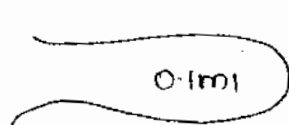


Appendix :- develops from midgut

- length 2-20cm



Intraluminal capacity

- mc-location - Retrocaecal

- supplied by - APPENDICULAR ARTERY (branch of ileocolic)
(end artery)

Acute Appendicitis

- Mc- General Surgical emergency world wide
- Young patients
- Mc Etiology (luminal obstruction by fecolith, worm eggs, fruit seeds, tumours)
- luminal obstruction which causes

↑ Intraluminal pressure



Impairs lymphatic drainage (LVA)



Venous drainage



Arterial drainage



Ischaemia



Perforation

- Mc site of perforation is just distal to obstruction ;
Over the Antimesenteric border.

(C/F) Pain in periumbilical region which shifts to (Rt) iliac fossa in 4 to 6 hrs

→ ASS - Anorexia, nausea, vomiting - low grade fever

(O/E) - Tachycardia - tenderness and rebound tenderness in (Rt) iliac fossa

Characteristic signs:-

DUMPHY'S Sign - pain on coughing

ROVING Sign - pain in (Rt) iliac fossa on pressing left iliac fossa

PSOAS Sign - on hyperextension of (Rt) hip pain in (Rt) iliac fossa

(+ve) in Retrocaecal appendicitis

OBTURATOR Sign - medial rotation of thigh (Rt) over hip joint leads to pain in pelvic appendicitis

*** TENHORN sign - Gentle traction on (Rt) testis leads to pain in (Rt) iliac fossa

(dx) ~~confirmed~~

- Bastedo sign → Rectum inflated with air, pain &
- Aoran sign tenderness.

- is purely clinical

- supplemented by USG & leucocytosis

(Rx) Emergency Appendectomy

(dx) by ALVARADO Score (or) MANTREL'S SCORE

(M) - migratory pain ¹ www.FirstRanker.com

(A) - Anorexia ¹

(N) - Nausea, vomiting ¹

(T) - Tenderness ⁽²⁾

(R) - Rebound tenderness ¹

(E) - Elevated temperature ¹

(L) - Leucocytosis ⁽²⁾

(S) - Shift to left ¹

www.FirstRanker.com

9-10 confirmed

7-8 highly suggestive

5-6 Equivocal

(LT-2)

1-4 - negative

- When the mantel's score (5-6) CECT is performed.*

OSCHNER SHERINE REGIME

- conservative management for (lump)

① NPO

② I/v antibiotics x 48 hrs

③ Vitals monitoring

When pain ↓ & size of lump decreases & normalisation of the pulse rate — interval appendectomy after 4-6 weeks

Indications of Surgery

* ↑ pulse rate

* Spread of peritonitis

* ↑ size in size of mass

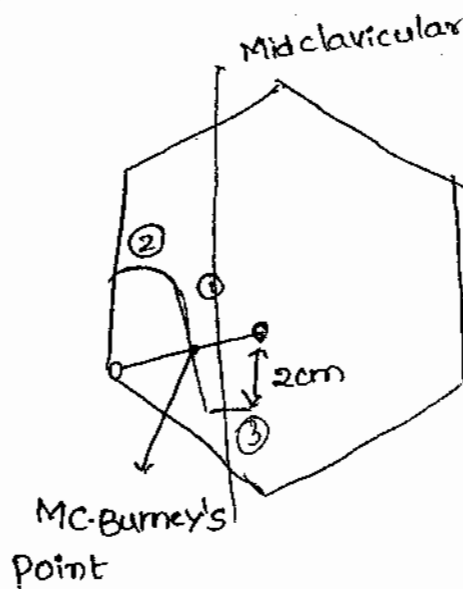
*

Perforation → Exploratory laprotomy by midline incision

FECOUTH DIE IN PELVIC SURGERIES

- 1) Fecolith destruction
- 2) DM
- 3) Immunocompromised states
- 4) Extremities of ages ($<5, >65$ years)
- 5) Pelvic appendicitis
- 6) Previous surgeries

Incisions given in appendectomy



- ① MCBURNEY'S (or) MCARTHUR (or) GRID IRON incision
 - muscle splitting incision
- ② RUTHERFORD MORISON
 - muscle cutting incision
- ③ 2cm below the umbilicus of mid clavicular line
 - LANZ incision
 - cosmetically better & preferred (splitting)

Mc. Malignancy of Appedix

** mucinous Adeno ca. > Adeno ca. > carcinoid

Carcinoid tumour

- Mc localised over tip $\bar{c}$ size $<1cm$ localised, not ass $\bar{c}$ metastasis
- Best prognosis ** in GIT

size upto 1cm $\rightarrow$ Appendectomy

> 1-2 $\rightarrow$ Appendectomy

- Indications of (Rt) hemicolectomy of this situation

* Base of appendix

* mesoappendix

* lymph nodes

> 2 cm $\rightarrow$ (Rt) hemicolectomy

HERNIA :-

Risk factors :-

Weakness of Abd. wall

↑ sed intra-abd. pressure

1) Patent processus vaginalis

(or) patent canal of nuck

2) Connective tissue disorders

(Ehler's danlo's syndrome)

3) Prune-Belly Syndrome

4) Ectopia vesicae

5) Defective collagen synthesis

6) Smoking

7) lower abdominal incision

1) chronic cough

2) COPD

3) Chronic constipation

4) obstructive uropathy

(BPH, stricture urethra)

5) Ascites

6) Abd. mass / tumours

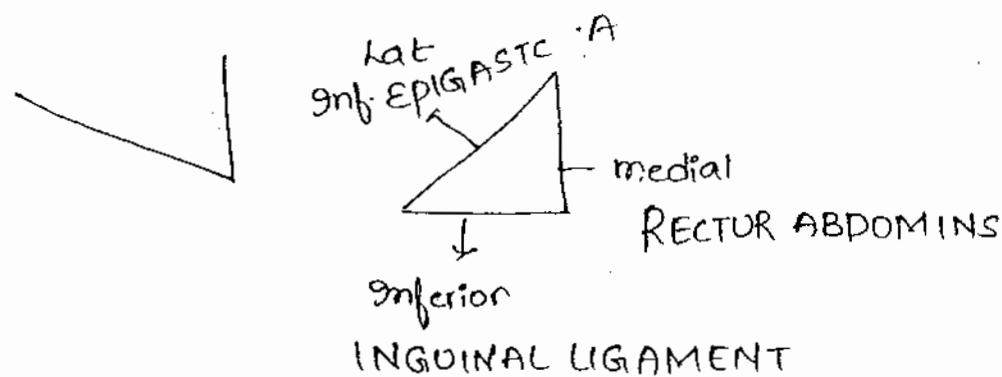
7) heavy weight lifting

* Indirect inguinal hernia is mc in both males & females

* femoral is mc in females

- Indirect inguinal hernia - comes out via deep ring traverses via inguinal canal & goes out through sup. ring

- Direct - directly from post. Abd wall through hesselbachs



- In inguinal hernia - neck of sac above & medial to pubic tubercle

- In femoral - neck below & ^{lateral} medial to pubic tubercle.

*** Relation of sac & cord in indirect inguinal hernia

↳ ANTEROLATERAL

Relation in direct → POSTERIOR (sac is post to cord)

Surgeries

- Herniotomy :- separation of sac from cord structures, opening in sac at fundus & inversion of contents back into the abdominal cavity & purse string suture application & excision of redundant sac

Herniorrhaphy :- herniotomy + strengthening of inguinal floor & help of sutures

Hernioplasty :- herniotomy + placement of mesh

*** primary tissue repair / tension repair

- ① Bassini's
 - ② SHOULDICE
- } repair

Bassini's is triple layered repair in which int. oblique, transverse abdominis, & facialis transversalis sutured in SHELVING EDGE of inguinal ligament

Shouldice :- Double breasting of fascia transversalis is done in this repair

- It is also known as 4 layered repair
- tension is lesser as compared to Bassini's
- So recurrence low, mesh is not used

ANT. Tension free mesh hernioplasty

(or)

Lichtenstein repair - *** Gold standard for inguinal hernia repair

- mesh is fixed to Ant. rectus sheath. not the periosteum of pubic tubercle

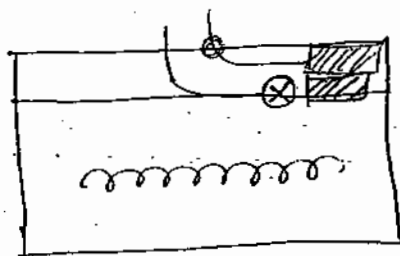
artificial deep ring is created w the help of mesh

- least recurrence
- considered as gold standard Rx for hernia ✓

Laproscopy :- Mc injured nerve lt. cutaneous N. of thigh **

TEP (Totally extra peritoneal)

TAPP (Trans abdominal pre peritoneal)

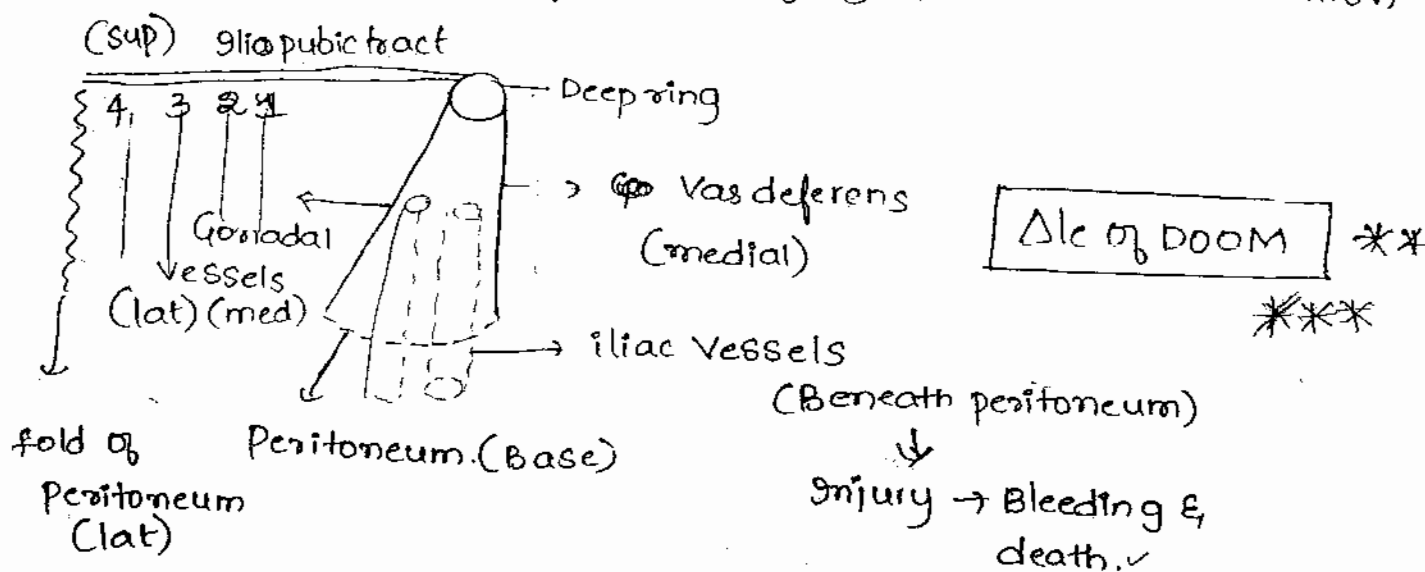


TEP :- performed by experienced
working space small

Risk of bowel injury & post-operative adhesions are low

- Working space large

- ↑ risk of bowel injury & adhesion formation



- * **Δle of pain** ***

* Femoral

* Femoral branch of Genitofemoral

* Ant. cutaneous

* Lat. cutaneous N. thigh (Mc injured)

(Medial to lateral) ✓

*** In laparoscopy *

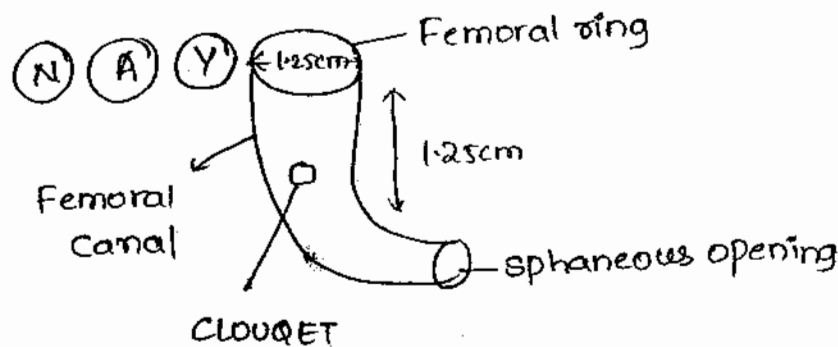
* Use of electrocautery can injure the nerves leading to the post-operative pain ✓

CORONA MORTIS - crown of death

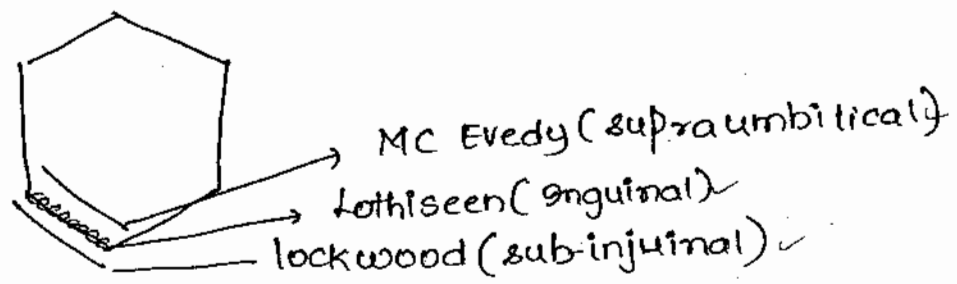
- Aberrant obturator - A. arising from 9th Epigastric. A forms vascular loop around ligament of Cooper injured while mesh fixation - death ✓

FEMORAL HERNIA

- mc in females (pregnancy is the common cause)
- Mc on (RT) side
- ass c max. risk of strangulation due to
 - * rigidity
 - * narrowness of canal
- surgery - as early as possible



Rx



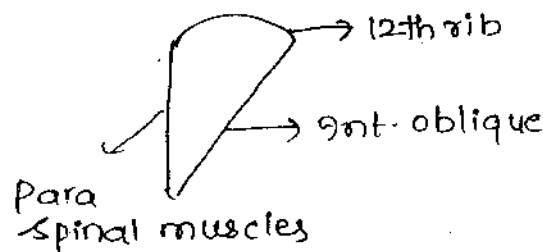
(Rx) of choice HENRY'S PROCEDURE :- MCVAY'S REPAIR.

- Trans-Abdominal midline extraperitoneal mesh hernioplasty

*** Variants

- LAUGIER'S HERNIA → defect in lacunal ligament
- CLOUET HERNIA → defect in Pectineus fascia
- NARATH HERNIA → pts of ~~can~~ CDH, sac is located behind the femoral vessels

- congenital (20%)
- Acquired (80%)
- Boundaries of superior Dle of **GRYNFELT**



- Inferior Dle of **PETIT**



→ mostly occurs through superior Dle, defect is large
= minimal risk of STRANULATION

Rx DOWD's operation ✓

OBTURATOR HERNIA

✓ Skinny old lady hernia

✓ French hernia

Risk factors

- malnutrition, lean & thin
- Elderly
- multipara

Signs :- HOWSHIP-ROMBERG SIGN - Compression of obturator foramen by bowel leads to pain along inner aspect of thigh radiating to ipsilateral knee joint.

(Rx) - Repair by posterior approach

SLIDING HERNIA

- hernia engorgement
- when post wall of sac is formed by viscera
- more common in males
- mc on left side
- mc content sigmoid colon (Lt) ***
caecum (Rt)
- ↑ risk of injury of bowel during repair
- content in sac inverted back to Abd. cavity & defect is repaired most useful investigation is Barium meal.

