exertion

Congenital

- The majority of pediatric hernias
- Patent processus vaginalis (PPV)
- The high incidence of indirect inguinal hernias in preterm babies.



DIAGNOSIS

- **History:**
  - Groin pain
  - Extrainguinal symptoms such as a change in bowel habits or urinary symptoms
  - Generalized pressure, localized sharp pain, and referred pain
  - Pressure or heaviness in the groin , following prolonged activity
- Sharp pain tends to indicate an impinged nerve and may not be related to the extent of physical activity performed by the patient.
- Neurogenic pain may be referred to the scrotum,testicle, or inner thigh.
- Hernias will often increase in size and content over a protracted time.
- Patients will often reduce the hernia by pushing the contents back into the abdomen, thereby providing temporary relief.

Physical Examination

- Ideally, the patient should be examined in a **standing position** to increase intra-abdominal pressure, with the groin and scrotum fully exposed.
- Inspection: an **abnormal bulge** along the groin or within the scrotum
- Palpation: **advancing the index finger** through the scrotum toward the external inguinal ring.
- Femoral hernias should be **palpable below the inguinal ligament**, lateral to the pubic tubercle.

Figure 37-11. Digital examination of the inguinal canal.

Table 37-5

Differential diagnosis of groin hernia

Malignancy
Lymphoma
Retroperitoneal sarcoma
Metastasis
Testicular tumor
Primary testicular
Varicocele
Epididymitis
Testicular torsion
Hydrocele
Ectopic testicle
Undescended testicle
Femoral artery aneurysm or pseudoaneurysm
Lymph node
Sebaceous cyst
Hidradenitis
Cyst of the canal of Nuck (female)
Saphenous varix
Psoas abscess
Hematoma
Ascites

Imaging

- US:
  - sensitivity of 86% and specificity of 77%
- CT :
  - sensitivity of 80% and specificity of 65%
- MRI:
  - Sensitivity of 95% and specificity of 96%

