Abdominal Wall Hernias

Dr. Raed Tayyem, FRCS
Consultant Bariatric, Upper GI, and General Surgeon
Hashemite University

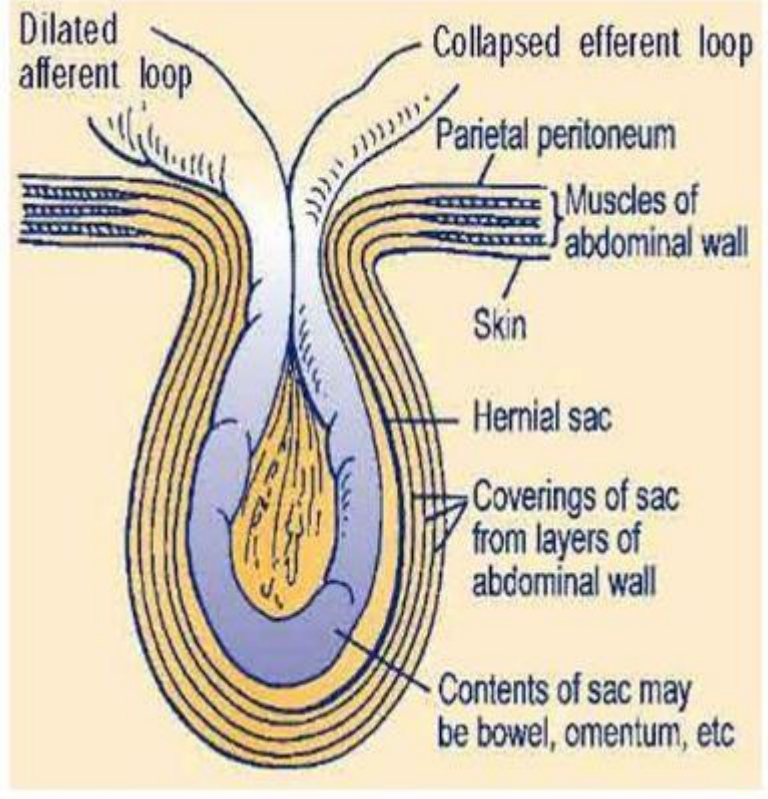
2020

Definition

- Hernia is the protrusion of a viscus or part of a viscus through an abnormal opening in the walls of its containing cavity

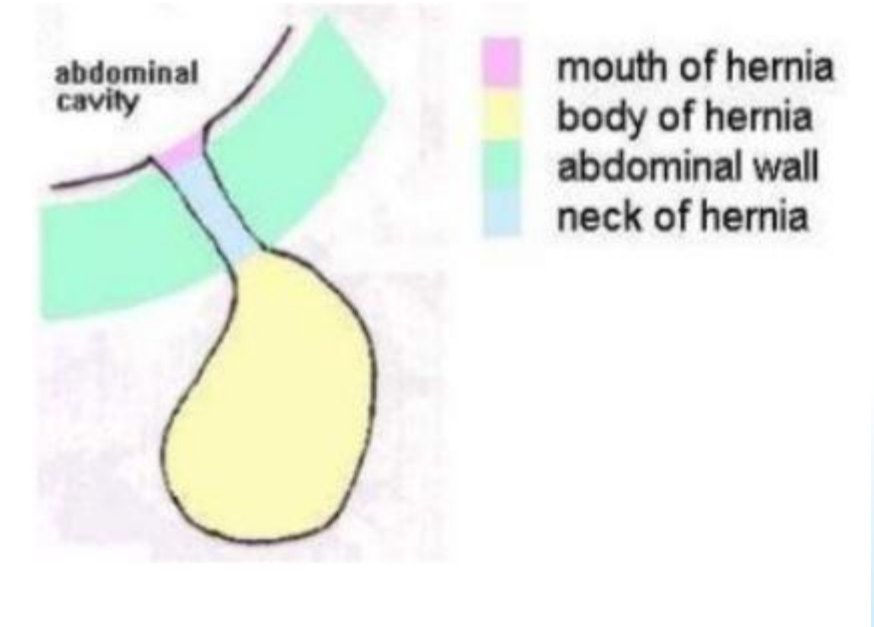
Hernia Components

1. The sac
2. The covering of the sac
3. The content of the sac



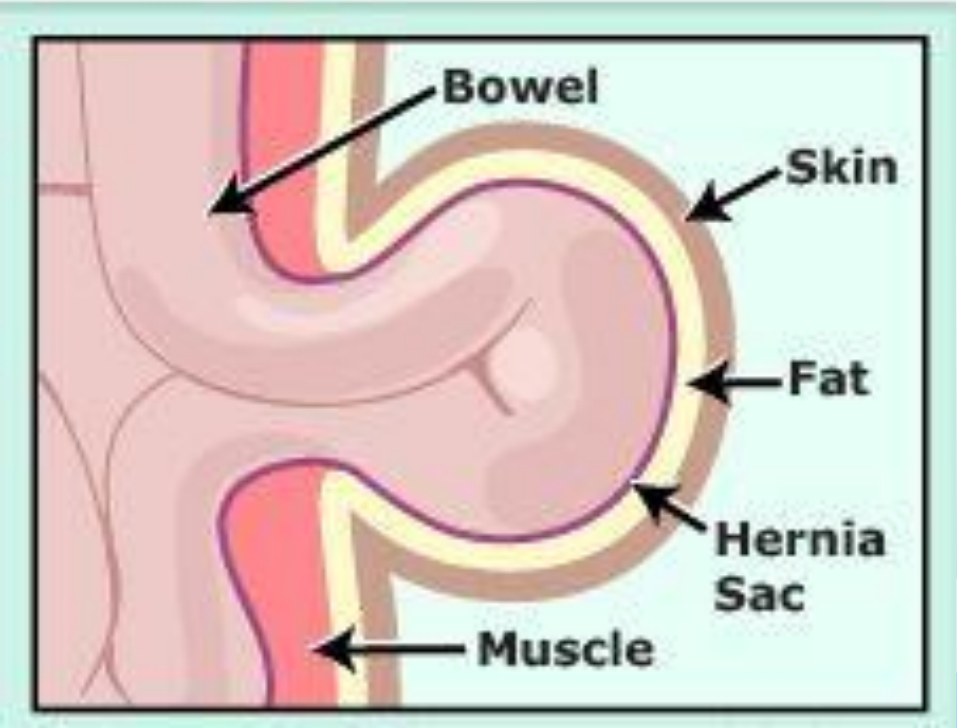
The sac

- diverticulum of peritoneum consisting of:
  - Mouth
  - Neck
  - body
  - fundus



