



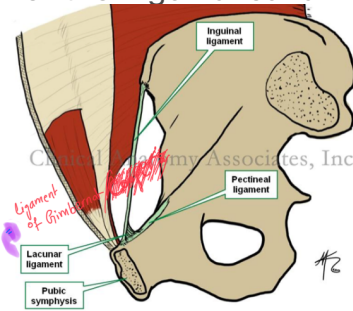
Round : ..General surgery

Group no : B3.....

Done By : ..Fatima abu assal

Hernia:

🌸 **External abdominal oblique aponeurosis** folds back on itself to **form the inguinal ligament** (poupart ligament) that extends from the ASIS to pubic tubercle and forms the floor of the inguinal canal



Inguinal canal

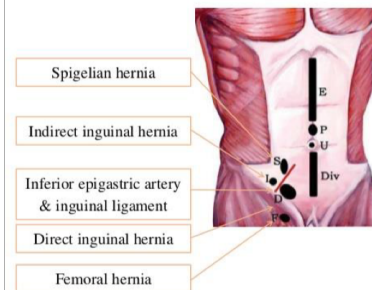
- It measures approximately 3-5 cm and extends from the **deep inguinal ring to the superficial inguinal ring**. (spermatic cord + round ligament pass through it)
- The **deep ring**, formed by an opening in the transversalis fascia, corresponds to the middle of the inguinal ligament midway between the anterior superior iliac spine and the pubic tubercle (spermatic cord + round ligament + ilioinguinal nerve pass through it)
- The **superficial inguinal ring** is formed by an opening in the aponeurosis of the external abdominal oblique muscle.
- The inguinal canal is formed **superiorly** by the lower edge of the internal abdominal oblique and transversus abdominis muscles; **inferiorly** by the inguinal and lacunar ligaments; and **anteriorly** by the external abdominal oblique aponeurosis. The lateral third of the anterior wall is further reinforced by a portion of the internal abdominal oblique. The **posterior** wall is formed by the conjoint tendon and the transversalis fascia.

In **males**, the **inguinal canal** contain the **spermatic cord** and **ilioinguinal nerve**, whereas in **females**, it remains less developed and contains the **round ligament of the uterus**, in addition to the **ilioinguinal nerve**.

Midinguinal point: half way between ASIS and pubic symphysis

Midpoint of inguinal ligament between ASIS and pubic tubercle (surgical landmark of deep inguinal ring)

Groin hernias



Jamadar DA et al. AJR 2007;188:1356-1364.

🌸🌸 Most common external hernia is inguinal hernia

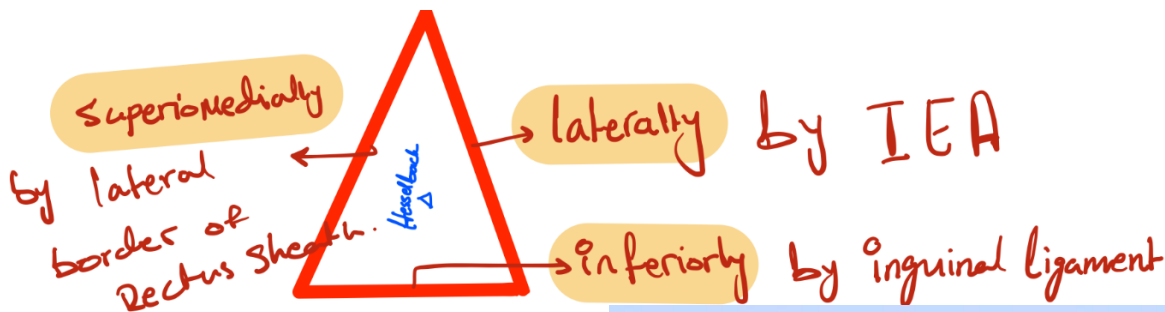
🌸🌸 Most common herniated organ in inguinal hernia in males is small bowel and in females is ovary

🌸🌸 Inguinal hernias always originate **above** the inguinal ligament (Direct and indirect inguinal hernia)

🌸 Pediatric inguinal hernia almost always indirect and has high risk to incarceration, it is more common on the Rt.

