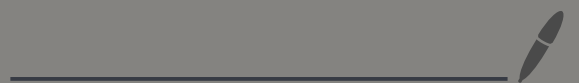


Hernia



• Hernia

• Definition

Latin - "Rupture"

Abnormal protrusion of viscus or a part of it through an abnormal osteomyocutaneous defect of the wall that contains it

• Bailey 25th

Protrusion of viscus or a part of viscus through an abnormal opening in walls of its containing cavity.

• Classification:

• Clinical

① Reducible

② Irreducible

↳ Narrow neck, adhesions.

③ obstructed

↳ Blood supply intact, cough impulse -ve

④ strangulated

↳ Obstruction + compromised blood supply

* Inflamed Hernia - Inflammation of contents of sac (appendicitis, salpingitis)

↳ Tender (Not tense), Overlying skin → Red, oedematous

• European

Hernia

Society

① Primary (P) / Recurrent (R)

② Lateral (L) / medial (M) / femoral (F)

③ Defect size, $1 = 1.5 \text{ cm}$.
(in terms of fingerbreadths)

PM3

↳ Primary Direct Hernia with 4.5 cms defect.

• Nyhus

• Type 1 - Indirect hernia with

- Normal deep ring
- Normal posterior wall

• Type 2 - Indirect hernia with

- Dilated deep ring
- Normal posterior wall

• Type 3 - Based on posterior wall defect

- Direct hernia (through Hesselbach's triangle)
- Pantaloon, Sliding - enlarged deep ring
- femoral

•

Type 4 - Recurrent Hernia - direct, indirect or combined.

• Gilbert's

Types I to VII based on posterior wall defect (direct) & Deep ring defect (Indirect)

- Type VI - Pantaloon hernia
- Type VII - femoral hernia

• Other Systems

- BENDAVID
- Caster's Staging
- Halverson and McVay
- Ponka's

Parts of Hernia

i) Covering

Derived from layers through which sac passes.

ii) Sac

- Diverticulum of peritoneum

- consists of mouth, neck, body and fundus

(many incisional hernias may have no neck)

iii) Content

① Enterocoele - Bowel

② Omentocoele - Omentum

③ Litter's Hernia - Meckel's diverticulum

④ Amyand's Hernia - Appendix

⑤ Cystocoele - Urinary Bladder

Enterocoele

① visible peristalsis

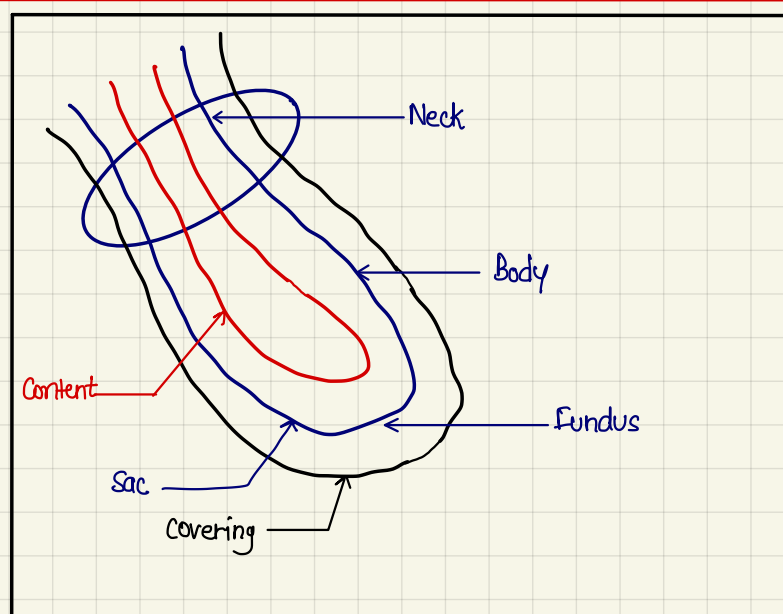
② Difficult to reduce 1st half than 2nd.

③ Bowel Sounds Auscultated

Omentocoele

① Doughy consistency

② Easier to reduce 1st part than 2nd.

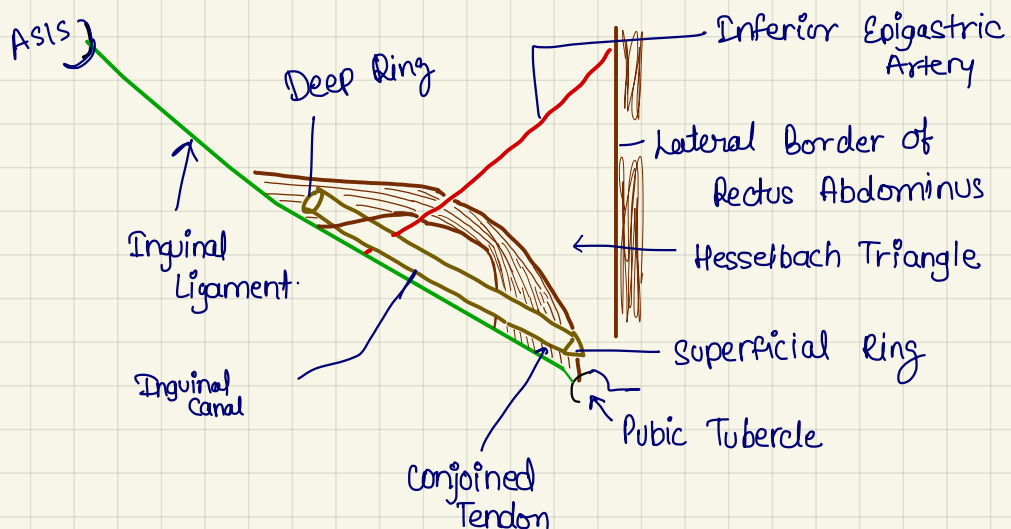
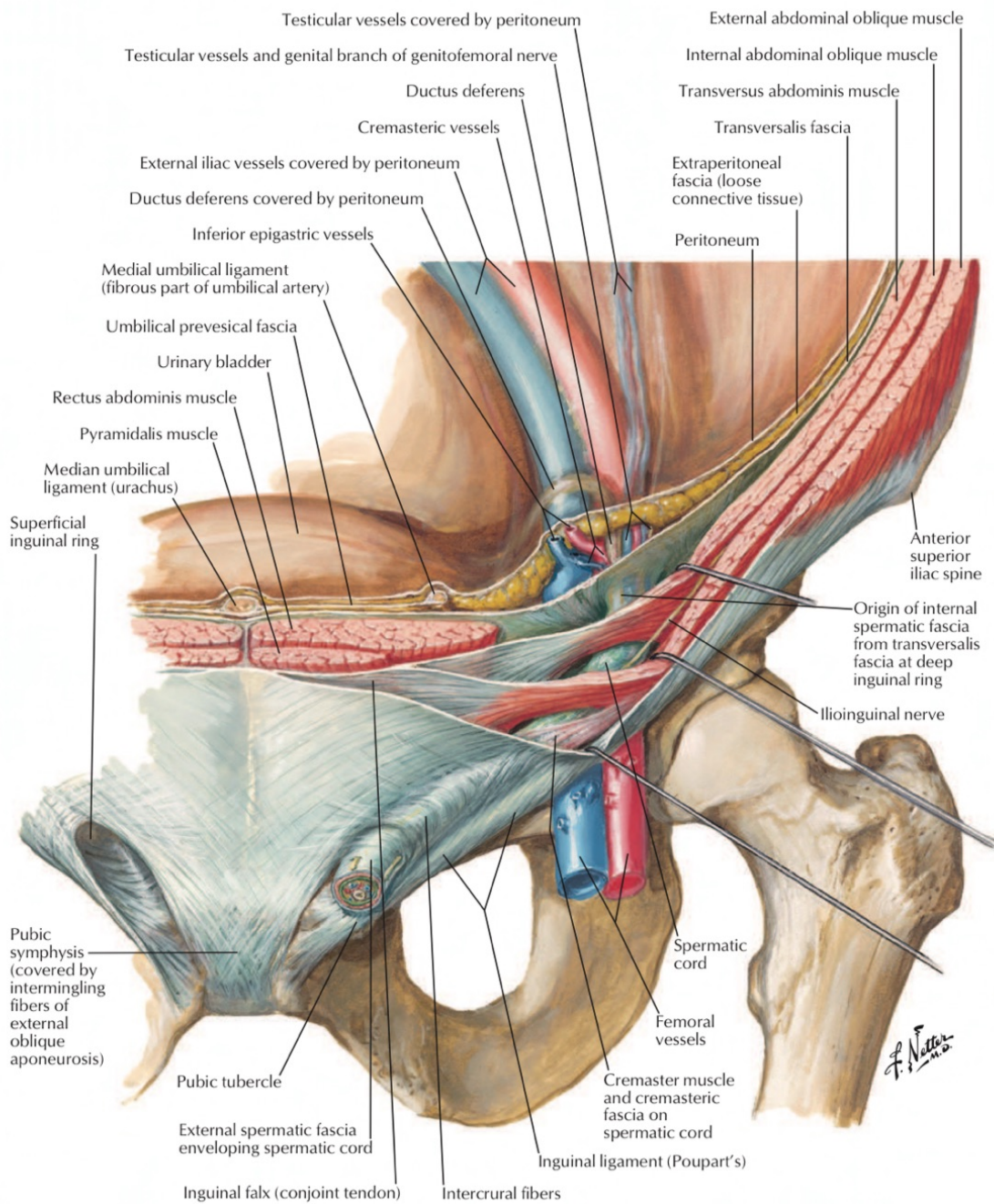


