

Abdominal wall hernias

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Layers of anterior abdominal wall

3 layers of muscle

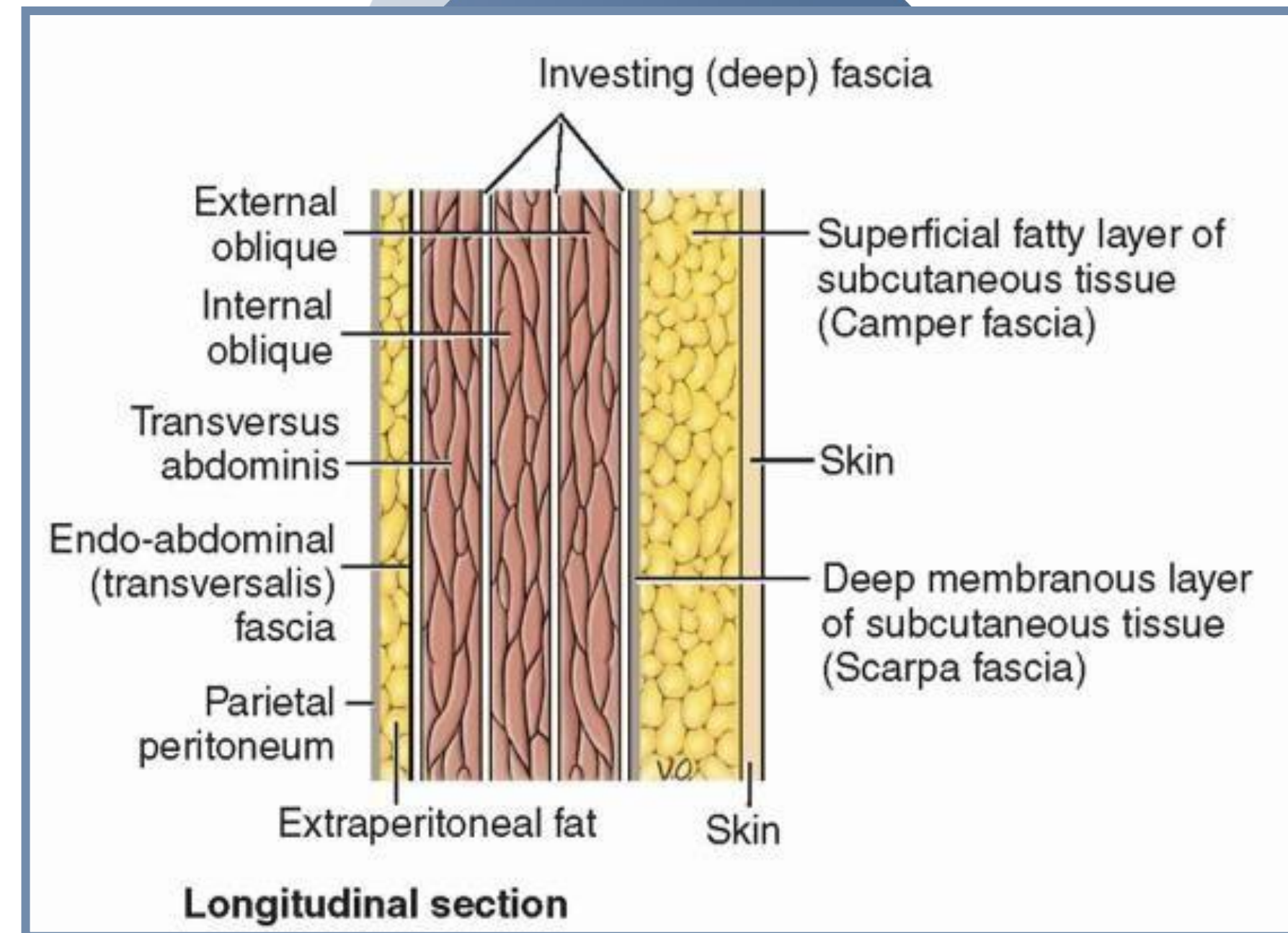
- external oblique
- internal oblique
- transversus abdominis

3 layers in front muscles

- skin
- superficial fatty layer of subcutaneous tissue (**Camper fascia**)
- Deep membranous layer of subcutaneous tissue (**Scarpa fascia**)

3 layers behind muscles

- transversalis fascia
- extra peritoneal fat
- parietal peritoneum



No deep fascia in anterior abdominal wall

External oblique

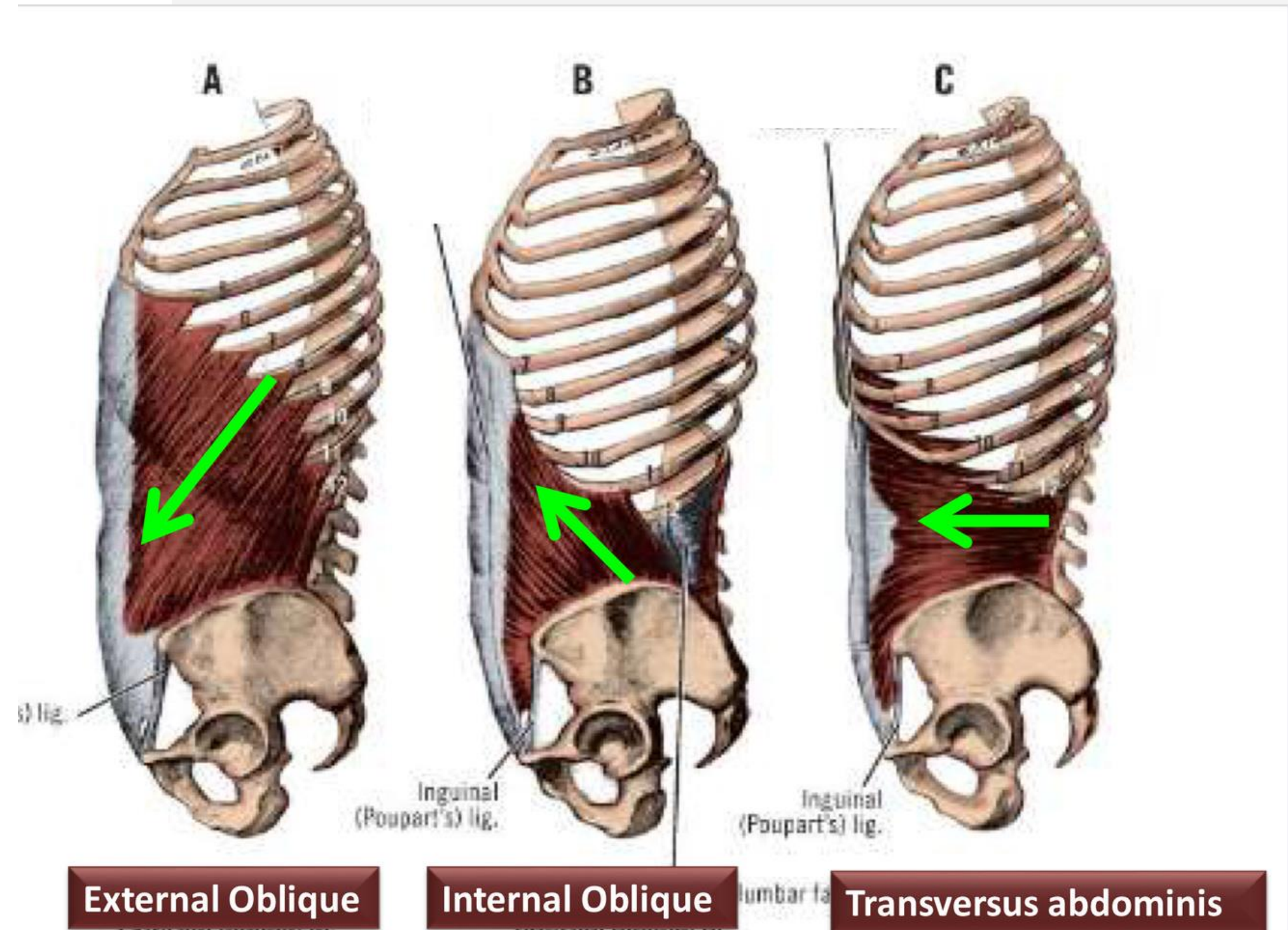
fibers run downwards,
forwards & medially

