

HERNIA and ABDOMINAL WALL DEFECTS

Dr. OMAR TARIK ALHEETI

General and Laparoscopic Surgeon

FICMS General Surgery

CABS General Surgery

ABDOMINAL HERNIA

is the bulging of part of the contents of the abdominal cavity through a weakness in the abdominal wall.

Types of Abdominal Wall Hernias

Groin Hernias

- Inguinal Hernias
 - > Indirect Inguinal Hernia
 - > Direct Inguinal Hernia
 - > Combined (Pantaloon) Hernia
- Femoral Hernia

Pelvic Hernias

- Obturator Hernia
- Sciatic Hernia
- Gluteal Hernia

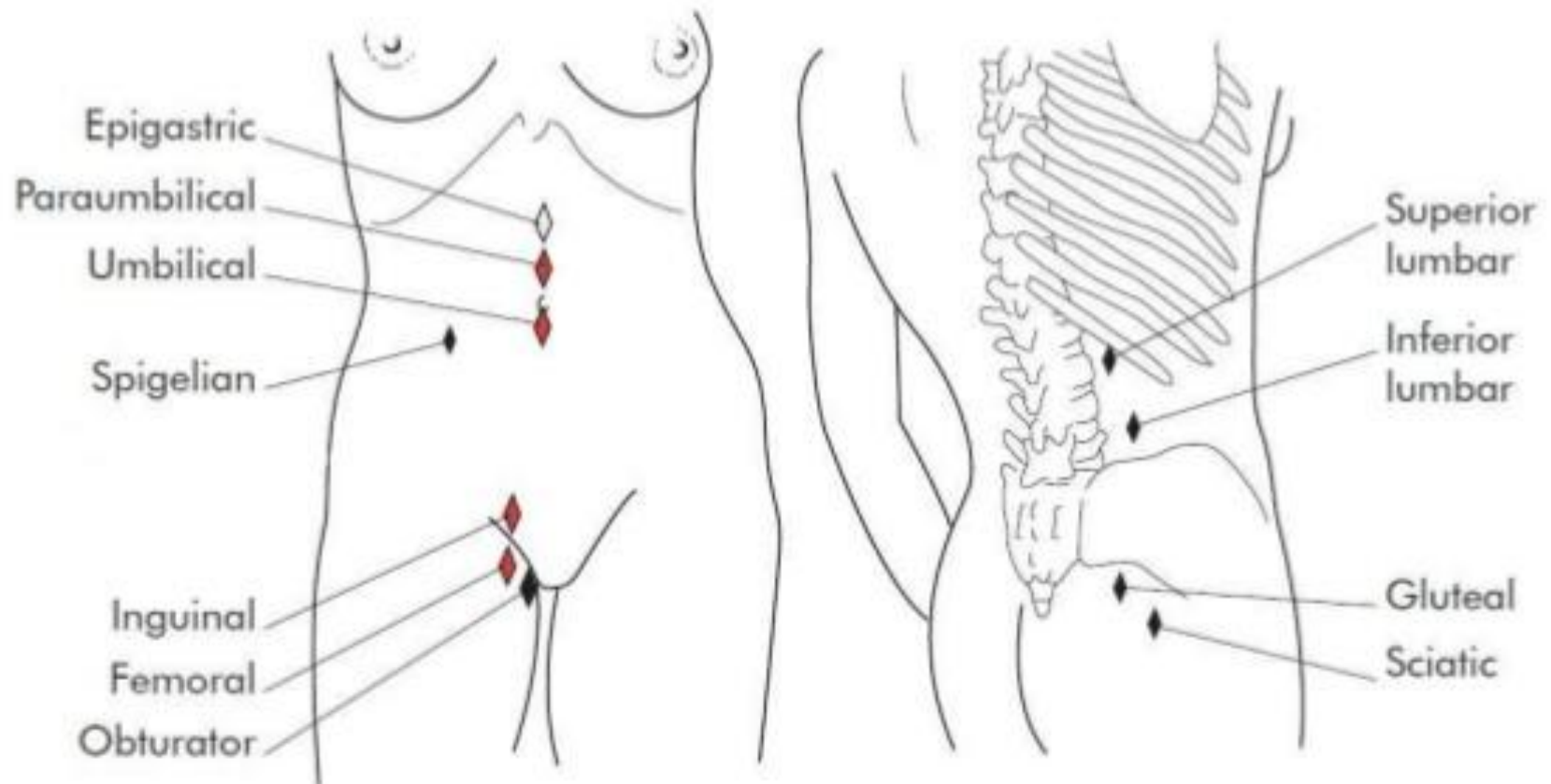
Anterior Abdominal Wall Hernias

- Umbilical Hernia
- Para umbilical Hernia
- Epigastric Hernia
- Spigelian Hernia

Posterior Abdominal Wall Hernias

- Superior Lumbar Hernia
- Inferior Lumbar Hernia

External Abdominal Wall Hernias



External hernias. Red = common; white = not unusual; black = rare.

Etiologies

- Increased abdominal pressure
 - Cough, urinary trouble, constipation, straining, ascites, intra abdominal malignancies, pregnancy
- Weakness of abdominal wall
 - Congenital
 - Patent processes vaginalis, patent canal of nuck in females
 - Acquired
 - Excess fat (obesity)
 - Post Pregnancy
 - Surgical incisions
 - Connective tissue disorders like Marfan's syndrome

Composition of a hernia

- A hernia consists of three parts –
 - the sac
 - the coverings of the sac
 - the contents of the sac
- ***The sac*** is a diverticulum of peritoneum, consisting of
 - Mouth
 - Neck
 - Body
 - Fundus
- ***The coverings*** are derived from the layers of the abdominal wall through which the sac passes.

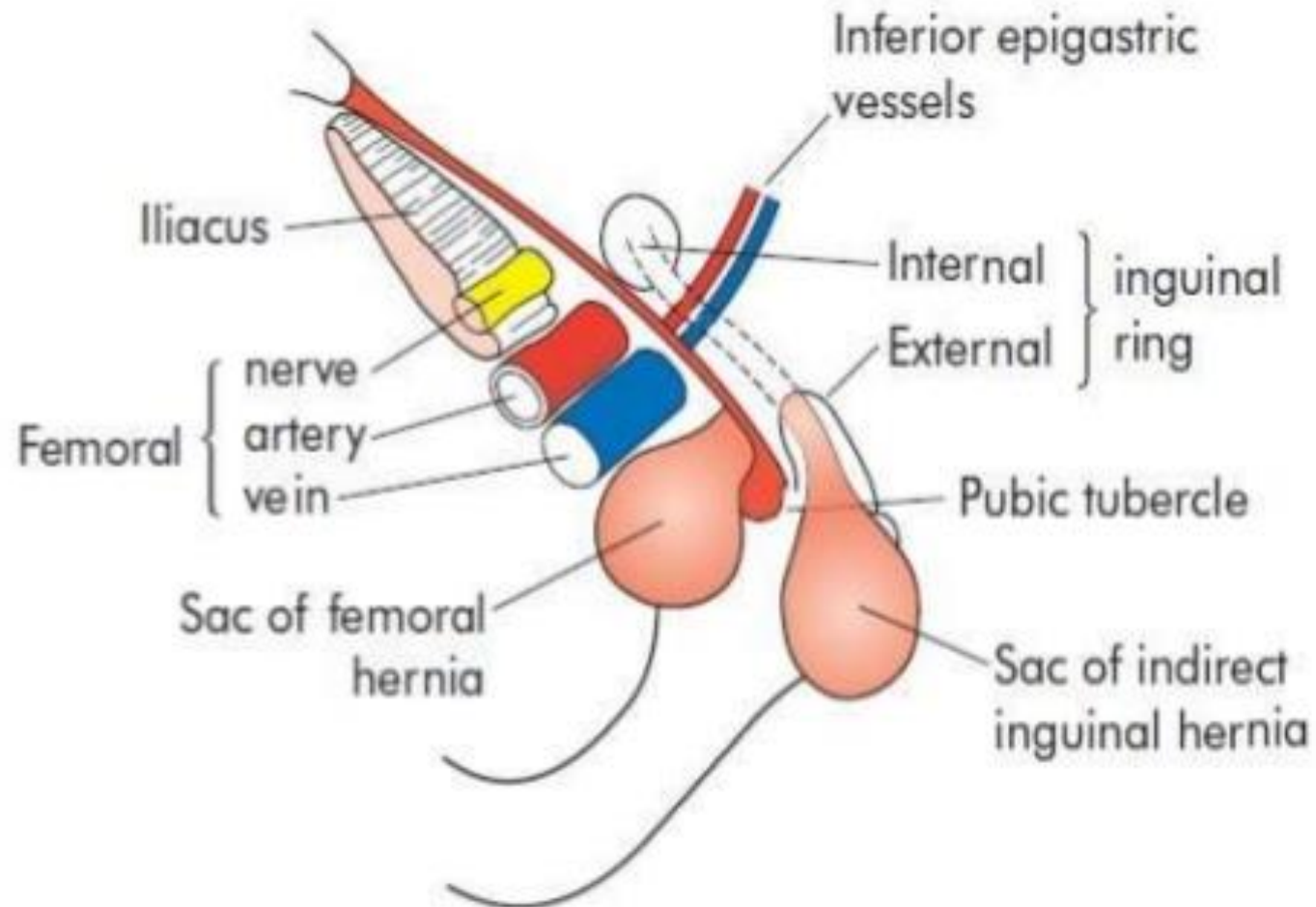
Contents

- **omentum** = omentocele;
- **intestine** = enterocele; more commonly small bowel but may be large intestine or appendix;
- a portion of the circumference of the intestine = **Richter's hernia**;
- a portion of **the bladder** (or a diverticulum);
- **ovary** with or without the corresponding **fallopian tube**;
- a **Meckel's diverticulum** = **a Littre's hernia**;
- **fluid**, as part of ascites or peritoneal fluid.