SPIGELIAN HERNIA

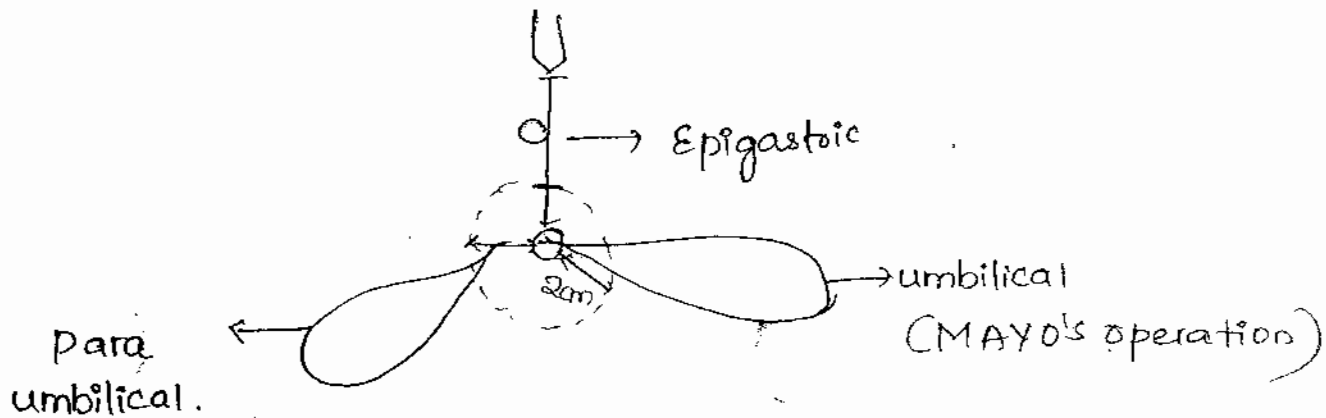
- located mainly in infra umbilical region
- mc. below ARCOATE LINE
- Spigelian fascia is located b/w lat border of rectus & semilunar line.
- contents penetrate the fascia, int. oblique & located b/w Ext. & int. oblique muscles (also known as ^{defect in the muscle} INTERparietal hernia)
- complaints of pain, bulge is not appreciated
- ↑ risk of strangulation due to delay of dx

(dx) - USG & CECT

(Rx) - invert the content & repair defect

EPIGASTRIC

- fatty hernia of linea alba / Epigastric lipoma



- It mimick's peptic ulcer becoz pain is present in Epigastric region (herniation of pre-peritoneal fat)
- Incarceration of fat → pain

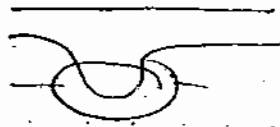
(Rx) Excision of preperitoneal fat & repair of defect

*** When defect is 4cm mesh used for repair

In >80% cases it is located just off to the midline

(Lt) side.

RICHTER'S :- strangulation & out obstruction.



- herniation of part of circumference of bowel
- It mimick's Acute G.E becoz presents as
 - 1) colicky pain
 - 2) multiple episodes of loose stools
 - 3) 1st risk of strangulation due to delay

- appendix - content - (AMYAND'S) hernia

GIBBON'S - hernia + hydrocoele

BERGER'S - hernia into pouch of douglas

BECLARD'S - hernia through Saphenous opening

OGILVIE'S - hernia through defect in conjoint tendon

PETERSON - hernia behind Roux-limb after

Roux-en-Y Gastric bypass *** (RYGB)

STAMMERS - hernia through transverse mesocolon after retrocolic gastrojejunostomy Transverse mesocolon -

SPLEEN.

- mc indication of splenectomy - Trauma (Kehr sign) **

- mc indication of elective splenectomy - ITP **✓

(ITP) :- characterised by formation of Autoantibodies against platelets - mc - in young woman

→ Ab coated platelets destroyed → Thrombocytopenia & ↑ sed megakaryocyte

- purpura, epistaxis, gum bleeding, menorrhagia in Bone marrow

(Rx) initially medical management by

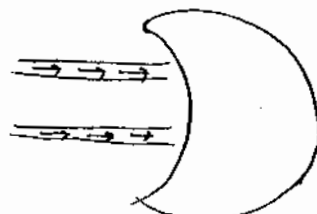
Azathioprine, cyclophosphamide, Steroids

• No splenomegaly

Non-responding cases

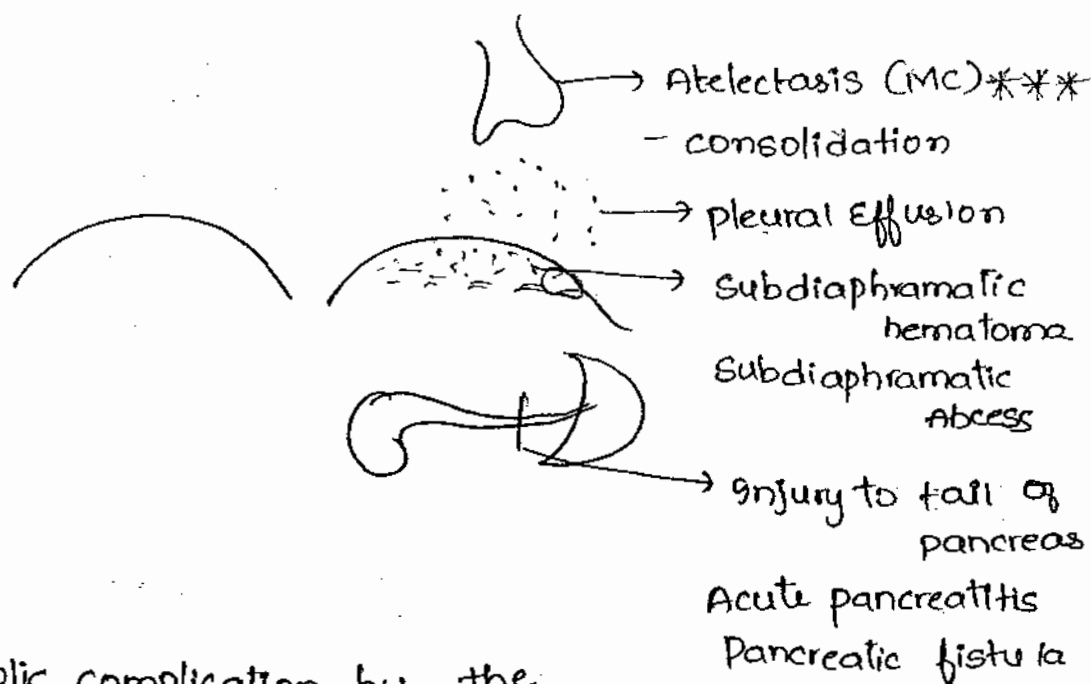
↳ ↑ PLT

* Laproscopic Splenectomy



- * min platelet count for elective surgery - 1 lakh
- * In patients of ITP min count for elective surgery - 50k.

Complications :-



- * Thromboembolic complication by the
- * thrombocytosis $\rightarrow$ DVT $\rightarrow$ pulm. Embolism

OPSI $\rightarrow$ overwhelming post splenectomy infections.

- maximum incidence of opsi is seen after 2-5 yrs of splenectomy.
- maximum is seen in pts of hematological malignance
- min risk - Trauma
- opsi most commonly caused by
 - pneumococcus*
 - meningococcus
 - haemophilus influenza type-B

Capsulated
Bacteria

- prevented by vaccination of these '3' capsulated organism

** Best time to give vaccine in elective splenectomy - 2 weeks before surgery

** Emergency splenectomy - as early as possible after surgery

(CYSTS IN SPLEEN)

- ✓ mc splenic cyst - HYDATID CYST
- ✓ mc non parasitic cyst - PSEUDOCYST
- ✓ mc congenital splenic cyst - EPIDERMOID CYST.

(Neoplasm) ***

- mc malignancy of spleen → ~~hodgkin's~~ lymphoma
- mc. benign tumour - hemangioma
- mc. primary malignant tumour → Angiosarcoma
- mc ~~engore~~ primary responsible for isolated secondaries to spleen - Ca. ovary
- mc. 1° responsible for secondaries - malignant melanoma

SPLENIC HILUM - mc - accessory spleen ***

Renal stones

- Mc type 1) Ca-oxalate $\Rightarrow$ Radioopaque (most severe pain) * + -
- ↑ incidence in pts of hypercalcemia, hypercalciuria, hyperoxaluria

2) uric acid stones

- $\rightarrow$ (MC) radiolucent renal stone
- MC in pt of Gout, Lesch myhan syndrome
myeloproliferative disorders

- (Rx) low purine diet
- Alkalinisation of urine
- (Doc) allopurinol

3) Struvite stones

- $\rightarrow$ Triple phosphate Ca, Mg, ammo
- $\rightarrow$ also known as staghorn calculi
- It is mc in females (UTI)
- mc organism (proteus) $\rightarrow$ urease $\rightarrow$ resp. of staghorn
(large having branching like staghorn)
- causes silent destruction of kidney

(Rx) Sandwich $\rightarrow$ [PCNL + ESWL]

(Doc) $\rightarrow$ Acetoxy - hydroxamic acid (irreversible inhibitor of urease &).

4) Cysteine stones - seen in cystinuria

- Very hard
- not easily broken by ESWL
- shows ground glass appearance

 - hexagonal / Benzene shaped

(Doc) - D-penicillamine

Alt $\rightarrow$ α -MPG $\rightarrow$ α -mercaptopyropionyl Glycine

- Radiolucent *** (U.A stones)
- BRICK RED IN COLOUR & shows lamination * on cross section

(DOC) :- Allopurinol

Alt → ~~Totam~~

⑤ Triamterene stones :- K⁺ sparing diuretic

→ Excessive usage → Radiolucent stones

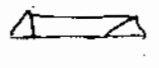
Indinavir :- protease inhibitor - Radiolucent stones

Silicate stone :- excessive use of antacid containing silica

* Radiolucent - TIXU (Triamterene, Indinavir, Xanthine, uric-acid)

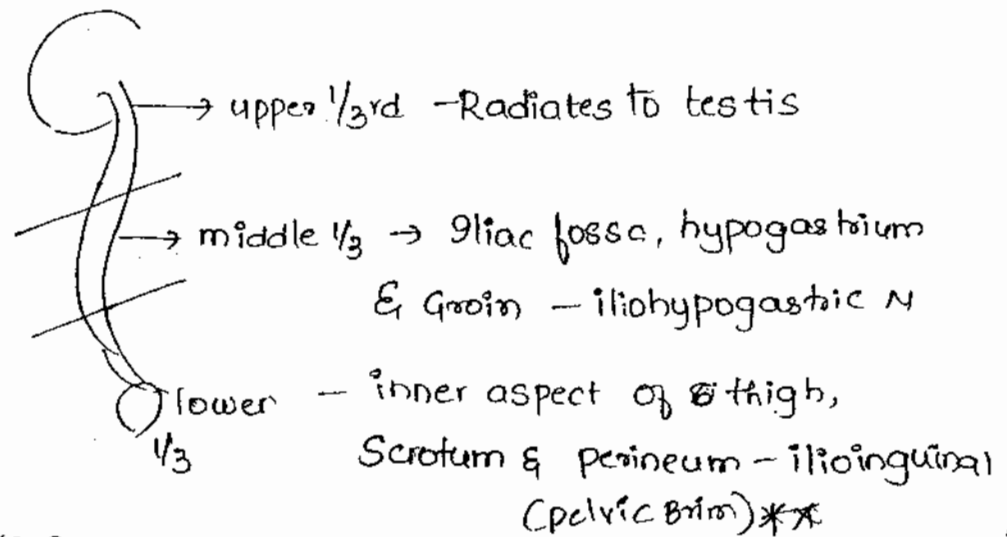
* Acidic - CCU (Ca-oxalate, cysteine & uric acid)

CRYSTALS

- Ca-oxalate monohydrate -  - dumbbell
- Ca-oxalate dihydrate -  - envelope → (Ca-oxalate only also envelope)
- BRUSHITE -  - needle shape
- cysteine -  - hexagonal / Benzene
- uric acid -  - multifaceted / rosette shaped
- Struvite -  - coppin lid

Clinical presentation

→ most patients with small stones are asymptomatic



DOC Diclofenac / Koveram.

90% for dx of ureteric colic **NCCT** *** SPIRAL

Investigations

- urine $\left\{ \begin{array}{l} \text{Routine} \\ \text{microscopy} \end{array} \right.$ — colour, pH, gravity, Red cells, WBC, Albumin, sugar, crystals, Pus cells assessed
- U_{CS} → presence of infection & **(+ve)** organism is diagnosed
- X-ray KUB becoz 90% are Radioopaque
90% Gallstones Radiolucent

Screening 90% for hydronephrosis → USG

- IvP :- is used to assess hydronephrosis, Renal function & proximal portion of obstruction
- For assesment of distal portion of obstruction RGP is done.

90c for Renal Morphology

Scan

Surface Anatomy

DTPA Scan :- Diethylenetriamine pentaacetic acid

— (Perfusion & function) for dilation of the ducts.

MAG3 — mercapto-acyl Glycine.

→ Gold standard for Renal perfusion ***

Indications of Conservative

- Size of stone < 5mm
- non-dilated ureter
- Progressive downward movement on repeated scan
- Stone in lower third of ureter.

Interventions :-

- 1) ESWL — extracorporeal shock wave lithotripsy — (85%)
- 2) PCNL — percutaneous nephrolithotomy — (15%)
- 3) URS — ureteroscopy
- 4) LSS — laproscopic stone surgery
- 5) OSS — open stone surgery

↳ Indications

- 1) Stone with destroyed / non functioning kidney
- 2) Stone & anatomical disorder

ESWL :- Gold standard lithotripter

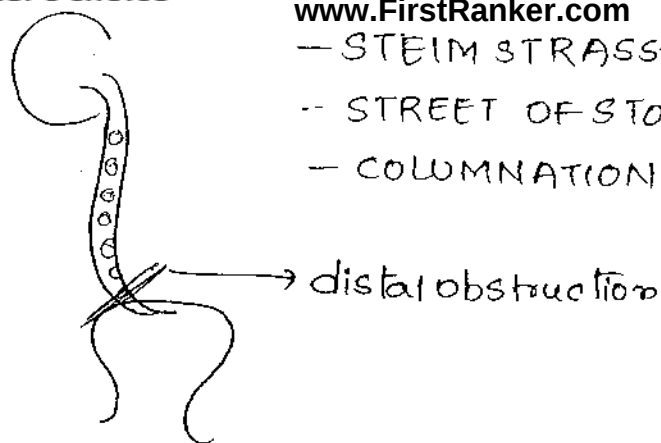
*** DORNIER UNMODIFIED HM3

- Shock wave induced tensile cracking → Erosion & shattering
- fragments of stones are excreted

— STEIN STRASSE *

— STREET OF STONES *

— COLUMNATION OF GRAVEL *



*** BHC-2 → not easily broken by ESWL

- Brushite
- hydroxyapatite
- Ca-oxalate monohydrate
- cysteine.

C/I :-

Absolute

1. pregnancy
2. Bleeding disorder

Relative

1. pacemaker
2. UTI
3. Distal obstruction
4. uncontrolled HTN
5. obesity
6. orthopaedic abnormalities
(Kyphosis, kyphoscoliosis)
7. Renal failure
8. Aneurysm.

PCNL

— posterior Calyceal approach preferred over pelvic approach to prevent injury of post. branch of Renal A.

Complications :- Mc injured is pleura
others are spleen & colon.

1. >2cm (Size)
2. distal obstruction
3. UTI
4. hard stones (BHC-2)
5. lower calyceal stone
6. Staghorn calculi (PCNL + ESWL)

URS :- is performed under spinal anaesthesia

- mc complication is ureteric perforation

indications :- Removal of foreign body
Removal of stone
Biopsy from urothelial tumour
insertion of ureteric stent

Size :- upto 2cm → ESWL ✓

>2cm → PCNL ✓

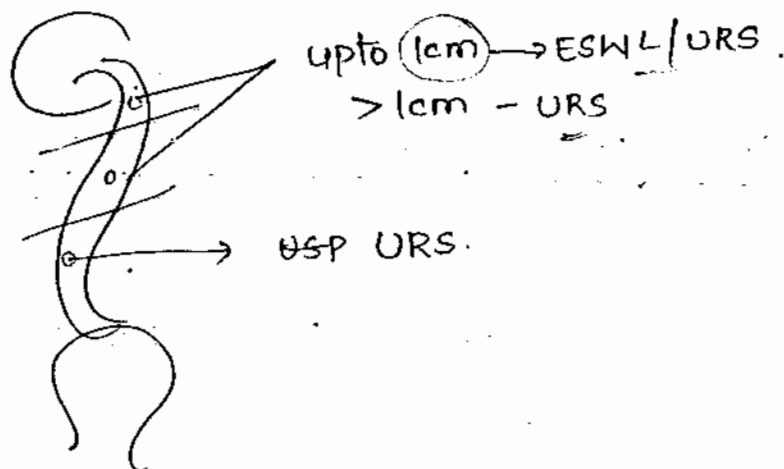
BHC-2 → PCNL ✓

Staghorn → PCNL + ESWL ✓

Renal

Size & location :-

ureteric



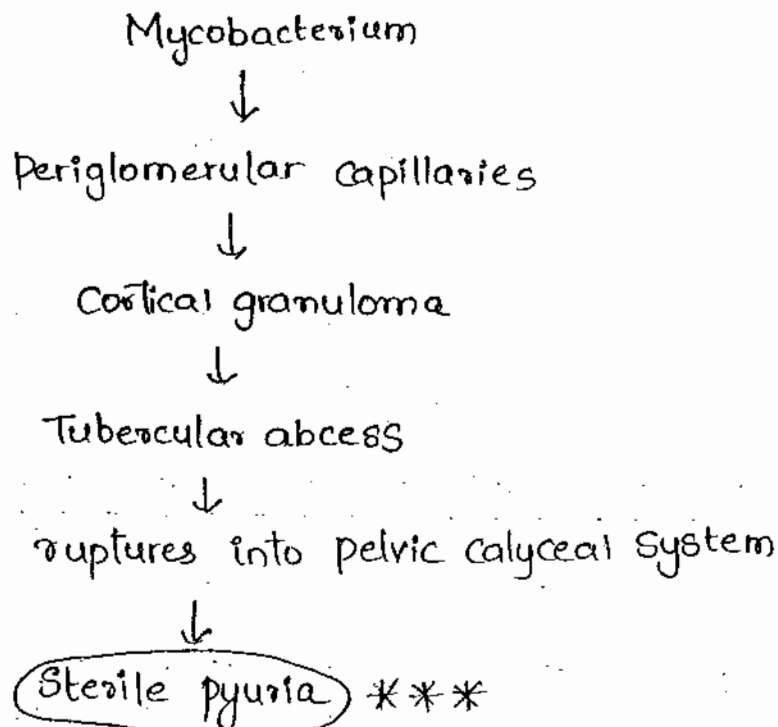
→ Dormia Basket lower 1/3 of ureter

- Emphy. cholecystitis - Cl. welchii > E. coli
- " pyelonephritis - E. coli
- Xanth granulomatous pyelonephritis - proteus
- " cholestitis - non infective
- Rupture of Rokintansky
- Aschoff sinuses