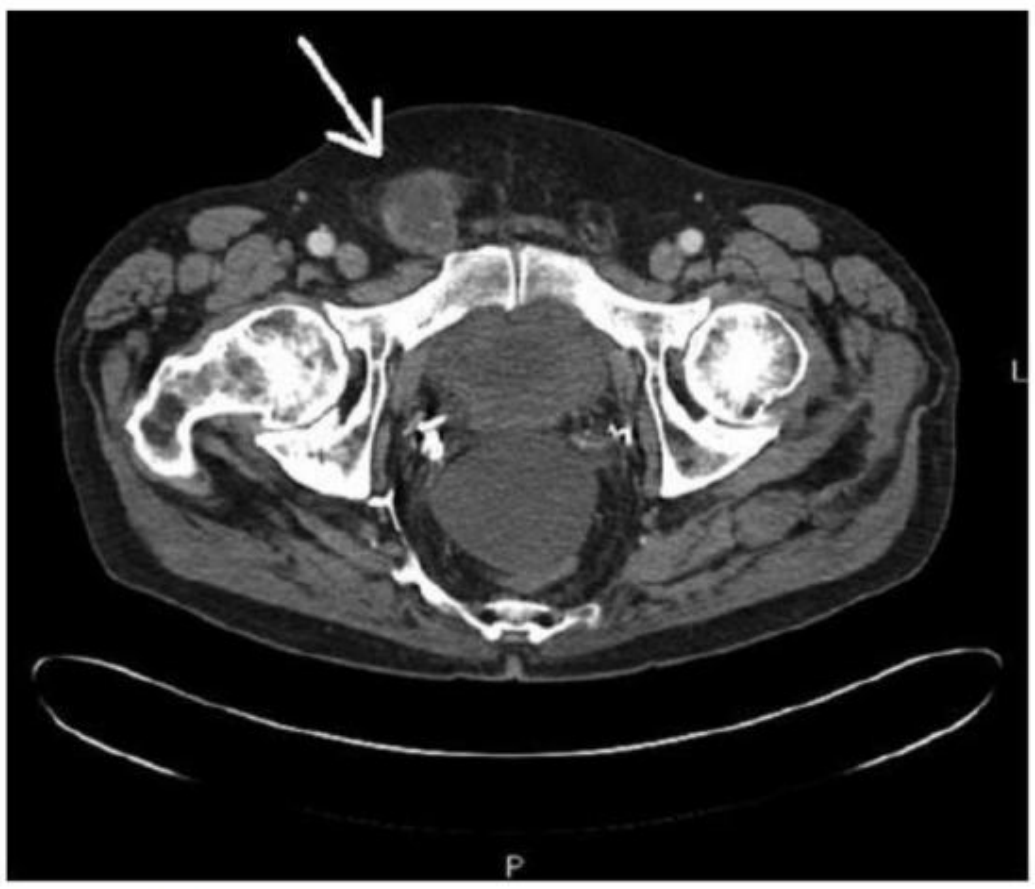


Figure 37-12. Computed tomography scan depicting a large right inguinal hernia (*arrow*). A smaller left inguinal hernia is also visualized.

TREATMENT

- Surgical repair is the definitive treatment of inguinal hernias

1. Surgical
2. Conservative

Conservative Treatment

- When the **patient's medical condition** confers an unacceptable level of operative risk, elective surgery should be deferred until the condition resolves, and operations reserved for lifethreatening emergencies.