Classification of Hernia

- **Occult** – not detectable clinically; may cause severe pain
- *Reducible* – if contents can be returned to abdomen
- *Irreducible* – if contents cannot be returned but there are no other complications
- *Obstructed* – if bowel in the hernia has good blood supply but bowel is obstructed
- *Strangulated* – if blood supply of bowel is obstructed
- *Inflamed* – if contents of sac have become inflamed
- *Incarcerated* – if the portion of the colon occupying a hernial sac is blocked with faeces
- **Infarcted** – when contents of the hernia have become gangrenous, high mortality

Groin Hernias

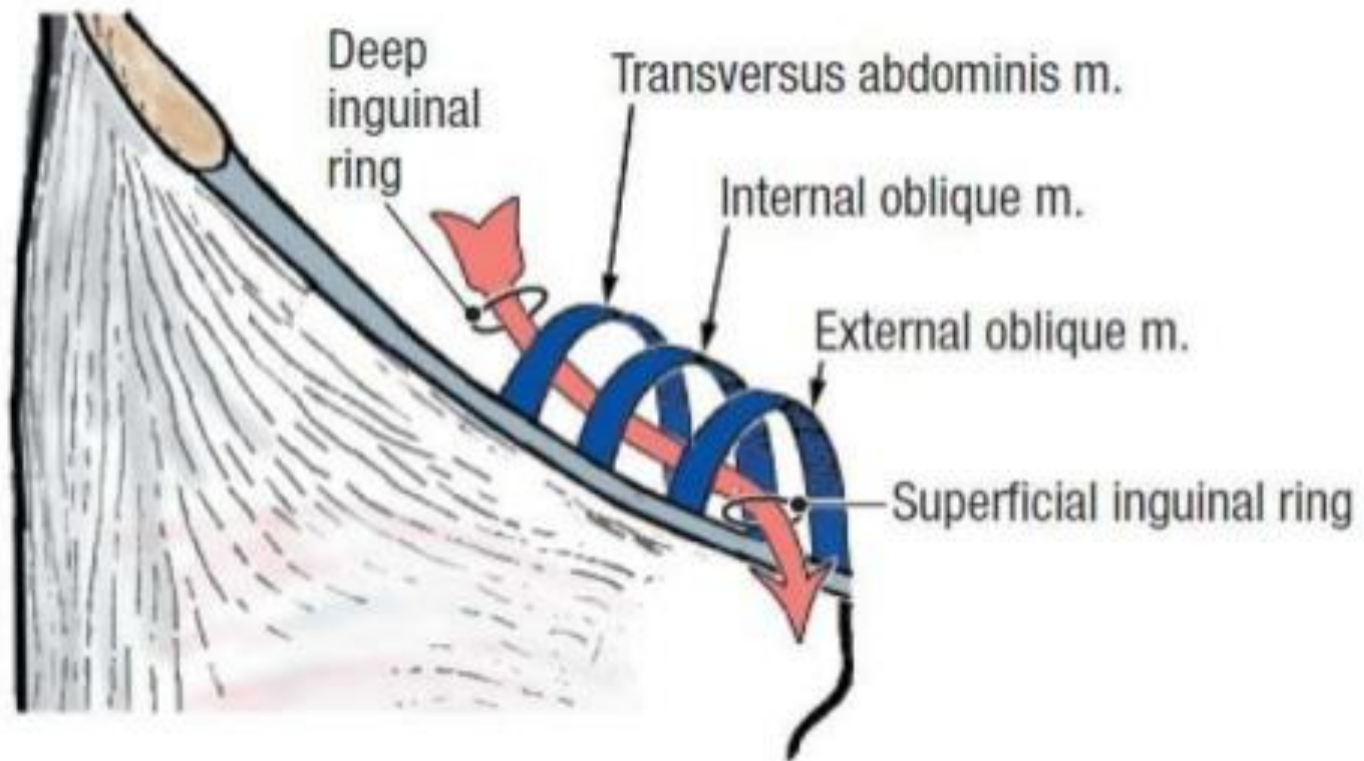


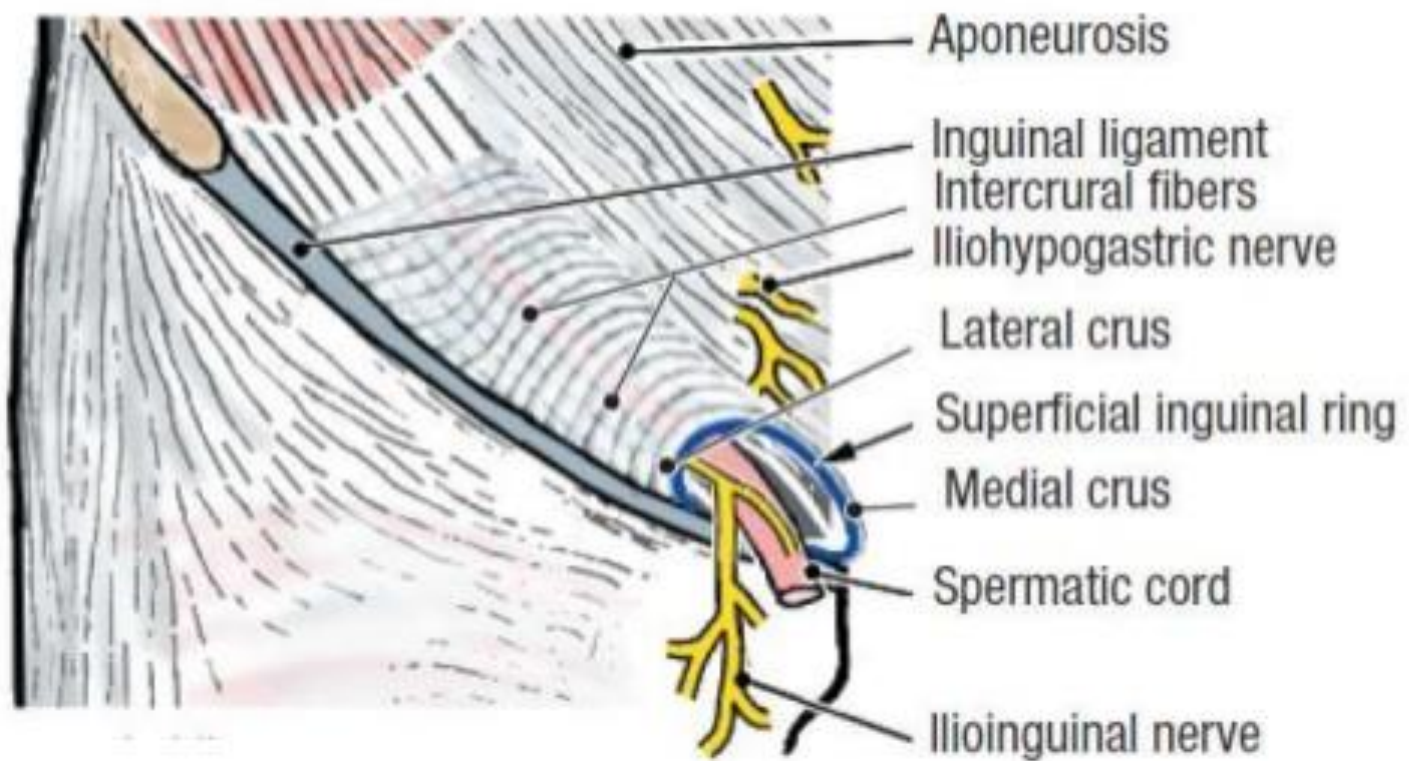
Nyhus Classification of Groin Hernia

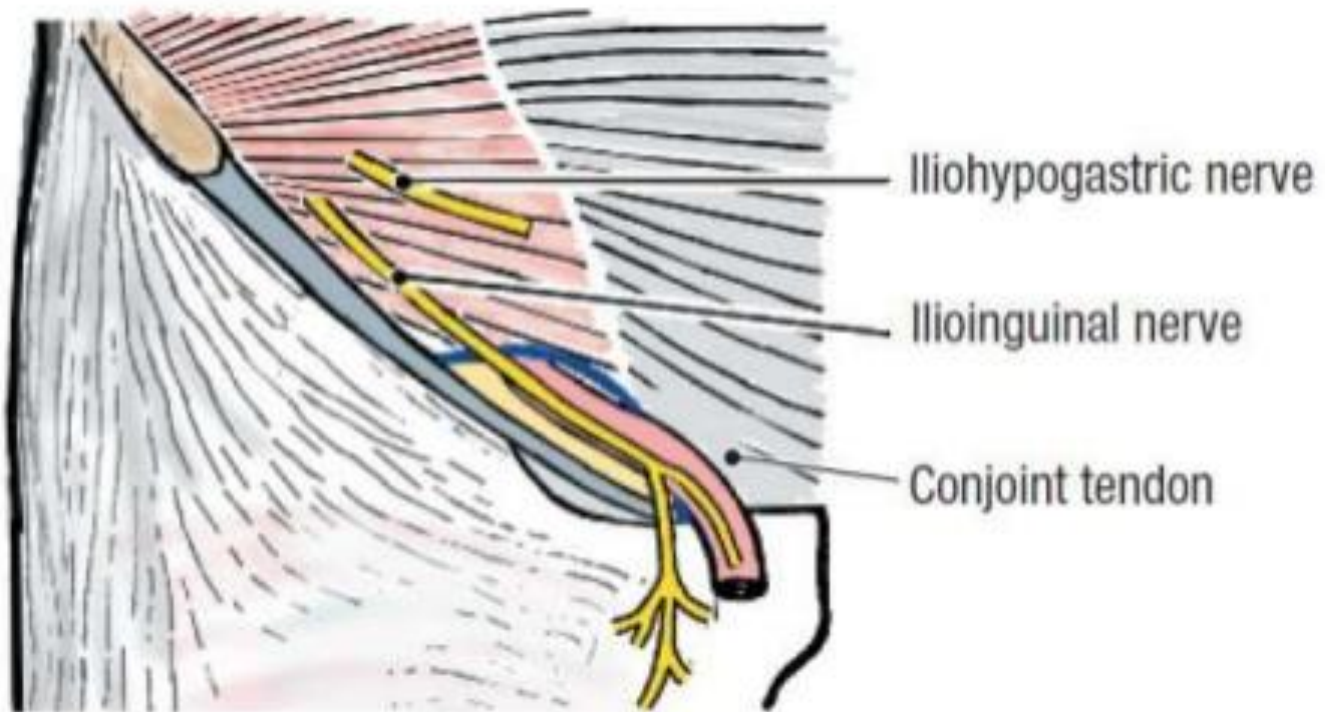
- **Type I:** Indirect inguinal hernia with internal inguinal ring normal
- **Type II:** Indirect inguinal hernia with internal inguinal ring dilated but posterior wall intact, inferior epigastric vessels not displaced
- **Type III:** Posterior wall defect
 - A:** Direct inguinal hernia
 - B:** Indirect inguinal hernia with internal inguinal ring dilated, medially encroaching on or destroying the transversalis fascia of hesselbach's triangle.
 - C:** Femoral hernia
- **Type IV:** Recurrent hernia
 - A:** Direct **B:** Indirect **C:** Femoral **D:** Combined