Internal oblique

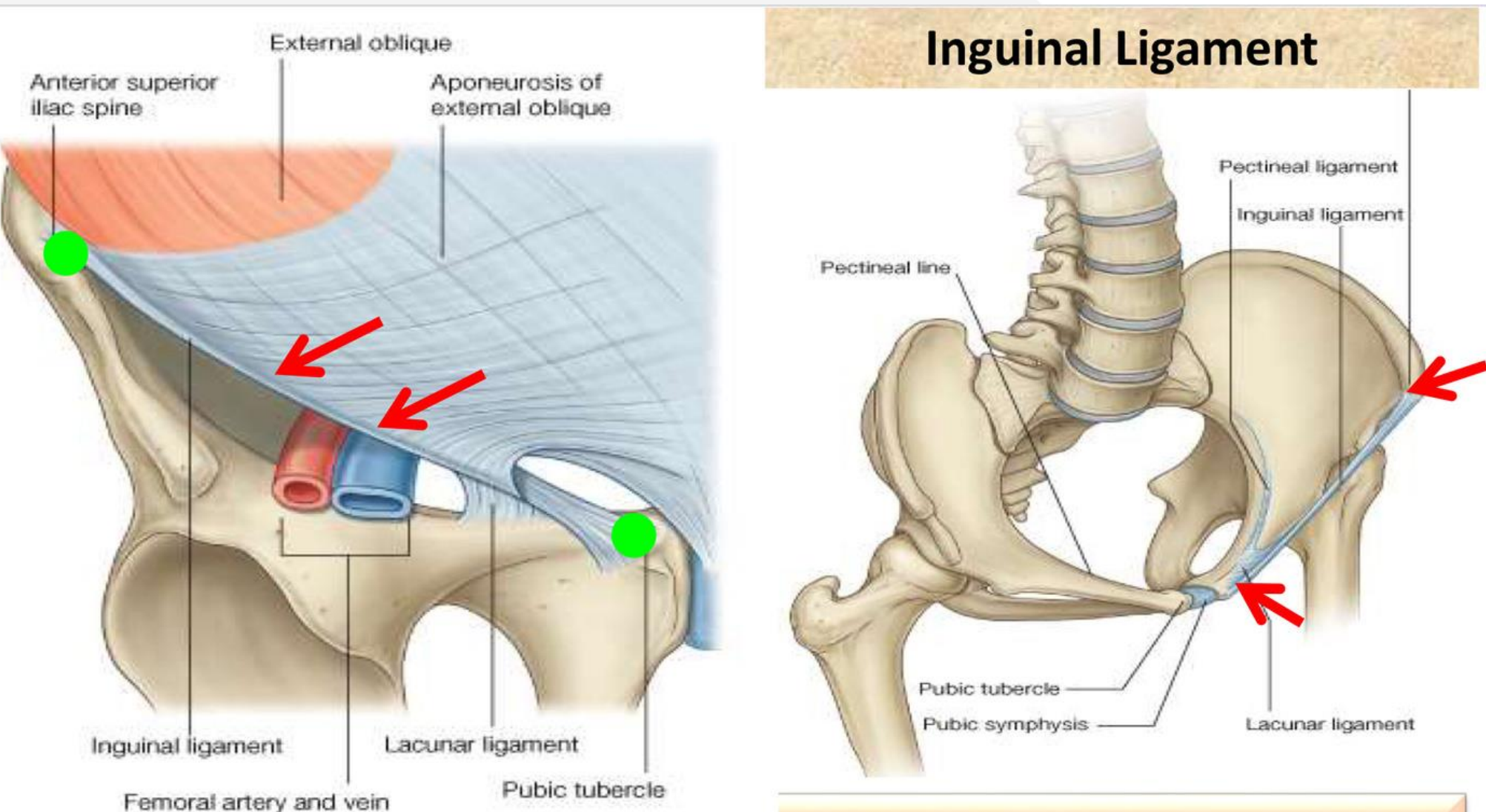
fibers run upwards,
forwards & medially

Transversus abdominis

fibers run transversely



Inguinal ligament



- The lower border of the external oblique aponeurosis is folded backwards on itself to form the inguinal ligament.

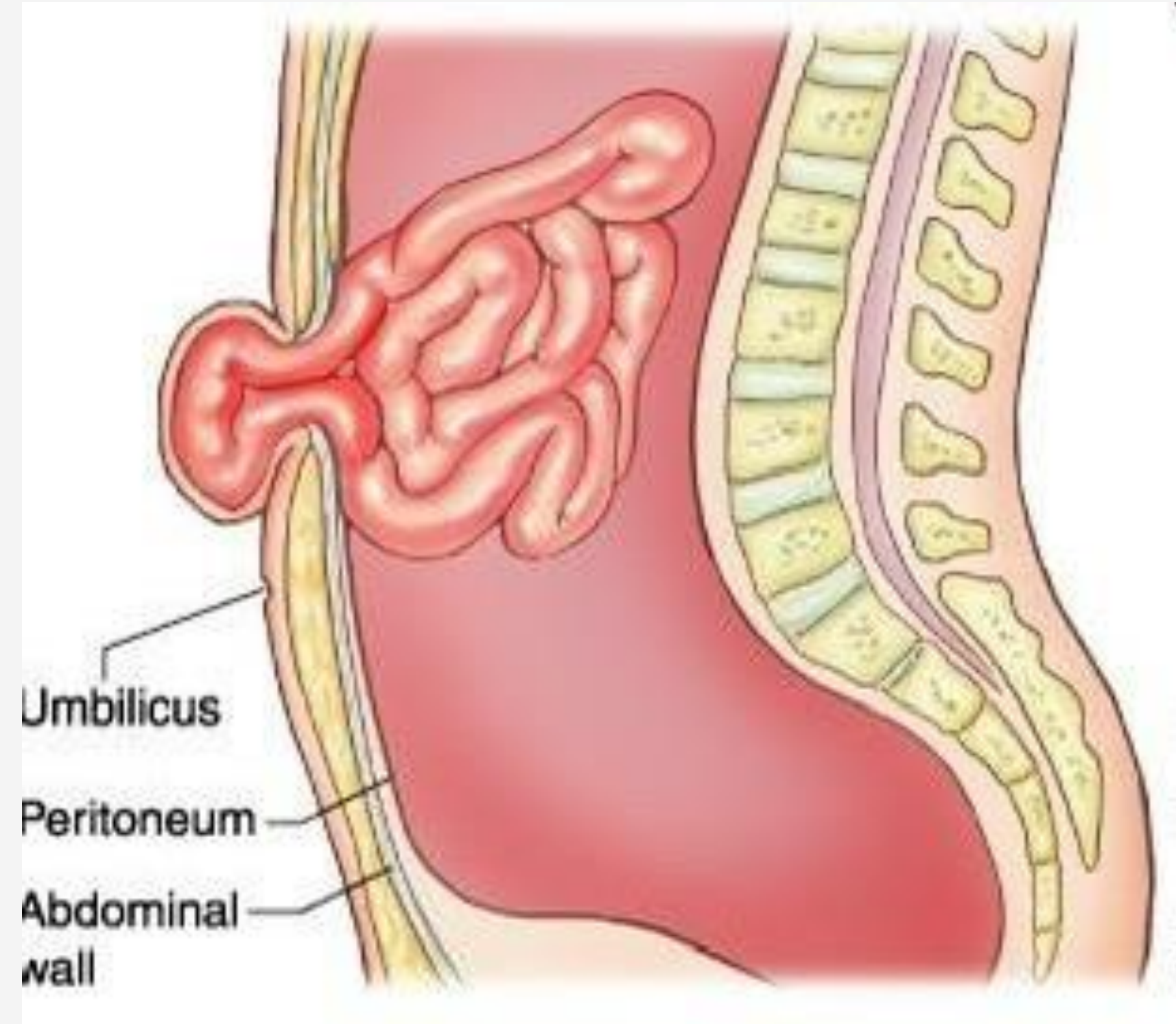
- The inguinal ligament is attached to the pubic tubercle medially and to the anterior superior iliac spine laterally.

What's a hernia?

A hernia is an abnormal protrusion of an organ or tissue through an opening in the layer that normally confines it.

Abdominal wall hernia

Abnormal protrusion of an intra abdominal contents through a defect in the abdominal wall



Hernia composition

THE SAC

THE COVERING OF SAC

THE CONTENT OF SAC

01. The sac

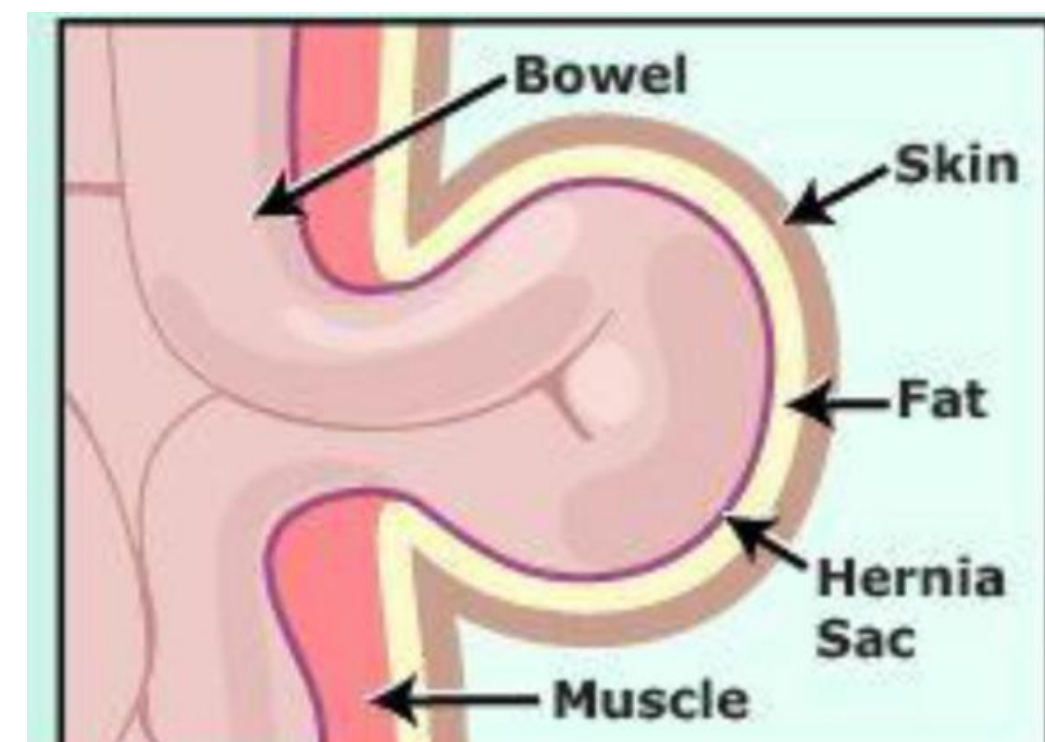
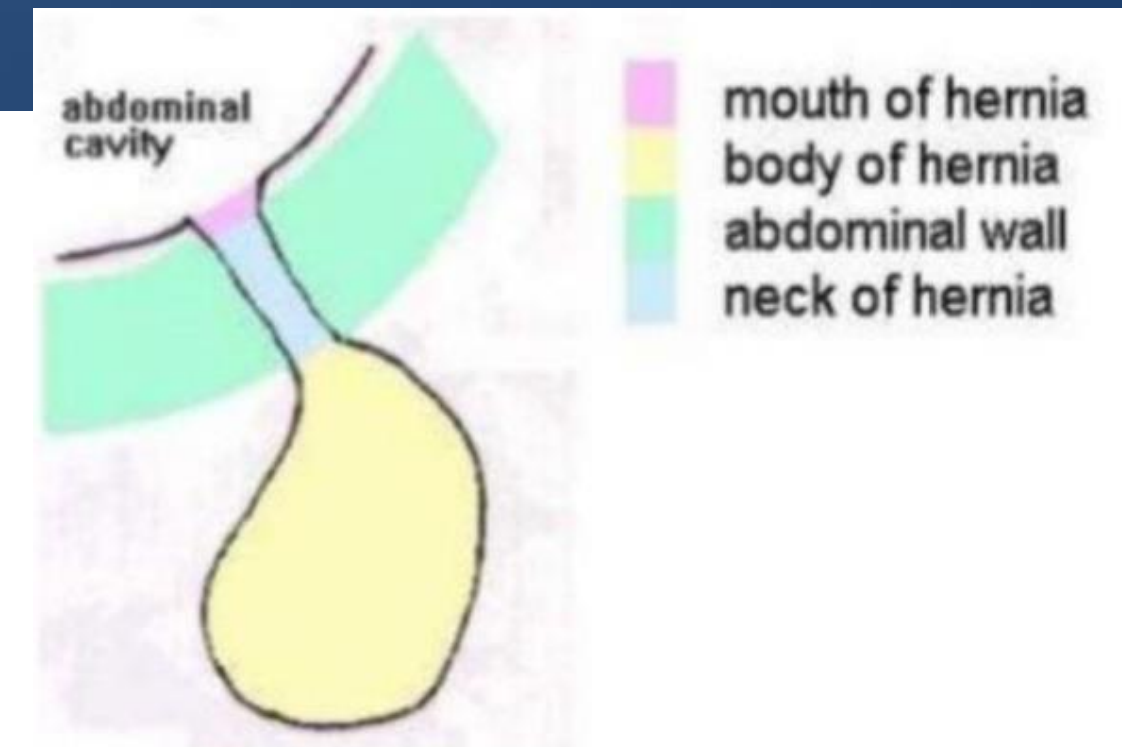
diverticulum of peritoneum consisting of:

1. Mouth
2. Neck
3. Body
4. Fundus

02. The covering of sac

derived from the layers of the abdominal wall

through which the sac passes



03. The content of sac

- can be almost any abdominal viscus, except the liver
- but the commonest are:
 - Fluid
 - Omentum
 - intestine
 - a portion of the circumference of the intestine = Richter's hernia
 - a portion of the bladder, or a diverticulum of the bladder
is sometimes present
 - These ovary with or without the corresponding Fallopian tube
 - Meckel's diverticulum = Littré's hernia

Why Do Hernias Occur? “ETIOLOGY

CONGENITAL DEVELOPMENTAL DEFECT

Failure of fascial opening to close (e.g., umbilical)

- **Failure of process to obliterate e.g. processus vaginalis)**
- **Abnormal collagen metabolism ,genetic defects of the elastic fiber and collagen synthesis**

THERE IS AN ACQUIRED WEAKNESS

- **Fascial thinning , Loss of tissue strength and elasticity (from aging or repetitive stress)**
- **Loss of tissue (injury, infection, poor woundhealing, etc.)**
- **prolonged or sever increased abdominal pressure: (heavy lifting, COPD, BPH, ascitis).**

classification of hernia

1. By degree of complication:

Reducible hernia:

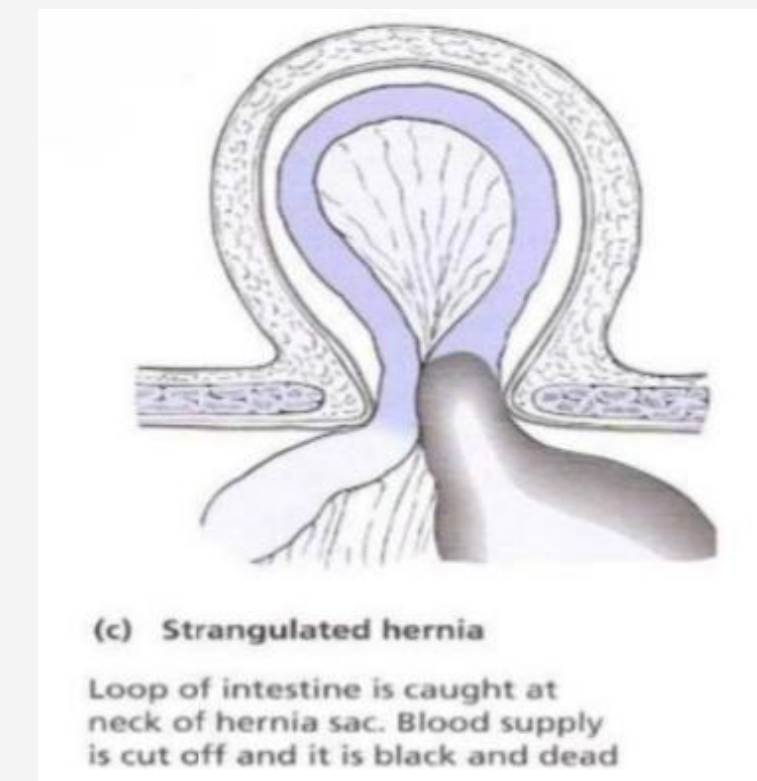
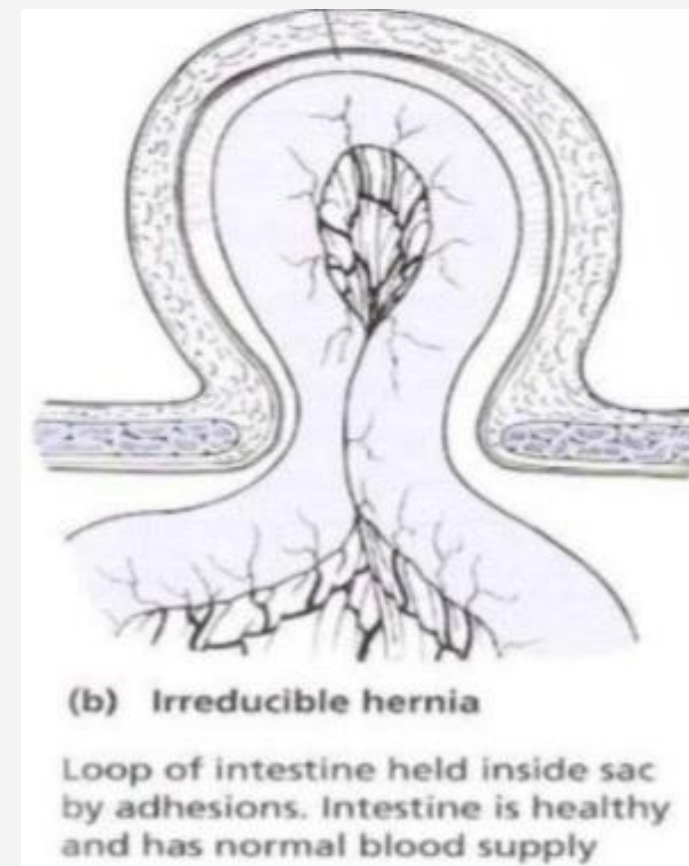
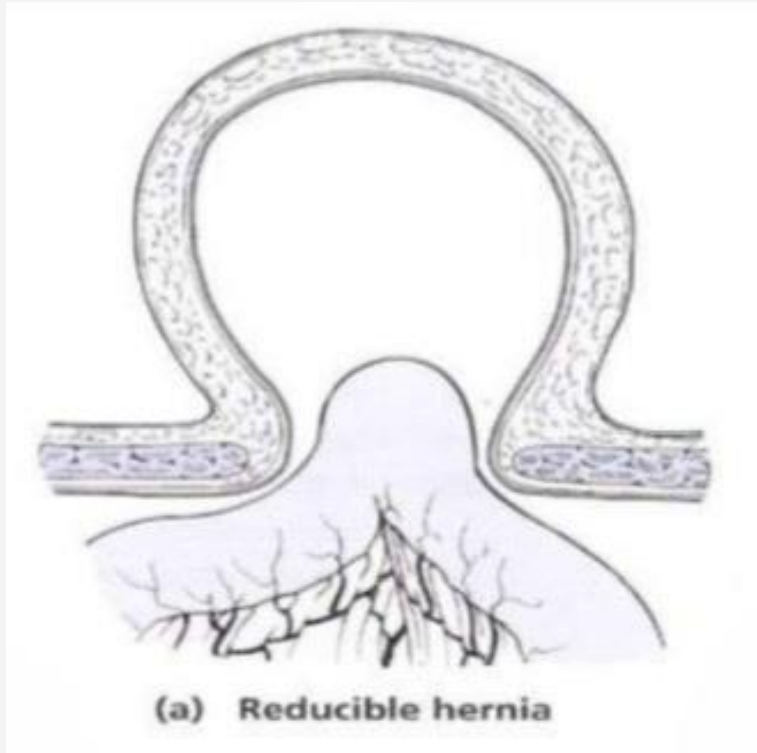
Hernia contents can be completely returned to the peritoneal cavity.

Irreducible hernia :

Hernia contents cannot be completely returned to the peritoneal cavity.

Strangulated hernia :

A hernia in which the contents of the hernial sac (e.g., omentum, bowel) have become ischemic due to a compromised vascular supply