🌸 **Indirect inguinal hernia** is the most common type of groin hernia // mainly congenital // M > F // neck of hernia with an internal inguinal ring superior and **lateral** to IEA // Fundus of hernia Anterolateral to spermatic or round ligament // mostly contains small bowel or omentum // Herniorrhaphy is the procedure of choice in managing it // deep ring occlusion test **positive**

🌸 **Direct inguinal hernia** is the second most common type of groin hernia // Mainly acquired // occurs through the floor of inguinal canal through **hesselbach** triangle // passing through a defect in conjoint tendon // rises inferior and **medial** to IEV // less association with strangulation // mostly contains preperitoneal fat // disappears by laying flat // deep ring occlusion test **negative**



Difference between indirect, direct I H

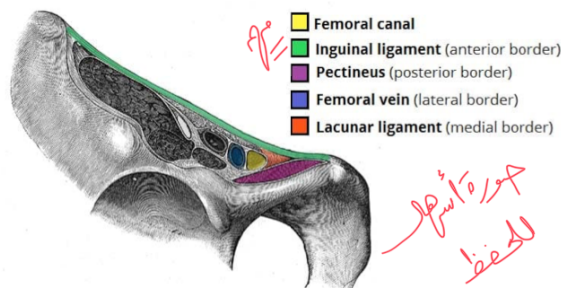
	INDIRECT	DIRECT
Age	Usually young	old
cause	May be congenital	acquired
Bilateral	20%	50%
Protrusion on cough	oblique	straight
Appearance on standing	Does not reach full size immediately	Does reach
Reduction on lying down	May not reduce	reduce

Difference between indirect, direct I H

	indirect	direct
Neck of sac	narrow	wide
strangulation	Not uncommon = common	unusual
Relation to inferior epigastric	lateral	medial
Descent to scrotum	common	rare
Internal ring test	control	No control

🌸 **Femoral hernia:** weakness in the transversalis fascia // typically present with a bulge **below** and **posterior** the inguinal ligament and **anterior** to the pubic ramus periosteum (Cooper ligament) and **medial** to the femoral vein//strangulation is the most common series complication(have the highest rate of strangulation(15-20%)) عكس الي فوقه //small bowel obstruction is the first presentation//F>M//always acquired//impulse on cough is RaRe!//60% on right side// rare before the age of 15.

🌸🌸 **Borders of femoral canal:** inguinal ligament anterosuperiorly//coopers ligament inferiorly// femoral vein laterally//The junction between Cooper's ligament(pectineal ligament) and in iliopubic tract medially



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

🌸 Pantaloons hernia=romberg's hernia=saddle bag hernia(ipsilateral concurrent direct and indirect inguinal hernia)

🌸 Nyhus classification:

type-1: indirect inguinal hernia(internal inguinal ring normal)

type-2: indirect inguinal hernia (The internal inguinal ring is dilated but posterior inguinal wall is intact)

type-3: posterior wall defect(Direct inguinal hernia,femoral hernia, indirect inguinal hernia with internal inguinal dilation and massive scrotal or a sliding hernia)

type-4: direct,indirect,femoral,combined

🌸 **Richter hernia:** only the border of the antimesenteric border of the **bowel** herniates through the fascial defect(involves portion of the circumference of the bowel) **obstruction is unlikely** even if the Hernia is incarcerated or strangulated thus the patient may **not** present with vomiting(can perforate **without** signs and symptoms of obstruction)

🌸 Most common complication in inguinal hernia is chronic groin pain(up to 36%)

🌸 Most **reliable diagnostic sign** in hernia examination is if the **lump reduces** when the patient lies flat.

Contents, how to know?

