

- Antithyroid Drugs Classification**
- Inhibit hormone synthesis—carbimazole, PTU
 - Ionic inhibitors—perchlorates, thiocyanate, nitrates
 - Inhibit hormone release—iodine, iodides
 - Destroy thyroid tissue—radioiodine.

Carbimazole

- Thyroid peroxidase inhibitor
- Dose
 - 40–60 mg daily × 1st 3 weeks
 - 20–40 mg daily × 4–6 weeks
 - Maintenance of 5–20 mg daily for 1.5–2 years (after that surgery should be done)
- Side effects: Agranulocytosis (sore throat: indicates immediate cessation of drug), fever, urticaria, liver disfunction.

Propylthiouracil (PTU)

- Thyroid peroxidase inhibitor + inhibit peripheral conversion of T₄ to T₃ (100 mg TID)
- Used in pregnant ladies
- Side effects—fever, rash, myopathy, arthralgia, agranulocytosis, hepatotoxicity.

Radioiodine Ablation

- Make the patient euthyroid with drugs
- Discontinue drugs for 5 days, ask the patient not to take iodised salts and compounds
- Administer I¹³¹ 5–10 mci
- Start antithyroid drugs after 1 week and continue for 6–8 weeks
- After 6 months if no improvement give another dose.

SURGERY

Why in benign thyroid, we go for total thyroidectomy

- Recurrence
- Area of malignant potential
- If we are doing hemithyroidectomy the follow-up cannot be maintained

Strap muscles (supplied by ansa cervicalis)

- Sternothyroid
- Sternohyoid
- Thyrohyoid
- Omohyoid

Preoperative Preparations

- Patient should be in euthyroid state
- Lugol's iodine 10 days before surgery to decrease vascularity [5% I₂ in 10% KI]
- Give propranolol
- Drugs given are antithyroid + Lugol's iodine + β -blocker
- Indirect laryngoscopy

Steps in Surgery

- Position: Supine with pillow under the shoulder to extend the neck. Head end with 15 degree elevation to prevent venous engorgement in the head and neck area (Rose's, Fowler's, reverse Trendelenburg position)
- Anesthesia: GA.
- Incision: Kocher's collar incision—transverse incision 2 finger breadth above the suprasternal notch from the anterior border of one SCM muscle to other.

PROCEDURE

- The transverse incision cuts through the skin, subcutaneous tissue and platysma: The two flaps are raised, the superior one up to thyroid cartilage and the lower one up to the suprasternal notch. Hold the flaps with Jolles self-retaining retractor.
- Vertical incision on the investing layer of deep fascia.
- Pull aside the strap muscles.
- Vertical incision on pretracheal fascia.

- Hand*
↓ lobe + left mus
- Look and ligate and cut the middle thyroid vein. Being a short one it bleeds, when thyroid is pulled.
 - Deliver the thyroid, if any difficulty in delivering, cut the strap muscles transversely.
 - Ligate and cut the superior thyroid pedicle (artery and vein), close to the gland, as the external laryngeal nerve is away near the gland.
 - Ligate and cut inferior thyroid pedicle (vein) as away as possible from the gland, as the RLN (Riedle's triangle) is the near the pedicle when it approaches the gland. Also identify and preserve parathyroid gland.
 - Remove the required amount of gland after placing appropriate clamps (2 nos) and cut between them and suture the gland with chromic catgut.
 - Close all layers.
 - Place suction drainage before closing and bring it out through a separate stab incision, remove drain when the secretions stops (usually 48 hours). Oral feeds can be started next day.

COMPLICATIONS OF THYROIDECTOMY

Peroperative

- Injury to RLN, trachea, carotid, esophagus
- Hemorrhage (primary)
- Thyroid storm

Early Postoperative

Reactionary hemorrhage
Respiratory obstruction due to:

- Tension hemorrhage
- Tracheomalacia
- RLN palsy
- Edema

Late

- Hypoparathyroidism—earliest clinical feature is perioral numbness. Other include carpopedal spasm, Achouther's hand, Chovstek sign.

Treatment: 10% calcium gluconate IV 10 mL for 10 minutes

- Hypothyroidism
- Recurrence
- Wound infection
- Keloid, granuloma
- Flap necrosis.

Postoperative follow-up

- Indirect laryngoscopy
- Side effect or complication after 4-6 hours after surgery
- Withhold thyroxine 1st 6 months as it takes thyroid function to become stable
- Lifelong follow-up for thyrotoxicosis

NEOPLASMS OF THYROID

CLASSIFICATION OF THYROID NEOPLASM

Benign

Follicular adenoma.

Malignant

Primary

- Follicular epithelium—differentiated
 - Follicular

Features of hypoparathyroidism

- Trousseau's sign
- Chvostek-Weiss sign
- Obstetrician's hand (Accoucher's hand)

Papillary carcinoma

Indicators
- malignancy
- mri
- 5. trace nodules
- compressing symptoms
- recurrent calcification
- cosmetic scars

C/E
- unresponsive to Sa
- calc. neck calcification
- calc. compressive Ca
- uncontrolled thyrotoxicosis

C/E
- solitary thyroid nodule
- low risk of thyroid cancer
- unilateral goiter
- trace adenoma?

C/E
- Bk thyroid gland
- confirmed malignancy
- anaplastic
- no nodules

Thyroidectomy

Feature	Thyroidectomy (Total/Near-total)	Hemithyroidectomy (Lobectomy) 
Definition	Removal of entire thyroid gland (both lobes ± isthmus)	Removal of one lobe ± isthmus
Extent of surgery	Bilateral	Unilateral
Common indications	- Thyroid malignancy - Bilateral multinodular goitre - Graves' disease (selected cases)	- Solitary thyroid nodule - Follicular neoplasm (diagnostic) - Small low-risk cancer
Purpose	Definitive treatment	Diagnostic + therapeutic
Hormone status after surgery	Always hypothyroid → lifelong thyroxine needed	Usually euthyroid (remaining lobe compensates)
Risk of hypocalcemia	Commoner (parathyroid damage possible)	Rare
Recurrent laryngeal nerve injury	Higher risk (both sides exposed)	Lower risk (one side only)
Complications	More	Less



Ask anything



Recurrent laryngeal nerve injury	Higher risk (both sides exposed)	Lower risk (one side only)
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Complications severity	More	Less
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Recurrence risk	Very low	Possible (remaining lobe may develop disease)
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Need for completion surgery	Not needed	May be needed if malignancy confirmed
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How to Say in Viva (1–2 lines)

👉 *"Thyroidectomy involves removal of the entire gland and is preferred for bilateral disease and malignancy, whereas hemithyroidectomy involves removal of one lobe and is mainly done for solitary nodules or diagnostic purposes, with fewer complications and preservation of thyroid function."*

If you want, I can next give you:

👉 **Complications compar**  (asked very frequently in OSCS)

 Ask anything



CHAPTER 9

Viva

OPERATIVE PROCEDURES—SURGERY

122. **Thyroidectomy:**
Refer chapter—Thyroid
133. **Mastectomy:**
Refer chapter—Breast
- **Parotidectomy:**
Refer chapter—Salivary Gland Swelling
- **Hernia:**
Refer chapter—Hernia
- **Varicose vein operation:**
Refer chapter—Varicose Vein
- **Hydrocele operation:**
 - **Lord's plication:**
Indication: Done for small hydrocele.
The sac is opened and the cut edge of the sac is plicated to tunica albuginea (reflected portion of processus vaginalis). As a result, the sac gets crumpled up near the testes (so testicular secretion gets absorbed by the subcutaneous lymphatics and venous system).
 - **Jaboulay's eversion procedure:**
Indication: Done for slightly larger hydrocele.
Here, instead of placating the tunica vaginalis, it is everted and sutured onto itself behind the testis.
 - **Excision and eversion:**
Indication: Done for very large hydrocele.
Here, part of the sac is removed.

Complications:

- Hematoma
- Infection
- Injury to testes
- Recurrence
- Torsion of testes.

Tracheostomy:

Making an opening in the anterior wall of the trachea and converting it into a stoma on the skin surface.

Indication:

- Respiratory obstruction
- Retained secretion
- Respiratory insufficiency.

*CS → anaphylactic
shock.*

Emergency
• Choking - FB,
• Stridor - Oedema, CA larynx
9/10 R.W. palsy after thyroid.

elective
Coma
Tetanus
Head injuries.
Prolonged sup. limb
Paralysis palsy

Types

- Emergency tracheostomy
- Elective tracheostomy
- Permanent tracheostomy
- Percutaneous dilatation
- Mini-tracheostomy

Steps

Position:

Anesthesia

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Steps

Position: Patient lies in supine position with a pillow under shoulder *Ron ?*

Anesthesia: Local anesthesia (LA)/ general anesthesia (GA)/without anesthesia

- A vertical incision is made in the midline, extending from the cricoid to just above the sternal notch
- OR
- A transverse incision, 5 cm long, 2 finger breadth above the sternal notch (cosmetically better scar). → T₂
- Tissue dissected in the midline.
- Strap muscles are separated in the midline and retracted laterally.
- Thyroid isthmus is displaced upward.
- A few drops of 4% lignocaine are injected into the trachea to suppress cough when the trachea is incised.
- The trachea is fixed with a hook and opened with a vertical incision in the region of the 3rd and 4th OR 3rd and 2nd rings. This is then converted into a circular opening (Never divide the 1st tracheal ring because it can cause perichondritis of the cricoid cartilage).
- Tracheostomy tube of appropriate size is inserted.
- The skin incision should not be sutured or packed tightly as it may lead to the development of subcutaneous emphysema.

Complications:**Immediate:**

- Hemorrhage
- Apnea
- Injury to recurrent laryngeal nerve
- Aspiration of blood.

Intermediate:

- Secondary bleeding
- Displacement of tube
- Subcutaneous emphysema
- Tracheitis, tracheobronchitis.

Late:

- Laryngeal stenosis
- Tracheal stenosis
- Tracheoesophageal fistula
- Keloid scar.

Circumcision**Indications**

- Religious
- Phimosis and paraphimosis
- Carcinoma penis stage I
- Balanitis
- Unable to retract prepuce for sexual intercourse
- Splitting of an abnormally tight frenulum.

Position: Supine

Anesthesia: LA/SA/GA (LA is preferred; Xylocaine 1 or 2% without adrenaline to the root of penis).

Procedure:

- With 2 hemostats, the prepuce is held at 3 o'clock and 9 o'clock positions and pulled forward.
- A longitudinal incision is made at the 12 o'clock position at the distal end on the prepuce up to the corona.
- At the corona, the incision is extended to either side, parallel to the coronal sulcus.
- The skin and subcutaneous tissues are removed.
- Bleeding from the frenular artery is possible and therefore should be ligated with a "Figure of 8" ligature.
- The skin is then sutured to the mucous membrane.