Coverings

- derived from the layers of the abdominal wall through which the sac passes



Contents

- 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

Natural history

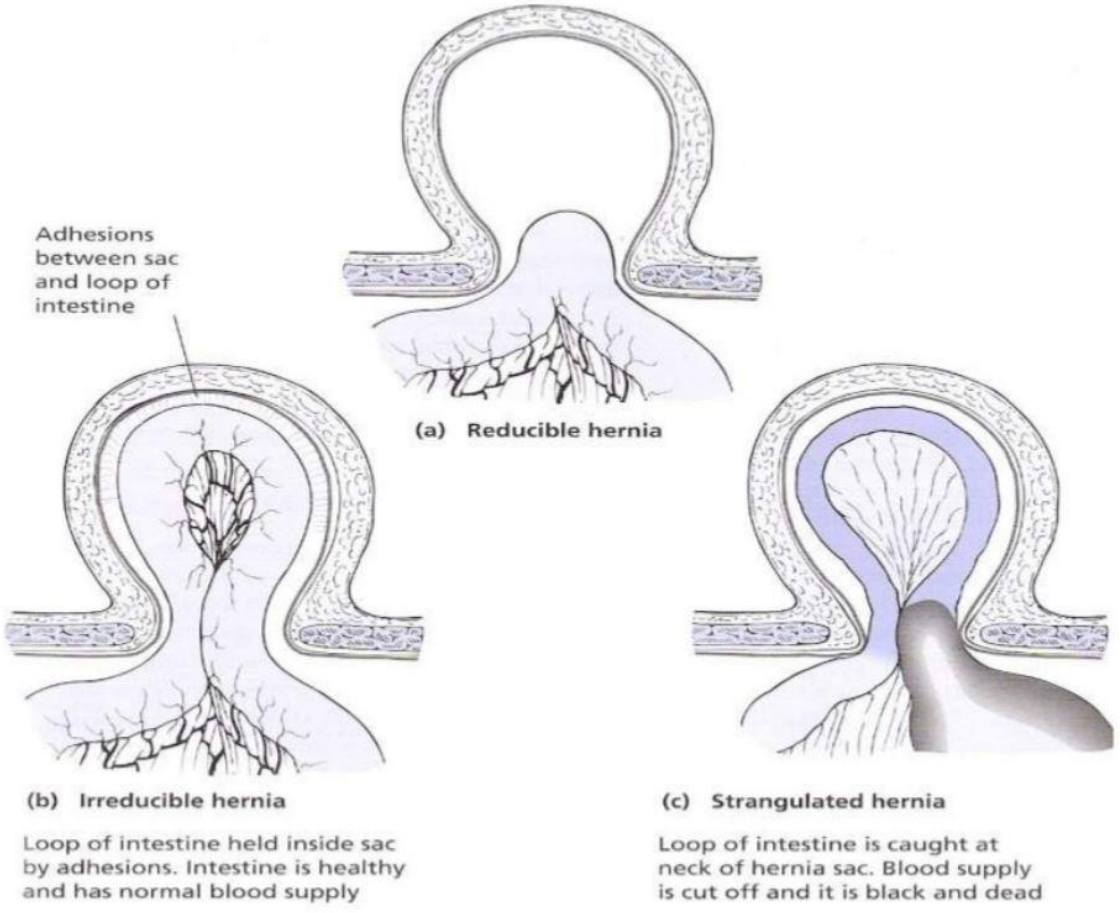
1. Reducible
2. Irreducible
3. Obstructed
4. Strangulated