	Intestine	Omentum
Consistency	Soft	Doughy
Gurgling	During reduction <i>Yes</i>	None <i>No</i>
Ease of reduction	First part more difficult	Last part more difficult
Percussion	Resonant	Dull

DDx and Examination

Summary of Groin Lumps and Swellings and Their Clinical Features		
Disorder	Anatomical/Developmental Basis	Clinical Features
a. Inguinal hernia <i>Direct</i>	Simple bulging of abdominal contents resulting from inadequate support by weak or ruptured <u>posterior wall of inguinal canal</u> (transversalis fascia).	Discomfort; lump usually disappears on lying down; risk of incarceration if large but <u>low</u> risk of strangulation
<i>Indirect</i>	Passage of abdominal contents, often including bowel, through inguinal canal towards scrotum or labium majus	Potential for incarceration and strangulation; much more common <u>in men</u>
b. Femoral hernia	Abdominal contents, often including bowel, migrate into femoral canal.	Rarely has a cough impulse; <u>rarely reducible</u> ; <u>high</u> rate of strangulation; <u>more common in women</u>
c. Inguinal lymphadenopathy	Inguinal nodes drain lower limb, abdominal wall below umbilicus, anal canal, scrotal skin, penis (but not testes, which drain to paraaortic and parailiac nodes)	Enlarged nodes indicate infection, lymphoma or metastases from primary lesion in drainage area
d. Saphena varix	Dilatation of long saphenous vein superficial to deep fascia before it enters the femoral vein	Can be mistaken for femoral hernia but empties on pressure and disappears on lying down, unlike femoral hernia; varicose veins present in the leg
e. Femoral artery aneurysm	Dilatation of common femoral artery just below inguinal ligament	Found in patients over 65 years, mostly male; classic clinical sign is expansile pulsation; could be mistaken for femoral hernia
f. Psoas abscess	Classically, a tuberculous abscess of lumbar vertebra tracking down inside sheath of psoas muscle; occasionally a pyogenic abscess originating within the abdomen presents via the same route	Tuberculosis presents as swelling or 'cold abscess' below inguinal ligament; rare nowadays but may be confused with lymph nodes; pyogenic abscess typically 'hot'; rarely may be caused by abscess from renal stones

inguinal - canal

- Anterior  Aponeurosis of the external oblique
- Root  Internal oblique and transversus abdominis. *forming Congant tendon.*
- Posterior  Transversalis fascia
- floor  Inguinal ligament

** inferior wall → Inguinal Ligament
(Poupart Ligament)*

🌸 **Umbilical hernia:** due to to incomplete closure of a umbilical ring// mostly in children// majority close spontaneously or manage with herniotomy(F diameter larger than 1.5cm or persist more than 4 years)

🌸 **Para-umbilical hernia:**

Defect in the linea alba usually **above** umbilicus in obese middle aged **females**

Content: omentum, small and large bowel.

Partial reduction, **impulse on cough**

🌸 Most liable hernias to be Strangulated are femoral and paraumbilical

🌸 **Epigastric hernia(epiploceles):**

Results from defect in the **linea alba** **above** the umbilicus

M>F and 20% are **multiple**

Recurrence rate as high as 10%

🌸 Ventral hernias:

1-Incisional hernia: most common type of ventral hernia results from poor wound healing in the previous surgical incision and occurs in up to 20% of abdominal incisions.

2- Spigelian hernia : defect in the lateral edge of the rectus abdominis at semilunar line(from coastal arch to pubic tubercle) add the semi circular line of Douglas(below the umbilicus)

3-obturator hernias: occurs the pelvis through the obturator foremen and can cause pain along the obturator nerve in mid anterior thigh(howship Romberg sign), this type of hernia occurs after significant weight loss.