• Taxis

Process of Reduction of Hernia.

✗ forceful taxis should not be performed in case of obstructed/strangulated hernia.

Inguinal canal



* Length - About 4cm. Larger in males.
Directed downwards, forward and medially.

• Deep Inguinal Ring - Oval opening in fascia transversalis.
1.25 cms above midinguinal point (Midpoint of line joining ASIS & Pubic Symphysis)

• Superficial Inguinal Ring - Triangular gap in External oblique Aponeurosis.
1.25 cms above Pubic Tubercle.
Base of triangle formed by Pubic Crest.
Two sides are called Crura.

* Boundaries -

<u>Anterior</u>	<u>Posterior</u>	<u>Roof</u>	<u>Floor</u>
① <u>Whole</u> - a) Skin b) Superficial fascia c) External oblique aponeurosis	① <u>Whole</u> - a) Fascia transversalis b) Extraperitoneal Tissue c) Parietal Peritoneum	Arched fibres of <u>Internal Oblique</u> and <u>Transversus</u> <u>Abdominus</u>	grooved upper surface of <u>Inguinal</u> <u>Ligament</u> .
② <u>Lateral 1/3rd</u> - → Internal oblique	② <u>Medial 2/3rd</u> - a) Conjoined Tendon b) Reflected part of Inguinal Ligament at Medial end.		

* Structures passing through Inguinal canal -

① Ilioinguinal Nerve
↳ Enters through interval b/w internal & external oblique muscles.
↳ Exits through superficial ring.

② males - Spermatic Cord
Females - Round ligament of Uterus

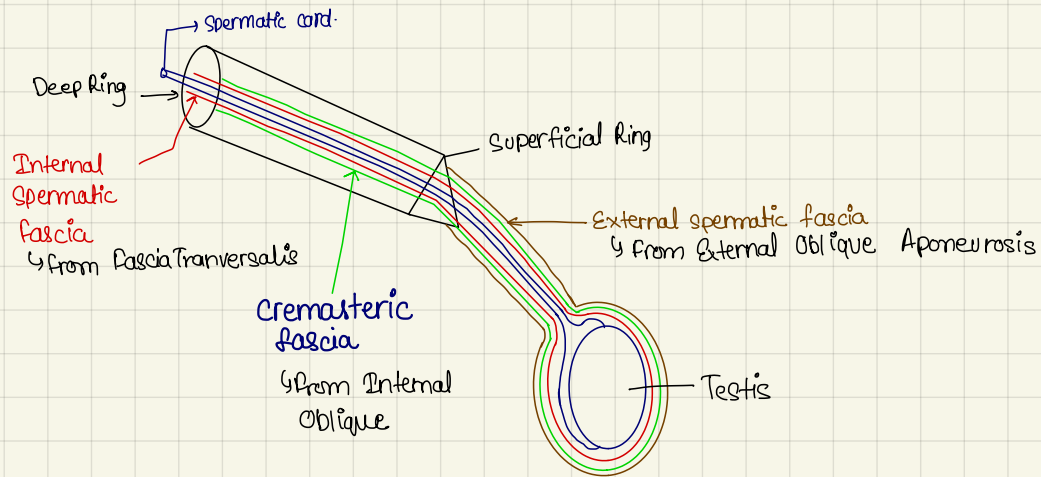
* Constituents of spermatic Cord -

- ① Vas deferens.
- ② Arteries -
 - Artery to vas deferens (with veins)
 - Testicular artery
 - Cremasteric artery (with veins)
- ③ Vein - Pampiniform Plexus of veins
- ④ Nerves -
 - Genital branch of genitofemoral nerve
 - Sympathetic nerves around artery to vas.
 - Visceral afferent nerve fibres.
- ⑤ Lymph vessels from testis
- ⑥ Remains of processus vaginalis.

• Development:

- Represents passage of gubernaculum through abdominal wall.
- Canal is very short in early life.
- Deep inguinal ring shifts laterally as pelvic width increases.

★ Coverings of spermatic Cord -



Mechanisms of inguinal canal

SPAD

① Obliquity of inguinal canal.

- When abdominal pressure rises, anterior & posterior wall of canal are approximated thus obliterating the passage.

→ **FLAP VALVE MECHANISM.**

② Guarding of Superficial Ring from behind by conjoint tendon and reflected part of inguinal ligament.

③ Guarding of deep inguinal ring in front by fibres of Internal Oblique

④ **Shutter mechanism of Internal Oblique-**

When the arched fibres of Internal oblique and Transversus abdominus contract, the roof is approximated to floor like a shutter.

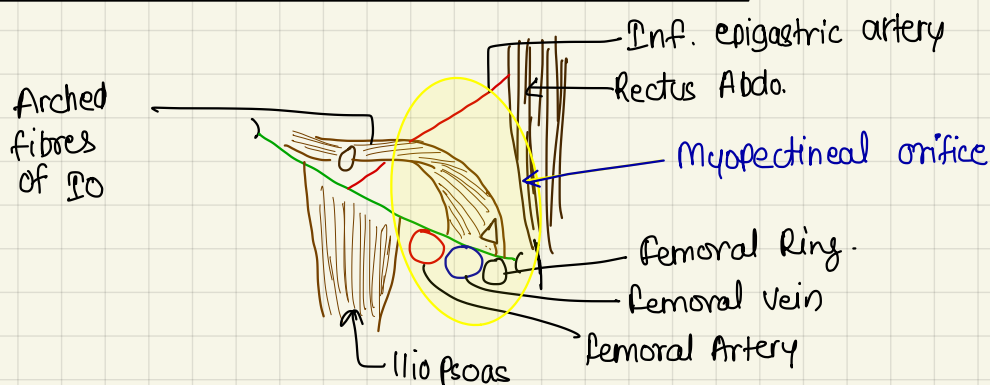
⑤ **Ball valve mechanism-**

Contraction of cremaster helps spermatic cord to plug the superficial inguinal ring.

