

Differential diagnosis of abdominal masses and abdominal hernias

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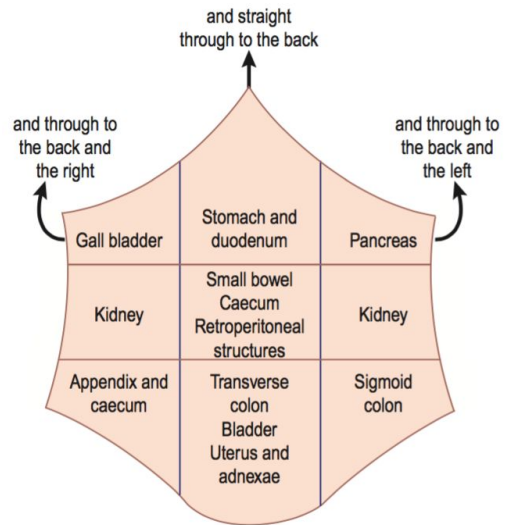
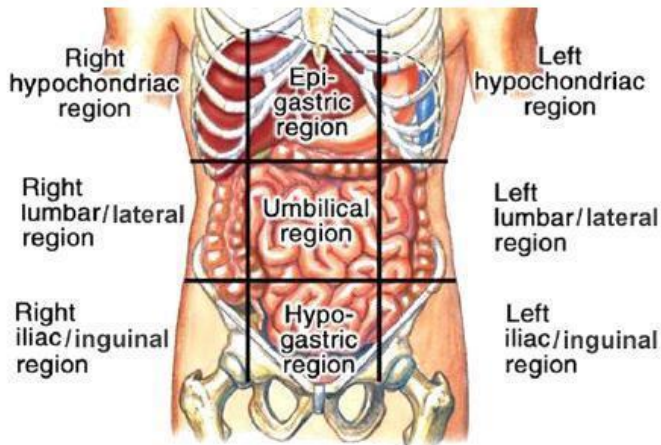
Malak Al-Khathlan
Abdulrahman Alkaff

Color Index:

-Surgery Recall -Browse's / Davidson's -Extra

Introduction:

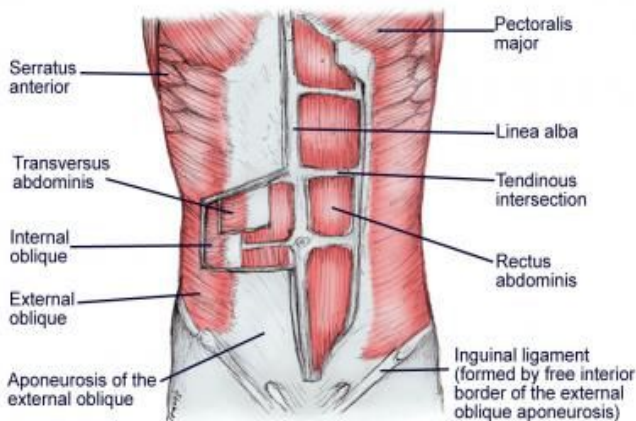
In order to narrow your differentials, you must know the exact anatomical position of each organ:



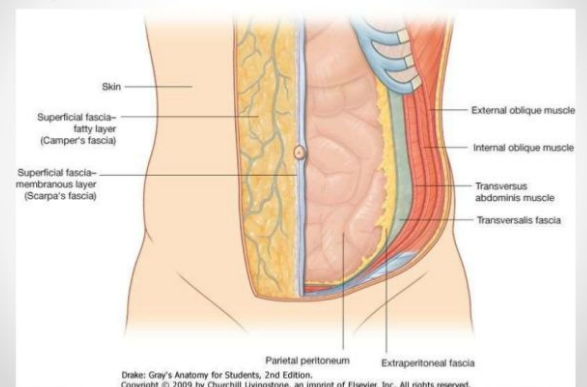
Layers of Anterior abdominal wall

From external to internal :

- Skin
- Superficial fascia (fatty layer is called Camper while membranous is called Scarpa)
- Deep fascia
- Aponneuroses of muscle layers
- External oblique muscle
- Internal oblique muscle
- Transversus abdominis muscle
- Transversalis fascia
- Extraperitoneal fat
- Peritoneum



Layers of Anterior Abdominal Wall

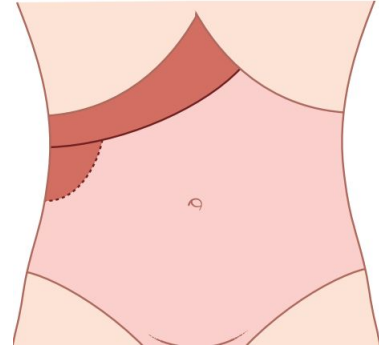


Right upper quadrant masses

Causes of hepatomegaly

- Infection
- Congestion
- Bile duct obstruction
- Cellular infiltration
- Cellular proliferation
- Space-occupying lesions

1) Hepatic: (Hepatomegaly)



The physical signs of an enlarged liver are as follows:

- It descends below the right costal margin.
- You cannot feel its upper limit.
- It moves with respiration.
- It is dull to percussion up to the level of the **eighth** rib in the mid-axillary line.
- It may have a sharp or rounded edge with a smooth or irregular surface.