Genitourinary TB

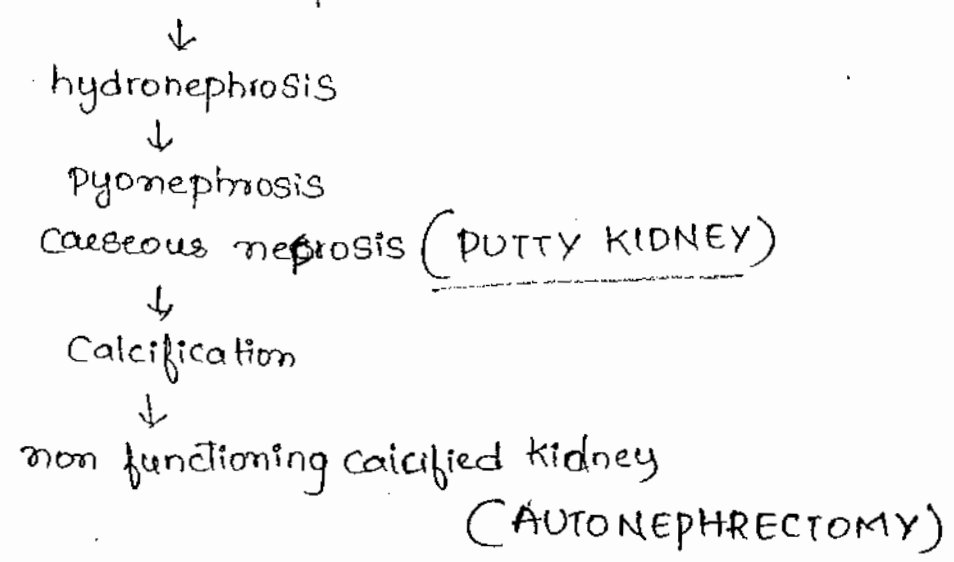
- mycobacterium TB
- primary - lungs
- hematogenous spread (kidney & prostate involved)
- Rest organs involved by ascent (or) descent
- Testis is spared.

*
*



Kidney

pt. sign pallor around
ureteric orifice



Bladder

- Formation of Tubercles

(Autosplenectomy)
↓
Sickle cell

↓
Chronic inflammation

↓
** THIMBLE BLADDER (small contracted)

Earliest change seen on cystoscopy pallor around ureteric orifice **

- Established cases of TB - GOLF HOLE ureteric orifice
**

Prostate

→ nodular & calcification

Vas deferens

Beaded appearance & multiple discharging sinus



Earliest change of TB given by (IVP) - MOTH EATEN CALYX *

90c

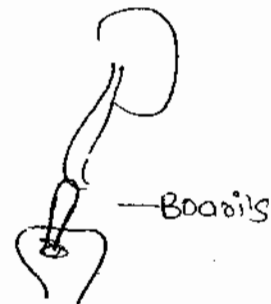
= CECT

Rx

= ATT

- ① Stricture dilatation
- ② Augmentation cystoplasty
- ③ nephrectomy for non-functioning kidney (<10% function)
- ④ BOARI'S → ureteric reconstruction in dist. portion

- Boari's flap



RENAL TUMOURS

→ Angiomyolipoma (BV, muscle, fat)

- Benign tumour composed of Blood vessel, muscle, & fat
- more common in females ♀ > ♂
- Age = 5th to 6th decade, generally single
- ASS $\bar{c}$ TUBEROUS SCLEROSIS *
- In patients of Tuberous sclerosis it is multiple / B/L seen in Young patients.
- marker (+ve) is HMB-45 ***

WUNDERLICH
SYNDROME
(10%)

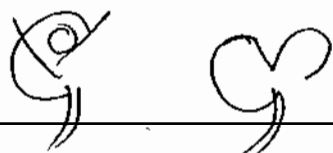
{ macro aneurysm
↓
Retroperitoneal haemorrhage

Rec	AML
fat ⊖	⊕
calci ⊕	⊖

⑨00 → CECT

Presence of fat & absence of calcification differentiates it from Rec.

⑨_x upto ucm → Asymptomatic - observation
> ucm / Symptomatic → nephron sparing surgery



- 3-7% of solid renal tumours

- Resembles Eosinophilic variant of RCC

- on CECT



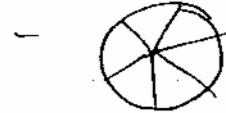
- central stellate scar **

① FNH

② Fibrolamellar variant of HCC

③ Serous cystadenoma pancreas

④ Renal oncocytoma



- spoke wheel / cart wheel

✓ Renal oncocytoma

✓ FNH

Ⓡ nephron sparing surgery

RCC

♂ > ♀ upper pole

- hypernephroma

- Gravitz tumour

- Radiologist tumour

- Internist "

mc - ~~Be~~ clear cell

diagnosis → papillary cell

brick cell trait → Medullary

Best prognosis → chromophobe carcinoma

* mc is males & smokers seen in 5th to 6th decade

- mainly 4m upper pole

Risk factors

mc 8th - PCT

not radioresistant

✓ Smoking / Tobacco

✓ Analgesic nephropathy

✓ Cadmium / Asbestosis

unique features :-

→ It is having pseudo-capsule

- prolonged period of stable disease

- Refractory to cytotoxic agents

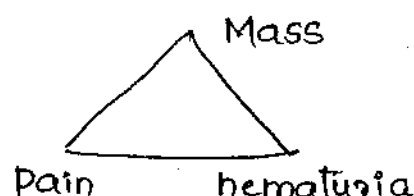
- Spontaneous regression seen **

NCCMR

- ↳ Neuroblastoma
- ↳ Choriocarcinoma
- ↳ RCC
- ↳ malignant melanoma
- ↳ Retinoblastoma

(C/F)

Triad of RCC



Seen in only 10% cases having the advanced disease.

- Also known as "Too late" triad
- Mc presentation is hematuria **✓

Paraneoplastic

- 1) ↑ ESR (>55%) → MC **
- 2) Anaemia → mass replaces kidney
- 3) polycythemia - ↑ se Erythropoietin
- 4) hypertension - production of Renin
- 5) hypercalcemia - PTHrp **
- 6) Stuffer's Syndrome

- non metastatic hepatic dysfunction due to

IL-6 *

RCC → special property of Vascular invasion. Initially

invades Renal Vein → IVC → thrombus → Rt atrium.

(90%)

(dx) of RCC = CECT

(dx) of vascular invasion - MRI

Gold standard for vascular invasion -

venography / venacavalography

MC Site of metastasis - lungs (cannon ball Secondaries) **
 also in choriocarcinoma

choriocarcinoma
 PLE

- Pulsatile Secondaries in bones are seen in RCC & Follicular
 Ca. of thyroid - osteolytic Secondaries ✓

** MC - malignancy for osteolytic Secondaries in males - RCC
 MC - " for osteoblastic " males = prostate
 MC - " for both osteoblastic & osteolytic
 Secondaries in (F) - Ca. Breast

(Rx) of choice for RCC

- Radical nephrectomy
- First line agent for unresectable / metastatic
 RCC → SUNITINIB

2nd line → IL-2 + IFN- α

Radical nephrectomy :-

Enbloc removal of

- * Kidney
- * Adrenals
- * Gerotor fascia
- * upper 1/3 ureter
- * lymphadenectomy from aortic bifurcation till cross of
diaphragm

WILM'S TUMOUR

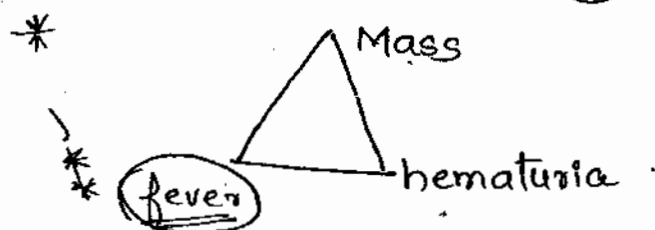
- * MC intraabdominal malignancy in children - neuroblastoma
- * 2nd most common intraabdominal malign. - WILM's
in children

- Mc Primary renal malignancy
- Mc Renal tumour of infancy & childhood - Congenital mesoblastic nephroma
- mc soft tissue tumour in children - Rhabdomyosarcoma
- mc malignancy of childhood - leukaemia
- mc solid malignancy of " - Brain tumour

Wilms **

- mc-primary renal malignancy of childhood seen in 2-5yrs characterised by

BEST → Blastema
Epithelium
Stroma



Fever disappears after nephrectomy

- mc site of metastasis - lungs

Variants of Wilms Tumour

- ① WAGR → WT, Aniridia, Genital anomalies, MR.
- ② DENIS-DRASH - Gonadal dysgenesis + Renal failure
- male pseudohermaphroditism
- ③ BECKWITH-WEIDMAN * hemihypertrophy
* visceromegaly (hepato, spleno)
* macroglossia
* omphalocele
* hepatoblastoma

⇒ 90% = (MRI) **

(Rx) of choice ⇒ Radical nephrectomy.

Most imp prognostic factor - histology > staging

- In patients having poor histological factors - chemotherapy should be started $\bar{c}$ in (5 days) **
- Radiotherapy $\bar{c}$ in (10 days) **

RT-10
CT-5

Congenital

ADPKD (AD) ⇒ (16,4)



- B/L kidney replaced by multiple cysts
- conc. ability of kidney is lost
- 75% of Adults & 25% children - hypertension
- It leads to polyuria, nocturia, nephrolithiasis, infection, & hematuria.

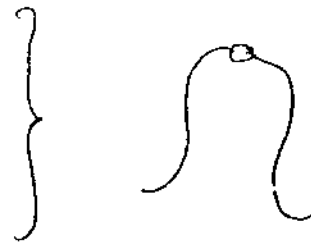
Extrarenal

* MC → polycystic liver disease

- Cyst in ovary, pancreas/spleen
- Mitral valve prolapse
- Berry aneurysm
- Colonic diverticulosis

(90C) $\Rightarrow$ CECT $\rightarrow$

(IVP) $\rightarrow$ Spider leg pattern
 Bell shaped
 Swiss cheese
 BUBBLE appearance

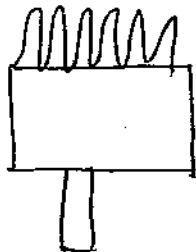


(Toc) - Renal transplantation

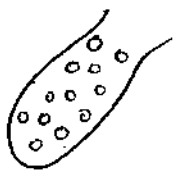
Medullary Sponge Kidney (IVP)

- characterised by dilated collecting duct which appears like sponge-
- ass $\bar{c}$ hemihypertrophy
- Hypercalcaemia
- Nephrolithiasis
- Nephrocalcinosis

(90C) = (IVP) $\rightarrow$



- Bristle or Brush appearance



- BOUQUET of flowers

(Rx) palliative

Horse shoe kidney



Kidney fused at lower poles

— 1 in 400 population (0.25%)

— level of isthmus is L3-L4 **



— 9m. mesenteric A. prevents ascent of kidney, axis is vertical

(IVP) → Hand joining sign due to medial orientation of calyces

high insertion of ureter = Ant. transposition
Flower vase like curve of ureter

(C/F) asymptomatic detected incidentally

9n some pts due to Relative outflow obstruction, (Stone, Infection, Hydronephrosis seen

(Doc) → CECT

(Rx) — depends on complications

— isthmus should not be divided

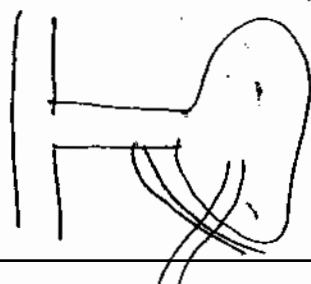
Vascular Anomalies

— Mc. Renal vascular abnormality — Supernumary Renal A.

9n majority — Duplicate Renal Arteries (20-40%)

— Supernumary Renal V. seen — bt less common

— Aberrant (Lt) Renal A. → Renal A. does not arise from aorta / primary branch



Compress PUJ $\rightarrow$ PUJ obstruction

- Aberrant Renal A. should not be divided as it can lead to lower pole infarction

(Rx) ANDERSON-HYNE'S DISMEMBERED PYLEROPLASTY

PUJ obstruction

- more Common in Boys
- more common on (Lt) Side / U/L

Congenital

- Stenosis / Atresia of ureter at PUJ
- Aberrant (Lt) Renal A.

acquired

- stone
- infection
- instrumentation

(C/F) - most patients are asymptomatic presents $\bar{c}$ palpable Intraabdominal mass

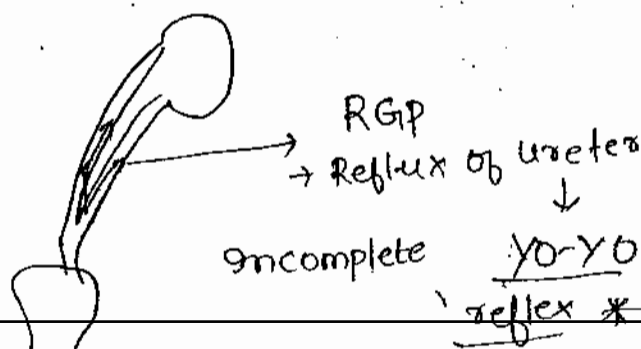
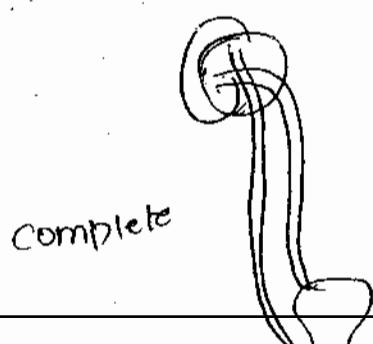
(SoC) DTPA scan which has replaced IVP

(Rx) $\rightarrow$ Anderson hynes dismembered pyleroplasty.

Duplication of ureter

* Mc congenital anomaly of upper urinary tract - Duplication

* mc " of urogenital tract = VUR



to lower pole ureter

- (C/F) - In males - upper pole ureter opens into ~~ant~~ prostatic urethra → so continent having repeated attack of UTI
- In females → upper pole ureter opens into ant-urethra
- So incontinence (continuous) & normal voiding pattern

- (dx) - upper pole ureter is having ureterocolic diagnosed by IVP having ADDER-HEAD (or) COBRA HEAD
- lower pole ureter having VUR (dx) by MCU ✓

- (Rx) - upper pole ureter → Excision & Reimplantation into the bladder
- lower pole ureter → VUR → ureterovesicoplasty

URETEROCOELE

→ It is Autosomal dominant

- mc- females

2 types

- ① Intra vesical (20%) - (Rx) cyst unroofing (incision over cyst)
- ② ectopic (80%) - mc - (Rx) Excision & Reimplantation

(C/F) In ectopic variety - cont incontinence & (N) voiding pattern

In Intra vesical - Repeated attacks of UTI / Infections

(90c) - (IVP) having ADDER HEAD / COBRA HEAD

- Cystoscopy - Intra vesical - Enlarging & collapsing cyst

- Vesicoureteric reflex
- mc congenital anomaly of urogenital tract *
- more common in children
- generally asymptomatic
- Spont. resolution occurs by 6-7 yrs of age.

Primary

- short intravesical length of ureter
- deficiency of long. muscles over ureter
- Attenuation of trigone

Secondary

- post-urethral valves in children
- neurogenic bladder in adults

90c - MCU

→ International classification of VUR (based on MCU)

grade I → Reflux into non-dilated ureter.

grade II → Reflux into pelvicalyceal system

grade III → mild to moderate dilatation of ureter & reflux into pelvicalyceal system

grade IV → reflux into pelvicalyceal system & blunting of fornices

grade V → dilatation & tortuosity of ureter

Chances of Spont. resolution **

I & II - 80%

III - 50%

IV - 20%

V - 0.5%

dr of choice for prophylaxis

< 6 weeks age ampicillin/amoxicillin

Others → TMP-SMX - DOC

(Rx) → medical management for grade I - III VUR
2) u/L grade IV VUR

surgical : 1) B/L Grade IV VUR

2) grade V VUR

3) Repeated infections after medical management

4) presence of Bladder diverticuli

5) older children

6) H/o of chronic pyelonephritis

— URETERO VESICO PLASTY (or) STING OPERATION

*** subureteric transurethral inj
of teflon paste

ureteric reconstruction by

① lead - Better politano technique

② lich - Gregoir technique.

BLADDER

Ectopia vesicae / Extrophy Bladder

Characterised by abnormal over development of the
urogenital sinus → rupture & ventral defect involving
musculoskeletal system in infraumbilical
region.