⑥ **Slit valve mechanism-**

Contraction of external oblique causes approximation of both crura of superficial ring.

* **Myopectineal orifice of Fruchaud-**



* **Boundaries -**

Superior - Arched fibres of internal oblique.

Lateral - Tendon of Iliopsoas

Medial - Outer border of Rectus

Inferior - Ligament of Cooper

* Cover defects of Inguinal, Femoral, Obturator hernias.

Inguinal ligament (Poupart's ligament)

- Formed by lower border of external oblique aponeurosis.
- Extends from Anterior Superior Iliac Spine to Pubic tubercle.
- Lateral half - Rounded & oblique
Medial half - grooved upwards & horizontal.

⇒ Attachments -

① Upper surface -

- (i) Lateral $\frac{2}{3}$ → Origin of Internal Oblique
- (ii) Lateral $\frac{1}{3}$ → Origin of transversus abdominus
- (iii) Middle part - Cremaster muscle.

② Lower border -

→ fascia lata

↳ Traction makes ligament convex downwards

★ Extensions -

① Lacunar ligament (Gimbernat's) - Pectineal part of inguinal ligament.

Anterior - medial end of inguinal ligament; Posterior - Pecten Pubis; Apex - Pubic Tubercle.
Horizontal in position & supports spermatic cord.

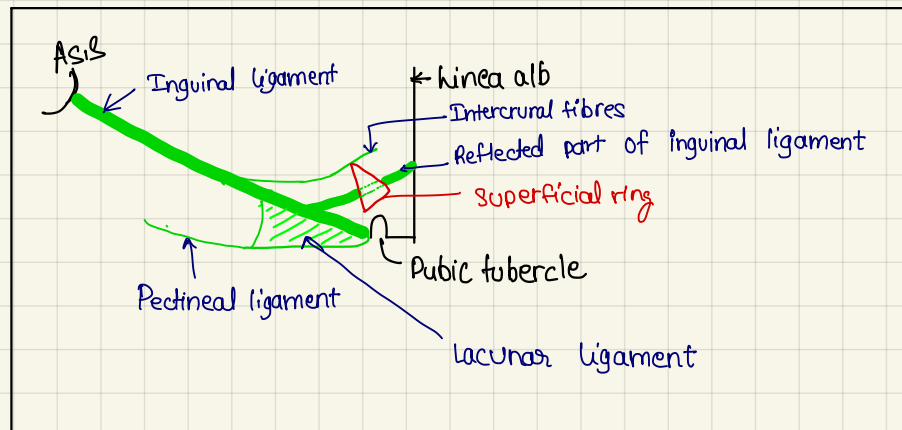
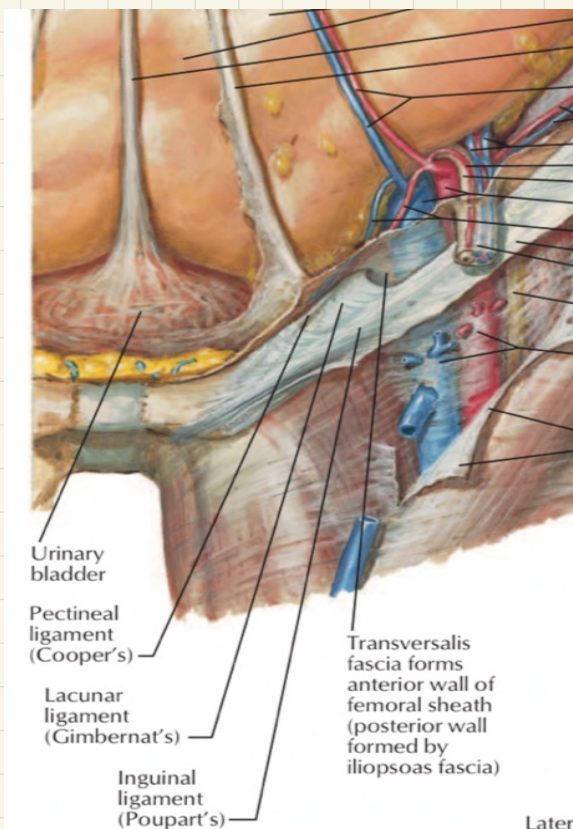
② Pectineal ligament (Ligament of Cooper) -

Extension from posterior part of base of lacunar ligament.
Attached to pecten pubis.

③ Reflected part of Inguinal ligament -

Fibres that pass upward and medially from lateral crus of superficial ring.
Lies behind superficial ring and anterior to conjoint tendon.

④ Intercrural fibres - Arise from middle of inguinal ligament and arch over superficial ring to keep crura together.



Inguinal hernia

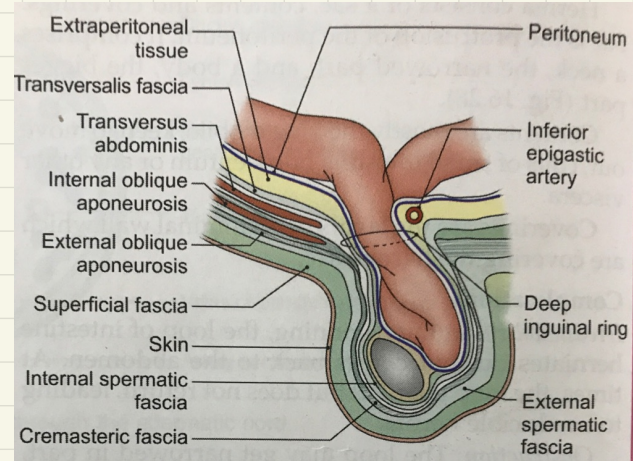
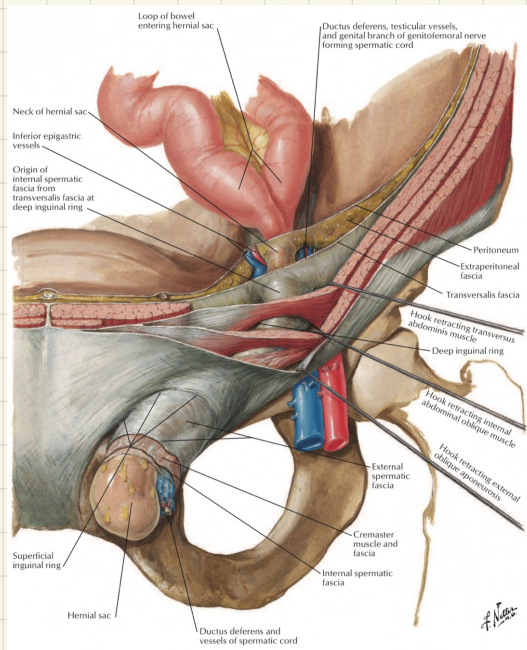
LAO

• Types

- i) Indirect Inguinal Hernia
- ii) Direct Inguinal Hernia

• Indirect hernia

(Lateral Hernia)



- Most common form of hernia (in both males & females).
- Right side is more common than left.