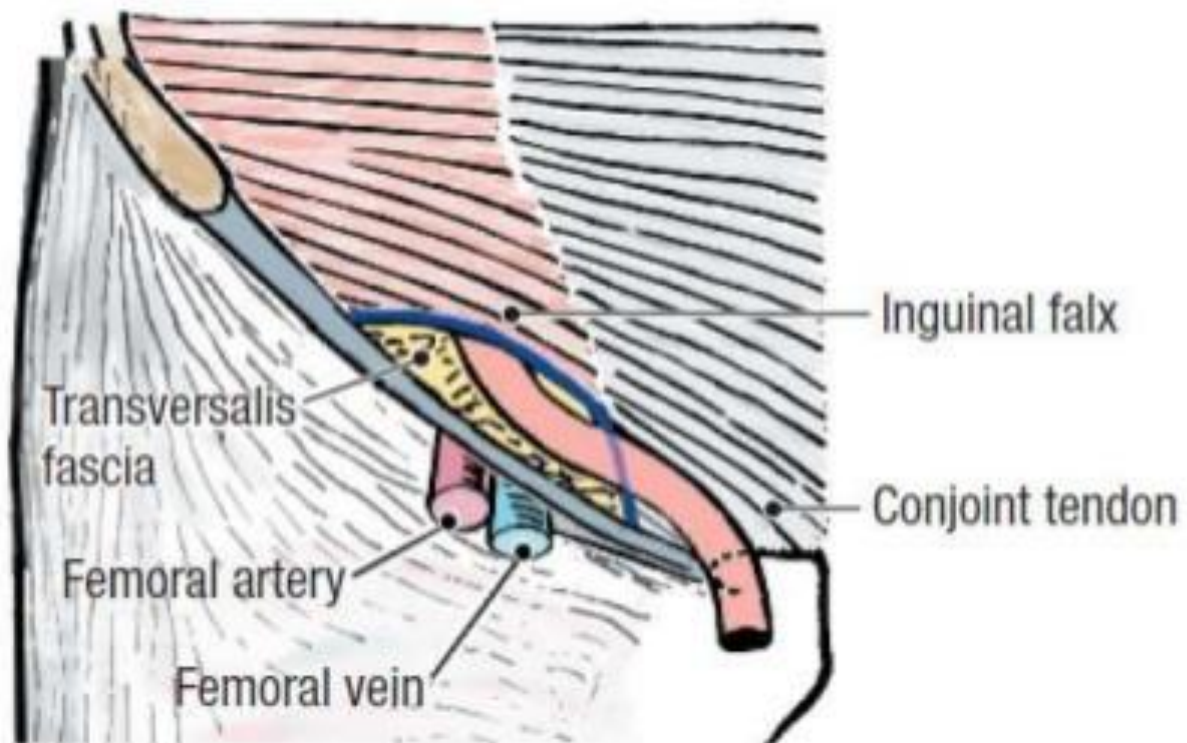
Anatomy of inguinal canal

- 4 cm in length passing downward and medially from deep to superficial ring
- Deep/internal ring is 'U' shaped in fascia transversalis which lies 1.25 cm above the mid inguinal point.
- Superficial/External ring is in external oblique aponeurosis situated just above and lateral to the pubic crest.









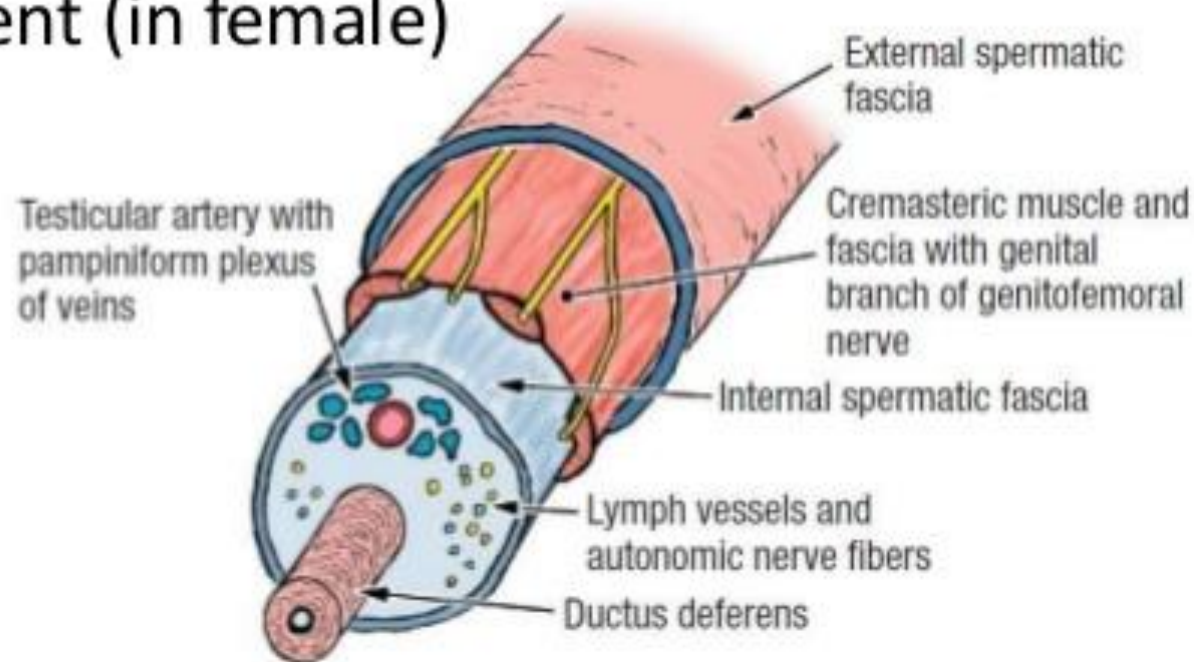
Boundaries of the inguinal canal

- **Anterior** – aponeurosis of the external oblique muscle
- **Inferior** (floor) – inguinal ligament and lacunar ligament on medial side
- **Superior** (roof) – the arching fibers of the internal oblique and the transversus abdominis muscles
- **Posterior** – transversalis fascia, reinforced medially by the conjoint tendon

Contents of Inguinal Canal

- Ilioinguinal Nerve
- Spermatic Cord (in male)-
- Round ligament (in female)

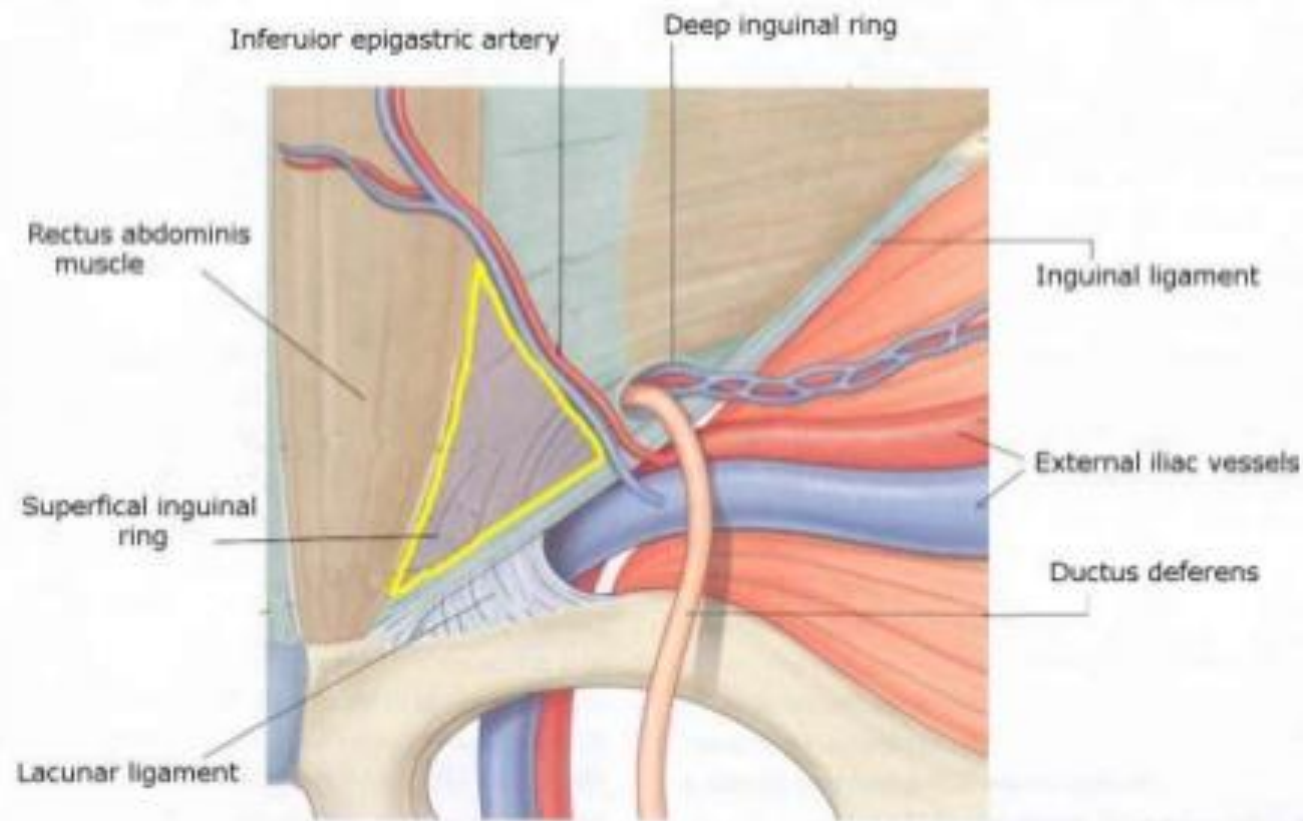
– fascia with genital branch of genitofemoral nerve



Transverse section through the spermatic cord.

