SURGERY BINGE REVISION

Medsynapse by Dr. Nikita

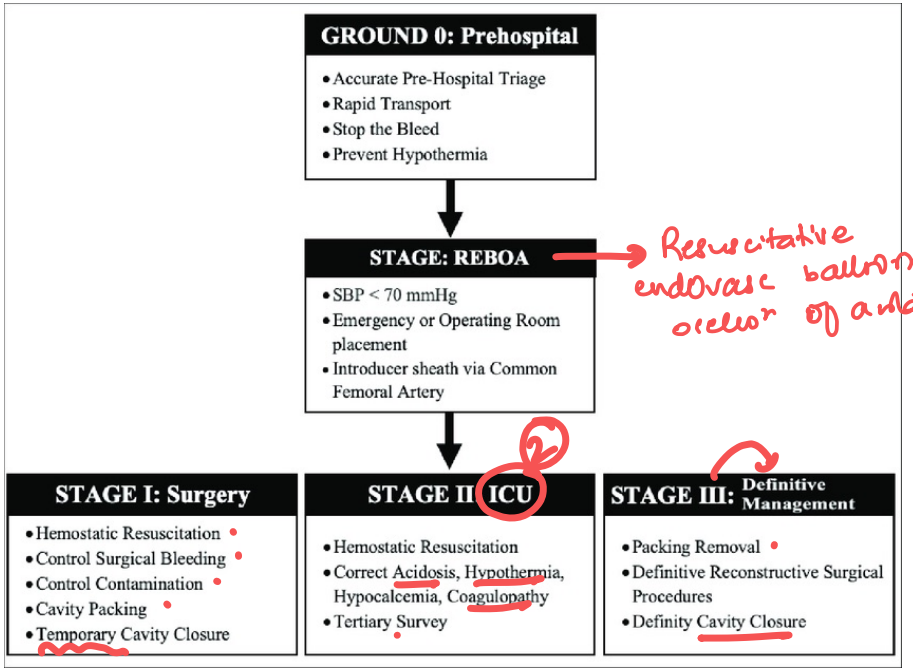
General | Shock | Trauma

* Neurogenic shock → loss of symp. (opp of hypovolemic)
  - ↓HR + ↓BP
  - warm extremities dry
  - motor sensory deficits
  - spinal injury ↓.

* EDH vs SDH
  - EDH: lucid, ×sutures, MMA, #, acute
  - SDH: veins, Trivial, chronic

- SDH → open craniotomy if
  1. Thickness > 1cm
  2. midline shift > 5mm
  3. GCS ↓ by ≥2

* Damage control surgery
  - 5 stages
  1) Pt selection
  2) control of Hx, contamin
  3) Resuscin in ICU
  4) Definitive Sx (vasc. anast)
  5) Abdominal closure



Introduction:
Overview:

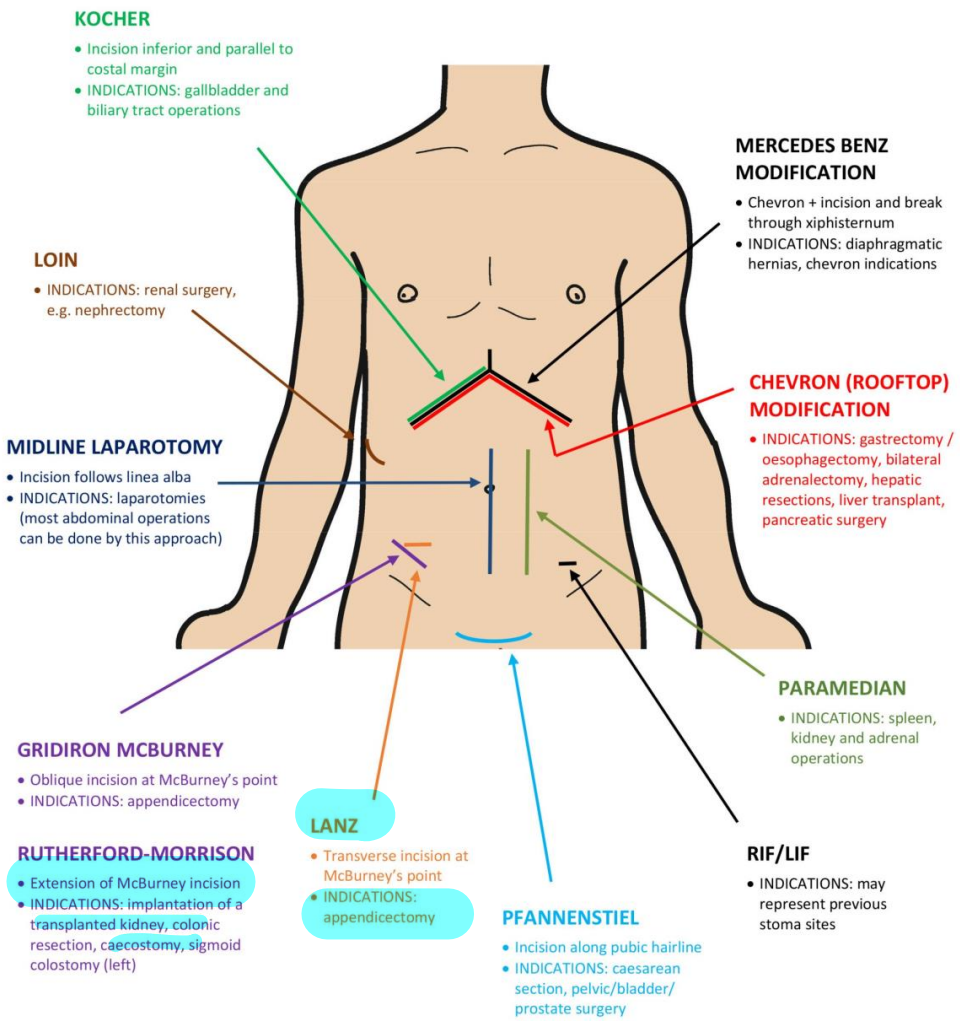
1. Primary Survey
   a. Airway and C-Spine
   b. Breathing
   c. Circulation
   d. Disability
   e. Exposure
2. Adjuncts to Primary Survey
   a. Monitoring
   b. Catheters
   c. X-Rays and Diagnostic studies
3. Secondary Survey
   a. History
   b. Head and Skull
   c. Maxillofacial and Intra-oral
   d. Neck
   e. Chest
   f. Abdomen (including back)
   g. Perineum/Rectum/Vagina
   h. Musculoskeletal
   i. Neurological
4. Adjuncts to Secondary Survey
   a. CT
   b. Contrast X rays
   c. Extremity X Rays
   d. Endoscopy and US

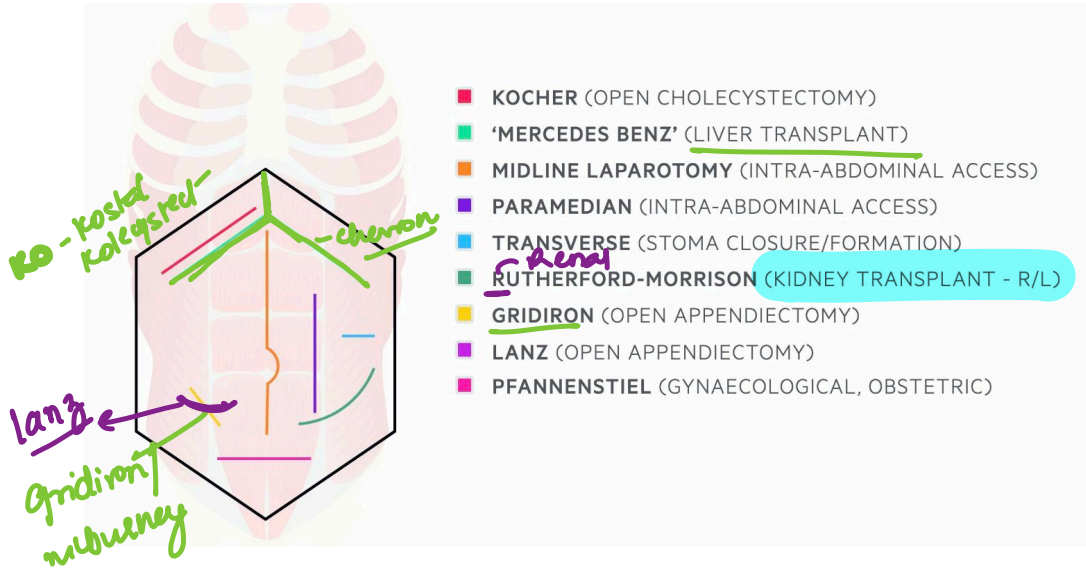
Primary Survey:

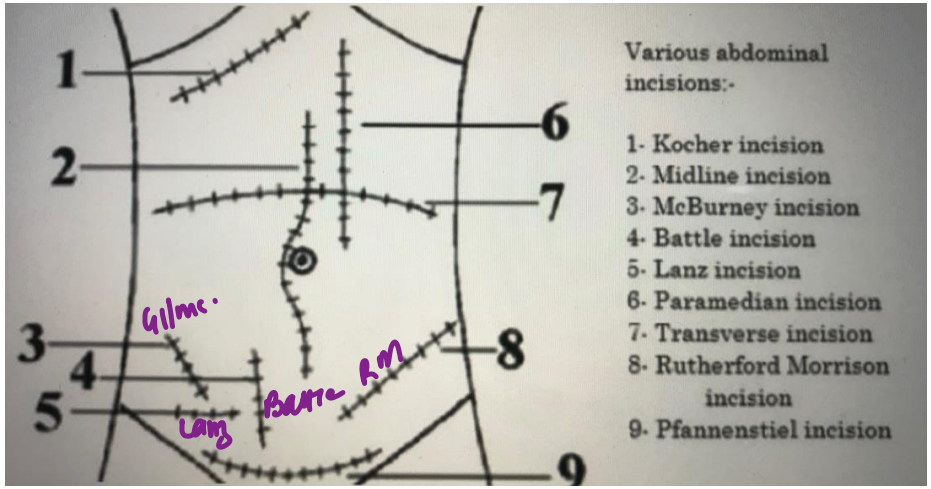
1. Airway and C-Spine
   a. Assume C spine injury in:
      i. Multitrauma
      ii. Decrease consciousness
      iii. Blunt injury above clavicle.
   b. Immbalise spine with hands until blocks can be administered – 2 person technique
   c. 15L of o2 via Re-breath bag and mask
2. Breathing
   a. Inspection and Monitoring
      i. RR and Sats
      ii. Colour of Patient
      iii. Accessory Muscles
      iv. Symmetrical Breathing
   b. Palpation
      i. Trachea
      ii. Apex
   c. Percussion
   d. Ascultation
   e. RULE OUT: ATOM FC
      i. Airway Obstruction
      ii. Tension Pneumothorax
      iii. Open Pneumothorax
      iv. Massive Haemothorax
      v. Flail Chest
      vi. Cardiac Tamponade (*Muffled HS, increase JVP, Hypotension- Becks Triad*)
3. Circulation and Haemorrhage Control
   a. Inspection and Observations
      i. Level of consciousness
      ii. Skin colour
      iii. HR, BP, Capillary refill,
   b. Palpate
   c. Auscultate
4. Disability
   a. Pupils
   b. AVPU/GCS
   c. BMs
5. Exposure
   a. Control Temperature
   b. Assess for other injuries

Adjuncts to Primary Survey:

1. ECG
2. Catheters
   a. Urinary CI:
      i. Blood at meatus
      ii. Perineal Ecchymosis
      iii. Scrotal Blood
      iv. High riding Prostate
      v. Pelvic Fracture
   b. Gastric
3. Monitoring
   a. Observations
   b. ABG
   c. End Tidal CO_2
4. X rays
   a. C Spine
   b. CXR
   c. Pelvic
   d. Diagnostic Peritoneal Lavage
   e. FAST Scan







MO-RO- cholecyste

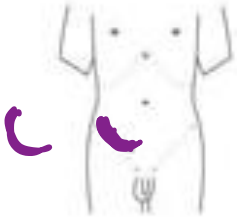
Mayo-Robson incision

- This is really a PARAMEDIAN incision that has been curved towards the xiphoid process.
- It allows a bigger and wider opening.
- Dissection continues in the same fascial planes as the paramedian incision.

gi-GO urology.

GIBSON INCISION

- Muscle splitting incisions
- Provides great extraperioneal access to
  - Lower ureter
  - Bladder
  - Pelvic vessels
- Surgical techniques:
  - Oblique or curvilinear
  - Muscles are splitted.
  - Peritoneum can be mobilized
  - Closure: two layers with running absorbable sutures.

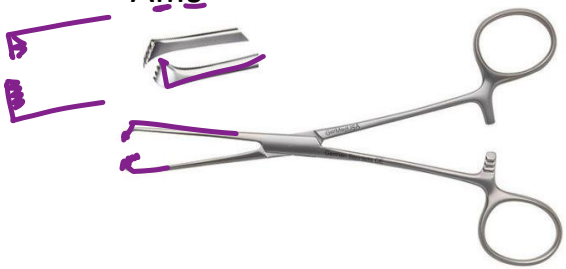


Kocher

Rampley sponge holding

Babcock

Mixter



Allis

Adson

MEDSYNAPSE
Where Concepts Meet Mnemonics

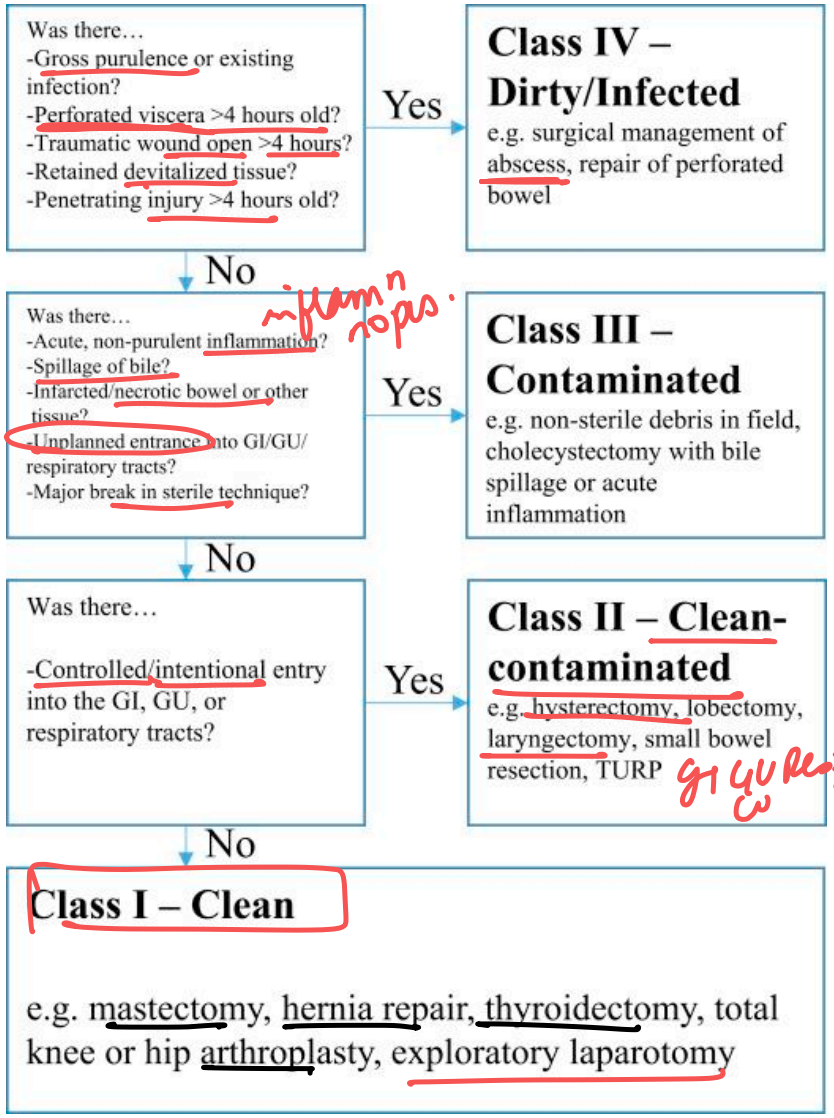
★ Veress needle :

Air flow : 1 L/min
max → 2 - ≤ 2 L/min

- opening pressure < 8
  s/o correct placement
- pressure → 15-20
  (always < 30)

Wound Classification	Definition	Examples	Surgical Site Infection Risk
Clean	Sterile procedure with no entrance into the GI tract, GU tract, or respiratory tract	Hernia repair, mastectomy, thyroidectomy, AAA repair	1%-3%
Clean-contaminated	Procedure with only minor breaks in sterility with controlled entry into the GI tract, GU tract, or respiratory tract with no significant contamination	Cholecystectomy, appendectomy, small bowel resection, colon resection	5%-8%
Contaminated	Procedure with poor sterility secondary to gross spillage from GI tract, GU tract, or respiratory tract or presence of foreign debris	Cholecystectomy with bile spillage, appendectomy for perforated appendicitis, small bowel or colon resection in setting of perforation	20%-25%
Dirty/Infected	Procedure involving contamination by established infectious processes	Abscess drainage, debridement of necrotizing soft tissue infections	30%-40%

Open cardiac massage



Clean

1

No tract

Breast

thyroid

clean cont

2

controlled

planned

tract

- cholecyst

cont

3

- spillage

inflamm

- bile spill.
- emergency

Ex.

dirty

4

↓

pus (+)

- open Abx
- debridement

Criterion	Description	Points
A Additional treatment	Antibiotics	10
	Drainage of pus under local anaesthetics	5
	Debridement of wound (General anaesthetics)	10
S Serous discharge	Daily	0-5
E Erythema	Daily	0-5
P Purulent exudates	Daily	0-10
S Separation of deep tissues	Daily	0-10
I Isolation of bacteria		10
S Stay in hospital prolonged over 14 days		5

Long incision (open) saphenous vein harvesting (Group A)

Southampton

Grade	Definition
0	Normal healing
I	Normal healing with mild bruising or haematoma
II	Erythema plus other signs of inflammation
III	Clear or haemoserous discharge
IV	Pus
V	Deep or severe wound infection with or without tissue breakdown; haematoma requiring aspiration

SIRS Criteria

TPR + WBC

Meet two or more of the followings:

- Temperature: < 36°C or > 38°C
- Heart rate: > 90 beats per minute
- Respiratory rate: > 20 breaths per minute
- White blood cell count: < 4,000 cells per mm³, > 12,000 cells per mm³, or > 10% immature (band) forms

qSOFA Criteria → RTS. RR + Trauma GCS + SBP.