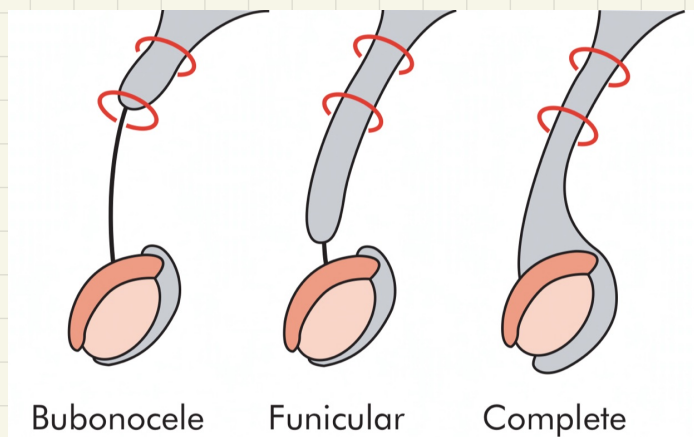
- Aetiology

Congenital preformed sac - due to persistent processus vaginalis.

- The preformed sac passes through deep inguinal ring, transverses inguinal canal and may extend upto scrotum.

- Types

- (i) Bubonocoele - limited to inguinal canal
[Bubon (greek) - groin]
- ii) Funicular - Processus vaginalis closed just above epididymis.
[Funiculus (latin) - a small cord]
- iii) Complete - till scrotum.

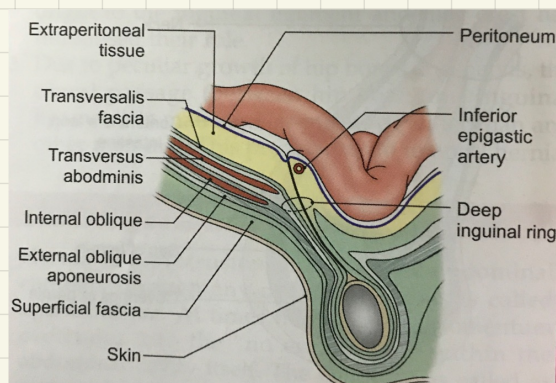


• Coverings

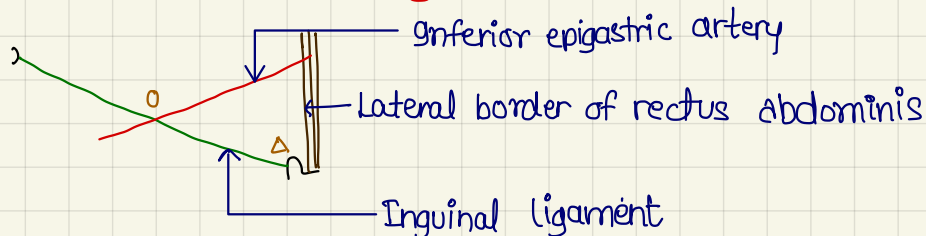
- ① Skin (outermost)
- ② Superficial fascia (Camper's & Scarpa's)
- ③ External spermatic fascia
- ④ Cremasteric fascia
- ⑤ Internal spermatic fascia
- ⑥ Extraperitoneal fat
- ⑦ Peritoneum

• Direct hernia

(Medial Hernia)



- Always acquired
- Sac passes through a weakness or defect in fascia transversalis
- Occurs through Hesselbach's triangle → floor → Fascia transversalis



- **Malgaigne's Bulges** - Presence of elongated bulgings in some patients (due to poor musculature).
↳ (lower abdo; side of Rectus abdom.)

• Precipitating Factors

- ① Elderly patients →
 - a) Chronic cough, chronic bronchitis
 - b) Benign prostate hypertrophy
 - c) Chronic constipation.
- ② Damage to ilioinguinal nerve → weakness of conjoint tendon.
↳ due to previous appendectomy.
- ③ Smoking → ↓ elastin → ↓ strength of abdominal muscles

• Coverings

- ① Skin
- ② Superficial fascia (Camper's and Scarpa's)
- ③ External oblique aponeurosis
- ④ Conjoint tendon
- ⑤ Fascia transversalis
- ⑥ Peritoneum

Clinical exam

• Complaints

1) Pain

- Dragging and aching type
- May appear before lump.
- Continues as long as hernia progresses; Ceases when hernia fully forms
- Severe pain and tenderness — Strangulation.

2) Lump

- Patient may present with no pain and just a swelling.
- Progression -
 - a) Inguinal hernia - Appears above groin crease and extends down.
 - b) Femoral hernia - appears below groin crease; extends upwards.

3) Systemic

If lumen is obstructed, cardinal symptoms of intestinal obstruction appear → colicky abdominal pain, vomiting, distension, constipation.

4) Others

Complaints that may have caused Hernia.
• Chronic cough, bronchitis, constipation, BPH.

• Inspection

Position of patient - 1st Standing, then supine.

1) Swelling

- Size & Shape : Indirect hernia - Pyriform
Direct - Spherical
Femoral - Retort shape
- Position:
Inguinal - Above pubic tubercle
Femoral - Below & lateral to pubic tubercle

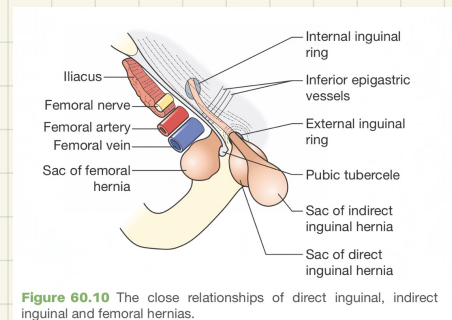


Figure 60.10 The close relationships of direct inguinal, indirect inguinal and femoral hernias.

2) Skin over swelling

Strangulated - Red.

3) Cough Impulse

Appearance of swelling when there is none or increase in size of swelling when there is one. ★ ★ v imp

• Seen at superficial ring

D/Ds of Expansile Cough Impulse:

- Hernia
- Saphena Varix
- Varicocele
- Laryngocele
- Meningocele
- Empyema necessitans

4) Position of Penis

• Palpation

1) Deep Ring Occlusion

CSA

- Reduce the hernia → Apply pressure over deep ring with thumb
↓
Ask patient to cough.
- Direct Hernia - Bulge medial to thumb
Differentiates b/w direct and indirect inguinal hernia.

• Fallacies of Deep Ring occlusion Test -

- ① Improper localisation of deep ring
- ② Dilated deep ring
- ③ Pantaloon hernia

2) Zieeman's test

- 3 finger test (Right hand for right side)
Index finger - Deep Ring
Middle finger - Superficial ring
Ring finger - Saphenous opening
(4cm below & lateral to pubic tubercle)

Cough Impulse
Indirect
Direct
Femoral

3) Getting above swelling

- Differentiates scrotal swelling from inguinoscrotal swelling.
- Never done in purely inguinal swellings.

Hold root of scrotum b/w thumb (front) and other finger (behind)
↳ Purely scrotal swelling → cord structures palpated
↳ Can get above swelling.

• Percussion

- Resonant Note - Enterocoele
- Dull Note - Omentum / Extraperitoneal fat.

• Differences

	Direct	Indirect
• Age	Elderly patients	Any age, commonly young.
• Aetiology	Acquired; Weakness of posterior wall	Preformed Sac; persistent processus vaginalis
• Factors	Chronic cough, Constipation, BPH	-
• On standing	Pops Out	Does not Pop out.
Sac	- Comes out from Hesselbach's triangle - Posterior to cord (Posteromedial)	- Comes out through deep ring - Anterolateral to cord.
• Complications	Uncommon; wide neck	Common, narrow neck
• Shape of swelling	Spherical	Pyramiform
• Deep Ring Occlusion	Swelling seen	Swelling not seen
• side	Usually bilateral	Usually unilateral, may be bilat.
• Malignant's bulgings	May be present	Absent

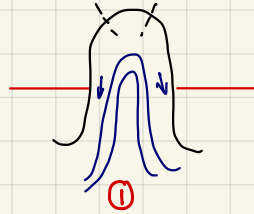
Management

① Herniotomy

Incision - 2 cm above and parallel to medial 2/3 of inguinal ligament.