Boundries of Hesselbach Triangle

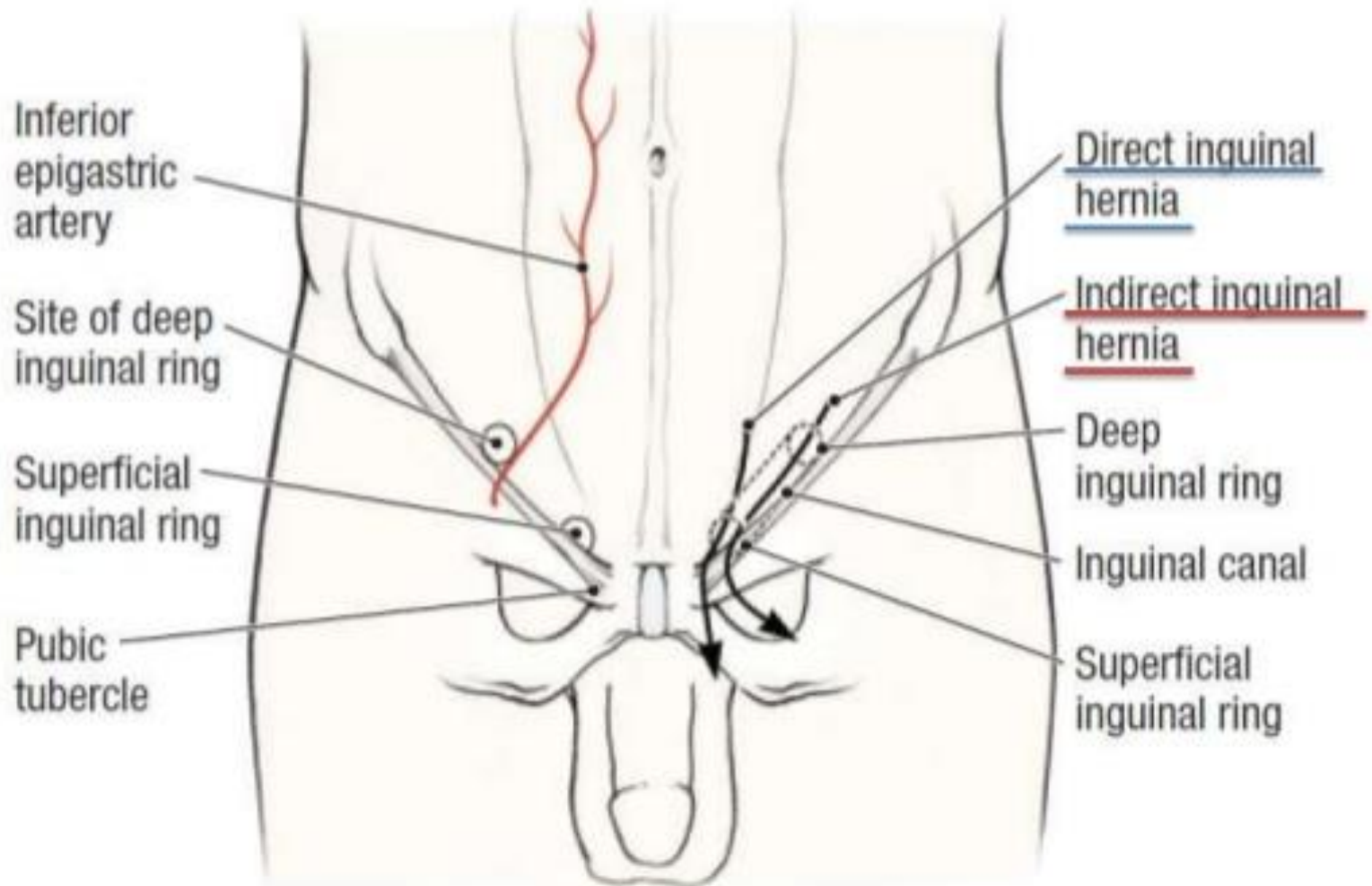
- **Laterally** inferior epigastric artery
- **Medially** lateral border or rectus abdominis
- **Inferiorly** (Base) Inguinal ligament



Natural mechanism of preventing inguinal hernia

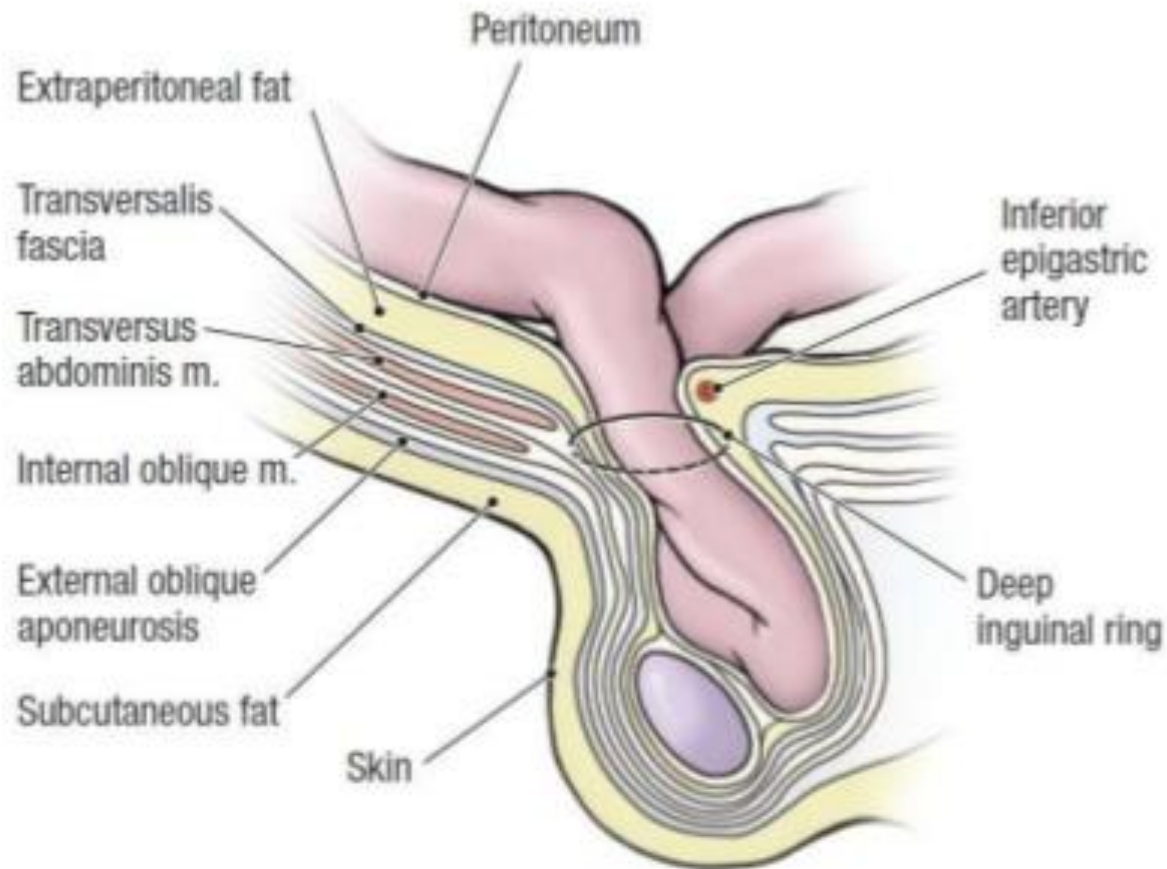
- Obliquity of canal.
- Shutter action of arched fibers of internal oblique and transverse abdominis.
- Plugging action of spermatic cord due to contraction of cremasteric muscles.

Types of Inguinal Hernia

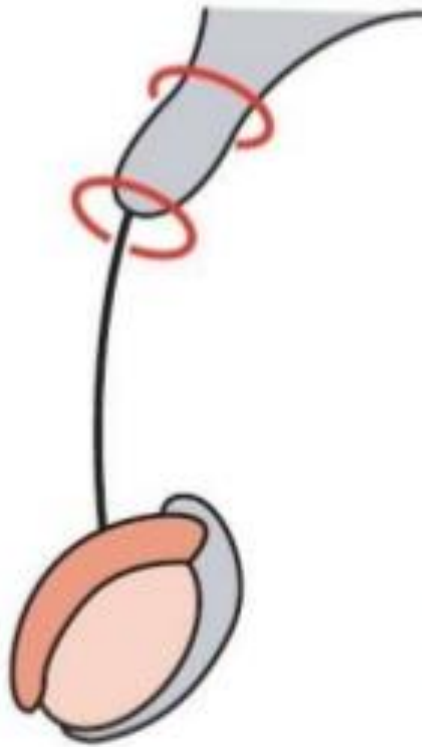


Indirect Inguinal Hernia

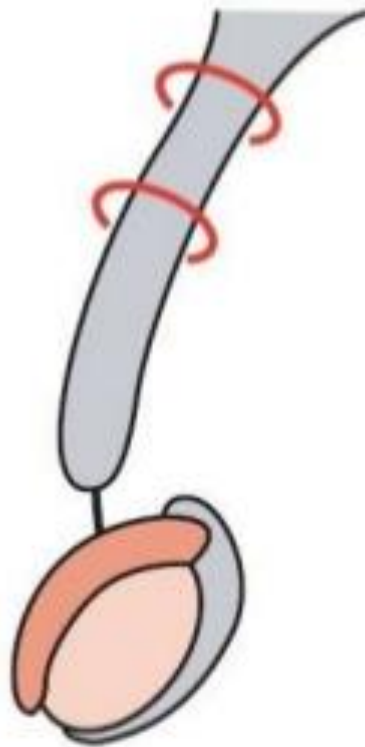
- From the internal to external ring.
- Usually due to processus vaginalis.