© Can Stock Photo

Localized swellings:	Generalised enlargement
<ul style="list-style-type: none"> ● DDX: ● Riedel's lobe*. ● Secondary carcinoma. ● Hydatid cyst. ● Liver abscess. ● Primary liver carcinoma. ● Cholangiocarcinoma. ● Benign liver adenoma. 	<p>Smooth generalized enlargement, without jaundice :</p> <ul style="list-style-type: none"> ● Congestion from heart failure. ● Cirrhosis. ● Lymphoma. ● Hepatic vein obstruction (Budd-Chiari syndrome). ● Amyloid disease. ● Kala-azar. ● Gaucher's disease.
	<p>Smooth generalized enlargement, with jaundice :</p> <ul style="list-style-type: none"> ● Infective hepatitis. ● Biliary tract obstruction (gallstones, carcinoma of pancreas, atresia). ● Cholangitis. ● Portal pyaemia. ● Chronic active hepatitis.
	<p>Knobbly generalized enlargement, without jaundice:</p> <ul style="list-style-type: none"> ● Metastatic deposits. ● Cirrhosis. ● Polycystic disease. ● Primary liver carcinoma (hepatocellular and cholangiocarcinoma).
	<p>Knobbly generalized enlargement, with jaundice :</p> <ul style="list-style-type: none"> ● Metastatic deposits. ● Cirrhosis.

2) Gall bladder



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Causes of gallbladder enlargement:

-Obstruction of the **cystic duct**, usually by a gallstone, and rarely by an intrinsic or extrinsic carcinoma -

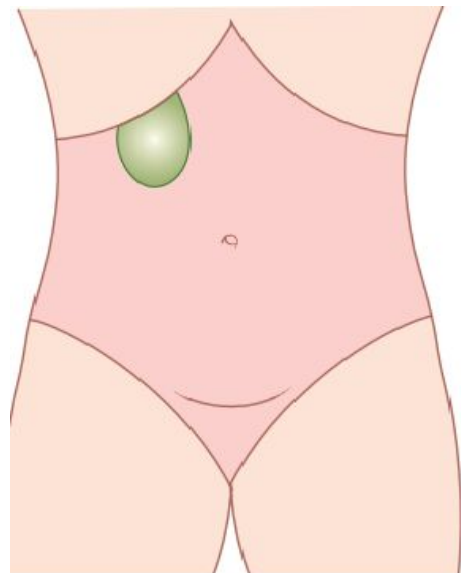
No jaundice and the gallbladder often contains bile, mucus (a mucocele) or pus (an empyema)

-Obstruction of the **common bile duct**, usually by a stone or a carcinoma of the head of the pancreas - the patient will be **jaundiced**.

The physical features of an enlarged gallbladder are as follows:

- It appears from beneath the tip of the right ninth rib.
- It is smooth and hemi ovoid.
- It moves with respiration.
- There is no space between the lump and the edge of the liver.
- It is dull to percussion

*It is an extension of the right lobe of the liver below the costal margin, along the anterior axillary line. It is a normal anatomical variation.(note on previous page)



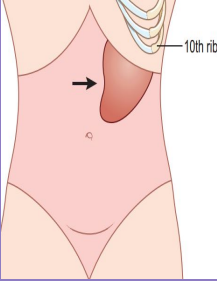
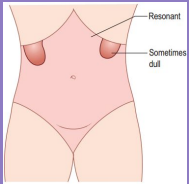
An enlarged gallbladder.

I Jus' WANNED TO MAKE YOU HAPPY...

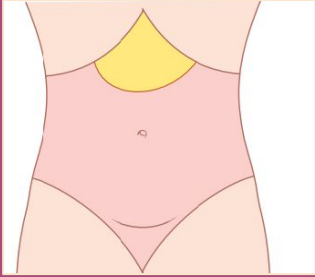
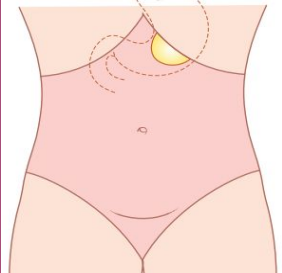


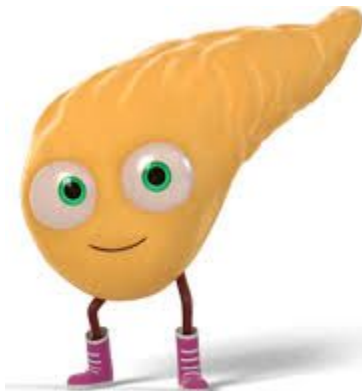
SAVE GALLBLADDER
project.theawkwardyeti.com

Left upper quadrant masses:

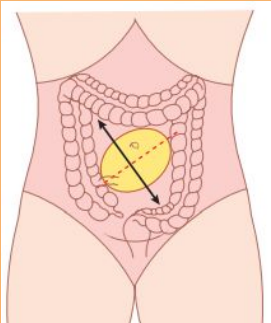

	DDx	Physical signs
<p>Splenomegaly</p> 	<p>Infection</p> <p>Bacterial :Typhoid Viral :Glandular fever. Epstein-Barr virus. Spirochaetal :Syphilis. • Leptospirosis Protozoal : Malaria,Kala-azar (leishmaniasis) ,Schistosomiasis.</p> <p>Cellular proliferation :</p> <ul style="list-style-type: none"> • Myeloid and lymphatic leukaemia. • Lymphomas. • Pernicious anaemia. • Polycythaemia rubra vera. • Spherocytosis and other haemolytic anaemias, for example elliptocytosis, autoimmune haemolytic anaemia and thalassaemia. • Thrombocytopenic purpura. • Myelofibrosis. • Sarcoidosis. <p>Congestion : Portal hypertension (cirrhosis, portal vein thrombosis). , Hepatic vein obstruction. • Congestive heart failure, Infarction and injury , Emboli from bacterial endocarditis. , Splenic artery or vein thrombosis caused by polycythaemia or sickle-cell disease. • Haematoma.</p> <p>Cellular infiltration : Amyloidosis. • Gaucher's disease.</p> <p>Collagen diseases : Felty's syndrome. • Still's disease.</p> <p>Space-occupying lesions : True solitary cysts. • Polycystic disease. • Hydatid cysts</p>	<p>-It appears from below the tip of the left tenth rib and enlarges along the line of the rib towards the umbilicus.</p> <ul style="list-style-type: none"> -It is firm, smooth and usually spleen shaped; it often has a definite notch on its upper edge. - You cannot get above it. -It moves with respiration. -It is dull to percussion. -it cannot be felt bimanually or be balloted.
<p>Kidney enlargement</p>  <p>5.20 Bilateral enlargement of the kidneys.</p>	<p>hydronephrosis; • pyonephrosis; • malignant disease: carcinoma of the kidney and nephroblastoma; • solitary cysts; • polycystic disease; • perinephric abscess</p>	<p>It is usually only possible to feel the lower pole, which is smooth and hemi ovoid</p> <ul style="list-style-type: none"> • It moves with respiration. <p>It is not dull to percussion because it is covered by the colon; • It can be felt bimanually and It can be balloted</p>

Epigastric masses

	Description	Physical signs
<p>Pancreatic pseudocysts</p> 	<p>definition: a collection of pancreatic juice and inflammatory exudate, usually associated with acute pancreatitis, which forms on the surface of the pancreatic gland and may bulge forwards, filling the lesser sac.</p> <ul style="list-style-type: none"> -The patient is usually known to have had an attack of acute pancreatitis. -They may then develop epigastric fullness, pain, nausea and vomiting 	<p>The epigastrium contains a firm, sometimes tender, mass. resonant to percussion because it is covered by the stomach.</p> <ul style="list-style-type: none"> • It moves very slightly with respiration
<p>Carcinoma of the stomach</p> 	<ul style="list-style-type: none"> -The onset of indigestion or epigastric pain, however vague, in a patient over 40 years of age should be treated very seriously - loss of appetite is a cardinal symptom. The inevitable consequence of a loss of appetite is loss of weight. The patient may lose 10-20kg in 1 or 2 months. 	<ul style="list-style-type: none"> - They are difficult to feel because they are situated high in the abdomen beneath the costal margin. -A palpable tumour is hard and irregular, disappearing beneath the costal margin . -It is rarely possible to feel its upper edge. <p>(Do not expect to feel a mass in a patient with carcinoma of the stomach)</p>



Umbilical region masses

	Description	Physical signs
<p>Mesenteric cysts</p> 	<ul style="list-style-type: none"> -They are cysts containing clear fluid that develop in the mesentery. -They arise from the vestigial remnants of reduplicated bowel and are usually found by chance -rarely cause recurrent colicky pain. rarely, cause abdominal distension 	<p>It forms a smooth, mobile, spherical swelling in the centre of the abdomen.</p> <ul style="list-style-type: none"> • It moves freely at right angles to the line of the root of the mesentery. • It is dull to percussion. • Large cysts may be felt to fluctuate and have a fluid thrill. <p>-It is difficult to discriminate between a very large cyst and tense ascites.</p>
<p>Retroperitoneal tumors</p> 	<ul style="list-style-type: none"> -Rare -The most common variety is the liposarcoma -The patient complains of distension, a vague abdominal pain and sometimes anorexia and weight loss. 	<ul style="list-style-type: none"> -abdominal distension; -a smooth mass with an indistinct edge -soft to firm consistency; -resonance while they are covered with bowel, but when they reach the anterior abdominal wall and push the bowel out to the flanks, they become dull to percussion . • very little movement with respiration; • possible transmission of aortic pulsation

Hypogastric Masses

DDx		Physical Signs
URINARY BLADDER	<p>Acute retention: the bladder is full and tender Chronic retention: Painless History of prostatism</p>	<p>Arises out of the pelvis and so it has no lower edge o Not mobile and dull to percussiono Direct pressure often produces a desire to micturate</p>
PREGNANT UTERUS	<p>-The uterus enlarges to the xiphisternum by the 36th week of pregnancy, at this stage the fetus is palpable - A pregnant uterus is smooth, firm and dull</p>	
FIBROIDS	<p>They cause irregular and heavy periods, disturbed micturition, lower abdominal pain and backache.</p>	<p>Arises out of the pelvis and so the lower edge is not palpable</p> <p>Firm or hard, moves slightly in transverse direction and dull on percussion</p>