Complications

↓
A few interrupted
sutures

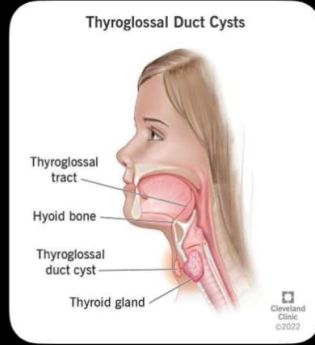
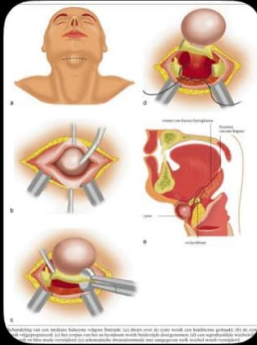
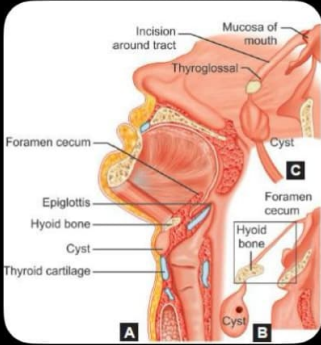
post-op

Suction of tracheostomy tube
Regular suction
check for air entry



◆ Sistrunk Operation

(For thyroglossal duct cyst)



Definition

Standard surgical procedure for removal of **thyroglossal duct cyst along with tract and central portion of hyoid bone** to prevent recurrence.



Indications

- Thyroglossal duct cyst (most common)
- Recurrent infection of cyst/sinus
- Thyroglossal fistula
- Suspicion of malignancy (rare – papillary carcinoma)



Contraindicatio. ↓



Message Surgery practic...





Contraindications

- Acute infection (operate after antibiotics)
- Only functioning thyroid tissue present in cyst (rare but important → confirm normal thyroid with USG/scan)
- Unfit for surgery

Preoperative Preparation

- USG neck → confirm normal thyroid gland
- Thyroid function tests
- Treat infection if present

Steps of Procedure

1. Incision

- Transverse incision at cyst level (skin crease)

2. Flap elevation

- Raise subplatysmal flaps

3. Identify cyst

- Dissect cyst carefully

4. Trace the tract

- Follow tract upwards





2. Flap elevation

- Raise subplatysmal flaps

3. Identify cyst

- Dissect cyst carefully

4. Trace the tract

- Follow tract upwards

5. Remove central part of hyoid bone

- Key step ★ (prevents recurrence)

6. Continue tract excision

- Up to foramen cecum (base of tongue)

7. Ligate and excise tract

8. Closure

- Layered closure ± drain



Complications

- Recurrence (if tract incompletely removed)
- Infection
- Hematoma
- Injury to nearby structures
- Scar formation
- Rare: hypothyroidism (if ectopic thyroid removed)



Viva Pearls ★



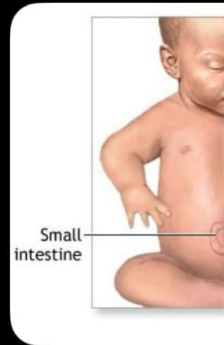
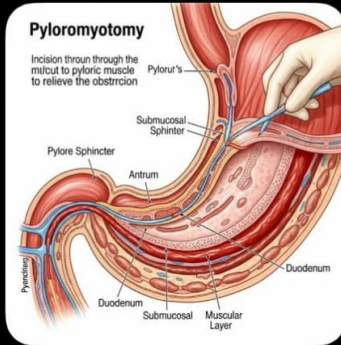
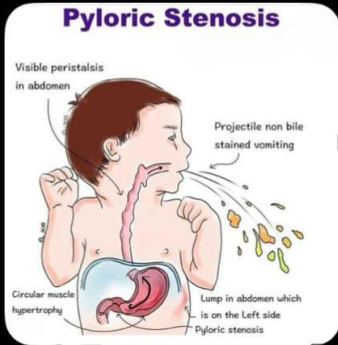
Message Surgery practic...





◆ Ramstedt's Operation (Pyloromyotomy)

(For hypertrophic pyloric stenosis)



Definition

Surgical longitudinal splitting of hypertrophied pyloric muscle without cutting mucosa.



Indications

- Infantile hypertrophic pyloric stenosis (features: projectile non-bilious vomiting, palpable "olive")



Contraindications

- Absolute: none (life-saving surgery)
- Relative:





Contraindications

- Absolute: none (life-saving surgery)
- Relative:
 - Severe dehydration
 - Electrolyte imbalance (must correct first)

Preoperative Preparation

- Correct dehydration
- Correct **hypochloremic hypokalemic metabolic alkalosis**
- NG tube aspiration

Steps of Procedure

1. Incision

- Right upper quadrant (or laparoscopic ports)

2. Identify pylorus

- Enlarged "olive-shaped" mass

3. Stabilize pylorus

4. Longitudinal incision

- On serosa and muscle

5. Split muscle fiber, ↓





5. Split muscle fibers

- Use blunt dissection until mucosa bulges out

6. Ensure adequate myotomy

- From gastric antrum → duodenum

7. Check mucosa

- Ensure no perforation

8. Closure

- No suturing of muscle



Complications

- Mucosal perforation !
- Incomplete myotomy → persistent vomiting
- Infection
- Bleeding
- Wound complications



Viva Pearls ★

- Vomiting is **non-bilious**
- Electrolyte imbalance is classic
- Surgery is **curative**
- "Olive mass" in epigastrium



- Apnea
- Injury to recurrent laryngeal nerve
- Aspiration of blood.

Intermediate:

- Secondary bleeding
- Displacement of tube
- Subcutaneous emphysema
- Tracheitis, tracheobronchitis.

Late:

- Laryngeal stenosis
- Tracheal stenosis
- Tracheoesophageal fistula
- Keloid scar.

• Circumcision

Indications

- Religious
- Phimosis and paraphimosis
- Carcinoma penis stage I
- Balanitis
- Unable to retract prepuce for sexual intercourse
- Splitting of an abnormally tight frenulum.

Position: Supine

Anesthesia: LA/SA/GA (LA is preferred; Xylocaine 1 or 2% without adrenaline to the root of penis).

Procedure:

- With 2 hemostats, the prepuce is held at 3 o'clock and 9 o'clock positions and pulled forward.
- A longitudinal incision is made at the 12 o'clock position at the distal end on the prepuce up to the corona.
- At the corona, the incision is extended to either side, parallel to the coronal sulcus.
- The skin and subcutaneous tissues are removed.
- Bleeding from the frenular artery is possible and therefore should be ligated with a "Figure of 8" ligature.
- The skin is then sutured to the mucous membrane.

Complications

- Bleeding
- Infection
- Injury to the urethra and stricture.

• Vasectomy:

Permanent sterilization of males by removing a part of both the ductus deferens.

Anesthesia: Local anesthesia (LA).

Post-op

Suction of tracheostomy tube
Regular suction
check for air entry

Procedure:

- Scrotum is cleaned before the operation.
- Anesthesia is administered.
- A transverse incision of 1 cm is made at the junction of the upper and middle third of the median raphe.
- Vas is isolated and drawn out through the incision.
- The vasa are clamped at 2 sites and cut. The ends are turned backward and ligated.
- Repeat on the other side.

Postoperative counseling:

- No bath for one day
- Scrotal support for 2 weeks
- No heavy work for 3 weeks
- Psychological support
- Analgesics and antibiotics
- Report if any complication
- Advise alternate contraceptives (because it takes 30–40 ejaculations to be effective).

Complications:

- Pain
- Infection
- Hematoma
- Spontaneous recanalization
- Autoimmune response to sperms
- Sperm granuloma.

No scalpel vasectomy

Here, the advantages include: Less time; quick recovery; less pain; less postoperative discomfort, no sutures.

- **Cholecystectomy**

Indications:

- Cholelithiasis
- Cholecystitis
- Empyema gallbladder (GB)
- Carcinoma of GB
- Mucocele
- As a part of Whipple's

Complications:

- Postcholecystectomy syndrome
- Hemorrhage
- Stricture to CBD

- Advise alternate contraceptives (because it takes 30-40 ejaculations to be effective).

Complications:

- Pain
- Infection
- Hematoma
- Spontaneous recanalization
- Autoimmune response to sperms
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• **Cholecystectomy**

Indications:

- Cholelithiasis
- Cholecystitis
- Empyema gallbladder (GB)
- Carcinoma of GB
- Mucocele
- As a part of Whipple's surgery.

Incision:

A short right upper transverse incision is made centered over the lateral border of the rectus muscle.

Steps:

- Incision
- The diagnosis is confirmed
- GB is appropriately exposed and packs are placed on the hepatic flexure of the colon, duodenum and lesser omentum (to ensure a clear view of the anatomy)
- Peritoneum is divided near the GB. Expose the cystic artery and duct and ligate (Calot's triangle).
- GB is dissected away from the GB bed.

• **Appendectomy:**

Indication: Acute appendicitis

Contraindication: Appendicular abscess

Position: Supine

Anesthesia: General anesthesia

Incision:

- Lanz incision: Transverse skin crease incision (nowadays done)
- Gridiron incision: At right angle to McBurney's point
- Rutherford Morison's: In para and retrocecal appendix.

Procedure:

- Lanz incision is made 2 cm below the umbilicus, centered along the midclavicular-midinguinal line
- The external oblique aponeurosis, IO and transversis abdominis are split in the direction of the fibers
- Peritoneum is opened

Complications:

- Postcholecystectomy syndrome
- Hemorrhage
- Stricture to CBD
- Injury to the liver
- Waltman Walters syndrome

Viva

- Cecum is identified by the presence of taenia coli
- The appendix is identified and the inflammatory adhesion is broken with fingers
- The appendix is conveniently controlled using Babcock's forceps
- The base of the mesoappendix is clamped, divided and ligated
- The appendix is amputated
- A Z-suture may then be inserted into the cecum about 1.25 cm from the base
- Closure of the incision

Complications:

- Wound infection
- Intra-abdominal abscess
- Paralytic ileus
- Fecal fistula
- Intestinal obstruction.

DRUGS AND SURGERY INSTRUMENTS

■ DRUG

Lignocaine

Uses

- Local anesthetic
- Antiarrhythmic

Dose:

- 3 mg/kg and effect last for 90 minutes
- Lignocaine + adrenaline (1:2 lakh)—7 mg/kg
- 1% means each mL contains 10 mg of drugs
- It can be used with/without adrenaline
- Subcutaneous giddiness, headache, postural hypotension.

Contraindication

It should not be used in places, where end arteries are present (ear lobule, tip of nose, lip, penis).