Meet two or more of the followings:

- Respiratory rate: ≥ 22 breaths per minute
- Altered mental status GCS
- Systolic blood pressure: ≤ 100 mm Hg

* SIRS

- TPR + WBC count
  - HR > 90
  - ↑ / ↓ . T > 20RR
  - paCO2 ↓ < 32
  - ↳ > 12K
  - < 4K
  - > 10% band forms

RR ↑ → CO2 washout
paCO2 ↓.

violet → polyglactin
BBB - Bladder bowel bileduct

00 - orange mono subcuticular.

SUTURE	COLOUR CODE
PLAIN GUT	YELLOW
CHROMIC GUT	BROWN
SILK → black	LIGHT BLUE
NYLON →	GREEN
PROLENE	ROYAL BLUE
VICRYL	PURPLE
ETHIBOND	ORANGE
PDS	GREY
STAINLESS STEEL	SILVER

Silk → skin

PRO → Omphalocele herniorrhaphy

iran

prev Nylon → Tendon

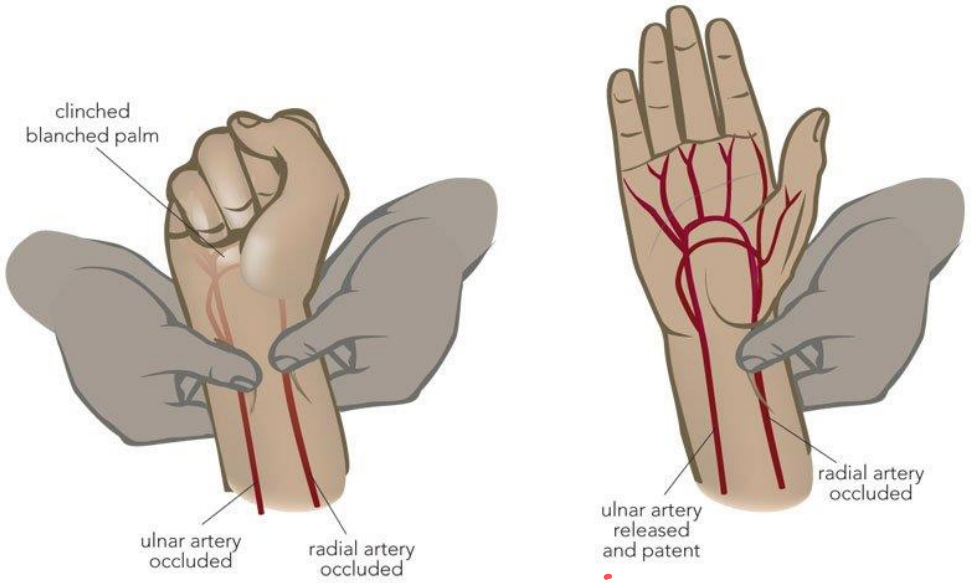
ulcer

① Neuropathic → plantar → loss of sensation, callus (+) (Dmileprosy.)

② Arterial → dorsal → pulse −, smoking / CAD / atherosc.

③ venous → medial malleolus → positive Brodie–Trendelenberg

- pain on calf → compression → DVT
  Homan sign (+) ↳



Allen

↓

arterial suppiciency

AV fistula.

Adson → TOO

(A) - positive

- If pall → negative

Special Tests

1. The Trendelenburg test
   - Used to assess the competence of SFJ
   - Patient lies flat
   - Elevate the leg and gently empty the veins
   - Palpate the SFJ and ask the patient to stand whilst maintaining pressure
   - Findings:
   - Rapid filling after thumb released→ SFJ is incompetent
   - Filling from below upwards without releasing thumb →presence of distal incompetent perforators

2. Tourniquet test

- Uses a tourniquet to control the junction rather than fingers
- Advantage of moving the tourniquet lower (mid-thigh region)
- Test is unreliable below the knee

3. Perthes Test

- Empty the vein as above, place a tourniquet around the thigh, stand the patient up.
- Ask them to rapidly stand up and down on their toes - filling of the veins indicated deep venous incompetence. This is a painful and rarely used test.

4. Schwartz test

- In standing position,tap the lower part of vein
- Impulse felt on saphenofemoral junction

5.Pratt's test-

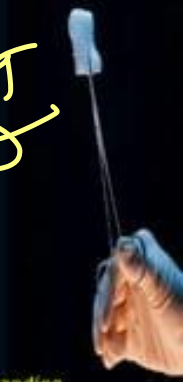
- Esmarch bandage applied on the leg from below upward with tourniquet on saphenofemoral junction
- Release of bandages
- Perforators seen as blow outs

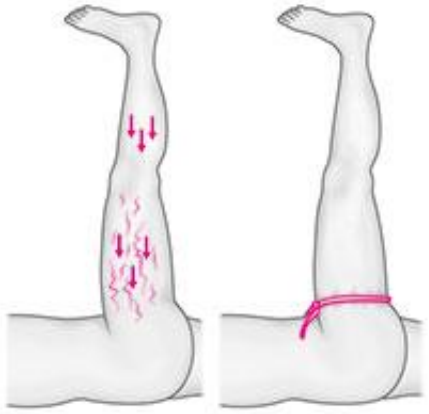
6.Morrissey's cough impulse test

- limb elevated and veins emptied
- Patient is asked to cough
- Expansile impulse in saphenofemoral junction

7.Fegan's test

- Line of varicosities marked
- Site where perforators pierce deep fascia-bulges on standing circular depressions on lying





Norm Trendelenburg 1 and 2

varicose

① Perthes

Pratt

Swbhavaz

fegans.

Skin Grafts

Partial Thickness (Thiersch) Graft	Full Thickness (Wolfes) Graft
• It includes **all epidermis & part of dermis**[Q].	• It includes **all epidermis & dermis**[Q].
• Partial thickness **grafts are thin, uptake of graft** is **easy (easy survival)**[Q].	• **Uptake** is **difficult** because of thickness
• **Large grafts could be taken** as the donor site is left with a **part of dermis** which will cause **easy regeneration of epidermis**[Q].	• Less chances of survival
• **Contract upto 40%, not useful** for **cosmetic surgeries**[Q].	• **Small grafts** could be **taken**[Q] as the donor site does not have epidermal or dermal remnants to allow epithelialization
• **Donor site** will **heal well**[Q] without any contraction, and is reusable.	• **Very minimal contraction** making it **suitable** for **cosmetic surgeries** on **face**[Q]
	• **Donor site** will have to be **closed primarily** or **left open to granulate** and contract[Q].

Contraction of Graft

- **Primary :** Occurs when the graft is harvested, **depends upon** amount of **dermis** present, **more in full thickness graft**
- **Secondary :** Occurs after the surgery, **more in partial thickness graft**

Primary contracture	Secondary contracture
Elastic recoil	Pull of myofibroblasts
Less in split-skin grafts	More in split-skin grafts
More in full-thickness grafts	Less in full-thickness grafts

1° → first full ↑
2° → secon- split ↑

TABLE Rule of 1–2–3 for hereditary breast and ovarian cancer

Who needs breast cancer genetics testing?
1 diagnosis in patient or first- or second-degree relative[a]
• Breast cancer at age <50 years
• Ovarian cancer at any age
• Triple-negative breast cancer at age ≤60 years
• Male breast cancer at any age
• Metastatic prostate cancer at any age
• Ashkenazi descent with breast, ovarian, pancreatic, or 2 aggressive prostate cancers at any age
• Known mutation carrier for breast cancer susceptibility gene
2 diagnoses in patient or family member(s)[a]
• 2 primary breast cancers in 1 person, with first diagnosis made at age <50 years
• 2 relatives diagnosed with breast cancer, with 1 at age <50 years
3 diagnoses (breast, ovarian, pancreatic, or aggressive prostate cancer, in any combination) on same side of family at any age[b]