Pathology

1. Reducible
2. Irreducible
3. Obstructed
4. Strangulated
    1. Ischemia
    2. Bacterial translocation
    3. Gangrene

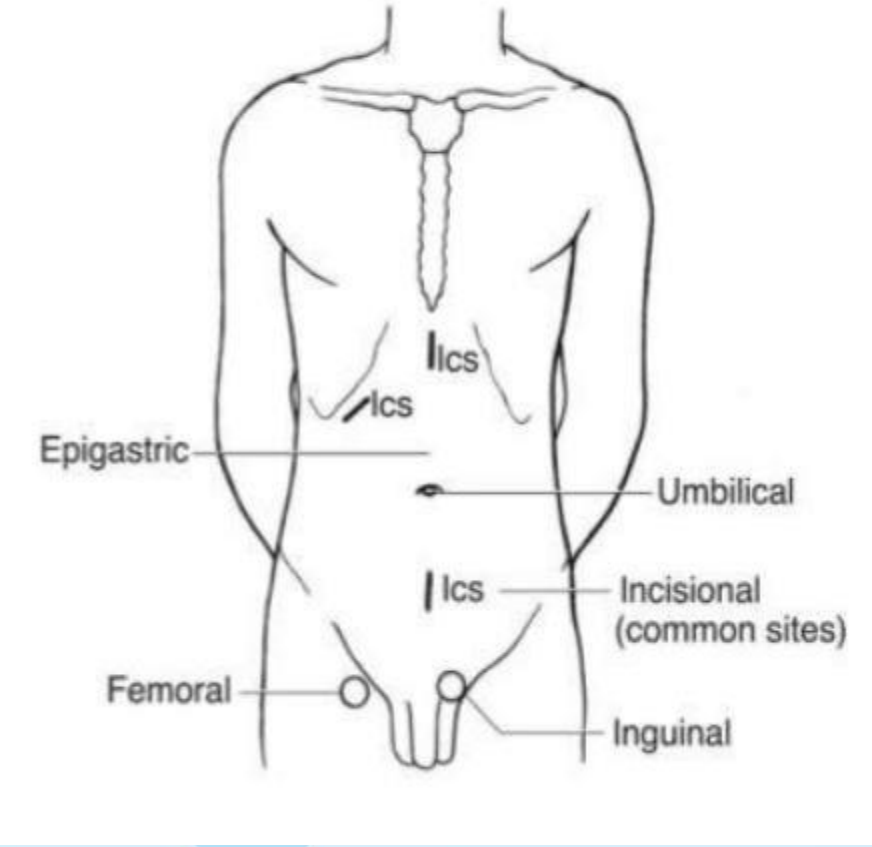
Clinical features

1. Reducible
2. Irreducible
3. Obstructed
4. Strangulated



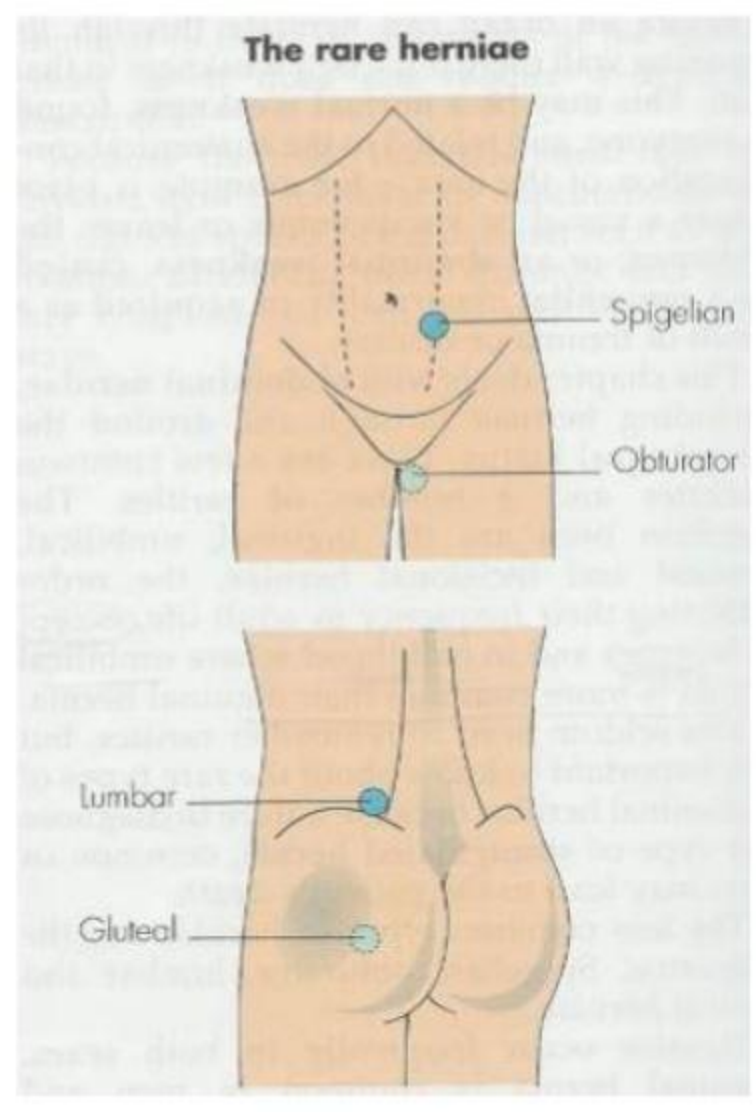
Classification

- Common hernia
  - Inguinal
  - Femoral
  - Umbilical
  - Incisional
  - Epigastria hernias



Classification

- Rare hernia
  - Spigelian
  - Gluteal
  - Obturator
  - Lumbar



Aetiology

- Hernias occur at sites of weakness in the wall This weakness may be :
  - Normal (physiological) weakness, related to the anatomical causes.
  - Congenital abnormality.
  - Acquired :
    - Traumatic
    - Diseases

Risk factors

- increases intra-abdominal pressure
  - Chronic cough
  - Constipation
  - Pregnancy
  - Straining at micturation
  - Severe muscular effort (lifting heavy objects)
  - Ascites - fluid may increase the size of an existing sac.

Anatomy of inguinal region

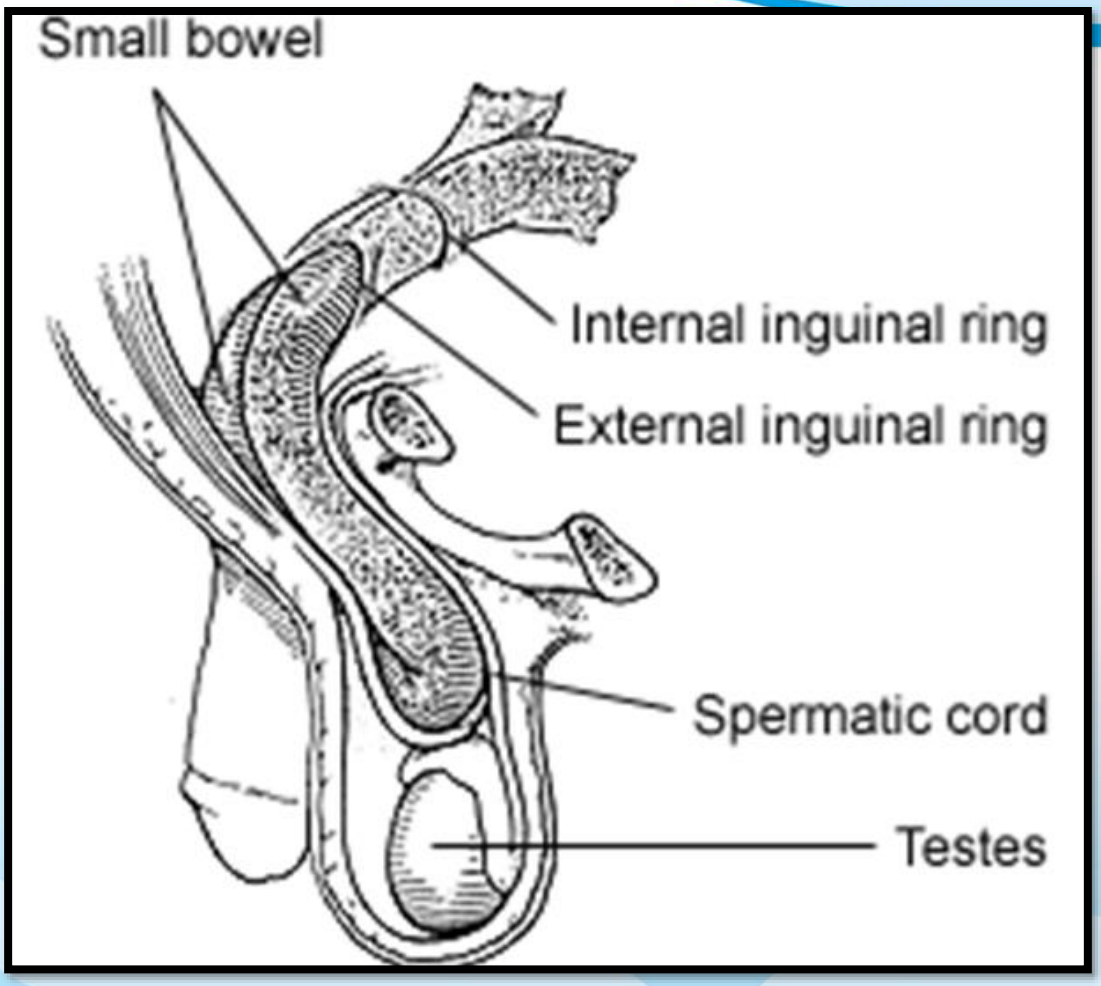
- **Superficial inguinal ring-**
  - triangular aperture in the aponeurosis of the ext oblique muscle .
  - Lies 1.25 cm above the pubic tubercle .
  - Normally it doesn't admit the tip of the little finger.

- **Deep inguinal ring –**
  - U shaped condensation of the fascia trasversalis
  - Lies 1.25cm above the mid inguinal point.

Inguinal canal

- Oblique passage in the lower part of the anterior abdominal wall.
- Extends from deep inguinal ring to superficial inguinal ring.
- Directed downwards forwards and medially
- About 4cm long


Iliac crest
Anterior superior spine
Muscles
Pubis
Inguinal canal


Small bowel
Internal inguinal ring
External inguinal ring
Spermatic cord
Testes

Boundaries

- Anterior – Ext. oblique aponeurosis & conjoined muscle laterally.
- Posterior – Fascia transversalis & the conjoined tendon.
- Superiorly – conjoined muscle.
- Inferiorly – inguinal ligament.

Contents

- Spermatic cord
- Ilioinguinal nerve
- Genital branch of genitofemoral nerve
- Females – Round ligament is present instead of spermatic cord.