- A nonoperative strategy is safe for **minimally symptomatic** inguinal hernia patients, and it does not increase the risk of developing hernia complications.

Conservative Treatment

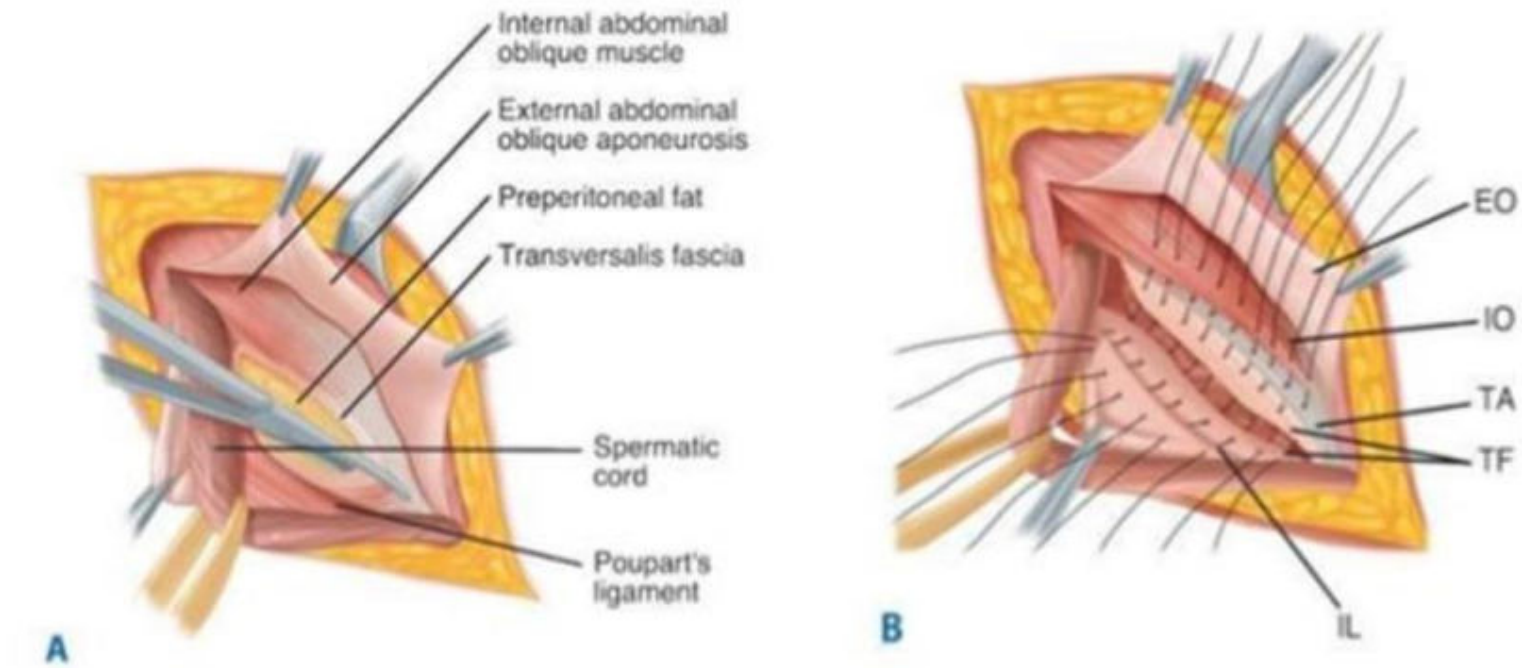
- Nonoperative inguinal hernia treatment targets pain, pressure, and protrusion of abdominal contents in the symptomatic patient population.
- **Trusses** externally
- not prevent complications
  - Femoral inguinal hernia ✗