FirstRanker's choice
 undrained by exposed post wall of bladder & urine

dribbling from trigone

- It is ass. & absent infraumbilical Abd. wall, widely separated pubic rami → WADDLING GAIT

Macbone
 - visible uterovesical
 reflex.

- ✓ Umbilical hernia
- ✓ (m)ales - Epispadias & undescended testis & shallow scrotum
- ✓ (F) - Epispadias & bifid clitoris & widely separated labia
- ✓ Rectal prolapse

- ↑ risk of Adenoca..

(Rx) → complex

1. Augmentation cystoplasty
2. Closure of Abdominal wall after posterior iliac bone osteotomy
3. Repair of umbilical hernia, Epispadias, Rectal prolapse, undescended testis

Bladder stones

(1^o)

- Formed in bladder in absence anatomical, functional, infectious & obstructive factors.

(2^o)

- Formed due to all these factors in bladder

- endemic Bladder calculi
- Seen in undeveloped countries (Burma, Indonesia, Thailand, Africa)
- ANDHRA, Rajasthan (India) ✓
- children - 2-4 yrs of age ✓
- Mc type of Stone - Ammonium urate > calc. oxalate *
- Common in children having chronic dehydration, exclusive breast feeding & high carb & low phosphate intake ✓

- It rarely recurs after treatment ✓

2° Bladder stones :-

- more common in elderly males.
- mc-cause - BPH ✓
- mc type of stone

mc-1° → NH_4 urate > cal oxalate
 mc 2° → uric acid > struvite
BPH

uric acid > struvite **

Predisposing

1. Bladder outlet obstruction due to BPH
2. Bladder diverticula
3. foreign body
4. Chronic catheterisation

(C/F) intermittent, painful voiding & severe pain at the end of micturition & passage 1 or 2 drops of blood at end / terminal haematuria

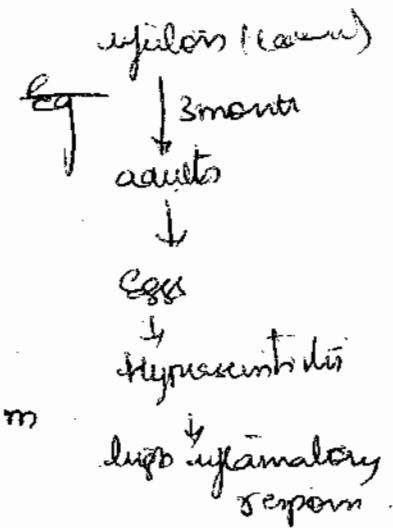
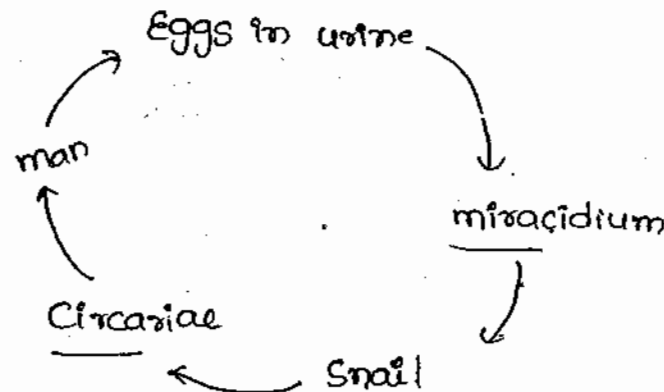
(dx) USG having characteristic shadowing



- (Rx) Small Stone - cystolitholapaxy ✓
 large stone - Suprapubic cysto-lithotomy (ov)
 Electro hydraulic lithotripsy ✓

SCHISTOSOMIASIS

- S. hematobium
- middle East, Egypt, Africa
- Def host - man
- Int host - Snail



(C/F) * Swimmer's Itch - zoonosis - ~~Exotic~~

* Katayama fever :- After 3 months larva become adult
 Start producing Eggs, Eggs are high antigenic
 - high inflammatory response ✓

Symptoms - high grade fever, hepatosplenomegaly,
 lymphadenopathy ✓

Earliest symptom - ↑ se frequency ✓



*** Mc cause of Bladder calcification - Shistosomiasis **
on X-ray - calcified Bladder → FETAL head in PELVIS *
appearance
- parallel / linear calcification. - terminal position

(90c) → urine examination for presence of eggs in urine

(Doc) - PRAZIQUANTEL ✓
** METRIPONATE ✓
** OXAMINIQUE ✓

✓ It rises the risk of both (squamous > transitional cell)

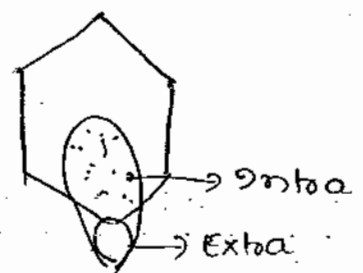
BLADDER RUPTURE

1. Extraperitoneal - (Mc) ** (urine get collected ^{pelvic diaphragm} above urogenital diaphragm) *
2. Intraperitoneal

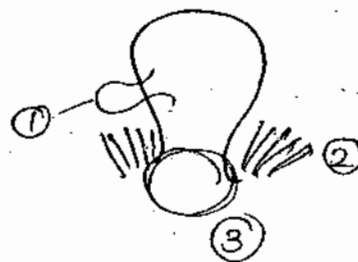
Extraperitoneal :-

- pelvic fracture in RTA -

- (c/f) suprapubic pain
Difficulty in passing urine
(dx) cystography ✓



- ① Tear drop
- ② flame shaped
- ③ Pear shaped

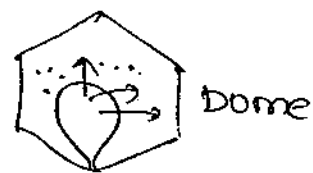


- Tear heals on its own by 7-10 days.

- Surgery
- ① Repeated occlusion of Catheter due to ongoing hematuria
 - ② Impinging bony fragment over bladder
 - ③ Tear near neck

Intraoperative :- External blow / Kick to full bladder

- C/F
- suprapubic pain
 - hematuria + Difficulty in passing urine + peritonitis



dx cystography

Rx Exploratory laprotomy & peritoneal lavage & closure of bladder defect

CA. BLADDER

Transitional > SCC > Adenocarcinoma — MC

Tcc

- ✓ Smoking
- ✓ drugs
 - Phenacetine & chlorzoxazone
- ✓ cyclophosphamide
- ✓ schistosomiasis
- ✓ Exp. to
 - Benzidine
 - hydrocarbon

SCC

- ✓ schistosomiasis
- ✓ chronic inflammation due to bladder stone
- ✓ Bladder diverticula
- ✓ chronic catheterisation

- ✓ Acrolein www.FirstRanker.com → Most malignant tumours are solid ***
- ✓ β -naphthylamine
- ✓ Rubber, leather, Petroleum, automobile, printing, dye,
- ✓ pelvic irradiation.
- Bladder tumours mc arises from mucosa **

(Scc)

- nodular & invasive

(Rx) Radical cystectomy

(Adeno)

- ⊖ Ectopia vesicae,
- ⊖ patent urachus ***
- ⊖ Augmentation cystoplasty
- ⊖ intestinal conduit
- (Rx) Radical cystectomy + pelvic lymphadenectomy

Transitional Cell ca.

- more common in males, smokers ✓
- age - 5th to 6th decade ✓
- Mc site post-lateral wall of trigone ***
- Mc symptom - PAINLESS GROSS INTERMITTENT hematuria
- Mc → pelvic (obturator nodes) ✓
- 9th ca: Bladder, medullary ca. of thyroid & malign. melanoma - Mc - LIVER *

(dx) cystoscopy + Biopsy
new tumour markers in urine

(90%) [Painless gross hematuria in elderly male
• urine microscopy for malignant cytology)
*** ↓
most imp (urothelia ca.)

- ① BTA (Bladder tumour antigen)
- ② NMP-22 (Nuclear matrix protein -22)
- ③ Lewis -X- antigen
- ④ Hyaluronidase

For adequate staging both MRI & CT required

urine cytology can be done

(Rx)

(T_{is}) — I/v BCG

(T_a) (Benign papillary tumour, Kiss ulcer) →

low grade, single, non-recurrent → TUR (transurethral resection)

*** (T_a) (high grade, multiple, recurrent) — TUR + I/v BCG

(T_i)

(T₂-T₄) → Radical cystectomy ± systemic chemotherapy
± Radiotherapy

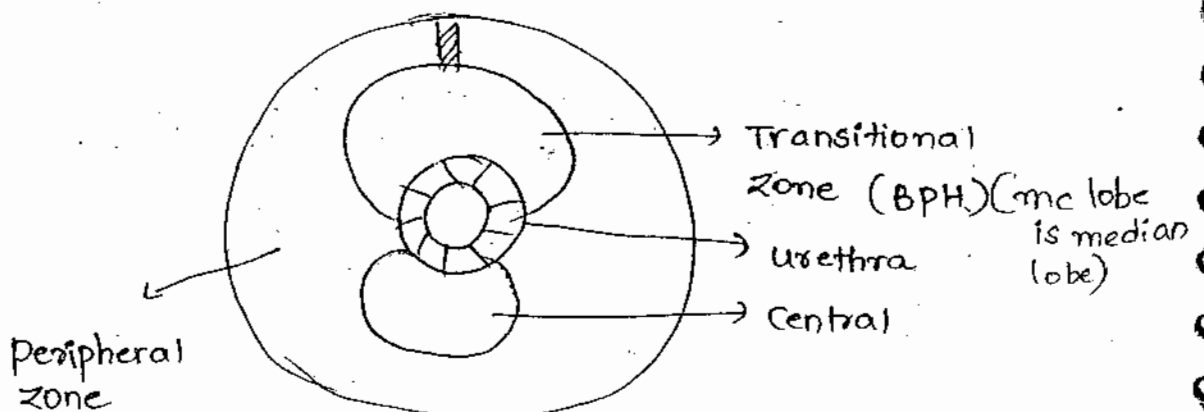
Any T_M+, N₊ → systemic chemotherapy f/b surgery/
Palliation

Intravesical chemotherapy

1. BCG → most effective ***
2. mitomycin
3. Epirubicin
4. Thiotepa

BCG, MET

PROSTATE → corpora amylacea



(ca. prostate)

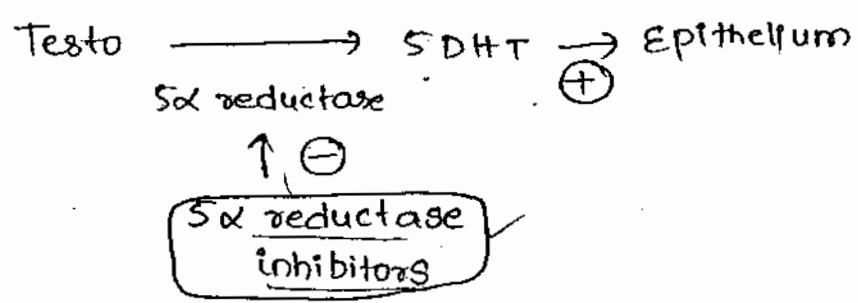
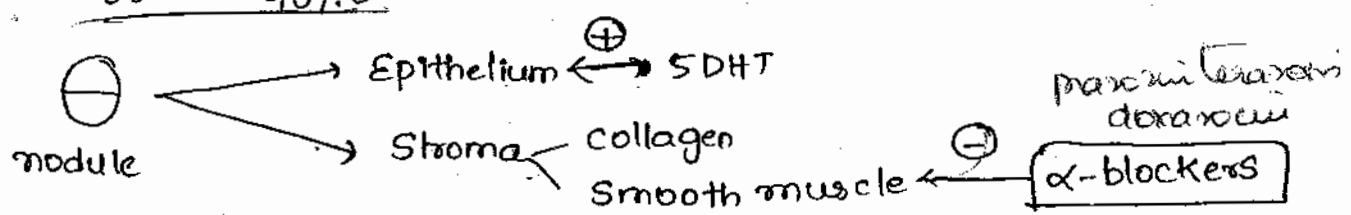
- most pts of ca. prostate are asymptomatic in initial stage
- Symptoms in ca. prostate suggestive of locally advanced / metastatic disease ✓
- TURP is not protective for ca. prostate so even after TURP life long screening by DRE + PSA done. ✓

BPH

Age related
Endocrine
multifactorial

- Age related, endocrine controlled, multifactorial process
- 41-50 - 20% ✓
- 51-60 - 50% ✓
- 80 - 90% ✓

> 80 yrs → 90% - Have BPH.



5α reductase inhibitors → Finasteride

→ Dutasteride

→ Triptorelin pamoate

✓ req. min 1 month to act, max.

Effect seen after 6 months period of time

α-blockers → prazosin, Terazosin
→ Doxazosin

** Tamsulosin - (DOC)

→ acts instantaneously

} Preferred



✓ Detrusor muscle hyperplasia

✓ Detrusor muscle hypertrophy

✓ collagen deposition

✓ fibrosis

(F) which causes irritate symptoms → frequency FUN
urgency
nocturia

FUN

Obstructive Symptoms :- hesitancy, intermittency, ↓sed flow, poor stream, incomplete evacuation bladder & dribbling of urine

(dx) on DRE :- Smooth elastic enlargement

Signs of malignancy - hard, indurated & obliteration of median sulcus.

UROFLOWMETRY → $Q_{max} \Rightarrow > 15 \text{ ml/sec} - \textcircled{N}$

$Q_{max} \Rightarrow 10-15 \text{ ml/sec} - \text{Equivocal}$

* $Q_{max} \Rightarrow < 10 \text{ ml/sec}$ → suggestive of BPH

* Bladder pressure

> 80 cm H₂O (cystometry)

(Rx) Mostly medically

→ TAMSULOSIN **

Combination (Rx) including α -reductase inhibitors + α -blockers

→ given & large prostate & ↑PSA *

- * no improvement after medical management
- * Refractory urinary retention
- * Recurrent UTI
- * hydronephrosis / Renal failure
- * Bladder stone
- * Gross hematuria

→ **TURP** - Gold standard (**Rx**)

monopolar **cauter** - **Verumontanum** is the distal landmark for Turp

- located just proximal to ext. urinary sphincter

- 1.5% Glycine ** (

** - normal saline should not be used $\bar{c}$ monopolar cautery ✓

- used $\bar{c}$ Bipolar cautery - TURIS ✓

complications : ~~✗~~ Retrograde Ejaculation (15%) - (**MC**) **
~~✓~~ Impotence (10%)
~~✓~~ Incontinence (<1%).

*** Late complication

Bladder neck stenosis > urethral stricture (3.6%) -

→ commonest cause of Periumbilical pain after 30 min - perforation of bladder ***
TUR Syndrome :-

- Water intoxication ✓
- Dilutional hyponatremia ✓
- Duration of Turp -- >90 min, Size >75gms ✓
- Bradycardia, HTN, Dizziness & visual abnormalities

(**DOC**) - furosemide

Symptomatic → (3% saline / hypertonic saline)

— used for smaller prostate (20gms)

— 2 incisions given at 5'o / 7'o clock COLLIN'S
KNIFE *

— no risk of Retrograde Ejaculation & impotence & incontinence

Open prostatectomy

— large prostate > 75gms

— Bladder stone & Bladder diverticuli

- ① Frazer's Suprapubic prostatectomy
- ② Millin's Retropubic "
- ③ Young's Perineal " — obsolete ✓

For Bladder's stone & diverticuli — ① is done

* Ho-YAG used for Renal stone & BPH ✓

CA. PROSTATE (Gleason scoring) ***

✓ 7th & 8th decade (Anaplastic ca. thyroid also)

✓ developed countries

✓ Afroamerican population

Risk factors — (Adv Aging)
(High fat intake)

Protective → Vit A, C, E
Lycopene

neoplasm p2 — 75%
— T2 — 15%
— C2 — 10%

- Glutathione transferase promoter region -4
- on chromosome 11

Pathology :- malignant glands are small crowded &

- Lack branching & characteristic absence of basal layer ***

- (cf) → most are asymptomatic — initial stages
- Symptoms → locally advanced / metastatic disease
 - Mc site of metastasis
 - (LUMBAR VERTEBRA (Bateson venous plexus))
 - osteoblastic secondaries ✓
 - pelvic (obturator gap & lymph nodes),

- (90c) — TRUS guided biopsy

for staging — MRI

(PSA) → $< 10 \text{ ng/ml}$ — (N)
 $> 20 \text{ ng/ml}$ — dx of ca. prostate

PSA velocity — $> 0.75 \text{ ng/ml/year}$ — more specific —

(Rx)

(T_{1a}) — obs + Follow up

(T_{1b}, T_{1c}, T₂) $\begin{cases} > 7 \text{ yrs} - \text{obs + follow up} \\ < 7 \text{ yrs} - \text{radical prostatectomy} \end{cases}$

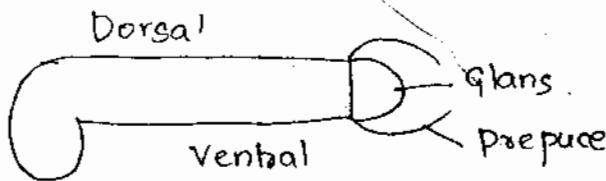
(T₃, T₄) → Hormone therapy preferred over Radiotherapy

(Rx) Bk orchidectomy + flutamide ***
 — LHRH agonist + flutamide ***

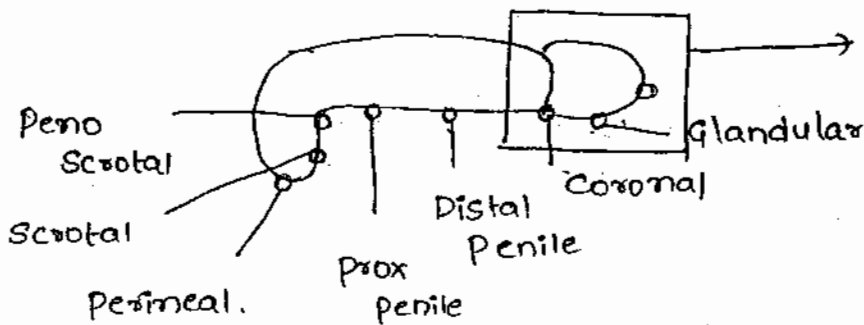
GOSERLIN & LEUPOROLIDE ***

PENIS AND URETHRA

Hypospadias → Circumcision Avoided, (MC) congenital anomaly of urethra



- Meatus opens over ventral aspect of penis
- incidence 1 in 250



Ant forms are more common
- 70% cases

Associations :-

(C/F)

- * ventral chordee
- * Hooded prepuce (dorsal)
- * Flattened glans penis
- * microphallus
- * Meatal stenosis.