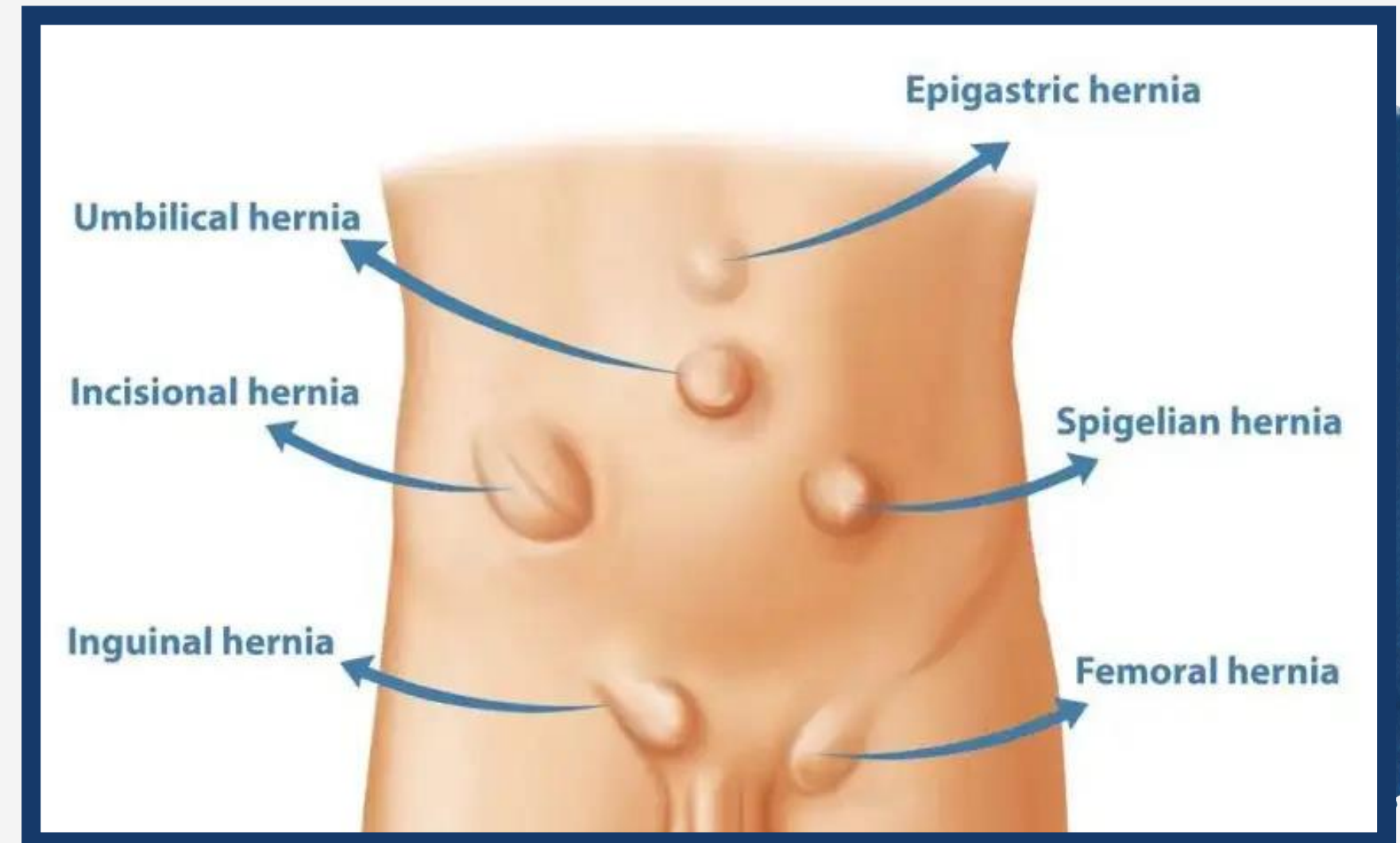
2. Anatomically

Common hernia

- ◆ Inguinal
- ◆ Femoral
- ◆ Umbilical
- ◆ Incisional
- ◆ Epigastric

Rare hernia

- ◆ Spigelian
- ◆ Gluteal
- ◆ Obturator
- ◆ Lumbar



Anatomy of inguinal region

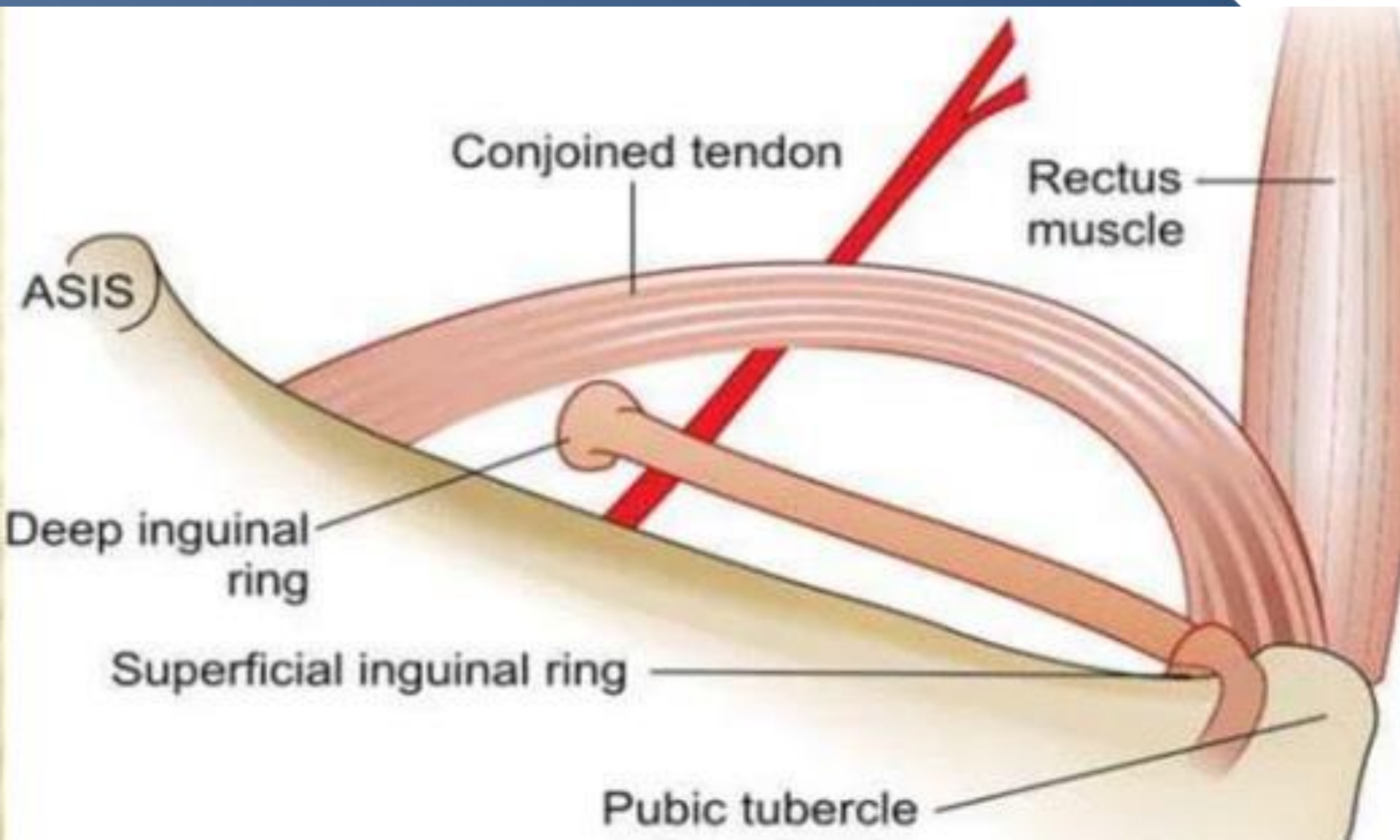
SUPERFICIAL (EXTERNAL) INGUINAL RING:

- **triangular aperture in the aponeurosis of the external oblique muscle**
- **Lies 1.25 cm above the pubic tubercle**
- **Normally it doesn't admit the tip of the little finger.**

DEEP (INTERNAL) INGUINAL RING:

- **U-shaped condensation of the fascia transversalis**
- **About 1.25 cm above the mid-inguinal point (midway between pubic symphysis and ant. sup. Iliac spine.**

inguinal canal



- Oblique passage in the lower part of the anterior abdominal wall just above the medial half of the inguinal ligament.
- Extends from deep inguinal ring to superficial inguinal ring.
- About 4 cm long directed downward forward and medially

Boundaries

Structures passing through the canal:

- **Anterior:**

- Skin, superficial fascia, ext. oblique aponeurosis & int. oblique muscle laterally.

- **Posterior:**

- Fascia transversalis & the conjoint tendon.

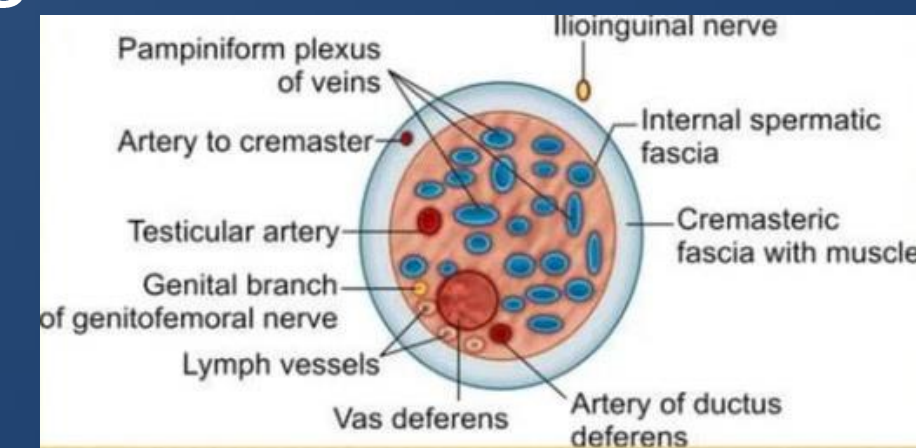
- **Roof:**

- Internal oblique and transverses abdominis muscle.

- **Floor:**

- inguinal ligament.

- Males: spermatic cord: vas deferens, testicular & cremasteric arteries, pampiniform plexus of veins, lymphatics
- Ilioinguinal nerve
- Genital branch of genitofemoral nerve
- Females: Round ligament of uterus.

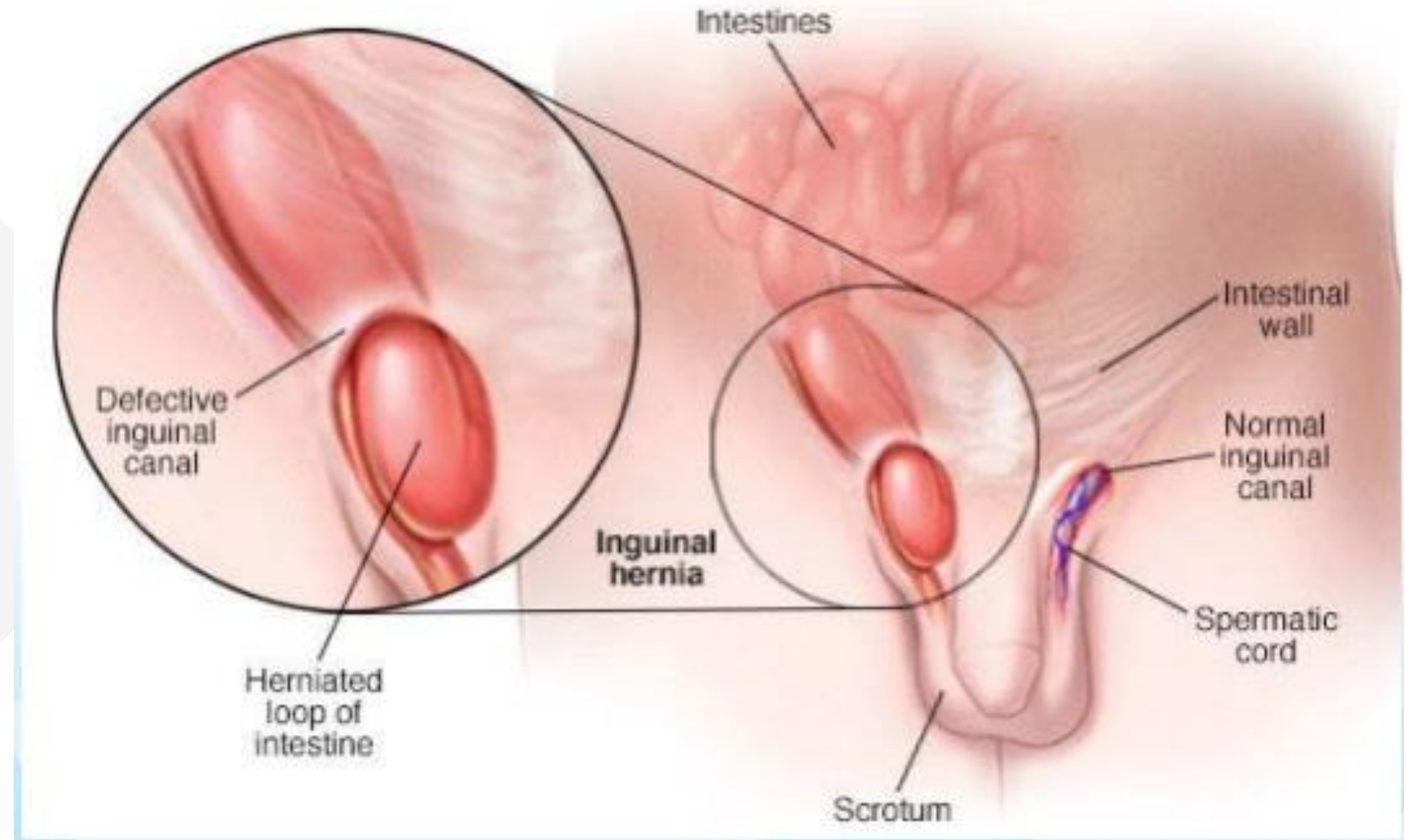


Groin hernia

- Groin hernias are found in 5% of the male population.
- Represents 86% of all hernia cases.
- It occurs 5 times more often in males than females.
- Inguinal 96% (indirect 75%, direct 25%).
 - Bilateral in 20% of cases
 - Right-sided hernias are more frequent than left-sided ones
- Femoral 4%

Defense mechanisms of the inguinal canal:

- Obliquity of the inguinal canal.
- Shutter mechanism due to:
 - conjoint tendon contraction



Classification

According to anatomy

- Indirect hernia: comes out through the int. ring along the cord. The sac is lat. to the inf. epigastric artery.
- Direct hernia: occurs through the Hasselbachs triangle. The sac is medial to the inf epigastric artery.