Spermatic cord constitutes- vas deferens, testicular & cremastic arteries , pampiniform plexus of veins, lymphatics

Defense mechanism of inguinal canal

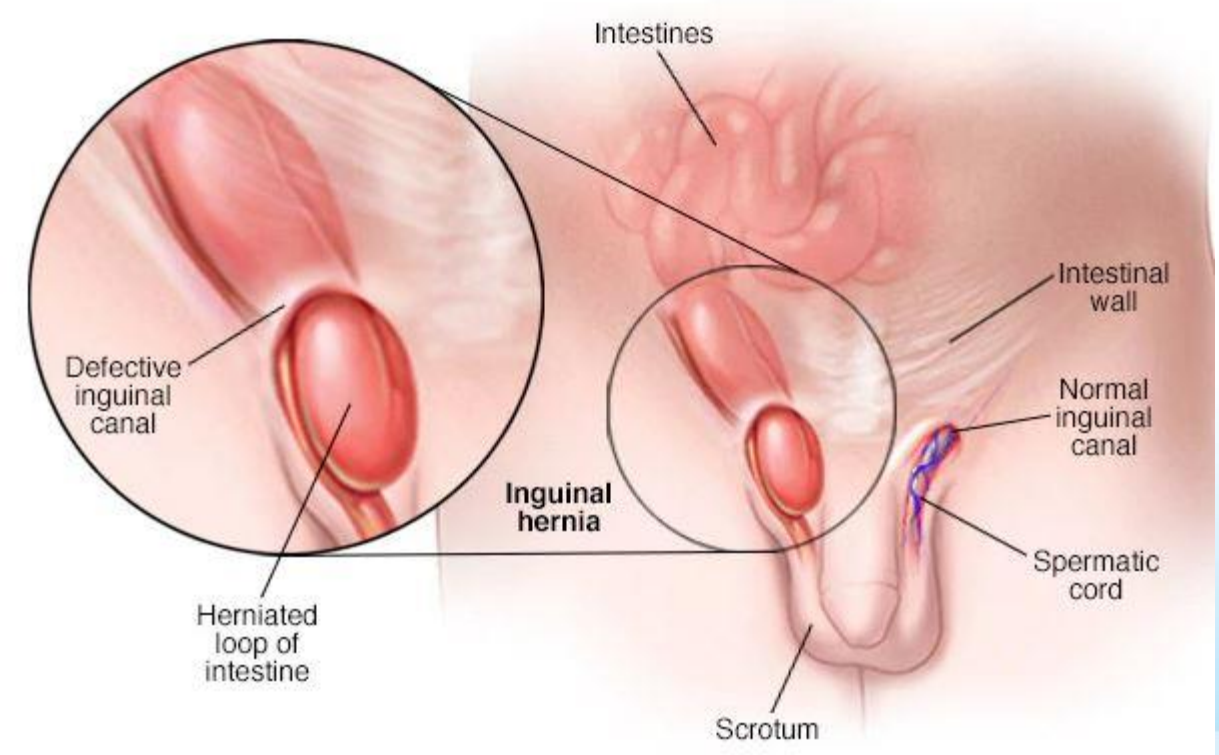
- Obliquity of the inguinal canal.
- Shutter mechanism-due to conjoined tendon contraction

Groin hernia

- Groin hernias are found in 5% of 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%.

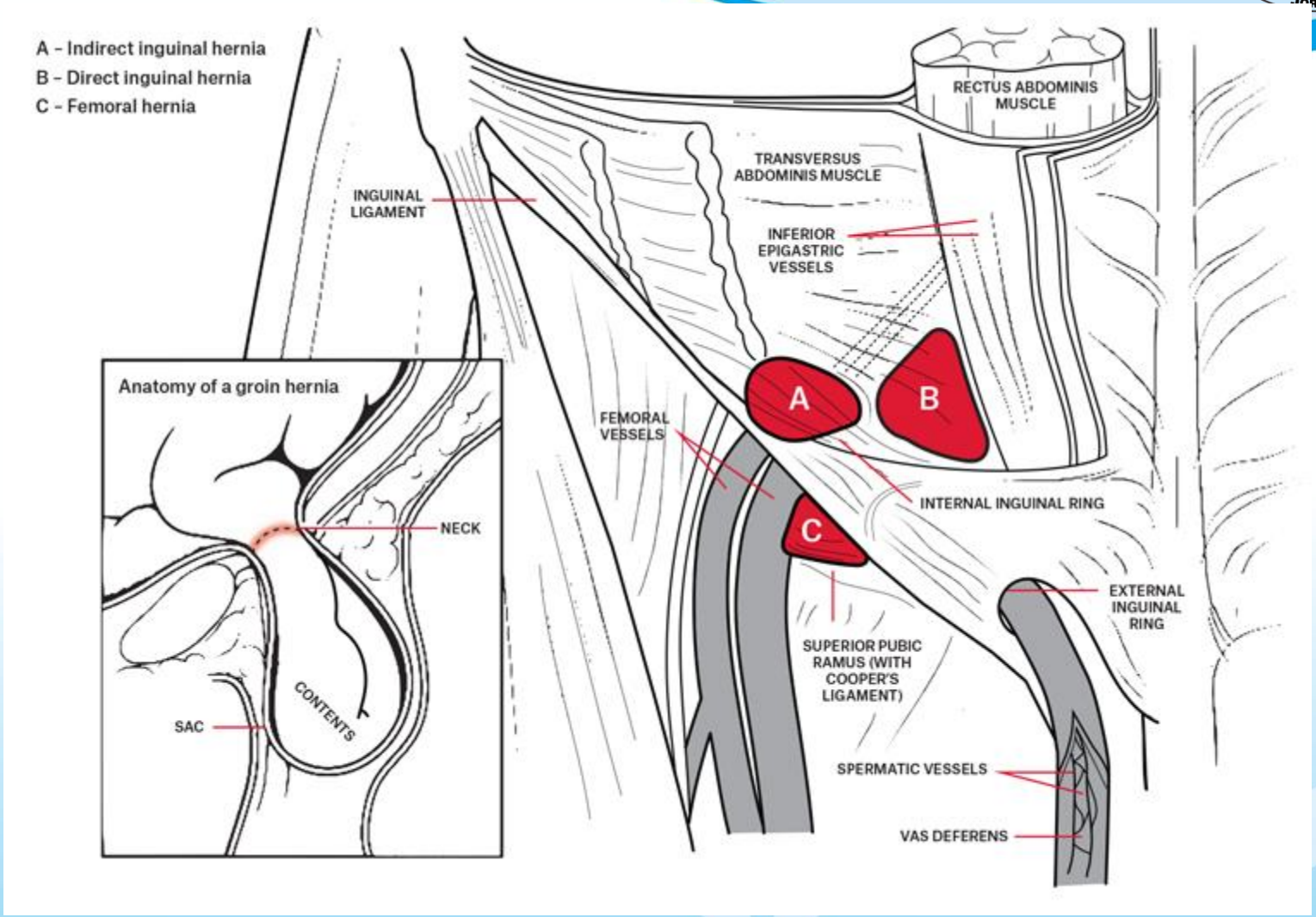
Femoral hernia vs. inguinal hernia

Inguinal hernia	Femoral hernia
1- more common in male	1- more common in females
2- pass through the inguinal canal	2- pass through the femoral canal
3- neck of the sac is above and medial the pubic tubercle	3- neck of the sac is below and lateral the pubic tubercle
4- less common to be strangulated	4- more common to be strangulated
5- can be treated without surgery	5- must be treated surgically
6- the sac mainly contain: bowel	7- the sac mainly contains: omentum


Intestines
Intestinal wall
Defective inguinal canal
Normal inguinal canal
Inguinal hernia
Spermatic cord
Herniated loop of intestine
Scrotum

Indirect hernia

- It is more common in young
- the abdominal contents herniation occurs through the deep ring into the inguinal canal.
- Comes out through the superficial ring.
- It may extend into the scrotum.
- Depending upon extent it may be complete or incomplete.