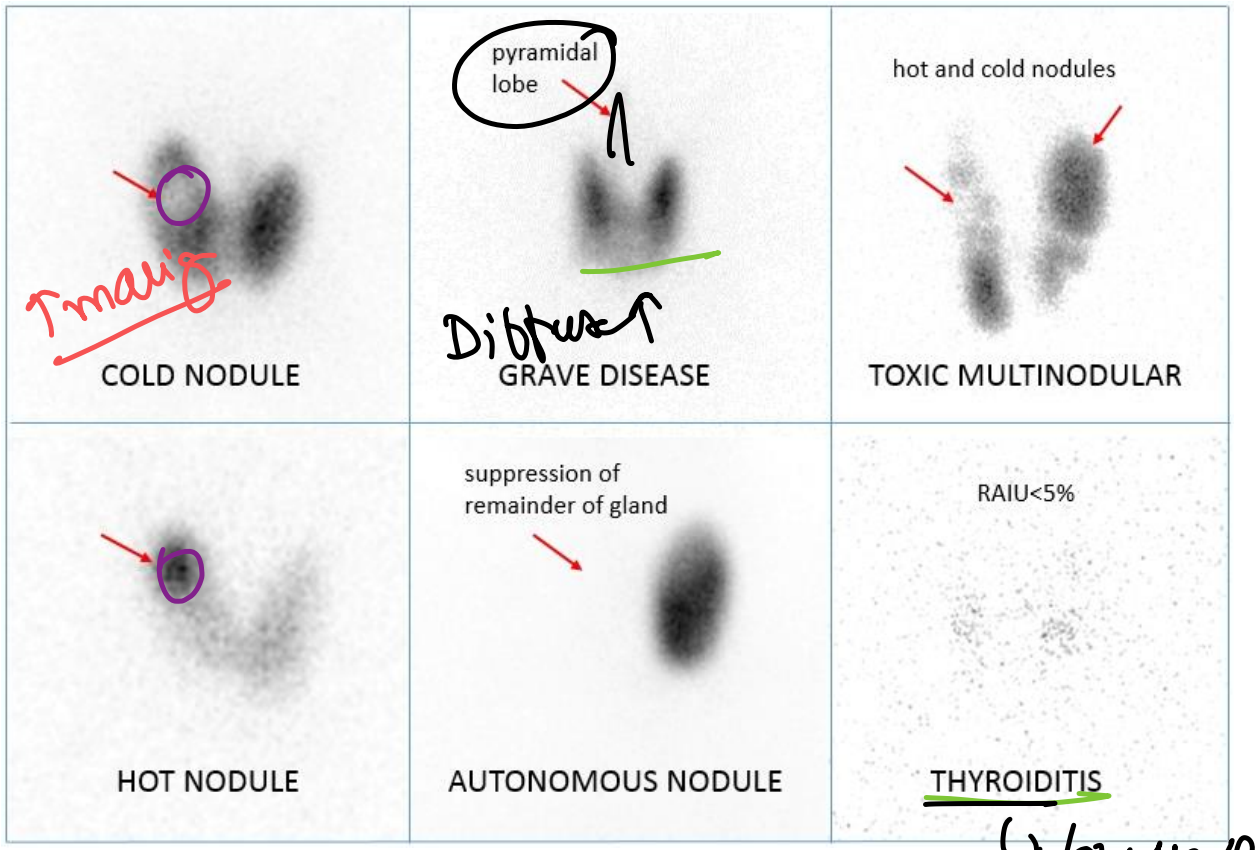
Adapted from National Comprehensive Cancer Network,[12] American College of Obstetricians and Gynecologists,[15] US Preventive Services Task Force,[21] and American Society of Breast Surgeons[22] publications.

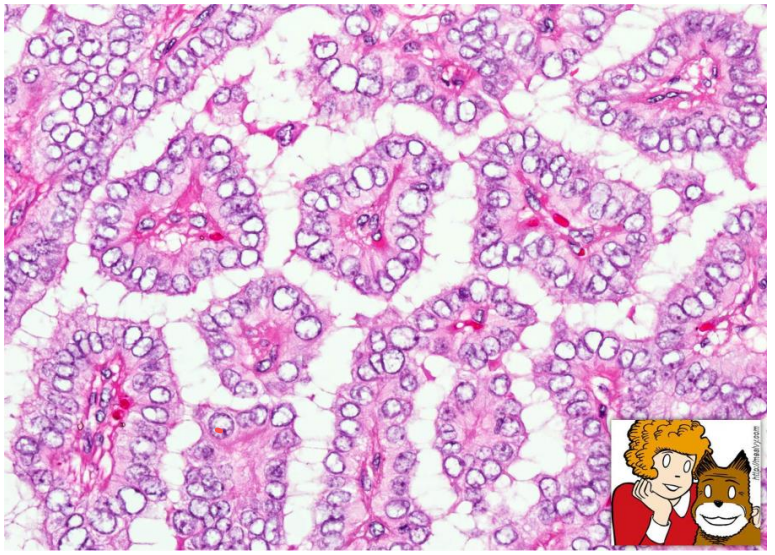
[a]First-degree relatives include parents, siblings and children; second-degree relatives include half-siblings, grandparents, aunts, uncles, nieces, nephews, and grandchildren.

[b]In this category only, third-degree relatives (eg, first cousins, great-grandparents, great-aunts, great-uncles, great-grandchildren) may be considered.

TABLE. Genetic Testing Criteria
Breast cancer at age <45 years
Ovarian cancer or family history
Two primary breast cancers
Second breast cancer at any age
Triple-negative breast cancer at age <60 years
Two or more relatives, maternal or paternal, with breast cancer
Male breast cancer
Ashkenazi Jewish ancestry

	BRCA 1	BRCA 2
Location	Long arm of **chromosome 17**	Long arm of **chromosome 13**
Differentiation	Poorly differentiated	Well-differentiated
Hormone receptor status	ER/PR- Negative, Her-2 negative – triple negative	ER/PR- Positive
Associated Cancers	Breast, ovarian, colon, and prostate (lesser extent), Pancreas (lesser extent) cancers	Breast, ovarian, colon, prostate, pancreas, gall bladder, stomach cancers, and melanoma
Male breast carcinoma	Low risk	**Increased risk**
Fanconi's anemia	Not associated	Associated
Medullary carcinoma	Associated	Not associated





Reidel → 1994 → fibrosis painless.

↳ burn out - Diffuse d.

- after viral pain → de Quervain

papillary → orphan annie

↳ lymphatic → lat ab-thyroid

- alw radn

* FNAC → not for follicular

* Drugs → RIA

PTU → T4 ⊖ T3 Acetaminophen

Aspirin ~~xxx~~ → ↑ protein binding

* Ilioinguinal n
- in inguinal canal
- m/c injured in open hernia repair

sensory loss: 1) Root of penis adj scrotum

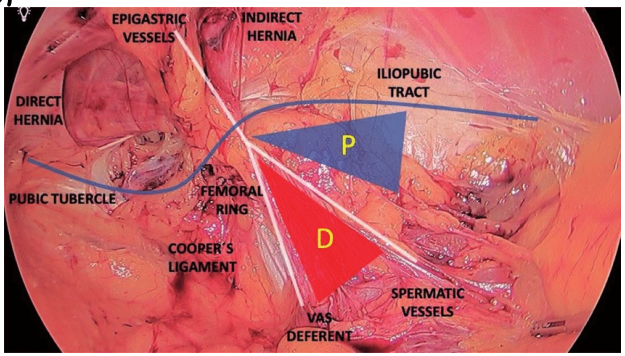
Iliohypogastric n
- appendicectomy
2) suprapubic

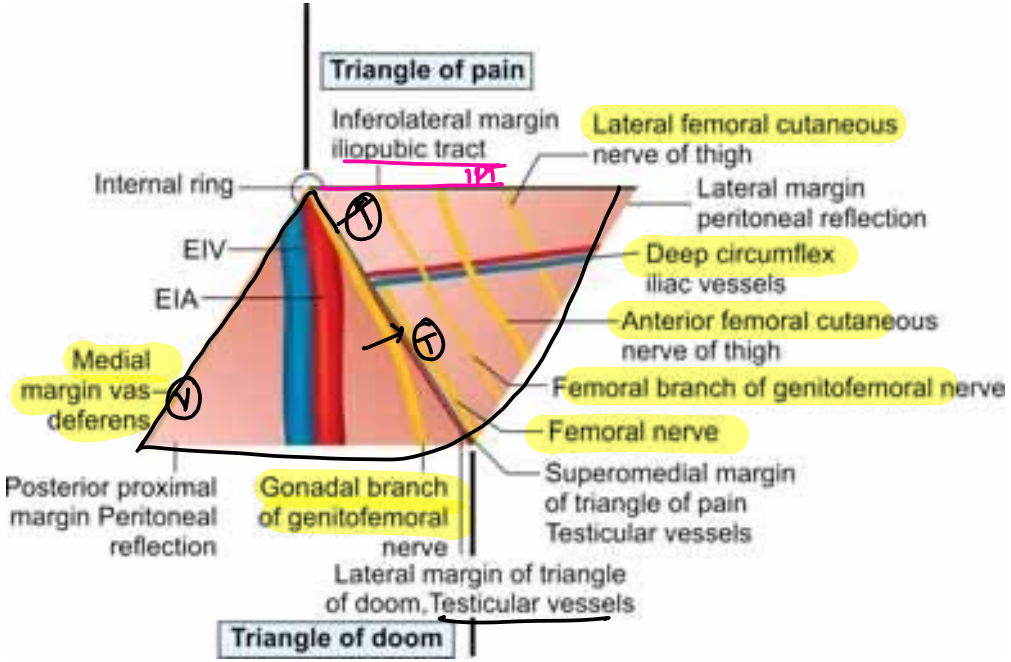
Genitofem n
genital → scrotum, mons pubis
femoral → ant thigh