According to the extent

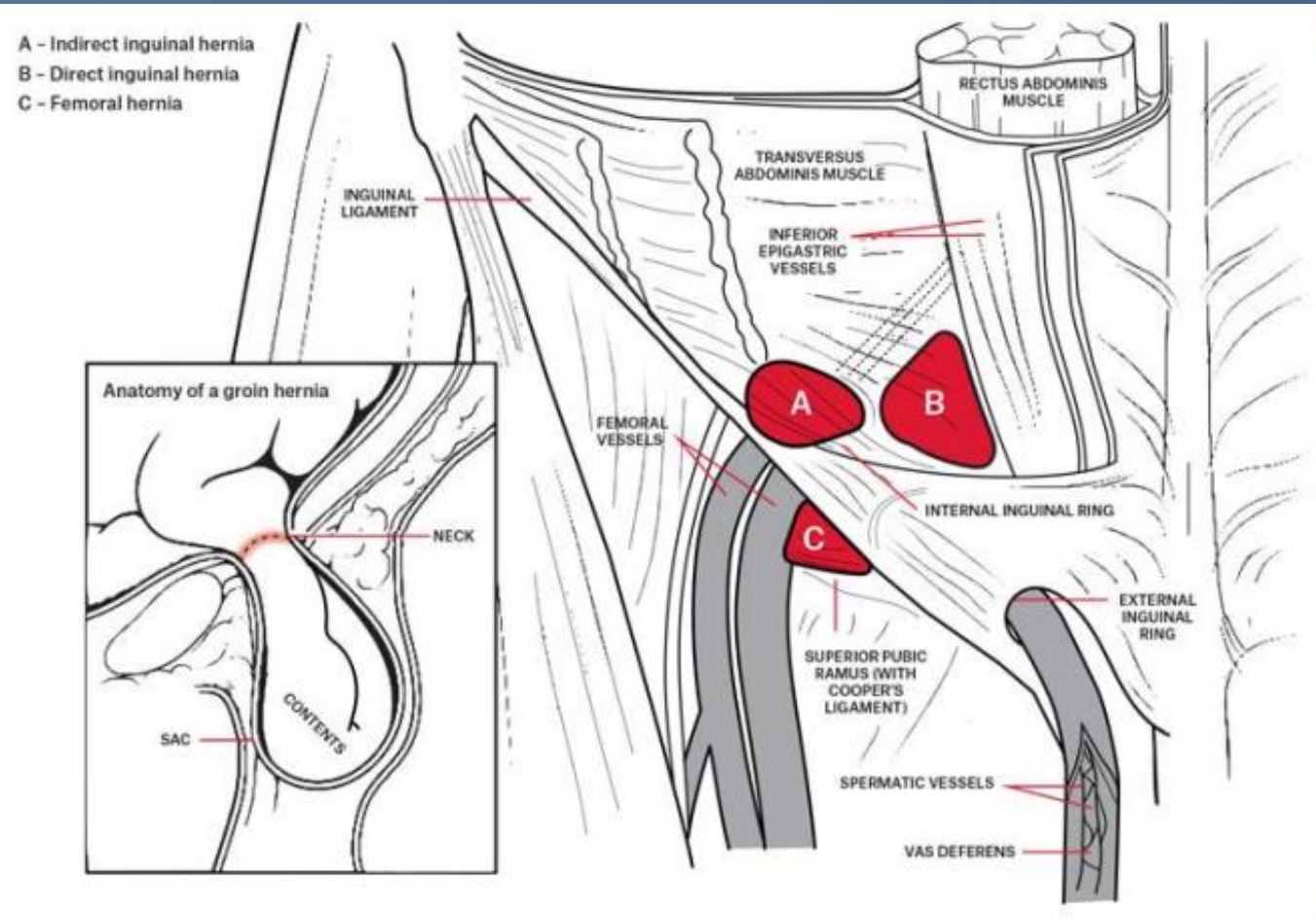
- Incomplete: sac does not reach the bottom of the scrotum
- Complete: sac descends to the bottom of the scrotum

Oblique inguinal Hernia	Direct inguinal Hernia
More frequent 80-90%	Less frequent 10-20%
Usually congenital (infants & young adults)	In old age (over 50yrs)
Usually unilateral	Usually bilateral
Bulges through deep inguinal ring → scrotum	Bulges through inguinal triangle → doesn't reach scrotum
Neck of hernia sac is lateral to inf. epigastric vessels	Neck of hernia sac is medial to inf. epigastric vessels
Line of descent is downwards & medially	Line of descent is directly forward through posterior wall of inguinal triangle
Commonly obstructed (strangulated) at deep inguinal ring	Rarely obstructed as it has a wider neck

Inguinal hernia

Female

Male



Femoral hernia

Femoral Ring --> Canal (narrow connective tissue space)

- **Transmit Blood Vessels Below Inguinal Ligament**
- **Big Enough To Accommodate Vasodilation**

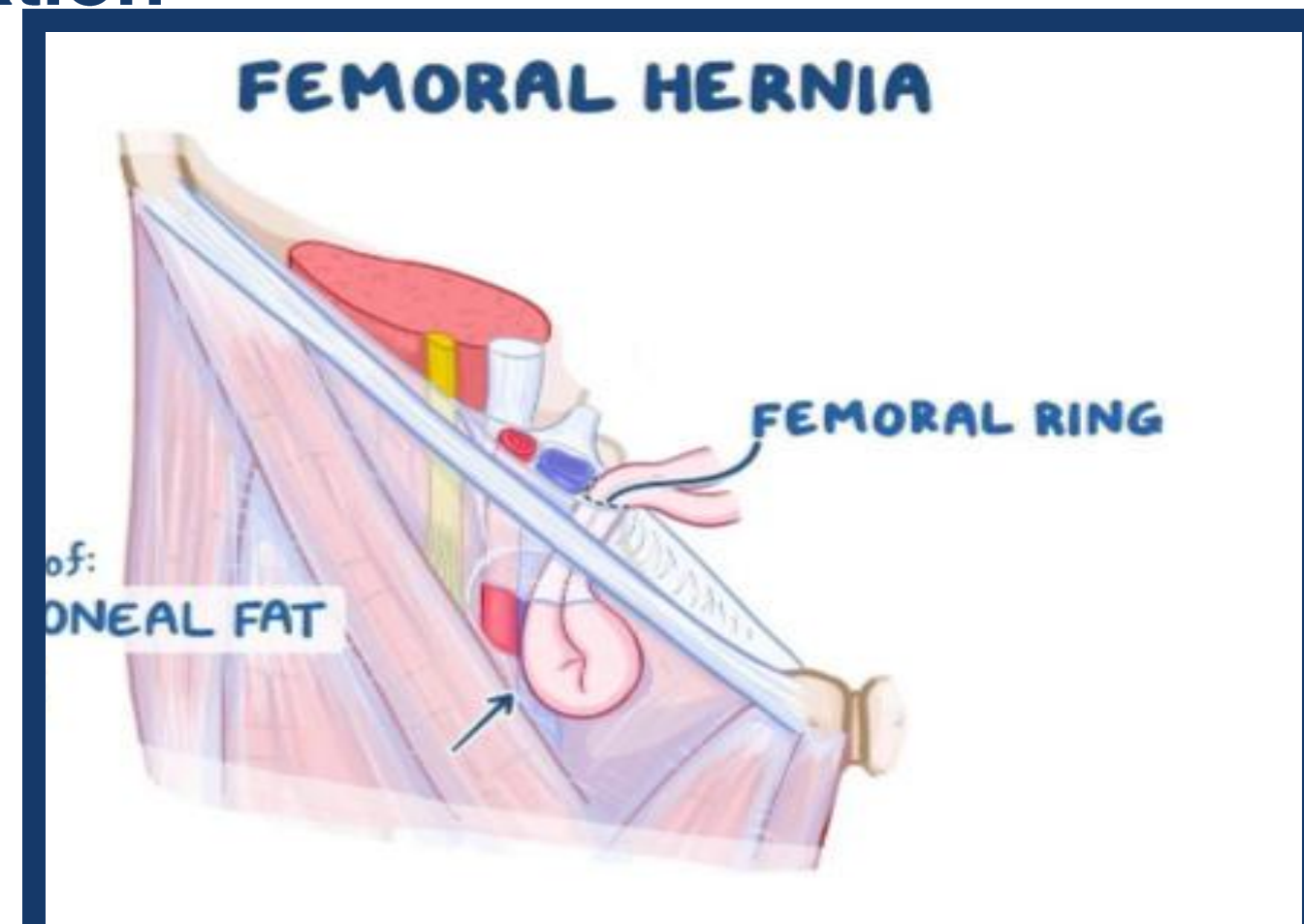
- **increase in intraabdominal pressure --> Bowel herniation**