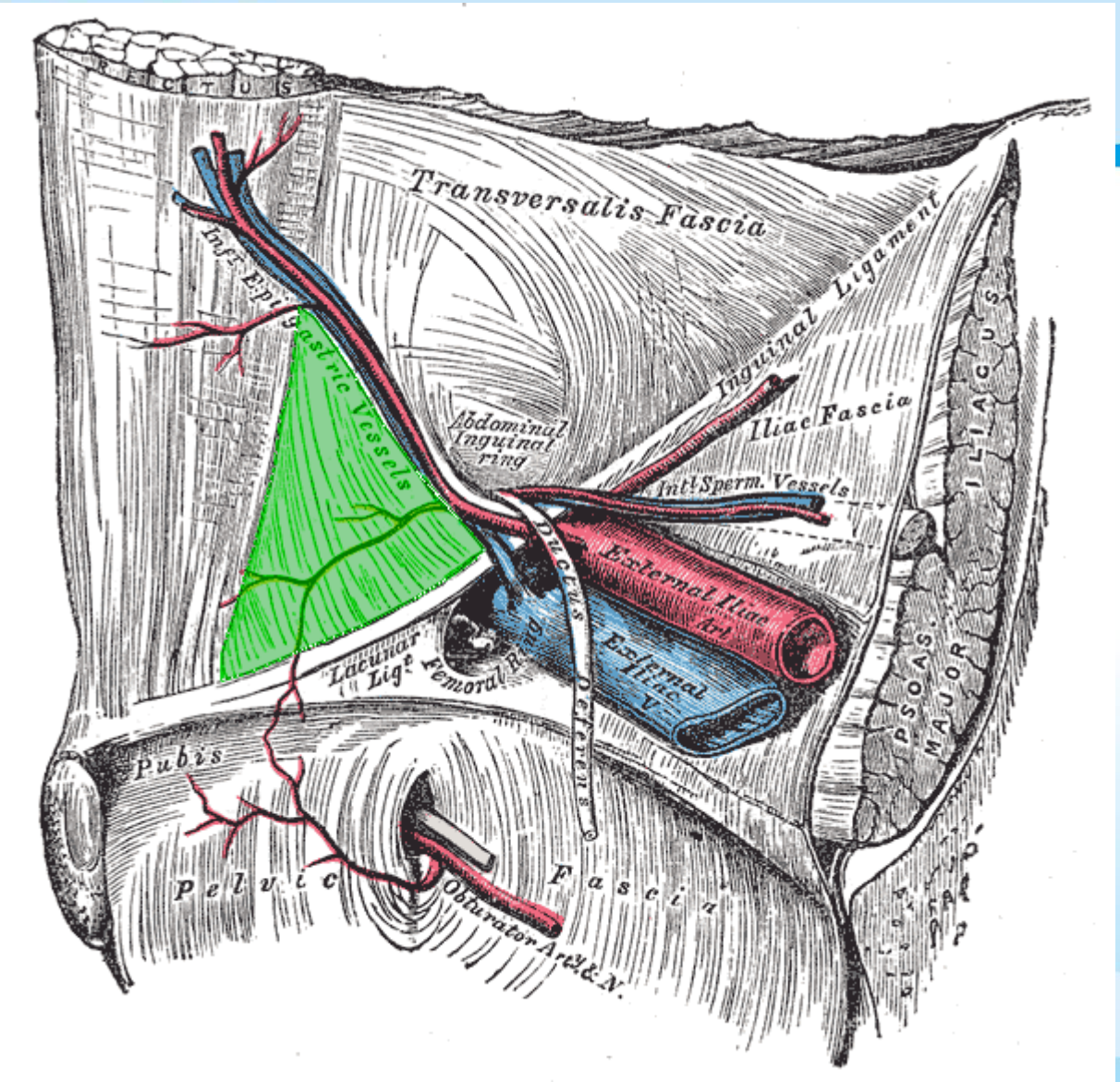

A – Indirect inguinal hernia
B – Direct inguinal hernia
C – Femoral hernia
Anatomy of a groin hernia
NECK
SAC
CONTENTS
INGUINAL LIGAMENT
RECTUS ABDOMINIS MUSCLE
TRANSVERSUS ABDOMINIS MUSCLE
INFERIOR EPIGASTRIC VESSELS
A
B
C
FEMORAL VESSELS
INTERNAL INGUINAL RING
EXTERNAL INGUINAL RING
SUPERIOR PUBIC RAMUS (WITH COOPER'S LIGAMENT)
SPERMATIC VESSELS
VAS DEFERENS

Direct hernia

- more common in old
- contents herniate directly through the posterior wall of the inguinal canal through the Hesselbach's triangle
- It is a weakness in posterior wall of the inguinal canal
- It is bounded laterally -inferior epigastric artery,

medially – lateral border of rectus abdominus muscle

inferiorly – inguinal ligament


Transversalis Fascia
Inguinal Ligament
Iliac Fascia
Abdominal Inguinal ring
Int. Sperm. Vessels
External Iliac Art.
External Iliac V.
Lacunar Lig.t
Femoral Ring
Ductus Deferens
Pubis
Pelvic Fascia
Obturator Art. & N.
PSOAS MAJOR
ILIACUS

- Male inguinal hernia
- Female inguinal hernia

Epidemiology

- **Approximately 7% of all surgical outpatient.**
- Accounts for 96% groin hernias (other 4% are femoral)
- Bilateral in 20% of cases
- Lifetime risk of inguinal hernia: 10%
- M:F 9:1

- Affects 1-3% of young children
- In men the incidence rises from 11 per 10,000 person years aged 16-24 years to 200 per 10,000 person years aged 75 years or above.
- Extremely common; represents the most frequent problem requiring surgical intervention in the paediatric age group
- Much more common in boys (90% of cases) than girls
- Definite familial tendency,
- more frequent on the right side as a result of later descent of the right testis and delayed obliteration of the right processus vaginalis.

Presentation

- Pain
  - Localized pain
  - Referred pain
  - Generalized pain
- Nausea and vomiting
- Constipation
- Urinary symptoms

Presentation

- At first appearance, it is easily reducible.

- With time it can no longer be reduced, it is irreducible or incarcerated.
- Strangulation: when visceral contents of the hernia become twisted or entrapped by the narrow opening.

Strangulation usually leads to bowel obstruction with sudden, severe pain in the hernia, vomiting and irreducibility.