■ INSTRUMENTS

1. Artery forceps

- To catch bleeding points



Late

- Recurrence (common if tributaries missed)
- Neovascularization
- Nerve injury:
 - Saphenous nerve → numbness along medial leg
- Deep vein thrombosis
- Chronic edema

◆ Key Exam Points

- "Flush ligation at SFJ" is the hallmark
- Often combined with **vein stripping**
- Recurrence mainly due to **inadequate ligation of tributaries**

If you want, I can also give you a ↪ diagram + viva points + comparison with stripping and endovenous laser therapy (EVL) for exams



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◆ Steps of Trendelenburg Operation

1. Position

- Patient supine
- Limb slightly abducted and externally rotated

2. Incision

- Oblique or transverse incision in the groin, just below the inguinal ligament

3. Identification of SFJ

- Locate the **great saphenous vein** where it joins the femoral vein

4. Flush ligation

- Ligate the vein **flush with femoral vein** (very close to junction)

5. Ligation of tributaries

- Important tributaries are tied:
 - Superficial epigastric vein
 - Superficial circumflex iliac vein



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6. Division of vein



Trendelenburg operation (for varicose veins) is a classic surgical procedure aimed at controlling reflux at the **saphenofemoral junction (SFJ)** of the great saphenous vein.

◆ Definition

Ligation (tying off) of the **great saphenous vein at its junction with the femoral vein**, along with ligation of its tributaries, to prevent venous reflux.

◆ Indications

- Primary varicose veins with **SFJ incompetence**
- Dilated, tortuous great saphenous vein
- Symptomatic patients:
 - Pain
 - Edema
 - Heaviness
- Complications of varicose veins:
 - Ulcer



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- Cosmetic concern (selected cases)

- Important tributaries are tied:

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External peer-reviewed review

6. Division of vein

- Great saphenous vein is divided

7. Additional procedures (often combined)

- Stripping of vein
- Phlebectomy (removal of varicosities)

8. Closure

- Hemostasis and wound closure

◆ Complications

Early

- Hemorrhage
- Hematoma
- Wound infection
- Injury to femoral vein (↓ serious)

Late



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- Neovascularization

- Nerve injury:

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- Ulcer
- Bleeding
- Thrombophlebitis
- Cosmetic concern (selected cases)

◆ Contraindications

- Deep vein thrombosis (DVT)
- Severe peripheral arterial disease
- Pregnancy (relative)
- Patients unfit for surgery
- Secondary varicose veins (due to deep venous obstruction)

◆ Steps of Trendelenburg Operation

1. Position



- Patient position



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2. Incision

Hemorrhoidectomy

dilated venous cushions in anal canal

→ dissection from submucosa

→ ligation of pedicle.

→ Hem. excised - cut.

Ind

grade II hemorrh (prolapsed during mict)
grade III hemorrh (irreducible prolapse)

→ Skin bridge preserved (pain and stenosis)

→ wound left open

Recall bleeding

Failure of unsphincter (bridge)

Complications

Early

pain m/c
bleeding
weight loss
Infr.

Late

Anal stenosis (fistula-in-ano)
Incontinence
Recurrent
Delayed hlg.

Type

Open hemorrh (Milligan Morgan)

m/c

wound left open
heals by 2nd wk.

closed hemorrhoidectomy (Ferguson)

wound sutured

Stapled hemorrhoidopexy (Longo procedure)

Staple device

Milligan Morgan

→ Lithotomy

→ Anesth (genit/epid)

→ Dissection of anal canal.

→ Identifn of hemorrh.

usually @ 3, 7, 11 o'clock

→ grasping the pile with forceps.

Prep

→ Lithotomy

→ Barnet anal dilator

→ Pencil like device placed in rectum above hemorrhoids

→ Staple inserted at first

removes a ring of mucosa

& staple edges together

Adv

less pain

fast recovery

Disadv

expensive

recurrence

YI

Absolute

Coagulated dir

rupt ellies

Active anastomosis

Relative

post-HIV.

IBD. - VC/CO

Encumbered.



◆ Disadvantages

- Postoperative pain
- Longer recovery

◆ Key Viva Points ★

- Common sites: 3, 7, 11 o'clock
- Preserve **skin bridges**
- Pain is most common complication
- Milligan-Morgan = **open**, Ferguson = **closed**

If you want, I can also give you a ↪ comparison of hemorrhoidectomy vs band ligation vs stapled hemorrhoidopexy—very useful for exams.



Hemorroidopexy



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◆ Indications

- Grade II hemorrhoids (with significant symptoms)
- Grade III hemorrhoids ★ (best indication)
- Selected Grade IV (without fibrosis)

◆ Contraindications

- Thrombosed hemorrhoids
- External hemorrhoids (predominant)
- Fibrosed, non-reducible piles
- Anal stenosis
- Inflammatory bowel disease

◆ Steps of Procedure

1. Position

- Lithotomy



2. Insertion of anal dilator

3. Reply to ChatGPT



- Placed in rectal mucosa above hemorrhoids (2–4 cm above dentate line)



Hemo



◆ Hemorrhoidectomy

◆ Definition

Hemorrhoidectomy is the surgical removal of hemorrhoids (piles)—dilated venous cushions in the anal canal.

◆ Indications

- Grade III hemorrhoids (prolapse requiring manual reduction)
- Grade IV hemorrhoids (irreducible prolapse)
- Recurrent bleeding
- Failure of conservative/office procedures (e.g., banding)
- Complications:
 - Thrombosis
 - Ulceration
 - Strangulation



◆ Types of Hemorrhoidectomy

1. Reply to ChatGPT



- Most commonly performed

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◆ Complications

◆ Early

- Pain (most common)
- Bleeding
- Urinary retention
- Infection

◆ Late

- Anal stenosis (if excessive tissue removed)
- Incontinence (rare, due to sphincter injury)
- Recurrence
- Delayed hemorrhage

◆ Advantages

- Definitive treatment
- Low recurrence rate



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- Postoperative pain

◆ Disadvantages

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- Not suitable for large external piles

◆ Complications

Early

- Bleeding
- Urinary retention
- Pain (less than hemorrhoidectomy)

Late

- Recurrence
- Staple line complications
- Rare but serious:
 - Rectal perforation
 - Pelvic sepsis

◆ Key Differences from Hemorrhoidectomy



Featxy



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Pain

More

Less



Hemorroidopexy

◆ Hemorrhoidopexy (Stapled Hemorrhoidopexy / Longo Procedure)

◆ Definition

Hemorroidopexy is a surgical procedure in which prolapsed hemorrhoidal tissue is repositioned (lifted back) into the anal canal and fixed, rather than removed.

👉 It is commonly done using a circular stapling device, hence also called **stapled hemorrhoidopexy**.

◆ Principle

- Removes a **ring of rectal mucosa** above hemorrhoids
- Pulls hemorrhoids **upward to their normal position**
- Cuts off part of their blood supply → shrinkage

◆ Indications



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- Selected Grade IV (without fibrosis)



Steps (Milligan–Morgan Method)

1. Position

- Lithotomy or prone jackknife

2. Anesthesia

- Spinal or general

3. Dilatation of anal canal

4. Identification of hemorrhoids

- Usually at 3, 7, and 11 o'clock positions

5. Grasping the pile

- Using artery forceps

6. Dissection

- From surrounding tissue (submucosal plane)

7. Ligation of pedicle

- Base is tied securely

8. Excision

- Hemorrhoid is cut

9. Skin bridges preserved

- Prevents anal stenosis

10. Wound left open



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This creates a copy that others can chat with



◆ Types of Hemorrhoidectomy

1. Open Hemorrhoidectomy (Milligan–Morgan) ★

- Most commonly performed
- Wounds **left open** to heal by secondary intention

2. Closed Hemorrhoidectomy (Ferguson)

- Wounds are **sutured closed**

3. Stapled Hemorrhoidopexy (Longo procedure)

- Uses a stapling device
- Reduces prolapse rather than excising piles

◆ Steps (Milligan–Morgan Method)

1. Position

- Lithotomy or prone jackknife

2. Anesthesia

- Spinal or general



3. Dilatation of anal canal

4. Reply to ChatGPT



5. Grasping the pile

- Fibrosed, non-reducible piles

- Anal stenosis

- Inflammatory bowel disease



◆ Steps of Procedure

1. Position

- Lithotomy

2. Insertion of anal dilator

3. Purse-string suture

- Placed in rectal mucosa **above hemorrhoids (2–4 cm above dentate line)**

4. Stapler insertion

- Circular stapler introduced

5. Firing the stapler

- Removes a ring of mucosa and staples edges together

6. Repositioning

- Hemorrhoids pulled upward and fixed

◆ Advantages ★



- Less postoperative pain (line above dentate line → less sensitive area)



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- Shorter hospital stay



Hemorrhoids pulled upward and fixed



◆ Advantages ★

- Less postoperative pain (done above dentate line → less sensitive area)
- Faster recovery
- Shorter hospital stay

◆ Disadvantages

- Expensive (stapler cost)
- Higher recurrence compared to hemorrhoidectomy
- Not suitable for large external piles

◆ Complications

Early

- Bleeding
- Urinary retention
- Pain (less than hemorrhoidectomy)



Late



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- Recurrence

- Staple line complications

Gastrostomy

opening is created into the stomach through abd wall for feeding, decompression & drainage.

Types

- Surgical gastrostomy
- Percutaneous endoscopic gastrostomy (PEG)

Ind

Feeding (nutr)

- Stroke, CP.
- Head cancer.
- Esophageal stricture.
- Dysphagia

Decompression

- Int. obstr.
- Malig

Adv

- Coagulation
- Perforation
- Steady nutrition

Rel

- Asulic
- Peri abdominal
- Woo
- Bye @ insertion site.

Tube insertion

- Tight suture.
- fixed to abd wall.
- Home.

Comp

- early Brady
- const after
- perforation
- Tube dislodged
- Aspiration

Leak

- Tube blockage
- Peri stomal leakage
- Gastrocutaneous fistula.
- Bleed from gastric granulation tissue formation

Steps

(Stomach tube)

1. Pre

- Explain
- GA.
- LOQ incision/midline inc.
- And opened
- Ant wall of stomach identified usually along body of stomach
- 2 purse string suture placed on ant wall. (prevent leakage)

Gastrostomy

- Insert into center of
- purse string suture

However, in appropriate cases where the hernia is to stop before surgery. If a patient should stop smoking.

Difficult cases wherein the hernia is not evident, however it is operator dependent. Sliding hernias, such as urinary, are useful information to be useful in cases of groin to rule out.

It is ideal in cases of special types such as hernia, etc.

Complete blood count may be necessary. Patients are evaluated for stricture urethra.



Fig. 52.20: Saphenous varix



Fig. 52.23B: Left inguinal hernia of the cord

Magnetic resonance imaging (MRI): Ideal in sportsmen who complain of groin pain, to differentiate between hernia, to rule out muscle sprain or any other orthopaedic disorders. Refer to Gilmore groin—page 949.