• open
inj → ilioing (II)
mesh → iliohypog
trapped
mesh

Dap → lat cut n thigh
L-V

Triangle of Doom & pain → lat (nerves)
medial Hz





Achalasia

achalasia

- mc motility disorder
- Chicago class^n → 3 types achalasia

→ Eckardt score based on
① wt loss
② dysphagia
③ retrosternal pain
④ regurgitn.

earliest ← ④

- mc complication → aspiration pneumonitis
→ a/w Chagas dis → 2°
→ pseudoachalasia
→ a/w malignancy

→ 24 hr pH monitoring → Not done
→ acid reflux (GERD)

- Chagas dis ✓
- Triad → dysphagia, regurg, wt loss

& halitosis → Zenker's

3 types of achalasia: IRP ↑, failed peristalsis
type 1 → classical DCI ↓ (<450)
2 → ± esoph. compression (panesophageal pressurization) > 20% swallows
3 → DCI ↑ (spastic) (>450)

★ 1st → Sx → pneumatic dil^n / myotomy
↓ type 2 responds best
2nd → Botox
1-2 → Sx (Heller's) LAPAROSCOPIC Heller's
3 → POEM best

Achalasia Subtype	Manometric Findings	Clinical Findings	Histologic Findings
I	Elevated median IRP (>15 mm Hg) 100% failed peristalsis (DCI <100 mm Hg/s/cm)		Increased aganglionosis and neuronal loss
II	Elevated median IRP (>15 mm Hg) Panesophageal pressurization ≥20% of swallows	Most likely to report weight loss	Increased aganglionosis and neuronal loss
III	Elevated median IRP (>15 mm Hg) Premature contractions ≥20% swallows with DCI >450 mm Hg/s/cm	Least likely to report weight loss More likely to report chest pain	Preserved ganglion cells

DCI, distal contractile integral; IRP, integrated relaxation pressure.

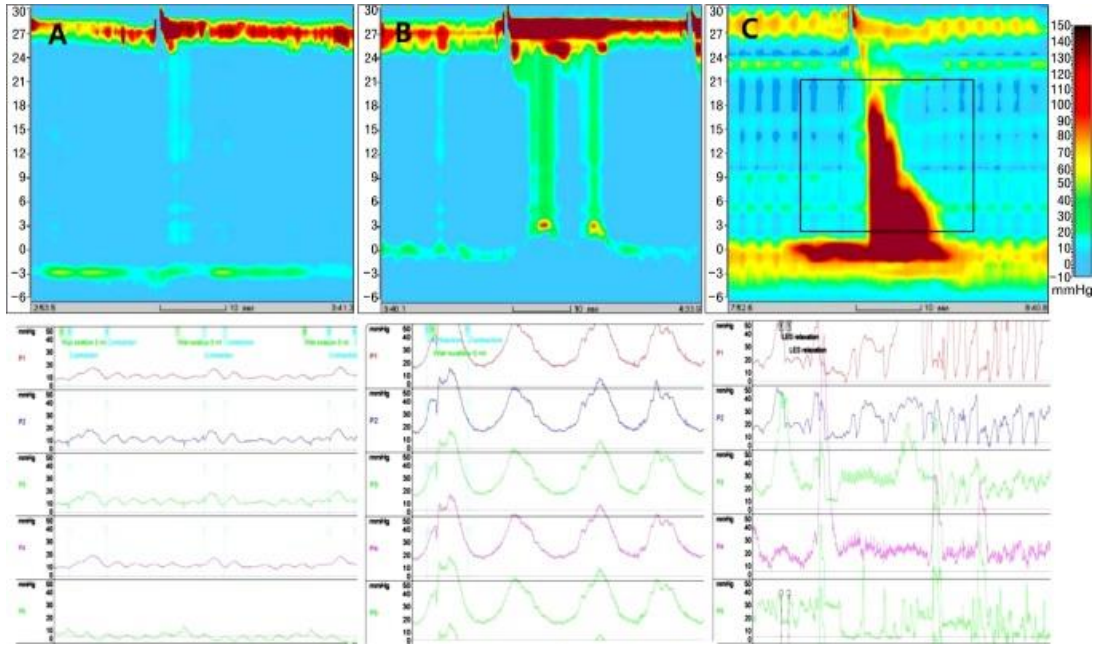
Achalasia cardia

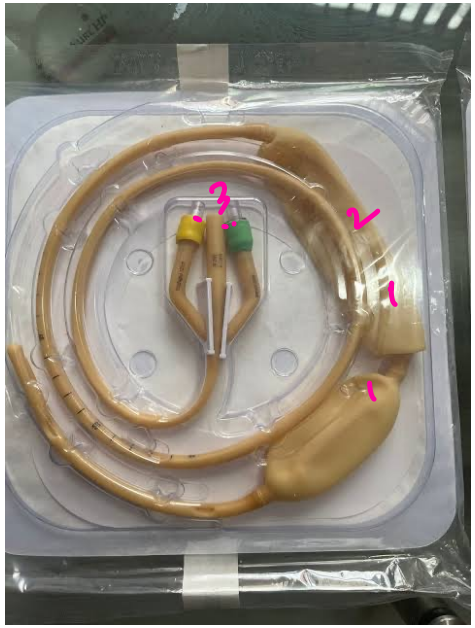
➢ **Chicago classification of esophageal motility**

Type I (classic) achalasia: Impaired LES relaxation, absent peristalsis, and normal esophageal pressure.

• Type II achalasia: Impaired LES relaxation, absent peristalsis, and increased panesophageal pressure.

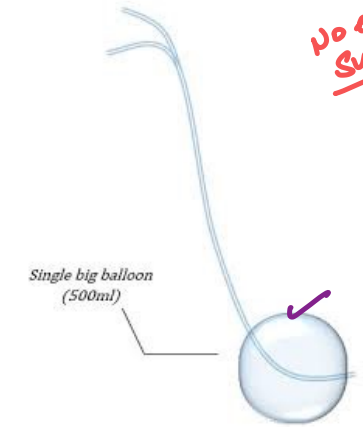
• Type III (spastic) achalasia: Impaired LES relaxation, absent peristalsis, and distal esophageal spastic contractions.





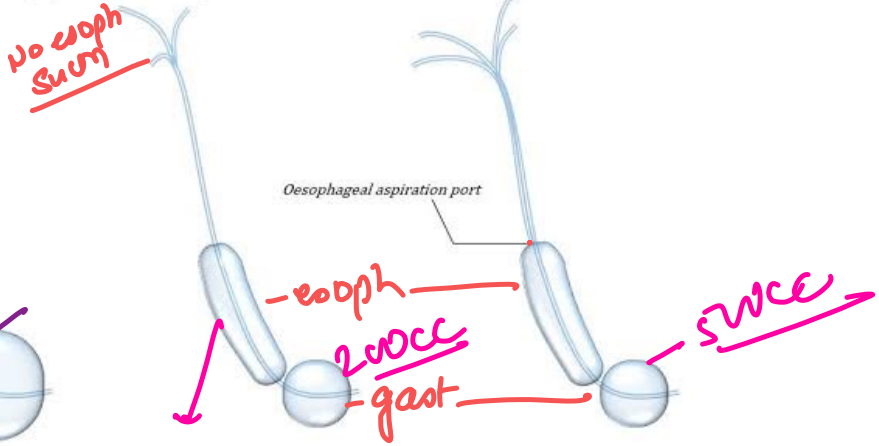
Linton-Nachlas tube

Ports:
- Gastric suction port
- Balloon inflation port



Sengstaken-Blakemore tube

Ports:
- Gastric suction port
- Gastric balloon inflation port
- Oesophageal balloon inflation port



Minnesota tube

Ports:
- Gastric suction port
- Gastric balloon inflation port
- Oesophageal suction port (above oesophageal balloon)
- Oesophageal balloon inflation port

Japanese classification of early gastric cancer

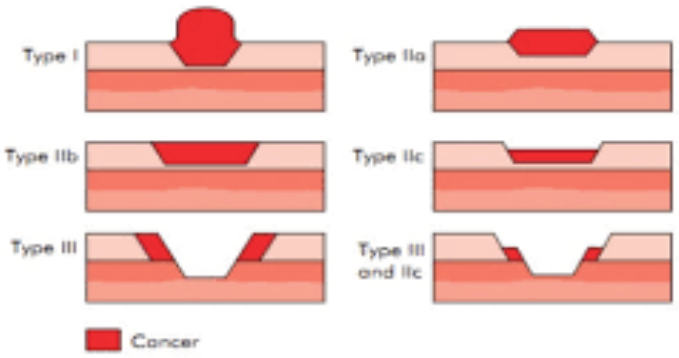
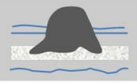
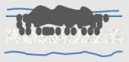


Table 2
The Borrmann classification of advanced gastric cancer

Type I		Polypoid tumors
Type II		Fungating carcinomas
Type III		Ulcerated carcinomas
Type IV		Infiltrating carcinomas

INTESTINAL	DIFFUSE
Environmental	Familial
Gastric atrophy, intestinal metaplasia	Blood type A
Men >women	Women >men
Increasing incidence with age	Younger age group
Gland formation	Poorly differentiated, signet ring cells
Hematogenous spread	Transmural/lymphatic spread
Microsatellite instability *APC* gene mutations	Decreased E-cadherin
p53, *p16* inactivation	*p53*, *p16* inactivation