Types of Indirect Inguinal Hernia



Bubonocoele



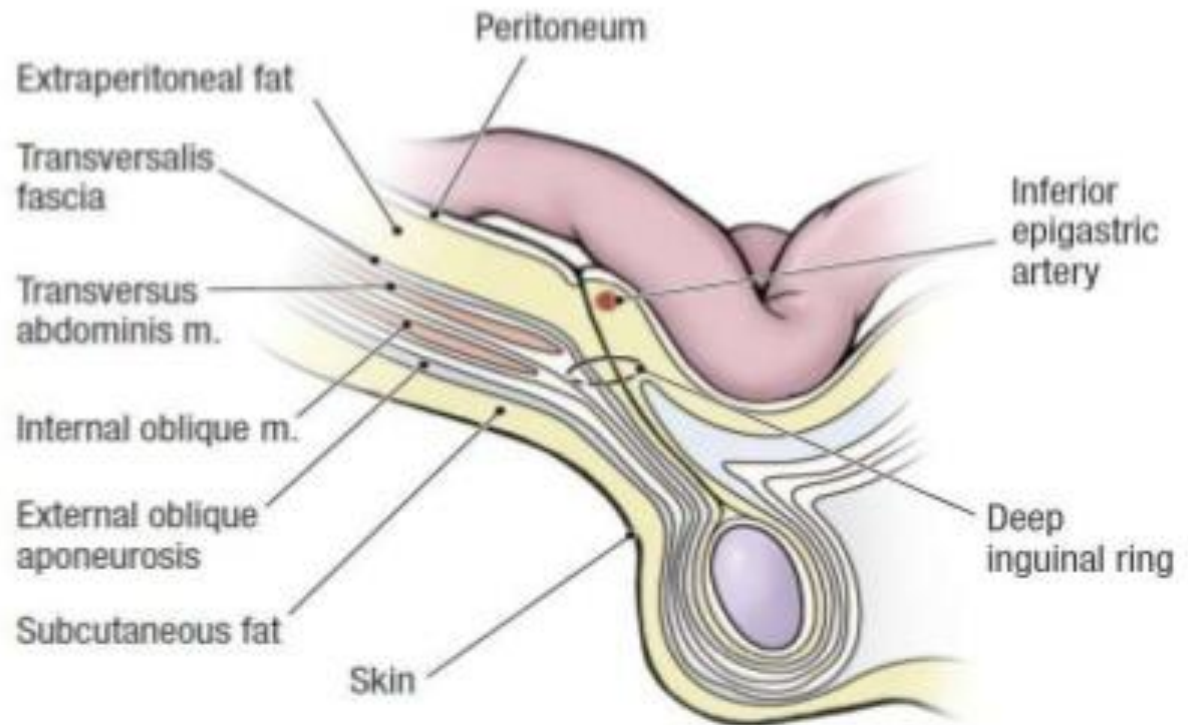
Funicular



Complete

Direct Inguinal Hernia

- A direct inguinal hernia is always acquired.
- The sac passes through a weakness or defect of the transversalis fascia in the posterior wall of the inguinal canal.



Clinical Features

- **Symptoms**

- Swelling
- Dragging pain
- h/o suggesting increased abdominal pressure
- Symptomless
- Accidental finding

- **Signs**

- Inguino-scrotal swelling
- Expansile cough
- Cannot get above the swelling
- Reducibility
- Finger invagination test
- Deep ring occlusion test
- Ziemen test (Three finger test)

Differential diagnosis of IH

Male:

- 1) Femoral hernia**
- 2) Vaginal hydrocele**
- 3) Spermatocele**
- 4) Encysted hydrocele of the cord**
- 5) Un-descended testis**
- 6) Lipoma of the cord**
- 7) LYMPH NODES**

Female

1) Hydrocele of the canal of nuck:

Is a fluid filled distal part of the sac of an indirect hernia with narrow proximal part it present with a smooth fluctuant swelling with out a cough impulse which will transilluminate

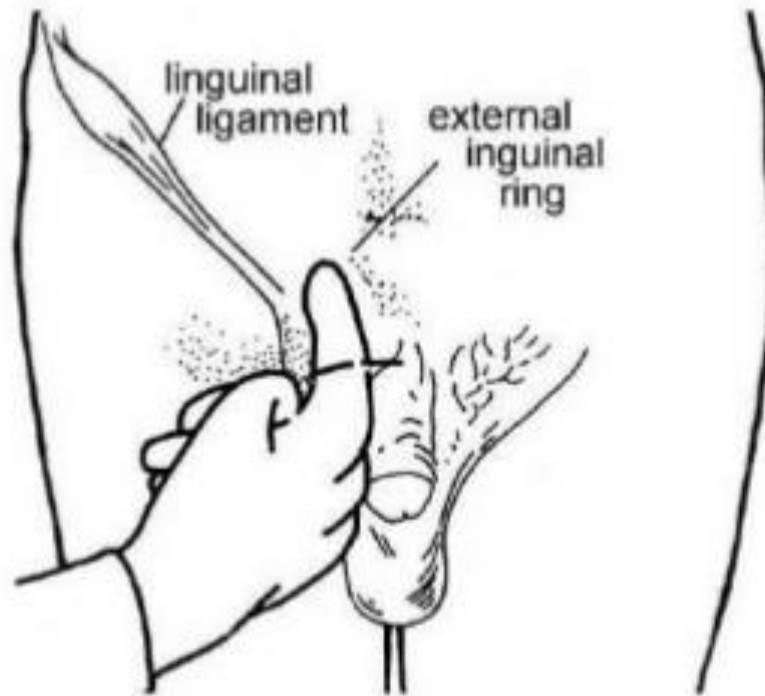
2) Femoral hernia

Note that examination using finger and thumb across the neck of the scrotum will help to distinguish a swelling of inguinal origin and one that is entirely intrascrotal

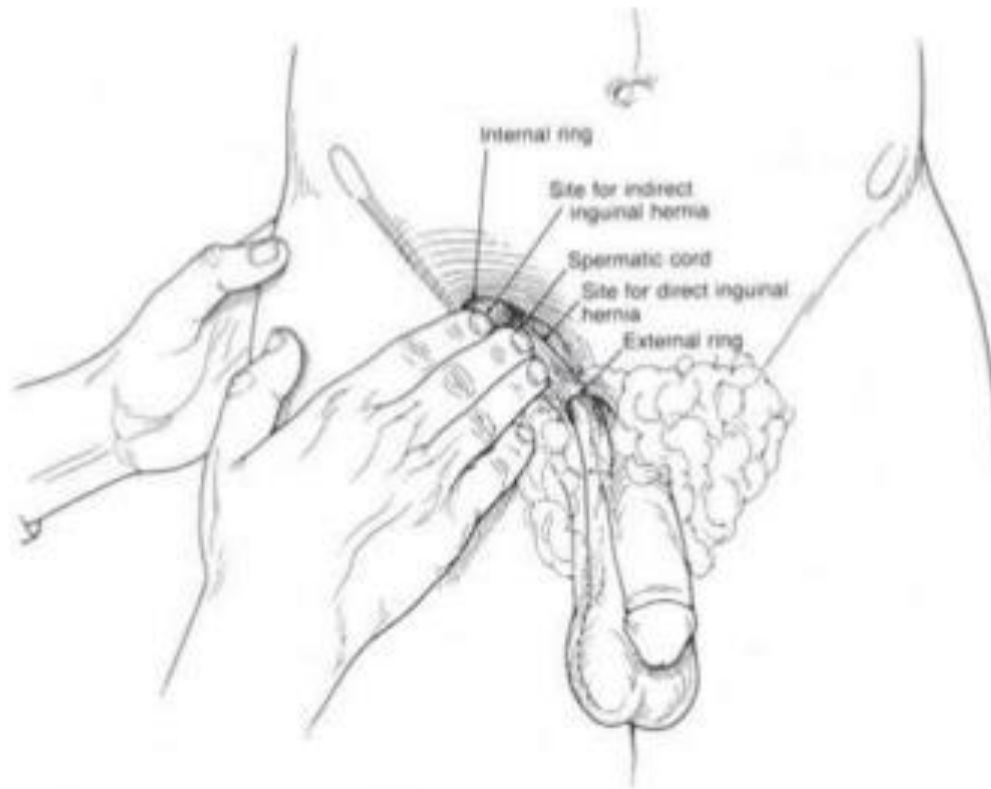
Checks

- Reducibility
- Cough impulse
- Tenderness
- Overlying skin colour changes
- Multiple defects/contralateral side
- Signs of previous repair
- Scrotal content for groin hernia
- Associated pathology