Preoperative Preparation

- A patient with chronic bronchitis and bronchial asthma should be properly treated with bronchodilators, antibiotics, mucolytic agents, etc. Cigarette smoking should be stopped at least 3 weeks before the surgery.
- Elderly patients with bilateral hernia mostly suffer from benign prostatic hypertrophy. Prostatectomy should be considered first followed by repair of hernia, in such cases. Recent history of constipation and appearance of a hernia should arouse the suspicion of carcinoma colon. Investigate by colonoscopy/fibre-optic sigmoidoscopy before the treatment of hernia.
- Often patients are smokers with chronic obstructed pulmonary diseases.
- Young adults with difficulty in passing urine may have a stricture urethra. They should undergo proper treatment for the stricture. Now it is rare to find a patient with hernia having a stricture urethra.

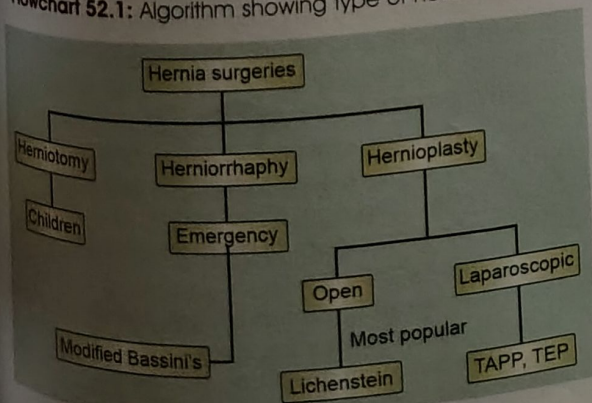
Treatment (Flowchart 52.1)

Competency

SU28.1.6: Describe general principles of management of abdominal wall hernias and the basic operative approach.

- Herniotomy:** Excision of hernial sac. No repair is required. It is done only in children.
- Hernioplasty:** Strengthening of posterior wall—mostly by prolene mesh is the most popular surgery called **Lichtenstein repair**. Details of hernioplasty are given below. It can be done by open or laparoscopic

Flowchart 52.1: Algorithm showing type of hernia surgeries



method. Details are also available in the operative surgery chapter.

- Herniorrhaphy:** Approximation of conjoined tendon to inguinal ligament by using nonabsorbable sutures is called Bassini's herniorrhaphy. It is not done nowadays because of high chances of recurrence. Hence it is not discussed here.

Pearls of Wisdom

Herniotomy, herniorrhaphy and hernioplasty are the three "key" operations for inguinal hernia. Mesh hernioplasty is the gold standard for inguinal hernias.

HERNIOPLASTY

There are two types of hernioplasties.

- Lichtenstein repair:** The posterior wall (Lichtenstein repair) (Fig. 52.24, Key Boxes 52.5 and 52.6) of inguinal canal is strengthened by a prolene mesh or Marlex mesh. The fibroblasts and capillaries grow over the mesh, converting it into a thick fibrous sheath and strengthening the posterior wall. The mesh is fixed inferiorly to lacunar and inguinal ligaments, medially to overlap rectus sheath and fixed to fascia over the pubic bone. A few interrupted sutures are put to fix it to the transversalis fascia. Laterally, an artificial deep ring is created by crossing of both upper and lower leaves of the mesh. To attain this, a slit is given on one side of mesh. (Lacunar ligament is that portion of the inguinal ligament which extends backwards and upwards to the pectineal line and forms the medial margin of the femoral ring).

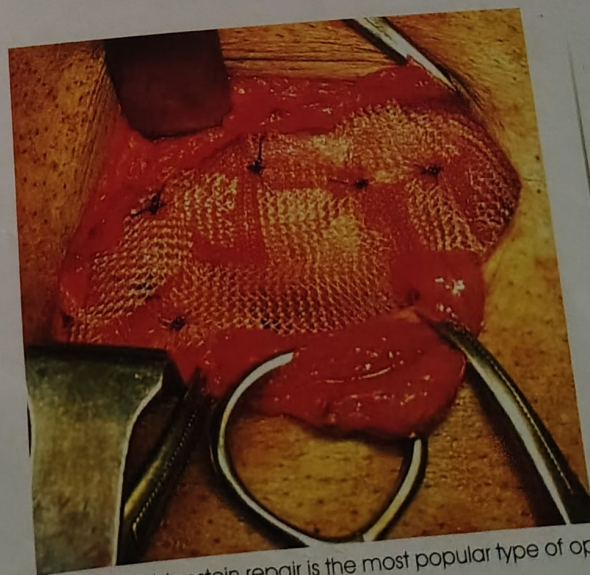


Fig. 52.24: Lichtenstein repair is the most popular type of open hernia repair

Key Box 52.5

Lichtenstein Repair*

- Polypropylene mesh is used (Fig. 52.24).
- 8 × 16 cm mesh is tailored to patient's requirement.
- **Preparation of mesh:** Corners can be cut so as to give a round shape. A slit is given on the lateral border of the mesh at the junction of lower one-third and upper two-thirds, to allow spermatic cord to pass through. The two tails (slit-ends) are overlapped.
- **Suturing:** Medially, the mesh overlaps the pubic tubercle and is sutured over the tissue of symphysis (avoid pubic bone to prevent osteitis pubis). Laterally, the two tails are placed beyond deep ring and sutured. Inferiorly, it is sutured to inguinal and lacunar ligaments and superiorly to conjoined tendon.

*Dr Irving Lichtenstein—Lichtenstein repair: The tension-free repair 1989. Los-Angeles

Key Box 52.6

Advantages of Polypropylene Mesh

- High tensile strength
- Biocompatible, nonabsorbable
- Monofilament strong, elastic and transparent mesh
- Ideal porosity for high visibility and colonisation
- Strong mechanical reinforcement
- Encourages rapid ingrowth of connective tissue
- Cheaper
- Flexible for any anatomic placement

Advantages of Light Weight and Large Pores Mesh

- Less shrinkage of mesh, more flexible, better tissue integration, better comfort.

Characteristics of the ideal mesh

- Biocompatibility means it should not do any harm, should be chemically and physically inert.
- Risk of infection should not be there.
- Handling should be good.
- Economical
- Longevity (also refer to biological mesh given in next page).

- B. Prolene (polypropylene) nylon darning:** Suturing the conjoined tendon to the inguinal ligament without tension in a criss-cross manner by using prolene suture material (handmade mesh). This is preferred in direct and indirect hernias described by Maloney.

Biological Mesh

These are sterilised sheets of connective tissue derived from human or animal dermis or porcine intestinal submucosa:

- They are decellularised
- Like the mesh, they provide scaffold for connective tissue to grow and collagen deposition.

- Enzymatic reaction takes place in the host followed by fibrous tissue formation.
- Advantages: Chronic inflammation and foreign body reaction, stiffness and fibrosis, and mesh infection are uncommon—usually do not occur.
- They can be used in presence of infection.
- They are very expensive.

Other Surgeries for Inguinal Hernia

1. Shouldice repair

- It is the most popular tensionless method wherein only local tissues are used.
- After opening the inguinal canal, herniotomy is done.
- Transversalis fascia, which forms the posterior wall, is incised from the internal ring till pubic tubercles.
- Then, upper and lower flaps of transversalis fascia are sutured in a double-breasting manner by using nonabsorbable sutures such as 34 gauge stainless steel wire, polyamide or polypropylene. This is the **first layer** of Shouldice repair.
- The **second layer** is like Bassini's, wherein conjoined tendon is sutured to the inguinal ligament by using nonabsorbable sutures.
- The **third layer** is completed by suturing upper flap of external oblique aponeurosis to the inguinal ligament.
- The results have been good in Shouldice's hands. The operation needs **expertise**.

- 2. Nyhus repair:** Ideally indicated in bilateral direct hernia or recurrent hernia, wherein a broad mesh is kept in the preperitoneal space. It requires a single large incision covering both groins. However, same surgery now can be done by laparoscopically by keeping a mesh in the extraperitoneal space.

- 3. Dasarda technique:** In this operation, a strip of external oblique aponeurosis is prepared isolated but still connected medially and laterally to the external oblique muscle, and sutured to conjoined tendon and inguinal ligament below. *More details are given in operative surgery section on page 1291.*

- 4. What is hernia system?** A two-layered mesh is used—one to place deep to transversalis fascia (with finger in the deep ring, blind and blunt dissection is done to develop a deep plane) and the other in front of the transversalis fascia.

- 5. What is mesh plug repairs?** These are simple plugs of mesh inserted into the deep ring. It is a simple procedure but mesh migration and seroma within the mesh called Meshoma are common.

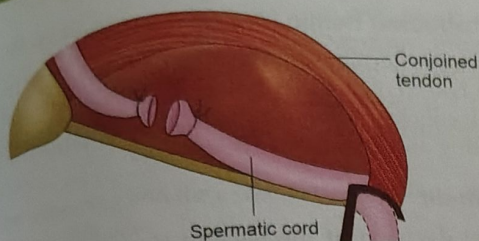


Fig. 52.25: Kuntz operation

Rare/uncommon surgeries

1. **Kuntz operation** (Fig. 52.25): In this operation, the spermatic cord is divided at the deep ring and it is removed along with the testis, so that the deep ring can be permanently closed, and hernia never recurs. It is indicated in elderly patients with recurrent hernia and poor abdominal muscle tone. Hamilton Bailey's operation—cord is divided but testis is retained.

2. **Stoppa repair**:¹ The Stoppa repair is a tension-free type of hernia repair. It is performed by wrapping the lower part of the parietal peritoneum with prosthetic mesh and placing it at a preperitoneal level over Fruchaud's myopectineal orifice. This operation is also known as giant prosthetic reinforcement of the visceral sac (GPRVS).

Pearls of Wisdom

"Hernia is a complex disease with many complications and surgeries and every effort should be made to understand and treat it in as simple effective way as possible".

—Prof Amit Jain

COMPLICATIONS OF HERNIA SURGERY

These are common complications after surgery. Often they are mild and not so worrisome. However, some of the complications can be serious which require immediate attention and treatment.

1. Complications during surgery

- **Injury to the iliac vessels:** The most serious but rare complication is injury to iliac vessels. It can happen in thin patients when suturing of the inguinal ligament is done from lateral to medial side. The sudden jet of fresh red blood indicates that the bite has been taken through the artery. It is better to call the vascular surgeon, extend the incision, have a proximal control, suture directly or do a resection and end to end anastomosis. They have to be anticoagulated with low molecular weight heparin followed by oral anticoagulants.

¹It was first described in 1975 by Rene Stoppa.

- **Injury to the urinary bladder:** This can happen when anatomy is not clear as in few giant or scrotal hernias, perineal hernias or distortion due to previous surgery. Sudden finding of clear fluid with urinary smell means bladder injury. Immediate repair with 2-0 vicryl followed by urinary catheter placement for 3 weeks is the treatment.