Classification according to the site

External	A. Anterior • ventral • Epigastric hernia • Umbilical hernia • para-umbilical hernia • Lateral • Spigelian hernia (Site: junction of the linea semilunaris and the arcuate line) • Groin • Above the inguinal ligament • (indirect & direct inguinal hernia)-MC • Below the inguinal ligament : (Femoral & obturator hernia).
	B. Posterior • Lumbar & gluteal hernia
	C. Incisional • Anywhere according to the site of the incision
Internal	• Diaphragmatic hernia • Esophageal hernia • Para esophageal hernia • Spigelian: aponeurotic fascia pushes through a hole in the junction of the linea semilunaris and the arcuate line creating a bulge
Rare	• Obturator • Gluteal

🌸 Possible complications after hernia surgery:

Nerve injuries like ilioinguinal nerve (most common injured nerve in open hernia repair) pts present with numbness over the lower abdomen and medial thigh

Lateral femoral cutaneous nerve (most common nerve injured during laparoscopic hernia repair) pts present with numbness over the lateral thigh as low as the knee

All of the following statements are true about inguinal canal except; (7/2018)

d) Superior wall is lacunar ligament and external oblique muscle.

Which artery is considered to be differentiate between site of origin in inguinal hernia; (7/2018)

c) Inferior epigastric artery

The most common injured nerve with inguinal hernia repair; (4/2018)

a) Ilioinguinal hernia repair

A 2 year old is brought into your office for an umbilical hernia. All of the following are true except; (4/2018)

- a) Patient should have surgery at about age 5 year if it fails to close
- b) Patient is at high risk for incarceration
- c) This hernia is increased in African patients.
- d) This hernia is increased in premature patients.
- e) Associated with congenital Hypothyroidism

A 50 year old male felt a pain in his groin after lifting a heavy box. He was advised on operation during the surgery a hernial sac with a small knuckle of intestine was found protruding just below the inguinal ligament the hernia was diagnosed as; (12/2017)

c) Femoral hernia

All of the following is differential diagnosis of Femoral hernia except; (7/2018)

a) Bartholin gland cyst

All are true about femoral hernia except; (7/2018)

- a) Most common groin hernia in women
- b) It goes into femoral canal
- c) It goes below inguinal ligament
- d) It lies medial to femoral vein
- e) It is high risk for strangulation

A 65 years old woman presents with a tender medial thigh mass the pain increases with internal rotation of the thigh the most likely Dx: (4/2018)

b) Obturator hernia

All the following sentences about hernia are true accepted; (12/2017)

- a) Inguinal hernia is the most common in both females and males
- b) Incisional hernia is more common after open compared with laparoscopic operation
- c) Open is always better and safer than laparoscopic approach for hernia repair
- d) Divarication of rectus abdominis muscles in elderly does not necessitate surgical repair
- e) Morbidity is increased after emergency compared with elective repair of hernia.

The commonest hernia type that can be strangulated i (12/2017)

d) Femoral

All sentences about abdominal hernias are true except ? (7/2017)

- a) Most umbilical hernias in adult are acquired .
- b) Incisional hernia results from a failure of fascial tissue to heal and close after surgery .
- c) Incisional hernia is more common after open compared with laparoscopic operation .
- d) Lumbar hernia is not common hernia .
- e) **Divarication of rectus abdominis muscles in elderly necessitates surgical repair .**

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All of the following is true regarding the femoral triangle except ? (4/2017)

- a) The inguinal ligament forms the base .
- b) **The medial border is formed by the lateral border of the adductor longus .**
- c) The lateral border is formed by the medial border of the Sartorius .
- d) The floor is formed by the adductor longus and pectineus muscle medially .
- e) The floor is formed by the Iliopsoas muscle laterally

Most common hernia in females is ? (1/2017)

e) Indirect inguinal hernia

A hernia sac containing a Meckels diverticulum is called : (10/2016)

b) Littre hernia

All of the following sentences about hernia are true except ? (7/2017)

- a) Inguinal hernia is the most common hernia in both females and male's .
- b) Femoral hernias are most common in females than male's .
- c) Morbidity is increased after emergency compared with elective repair of hernia .
- d) Urinary hesitancy and straining increase the risk for hernia formation .
- e) **Open is always better and safer than laparoscopic approach for hernia repair .**

One is false? (1/2017)

- a) Femoral artery is lateral to femoral vein in the inguinal area .
- b) **Femoral nerve is present within the femoral sheath .**
- c) Femoral triangle is bounded by Sartorius muscle laterally .
- d) Siatic nerve injury can be avoided by giving an injection on the upper lateral quadrant on the gluteal area .
- e) Great saphenous vein drains to femoral vein below the inguinal ligament .