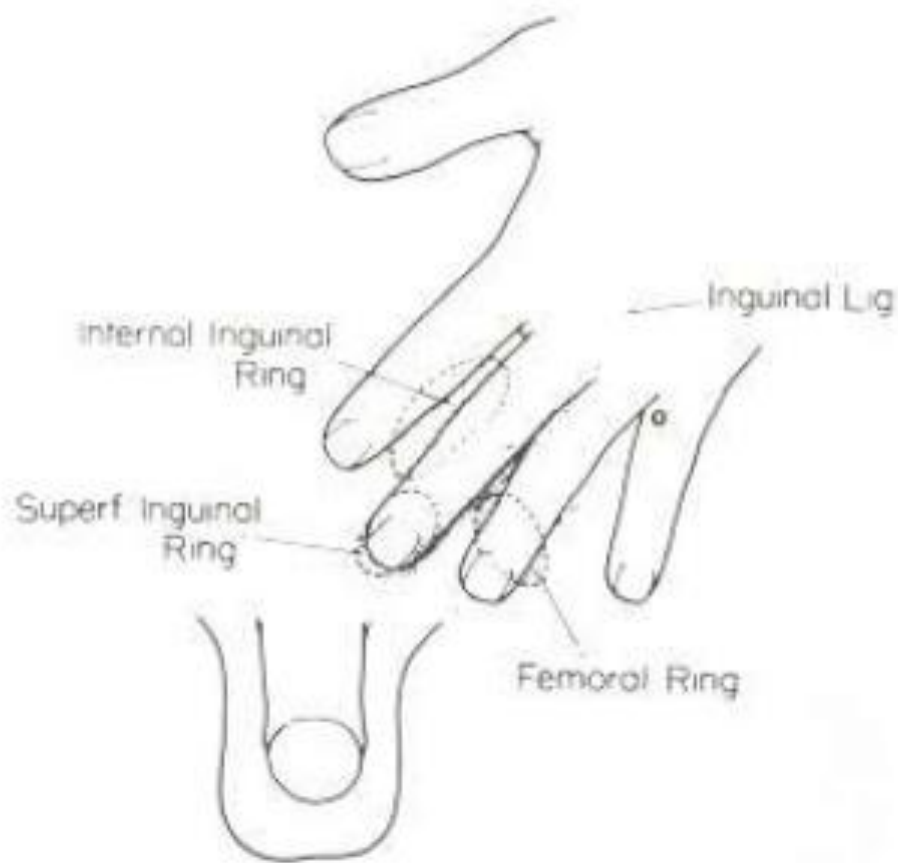
Finger invagination test



Deep ring occlusion test



Ziemen test (Three finger test)



DIRECT VS INDIRECT

AGE	ELDERLY	ANY AGE GROUP
AETIOLOGY	WEAKNESS OF POSTERIOR WALL OF INGUINAL CANAL	PREFORMED SAC
PRECIPITATING FACTOR	CHRONIC BRONCHITIS, ENLARGED PROSTATE	-----
ON STANDING	POPS OUT	DOES NOT POPS OUT
SIDE	USUALLY BILATERAL	UNILATERAL (30% BILATERAL)
INTERNAL RING OCCLUSION TEST	SWELLING IS SEEN	SWELLING NOT SEEN
COMPLICATION'S	NOT COMMEN BECAUSE NECK IS WIDE	COMMON , NECK IS NARROW OBSTRUCTION OR STRANGULATION
RELATIONSHIP OF THE SAC TO THE CORD	SAC IS POSTERIOR TO THE CORD	ANTEROLATERAL TO THE CORD
DIRECTION OF THE SAC	COMES OUT OF HESSELBACH'S TRINAGLE	SAC COMES THROUGH THE DEEP RING

Investigations for hernia

- Plain x-ray – of little value
- Ultrasound scan – low cost, operator dependent
- CT scan – incisional hernia
- MRI scan – good in sportsman's groin with pain
- Contrast radiology – especially for inguinal hernia
- Laparoscopy – useful to identify occult contra lateral inguinal hernia

Management principles

- Not all hernias require surgical repair
- Small hernias can be more dangerous than large
- Pain, tenderness and skin colour changes imply high risk of strangulation
- Femoral hernia should always be repaired

Treatment

- Conservative treatment
- Surgical treatment



Applying Truss as a conservative management of inguinal hernias.

Surgical approaches to hernia

All surgical repairs follow the same basic principles:

- 1 reduction of the hernia content into the abdominal cavity with removal of any non-viable tissue and bowel repair if necessary;**
- 2 excision and closure of a peritoneal sac if present or replacing it deep to the muscles;**
- 3 reapproximation of the walls of the neck of the hernia if possible;**
- 4 permanent reinforcement of the abdominal wall defect with sutures or mesh.**

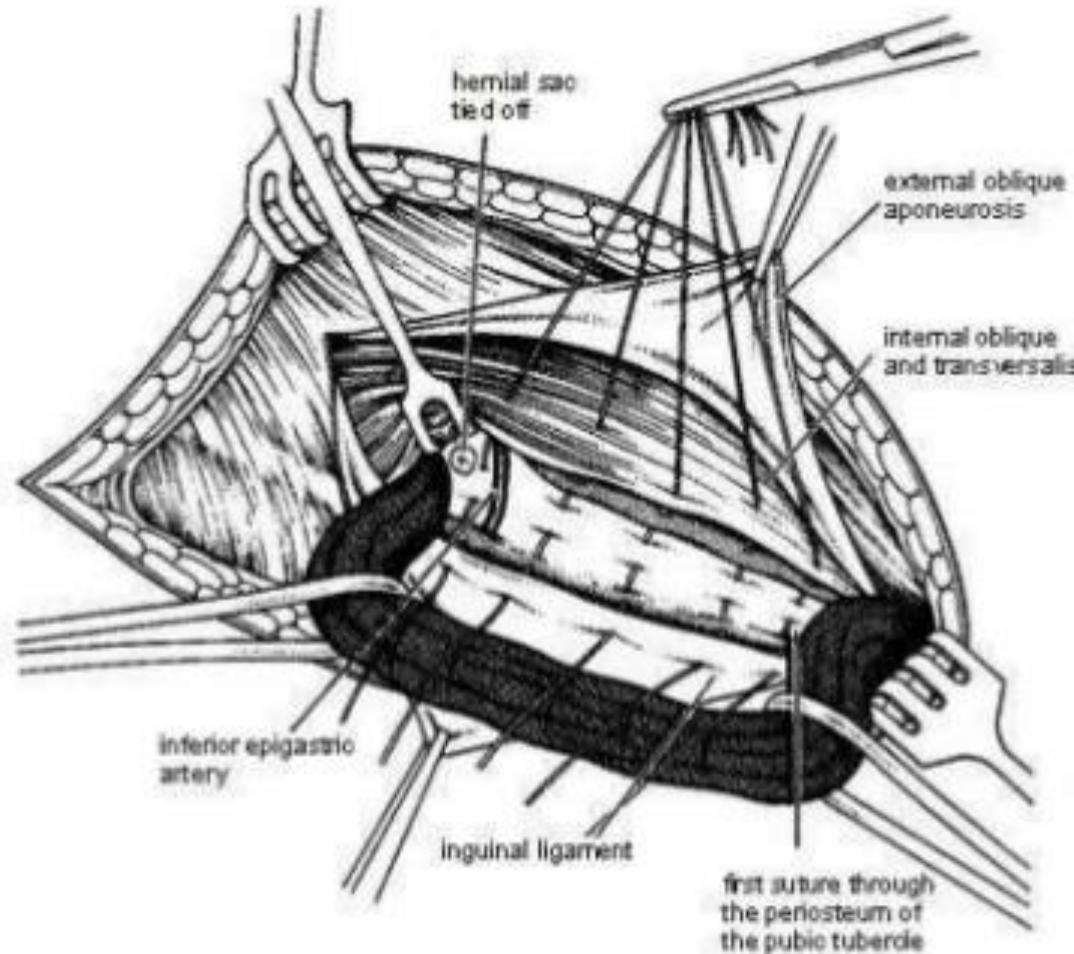
Surgical Treatment Types

- **Herniotomy** (excision of hernia sac)
 - Usually done in children
- **Herniorrhaphy** (herniotomy with strengthening of the posterior wall)
 - Bassini repair
 - Shouldice repair
 - McVay repair
- **Hernioplasty** (herniorrhaphy with application of prosthesis)
 - Lichtenstein repair
 - Plug and patch repair
- **Laparoscopic repair**
 - TEP (Total Extra Peritoneal)
 - TAPP (Trans Abdominal PrePeritoneal)

Bassini Repair

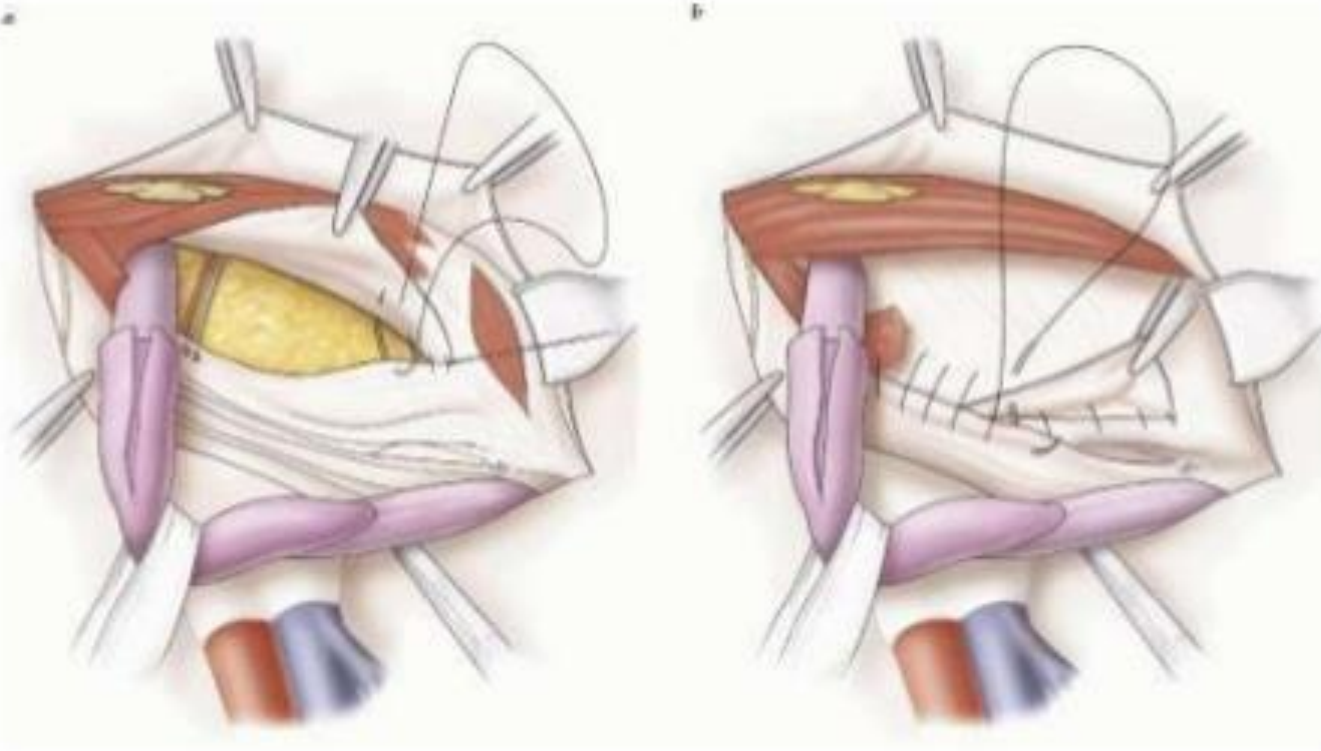
A BASSINI REPAIR

- Conjoined tendon to the inguinal ligament.