SURGICAL REPAIR

- All surgical repairs follow the same basic principles:

1. Reduction of the hernia content into the abdominal cavity.
2. Excision and closure of a peritoneal sac if present or replacing it deep to the muscles
3. Re-approximation of the walls of the neck of the hernia if possible
4. Permanent reinforcement of the abdominal wall defect with sutures or mesh.(i.e. Anatomical vs Prosthetic repair)

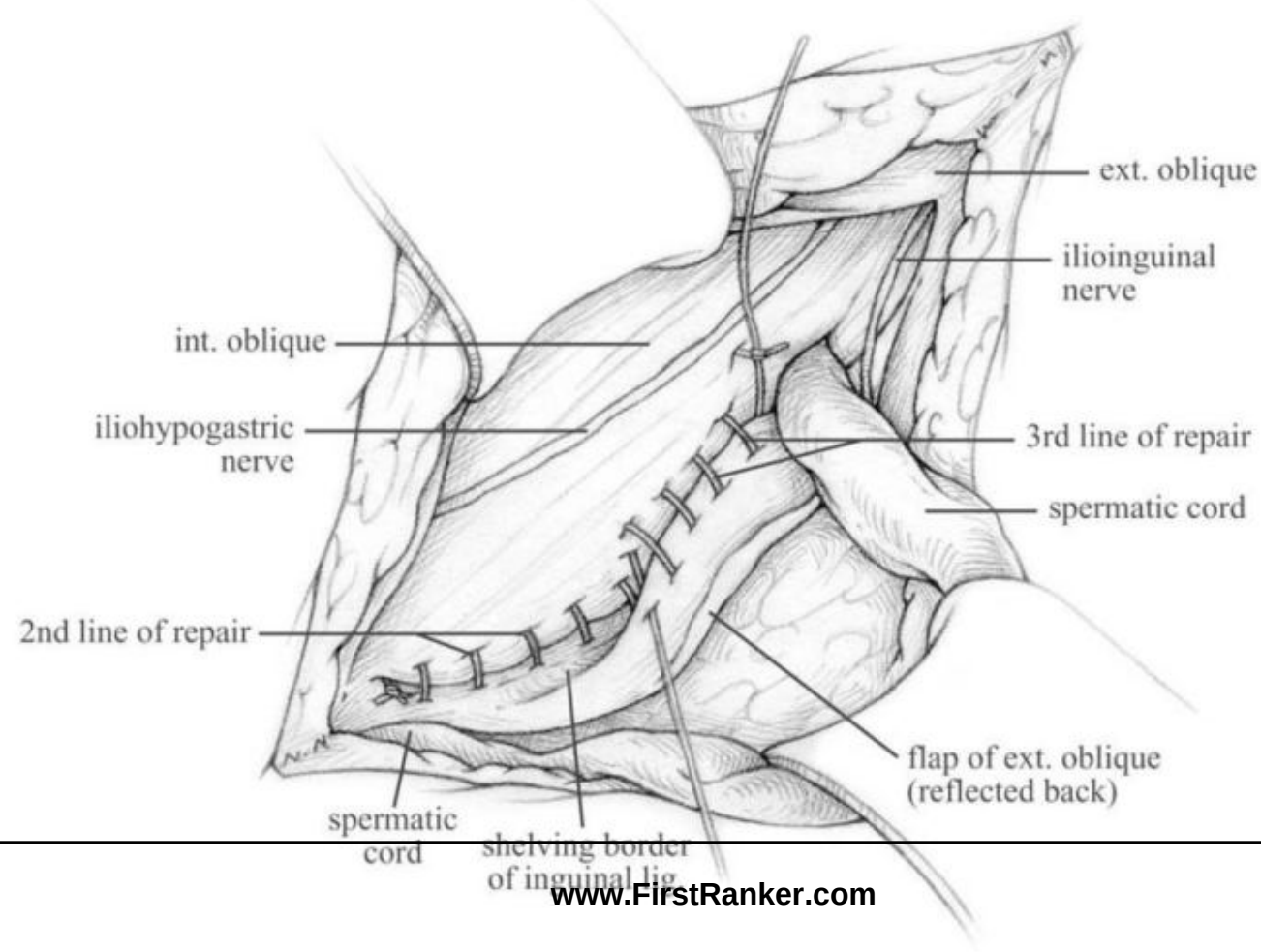
BASSINI REPAIR



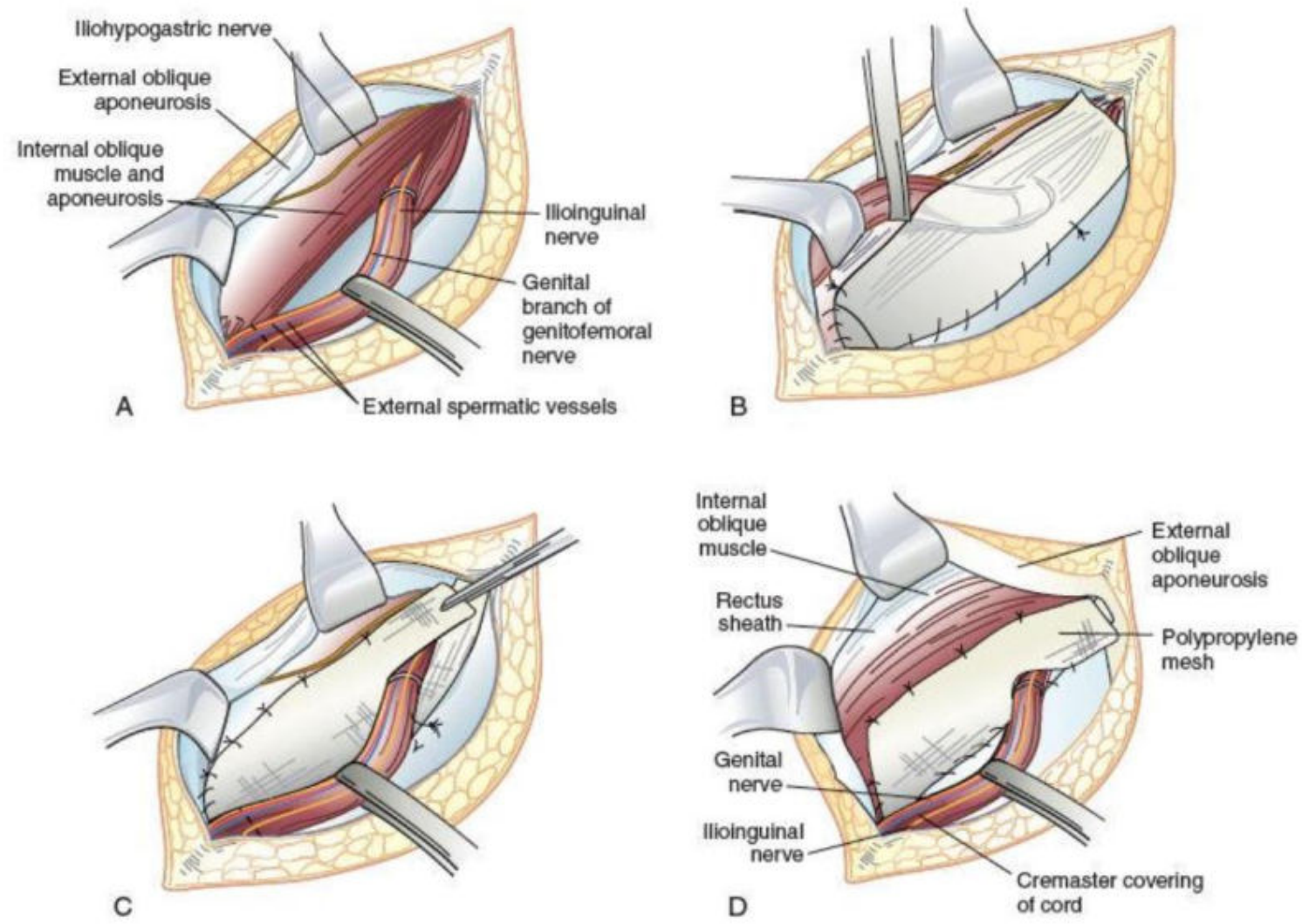
A. The transversalis fascia is opened from the internal inguinal ring to the pubic tubercle exposing the preperitoneal fat.