1. Narrow --> Vessel Compression (Strangulation)

2. Ischemia, Necrosis --> Perforation

3. Women (Wider Pelvis) --> Men

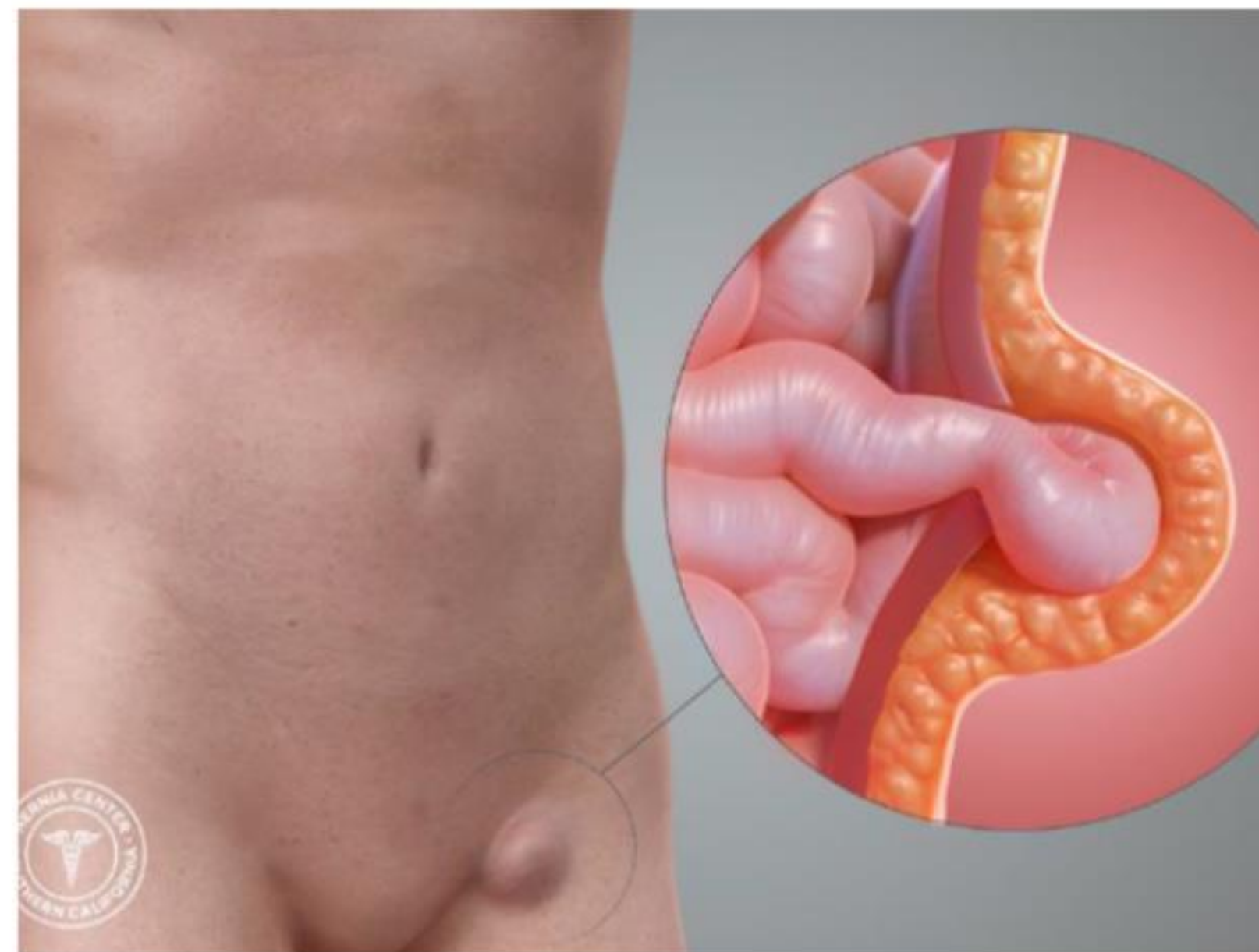
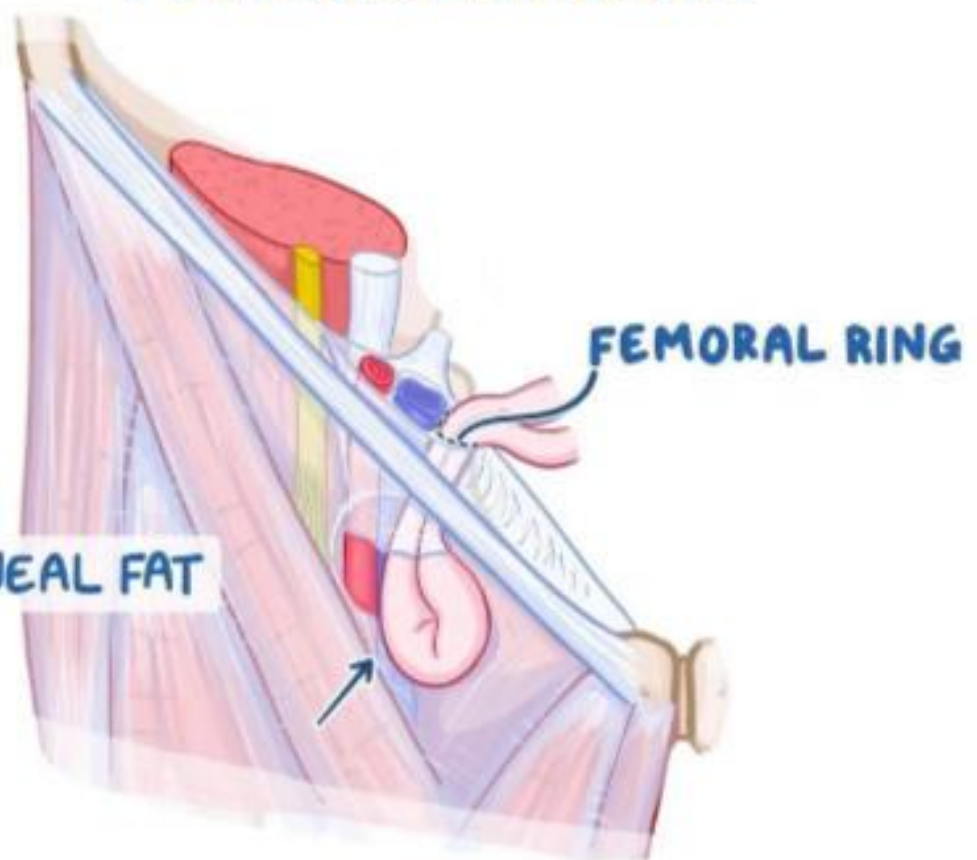
Surgical Repair +- Bowel Resection



FEMORAL HERNIA

PROTRUSION of:

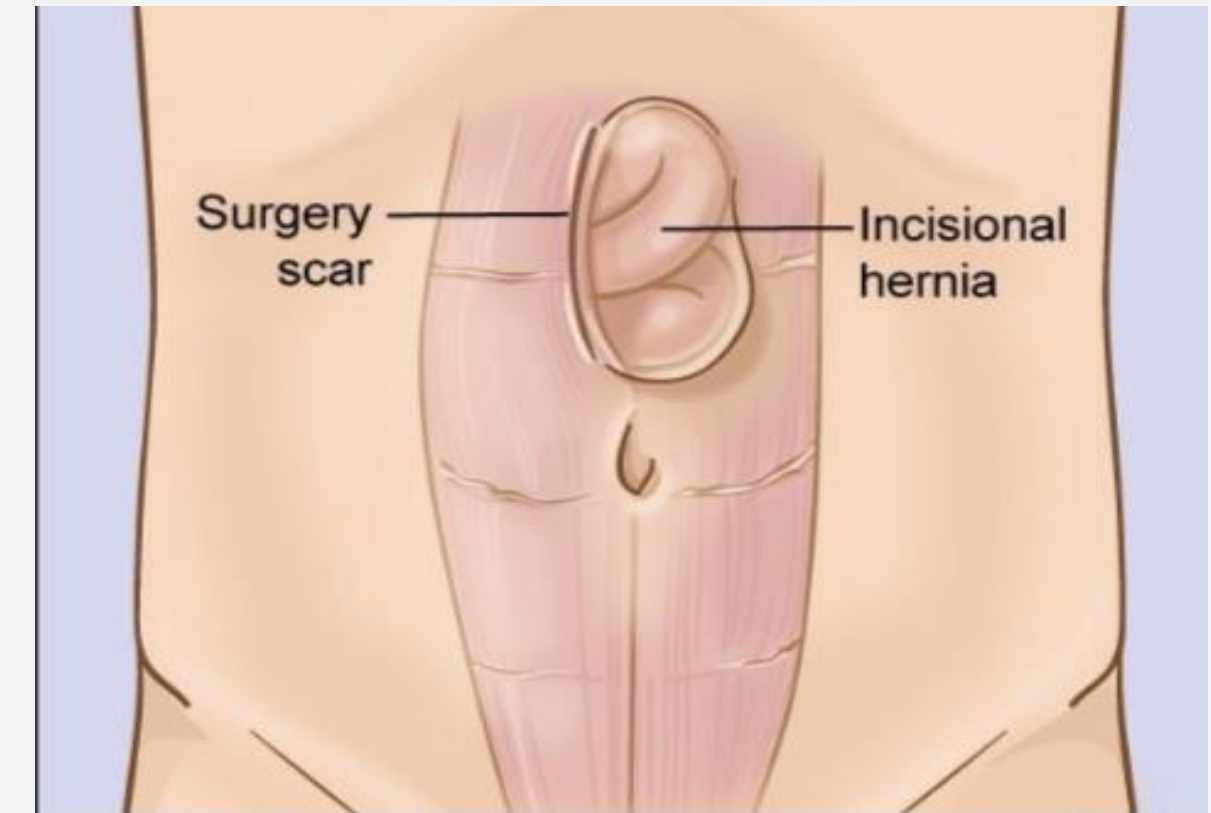
- * PREPERITONEAL FAT
- * OMENTUM
- * BOWEL



Ventral Hernia

1. Incisional: Develop Anywhere An Incision is Made ' Midline Incisions (Commonly Used in Laparotomies.)

- Abdominal surgery causes a flaw in the abdominal wall that must heal on its own.
- This flaw can create an area of weakness where a hernia may develop.
- This occurs after 2 -10 % of all abdominal surgeries, although some people are more at risk.
- After surgical repair, these hernias have a high rate of returning (20-45%).