✓ In Ant type :-

Poor & abnormal stream

✓ In post type :-

Painful Erection, impotence

✓ & infertility

MAGPI



- Best age (6-12) months

↓ Dennis - brown

cf. Bracka's repair

2. Thiersh - Duplay

cf. Asopa - Buckett

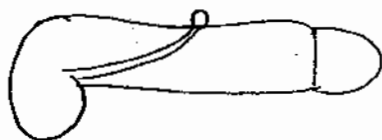
3. Mathiew's

- Mc complication of repair - URETHRAL FISTULA in 10% cases

Epispadias

- rare

- Ext opening present over dorsal aspect of penis



✓ ASS $\bar{c}$ Dorsal chordee

✓ ASS $\bar{c}$ ectopia vesicae.

✓ $\bar{c}$ undescended testis

✓ Shallow scrotum

- post. forms are ass $\bar{c}$ incontinence

(Rx) Repair of Epispadias $\bar{c}$ correction of incontinence

Posterior urethral valve

- Exclusively abnormality of male urethra

- Mc $\rightarrow$ * Type (1) - At / just below verumontanum

- most pts are symptomatic

9n $\geq$ 50% cases ass $\bar{c}$ VUR

GOC

MCU ***

other associations

① oligohydramnios

** ② pulmonary hypoplasia - Mc cause of death

③ Bladder dysfunction

④ Renal parenchymal dysplasia

≤ After birth pts develop uremia

- o/e B/L palpable intraabdominal mass

(Rx) Insert infant feeding tube. If Creatinine is (N) then we perform endoscopic fulguration of valves

- Creatinine if raised → Suprapubic cystostomy by blockson technique

then endoscopic fulguration

Phimosis

- Prepuce cannot be retracted over Glans penis

- It can be congenital/acquired

Acquired

- * Trauma
- * ca. penis
- * BXO (Balanitis Xerotica obliterans)
- * Infections



(C/F) Ballooning of prepuce during micturition
- difficulty in intercourse

(Rx) 1) Steroidal cream application - (4-6) wks

Surgery indications (CIRCUMCISION)

- * no response to steroids
- * recurrent infections
- * Age 16-18 yrs

Complications

- ✓ Balanitis
- ✓ Balanoposthitis

Paraphimosis

- Gatoogenic (catheter induced) ***

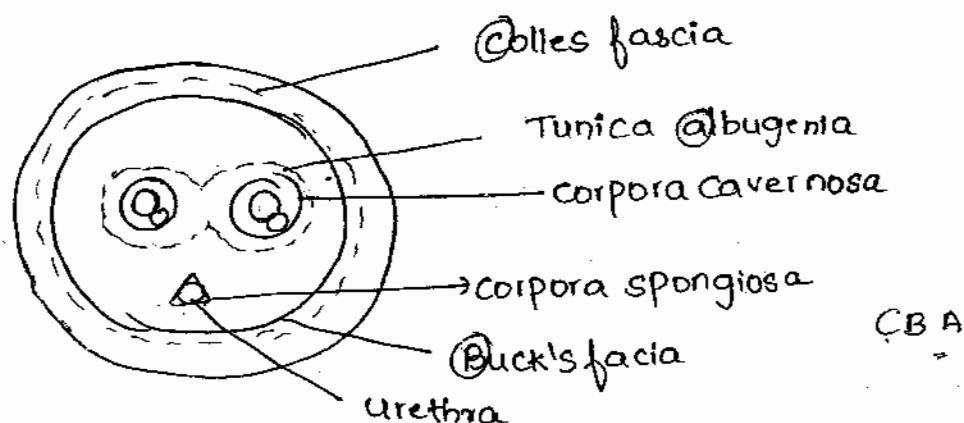
- It is acquired caused by formation of tight ring around the glans penis leading to impaired lymphatic, venous & in severe cases leads to impaired arterial which can cause Gangrene of glans penis,



- Urine flow not obstructed

(Rx) Ice bag application + Hyaluronidase inj

For non responding - Circumcision.

Anatomy

- Tunica albuginea & buck's fascia are a strong barriers which prevents involvement of blood vessels
- Pulmonary metastasis rare in CA penis.

Peyronie's disease

• >40yrs
of age

- characterised by chronic vasculitis involving tunica albuginea & formation of fibrous plaque around dorsolateral aspect of penis.

- Palmar fibromatosis &
- also known as penile fibromatosis

(C/F) - Painful Erection

- Curvature of penis on erection
- Poor erection distal to fibrosis
- It leads to impotence & infertility

(Rx) observation & emotional support

* 9n > 50% case spontaneous resolution occurs

* 9n non-responding cases NESBITT operation **

(straightening of penis & non-absorbable suture over dorsal aspect)

Ca. penis

- ⊖ It is seen in 5th to 6th decade
- ⊖ more common in low socioeconomic status
- ⊖ 40% pts are < 40yrs of age
- ⊖ MC → sq. cell carcinoma ✓
- ⊖ > 50% ass & phimosis ✓
- ⊗ neonatal circumcision is protective (at 1 month of age) for capenis, HIV & STD also
- ⊖ ass & infection HPV (16, 18, 31, 33)

Mc site

✓ Glans penis > Sulcus > prepuce

* Premalignant lesions

* Buschke - lowenstein tumour :-
also known as verrucous carcinoma

- 2) BxO
- 3) cutaneous horn
- 4) warts
- 5) leukoplakia (whitish patch over glans)

Carcinoma in situ forms

1. BOWEN'S disease :- ca. penis

2. Erythroplasia of Queyrat :- ca. in-situ involving glans penis.

- * Mc presentation is lesion itself
- * ass & foul smelling discharge
- * minimal / no pain
- * one inguinal (superficial) involved
- * In more than half of patients inguinal lymph nodes involve
- 50% Cases of inguinal lymphadenopathy due to metastasis & rest 50% due to sepsis
- Routinely all should be given antibiotics for 4-6 weeks

(90%) - Biopsy ✓

*** For staging - MRI.

* CABANA performed first sentinel lymph node biopsy - ca. penis.

* - so called Cabana's procedure

(Rx) Distal part involved - partial penectomy ± 2cm margin
Prox. part - Total penectomy + perineal urethrostomy ✓

* Cisplatin very good for sq. cell ca**

* 5-FU - good activity against Adenocarcinoma**

- Incidence of pulmonary metastasis rare due to two strong barriers

✓ Tunica Albuginea
 ✓ Buck's fascia } prevents involvement of vessels

Urethral injury

1) Post-urethral injury (membranous) 2) Ant urethral injury (bulbar)

→ In ① mc. injured - Membranous
 - In ② mc. injured - Bulbar. (due to fixity of urethra)

Post-urethral injury :-

- Mc site - prostatic membranous

junction of membranous urethra

- Mc cause - RTA leading to pelvic fracture. (collection of blood in deep perineal pouch)

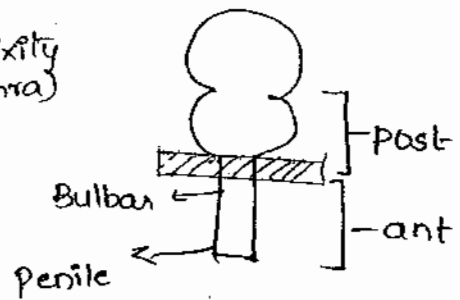
- (C/F) characterised by urinary retention + pelvic hematoma + blood at meatus + high lying prostate

on (IvP) high lying prostate - " ~~FLY~~ PIE IN SKY " ***

(Rx) Definitive Rx / Repair should not be performed in emergency becoz ass t risk of stricture impotence & incontinence
 ↓ common cause

so Spc → Repair after 4-6 weeks.

*** Don't pass urinary catheter ***



- mc site - Bulbar urethra

- Caused by STRADDLE / MAN HOLE injury

(C/F) urinary retention + perineal hematoma + Blood at meatus = normally lying prostate

Hematoma - Butterfly shaped involved shaft of penis, Scrotum & perineum

(Rx) Spc followed by delayed repair after 4-6 weeks

(Goc) For post-urethral stricture - MCU (PM)
Ant " " - RGU

Adequate evaluation of urethral strictures both MCU + RGU is required.

(Rx) for stricture

- length upto 2cm - Excision ✓

- for >2cm - excision & Graft reconstruction

*** MC (BUCCAL MUCOSA) ***

✓ Bladder mucosa

✓ penile skin

TESTIS AND SCROTUM

Undescended testis

→ Incidence at birth - 3% *** , 1 yrs of age - 1%

- 2/3 rd cases - spontaneous descent → (3) months of age

- Generally no descent after 3 months.

- Common (RT) side.

1. Inguinal palpable in 80% cases

2. Abdominal / non palpable in 20%.

* Earliest change detected on histology - hypoplasia of Leydig cells $\bar{c}$ in 1 month

* Leydig cells are less sensitive to temp. so testosterone produced

* even in BLK undescended testis - Secondary sexual characters Present

* By 6-7 yrs of age complete absence of spermatogenesis

Complications

(S)terility.

(A)trophy.

(T)rauma, tumour, torsion

(H)ernia

(I)nflammation

Mc Tumour is

* SEMINOMA here

* Higher the testis greater the risk

* risk more in Abdominal testis

* orchidopexy doesn't $\downarrow$ se risk. It facilitates early (dx)

(90c) Inguinal Exploration

Non palpable testis $\rightarrow$ Diagnostic Laparoscopy ***

- During diagnostic laparoscopy vas deferens & test. Artery followed. If vas is blind testis may or may not be present. If test. A blind then test. agenesis

* Best age for orchidopexy - 6 months ***✓

It should not be delayed by 12 months.

- ① Ormrod and Darnes
- ② Keetely tosek
- ⑤ Ladd & Gross

- ② Stephen Fowler's
- ④ Placing testis in dartos pouch
- ⑥ microvascular testicular auto transplantation

Testicular tumours

— Risk factors

- ✓ cryptorchidism (% ass - 10%)
- ✓ H/o testicular tumour in sibling
- ✓ Gonadal dysgenesis (testicular feminisation syn)
- ✓ personal H/o of (T.T)
- ✓ Klinefelter syndrome
- ✓ In utero exposure of DES

WHO classification :-

1. Germ cell tumour :-

Seminoma
(Histologically resemble dysgerminoma)

non-seminomatous

- ✓ Yolk sac Tumour
- ✓ teratoma
- ✓ embryonal ca.
- ✓ chorio carcinoma

2) Sex cord/Stromal cell tumour

- ✓ Leydig cell, Sertoli cell tumour
- ✓ Thecoma
- ✓ fibroma

3) mixed

- Gonadoblastoma

* 1st risk Gynecomastia in tumours having Stromal component

4) Lymphoid (haemopoietic)

- lymphoma
- leukaemia

- Adenoma carcinoma

- Carcinoid

* Mc testicular tumour - Seminoma

* most radiosensitive - Seminoma

* mc B/L primary tumour - seminoma

* Age 1-3 yrs - Mc - Yolk sac tumour

11-13 yrs - Mc - Teratoma
(prepubertal)

* Mc Secondary - lymphoma

* Elderly - lymphoma

* Mc B/L tumour - lymphoma

* Tumour $\bar{c}$ Early hematogenous spread $\bar{c}$ worst prog is choriocarcinoma *

Seminoma - 30-40 yrs (pure Seminoma not aggressive)

- (20/f) mc presentation - palpable mass in relation to testis
o/e $\rightarrow$ mass is palpable ✓

* affected testis enlarged & hard ✓

* Secondary hydrocoele seen in 10% cases ✓

* Gynecomastia - 5% (leydig cell, sertolicell, Gonadoblastoma)

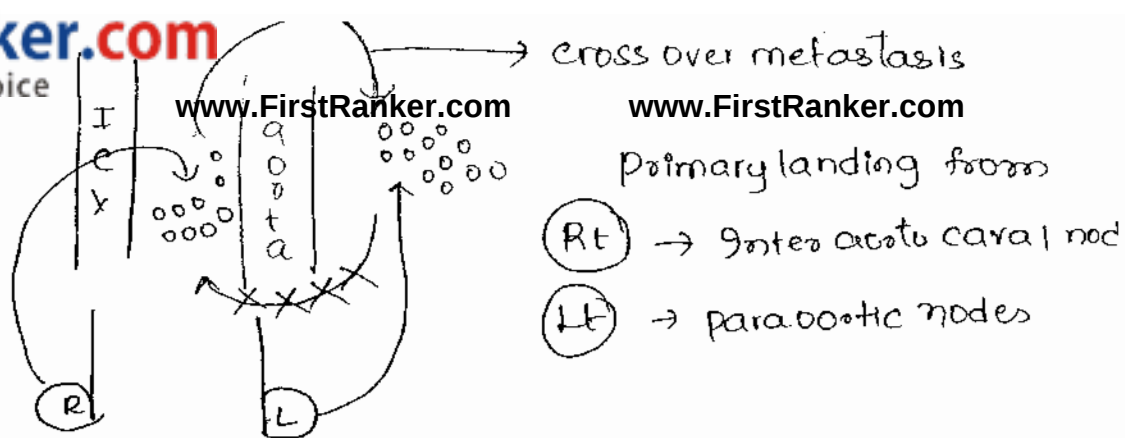
*** FNAC & Biopsy is contraindicated

(90c) First - USG - hypoechoic mass

(Rx) high inguinal orchiectomy

- orchiectomy performed near deep ring so it is

known as high inguinal orchiectomy



→ mc involved group of nodes - para-aortic ***

- In Seminoma - RT given - Retroperitoneal lymph nodes

- In non seminoma - ~~RT~~ → RPLND performed

- Best prognosis

Tumour markers

✓ AFP → YET (Yolk sac, Embryonal, Teratoma)

✓ β -HCG - CES (chorionic, embryonal, seminoma)

① LDH

② PLAP

③ GGT (gamma glutamyl transpeptidase) } → seminoma

} → Bulk of disease

TNM (S)

① AFP ② β -HCG ③ LDH - included

Rx

Seminoma

non-Seminoma

(RT)

(RPLND)

IA, IB
IIA, IIB

IIc, III
IS

Chemotherapy ± RPLND
→ BEP
→ Bleomycin
→ Etoposide
→ cisplatin } x6 cycles

Intravaginal torsion



- Young patients 16-25 yrs
- Predisposing :
 - * Inversion of testis.
 - * Bell clapper deformity (high invest. of tunica)
 - * Separation of epididymis from body of testis.
 - * transversely lying testis.
 - * Spiral attachment of cremastic fibres over cord

(Clf) Severe Agonising pain ass c nausea & vomiting

o/e :- Testis is lying near upper part of scrotum.

- PREHN'S sign (-ve)

- Cremastic reflex is absent

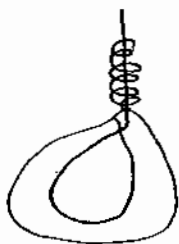
(90c) Doppler

(Rx) orchidopexy → During orchidopexy contralateral scrotum is explored & if Bell clapper deformity present

↓
B/L orchidopexy done

Extravaginal

- children
- ~~per~~



- occurs during pregnancy
- testis is palpable in inguinal canal

- after birth

HARD & NON-VIABLE

(Rx) orchidectomy

(Rx) orchidopexy

Epididymorchitis

- Mc - organism resp for Epididymorchitis in sexually active male < 35yrs (Chlamydia)
- mc in children, elderly, homosexuals (E. coli) *

(Clf) Burning micturition & pain in inguinoscrotal & low Q. fever

PHREHN sign +ve ✓

cremastic reflex present ✓

cord thickened ✓

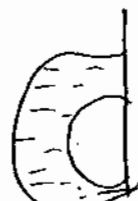
(Doc) (USG) - thickened cord & hydrocoele

- Epididymorchitis - mc cause of 2^o hydrocoele ✓

(Rx) antibiotics & NSAIDS.