• Lateral Hernia -

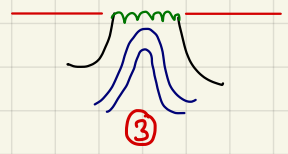
- ① Sac is separated from cord
- ② Sac is opened (Herniotomy)
- ③ Contents are reduced
- ④ Sac is sutured close to neck & excess sac is removed.



Identify & open sac.
Push contents down.



- Sac sutured close to neck
- Excess sac removed



- Defect left as it is
(Posterior wall not repaired)

• Medial Hernia.

- Sac is inverted (not cut) ie- **Herniotomy is not done for Direct Hernia.**
- Excess transversalis fascia is future plicated with Purse String sutures

• Drawbacks

Highest Recurrence Rate.

• Indications

- ① Congenital Inguinal Hernia (young patients)
- ② Congenital hydrocele

② Herniorrhaphy

Repair of posterior wall using local adjacent tissue.

(Herniotomy + Suturing the edges of defect together)

a) Bassini's

- Key Stich (Bassini Stich) placed at Pubic tubercle (periosteum)
- Sutures placed between conjoint tendon and inguinal ligament from pubic tubercle to deep inguinal ring. [original - silk, modified - Prolene]

- Original - Silk sutures used (Multifilament $\rightarrow$ $\uparrow$ chance of infection)
- Modified - Prolene suture used

Bassini's repair is not anatomical (Roof sutured to floor $\rightarrow$ $\uparrow$ tension) and not physiological (muscle sutured to ligament)

b) Shouldice

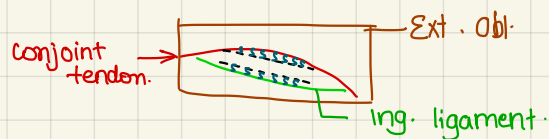
6 layer repair

- ① Transversalis Fascia opened by central incision from PT to deep ring. Then closed by 2 suture lines to create a layered posterior wall (Double Breasting)
 - ② Suturing of Conjoint tendon and inguinal ligament
 - ③ Double breasting of External Oblique Aponeurosis.
- * Recurrence $< 2\%$; but technically demanding surgery.
* 2nd layer of Shouldice corresponds with Bassini's.

- Modified Shouldice - 4 Layer repair $\rightarrow$ External oblique aponeurosis layer excluded.

c) Desarda

- ① 1-2cm Strip of Ext. oblique Apo is Separated from muscle except medially and laterally.
- ② Upper & lower ends sutured to conjoint tendon & inguinal ligament
 $\rightarrow$ Reinforces posterior wall of canal



* On contraction of muscle $\rightarrow$ Strip tightens $\rightarrow$ Further Physiological Support.

d) McVay's Repair

- Aka Cooper Ligament Repair
 - Conjoint tendon sutured to pectineal ligament.
 - Protects against Direct, Indirect and femoral hernias
- Tanner's Slide - Relaxing incision on lower rectus sheath so that conjoint tendon can be pulled down more.

• Drawback

Wider defect $\rightarrow$ $\uparrow$ tension $\rightarrow$ may cause failure

• Indications

strangulated hernia, Infected hernia.

③ Hernioplasty

Repair using material / tissues foreign to that part.

Autogenous (Not done now)

↓
Fascia lata

Heterogenous

↓
mesh

- Lichtenstein Tension free Prolene mesh Hernioplasty

- Mesh - Polypropylene
- Size - 8 x 15 cm
- Sutures at Pubic tubercle, conjoint tendon & inguinal ligament.
- Laterally, mesh is split into 2 tails $\left[\begin{array}{l} 2/3 \text{ upper leaf} \\ 1/3 \text{ lower leaf} \end{array} \right.$
↳ wrapped around cord.

(Upper leaf goes in front of lower and is sutured to inguinal ligament at level of deep ring).

b) Plug mesh repairs

Simple to insert.

Require none to little fixation.

Drawbacks - ① Migration

② may become solid - Meshoma of plug & collagen

c) Stoppa's repair

- Open preperitoneal mesh repair.
- Forms the basis of TEP.

Indication -

Multiple open standard surgery failures and recurrence.

• Complications

① Operative

- Injury to Vas deference.
- Injury to nerves → MC → Ilioinguinal nerve
- Haemorrhage → injury to vessels

② Post operative

a) Early

- Pain [MC nerve injured - Ilioinguinal]
- Bleeding - Damage to inf. epigastric, iliac vessels
- Urinary Retention
- Anaesthesia Related
- Injury to vas.

b) Intermediate

- Seroma - Due to excessive inflammatory response to sutures & mesh.
↳ May require aspiration
- Haematoma
- Wound infection.
- Mesh infection

c) Late

- Recurrence
- Chronic Pain - Pain > 3 month after surgery
↳ Due to nerve entrapment → MC → Iliohypogastric Nerve

Laparoscopic Repairs

d) TEP

Totally Extraperitoneal

Space created deep to abdominal muscles without entering peritoneal cavity

b) TAPP

Transabdominal pre peritoneal

Surgeon enters peritoneal cavity and incises peritoneum above hernia defects, entering same space as TEP.

• TEP is better than TAPP (but also more difficult to perform).

Mesh

• 10 cm X 15 cm

• Covers deep inguinal ring, hesselbach's triangle & Femoral canal.