B. Reconstruction of the posterior wall by suturing the transversalis fascia (TF), the transversus abdominis muscle (TA), and the internal oblique muscle (IO) (Bassini's famous "triple layer") medially to the inguinal ligament (IL) laterally.

SHOULDICE REPAIR

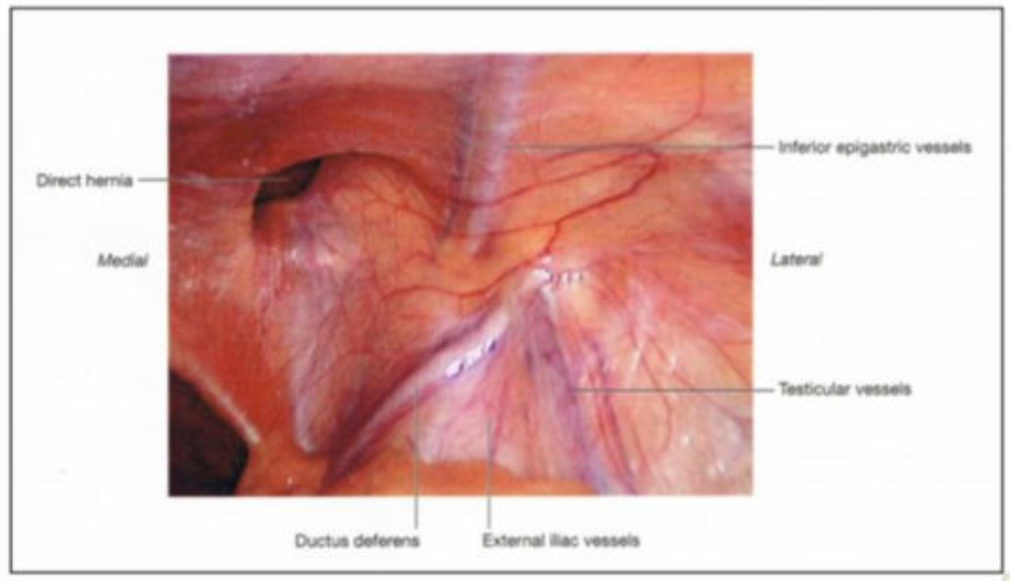


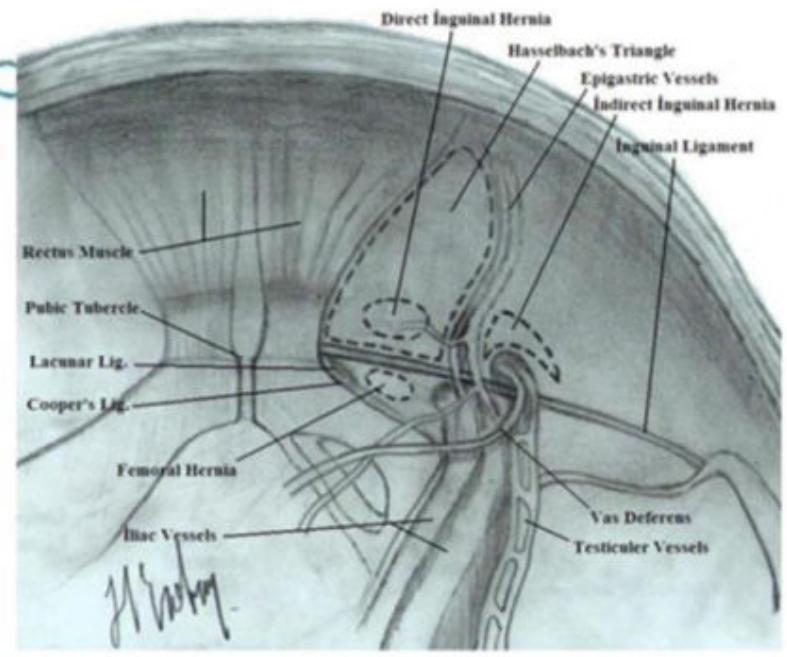
LICHENSTEIN REPAIR i.e. MESH HERNIOPLASTY

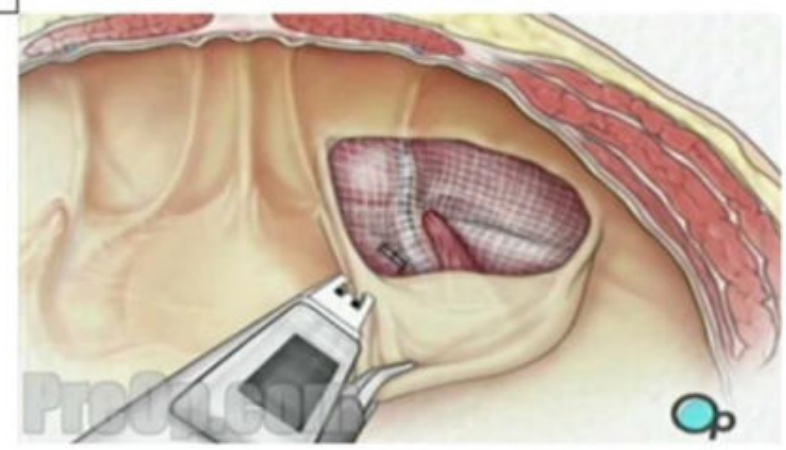


Laparascopic hernia repair

1. Trans abdominal Preperitoneal Procedure (TAPP)
2. Totally Extraperitoneal (TEP) Repair







COMPLICATIONS

- Hernia Recurrence
- Pain
- Cord and Testes Injury
- Wound infection
- Seroma
- Hematoma
- Bladder injury
- Osteitis pubis
- Urinary retention

Table 37-6

Complications of groin hernia repairs

Recurrence
Chronic groin pain
Nociceptive
Somatic
Visceral
Neuropathic
Iliohypogastric
Ilioinguinal
Genitofemoral
Lateral cutaneous
Femoral
Cord and testicular
Hematoma
Ischemic orchitis
Testicular atrophy
Dysejaculation
Division of vas deferens
Hydrocele
Testicular descent
Bladder injury
Wound infection
Seroma
Hematoma
Wound
Scrotal
Retroperitoneal
Prosthetic complications
Contraction
Erosion
Infection
Rejection
Fracture
Laparoscopic
Vascular injury
Intra-abdominal
Retroperitoneal
Abdominal wall
Gas embolism
Visceral injury
Bowel perforation
Bladder perforation
Trocar site complications
Hematoma
Hernia
Wound infection
Keloid
Bowel obstruction
Trocar or peritoneal closure site hernia
Adhesions
Miscellaneous
Diaphragmatic dysfunction
Hypercapnia
General
Urinary
Paralytic ileus
Nausea and vomiting
Aspiration pneumonia
Cardiovascular and respiratory insufficiency