Diagnosis- Inspection

- Inguinal hernias are best examined with the patient standing.
- Coughing may increase the size of the hernia.
- Site and shape of the hernia:
  - those appearing above and medial to the pubic tubercle are inguinal hernias
  - those appearing below and lateral to the pubic tubercle are femoral hernias
- whether the lump extends down into the scrotum
- any other scrotal swellings
- any swellings on the 'normal' side
- scar from previous surgery or trauma

Palpation

- Confirm inspectory findings
- Examine the scrotum- Getting above the swelling is not possible
- Consistency, temperature, tenderness and fluctuance.
- One should attempt to reduce the hernia:
  - Ask the patient to reduce.
- If the hernia cannot be reduced the probable identity of the hernia is: femoral > indirect inguinal > direct inguinal
- Expansile cough impulse

- **Deep ring occlusion test-** reduce the swelling
  - Locate the deep ring 1/2 " above the midpoint of the inguinal ligament and occlude it asking the patient to cough.
  - Impulse seen- direct, not seen- indirect
- Leg raising test- Malgaigne's bulgings seen
- Swelling gurgles- enterocoele, firm/granular- omentocoele.
- Always palpate the other inguino-femoral region as herniae are often bilateral

Percussion

The characteristics of hernias depend on their contents:

- bowel is hyper-resonant and has bowel sounds unless it is strangulated
- omentum and fat is dull and does not have bowel sounds

Investigations

Ultrasound

- High Test Sensitivity (>90%)
- High Test Specificity
  - Distinguish Incarcerated Hernia from firm mass

Herniography

- Suspected hernia, but clinical dx unclear
- Procedure done under flouroscopy following injection of contrast medium
- Frontal and oblique radiographs are taken with and without increased intra-abdominal pressure

Management

Non operative Treatment

- Watchful waiting: for asymptomatic or minimally symptomatic

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

The purpose is twofold: to maintain reduction and to prevent enlargement.

Surgery

Mesh repairs

Open repair (Lichtenstein)

Most commonly performed: Lichtenstein repair

It’s "tension-free" repair

Tension-free suture repairs

- Shouldice
- Bassini

Laparoscopic repair

- transabdominal preperitoneal (TAPP)
- totally extra-peritoneal (TEP) repair

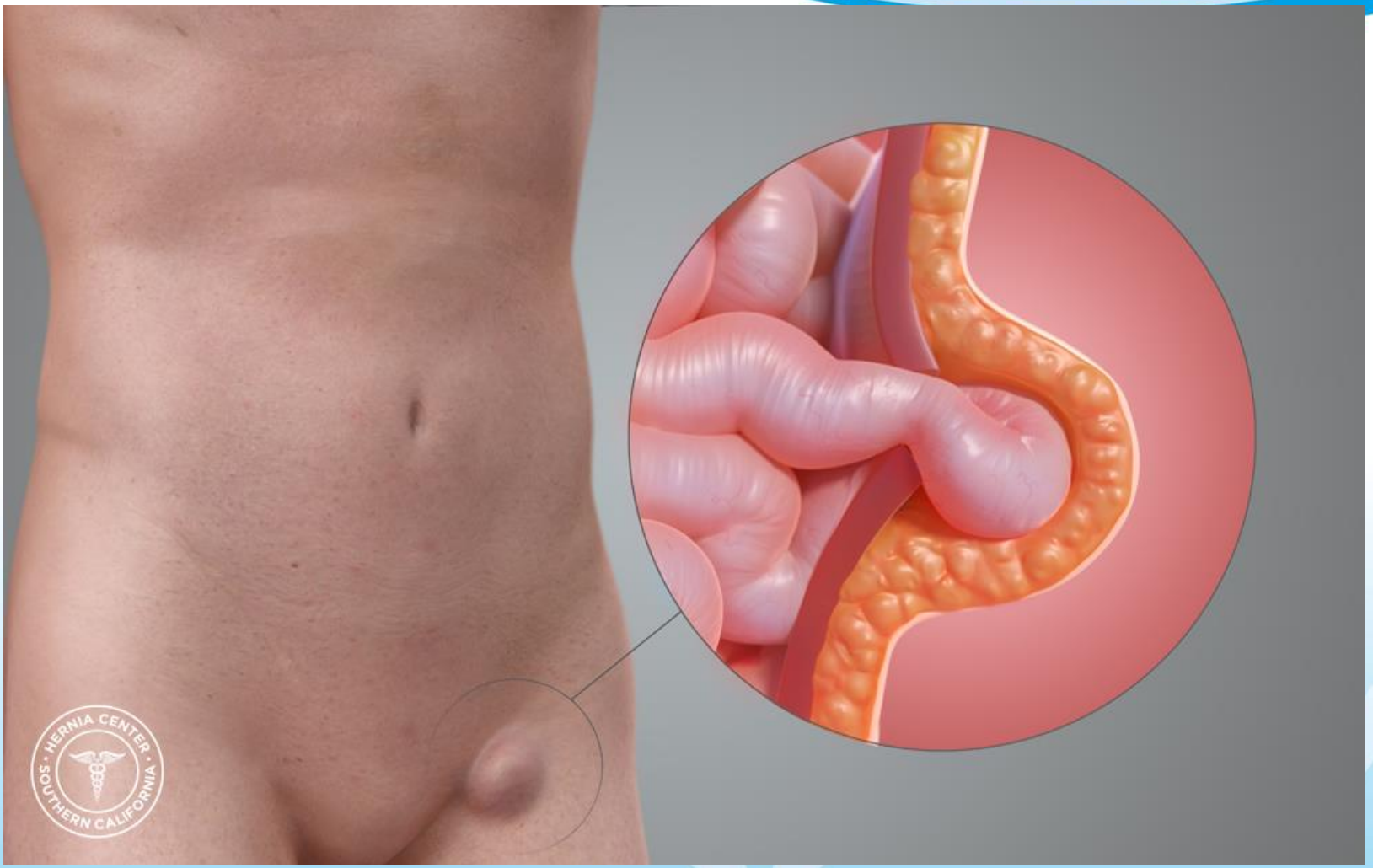
Laparoscopic vs. open mesh surgery

Advantages	Disadvantages
•Quicker recovery	•Needs surgeon highly experienced
•Less pain during first days	Longer operating time
•Fewer postoperative complications such as infections, bleeding and seromas	Increased recurrence of primary hernias if surgeon not experienced enough
•Less risk of chronic pain	

Complications are frequent (>10%).

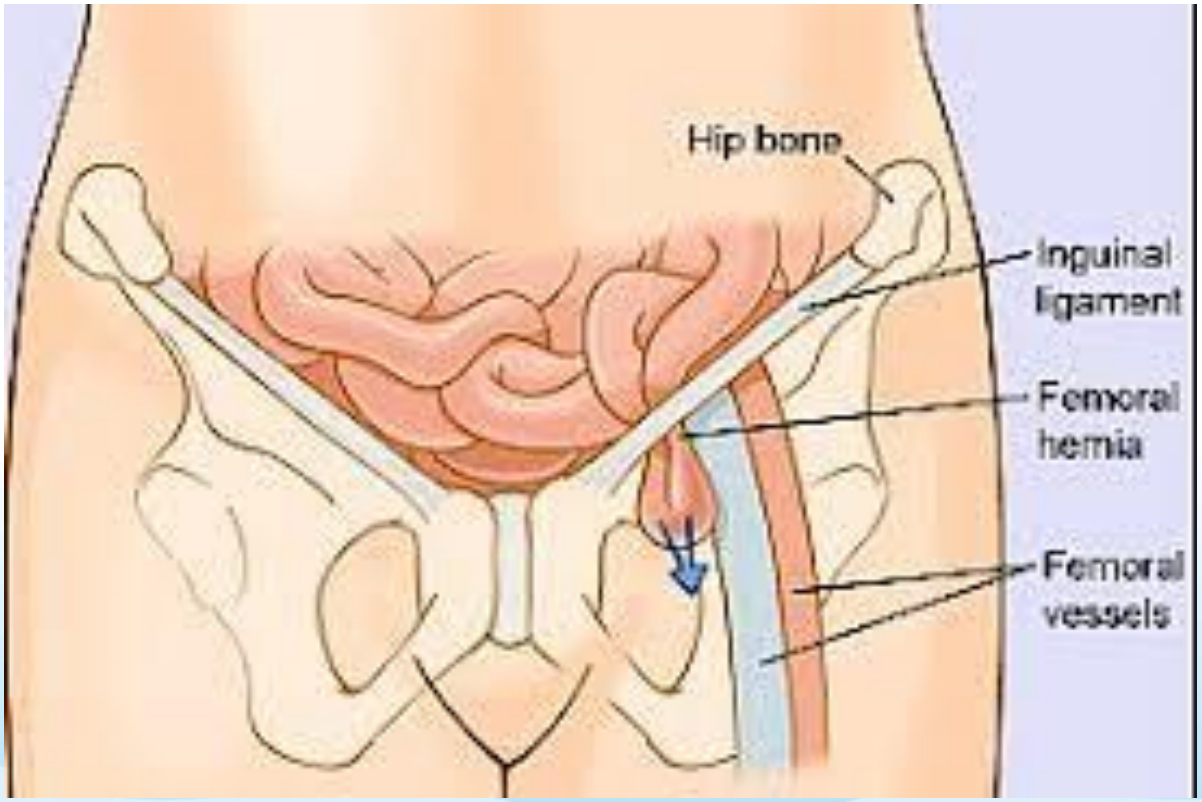
- Foreign-body sensation
- Chronic pain
- Ejaculation disorders
- Mesh migration
- Mesh folding (meshoma)
- Infection
- Adhesion formation
- Erosion into intraperitoneal organs