Right Iliac Fossa Masses

DDx		Physical Signs
APPENDICULAR MASS	Central abdominal pain shifting to the right iliac fossa. Associated with nausea, vomiting and loss of appetite.	Tender indistinct mass, dull to percussion and fixed to the right iliac fossa posteriorly
APPENDICULAR ABSCESS	As for appendicitis with additional symptoms of an abscess such as fever, rigors, sweating and increased local pain	A tender mass which in its late stages may fluctuate and be associated with edema and reddening of the overlying skin
TUBERCULOSIS	<ul style="list-style-type: none"> - inflamed ileocecal lymph nodes, parts of and the terminal ileum and the cecum - Vague chronic central pain for months - General ill health and weight loss - The pain eventually becomes intense and settles in the iliac fossa 	The mass is firm, distinct and hard. It is not tender and does not resolve with observation
CROHN'S DISEASE	Recurrent episodes of pain in the right iliac fossa, malaise, loss of weight and episodes of diarrhea and melena	The elongated terminal ileum forms an elongated sausage-shaped mass which is rubbery and tender
PSOAS ABSCESS	General ill feeling for months, night sweats and weight loss	<ul style="list-style-type: none"> - Soft, tender, dull and compressible There may be fullness in the lumbar region - The swelling extends below the groin and it may be possible to empty the swelling.
OTHERS	<ul style="list-style-type: none"> - Cecal carcinoma - Actinomycosis: rare infectious disease by actinomyces/complication of appendicitis. - Ruptured epigastric artery - Iliac lymphadenopathy - Iliac artery aneurysm - Kidney Transplant: The mass is situated beneath the transplant scar - Ovarian cyst/ tumor - Fibroids. 	

Left Iliac Fossa Masses

DDX		Physical Signs
DIVERTICULITIS	-Recurrent lower abdominal pain and -chronic constipation for years The acute episodes starts suddenly with severe pain, nausea, loss of appetite and constipation	Tender indistinct mass, with signs of general or local peritonitis
CARCINOMA OF THE SIGMOID COLON	<ul style="list-style-type: none"> -General cachexia -Lower abdominal pain associated with rectal bleeding -Change in bowel habits and sometimes intestinal obstruction 	<ul style="list-style-type: none"> -Hard mass, non tender -May be mobile or fixed -The colon above the mass may be distended with indentable feces
Others	<ul style="list-style-type: none"> - Crohn's disease - Psoas Abscess - Same masses of Right Iliac Fossa 	

Hernias

General information :

- A hernia is an abnormal protrusion of a cavity contents, through a weakness in the wall of the cavity, but takes with it all the lining of the cavity.
- Multiple factors contribute to the development of hernias
- In essence, hernias can be considered design faults, either anatomical or through inherited collagen disorders, these two factors work together in the majority of patients,.
- Hernias may exploit natural openings such as the inguinal and femoral canals, umbilicus, obturator canal or esophageal hiatus, or protrude through areas weakened by stretching (e.g. epigastric hernia) or surgical incision.

..بإختصار: يكون لها فتحة جاهزة او هي تستغل الضعف بجدار البطن

- In addition to these 'weak' anatomical areas, the collagen make-up of the tissues, especially the Type I to III collagen ratio is also important.
- Type I imparts the strength to the tendon or fascia,
- Type III provides elastic recoil to the tissue.
- Hernias can be considered as a disease of collagen metabolism.

Hernia parts

The Sac	The neck of the sac	Contents of hernia
<p>-The hernia is immediately invested by a peritoneal sac drawn from the lining of the abdominal wall</p> <p>-The sac is covered in turn by those tissues that are stretched in front of it as the hernia enlarges.</p>	<p>-is the constriction formed by the orifice in the abdominal wall through which the hernia passes.</p>	<p>-A hernia may contain any intraabdominal structure but most commonly contains omentum and/or small bowel.</p>

Hernia may be classified into; reducible and irreducible and the contents may become obstructed or strangulated.

Reducible - when the contents of the hernia can be manipulated back into its original position through the defect from which it emerges

Incarcerated hernia (irreducible) - the hernia is compressed by the defect causing it to be irreducible (i.e. unable to be pushed back into its original position)

Obstructed hernia - refers mainly to hernias containing bowel, where the contents of the hernia are compressed to the extent the bowel lumen is no longer patent and causes bowel obstruction

Strangulated hernia - the compression around the hernia prevents blood flow into the hernial contents causing ischemia to the tissues and pain.

A hernia may involve:

- Only part of the circumference of the bowel (Richter's hernia),
- A Meckel's diverticulum* (Littre's hernia)
- or an incarcerated appendix (Amyand's hernia).

A sliding inguinal hernia is defined as one in which a viscus forms a portion of the wall of the hernia sac. Most commonly, the viscous involved is caecum, sigmoid colon or urinary bladder.

In the early stages of a hernia, sometimes the hernial contents are pre-peritoneal fat only, such as a lipoma of the cord which can mimic an inguinal hernia.

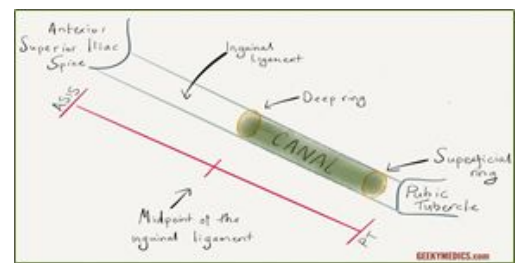
*a true congenital diverticulum, is a slight bulge in the small intestine present at birth and a vestigial remnant of the omphalomesenteric duct (also called the vitelline duct or yolk stalk).