2. Early postoperative period

- **Pain:** Pain is common due to the incision in the skin and some degrees of retraction of structures such as inguinal ligament downwards and conjoint tendon upwards. The pain can be decreased by local anaesthetic infiltration, e.g. bupivacaine 0.25%—20 ml.
- **Bleeding:** Perfect haemostasis is the aim of all surgeries. In spite of this, a few bleeders may open up, mostly venous blood—may be pampiniform plexus veins or arterial blood from inferior epigastric artery. The bleeding may stop with compression bandage. Otherwise, exploration and ligation of bleeders needs to be done in the operation theatre.
- **Urinary retention is common, more so in males:** Pain, spinal or epidural anaesthesia, sedatives, lack of privacy are contributing factors. Provide analgesia, privacy and hot fomentation to suprapubic region. If all of these fail, catheterise bladder as a last step.
- **Abdominal distension:** This is not common. It can happen when large intestinal contents of the hernia sac are reduced or handled as in scrotal hernias or sliding hernias. It is also important to realise that omentum is attached to stomach and colon above. One should see that bleeders from injured arteries of the omentum are ligated properly. Some intraperitoneal blood may add to paralytic ileus.

3. Intermediate—between 3 and 7 days

- **Seroma** is due to inflammatory response to mesh or suture materials. It causes swelling and anxiety that it may be a recurrence. When in doubt, get an ultrasound examination first. Seroma needs to be aspirated. Seroma is more common after laparoscopic hernia repairs.
- **Surgical site infection:** Hernia is a clean surgery. Infection should not occur. However, poor handling of the tissues, haematoma, seroma and diabetes may precipitate wound infection. Patients with skin disease or co-morbid factors are given injection cefazolin 1-2 g intravenously 30 minutes before the incision or clindamycin, if patient is allergic to cefazolin. If infection is suspected, open the sutures, drain the pus and use appropriate antibiotics. Persistent wound infection may prompt removal of the mesh. A few cases of tuberculosis have been reported. This is due to improper sterilisation of the mesh used.

4. Late: Late complications are not all that common. One complication which bothers a few patients is chronic pain called **inguinodynia**. It is seen in about 10% of post-hernioplasty pain. It is defined as persisting pain more than 3 months after surgery.

- **Inguinodynia:** The chief factor is injury to the following nerves: Iliohypogastric, ilioinguinal and genital branch of genitofemoral nerve. Injury can be in the form of entrapment of the nerves, traction injury, cauterisation, transection, etc. These are more common after mesh repair because of entrapment of the nerves or perineural fibrosis and adhesions between mesh and the nerves. Clinical features include dull aching or dragging pain in the groin, genitalia, suprapubic region. Some may complain of diminished sensation or even hyperaesthesia. Treatment usually includes reassurance, simple analgesics, nerve blocks with anaesthetic agents and injection of steroids. Neurolysis by inguinal exploration or neurectomy may be required in appropriate cases.

Ischaemic orchitis and testicular atrophy

- It occurs due to thrombosis of veins of pampiniform plexus within spermatic cord. It is more common in direct hernias where handling of the spermatic cord while separating it from the long-standing sac may result in thrombosis.
- It can also be due to injury to testicular artery.
- Venous congestion results in ischaemic orchitis causing pain in the testis.
- It is treated with anti-inflammatory drugs.
- Ischaemic orchitis is more common after recurrent hernia surgeries.

COMPLICATIONS OF HERNIA

Competency

SU28.1.5: Describe complications of abdominal hernias.

1. Irreducibility (Key Box 52.7)

It occurs due to adhesions formed between omentum, sac and the contents. Irreducibility produces dull aching pain.

Key Box 52.7

2. Obstructed Hernia (Key Box 52.8)
Irreducible hernia + obstruction gives rise to obstructed hernia. severe colicky abdominal pain, vomiting and step ladder peristalsis.

Treatment

Urgent division of the neck of hernioplasty.

Key Box 52.8

Factors Responsible for Obstruction

- Narrow neck
- Irreducibility
- Sudden straining
- Too many contents
- Long duration of hernia
- Sliding hernia

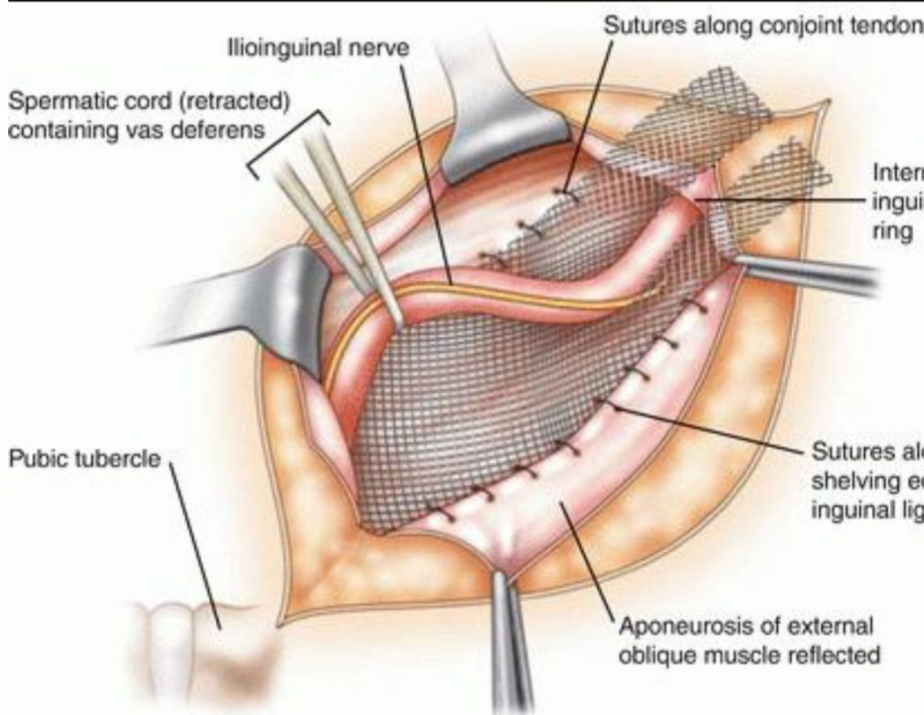
Fig.

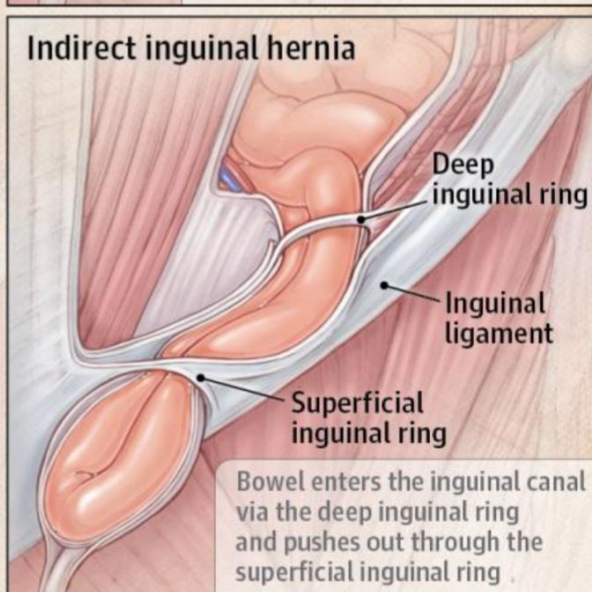
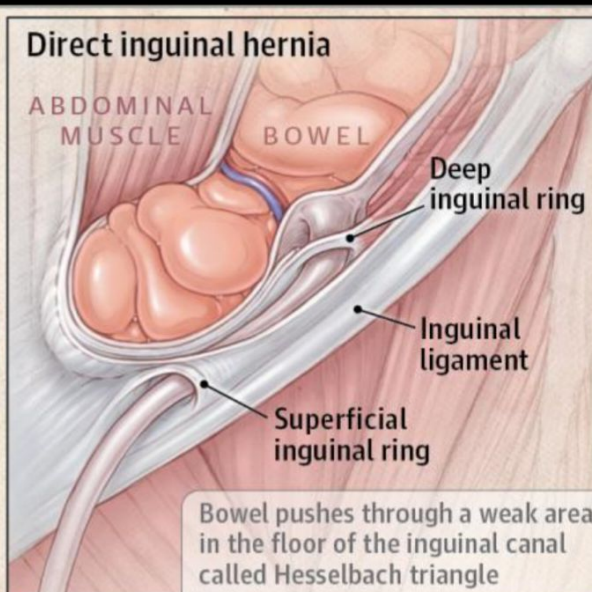
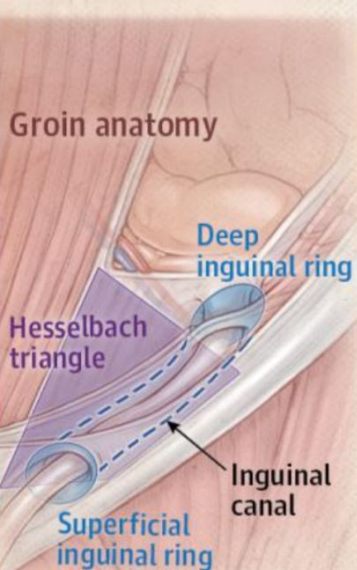
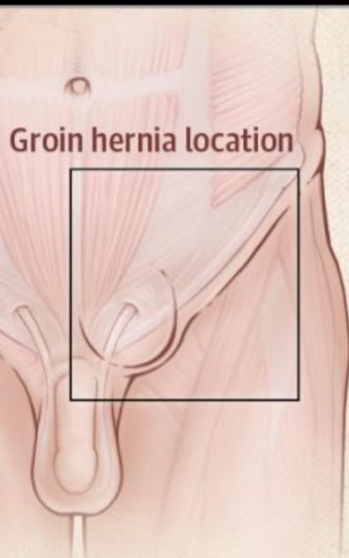
3. Strangulated Hernia

Irreducibility + obstruction of blood supply to intestine.

Pathology

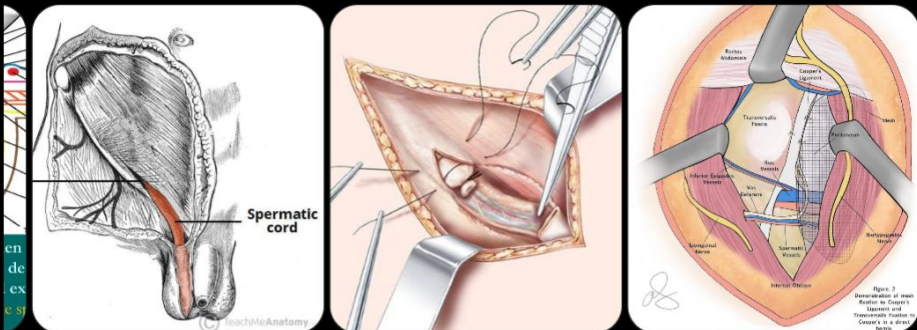
- Strangulation commonly occurs in obturator hernia and in indirect inguinal hernia.
- Initially the venous return is obstructed, and mucosal ulceration occurs into the gut wall. It leads to capillary exudation.
- If the obstruction is not relieved, the artery takes place resulting in gangrene. If this happens, there is a perforation.
- Gangrene appears at the ring of the hernia. It develops in the antimesenteric border.