A 30-year-old man presents with a mass in his right groin. It is not tender and is a bulge that is more prominent on standing and with exercise. On examination, you noted a 3-cm protrusion into the right scrotum that completely resolves with gentle pressure. The most appropriate management is:

C. Elective surgical repair

1. Which of the following is true regarding inguinal hernias?

- a. Inguinal hernia is more common in women than men
- b. Inguinal hernias are rarely bilateral
- c. Direct inguinal hernias are more common than indirect
- d. Recurrent hernias are more likely to be direct than indirect**
- e. There is no difference in recurrence rate based on type of repair

. Answer: d. Inguinal hernias are more common in men. They are frequently bilateral. Indirect inguinal hernias are more common than direct inguinal hernias. Recurrence rates vary widely depending on type of repair: mesh-based repairs have lower rates of recurrence than tissue-based repairs except for potentially the Shouldice repair (in the correct patient populations). It has been reported that direct inguinal hernias are more likely to recur than indirect inguinal hernias. The exact mechanism is unclear, though posited reasons include: inadequate mesh overlap on the pubic tubercle or differences in local collagen composition. Interestingly, there is a correlation between the primary subtype and recurrent subtype of hernia; that is, indirect inguinal hernias were correlated with finding a recurrent indirect inguinal hernia at reoperation and direct inguinal hernias were correlated with finding recurrent direct inguinal hernias

2. An 83-year-old thin woman with no history of abdominal surgery presents with symptoms of a small bowel obstruction. On physical examination, she has pain with medial (internal) thigh rotation. There is no palpable hernia in the groin. What is the most likely diagnosis?

- a. Femoral hernia
- b. Inguinal hernia
- c. Spigelian hernia
- d. Obturator hernia**
- e. Adhesive small bowel obstruction

2. Answer: d. Obturator hernias frequently occur in elderly, thin female patients. They have a high incidence of incarceration and small bowel obstruction may be the initial presentation. Pain with medial thigh rotation is the Howship–Romberg sign.

3. A 35-year-old woman presents with a 1-day history of abdominal pain, distension, and nausea. Physical examination reveals temperature of 38.5°C, heart rate 115, abdominal distention, and a tender bulge in the right groin with erythema. What is the most appropriate next step in management?

- a. Ultrasound of the right groin
- b. CT scan of the abdominal/pelvis
- c. Admission, NG tube decompression, IV fluid resuscitation**
- d. Laparoscopic inguinal hernia repair
- e. Open inguinal hernia repair

3. Answer: c. Though this patient is presenting with an incarcerated inguinal hernia requiring operative intervention, she is tachycardic and febrile and will require resuscitation. Obtaining a CT scan may be appropriate prior to operative repair. In the emergent setting, laparoscopic repair is typically not attempted and most patients with similar presentations will undergo open operations.

4. A 28-year-old active man with an athletic build is being evaluated for a 5-cm wide incisional hernia from a previous exploratory laparotomy for trauma. Which of the following repairs is

preferred for this patient?

- a. Open repair with intra-abdominal placement of synthetic mesh
- b. Laparoscopic repair with synthetic mesh
- c. Open repair with retrorectus placement of synthetic mesh
- d. Laparoscopic repair with barrier-coated synthetic mesh**
- e. Open repair with retrorectus placement of biologic mesh

4. Answer: d. The patient's defect is relatively small and he is a good candidate for laparoscopic repair, which is associated with less postoperative pain and a shorter hospital length of stay. Because the mesh will be placed as an intraperitoneal onlay (IPO), only barrier-coated meshes should be used, to prevent adhesion and erosion into bowel.