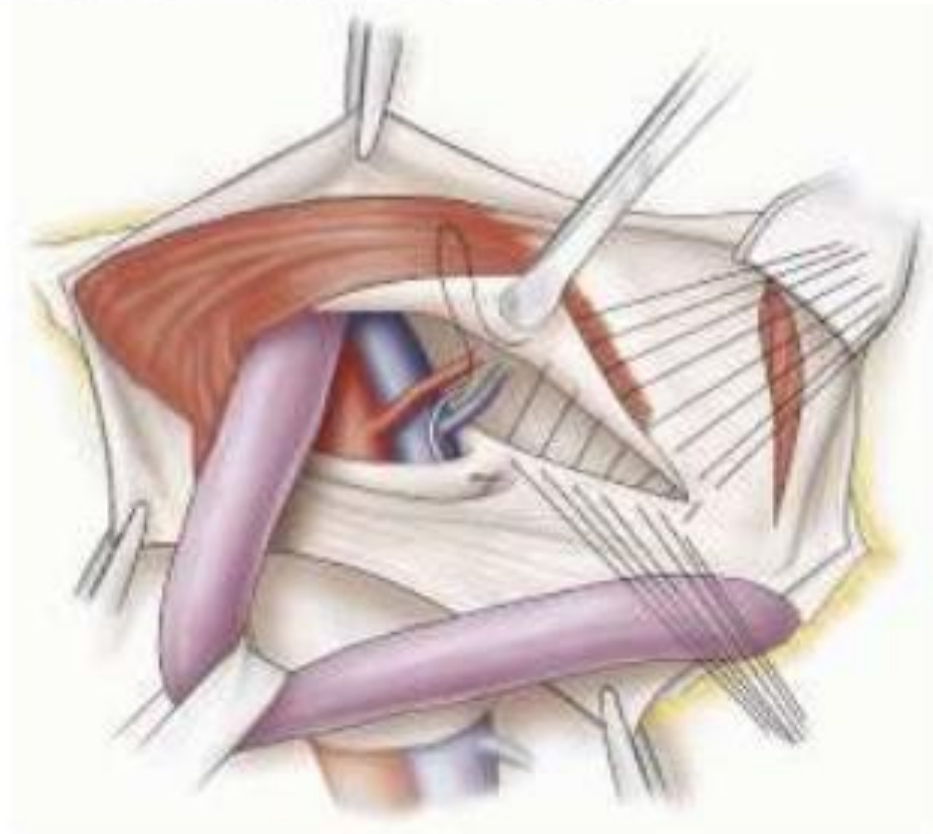
Shouldice Repair

- Multilayer repair of the posterior wall of the inguinal canal
- Double breasting of transversalis fascia
- Transverse abdominis aponeurotic arch to the iliopubic tract and Conjoined tendon to the inguinal ligament



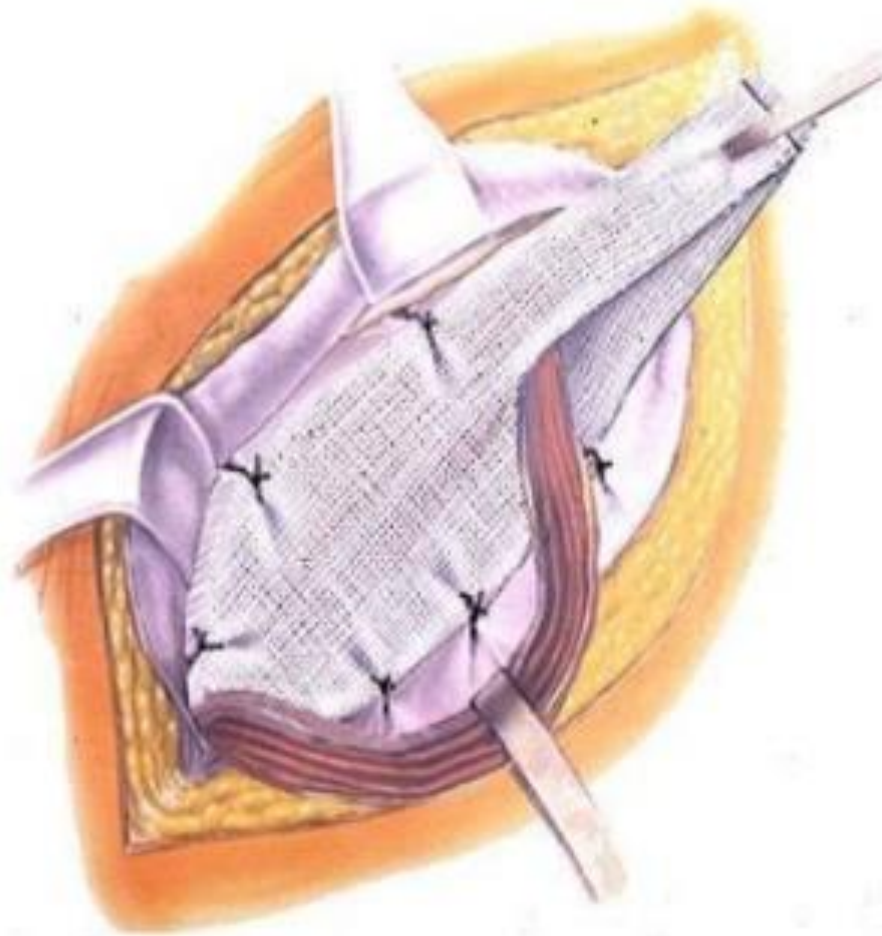
McVay Repair

- Transverse abdominis aponeurosis to Cooper's ligament and iliopubic tract



Lichtenstein Repair

- A piece of prosthetic non-absorbable mesh is placed to fit the canal
- The mesh is sutured to the aponeurotic tissue overlying the pubic bone medially, continuing superiorly along the transversus abdominis or conjoint tendon.
- The inferolateral edge of the mesh is sutured to the inguinal ligament



Complications of inguinal hernia surgery

1. Early – pain, bleeding, urinary retention, anaesthetic related
2. Medium – seroma, wound infection
3. Late – chronic pain, testicular atrophy

Sportsman's hernia

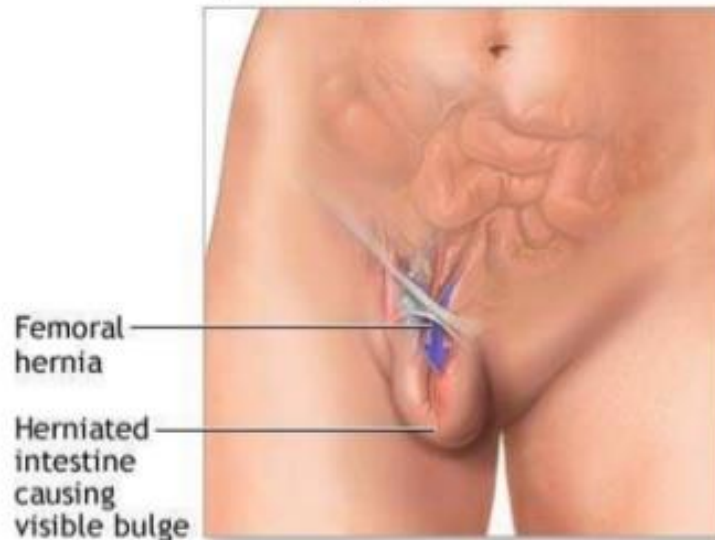
is presents as severe pain in the groin area, extending into the scrotum and upper thigh. It is restricted to young men who play contact sports such as football. The pain can be debilitating and prevent the patient from exercising.

On examination tenderness in the region of the inguinal canal, over the pubic tubercle and over the insertion of the thigh adductor muscles. no hernia can be felt and only occasionally can a true inguinal hernia be found.

In most cases, the pain is due to an orthopaedic injury, such as adductor strain or pubic symphysis diastasis. However, some believe that it can be due to muscle tearing (Gilmore's groin) or stretching of the posterior wall of the inguinal canal. Other causes of pain should be excluded, such as hip, pelvic or lumbar spinal disease and bladder/prostate problems. MRI scanning is most likely to detect an orthopaedic problem but ultrasound, herniography or even laparoscopy may be used. There are many anecdotal reports of successful treatment using all types of inguinal hernia surgery, suture and mesh, open and laparoscopic,. Hernia surgery should be a last resort and the patient warned of a significant risk of failure to cure the pain.

Femoral Hernia

- Femoral hernia enters the femoral ring, traverses the femoral canal and comes out through the saphenous opening.
- The female to male ratio is about 2:1.
- The right side is affected twice as often as the left.