Hydrocoele

- Mc - vaginal hydrocoele



collectin of fluid in tunica vaginalis

- Congenital hydrocoele ⇨



- communicates with peritoneal cavity
- Swelling more prom. in standing
- cough impulse present

Rx Herniotomy

Infantile hydrocoele :- processus vaginalis patent upto inguinal canal.
does not communicate with peritoneal cavity.

HYDROCOELE - En bisac - bilocular hydrocoele

- Two sacs communicating with each other near neck of the scrotum

Hydrocoele of cord / hydrocoele of canal of nuck



- cystic swelling remnant of processus vaginalis in relation to cord - hydrocoele of cord / hydrocoele of canal of Nuck



Rx

- Small → Lord's plication of sac
- medium → Jaboulay's eversion of sac
- large → excision

VARICOCELE

- dilated pampiniform plexus of veins
→ located posterior & above testis common in
- Young pts
- Mc cause of reversible atrophy of testis in Adolescents
- It can lead to sub-fertility ✓
- more common on (Lt) side as (hypothesis)

* (Lt) Gonadal vein drains at (Rt) angle into Renal vein

* nut cracker's phenomenon : (Lt) Renal vein compressed b/w aorta & SMA ✓

* Distended Sigmoid colon & fecal matter compress (Lt) Gonadal vein

(Suspicious varicocele) - suggestive of (Rcc) seen in ~~old~~

1) old patients

2) Short H/O

3) (R) Sided

4) does not decompress on lying down

(C/F) swelling in scrotal region which decompress on lying down position & discomfort

- In advanced BAG OF WORMS like on palpation

- Due to rise temp around testis - motility & no. are most severely & most commonly affected parameter

↳ lead to subfertility

(90%) Doppler

Gold standard VENOGRAPHY

(Rx) Indications of surgery

1) Infertility

2) Atrophy of testis

3) Discomfort

4) Recruitment in army / police services

Surgery → HIGH INGUINAL LIGATION of Pampiniform plexus of veins

- After ligation of plexus Venous drainage occurs by the cremasteric veins ***

- Best - MICROVASCULAR SUBLINGUAL LIGATION OF PAMPINIFORM PLEXUS OF VEINS

FOURNIER'S GANGRENE

- idiopathic scrotal gangrene ✓
- type of necrotising fascitis ✓
- characterised by necrotising fascitis involving skin, sup. fascia, deep fascia of perineum
- testis, epididymis, corpora cavernosa, corpora spongiosa is spared - caused by polymicrobial infec. leading to obliterative endarteritis.

Predisposing

- ✓ DM
- ✓ immunocompromised state
- ✓ Anal infections
- ✓ Recent instrumentation

(C/F) Blackish discoloration of perineal skin & Rice water discharge & fetid odour out (Rx) →
 - mortality is 7-70%

(Rx) Surgical debridement of necrosed skin followed by skin grafting to cover exposed testis ✓

Ca. Scrotum

- CHIMNEY SWEEPS CANCER
- 5th - 6th decade
- Mc - Sq. cell carcinoma

(ClF) presents ulcer in scrotum ✓

(90c) - Biopsy ✓

(Rx) - wide local excision - 2cm^{***} margin

- Inguinal nodes involved - mc ✓

ARTERIAL DISORDERS

- Arterial occlusion →
- (P)ain
 - (P)alor
 - (P)ulselessness
 - (P)araesthesia
 - (P)aralysis

Atherosclerosis

- mc cause of arterial occlusion
- 6th to 7th decade
- involve aorta, iliac-A,
- Popliteal & femoral
- lower limb

Berger's

- Exclusively males
- Young < 40yrs
- small and medium sized vessels ✓
- (T)ibial, (P)lantar T.P.e
- (R)adial
- both limbs are involved.

Berger's

- Thrombangitis obliterans
- characterised by chronic inflammation involving Artery, Vein & nerves.
- Segmental disease w skip lesions.

Intermittent
claudication

migratory sup
thrombophlebitis

Grading of Intermittent claudication **BOYDE'S**

(I) - Pain appears at start of walking bt disappears if pt continues to walk

[local metabolism washes substance 'p']

(II) - continues to walk w pain

(III) - Pain compels pt to take rest

(IV) - Resting pain

Ankle brachial index :- Ratio **(0.1-0.4)** - critical limb ischaemia

0.5-0.9 - Intermittent claudication

1-1.2 - Normal

>1.2 - calcified vessels
(DM, ESRD)

Fontain classification for staging of limb ishaemia

I - Asymptomatic

II_A - mild - Intermittent claudication

II_B - mod - Severe Intermittent claudication **III** - rest pain

IV - ulcer / gangrene

Complications :-

→ critical limb ischaemia → ulcer & gangrene.

(90%) 4 limb Angiography w presence of

*** CORK SCREW collaterals

(Rx) (→) Abstinence 4m Smoking

(→) vasodilation (TRENAL - Pentoxifyllin)*** ✓

COMPLAMINA - Xanthinol nicotinate*

(→) lumbar sympathectomy (Rest pain)

(→) Amputation → Gangrene

* Blood supply not ~~adequate~~ supplied of muscle not controlled by sympathetic system. - intermittent claudication so not indicated for lumbar sympathectomy

Indications for lumbar sympathectomy

- Rest pain in Bergers
- Atherosclerosis
- Raynaud's
- Crocyanosis
- Causalgia
- Hyperhydrosis
- Erythro cyanosis
- Frost bite

BARA CHEF

- During lumbar sympathectomy L₁ to L₅, sympathetic ganglia removed. For BLK lumbar sympathectomy, atleast L₁ should to preserved to prevent the RETROGRADE EJACULATION*

Subclavian Steal Syndrome ***

- subclavian A. stenosis - Mc - Atherosclerosis
- Mc → on (lt) side
- mainly involves (1st) part of A.
- In most of the cases of stenosis - Asymptomatic becoz not significant.

(C/F) Visual Abnormalities & ataxia & imbalance.

(Rx) Angioplasty / Resection & Grafting.

Thoracic outlet Syndrome

— misnomer

— Thoracic inlet Syndrome

✓ caused by compression of brachial plexus, subclavian A & subclavian V. at inlet

✓ more common in middle aged females

✓ Dynamic obstruction not the static

✓ Difficult to diagnose by Radiological investigation

Predisposing :-

- ① cervical rib
- ② fibrous band
- ③ Pancoast tumour
- ④ neck hematoma
- ⑤ long transverse process of cervical vertebra.
- ⑥ osteoarthritis

Two forms

- ① Neural — mc — due to compression of C₈, T₁ (Mc — ulnar)
- ② vascular —

→ (C/F) Pain & paraesthesia along inner aspect of forearm & hand & atrophy of hypothenar muscles

✓ Venous - pain, Edema & bluish discoloration

(dx) by provocative tests

- ① Adson's test
- ② costoclavicular test
- ③ hyperabduction test
- ④ Roos test

(Rx) physiotherapy in which shoulder-girdle strengthening exercises

Surgery :- Indications :-

- * no improvement after cons. management
- * appearance sensory motor symptoms due to nerve compression.
- * delayed n-conduction velocity
- * presence of Anat abnormality
- * vascular forms.

ANEURYSM

- Mc cause of most of aneurysms is atherosclerosis except renal artery aneurysm (Medial fibroplasia > Atherosclerosis)

- Mc Site of atherosclerosis & Extracranial aneurysm

⇒ Infra renal Aorta *

(Aorta) > (Iliac) > (Popliteal) > (Femoral) - incidence

Cut off diameter

for aneurysm repair

(5.5cm)

(3.5cm)

(2cm)

(Rest all medium sized also)

↳ S.MA
common hepatic
Splanic
Renal

AIPF

- Mc site of rupture → (Lt) Retroperitoneal
- mortality ass >50%

Pseudoaneurysm — involves only 2 walls of vessel

- mc cause — penetrating trauma
- Generally catheterisation
- Mc-vessel — Femoral Artery **
- During cannulation of hematoma occurs (Rx) Thrombin injection + probe compression.

Mycotic aneurysm — aneurysm + infection

- Mc involved vessel — Femoral A > Aorta **
- Mc organism * Staph aureus > salmonella **

Vascular Graft

Bioprosthetic

- Autograft
- Allograft
- Xenograft
- Tissue-engineered

Synthetic

Textile

- Dacron

non textile

- PTFE (polytetrafluoroethylene)
- polyurethane

- * For supra inguinal Bypass preferred graft is (PTFE) *
- * For infra inguinal Bypass " " (saphenous) *
- ↳ long

VENOUS DISORDERS

DVT

- Virchow's triad
 - ✓ endothelial injury
 - ✓ hypercoagulable state
 - Stasis

DVT prophylaxis :-

mechanical

- ✓ Early ambulation
- ✓ use of pneumatic Compression devices

pharmacological

- ✓ LMWH (most preferred)
- ✓ UPH

* mc veins involved in DVT - calf / soleal veins **

- MC - Site of DVT - Responsible for pulm. embolism

→ Femoro popliteal / thigh veins **

(C/F) crampy pain in the calf region & Edema initially followed by non pitting ass & low grade fever ✓ ↓
pitting

* Homan's Sign :- ↑ resistance to passive dorsiflexion of foot

* Moses Sign :- pain on pressure to calf region

* Pratt Sign :- Pain on squeezing calf region

Phlegmasia Albadolens - painful white leg. caused by DVT. but collaterals are patent

→ cause due to DVT & obstruction of collaterals.

(90c) - Doppler.

(Rx) Start anticoagulants both heparin & warfarin

- heparin given minimum for 5 days

- 3rd day onwards dose adjustment done & INR.

*** Heparin aPTT (1.5-2.0)

warfarin INR (2-3)

Varicose veins

- Dilated elongated tortuous veins > 3mm. in diameter.

- congenital predisposition & occupational Reinforcement is responsible.

Primary

- occupational prolonged standing (surgeon, teacher, Bus conductor, traffic policeman)

Secondary

✓ DVT (mc) *

✓ pelvic mass

✓ pelvic malignancy

Pathophysiology

chronic ambulatory venous HTN

(c/f) dull aching pain (relieved completely by limb elevation / taken rest)

complications :-

* hyperpigmentation

* lipodermatosclerosis

Location typically 1cm above medial malleolus *

BISGARD'S regime for Rx of venous ulcer

- 1) limb elevation
- 2) compression stocking
- 3) massage

Tests

① Brodie's Trendelenberg test :-

① After removal of Tourniquet rapid filling from above
Suggestive of incompetent SFJ

② After application of Tourniquet slow filling from below
Incompetent perforator

2) Morrissey's test :- cough impulse test

3) Schwartz test :- Tapping vein above feeling impulse below

4) Perthes test :- appearance of crampy pain after
application of Esmarch bandage when pt perform
work/Exercise suggestive of DVT

5) modified perthes :- application of tourniquet at sapheno
femoral junctn after work/exercise

6) Fegan's test :- on palpation crescentic defect in fascia
is known as Fegan's test

- ① involved system - long saphenous / short saphenous
- ② SF & SP junction location & incompetence.
- ③ location & incompetence of perforators
- ④ DVT (present/absent)

9n DVT shippings is contraindication

Rx TRENDELENBERG operation :- ***

- ① individual tributaries are ligated
- ② flush ligation SFJ
- ③ Shipping till $\frac{1}{3}$ of leg (lower)

- ① sup. inf. epigastric
- ② sup. circumflex iliac
- ③ sup & deep ext. pudenda

* Mc nerve injured in long saphenous - Saphenous Nerve *
Short saphenous - sural nerve.

< 3mm - SCLEROTHERAPY ** (saphenofemoral incompetence
in normal perforator)

- ① Varices
- ② haemorrhoids
- ③ Varicose veins

Agents :-

- ① Sodium tetradecyl sulphate - *** - Mc
- ② Ethanolamine oleate
- ③ Polidocanol
- ④ 5% phenol & almond oil

Advanced

- Radio freq Ablation
- Endovenous Laser Ablation (EVLA) *

→ In the help of endoscope clip applied over incompetent perforator.

CEAP classification :-

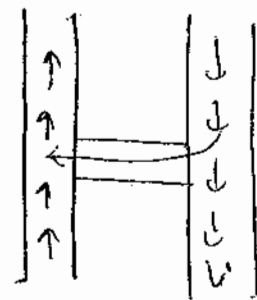
- * (C)linical signs & symptoms
- * (E)tiology
- * (A)natomical distribution
- * (P)athological dysfunction

AV fistula → pulsating varicose veins ***

- Mc congenital *
- mc cause of Acquired AV fistula - penetrating trauma >
gastrogenic **

* ↑ venous return

- ↑ CO
- ↑ HR
- ↑ SBP
- wide pulse pressure
- palpable thrill.
- Arterialisation of vein.



** Nicoladoni-Branham's sign! - on compression of (A) proximal to fistula, palpable thrill disappears, normalisation of CO, SBP, & Bradycardia.

(Dx) Angiography

(Rx) smaller AV fistula - Angiography & embolisation
larger AV fistula - surgical ligation

* A) malformation

* local gigantism

* cutaneous hemangioma

* varicosity

* Absence of deep venous system. ←

- pathological varicosty should not be shipped as

(Rx) - compression stocking.

Kassabach-meritt syndrome ***

* microangiopathic haemolytic anaemia

* consumptive coagulopathy:

* Thrombocytopenia

* platelet trapping

(ASVT)

- Axillary Subclavian Vein thrombosis

(1°)

- paget-shroetter's disease ***



- Repetitive movement in shoulder joint

(2°)

- Presence of endvenous catheter

(C/F)

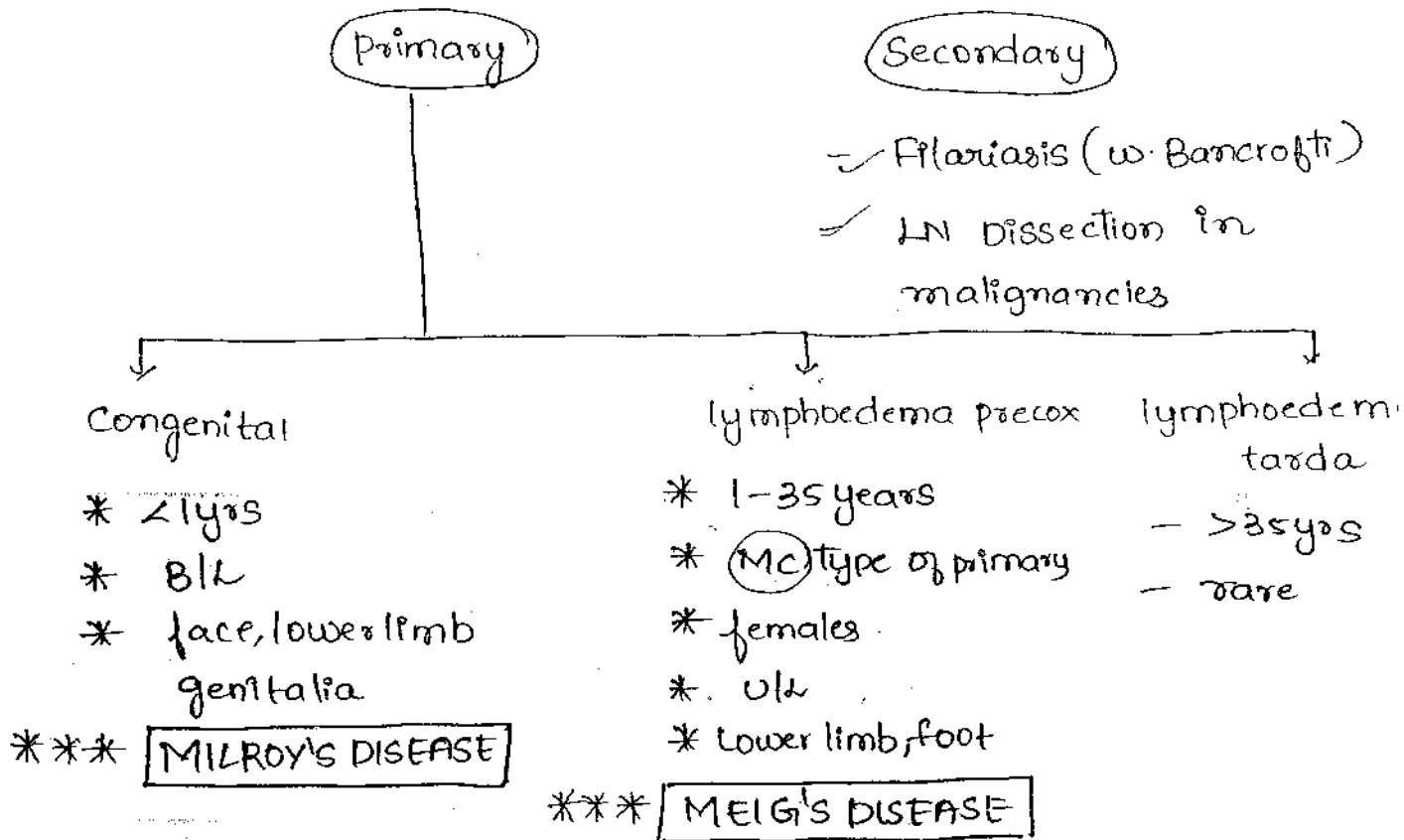
Pain, edema, bluish discoloration

(90c)

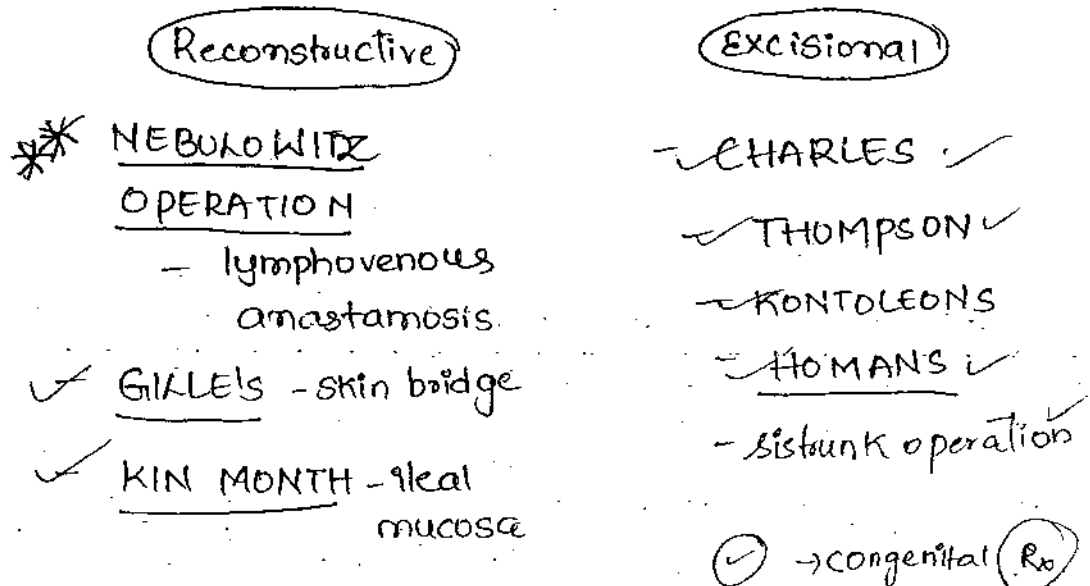
Doppler

(Rx)

Anticoagulants → thrombolytics.