GIST → . mlc site – stomach

↓

. CD117 / cKit

. CD34

DOG1 – most specific

. sporadic > hereditary

. Δ → CT ✓ Not biopsy

. To monitor Rx – PET-CT

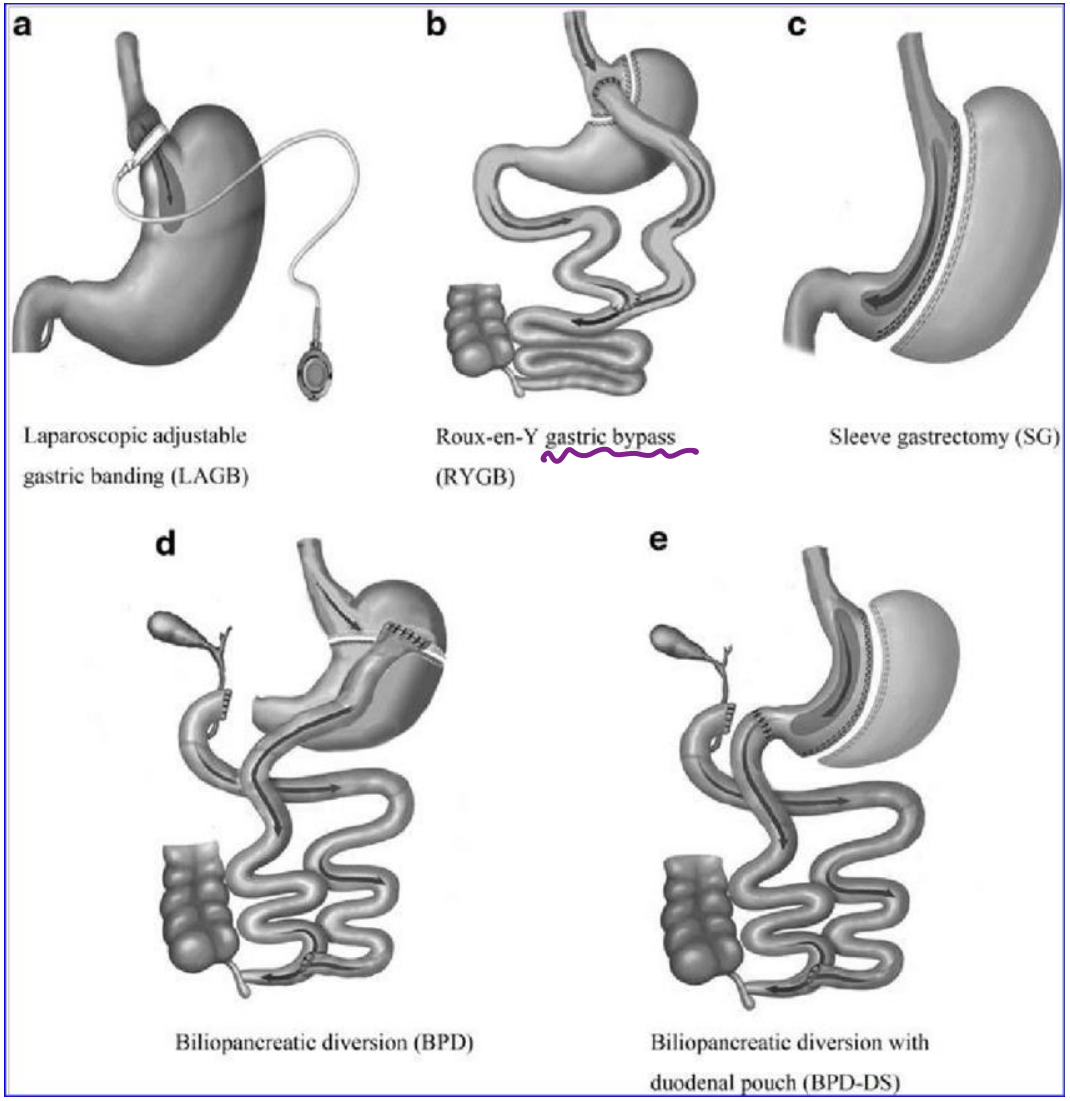
. Fletcher's class for malignancy risk

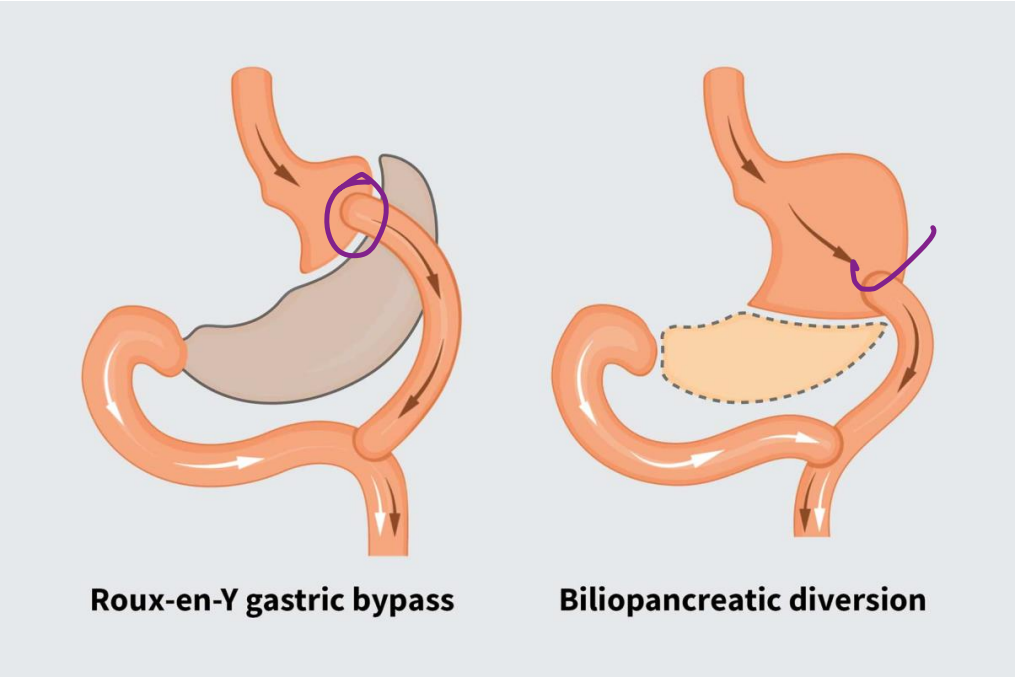
based on

size

mitotic index

mlclf → VGI bleed

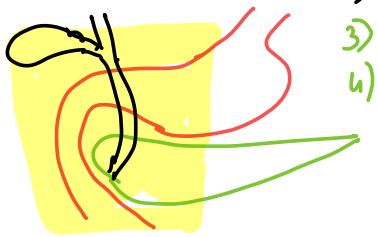




Bariatric Sx > 40 Bmi

* Whipples → for periamp Ca (waxing waning jaundice)

- Structures removed: 1) distal stomach, duodenum
  2) GB, CBD
  3) pancreas
  4) regional lymphatics

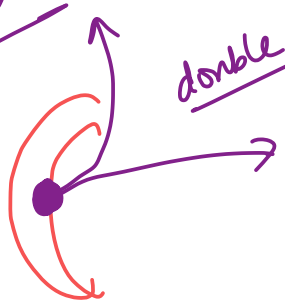


↓

GJ, CJ, PJ ← leaks mc

m/c complicn after whipple's

periamp. cancer



double duct sign (PS)

* Anemia - GIT (hookworm)
  - iron → duodenum microcytic
  - folate → jejunum (folate) } macrocytic
  - B12 → stomach + ileum
    ↓
    diphyllobothrium
    IF - parietal cells.

4

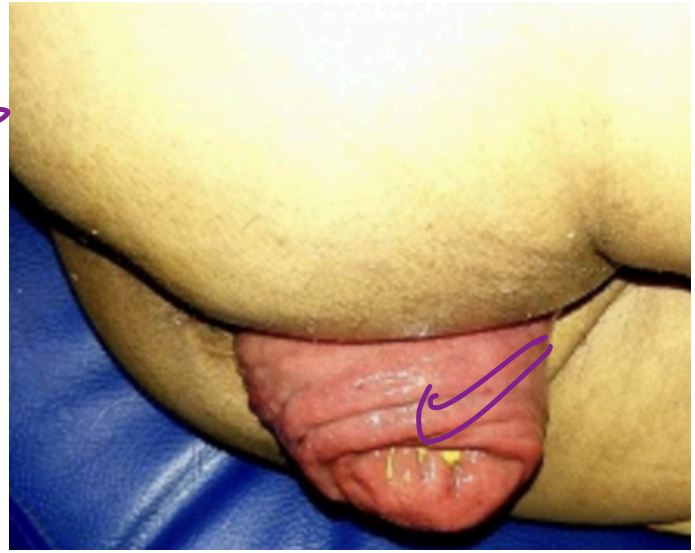
* Meckel's → appendicitis if
  - ectopic → gastric, pancreatic
  - vitelline duct VID
  - m/c lf → lower GI bleed < 2yr old
  - antemesenteric border
  - intussuscepn - adults.