Lichtenstein Tension-Free Hernioplasty

— Detailed Textbook Steps



Based on **Bailey & Love's Short Practice of Surgery**
(exam-oriented, stepwise)

PREOPERATIVE PREPARATION

- Informed consent (mesh, recurrence, chronic pain explained)
- Shaving and antiseptic preparation
- Prophylactic antibiotics (single dose)
- Anesthesia: spinal / general / local (Lichtenstein can be done under local)

OPERATIVE STEPS

1. Skin Incision

- 6–8 cm oblique incision
- 2 cm above and parallel to inguinal ligament
- Extends from pubic tubercle → laterally



Ask anything



- Anesthesia: spinal / general / local (Lichtenstein can be done under local)

OPERATIVE STEPS

1. Skin Incision

- 6–8 cm oblique incision
- 2 cm above and parallel to inguinal ligament
- Extends from pubic tubercle → laterally

2. Superficial Dissection

- Incise:
 - Skin
 - Superficial fascia (Camper's + Scarpa's)
- Achieve hemostasis
- Expose **external oblique aponeurosis**

3. Opening Inguinal Canal

- Incise **external oblique aponeurosis** in line of fibers
- Open **superficial inguinal ring**
- Retract edges → expose **inguinal canal contents**

4. Identification & Mobilization of Spermatic Cord



Ask anything



4. Identification & Mobilization of Spermatic Cord

- Identify **spermatic cord**
- Loop with finger / tape
- Mobilize and lift out of canal

⚠️ Preserve:

- Ilioinguinal nerve
- Iliohypogastric nerve

5. Identification of Hernial Sac

◆ Indirect Hernia

- Sac lies **anteromedial to cord**
- Dissect sac up to **deep ring**
- Open sac → check contents
- Reduce contents
- **High ligation of sac** at neck
- Excise distal sac

◆ Direct Hernia

- Bulge in **posterior wall (Hesselbach's triangle)**
- Sac inverted/plicated (no excision usually)



6. Preparation of Posterior Wall



Ask anything



- Bulge in **posterior wall** (Hesselbach's triangle)
- Sac inverted/plicated (no excision usually)

6. Preparation of Posterior Wall

- Clear transversalis fascia
- Identify landmarks:
 - **Pubic tubercle**
 - **Inguinal ligament**
 - **Conjoint tendon**
- Ensure adequate space for mesh

7. Mesh Preparation

- Use **polypropylene mesh** (~7.5 × 15 cm)
- Tailored to fit inguinal floor
- Create **lateral slit (keyhole)** → forms two tails

8. Placement of Mesh

- Place mesh over **posterior wall**
- Medial end overlaps **pubic tubercle** (important to **prevent recurrence**)
- Lateral end extends beyond **deep ring**

9. Fixation of Mesh (⬇️ CRUCIAL STEP)



Ask anything



- Lateral end extends beyond **deep ring**

9. Fixation of Mesh (CRUCIAL STEP)

♦ Inferior border

- Sutured to **inguinal ligament**
(continuous/interrupted)

♦ Medial fixation

- To **pubic tubercle fascia** (secure anchor point)

♦ Superior border

- Sutured to **conjoint tendon**

♦ Around cord

- Two tails passed around cord at deep ring
- Crossed and sutured → recreate deep ring

👉 Ensure:

- Mesh is **flat, tension-free**
- Not too tight → avoid cord compression

10. Repositioning

- Place **spermatic cord** over mesh

11. Closure



Ask anything



11. Closure

- Close **external oblique aponeurosis**
- Subcutaneous tissue closure
- Skin closure (sutures/staples)

🎯 PRINCIPLES (Exam Core)

- **Tension-free repair**
- Mesh reinforces **posterior wall**
- Fibrosis → permanent strength

⚠️ IMPORTANT STRUCTURES TO PROTECT

- Ilioinguinal nerve
- Iliohypogastric nerve
- Genital branch of genitofemoral nerve
- Spermatic cord structures

❗ COMPLICATIONS (Exam Favourite)

- Hematoma / seroma
- Wound infection
- Chronic groin pain (nerve injury)
- Recurrence (if mesh not ↓ fixed properly)



Ask anything





Based on Bailey & Love's Short Practice of Surgery



Definition

👉 Shouldice repair is a multilayer anatomical (non-mesh) repair of inguinal hernia in which the posterior wall is reconstructed by double-breasting (imbrication) of the transversalis fascia and muscle layers.



Principle

- 👉 Reinforce posterior wall using patient's own tissues
- 👉 Done in 4 continuous suture layers (very important exam point)



Steps (Detailed, Exam-Oriented)

1. Incision & Exposure

- Standard inguinal incision
- Open inguinal canal
- Mobilize spermatic cord

2. Deal with Hernial Sac

- Indirect → sac ligated & excised
- Direct → sac reduced



Ask anything



3. Incision of Transversalis Fascia

- Posterior wall (transversalis fascia) is incised longitudinally
- Creates upper and lower flaps

4. Reconstruction — 4 Layer Repair (CORE STEP)

◆ Layer 1

- Lower flap sutured to undersurface of upper flap
👉 Starts from pubic tubercle → deep ring

◆ Layer 2

- Upper flap sutured to inguinal ligament
👉 Creates double-breasting (overlap)

◆ Layer 3

- Conjoint tendon sutured to inguinal ligament

◆ Layer 4

- Reinforcement layer (↓ tentional continuous suturing)



Ask anything



5. Reposition Cord

- Cord placed back in canal

6. Closure

- External oblique aponeurosis closed
- Skin closure

Key Concept (VERY IMPORTANT)

👉 Double-breasting = overlapping layers to strengthen wall

👉 No mesh → tension repair

Comparison with Lichtenstein

Feature	Shouldice	Lichtenstein
Type	Tissue repair	Mesh repair
Tension	Present	Tension-free
Layers	4 layers	Single mesh
Recurrence	Low (if done well)	Very low
Skill required	High	Moderate



Ask anything





Walls of Inguinal Canal

Anterior wall:

External oblique aponeurosis, reinforced laterally by the origin of internal oblique from the inguinal ligament. It contains superficial inguinal ring medially.

Posterior wall:

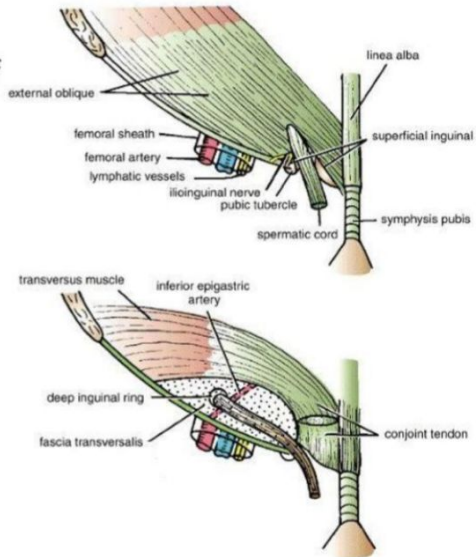
Conjoint tendon medially, fascia transversalis laterally. It contains deep inguinal ring laterally.

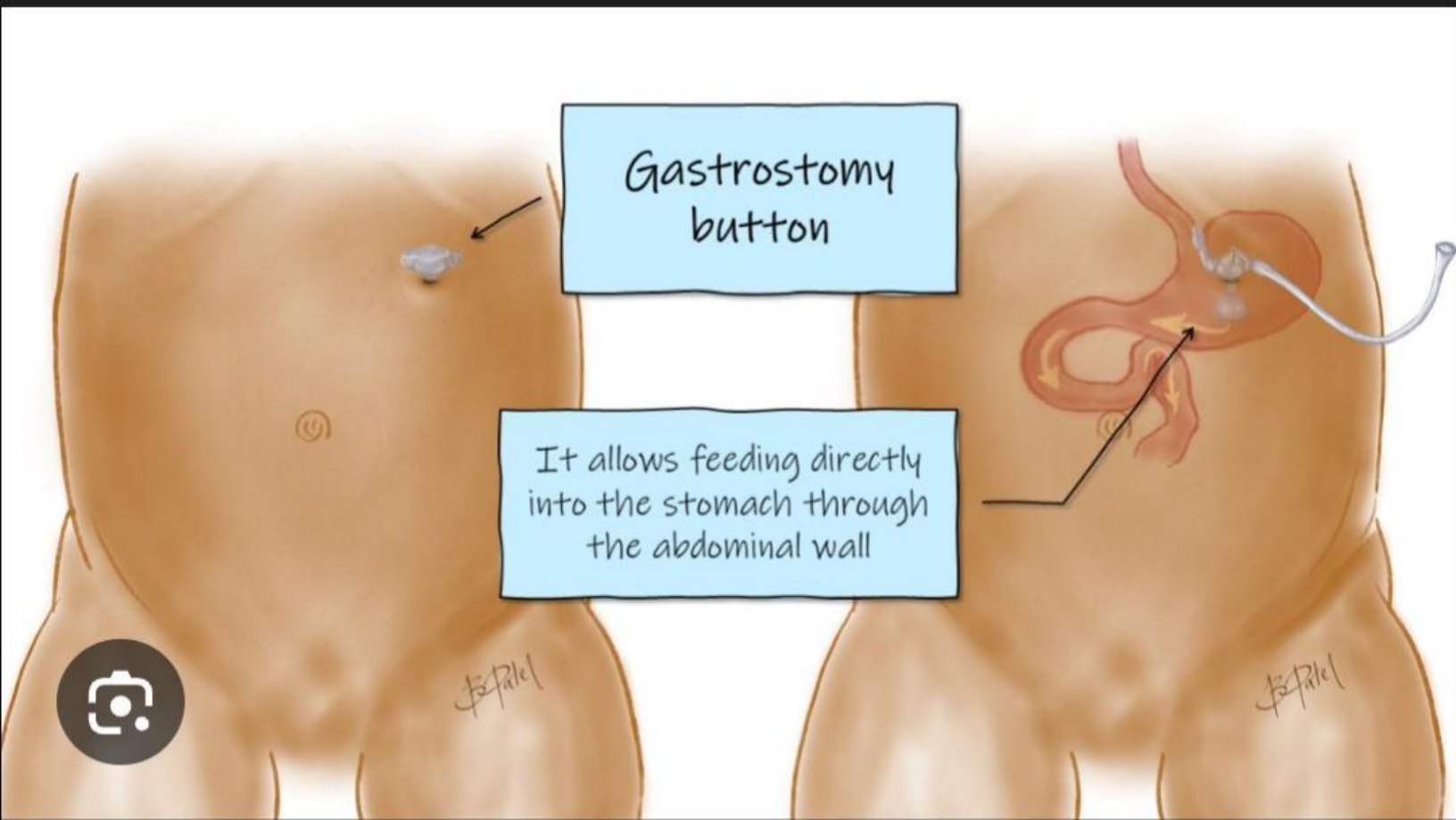
Roof or superior wall:

Arching lowest fibers of internal oblique & transversus abdominis

Floor or inferior wall:

Upturned lower edge of inguinal ligament and lacunar ligament medially.