- (Rx)** - Most are managed conservatively by limb elevation
- Use of compression stocking
 - Antibiotics in cases of infection



* subclinical - no edema, on m/e $\rightarrow$ 1 interstitial fluid

Grades ~~I~~ - pitting edema (disappearing on overnight rest) ***

~~II~~ - non pitting edema

~~III~~ - non pitting $\bar{c}$ irreversible skin changes.

BURNS

Indications of referral

* partial thickness burn $> 10\%$ BSA

* full thickness burn.

* Burns involving face, hand, foot, Genitalia

* Inhalational injury

* chemical burn

* electrical burn

* Burn $\bar{c}$ trauma.

* Burn $\bar{c}$ elderly in having comorbidity.

* Burn in children requiring special emotional care

Management

* 2 large bore cannula

* large IV fluids

* For cannulation fore arm/hand veins preferred over leg veins

* If veins are not accessible venous cut-down preferred

over central line ~~insertion~~ insertion

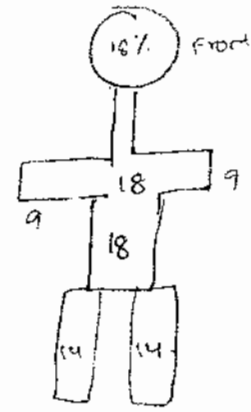
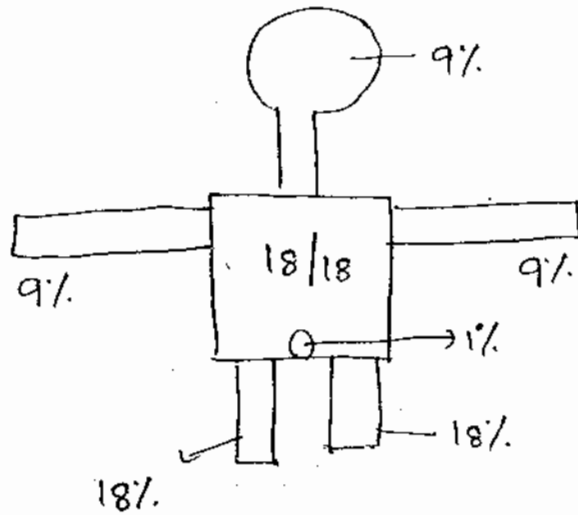
Fluids :-

① (RL)

② Others :- normal saline - human albumin ✓

- FFP

- hypertonic saline ✓



* LUND & BROWDER CHART * * *

→ Estimation of BSA in children

$$\text{Head \& neck} = 21\%$$

$$\text{LL} = 13\%$$

* Rule of palm (For mixed distribution):-

→ 1% of BSA for palms

— For mixed & scalds.

Formulas :-

* * * PARKLAND = $\frac{4\text{ml}}{\text{kg}} \times \% \text{ of BSA (crystalloid)}$ ✓

* * * BROOKE = $\frac{1.5\text{ml}}{\text{kg}} \times \% \text{ of BSA (crystalloid)}$

+ $\frac{0.5\text{ml}}{\text{kg}} \times \% \text{ BSA (colloids)}$ ✓

+ 2 litres of free water (orally) ✓

Galveston :- $5000\text{ml}/\text{m}^2 \text{ of BSA} + 1500\text{ml}/\text{m}^2 \text{ of Body surface area.}$

Required fluid in 24 hrs $\left\{ \begin{array}{l} 1/2 \rightarrow 8 \text{ hrs} \\ 1/2 \rightarrow 16 \text{ hrs} \end{array} \right.$

- Half of fluid required given in 1st (8 hrs)
- rest half in (16 hrs)

* MC cause of early death - hypovolemia / shock

* MC cause of late death - sepsis

* overall mc - death - sepsis

* MC involved / responsible organ for sepsis - Pseudomonas

(Rx) prophylactic systemic Antibiotics are not given

* Topical antimicrobials are preferred

① Silver sulfadiazine

② Silver nitrate

③ mafenolic acetate

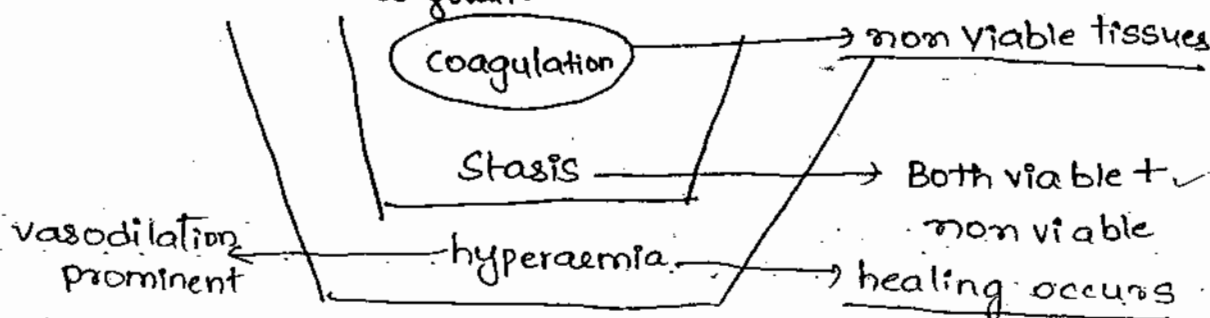
④ Silver sulfadiazine + cerium nitrate

* For cooling of Burnt area - room temperature water *

**

of 15°C used

cool water not used
↓ converts viable to nonviable
coagulation



→ use of cold water converts viable → nonviable

classification

1. (i) → epidermal burns (1st degree)

- characterised by Erythema / Redness (or) blisters

- Very painful heals w/out scarring in 7-10 days

Two types

sup. partial thickness

- ✓ Epidermis + papillary Dermis
- ✓ Painful
- ✓ blisters present
- ✓ heals w/out scarring
- ✓ ~~in~~ 10-14 days

deep partial thickness

- ✓ Epidermis + reticular dermis
- ✓ Painless
- ✓ no blisters
- ✓ Pin-prick Sensation preserved
- ✓ heals w/ scarring
- ✓ in 3-6 weeks

3) 3rd - full thickness burns - Eschar (+)

- * Epidermis + whole dermis
- * characterised by presence of leathery black coloured Eschar
- * painless, no blisters, no pin-prick sensations can lead to compartment syndrome.
- * ↙ For prevention Escharotomy done
- * healing occurs by contracture ***

* Contracture can be avoided by excision of burnt surface & use of skin grafting

4) 4th - involvement of subcut tissue, muscle/boneSKIN GRAFTING

→ Humbeck's knife is used for harvesting skin graft ✓

- ① plasma imbibition
- ② anastomosis
- ③ Revascularisation

①

- upto 48hrs graft receives nutrition through diffusion

②

- In 4-5 days capillaries are aligned.

③

- After 5 days established arterial supply & venous drainage

Causes of graft failure

- ① Shear stress / relative movement
- ② hematoma
- ③ seroma
- ④ Infection

β -haemolytic streptococci - presence is absolute c/I for skin grafting

Skin grafting

Partial thickness

- Thierch graft *
- Epidermis + part of dermis
- large grafts can be taken
- Graft survival - easy
- Donor site heals spontaneously

full thickness graft

- Wolff's *
- Epidermis + whole dermis
- Small grafts taken
- Graft survival - difficult
- Donor site should be closed & sutures / left open to heal

- Contraction in graft is maximum ✓
- poor cosmesis

- ≠ Graft contraction minimal
- Better cosmesis

*** Donor Sites :-

(MC) inner aspect of thigh

- Abdomen
- back
- Inner aspect of forearm / arm

Donor Sites :-

- ✓ upper Eyelid
- ✓ Retroauricular region
- ✓ supraclavicular
- ✓ antecubital
- ✓ Inframammary
- ✓ inguina, Genital, Gluteal

Flap

- partially (or) totally isolated island of tissue & its own blood supply
- used to cover exposed bone, exposed tendon, exposed nerve, irradiated recipient bed.

Random

- ✓ Based on subdermal plexus of vessels
- ✓ used to cover smaller defects
- generally rotation / advancement flap.

axial

- ✓ Based on named vessel

Free

- ✓ Devascularised from ~~recipient bed~~ donor
- Revascularised at recipient bed ✓

*** Cock's peculiar tumour → infected sebaceous cyst of scalp.

* Pilomatixoma - calcifying epithelioma of malherb
- benign hair matrix derived tumour

FirstRanker tumor

www.FirstRanker.com

www.FirstRanker.com

* cylindroma → TURBAN tumour - multiple cylindromas are
 appendage tumour Stacked over each other

ORAL CAVITY

- Risk factors for ca. oral cavity

- ✓ Tobacco
- ✓ Smoking
- ✓ Alcohol
- ✓ Jagged tooth
- ✓ Syphilitic Glossitis
- ✓ Plummer Vinson Syndrome
- ✓ HPV (16, 18, 32, 33)
- ✓ Siderophonic dysphagia (Paterson Kelly syndrome)
- ✓ Chronic hyperplastic candidiasis

Pre malignant - speckled Erythroplakia ✓

↓
Erythroplakia ✓

↓
Leukoplakia ✓

- mc. Site of ca. oral cavity - ca. (tongue) > (lip)

- max. risk of lymph node metastasis - (ca. tongue) ✓
 min " " "

✓ ca. lip > ca. hard palate

- SSC - mc. **

Dx - biopsy

(P_x)

T₁, T₂ → surgery ✓

T₃, T₄ → surgery + RT ✓

* mc. malignancy → (ca. oral cavity)

mc → Buccal mucosa *

- Risk factor for ca. oral cavity
- Seen in asian population due to betel nut chewing
- Pathology :- Formation of fibrous bands in buccal mucosa more common in females.
- (C/F) Trismus / difficulty in opening in mouth.
 - intralesional injection of steroids / Excision of fibrous bands → Grafting.

Level of lymph nodes in cervical region

- * 1a - Submental
- 1b - Submandibular
- 2,3,4 - upper, middle, & lower jugular
- 5 - post. Ole
- 6 - Ant. compartmental / central
- 7 - Superior mediastinal.

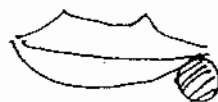
* Virchow nodes are included in level (4)

- * (RND) - Radical neck dissection
 - Removal of level I & level 5
 - Removal of Sternocleidomastoid, 9th Gth, Spinal accessory N

- (MRND) → I - V lymph nodes +
 - preservation of one of the following
 - * Sternocleidomastoid
 - * 9th Gth
 - * Spinal accessory

Generally all are preserved

Ca. lip - Mc site vermillion border of lower lip



- males, 5th-6th decade
- ulceroproliferative growth
- (dx) ex biopsy

Mc → I_A & I_B ***

T₁ T₂ Surgery only

* 9/10 length of tumour $\leq$ 1/3 of lip - 'V' (or) 'W' shaped Excision.

9/10 Tumour > 1/3 of lip → ABBE ESTANDER'S FLAP

T₃ T₄ - Surgery + RT

(cross lip flap)
→ sup. labial A **

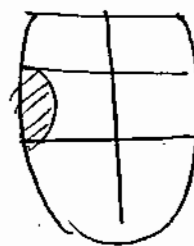
Ca. Tongue

→ mc site - lat border of middle 1/3 of tongue

- (Hx) presents w ulcer

- foul smelling discharge

- intolerance to hot & spicy food.



(ant. 2/3rd)

- level 2 nodes.

(dx) - Biopsy

(Rx) T₁ - partial glossectomy

T₂ - hemiglossectomy

T₃ - Total glossectomy + RT.

T₄ - Total glossectomy + hemimandibulectomy +

→ infiltrating to the floor of mouth. ✓

Steps :-

- ✓ Total glossectomy +
- ✓ hemimandibulectomy +
- ✓ Radical neck dissection +
- ✓ Resection of floor of mouth

→ not permed now.

Ca. Buccal mucosa — cheek

→ mc cause of ca. oral cavity

— caused by use of Tobacco leaves mixed w lime ***

(dx) — Biopsy

(Rx) — T₁ T₂ — Surgery.

T₃, T₄ — Surgery + RT.

** MC flap for reconstruction

— Pectoralis major myocutaneous flap

— In males — forehead flap based on sup. temporal A.

In (F) — Deltopectoral flap based on int. mammary artery.

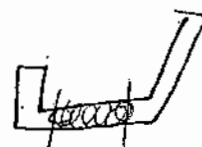
Mandibulectomy

marginal



— excision of inner aspect of mandible along vertical plane

Segmental



— Removal of one segment of mandible

— continuity maintained

Indications :- tumour abutting
(or) touching
periosteum of
mandible.

— continuity lost

— restored by metallic
plates/screws/fibula

Indication :- invasion of
periosteum of mandible ✓
* invasion of mandibular
foramen ✓
* invasion of medullary
space of mandible ✓
* involvement of the
occlusal surface of mandible
in Edentulous patients ✓

SALIVARY GLAND

	Benign	malignant
Parotid	75	25
Sublingual &	50	50
Submandibular		
minor salivary gland	25	75

Pleomorphic adenoma

— mc Benign tumour of children — hemangioma

Adults → pleomorphic adenoma

malignant in both child → mucoepidermoid
& Adult

mc malignant of minor salivary — Adenoid cystic
gland Carcinoma

PAROTID *

** parotid is most common in all tumours Except adenoid
cystic like

* Pleomorphic adenoma

* Warthin tumour → Exclusive in parotid

* mucoepidermoid

* acinic cell → Exclusive in parotid

* lymphoma * metastasis

→ All Salivary gland tumours & thyroid related are common in females Except Warthin - males.

Pleomorphic Adenoma

- mixed Tumour, slow growing lobular, Firm & capsulated

- origin is both Epithelial & mesenchymal

- mc site is parotid, also in S.M & S.L gland

appearance :- Finger like projections (or) pseudopodia *

- Enucleation is C/I becoz pseudopodia are resp. for recurrence



(C/F) * Swelling in parotid region located in front, below & behind Ear lobule pushing it up.

* c out involvement of LN / FN.

(900) FNAC

(Rx) superficial parotidectomy

incision.

① lazy 'S' ② assistant ③ modified Blair's ***

Warthin's

- Papillary cystadenoma lymphomatousum

- also known as Adenolymphoma **

- Benign tumour, exclusively seen in parotid

 - Double lining of Epithelium ***

Tc - pectechmate scan - hot spot ***

* males, smoker

(dx) FNAC

(Rx) superficial parotidectomy

Mucoepidermoid ca.

- mc radiation induced neoplasm of parotid
- mucin secreting cells & Epidermal Component
- clear cell & hydropic cell

low grade

- mucin secreting
- children

(Rx) Sup or total parotidectomy

~~low~~ - Hig grade

- Epidermal component
- Adults

(Rx) Total parotidectomy + MRND

Adenoid cystic ca. *****

- Mc site hard palate > sinonasal tract
- mc type - Type 1 (CRIBIFORM VARIETY)
 ↓
 Swiss cheese appearance

- Peculiar property of PERINEURAL INVASION *

↓
 VII > V nerve

(Rx)

* Haversian system of long bones are involved

- Mc - Site of metastasis - LUNGS **

(Dx) - FNAC ✓

for staging - MRI ✓

(Rx) Wide local excision + skull base (Rr)

Complications :-

* Frey's Syndrome - Gustatory sweating / Auriculotemporal Syndrome

- mc. injured nerve in Frey's

Syndrome - Auriculotemporal N.