→ Tc99 - pertechnetate scan

Rule of 2

Rectal prolapse

- Perineal approach
  - Delorme
  - Altemeir
  - Thiersch
- Abdominal
  - Well
  - Ripstein

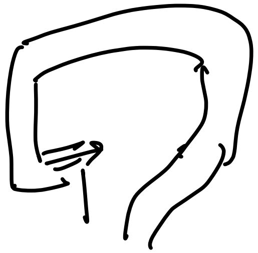


Rectal prolapse

- perineal → DAT
- abdominal (↓recurrence, ↑complic^ns) → WAR

- LVMR sx = lap ventral mesh rectopexy (plane betn vagina & rectum)

Ulcerative colitis vs Crohn's → IKOD card



Ulcerative colitis → 5ASA Rx.
↓
colon
retrograde
no skip

- Backwash ileitis
- colon: lead pipe; Toxic megacolon (>6cm, xray)
- Submucosal.

Crohn's:
- complete Transm
- cobblestone
- creeping fat
- coloveoical fistula

m/c → Terminal ileum (NTB) stricture → string sign Kantor Krohns.

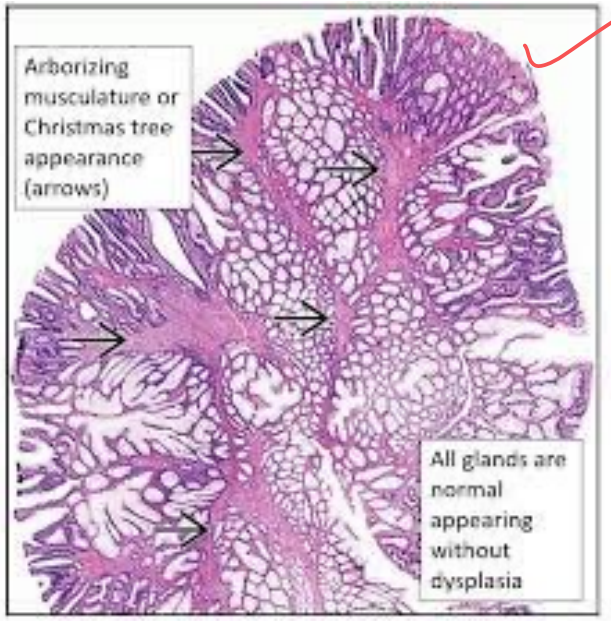
- C - complete
- fistula / absces

- mucosal granularity
- aphthous ulcer

★ Peutz Jeghers : . Jejunum
. Jhaad.

- Pigmentation
- Hamartomatous polyps
- chrom 19 - LKB-1/STK-11
- Tree like / arborizing
- ↓ jejunum.
- ↑ pancreatic Ca + other Ca.

- jejunum



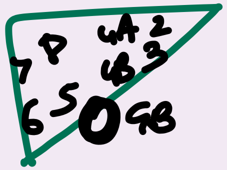
★ Tuberous sclerosis
↓
Hamartomas polyps.

★ post cholecystectomy bile leak → most sensitive HIDA ✓/✗

- small, pt stable ↓ monitor.
- symptomatic (jaundice +)
  - Early 3d g Sx ↓ re-explore
  - after 3 d ↓ Pig tail + then ERCP

If USG collection ⊕ → pigtail → MRCP ↓ ERCP stent

R4U line
- above line → ✓ CA, CD
- below line → ✗✗ CBD injury
- cystic plate → b/w seg 4 & 5



★ B SAFE method:
- Bile duct
- Sulcus Rouviere
- artery – hepatic
- fissure – umbilical
- enteric – duodenum

Strasberg classⁿ
- A → arise fr cystic duct/ minor
- B → band / occlusⁿ
- C → cut aberrant hep duct
- D → lat CBD injury
- E → Bismuth

★ vascular + bile duct inj → Stewart Way (vascular)

CBD stones
- ✓ MRCP > USG
- If ✓ OJ ⊕ ✓ CBD dilated → USG not ✓ showing stones ↓ MRCP → ERCP

Risk factors : h/o cholangitis / pancreatitis
- abn LFT - ALP
- dilated CBD (>6mm)

TG18 cholecystitis

Tokyo guidelines - for ac. cholecystitis Mx
- Gr. 1 – mild → antibiotics → Lap chole
- 2 – mod →
- 3 – severe → organ dysfuncⁿ ⊕ → GB drainage
- If Sx cannot be done → GB drainage (cholecystostomy).

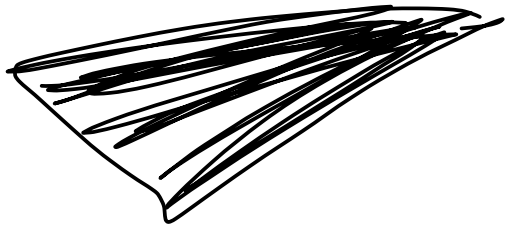
★ Δ → inflammⁿ + USG
- local ↳ murphy sign
- systemic

★ HIDA → GB not visualised + not seen sign hep

Ch. Biliary atresia → • Fasting USG / MRCP

↓ • HiDA - r/o atresia

Δrd cord sign on USG • Biopsy



Class	Criteria
I	CBD mistaken for cystic duct, but recognized on cholangiogram; incision in cystic duct extended on to CBD
II	Bleeding, poor visibility. Multiple clips placed on CBD/CHD
III	CBD mistaken for cystic duct, not recognized. CBD, CHD, or right or left hepatic ducts transacted and/or resected
IV	Right hepatic duct (or right sectoral duct) mistaken for cystic duct RHA mistaken for cystic artery. Right hepatic duct (or right sectoral duct) and RHA transacted.

Stewart way

Woodward

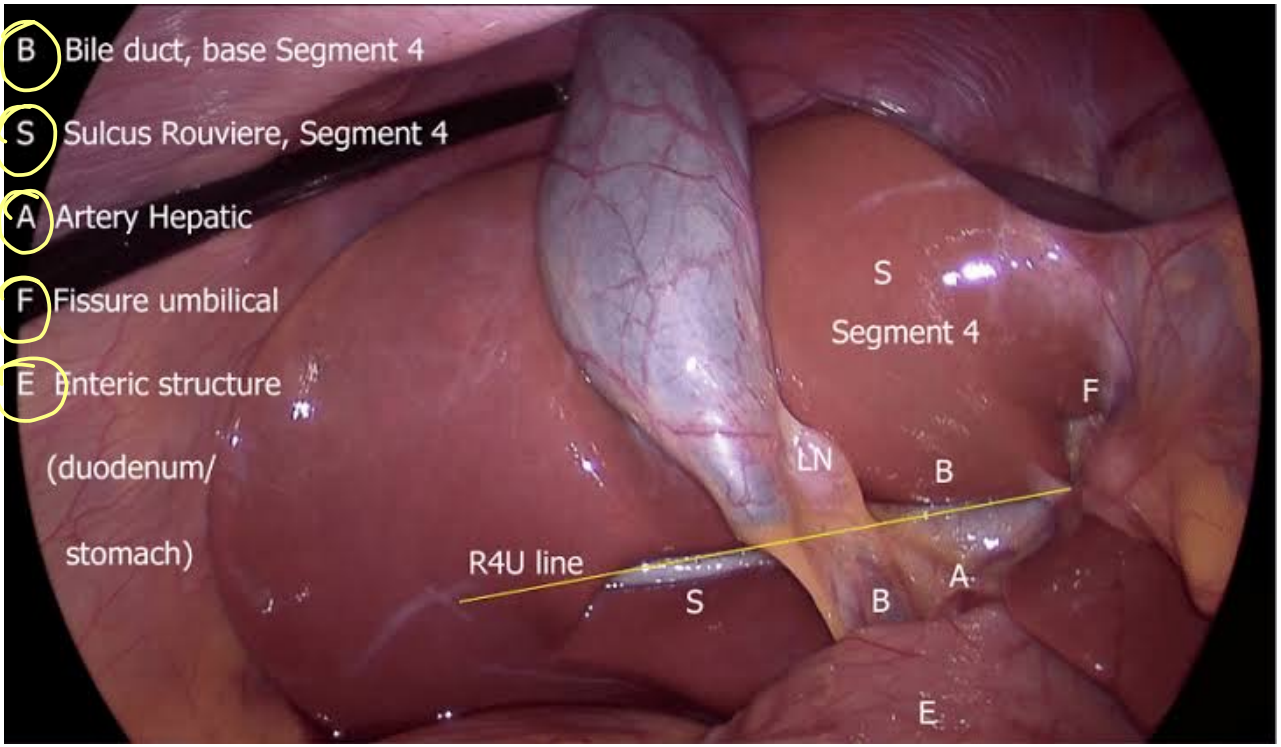
McMahan

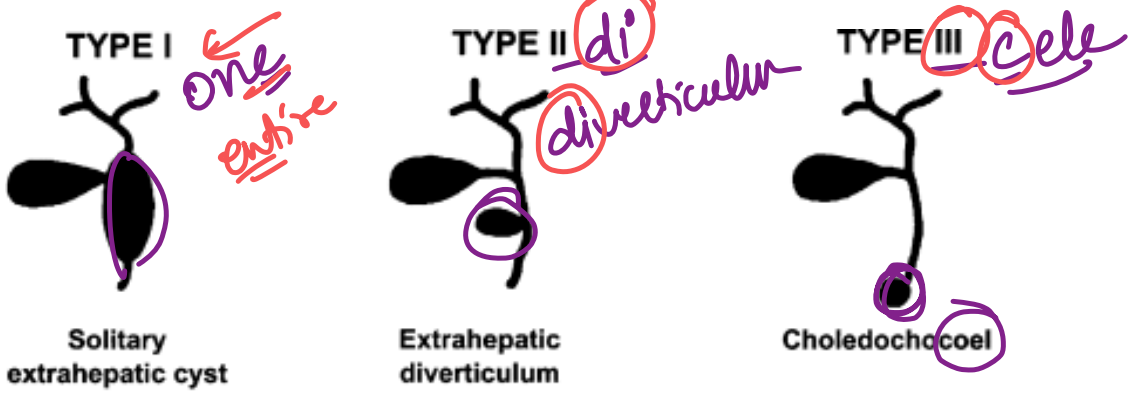
Hannover

Bismuth – Corlette

↓

cholangiocarcinoma.