Ventral Hernia

2. Epigastric: Upper Abdomen, Linea Alba

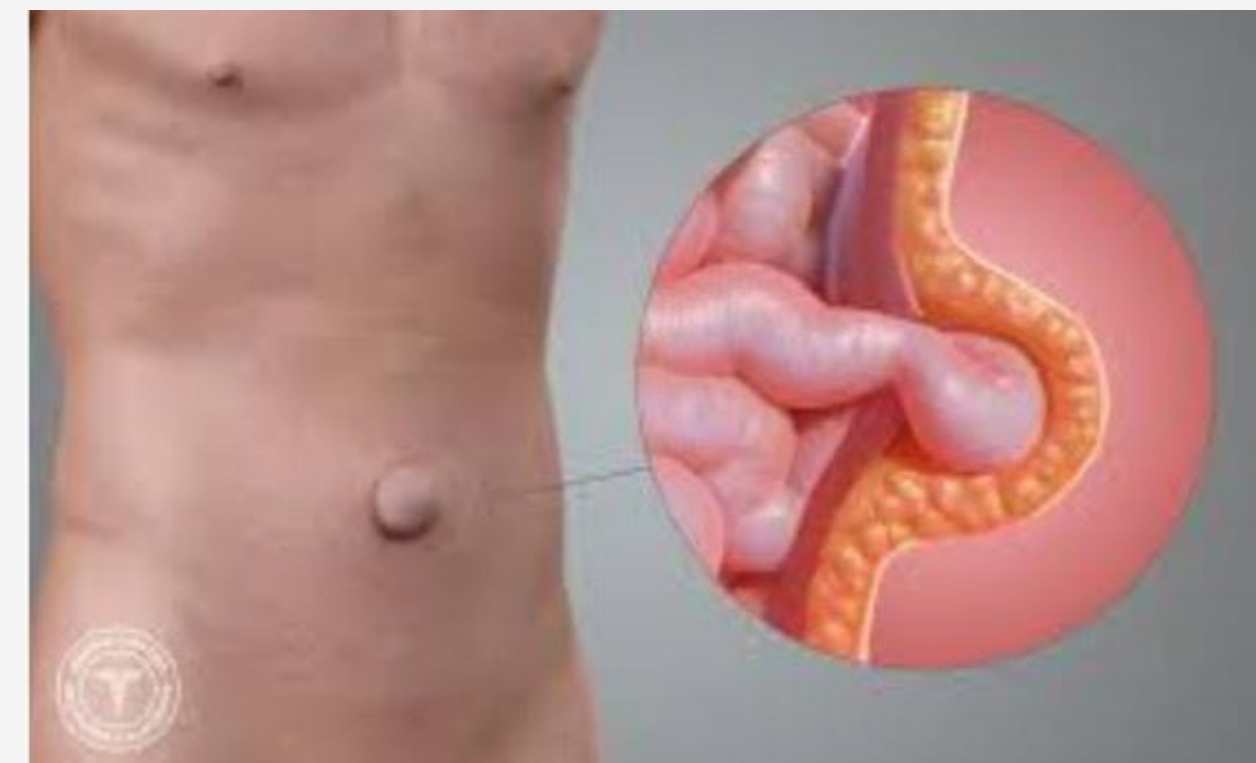
- Occurring between the navel and the lower part of the rib cage in the midline of the abdomen, these hernias are composed usually of fatty tissue and rarely contain intestine.
- Formed in an area of relative weakness of the abdominal wall, these hernias are often painless and unable to be pushed back into the abdomen when first discovered.



Ventral Hernia

3. Umbilical :

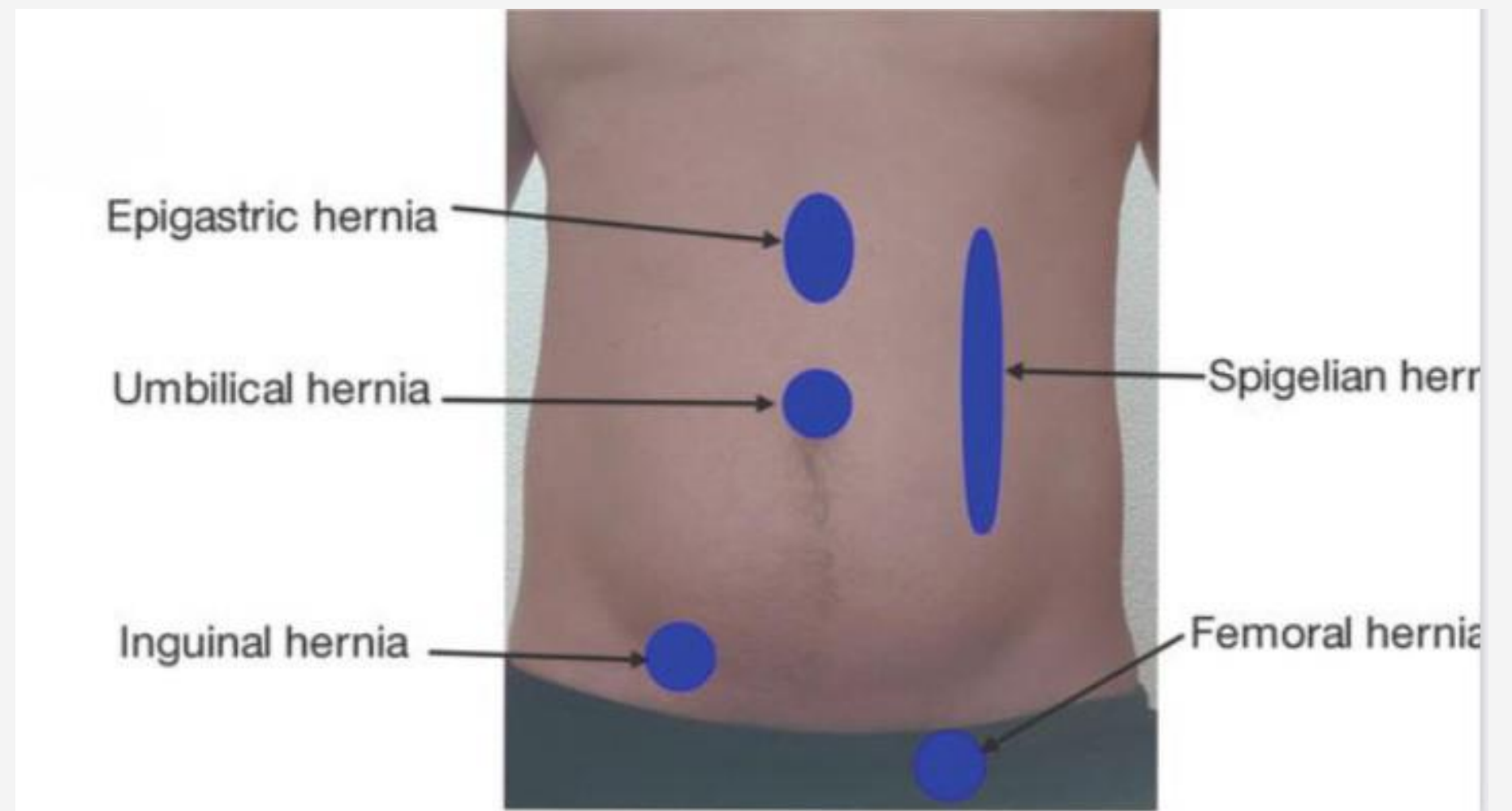
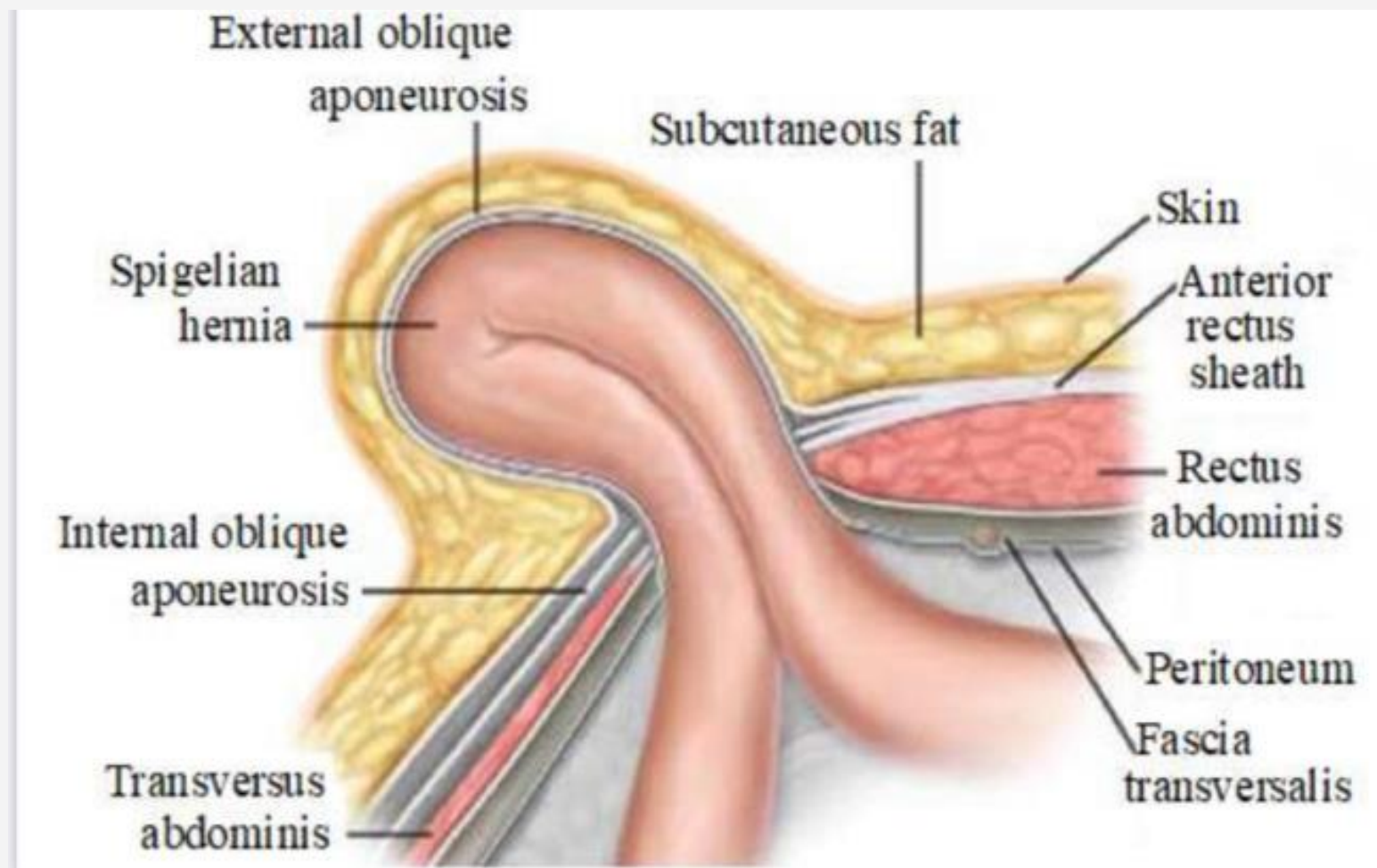
- 6th Week of Development: Midgut Herniates Through The Umbilical ring.
- Umbilical Ring Fails to Close before birth --> Hernia
- Simple Suture Versus Mesh (Recommended) Repair
- These common hernias (10-30 %) are often noted at birth as a protrusion at the bellybutton (the umbilicus).
- Even if the area is closed at birth, these hernias can appear later in life because this spot remains a weaker place in the abdominal wall.
- They most often appear later in elderly people and middle aged women who have had children.