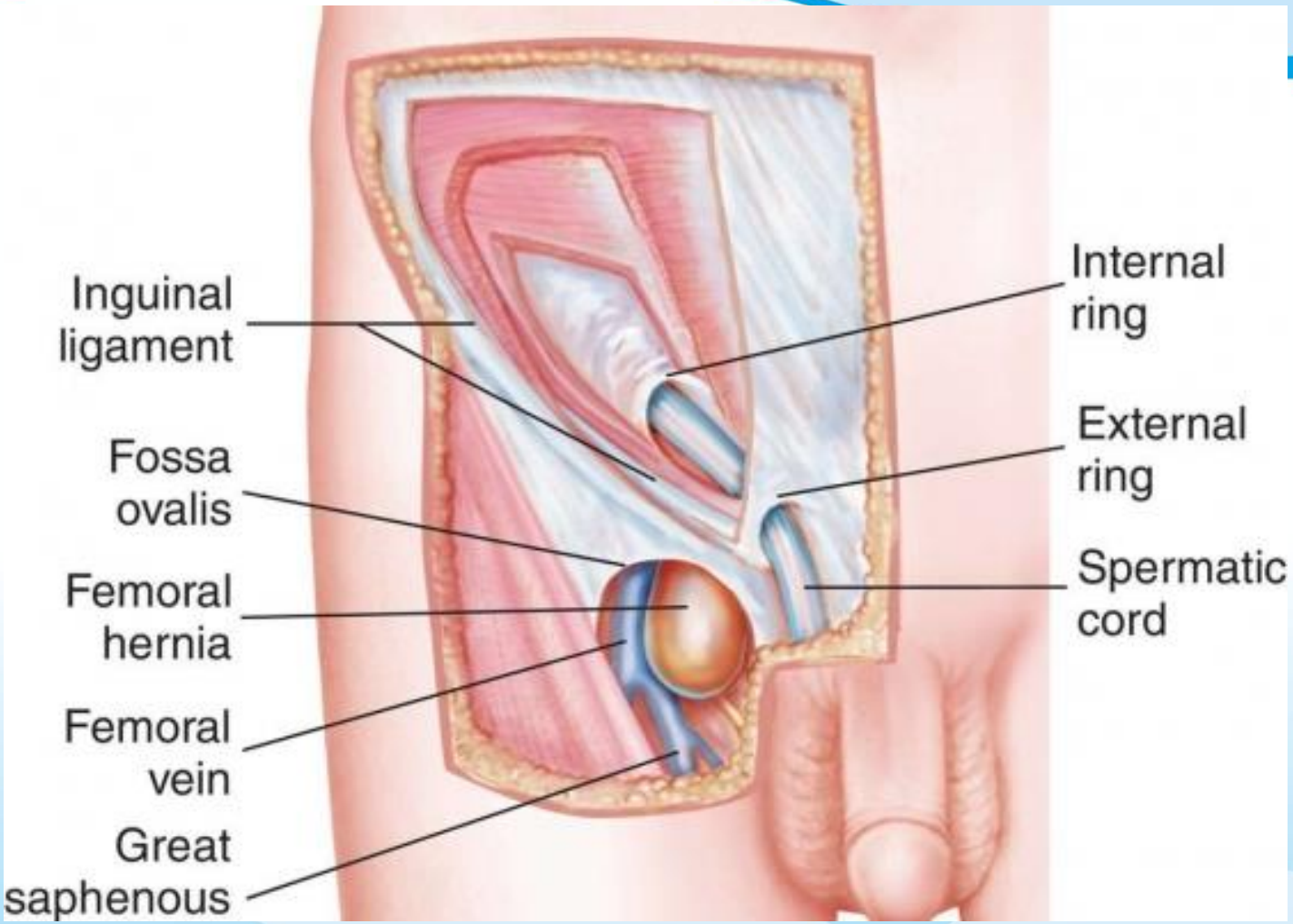
- In the long term, polypropylene meshes face degradation due to heat effects.
- obstructive azoospermia