Advantages

Reduced pain

• Rapid recovery

• Reduced complications

• Particular benefits in a) Bilateral cases *

b) Recurrent cases

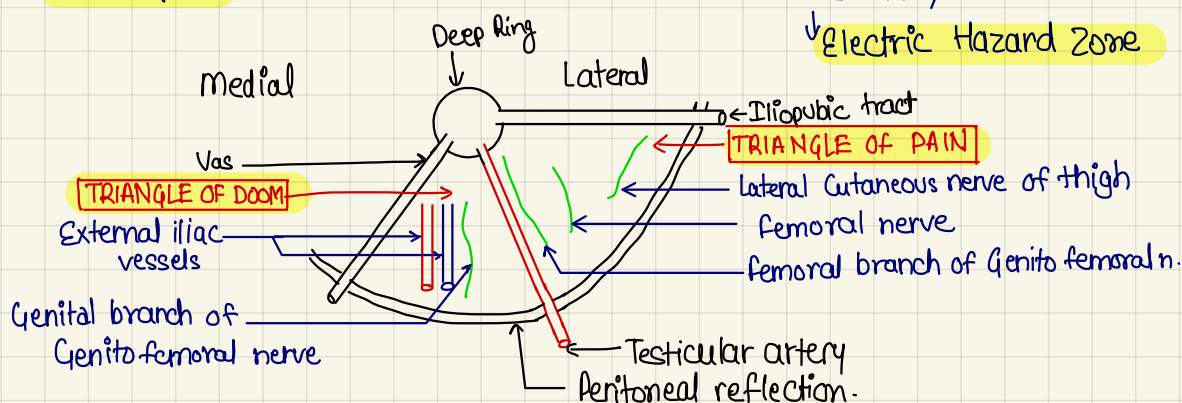
Dangerous Areas

• **Trapezoid of disaster** = Triangle of doom + Triangle of pain

↳ No staplers should be used

↳ No cautery

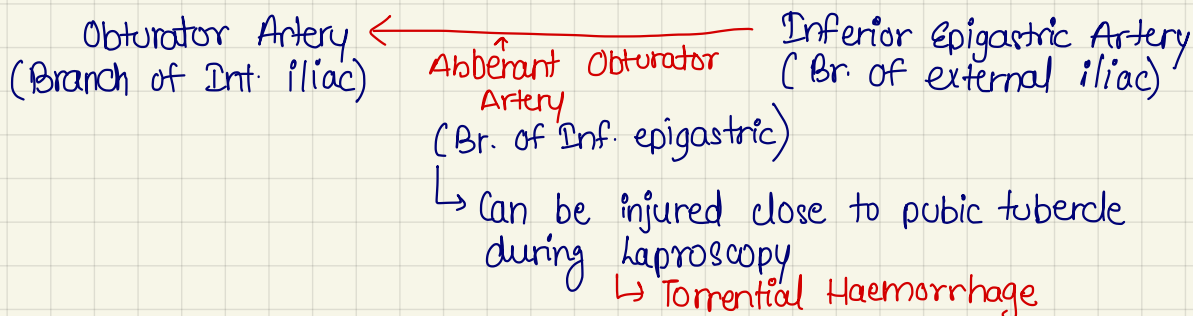
↳ Electric Hazard Zone



* Most common nerve entrapped - Lateral cutaneous nerve of thigh
↳ Meralgia Paresthetica

• **Corona mortis** - Circle of death.

Abnormal connection b/w external and internal iliac systems.



Mesh in Hernia Repair

mesh can be used to

- Bridge the defect
- Plug the defect
- Augment repair done with sutures.

• Structure

- Net meshes** -
 - Allow fibrous ingrowth between strands
 - Get integrated to host tissues within months
- Solid/Sheet meshes** -
 - Do not allow tissue ingrowth.
 - Become encapsulated by fibrous tissue
 - Non absorbable sutures required.

• Types

a) Synthetic

① **Polypropylene** → **mc**

- Monofilament
- Does not have antibacterial properties.
- Hydrophobic → Impede bacterial growth.
- Colour → White

② Polyester

Braided Filament Mesh.

Hydrophilic → Allows rapid vascular & cellular infiltration
↳ Aids host immune system to infection.

③ **Polytetrafluoroethylene (PTFE)** -

Sheet meshes

Do not allow tissue ingrowth.

Non adhesive barrier b/w tissue layers.

Fenestrated PTFE - Intraperitoneal mesh

↳ Peritoneum will grow through perforations but bowel will not adhere to sides.

b) Biological

• **Sheet meshes**, **Expensive**

- Sterilised, decellularised, non immunogenic connective tissue
- Broken down by enzymes and remodelled with normal host fibrous tissue.

eg -

- a) Acellular Human Dermis (Alloderm)
- b) Acellular Porcine Dermis

• Positioning

a) **Onlay** - Just outside muscle in subcutaneous space.

b) **Inlay** - Within defect (Plug meshes)

c) **Sublay** -

- i) Between fascial layers of abdominal wall.

- ii) Immediately extraperitoneal, against muscle/fascia.

d) **Intraperitoneally**

• Mesh Shrinkage

- Progressive decrease in size of mesh over time.
- Shrinkage can be upto 50% or more.
- Thus, a mesh should have good overlap around all margins of defect. (At least 2 cm ; Ideal $\Rightarrow$ 5 cm).
- Light meshes $< 40 \text{ gm/m}^2$
- Heavy meshes $> 80 \text{ gm/m}^2$ $\rightarrow$ Heavy weight has more shrinkage.

• Ideal mesh

- a) Low weight
- b) Thin fibres
- c) Large Pores

• Special Inguinal Hernias

• Gibson's Hernia

Hernia + Hydrocele

• Pantaloon Hernia

Direct + Indirect Hernia.

• Sliding Hernia

- Acquired Lateral Hernia.
- In elderly patients
- Retroperitoneal fatty tissue pushed downwards along inguinal Canal.
- Peritoneum may be pulled, thus creating a sac.
- Viscera is not content of the sac, it forms posterior boundary of sac.
- Left side $>$ Right side
- Structures pulled $\Rightarrow$ MC - Sigmoid Colon (Lt side)
Bladder
caecum (Rt side)
 $\hookrightarrow$ Are not contents of the sac.
- Injury to viscera may occur during sac dissection.

• Sportsman's hernia (Gilmore's Groin)

- In Young men who play contact sports.
may be due to muscle tearing or stretching of posterior wall of inguinal canal.
- Severe Inguinal Pain and tenderness.
- Hernia sac very small ; usually not palpable.
- IOC - MRI
- Sx - Laparoscopic inguinal hernia surgery.
 $\hookrightarrow$ Pain may not resolve after surgery.

* Other causes of inguinal pain must be ruled out.
 $\hookrightarrow$ Hip, pelvic, bladder/prostate problems, Lumbar Spine dis.

Femoral hernia

• Femoral Canal

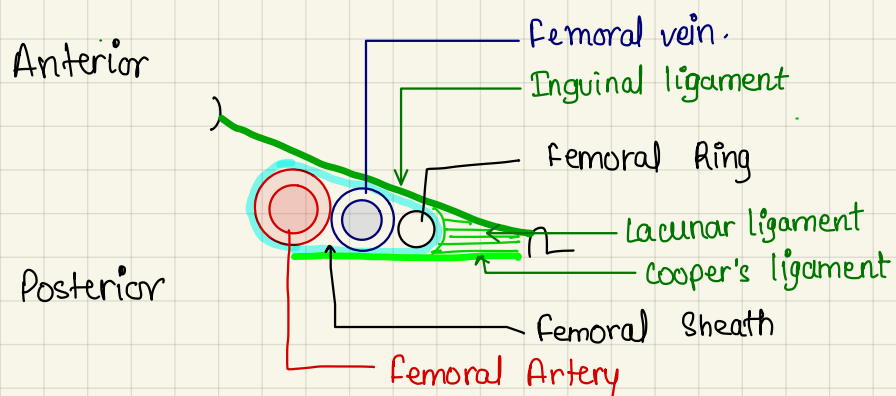
- Most medial compartment of femoral sheath.

• Anatomy

- Extends from femoral ring (above) to saphenous opening.
- Length = 1.25 cm,
- Width = 1.25 cm (at base)
- Base → Upper end (femoral ring)
- Closed above by **Septum Crurale** and below by **Cribriform fascia**.

• Boundaries of femoral ring

- Anterior - Inguinal ligament
- Posterior - Cooper's ligament
- Medial - Lacunar ligament
- Laterally - Septum of femoral vein.



- Femoral ring is surrounded by rigid ligamentous structures on 3 sides.
 - ↳ More chances of **strangulation** of hernia.

• Contents of femoral canal

- fat, Lymphatic vessels
- Lymph node of Cloquet

• Incidence

- Females > Males.
- Right > Left (20% cases → Bilateral)

• Differential Diagnosis

① Inguinal Hernia

② Saphena Varix - Disappears when patient lies, whereas sac of femoral hernia does not.

↳ Also imparts **Fluid Thrill** on coughing or when saphenous vein below is tapped.

→ Sometimes, venous hum may be heard on auscultation.

③ Enlarged femoral lymph node.

④ Lipoma

⑤ Femoral Aneurysm.

⑥ Psoas Abscess

⑦ Distended Psoas Bursa

⑧ Rupture of adductor longus with Haematoma formation.