The inguinal canal:

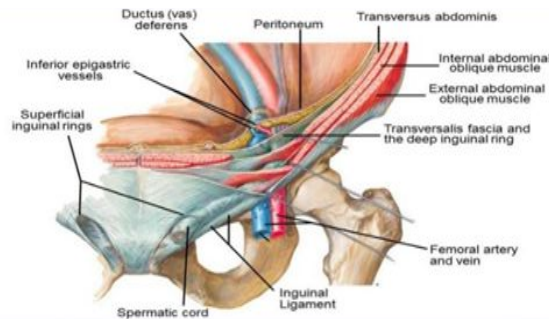
(Inguinal canal) باختصار هي مثل النفق اللي له بداية (deep ring-Start)

ونهاية وسقف (Superficial ring-End)

- The inguinal ligament runs between the anterior superior iliac spine (**ASIS**) and the pubic tubercle (**PT**). Within this ligament runs a tube-like structure known as the inguinal canal.
- The inguinal canal is an oblique passage in the lower anterior abdominal wall.



- **The innermost layer** : is derived from the transversalis fascia (the internal spermatic fascia)
- **The middle layer** : from the internal oblique muscle (the cremasteric muscle and fascia)
- **The outer layer** : from the external oblique aponeurosis (the external spermatic fascia).



- The function of this canal is to provide a passageway for abdominal contents to exit the abdomen.
- To be more specific,

In both sexes the canal also carries a sensory nerve known as the ilioinguinal nerve.

In males: Spermatic cord (to facilitate ejaculation) ♂

- Within the inguinal canal, the spermatic cord is covered only by the cremasteric and internal spermatic fasciae.
- The testis & spermatic cord receive a covering from each of the layers as they pass through the abdominal wall.

The spermatic cord consists of: **3 arteries, 3 nerves, 3 other things**

- **3 arteries**: testicular, artery of the ductus deferens, cremasteric .
- **3 nerves**: genital branch of the genitofemoral , cremasteric nerve*, sympathetic nerve fibers.
- **3 other things**: ductus deferens, pampiniform plexus, lymphatic vessels

the artery of the vas (branch of the inferior vesical artery),
 the testicular artery (branch of the aorta on the right and renal artery on the left),
 the cremasteric artery (branch of the inferior epigastric artery),

In females: The round ligament to the labium majus in the female. ♀

- The tube has an entry point from the abdominal cavity into the canal (deep inguinal ring) and an exit point (superficial inguinal ring) as it leaves the canal. The location of these two points is clinically important.
- **Deep inguinal ring**: is an opening in the transversalis fascia [innermost layer of the inguinal canal], just above the midpoint of the inguinal ligament, is bounded medially by the inferior epigastric artery.
- **Superficial inguinal ring**: which is an opening in the aponeurosis of the external oblique muscle [external oblique] just above and medial to the pubic tubercle.
- The processus vaginalis reversing the canal is normally obliterated at birth, but persistence in whole or in part presents an anatomical predisposition to an **indirect inguinal hernia**
- At birth, the internal and external rings lie on top of each other, so that the inguinal canal is short and straight; with growth, the two rings move apart so that the canal becomes longer and oblique.

1. Groin hernia

- Inguinal hernia is $\frac{3}{4}$ of all abdominal wall hernias **"Most common"**
- Inguinal herniorrhaphy[1] is one of the most frequently performed general surgical procedures.
- Inguinal hernia Mostly occurs in **males /1-3% of all newborn males**
- The incidence in **premature infants** is 30 times higher
- **Femoral hernia relatively more common in females** "comparing to males": possibly because of stretching of ligaments and widening of the femoral ring in pregnancy, but an indirect inguinal hernia is still the most common type of groin hernia in women.

A. Inguinal hernia

Indirect inguinal (60%)

- An indirect inguinal hernia enters the **internal (deep)** inguinal ring and descends within the coverings of the spermatic cord so that it can pass on down into the scrotum, **the so-called inguino-scrotal hernia**.
- Very occasionally, it enlarges between the muscle layers of the abdominal wall to form an interstitial hernia.



- Might be asymptomatic or may cause a dragging discomfort in the groin, particularly during lifting or straining, or at the end of the day.
- Following a period of rest, such symptoms may improve
- Often patient present with painful symptoms rather than because of a lump in the groin
- The hernia forms a swelling in the inguinal canal, which may extend into the scrotum. Which often readily visible when the patient stands or is asked to cough.

Direct inguinal (25%)

- Direct hernias are due to **weakness of the abdominal wall and may be precipitated by increases in intra-abdominal pressure** (e.g. obstructive airways disease, prostatism[2] or chronic constipation).
- The hernia protrudes through the **transversalis fascia in the posterior wall of the inguinal canal**. The defect is bounded *above by the conjoint tendon, below by the inguinal ligament, and laterally by the inferior epigastric vessels*. These boundaries mark the area known as **Hesselbach's triangle**.
- The hernia **occasionally bulges through the external (superficial) inguinal ring**, but the transversalis fascia cannot stretch sufficiently to allow it to descend down into the scrotum. The sac has a wide neck, so that the hernia seldom becomes irreducible, obstructs or strangulates.