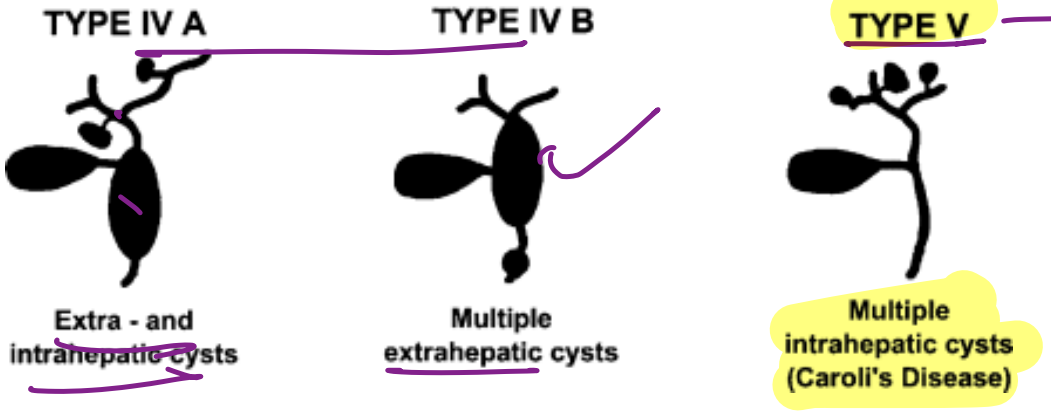

B Bile duct, base Segment 4
S Sulcus Rouviere, Segment 4
A Artery Hepatic
F Fissure umbilical
E Enteric structure
(duodenum/
stomach)
S
Segment 4
F
LN
B
R4U line
A
S
B
E



Choledochal cyst

Todani

- ↑ cancer



→ 5 H intrahep

Cancers

* Gall bladder Ca
- elderly
- poor prognosis, <6m survival
- ~ cholecystitis / GB stones
- Jaundice - early feature (latest)
- Monitoring by Ca19-9
- m.imp prognostic factor → Depth of invasion

GB polyp >1cm

xx strawberry – cholesterosis

muscularis → Ib

↓

extended cholecystectomy

→ 3,4 → GB beyond.

* Basal → Triple negative
bad prog
- CK 5/6 +
- BRCA 1 – none +

TRIPLE ASSESSMENT for Ca breast

Phy + Radio + HIP

USG / mamm FNAC / biopsy

· No PET

xx ER/PR

UROLOGY

* Blood at the tip of meatus → s/o urethral rupture
  - DO RGU
  - NO foleys / MCU

* NO blood at meatus, no urine on catheterism } s/o bladder rupture
  - intraperitoneal → distended → Laparotomy
  - extraperitoneal (mc) → Catheter drainage for 7–10d.
    - localised Rebjus.

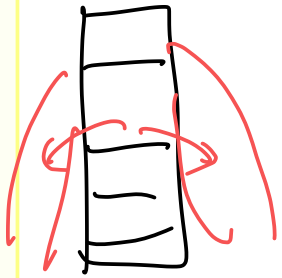
* SPC → if bladder full.
  - If bladder empty → wait for bladder to fill.

* pelvic # → posterior memb. urethra ↓ deep pouch → limited..
  - straddle → ant → scrotum / ant abd.

* Hypospadias
  - mc congenital urethral abn
  - penile → most severe
  - No circumcision
  - Sx age → 6–18m
  - seq → one → O U G M S
    - Urethroplasty
    - Glans
    - Meato
    - Scrotal
  - Ventral chordee ✓✓
    ventral openig

Psoas abscess

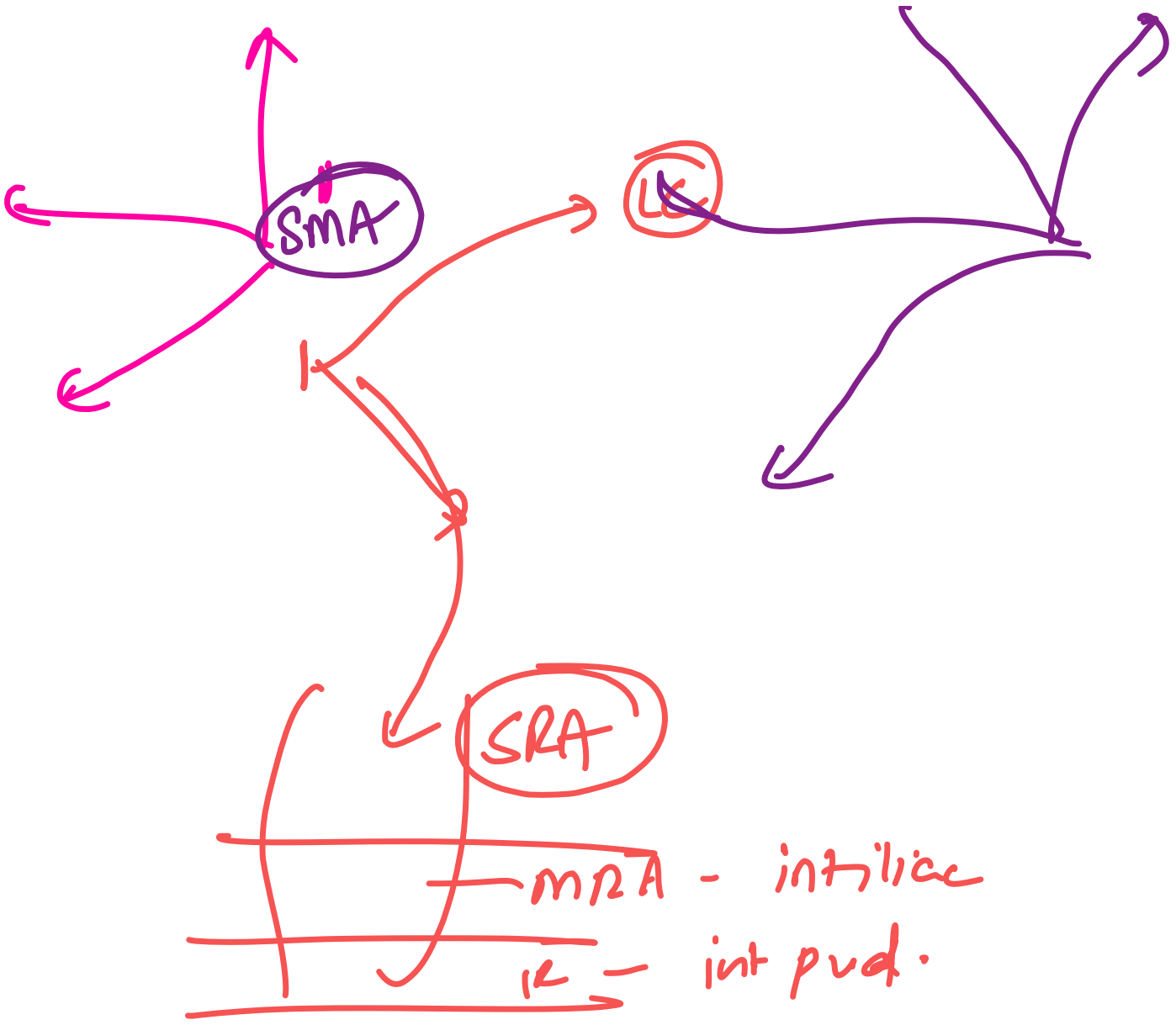
- TB spine / hematogenous spread
  ↓
  in I/C & elderly
- pain on passive extensn
- fluctuant swelling ⊕
- cold abscess



* vaccines in splenectomy → capsulated org
  - 1 wk before
  - In emerg → before discharge
    - Meningococcal,
    - Hib,
    - pneumococcal.
    - xx typhoid

* Appendicular artery → br of ileocolic a → br of SMA (angiogram)

* min no of LN removed → Ca
  - Bladder < Breast < Colon < Stomach
  - gall
  - 6
  - 10
  - 12
  - 16


SMA
LC
SRA
MRA - initiac
IR - int pud.