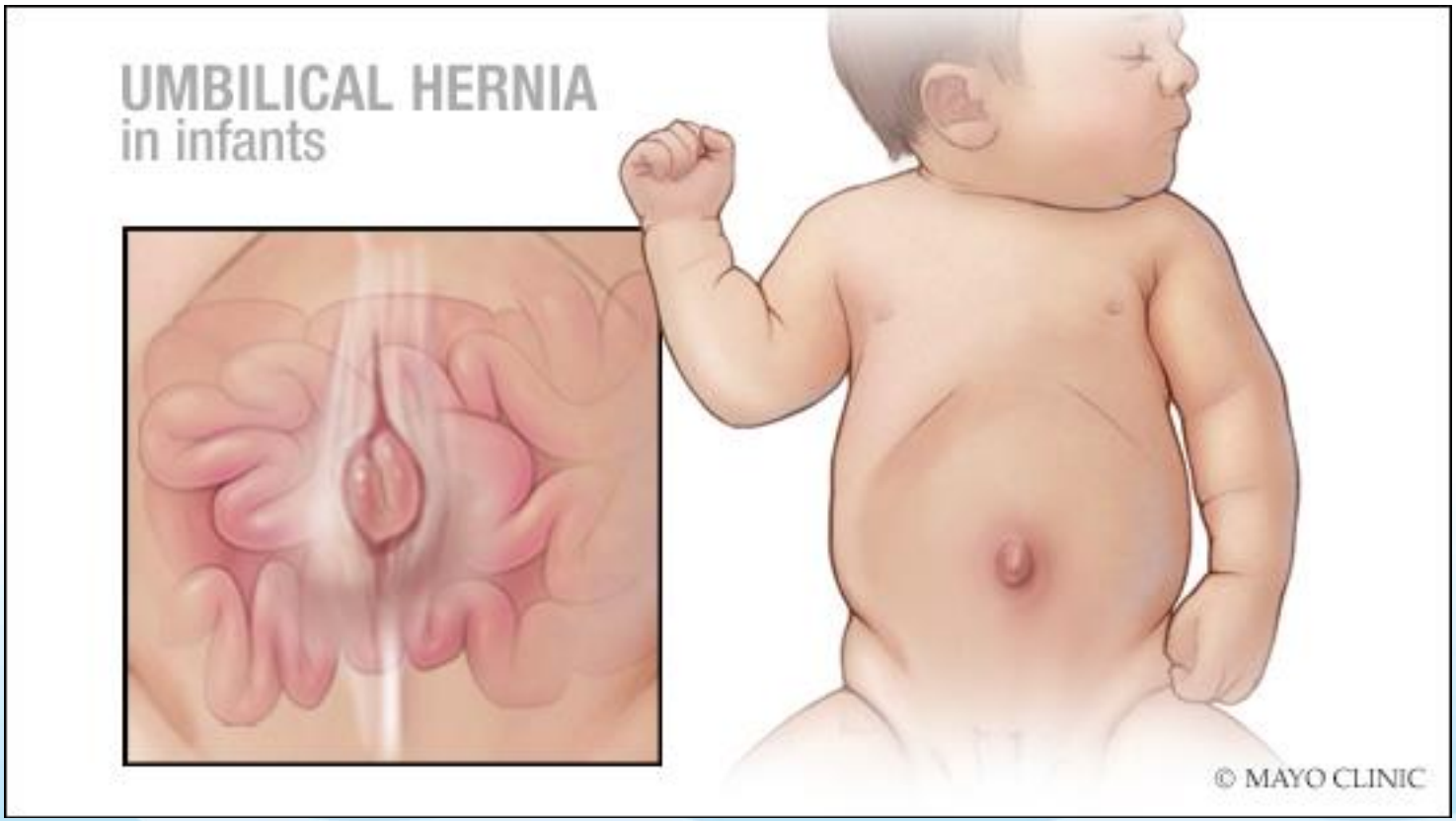

HERNIA CENTER
SOUTHERN CALIFORNIA

Femoral hernia

- The femoral canal is the way that the femoral artery, vein, and nerve leave the abdominal cavity to enter the thigh.
- Although normally a tight space, sometimes it becomes large enough to allow abdominal contents (usually intestine) into the canal.
- This hernia causes a bulge below the inguinal crease in roughly the middle of the thigh.
- Rare and usually occurring in women, these hernias are particularly at risk of becoming irreducible and strangulated.


Hip bone
Inguinal ligament
Femoral hernia
Femoral vessels


Inguinal ligament
Fossa ovalis
Femoral hernia
Femoral vein
Great saphenous
Internal ring
External ring
Spermatic cord

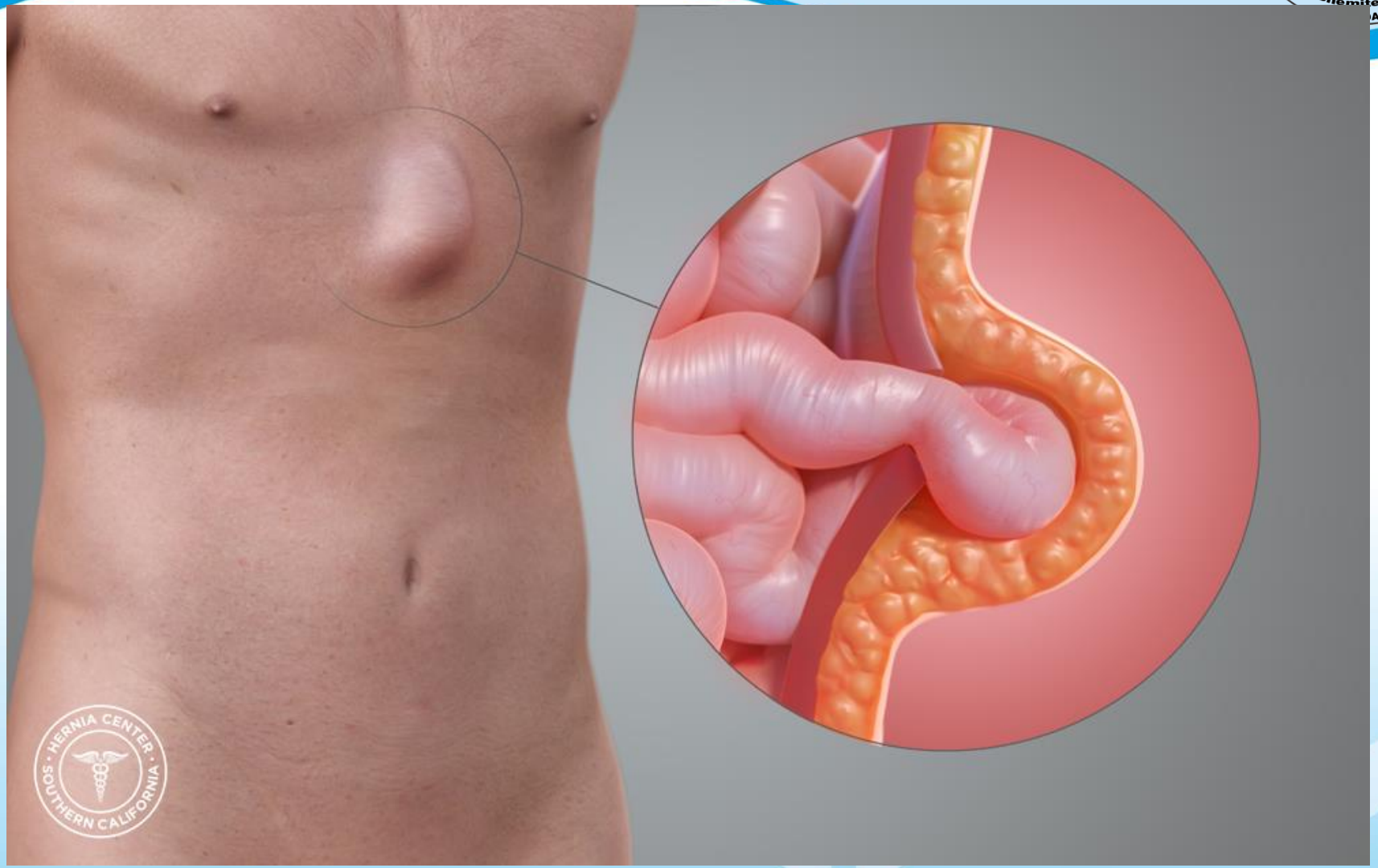

UMBILICAL HERNIA
in infants
© MAYO CLINIC

Umbilical hernia

- These common hernias (10-30%) are often noted at birth as a protrusion at the bellybutton (the umbilicus).
- This is caused when an opening in the abdominal wall, which normally closes before birth, doesn't close completely.
- 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.

Incisional hernia

- 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%).


HERNIA CENTER
SOUTHERN CALIFORNIA

Epigastric hernia

- 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.