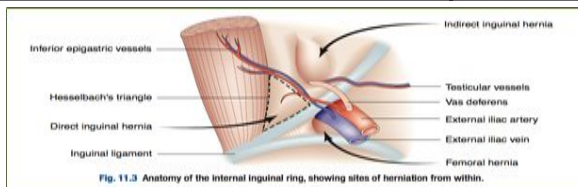
- The hernia forms a diffuse bulge in the region of the medial part of the inguinal canal.
- It is usually readily reduced by backward pressure, and the edges of the defect may then be palpable.
- Clinically, it is frequently impossible to determine whether a hernia confined to the inguinal canal is of the direct or the indirect variety.



[1] Refers to a surgical operation for the correction of a hernia

[2] **Prostatism** is a syndrome associated with outlet obstruction at the bladder neck and the commonest cause is benign prostatic hypertrophy.

- However, look for signs of asymmetry between the two groins.
- While bilateral inguinal hernias are not unusual, it is unusual for both hernias to be of similar size.
- If there is no visible swelling, a **cough impulse** is sought with the patient standing.
- The hernia often reduces spontaneously when the patient lies down, or it may be reduced by gentle pressure applied in an upward and lateral direction.
- It may be possible to control the hernia, once reduced, by placing a finger over the internal (deep) inguinal ring.



Both types of hernia can exit the superficial ring and emerge within the testes. Please note that it is more common for indirect inguinal hernias to do this as the path through both anatomical inguinal rings, rather than a muscle defect, has less resistance. The neck of the sac of a direct inguinal hernia lies medial to the inferior epigastric vessels, whereas that of an indirect hernia lies lateral to them. A combined indirect and direct hernia may occur on the same side (pantaloon or saddle-bag hernia), with sacs straddling the inferior epigastric vessels.

Management:

- **Children** > The identification of an inguinal hernia in any child is *nearly always* an indication to operate. Elective surgery is usually undertaken on a day-case basis, with liberal use of local anaesthetic blocks for postoperative pain relief.

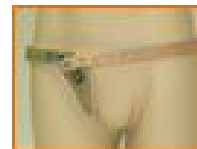
- **Adults** > with a symptomatic inguinal hernia should be offered surgery.

Open mesh repair or laparoscopic mesh repair aims to reduce postoperative pain to a minimum, enabling most procedures to be undertaken as day cases.

Inguinal hernias can be controlled by a **truss**, but this is uncomfortable and is now seldom indicated, as repair using local or regional anaesthetic techniques can be employed in higher-risk patients.

In all hernia repairs, it is important to avoid constricting the spermatic cord by making the deep inguinal ring too tight. This may compromise the blood supply to the testis, particularly in large or recurrent hernias.

- **In older patients**, removal of the testis may be considered so that the inguinal canal can be completely obliterated in recurrent hernias.



- The most common surgical procedure now performed is the **Lichtenstein open tension-free repair**.
- **Laparoscopic hernia repair** is increasing in popularity. Proponents of these techniques emphasize minimal pain, both acute and chronic, a more rapid return to normal activities and work, improved cosmesis and fewer infective complications; however, critics emphasize the necessity for a general anaesthetic. It is generally accepted that the laparoscopic approach is particularly useful for patients with recurrent inguinal hernias or bilateral inguinal hernias, or exploration of the groin when a symptomatic hernia is suspected from the history but is not obvious on clinical examination. The asymptomatic inguinal hernia does not always require repair. However, the majority of such hernias become symptomatic within several years, at which time they can be repaired.
- Approximately 5% of hernias will recur. Early recurrence within 2 years is usually a result of an inadequate primary operation, whereas late recurrence reflects progression of the underlying muscular weakness. Recurrent hernias can be difficult to repair and the laparoscopic approach may be of particular benefit to these patients.