• Special types

• Laugier's - Through a gap in lacunar ligament.

• Narath's - In children with congenital dislocation of Hip.

• Cloquet's - Sac lies under fascia covering pectineus muscle. Sac may coexist with usual type of femoral hernia sac.

• Velpeau's - Prevascular - Hernia in front of femoral vessels.

• Serafini's - Retrovascular - Hernia behind femoral vessels.

* All these have high chances of strangulation.

• Management

• Lockwood

• Low Approach

Done in uncomplicated hernia.

① Transverse incision made over hernia

② Sac is opened & contents reduced. Sac is also reduced.

③ Non absorbable sutures placed inguinal ligament (above) and fascia overlying the bone (below).

* Small incision can be made in lacunar ligament to aid reduction.

* Mesh plug may be used.

• Lotheissen

• Inguinal Approach

① Initial incision as bassini's.

② Spermatic cord mobilised, transversalis fascia opened from deep inguinal ring to pubic tubercle.

③ femoral hernia lies immediately below this incision.
↳ Reduced by combination of pulling from above and pushing from below.

④ Neck is closed with sutures or plug mesh, protecting iliac vein throughout.

⑤ Layers are closed as for inguinal hernia.

⑥ A mesh may be placed for prevention of inguinal hernia.

• Mc EVEDY

High Approach

Complex surgery; Ideal for cases with Strangulation.

- ① Horizontal incision is made in lower abdomen centered at lateral edge of Rectus abd.
 - ② Anterior rectus sheath is incised and rectus muscle is displaced medially.
 - ③ Surgeon proceeds into preperitoneal space.
 - ④ femoral hernia reduced and sac opened for inspection of of bowel.
- ⇒ Decision is made regarding need for Bowel resection.
- ⑤ In doubtful cases, bowel is re-placed into peritoneal cavity for 5 minutes and re-examined.
 - ⑥ Femoral defect is closed with sutures, mesh or plug.

• Laparoscopic

- TEP and TAPP.

Ventral hernias

- Means Abdominal wall hernias.

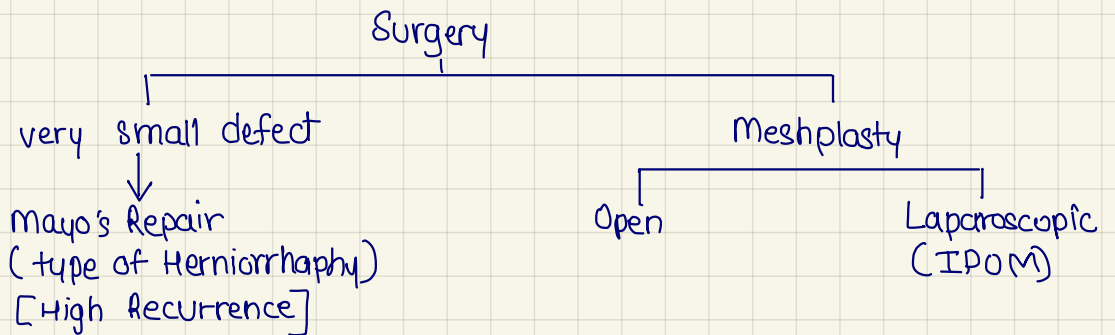
• Types

- Epigastric
- Umbilical / Paraumbilical
- Spigelian
- Traumatic
- Lumbar
- Parastomal
- Incisional

• Incisional Hernia

5/11/20

- Develops in region of incision.
- Cases of incisional hernia following surgery
 - a) Open abdominal: 30-50%
 - b) Laparoscopic: 1-5%
- Usually a large defect - Strangulation uncommon.
- Mx -



- Tissue Repairs like Keel and de Silva is preferred these days
- Ramirez component separation technique
 - ↳ Done if incisional hernia volume > 25% of abdominal volume.
 - ↳ Relaxing incisions are made laterally in external oblique aponeurosis.
 - ↓
 - Avoids loss of abdominal domain.

• Epigastric Hernia

SAD

Fatty Hernia of Linea Alba

- Most common in young fit males (M > F).
- Can occur anywhere b/w xiphisternum and umbilicus.
- Usually in midline
- Single (multiple defect).
- Most common cause of recurrence → not identifying multiple defects.
- Transverse split in median raphe
↳ Elliptical defect (<1cm)
- C/F
Swelling
Cough impulse
Pain similar to peptic ulcer.
- Mx - Same as incisional hernia.

• Umbilical/Paraumbilical Hernia:

SAD

Umbilical

- Causes eversion of umbilicus

Large defect - Obstruction uncommon

- Common in premature babies (Black babies have 8 times more incidence)
- Also seen in Cirrhosis/massive ascites.
- Mx

Conservative management
(2-3 years)

↓

If hernia persists

↓

Surgery

Paraumbilical

- Umbilicus forms one of boundaries of defect
- Narrow defect - obstruction common
Richter's hernia common.
- More common in obese patients.
Females > Male.
- Defect is usually superior and right sided.
- Mx

Early surgery because
Richter's hernia is common.

• Lumbar Hernia

- Secondary > Primary [Primary lumbar hernias are rare].
- Secondary lumbar hernia - Post Renal Surgery trauma.
- Differential Diagnosis -
 - ① Lipoma
 - ② Pseudohernia - muscle bulges out due to weakness
↓
Injury to Subcostal nerve during renal surgery
- Lumbar hernia can come out through 2 triangles.
 - a) Inferior Lumbar triangle of Petit
 - Majority of cases.
 - Boundaries
 - Inferiorly: Iliac crest
 - Laterally: External oblique.
 - Medially: latissimus dorsi
 - b) Superior Lumbar triangle of Grynfeltt
 - Superiorly - 12th rib.
 - Laterally - Internal oblique
 - Medially - Sacrospinalis.

My -

- ① Open / Laparoscopic repair
- ② Dowd - Ponka repair.

• Spigelian Hernia

Aka Intraparietal Hernia - Rare & Underdiagnosed.

- Defect in spigelian fascia (aponeurosis of transversus abdominis).
- Sometimes it can pass through internal oblique also.
- MC location - Below umbilicus & Above arcuate line.
- In young patients, Defect is narrow, there can only be preperitoneal fat
- In adults, large sac
- These hernias are detected late as swelling is not palpable sometimes.
- My Open or laparoscopic.

OTHER HERNIAS

• Richter's Hernia

CFX

- Can be seen in femoral hernia, paraumbilical hernia & obturator hernia.
- Very narrow defect
↓
Only portion of circumference of bowel herniates.
↓
Strangulation occurs & detected late
- Initial features - Same as Gastroenteritis.

• Obturator Hernia

• Little Old Lady's Hernia

- Common in elderly, multiparous women
- Narrow defect → ↑ chances of strangulation & Richter's hernia.
- C/F -
 - Pain
 - Limb kept in semiflexed position, movement causes pain.
 - Swelling in Scarpa's triangle can be missed because it is covered by pectineus.
 - On digital rectal or pervaginal examination; A tender swelling can be felt.
- Howship Romberg Sign - Abduction & medial rotation of limb
↓
Shooting pain along the obturator nerve.
- Mx - Open repair
Laparoscopic repair - TAPP.

• Gluteal Hernia

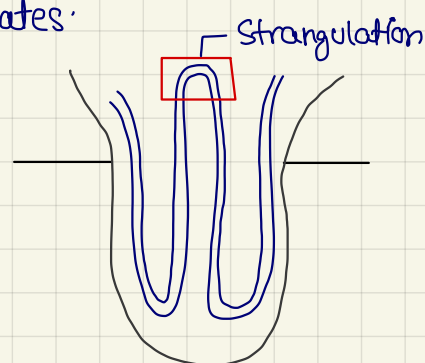
Through greater sciatic foramen.