The diagram consists of two side-by-side illustrations of a human torso from the waist up. The left illustration shows the external view of the abdomen with a small, grey, button-like device (the gastrostomy button) placed on the skin. An arrow points from a text box to this button. The right illustration shows the internal view of the stomach and intestines. A tube is shown passing through the abdominal wall, entering the stomach, and connected to a pump or reservoir. An arrow points from a text box to the internal placement of the tube. Both illustrations are signed 'J. Patel' in the bottom right corner.

Gastrostomy
button

It allows feeding directly
into the stomach through
the abdominal wall



c. Capnothorax/pneumothorax: Capnothorax can be caused by carbon dioxide escaping into the chest through a defect in the diaphragm or tracking through fascial planes during dissection of the oesophageal hiatus. It can also be due to opening of pleuroperitoneal ducts most commonly seen on the right side.

HERNIA REPAIR: TAPP

(Transabdominal Preperitoneal Mesh Repair)

KEY POINTS IN LAPAROSCOPIC INGUINAL ANATOMY

Space of Bogros

This 'preperitoneal space' is divided into two by the posterior lamina of the transversalis fascia. The posterior compartment of this space is called the 'Space of Bogros (proper)', described by French anatomist Bogros in 1923. The anterior space has been termed as the 'Vascular Space'. Medially it is continuous with the space of Retzius.

Prevesical Space of Retzius

The preperitoneal space that lies deep to the supra-vesical fossa and the medial umbilical fossa is the prevesical space of Retzius (described in 1858, by Swedish anatomist Retzius). Dissection of this space during a laparoscopic hernia repair is mandatory to enable proper mesh overlap of the hernial defect to aid in proper mesh placement/fixation.

Corona Mortis/Crown of Death/Circle of Death

- The pubic branch of the inferior epigastric artery courses in a vertical fashion inferiorly, crossing the Cooper's ligament and anastomosing with the obturator artery. In 25–30% of individuals (can be as high as 70–80%), the pubic branch is large and can replace the obturator artery.
- This large arterial branch is called aberrant obturator artery can partially encircle the neck of a hernia sac and be injured in a femoral hernia repair. It could also be injured while exposing the Cooper's ligament by freeing it of areolar adipose connective tissue.
- Because of this possibility an enlarged pubic branch of the inferior epigastric artery has in the past been known as the 'Corona Mortis'. The danger of injury in this area is more significant for obturator veins.

Triangle of Doom

- It is a misnomer. It is not a triangle. It indicates an area where it is dangerous to place staples or sutures during laparoscopic hernia surgery.

The "triangle of doom" is an inverted "V"-shaped area with its apex at the internal (deep) inguinal ring. The "triangle of doom" is bound laterally by the gonadal vessels, and medially by the vas deferens in the male, or the round ligament of the uterus in the female.

- Within the boundaries of this area you can find the external iliac artery and vein.
- Injury to these vessels can be catastrophic.

Triangle of Pain

Formed medially by gonadal vessels, laterally by iliopubic tract and inferiorly by peritoneal reflection. It contains lateral femoral cutaneous nerve, genital femoral nerve.

Introduction

Novel method used for hernias wherein trans-abdominally (intraperitoneal) dissection is done through a laparoscope, and a mesh placed in the preperitoneal space.

Indication

Large indirect hernias and irreducible hernias.

Procedure

- **10 mm infraumbilical port** is used for the laparoscopic camera.
- **5 mm ports** are placed one on each side on pararectal point at or above the level of umbilicus, so as to achieve adequate triangulation.
- Once ports are inserted, the hernial sac is recognized and the contents are reduced by pulling it trans-abdominally using a dissector (laparoscopic).
- Hernial sac is dissected in the preperitoneal plane after incising at the upper part of the hernial sac opening.
- Once the sac is dissected and excised, a **prolene mesh** is placed in the preperitoneal space. It is fixed to the pubic bone using tacks. Peritoneum is closed with prolene sutures.

Complications

- Mesh displacement
- Intestinal obstruction, if the mesh displaces into the peritoneum.
- Expensive
- Higher recurrence rates

HERNIA REPAIR: TEP (TOTALLY EXTRAPERITONEAL REPAIR)**Indications**

1. Recurrent hernia
2. Bilateral inguinal hernias
3. Indirect/direct/femoral hernias

Contraindications

1. Obstructed/strangulated hernias
2. Ascites
3. Bleeding disorders

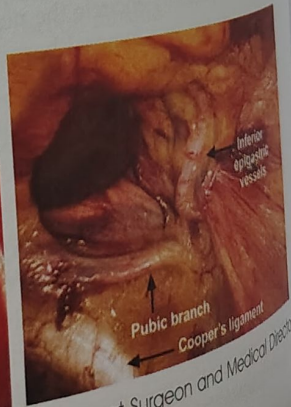
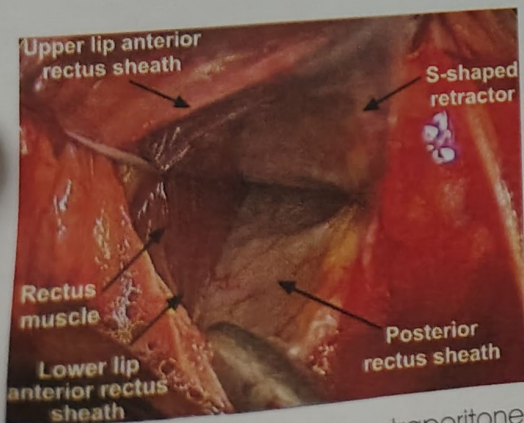
This surgery has surpassed the TAPP procedure and is turning out to be a promising procedure for management of hernias.

Procedure (Figs 70.55 to 70.57)

- Subumbilical incision (10 mm) placed
- **Extraperitoneal space** is created by passing the scope between the rectus muscle and the posterior rectus sheath medial to the muscle bundle edge.
- Initial dissection is carried out using laparoscope itself and **inflation of CO₂**.
- 2 more 5 mm ports are placed in the midline **4 cm and 8 cm below the 1st port respectively**.
- **Dissection** is carried out medially till the pubic tubercle, iliopectinate ligament and laterally till the iliac vessels and inferior epigastric vessels. Once adequate space is dissected, the sac is reduced by pulling it down from the inguinal canal (reduction of sac) and a 15 × 15 cm mesh is placed and spread.
- Mesh may be sutured, left as it is or fixed with tackers.
- Both sides can be done together through the same ports.

Complications

1. Cord/vas injuries
2. Inadvertent opening of the sac/peritoneum and creation of pneumoperitoneum



Figs 70.55 to 70.57: Totally extraperitoneal repair (TEP) (Courtesy: Dr Praveen Bhatia, Consultant Surgeon and Medical Director, Bhatia Global Hospital and Endosurgery Institute, New Delhi)

3. Seroma formation
4. Infection

Advantages of TEP

1. Approach is totally extraperitoneal
2. Smaller incisions
3. No need for fixing mesh
4. Peritoneum is intact

SILS (LESS)**Introduction**

- Single port access (SPA) surgery, also known as laparoendoscopic single-site surgery (LESS), single incision laparoscopic surgery (SILS) or single port incision less conventional equipment-utilising surgery (SPICES) or embryonic natural orifice transluminal endoscopic surgery (E-NOTES) is an advanced minimally invasive surgical procedure in which the surgeon operates almost exclusively through a single entry point, typically the patient's navel.
- SPA surgical procedures are like many laparoscopic surgeries in that the patient is under general anaesthesia; insufflated and laparoscopic visualisation is utilised.
- In laparoendoscopic single-site surgery (LESS), a single small incision is used at the entry point rather than four to five small incisions.
- All surgical instruments are placed through this small incision and also the incision site is located in the left abdomen or umbilicus. In general, SILS techniques take the same amount of time to do as traditional laparoscopic surgeries.
- However, SILS is recognised as to be a more complicated procedure because it involves manipulating three articulating instruments through one access port.

• Obesity, severe a
surgeries are a f
Failure rates are

How SILS Differs from surgery?

- In single incision of ar
incision of all
umbilicus to all
side by side pa
• Port, a special
abdomen; this
scopic instrum
• Steps of sur
conventional
• As there is on
to traditional
faster. The he
thus making
• In 5 to 10% pa
the operation
One has to
completes th
scopic man

NATURAL O**Introduction**

It means surg
passing the
natural orifice
to achieve ac
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appendect

Advantage

- Less inva
- No abdo
- Reductio
- Wound i
very less

Commonly

- Transgas
- Transvag

SUPRAPUBIC CYSTOSTOMY

Indications

- A/C urinary retention
- Urethral injury (trauma, pelvic fracture)
- " stricture
- BPH, Ca prostate
- Neurogenic bladder
- Post op urinary diversion

Contraindications

- Ca py bladder
- Coagulopathy
- Bladder ca

Steps

- Supine position.
- LA.
- Midline incision 2-3 cm above pubic symphysis
- Insert needle attached to syringe, aspirate urine to confirm bladder entry.
- Introduce trocar & cannula
- Insert Foley's Catheter through tract
- Inflate the balloon inside bladder
- Secure the catheter, attach urinary drainage bag

Complications

Early

- Bleeding, hematuria
- Bowel injury
- Pain
- Inf - leakage

Late

- Catheter blockage
- Fistula formation
- Recurrent UTI

Eversion of TV Sac (Taboulay's Procedure)

Indications

1st vaginal hydrocele - (when the sac is thin & pliable).

Steps

- Scrotal / inguinoscrotal incision is made (skin flaps).
- Delivery of hydrocele sac through the wound.
- Sac opened & fluid drained.
- Eversion - Sac is turned inside out, so endothelial surface face outward.
- Edge of ~~sac~~ sac ~~is~~ stitched together behind testis & spermatic cord.
- Closure - Testis is placed in scrotum & closed in layers.