B. Sportsman's hernia	C. Femoral hernia (15%)
<p>- Groin injury leading to chronic groin pain is often referred to as the sportsman's hernia. However, the definition, investigation and treatment of this condition remain controversial.</p> <p>- The differential diagnosis includes musculotendinous injuries, osteitis pubis, nerve entrapment, urological pathology or bone and joint disease. In many cases, clinical signs are lacking, despite the patient's symptoms. herniorrhaphy studies have demonstrated a significant incidence of symptomatic impalpable hernia in patients presenting with obscure groin pain. Dynamic ultrasound (ultrasound examination of the groin with the patient at rest and when straining) is replacing herniography as it is non-invasive. MRI scanning is also used, more to exclude other pathology that might be causing the groin pain rather than to diagnose a sportsman's hernia.</p> <p>- A deficiency of the posterior inguinal wall is the most common operative finding in patients with chronic groin pain. Some authors have described a tear in the conjoint tendon as the cause of the pain, whereas in Gilmore's description, a tear in the external oblique aponeurosis, causing dilatation of the external (superficial) inguinal ring, was implicated. Surgical intervention is recommended only when conservative management has failed. Appropriate repair of the posterior wall of the inguinal canal has proved to be of therapeutic benefit in selected patients.</p>	<p>- An inguinal hernia, which passes into the scrotum, passes above and medial to the pubic tubercle, in contrast to a femoral hernia, which bulges below and lateral to the tubercle</p> <p>- A femoral hernia projects through the femoral ring and passes down the femoral canal. The ring is bounded laterally by the femoral vein, superiorly by the inguinal ligament, medially by the lacunar ligament, and inferiorly by the superior ramus of the pubis and the reflected part of the inguinal ligament (pectineal ligament of Astley Cooper). As the hernia enlarges, it passes through the saphenous opening in the deep fascia of the thigh (the site of penetration of the long saphenous vein to join the femoral vein) and then turns upwards to lie in front of the inguinal ligament. The hernia has many coverings and may be deceptively small, sometimes escaping detection. It frequently contains omentum or small bowel, but the urinary bladder can 'slide' into the medial wall of the sac.</p> <p>- The hernia forms a bulge in the upper inner aspect of the thigh. While a lump or swelling may be the presenting symptom, groin pain related to exercise is also a common presentation. It can sometimes be difficult to differentiate between an inguinal and a femoral hernia, but as indicated earlier, the former passes above and medial to the pubic tubercle as it enters the groin, whereas the latter passes below and lateral to it. Tracing the tendon of adductor longus upwards to its insertion can be a useful guide to the position of the pubic tubercle.</p> <p>- A femoral hernia is frequently difficult or impossible to reduce because of its J-shaped course and the tight neck of the sac. As well as needing to be differentiated from inguinal hernia, it can be confused with an inguinal lymph node (no cough impulse, irreducible), saphenous varix (positive cough impulse or 'saphenous thrill', which is prominent on standing but disappears on elevating the leg), ectopic testis, psoas abscess, hydrocoele of the spermatic cord or a lipoma.</p> <p>Surgical repair of femoral hernia</p> <p>A femoral hernia is particularly likely to obstruct and strangulate (indeed 40% of such hernias present this way), and therefore surgical intervention is indicated. As with inguinal hernia, repair can be carried out under local or general anaesthesia.</p> <p>- The approach (McEvedy approach) gives the best access, and is particularly useful if the hernia contains strangulated bowel and intestinal resection is required. The laparoscopic approach is an alternative 'high' approach.</p>

2. Ventral Hernia

- Ventral hernias occur through areas of **weakness in the anterior abdominal wall** namely, the linea alba (epigastric hernia), the umbilicus (umbilical and paraumbilical hernia), the lateral border of the rectus sheath (Spigelian hernia), and the scar tissue of surgical incisions (incisional hernia). Such incisions include scars from laparoscopic surgery, the so-called port site hernia.

A. Epigastric hernia

Epigastric hernias protrude through the linea alba above the level of the umbilicus. The herniation may consist of extra-peritoneal fat or may be a protrusion of peritoneum containing omentum. The hernia is common in thin individuals and can cause local discomfort. Unless large, epigastric hernias are rarely visible on inspection, but are palpable as a firm midline lump. It is repaired by closing the defect with nonabsorbable sutures, or by inserting a small mesh, or by laparoscopic intraperitoneal mesh repair.

B. Umbilical hernia

True umbilical hernias occur in infants. The small sac protrudes through the umbilicus, particularly as the child cries, but is easily reduced. Over 95% of these hernias close spontaneously in the first 3 years of life. Persistence after the third birthday is an indication for elective repair. Surgery involves excision of the hernial sac and closure of the defect in the fascia of the abdominal wall.

C. Para-umbilical hernia

This hernia is caused by gradual weakening of the tissues around the umbilicus. It most often affects obese multiparous women, and passes through the attenuated linea alba just above or below the umbilicus. The peritoneal sac is often preceded by the extrusion of a small knuckle of extraperitoneal fat through the linea alba. The hernia gradually enlarges, the covering tissues become stretched and thin, and eventually loops of bowel may become visible under parchment-like skin. The sac is often multilocular and may be irreducible because of adhesions that form between omentum and loops of bowel. The skin may become reddened, excoriated and ulcerated, and rarely an intestinal fistula may even develop.

Operation is advised because of the risk of obstruction and strangulation. Unless there is a large protrusion of the umbilicus itself, most surgical repairs can be performed preserving the umbilicus. Like epigastric hernias, there is increasing use of laparoscopic mesh repair, especially for a large hernia or a small hernia in a fat patient.

D. Incisional hernia

Incisional hernias occur after 5% of all abdominal operations. **Over half of incisional hernias occur in the first 5 years after the original surgery.** Midline vertical incisions are most often affected, and poor surgical technique, wound infection, obesity and chest infection are important predisposing factors, in addition to the collagen metabolism status of the patient. The diffuse bulge in the wound is best seen when the patient coughs or raises the head and shoulders from a pillow, thereby contracting the abdominal muscles. Strangulation is rare, but surgical repair is usually advised.

Again, open or laparoscopic mesh repair is possible. The sublay operation is associated with the lowest incidence of wound complications and recurrence of the hernia. Many incisional hernia wounds are cosmetically poor, so laparoscopic surgery for cosmesis is not so clear cut. However, laparoscopic surgery is associated with less pain, shorter hospital stay and more rapid return to activities. However, it is difficult to restore the normal anatomy by bringing the muscles together again at laparoscopic surgery, and thus such an approach is mainly used for smaller incisional hernias.