Ventral Hernia

4. Spigelian

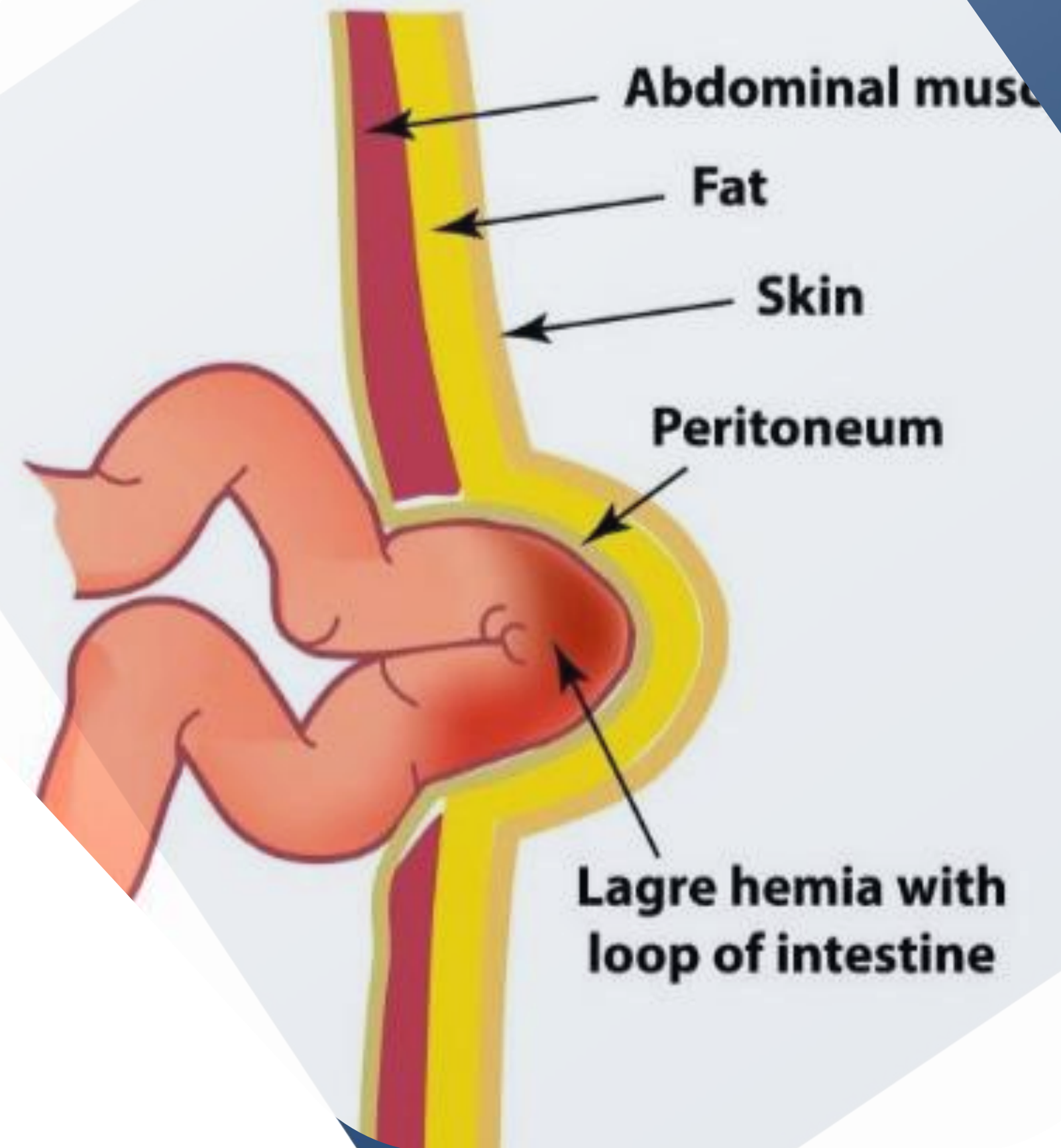
Internal Oblique + Transversus Abdominus Aponeurosis Defect
Tissue Herniates Between External + Internal Oblique Muscles



Hernias and Wall Defects

Hernias and wall defects are common conditions that affect millions of people worldwide. They occur when a part of an organ protrudes through a weakened area in the surrounding muscle or tissue.

These conditions can range from minor to severe, and treatment options vary depending on the type, location, and severity of the hernia.



Symptoms and Clinical Presentation of Hernias

Hernias can manifest in various ways, depending on their location and size. Common symptoms include a bulge or protrusion in the affected area, especially when straining, coughing, or lifting heavy objects.

Pain, discomfort, or a feeling of pressure in the affected area may also be present, particularly when standing or moving around. In some cases, the hernia may become trapped or .incarcerated, causing severe pain and requiring immediate medical attention

Other symptoms may include a feeling of fullness, bloating, or difficulty with bowel movements .or urination, particularly when the hernia affects the abdomen or groin

Risk Factors for hernia

Age

Older adults are more prone to weakened abdominal muscles and connective tissues.

Genetics

Family history of hernias can increase individual susceptibility.

Chronic coughing

Persistent coughing can strain abdominal muscles, contributing to hernia development.

Smoking

Smoking weakens connective tissue, making the abdominal wall more susceptible to hernias.

Heavy lifting

Strenuous lifting can strain abdominal muscles, increasing the risk of a hernia.

Obesity

Excess weight puts increased pressure on the abdominal wall, increasing hernia risk.

Pregnancy

Pregnancy can weaken abdominal muscles due to hormonal changes and physical strain.

Preventive Measures for Hernias

Maintain a Healthy Weight

Excess weight puts strain on abdominal muscles, increasing hernia risk.

Proper Lifting Techniques

Use proper lifting techniques to minimize strain on the abdomen

Avoid Heavy Lifting

Reduce strain on abdominal muscles by avoiding heavy lifting or strenuous activities.

Regular Exercise

Strengthening abdominal muscles helps support the abdominal wall.

Quit Smoking

Smoking weakens connective tissue, increasing hernia risk.

Investigation



A detailed investigation is crucial for making the right treatment decisions for hernias. This process involves a thorough evaluation of the patient's condition, medical history, and lifestyle factors, followed by a comprehensive physical examination and the use of imaging studies such as ultrasound or CT scans.

1

Patient History

Gather information about the patient's symptoms, medical history, and any relevant lifestyle factors

2

Physical examination

A thorough physical examination of the abdomen, including palpation to assess the hernia's location, size, and reducibility.

3

Imaging studies

Ultrasound or CT scan to confirm the diagnosis, assess the hernia's size and location, and rule out other conditions.

Imaging Studies: A Visual Insight into Hernias

Imaging studies play a vital role in diagnosing and understanding the nature of hernias. These non-invasive techniques provide valuable insights into the size, location, and extent of the hernia, aiding in the development of appropriate treatment plans.

Common imaging studies used for hernia investigation include:

- **Ultrasound:** A painless, non-invasive technique that utilizes sound waves to create images of internal structures. It is often the first-line imaging study for hernia diagnosis, particularly in the case of inguinal and umbilical hernias. It is a sensitive test (>90%)
- **CT Scan:** A more detailed imaging technique that uses X-rays to generate cross-sectional images of the body. CT scans are particularly useful for complex or atypical hernias, providing a comprehensive view of the hernia's anatomy and surrounding structures.

Conservative Treatment Options for Hernias

Watchful waiting

This approach is suitable for small, asymptomatic hernias or minimally symptomatic

Pain Management

Over-the-counter pain relievers, such as ibuprofen or acetaminophen, can alleviate pain and discomfort.

Truss and belt

Truss is a mechanical appliance ,belt with a pad applied to groin after spontaneous or manual reduction of hernia

The purpose is :

- 1) maintain reduction
- 2) prevent the enlargement of hernia



Surgical Treatment Options for Hernias

Open Hernia Repair

Traditional approach involving an incision at the hernia site. Repairing the weakened area with mesh or sutures.

Laparoscopic Hernia Repair

Minimally invasive surgery using small incisions and a laparoscope . Inserting mesh to reinforce the weakened area.

Open Hernia Repair Procedure

1

Anesthesia

General anesthesia is typically used to ensure patient comfort and immobility during the procedure.

2

Incision

A surgeon makes an incision over the hernia site, exposing the weakened area.

3

Repair

The surgeon repairs the defect using sutures or a mesh patch to reinforce the weakened area.

4

Closure

The incision is closed with sutures or staples, and a dressing is applied.

Laparoscopic Hernia Repair Procedure

1

Anesthesia

General anesthesia is administered to ensure patient comfort and immobility during the procedure.

2

Small Incisions

A surgeon makes several small incisions in the abdomen, through which a laparoscope and surgical instruments are inserted.

3

Hernia Repair

Using a laparoscope, the surgeon visualizes the hernia and repairs the defect using a mesh patch to reinforce the weakened area.

4

Closure

The incisions are closed with sutures or staples, and a dressing is applied.



Laparoscopic Repair vs Open Mesh Surgery

Both Laparoscopic repair and Open mesh surgery are commonly used to fix hernias. Laparoscopic repair uses a laparoscope, a telescopic instrument with a camera, to access and repair the hernia through small incisions. Open mesh surgery, on the other hand, requires a larger incision to directly access and repair the hernia.

◆ Laparoscopic Repair

This technique is typically associated with faster recovery time, less pain, and a shorter hospital stay compared to open surgery.

- Smaller incisions and less pain
- Faster recovery time and shorter hospital stay
- Lower risk of infection and complications
- Less scarring

◆ Open Mesh Surgery

Open mesh surgery is a more traditional technique. This technique is typically used for more complex hernias or in situations where laparoscopic repair is not feasible.

- May be more effective for larger or complex hernias
- Can address multiple hernias simultaneously

Complications and Recurrence Rate

Infection

A common complication, occurring in 1-5% of cases, with symptoms like redness, swelling, and pain at the incision site.

Hematoma

A collection of blood under the skin, occurring in 1-2% of cases, usually resolving on its own.

Seromas

A collection of fluid under the skin, occurring in 1-3% of cases, treated with drainage or aspiration.

Mesh Complications

Less common, can include rejection, infection, or migration of the mesh. Recurrence rates for hernia repair range from 5% to 15% depending on the type and location of the hernia.



Recovery and Aftercare Following Hernia Repair

- 1 Hospital Stay**
Patients typically stay in the hospital for 1-2 days after surgery.
- 2 Pain Management**
Pain medications are prescribed to manage discomfort.
- 3 Incision Care**
Keep the incision clean and dry, follow wound care instructions.
- 4 Activity Restrictions**
Gradually increase activity levels as instructed by the surgeon.
- 5 Follow-Up Appointments**
Regular check-ups with the surgeon to monitor healing and recovery progress.



Thank you