Complications

- Hematoma
- Inf.
- Injury to vas deferens
- Testicular atrophy.

Prevention

- **Thyroidectomy:**
Refer chapter—Thyroid
- **Mastectomy:**
Refer chapter—Breast
- **Parotidectomy:**
Refer chapter—Salivary Gland Swelling
- **Hernia:**
Refer chapter—Hernia
- **Varicose vein operation:**
Refer chapter—Varicose Vein
- **Hydrocele operation:**

- **Lord's plication:**

Indication: Done for small hydrocele.

The sac is opened and the cut edge of the sac is plicated to tunica albuginea (reflected portion of processus vaginalis). As a result, the sac gets crumpled up near the testes (so testicular secretion gets absorbed by the subcutaneous lymphatics and venous system).

- **Jaboulay's eversion procedure:**

Indication: Done for slightly larger hydrocele.

Here, instead of placating the tunica vaginalis, it is everted and sutured onto itself behind the testis.

- **Excision and eversion:**

Indication: Done for very large hydrocele.

Here, part of the sac is removed.

Complications:

- Hematoma
- Infection
- Injury to testes
- Recurrence
- Torsion of testes.
- **Tracheostomy:**

Making an opening in the anterior wall of the trachea and converting it into a stoma on the skin surface.

Indication:

- Respiratory obstruction
- Retained secretion
- Respiratory insufficiency.

Types

- Emergency tracheostomy
- Elective tracheostomy
- Permanent tracheostomy
- Percutaneous dilatation
- Mini-tracheostomy

- Injury
 - Aspiration
 Intermediate:
 - Secondary b
 - Displaceme
 - Subcutaneo
 - Tracheitis, t
 Late:
 - Laryngeal
 - Tracheal st
 - Tracheoes
 - Keloid sca
 • **Circumcision**
 Indications
 - Religious
 - Phimosis
 - Carcinom
 - Balanitis
 - Unable t
 - Splitting
 Position: Su
 Anesthesia:
 Procedure:
 - With 2
 - A long
 - At the
 - The sk
 - Bleedi
 - The sk
 Complicat
 - Bleed
 - Infect
 - Injur
 • **Vasecto**
 Perman
 Anesth

MRM

procedure for c.c breast.
entire breast is removed & axillary dis.
preserving the P. major muscle.

Preserve Long thoracic N.
(Winging of scapula)
Thoracodorsal A
Axillary V

Ind.

Reoperable Breast Cancer (I-III)
large tumor not suitable for BCS
Multifocal/multicentric tumors
Pt. preference
Recurrence after lumpectomy.

→ Hemostasis
→ Place Drain
→ closure.

Complics

Early

Htg
Seroma
Infection
Flap necrosis

Late

Lymphedema arm
Shoulder stiffness
Long term slinging
Wing of scapula
Intercostobrachial
N → numbness

Types

Patey's (MRM)

Removes P. major

Achincloss MRM

preserves P. major
+ P. minor

Steps

- Pos - Supine, arm abducted (90°)
- Incision - Elliptical incision including NAC
- Flap raising →
 - Sup → up to clavicle
 - Inf → up to inframammary fold.
 - med → sternum.
- Dissect breast tissue from P. major
- Axillary LAD.

Remove I, II ± III

Ochidectomy

Surgical removal of one / both testis.

Types

Simple

Removal of testis through scrotal incision

for benign condn.

Inguinal (Radical)

Removal of testis + spermatic cord via inguinal approach.
Standard for testicular tumours.

3) Bil. orchidectomy

Removal of both testis
for prostate cancer.

4) Subcapsular orchidectomy

Tunica albuginea preserved.
Cosmetic benefit.

Ind

Testicular tumor

Toxin

Trauma to testis

Atrophic testis.

Carcinoma prostate for
hormonal ablation

Steps

Superficial port → oblique inguinal incision (similar to hernia)

Open inguinal canal.

~~Deliver testis from scrotum~~

Deliver testis from scrotum

high ligation of spermatic cord

② deep inguinal ring.

Removal of testis + cord.

Hemostasis

closure.

Comp

Early

hematoma

hbg.

infn

pain

Late

Infertility (b/c)

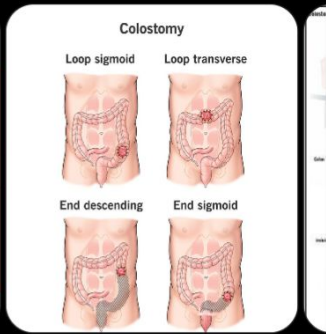
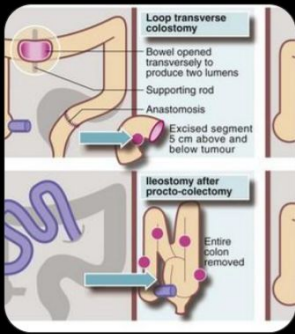
Hypogonadism

psychol impact

Scrotal asymmetry



Colostomy – Detailed (Textbook Style)



Based on **Bailey & Love's Short Practice of Surgery** and standard MBBS surgery texts

Definition

 **Colostomy** = Surgical creation of an **opening of the colon onto the abdominal wall** to divert fecal flow.

Types of Colostomy

1. Based on duration

- **Temporary** (protective/diversion)
- **Permanent** (e.g., after abdominoperineal resection)

2. Based on anatomy

- **End colostomy**



Ask anything



2. Based on anatomy

- **End colostomy**
 - Proximal end brought out as stoma
 - Distal end closed or forms mucous fistula
- **Loop colostomy** (most common temporary)
 - Loop of colon brought out and opened
- **Double-barrel colostomy**
 - Both proximal and distal ends exteriorized

Indications

Obstructive conditions

- Left-sided colorectal carcinoma
- Volvulus
- Stricture

Perforation / peritonitis

- Perforated colon
- Traumatic injury

Protective (diversion)

- After low anterior resection
- To protect distal anastomosis



Ask anything



● Protective (diversion)

- After low anterior resection
- To protect distal anastomosis

● Inflammatory conditions

- Complicated diverticulitis
- Severe Ulcerative colitis (selected cases)

● Congenital

- Anorectal malformations

✗ Contraindications

👉 No absolute contraindication in emergencies (life-saving)

Relative

- Poor general condition (if elective)
- Unfit for anesthesia
- Severe coagulopathy (correct before surgery)

✂ Steps of Colostomy (Loop Colostomy — Exam ↓ Favourite)



Ask anything





Steps of Colostomy (Loop Colostomy – Exam Favourite)

1. Site Selection (VERY IMPORTANT)

- Usually left iliac fossa (sigmoid colon)
- Preoperative marking:
 - Away from bony prominences
 - Visible to patient
 - Through rectus muscle

2. Incision

- Circular/elliptical skin incision at marked site

3. Opening Layers

- Skin → subcutaneous tissue
- Rectus sheath opened
- Rectus muscle split
- Peritoneum opened

4. Delivery of Colon

- Identify sigmoid colon
- Deliver **loop of colon** through opening



Ask anything



5. Fixation

- Colon fixed to abdominal wall (seromuscular sutures)

6. Opening the Colon

- Anterior wall incised
- Fecal stream diverted

7. Maturation of Stoma

- Edges of colon sutured to skin
👉 Creates **spouted stoma**

Key Surgical Principles

- Good **blood supply**
- No **tension**
- Proper **spout formation**
- Secure fixation

Complications (VERY IMPORTANT)



Early



Ask anything



- Secure fixation

⚠️ Complications (VERY IMPORTANT)

Early

- Hemorrhage
- Ischemia/necrosis
- Retraction
- Infection

Late

- Prolapse
- Parastomal hernia
- Stenosis
- Skin irritation

🧠 Viva Pearls

- Sigmoid colostomy → formed stools
- Transverse colostomy → semi-formed stools
- Loop colostomy → easier to reverse

🗣️ Viva One-Liner



Ask anything



3. Bring jejunum through transverse mesocolon

👉 Why retrocolic route? Shorter, more direct, less tension

4. Create openings

- Stomach (posterior wall)
- Jejunum

👉 Why adequate size? Prevents stenosis

5. Anastomosis (2-layer)

- Inner: absorbable
- Outer: seromuscular

👉 Why 2 layers? Strength + leak prevention

6. Ensure no tension, good blood supply

👉 Why important? Prevents anastomotic leak

7. Close mesenteric defects



Message Surgery practic...



Contraindications

- Poor general condition (relative)
- Diffuse peritoneal disease (palliative benefit questionable)
- Severe malnutrition (optimize first)

Types

- Anterior vs Posterior
 - Antecolic vs Retrocolic
- 👉 Most common: **Posterior retrocolic GJ**

Steps (Posterior Retrocolic GJ – most asked)

1. Access lesser sac

- Open gastrocolic omentum
- 👉 **Why?** To reach posterior stomach (better dependent drainage)

2. Identify jejunal loop (~25–30 cm from DJ flexure)

👉 **Why this distance?** ↓ events bile reflux and tension



6. Ensure no tension, good blood supply

👉 Why important? Prevents anastomotic leak

7. Close mesenteric defects

👉 Why? Prevents internal hernia ★

📌 Complications

Early

- Hemorrhage
- Leak → peritonitis
- Ileus

Late

- Dumping syndrome
 - Marginal ulcer
 - Bile reflux gastritis
 - Afferent loop syndrome
-

📌 Viva Pearls ★

- Posterior GJ preferred → better drainage
- Always close mesenteric defects → prevents internal hernia

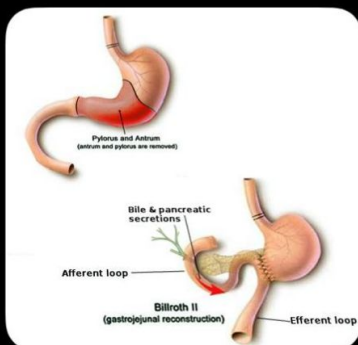
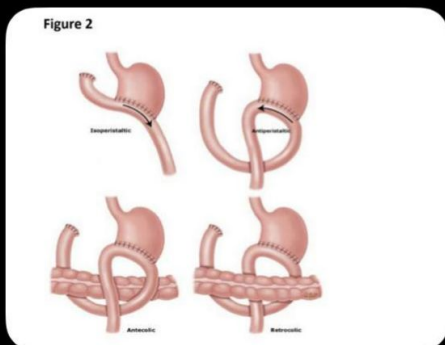


Message Surgery practic...



◆ Gastrojejunostomy (GJ)

(Creating an anastomosis between stomach and jejunum)



Definition

A surgical connection between **stomach** and **jejunum** to bypass pylorus/duodenum.

Indications

- Gastric outlet obstruction (peptic ulcer, carcinoma pylorus)
- Unresectable distal gastric cancer (palliative)
- Chronic duodenal obstruction
- Part of procedures like **Billroth II reconstruction**



Message Surgery practic...