E. Parastomal hernia

These occur after the formation of an abdominal wall stoma. The majority of patients with a stoma will develop a parastomal hernia with time. The best way to treat such a hernia includes reversing the stoma, if possible. Otherwise, the techniques for incisional hernia are relevant here including repositioning of the stoma. There is evidence to support the use of mesh reinforcement at the time of creation of the stoma to minimize the risk of parastomal hernia development. Such prophylactic use of mesh is also considered in other high risk groups, such as midline incisions in the obese.



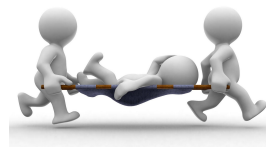
Rare external hernias:

- *A Spigelian hernia* occurs through the linea semilunaris at the outer border of the rectus abdominis muscle. Treatment is surgical, as the hernia is liable to strangulate
- *A lumbar hernia* forms a diffuse bulge above the iliac crest between the posterior borders of the external oblique and latissimus dorsi muscles. It seldom requires treatment
- *An obturator hernia* is a rare hernia that is more common in women and passes through the obturator canal. Patients may present with knee pain owing to pressure on the obturator nerve; however, the diagnosis is frequently made only when the hernia has strangulated and is discovered at laparotomy.

Internal hernia

- Herniation of the stomach through the oesophageal hiatus in the diaphragm (**hiatus hernia**) is a common cause of internal herniation. A variety of cul-de-sacs and peritoneal defects resulting from rotation of the bowel and other abnormalities of development may be responsible for the entrapment of bowel and acute intestinal obstruction. For example, herniation may occur through the foramen of Winslow (opening of the lesser sac) and through various openings in the diaphragm, including the oesophageal hiatus. In addition, bowel operations, such as the development of a Roux loop can lead to 'iatrogenic' sites for internal hernia formation.

Complications of hernia



- Irreducibility

An irreducible hernia is one in which the contents cannot be manipulated back into the abdominal cavity. This may be due to narrowing of the neck of the sac by fibrosis, distension of the contained bowel, or adhesions to the walls of the sac.

- Obstruction

An irreducible hernia may progress to intestinal obstruction. Abdominal pain, vomiting and distension signal the need for urgent operation *before* strangulation supervenes.

- Strangulation

The vessels supplying the bowel within a hernia may be compressed by the neck of the sac or by the constricting ring through which the hernia passes. The contents initially become swollen as a result of venous congestion, and there is exudation of a blood stained fluid. The arterial supply is subsequently compromised and gangrene follows. Bacteria and toxins pass out through the bowel wall, causing local peritonitis.

The patient complains of pain in the hernia and usually has features of intestinal obstruction (vomiting, abdominal distension). The skin overlying the hernia is red, warm to touch and tender, the cough impulse is lost, and there may be increasing evidence of circulatory collapse and sepsis. In a Richter's hernia, only part of the circumference of the bowel is strangulated, and there may be no evidence of intestinal obstruction. Strangulation is the main risk factor for death in such cases.



Management of complicated hernia

- If there is no evidence of **strangulation**, an attempt can be made to reduce an apparently irreducible hernia by giving analgesia, putting the patient to bed with the foot of the bed elevated, and applying gentle pressure. Undue force must never be used for fear of rupturing the bowel or returning the entire hernia to the abdomen with the bowel still trapped within it (reduction en masse). If the hernia does not reduce readily, emergency same day surgery is advised to avoid further complications. **Femoral hernias** are the least likely hernia (of the common hernias) to be reduced in this way. Following successful reduction of a hernia, the patient can be discharged from the Accident and Emergency department with a plan to repair the hernia within a month.

- **In infants and children**, the majority of 'irreducible' inguinal hernias can, in fact, be safely reduced by a suitably trained clinician. Small doses of intravenous opiate analgesia administered in the presence of suitably trained paediatric nursing staff can relax the child and assist with the reduction process. The hernia can then be repaired within 72 hours on the next available operating list. The child should be detained in hospital pending repair to allow early detection of further episodes of incarceration. Failure to reduce a hernia in this manner necessitates emergency surgery which is often more difficult than when the hernia has been reduced prior to surgery.

- Urgent operation is indicated for **all obstructed hernias**, as one can never be certain that strangulation is not present. Occasionally, a CT scan is indicated in such cases, *especially if an underlying malignancy is suspected, such as anaemia, significant weight loss or palpable mass away from the hernia.*

Important information from surgical recall

1- Why should hernias be repaired?

To avoid complications of incarceration/ strangulation, bowel necrosis, SBO, pain.

2- What is the most common organ in an inguinal hernia sac in men?

Small intestine

3- What factors are associated with femoral hernias?

Women, pregnancy, and exertion

4- What are the borders of Hesselbach's triangle? 1. Epigastric vessels 2. Inguinal ligament 3. Lateral border of the rectus

5- What type of hernia goes through Hesselbach's triangle? Direct hernia due to a weak abdominal floor

6- What parts of GI tract are retroperitoneal? Most of the duodenum, the ascending colon, the descending colon, and the pancreas.

7- What are the symptoms of gastric cancer? "WEAPON" weight loss, emesis, anorexia, pain/epigastric discomfort, obstruction and nausea.

8- What is the most common liver cancer? Metastatic disease

9- What is the most common cause of splenic vein thrombosis? Pancreatitis

Thank you

when you feel like quitting:

**think about why
you started.**