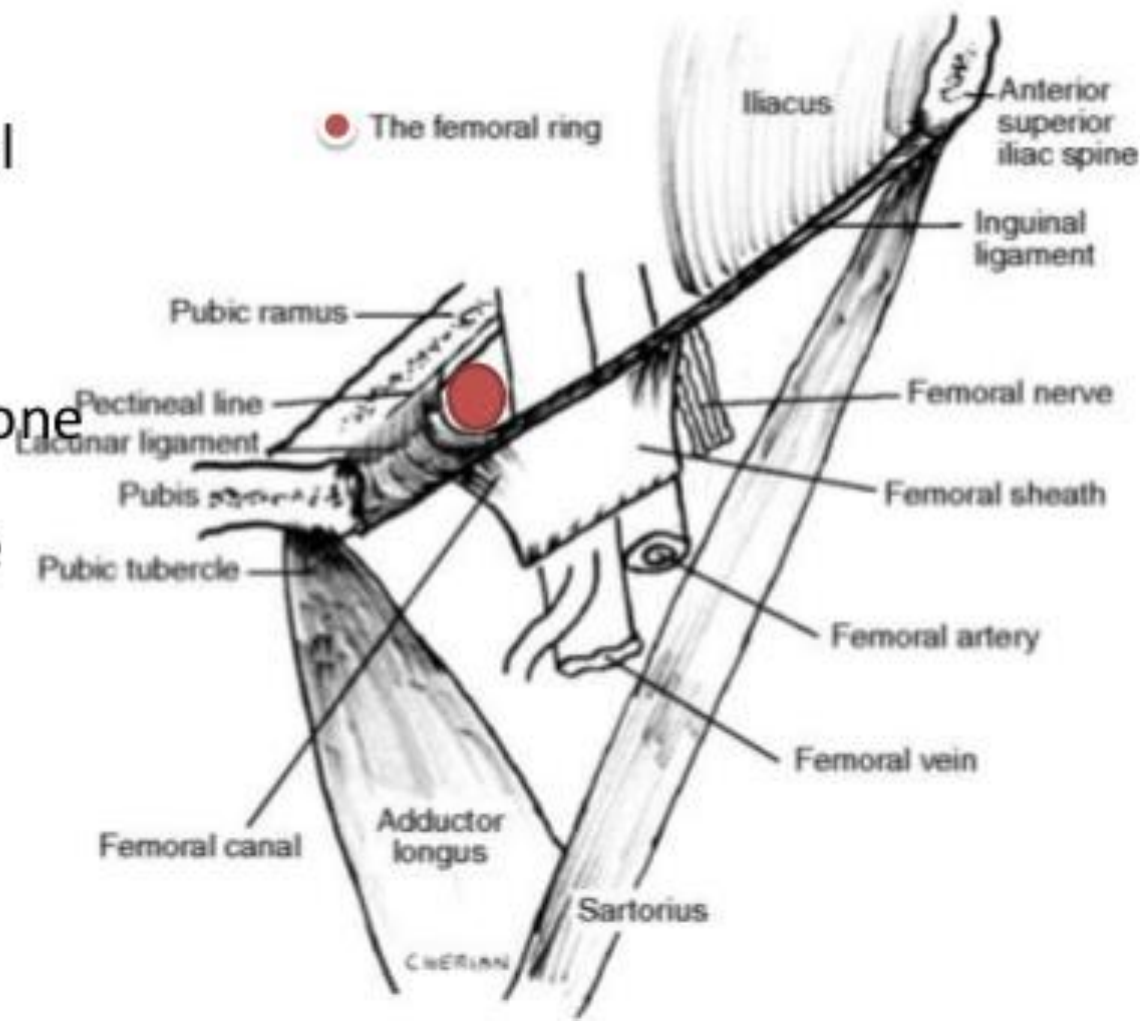
- **Easily missed on examination**
- **Fifty per cent of cases present as an emergency with very high risk of strangulation**

Differential diagnosis OF FEMORAL H

- Direct inguinal hernia
- Lymph node
- Saphena varix
- Femoral artery aneurysm
- Psoas abscess
- Rupture of adductor longus with haematoma

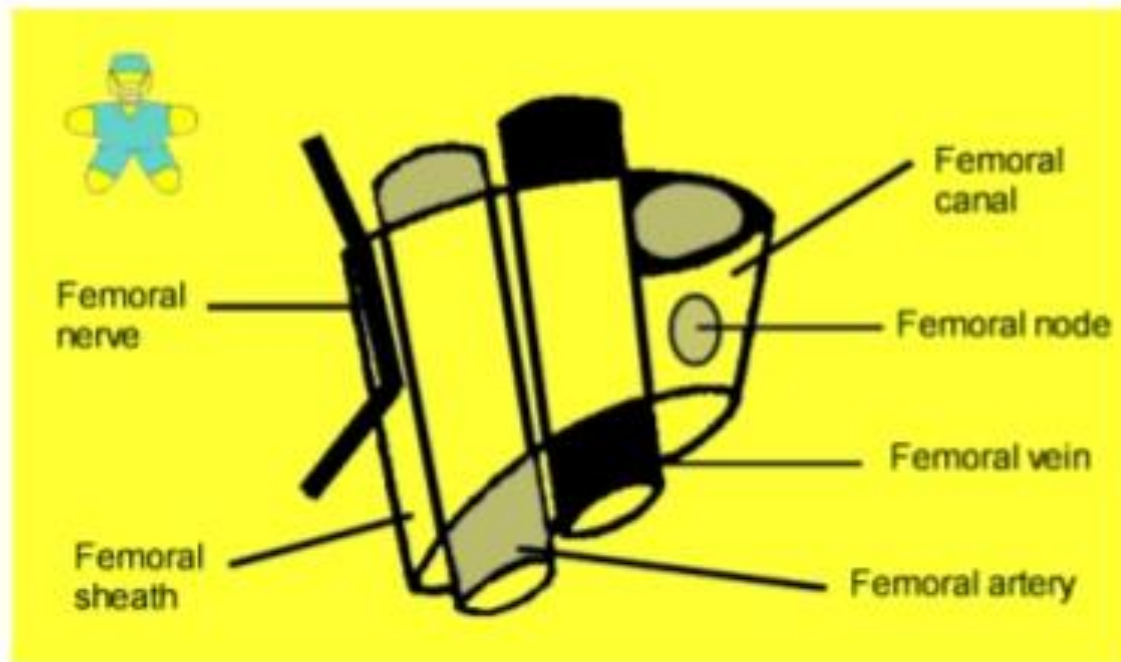
Femoral Ring

- Oval opening $\frac{1}{2}$ " to 1" in diameter
- Boundaries
 - Anteriorly inguinal ligament
 - Posteriorly iliopectineal ligament, pubic bone and fascia over pectinious muscle
 - Medially lacunar ligament
 - Laterally septum separating from femoral vein.



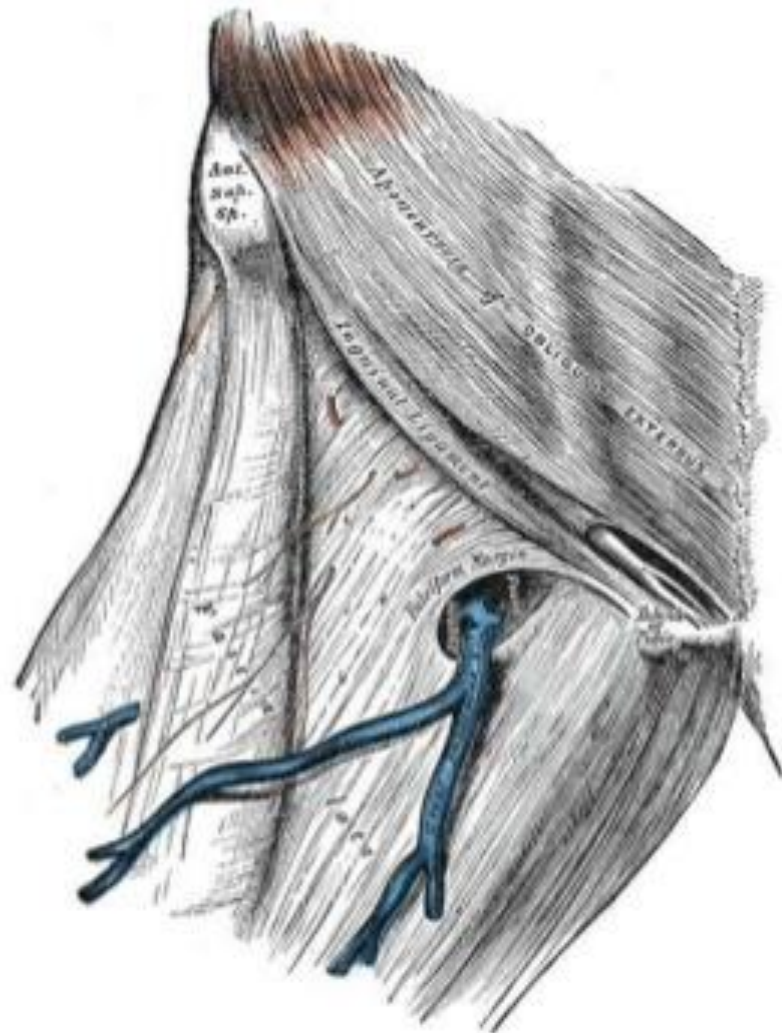
Femoral Canal

- Most medial compartment of femoral sheath.
- Conical in shape, 1.25 cm long and 1.25 cm wide at base (Femoral ring).
- Extends from Femoral ring (above) up to saphenous opening (below).
- Contents- fats, lymphatic and lymph nodes of Cloquet.



Saphenous Opening

- An oval opening in the supero-medial part of the fascia lata of the thigh.
- Lies 3–4 cm infero-lateral to the pubic tubercle.
- Long saphenous vein and femoral branch of genito-femoral nerve traverses through this opening.



Surgical Treatment

- ***The low (Lockwood) operation***- the inguinal ligament to the iliopectineal ligament.
- ***The high (McEvedy) operation***- the conjoint tendon to the iliopectineal ligament.
- ***Lotheissen's operation***- the conjoint tendon or inguinal ligament to the iliopectineal ligament through inguinal canal
- ***Lap operations***

Laparoscopic approach

Both the TEP and TAPP approaches can be used for femoral hernia and a standard mesh inserted. This is ideal for reducible femoral hernias presenting electively but not in emergency cases nor for irreducible hernia.

**THANK YOU
FOR YOUR
ATTENTION .**