• Sciatic Hernia

Through lesser sciatic foramen.

• Maydl's Hernia

- Very large defect.
- More than one loop of bowel herniates.
- W shaped hernia.
- If strangulation occurs
↓
It 1st affects connecting portion which is intraperitoneal.
(Strangulation may be missed).



• Internal Hernia

- Stammer's Hernia
- Petersen's Hernia
- Left Paraduodenal Hernia:
 - Through Fossa of Landzert.
 - Develops due to defective fusion of colon mesentry
 - Lies behind inferior mesenteric vessels.
- Right duodenojejunal Hernia:
 - Defective fusion of Ascending colon mesentry
 - Lies behind superior mesenteric vessels.

★ Left paraduodenal more common than Right duodenojejunal.

MYSENTRY

• Mesenteric Cyst

- Presents with Tillaux triad.
- Periumbilical swelling.
- Moves at right angles to attachment of mesentry but not along the line of attachment.
- Transverse band of resonance over the swelling.

• IOC - CECT.

• Types

- 1) Chylolymphatic (most common)
- 2) Enterogenous
- 3) Dermoid.

Chylolymphatic Cyst

- Sequestered lymphatic tissue
- Independent blood supply
- Thin walled with clear fluid.

Mx

⇒ Enucleation

Enterogenous Cyst

- Sequestered bowel tissue.
- Shares blood supply with bowel.
- Thick walled with turbid fluid.

⇒ Resect & Anastomosis.

• Misty Mesentry

- Seen in pancreatitis, edema, cancer haemorrhages
- Should not be confused with mesenteric panniculitis.
- Misty mesentry mean ↑sed fat attenuation on CT.

• Mesenteric Panniculitis

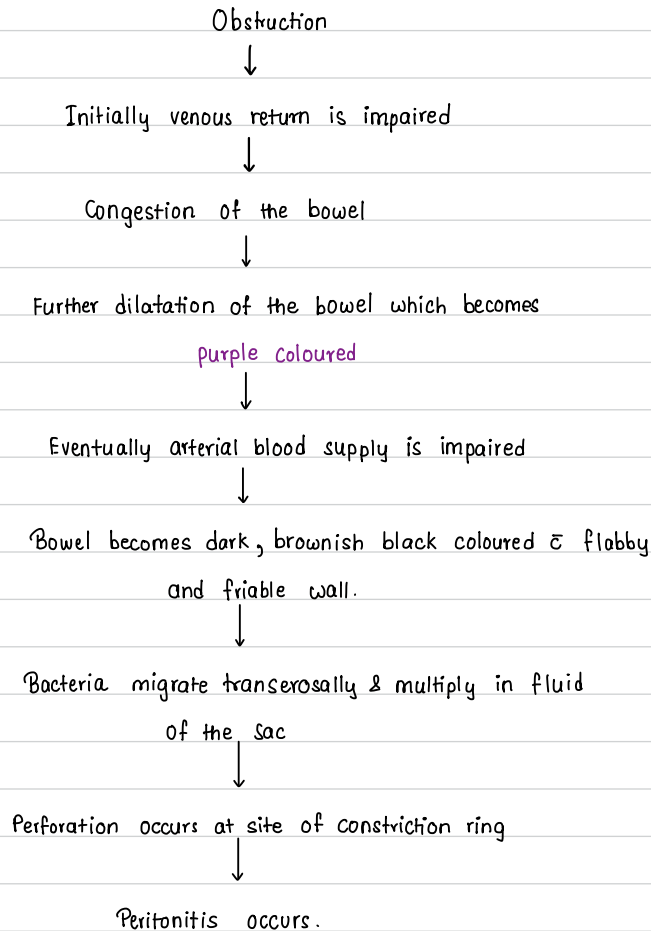
Mesenteric manifestation of Weber Christian disease.

Strangulated hernia

It occurs when blood supply of contents of hernia is seriously impaired leading to formation of gangrene.

Common bacteria - E. coli, Anaerobic Strep., Klebsiella

Pathology



Strangulation commonly occurs in small bowel and also in large bowel.

Occasionally strangulated omentocoele also can occur without any intestinal obstruction.

- Strangulation can occur in femoral, inguinal, obturator, umbilical / any other hernias.
- Indirect inguinal hernia is more prone for strangulation than direct inguinal hernia. It is due to narrow neck, adhesions, narrow external ring in children.
- **Richter's hernia** :- Part of circumference of bowel when strangulated.

Pt. presents with
→ diarrhoea
→ toxicity mimicking gastroenteritis.

More common in femoral, obturator hernias.

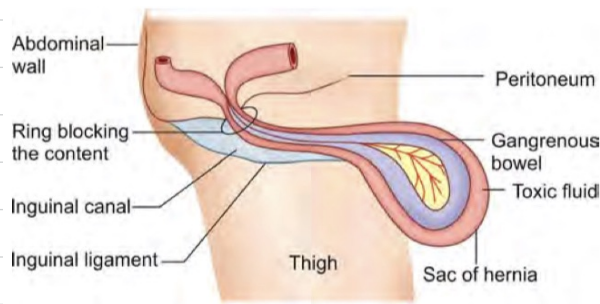


Fig. 18.62: Picture showing strangulated hernia with toxic fluid and site of constriction.

Causes

- 1] Narrow neck
- 2] Adhesions
- 3] Irreducibility
- 4] Long time, large hernia with adhesions.

Features

- 1] Tense, tender, irreducible
- 2] No impulse on coughing
- 3] Shock, toxicity
- 4] Features of obstruction when there is enterocoele
- 5] Abdominal distension, vomiting
- 6] Rebound tenderness. (diagnostic)

Strangulation during infancy:- 4% incidence ; F > M = 5:1

In female infants, contents may be ovary & / or fallopian tub

- In strangulated omentum, features of Obstruction i.e. vomiting, Constipation are not present.
Omentum becomes congested, oedematous & black in colour which secretes fluid toxic fluid & secondary bacterial infection.
Sepsis is slower than strangulated intestinal obstruction
- Infection causing diffuse peritonitis, downward spread can cause scrotal abscess.

Investigations

- 1] Plain X-ray abdomen in erect posture shows multiple air-fluid levels
- 2] Serum electrolytes
- 3] Blood urea and serum creatinine
- 4] Total count ↑
- 5] U/S abdomen.

* Strangulation & out obstruction :-

- Richter's hernia
- Omentocoele

Treatment

- 1] Pt. is admitted
- 2] Ryle's tube aspiration
- 3] Intravenous fluids to correct dehydration & electrolyte imbalance.
- 4] Antibiotics
- 5] Catheterisation to maintain adequate urine output.

6] Emergency surgery

Groin incision is made & incision extending into the most prominent area of swelling



Sac is exposed



Constriction ring and superficial ring is cut



Sac is opened carefully & allowing the spillage of fluid



Fluid is sucked & suction apparatus



Bowel is held & fingers so as to prevent it from getting reduced



Viability of bowel checked by peristalsis, colour, pulsation, bleeding



When gangrenous, resection and anastomosis done & drain placed.

Bassini's repair done by placing interrupted non-absorbable sutures. Antibiotics, IV fluids given. Drain is removed in 4-5 days. Oral diet started in 5 days once bowel movt. begins.

Postoperative problems:-

Infection, leak & fistula, septicaemia.