- Aberrant cross innervation b/w parasympathetic fibres & secretomotor fibres of Auriculotemp N (fused)

- Sympathetic fibres - sweating during eating ^{greater} auricular N ***

(dx) → minor's starch iodine test

(Rx) → Anti-perspirants, Botulinum toxin, Aluminium chloride non-responding - Tympanic neurectomy.

* Parotid fistula

- Ext. parotid fistula

causes :- penetrating trauma

Biopsy

✓ Ild of parotid abscess

✓ Surgical damage of duct

(C/F) skin excoriation around pinpoint opening in cheek region

(dx) Sialography (C/I in acute parotitis)

SIALOLITHIASIS

→ Mc - submandibular gland due to viscid secretions & tortuous course of Watson duct hooked by Lingual nerve
** ** **

(+) Pain in upper part of neck during meals
composition → Ca/mg-bicarbonate/phosphate
Mc → CaHCO₃ *

(Rx) stone in duct - incision over duct & Removal
Gland - SM gland excision
↓
Mc nerve injured
*** lingual > hypoglossal

Ranula

→ It is both Retention & extravasation cyst
- mc - Extravasation cyst
- Mc - (S/L) gland ***
- Resembles - FROG'S BELLY **

(Rx) Marsupialisation
For recurrence - Excision (injury to submandibular duct)

Plunging Ranula :- Ranula + cervical Extension

→ Facial (N) Sacrificed during parotid surgery ** ✓

→ incidence of CL & CP - 1 in 600 ✓ * - 45%.

Isolate CP = 1 in 1000. - 40%.

CL = - 15%.

- common on (L) side

Risk factors :- H/o intake of phenytoin & Diazepam by mother

* Abnormality in fusion of maxillary & median nasal process

→ cleft lip ✓

Repair * Repair first isolated cleft lip - 5 to 6 months

*** * Isolated cleft palate - (Ass. w/ hearing loss) **

* Soft - palate - 5 to 6 months

* hard - palate - 15 to 18 months

* cleft lip + palate ⇒ cleft lip + soft - 5 to 6 months
palate

cleft hard palate - 15 to 18 months

* MILLARD RAT (Rotation & Advancement technique) - cleft lip

* THOMSON

* LE MUSERIERS

* Tennison Rendall

} cleft lip (All stitches are removed on 7th day) *

NECK

Carotid body tumour → arises from chemoreceptor cells
Rarely metastasize.

→ chemodectoma

- non-chromaffin paraganglioma

- * Mc in patients staying in hilly area due to chronic hypoxia
- 10% having +ve family H/O

(C/F) pts presents $\bar{c}$ pulsatile painless mass in carotid region

- It is a compressible swelling

(dx) vascular swelling both Bx & FNAC (C/I)

(Doc) - Angiography $\rightarrow$ LYRE's sign **** 

SCHAMBLIN CLASSIFICATION USED **

- 5th to 6th decade.

(Rx) Size > 3cm - Embolisation $\bar{c}$ Angiography ✓

Size > 5cm - Excision $\bar{c}$ grafting ✓

Cystic hygroma

$\rightarrow$ cystic swelling

- Mc - post. D/c of neck.
- due to Aberrant extravasation / non-canalisation of jugular sacs $\bar{c}$ main lymphatic system.
- Brilliantly transilluminant.
- ASS $\bar{c}$ Turner's Syndrome.
- In some children - After birth
- Property of Spontaneous Regression

(dx) (Doc) For preoperative planning - (MRI) **

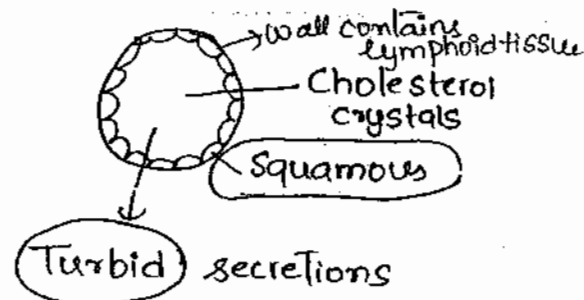
(Rx) - Surgical excision *

* PICIBAMIL (OK-432) (derived from step. pyogenes)

Branchial abnormalities

- Branchial sinus / fistula - Mc - infants / young children ✓
- Branchial cyst - mc in older children / Adults ✓

Branchial cyst



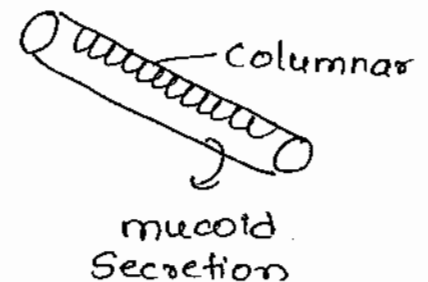
- located in upper part of neck in relation to upper 1/3 of sterno cleidomastoid *

(dx) FNAC & USG

(Rx) Excision ✓

→ Arises from 2nd brachial cleft

Branchial fistula



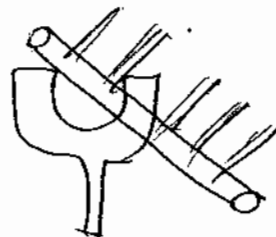
- located :-

Ex. opening → lower 1/3 of neck near ant. border of sterno cleidomastoid

Int. opening - Tonsillar fossa behind post. faucial pillar

* FISTULA → when int opening not seen - SINUS :- ✓

(Rx) Excision of fistula & multiple incisions in step-ladder pattern



BREAST

* Mc Bloody nipple discharge — Duct papilloma (Mc) **
Duct Ectasia
Carcinoma

* Mc cause of Serous discharge → Fibrocystic disease
Duct Ectasia
Carcinoma

* greenish/blacking/grossous pultaceous discharge
 — seen in duct Ectasia

✓ most pts w/ nipple discharge are having benign disorders

✓ (F) pts w/ bloody nipple discharge coming from
 Single duct associated w/ a mass is highly suggestive of
 malignancy.

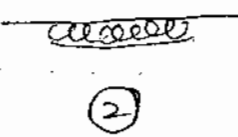
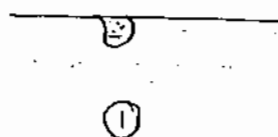
— 1^o indication for ductography

= Blood discharge w/ out a mass.

① On Ductography single intraluminal filling defect — papilloma

② multiple " " " — Carcinoma

③ Dilated duct — Ectasia



(Rx) Excision of
 involved duct only
 microdochectomy
 * Radical duct Excision
 not done

(Rx) HADFIELD
OPERATION
 — conical Excision
 of involved duct

Risk factors

- ✓ Advancing age
- ✓ Alcohol
- ✓ hyperestrogenemia
- ✓ late menopause
- ✓ late 1st full term pregnancy
- ✓ Genetic factors (BRCA-1, BRCA-2, personal H/O of ovarian & endometrial cancer)
- ✓ HRT
- ✓ high socioeconomic status
- ✓ obesity (high fat intake)
- ✓ Early menarche
- ✓ multiparity
- ✓ +ve family H/O
- ↓ Breast feeding,
- Therapeutic radiation exposure

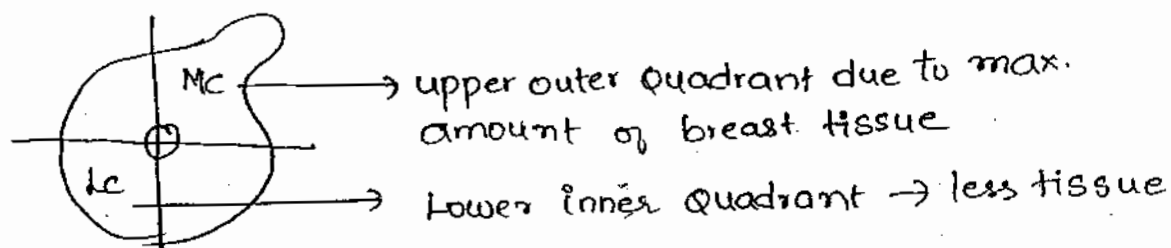
*** OCP's & Smoking not the risk factors.

* Estrogen + progesterone containing HRT risk factor for CA breast

* MC malignancy of females - worldwide

* MC malignancy of urban females in India

MC — Adenocarcinoma, subtype — Invasive ductal ca.



MC site of metastasis bone :- (Lumbar > Femur > Thoracic vertebra)

* MC cause of death — malignant pleural effusion ***

* CA Breast is the MC malign. responsible for both osteoblastic & osteolytic secondaries in females

- In a (F) pt of age >40yrs presenting w/ bloody nipple discharge coming from single duct ass w/ mass is highly suggestive of Ca breast
- In Advanced cases nipple retraction/deviation/ulceration w/ architectural distortion & loss of symmetry
- Edema/ Pseud' Orange.

TRIPLE ASSESSMENT ***

Composed of

- (1) Clinical Signs & Symptoms
- (2) Radiological investigations
mammography / USG
- (3) Pathological investigation
FNAC / Biopsy

(+ve) predictive value
= 99.9% **

* First inv done in suspected case — FNAC ✓

(90%) = Biopsy **

FNAC

Biopsy

* 22-26 Gauge
needle (25)

* Trucut / Corecut /
needle biopsy

- Exp. cytopathologist
is required

- Difficult to differentiate
Ca. insitu from invasive
ductal cancer becoz

- Easily differentiate
Ca. insitu from
invasive ductal Ca.

not present

- Difficult to assess hormone receptors status

- HR status assessed Easily

Mammography

- Screening (9bc) for Breast ca ✓
- Should be started at 40 yrs ✓
- Annual mammography recommended of all females of 40 yrs of age
- 0.1 c. Gray / study
- 1 mammography = 4 chest X-ray
- low dose radiation exposure - it does not ↑ risk of ca Breast
- CranioCaudal view - medial aspect of breast & breast Compression
- Mediolat oblique view - max. amount of breast tissue & axillary tail ✓
- * diagnosing ca. in Early / non palpable stage. It is assoc. $\bar{c} > 33\%$ improvement in survival
decrease in mortality $> 33\%$.

Benign

opacity:-

- ✓ regular margins
- ✓ homogenous
- ✓ low density
- ✓ Thin halo



malignant

- ✓ irregular margin / stellate, spiculate, comet tail *
- ✓ heterogenous
- ✓ high density
- ✓ Wide halo

Associated changes
are absent

Present

- ✓ nipple retraction
- ✓ nipple deviation
- ✓ skin thickening
- ✓ obliteration of axillary space.

BIRAD'S score

— Breast imaging reporting & data system

0 — incomplete assessment, other invest. is Required.

1 — negative, Annual mammography recommended.

2 — Benign, Annual mammography recommended

3 — probably benign, short term follow up.

4 — Suspicious — Biopsy is recommended

5 — highly suggestive, intervention should be done

6 — Biopsy proven malignancy.

— First investigation done in a female < 35 yrs is a mass is USG.

* MC presentation of DCIS is microcalcification ✓

* MRI is having poor sensitivity for dx of calcification

* microcalcification detected easily by mammography so better than MRI for DCIS **

Indications of MRI

— gnoc for screening of breast ca in high risk females
(having + Family Hlo / BRCA-4 mutat)

PET Scan

- differentiates recurrence/metastasis from fibrosis/scarring **✓

7th AJCC TNM classification of ca. breast

(T₁) - upto 2cm

(T₂) ⇒ 2-5cm

(T₃) - >5cm

(T_{4a}) - Extension to chest wall

(Chest wall is composed of ribs + intercostal muscles + serratus anterior)

(T_{4b}) - Skin changes (ulceration, satellite nodules, edema & peau d'orange)

(T_{4c}) - T_{4a} + T_{4b}

(T_{4d}) - Inflammatory breast ca.

(N₁) - involvement of ipsilat. Axillary LN - mobile

(N_{2a}) - involvement of ipsilat Axillary LN - fixed & matted

(N_{2b}) - involvement of clinically apparent internal mammary LN

(N_{3a}) - involvement of infraclavicular LN ✓

(N_{3b}) - involvement of axillary + int. mammary LN ✓

(N_{3c}) - involvement of supraclavicular ✓

(M₀) - no metastasis ✓

(M₁) - metastasis ✓

Stage I = T_1 (1)

IIA = $T_{0-1} N_1$ (2)
 T_2

IIB = $T_2 N_1$ (3)
 T_3

IIIA = $T_{0-2} N_2$ (4)
 $T_3 N_{1-2}$

IIIB = T_4, N_{0-2}

IIIC = $T_{any} M_3$

IV = $T_{any} N_{any} M_1$

Management

① Early invasive breast cancer:-

(I, IIA, IIB)

① * Breast cons. Surgery + Sentinel LN Biopsy + RT
alternative → simple / total mastectomy + axillary LN sampling

*** indications of chemotherapy :-

* Size of tumour > 1cm

* LN is (+ve)

* Size > 0.5cm, LN (+ve) & adverse prognostic factors:-

- ✓ high histological grade
- ✓ lymphovascular invasion
- ✓ ER PR (-ve)
- ✓ her-2-neu (+ve)

— neoadjuvant chemotherapy + (MRM) + RT

3) metastatic breast cancer (IV) :-

Principle :- prolonged survival improve the quality of life

Hormonal therapy — less Side Effective

Hormone therapy

- ① ER/PR (+ve)
- ② Asymptomatic visceral metastasis
- ③ Bony / soft Tissue metastasis

Chemotherapy

- ① ER/PR (+ve)
- ② symptomatic visceral metastasis
- ③ Hormone refractory (after 3 cycles)

Radiotherapy

→ Breast conservation surgery

→ LABC

✓ +ve margin ✓

— ④ > more lymph nodes (+ve) ***

*** metastatic Breast ca. ER/PR (+ve) & symptomatic visceral metastasis

preferred → chemotherapy

chemotherapy

* CAF ***

~~CAF~~ — not preferred

— cyclophosphamide, methotrexate, 5-FU

CAF - most preferred

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- Cyclophosphamide Adriamycin, 5-FU

↳ Anthracycline derivative

* Adriamycin resistance → TAXANES

*** Docitaxel / Paclitaxel - given

* IXABEPILON → given in pt of Breast ca. given to both resistance of adriamycin & taxanes

* LAPATINIB :: 2nd line for her-2-neu (+ve) ca.

* SUNITINIB :: ① Imatinib resistant GIST

② Advanced & metastatic RCC

③ Refractory metastatic breast cancer

trastuzumab
→ single therapy
for her-2-neu (+ve)

Hormonal therapy

① ovarian ablation:-

✓ B/L oophorectomy ✓

✓ LHRH agonist (Goserelin, Leuprolide) ✓

② SERM :- (Tamoxifen, Raloxifen) ✓

③ Aromatase inhibitors

✓ non-steroidal → Letrozole, Anastrozole ✓

✓ Steroidal → Exemestane ✓

④ Antiestrogens

✓ Fulvestrant ✓

⑤ Progestins :- megestrol

medoxy progesterone acetate

* In both premenopausal & post menopausal patients

(Doc) for hormone therapy - Tamoxifen **

= 10mg 100 - sys

* aromatase inhibitors - only in post menopausal

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Side Effects - ↓ BMD → osteoporosis / lytic fracture

* Tamoxifen - MC Side Effect - Hot flushes **

- ✓ Irregular vag. Bleeding ✓
- ✓ Thromboembolic complication ✓
- ✓ lenticular opacity (Cataract) ** ✓
- ✓ ↑ risk of endometrial ca ✓

Mastectomy

- levels of lymph node in relation to pectoralis minor **

(level)	(location)	(Groups)
I	Below & lateral to pect. minor	✓ Anterior ✓ Posterior ✓ lateral
II	Behind pectoralis minor	✓ central ✓ inter pectoral <u>(ROTTERS)</u> *
III	medial & above pectoralis minor	✓ Apical.

Types

① Simple/ Total mastectomy :-

- En bloc removal of nipple, areola skin, breast tissue, breast mass

Extended mastectomy:-

→ Simple + Removal of level I (LN)

→ nipple + areola + skin + Breast tissue + mass +
level I + level II lymph nodes

HALSTED Radical mastectomy

→ MRM + level III + pectoralis major & minor

(A) xillary vein
(B) Brachial plexus
(C) Cephalic vein } Preserved

Extended Radical mastectomy

— Radical + Removal of Int. mammary LN.

Super radical :-

→ Radical + (S)upraclavicular
(I)nt. mammary } lymph nodes
(M)ediastinal

Complications of mastectomy

- 1) Seroma — Mc complication in 30% pts *** ✓
- 2) Flap/necrosis (or) wound infection ✓
- 3) Injury to nerves * → 1) long thoracic N
2) thoracodorsal N
- 4) Persistent axillary pad fat
- 5) lymphoedema

Radiotherapy → STEWART-TREVES SYNDROME ****

→ any duration b/w RT & angiosarcoma = 10 yrs

(C/F) worsening of lymphoedema & severe pain & violet colour nodules over skin

(dx) Biopsy

(Rx) FORE-QUARTER AMPUTATION (disarticulation of limb at shoulder)

Breast Reconstruction

Transverse Rectus Abdominis

Autogenous

- 1) TRAM FLAP** MC
- 2) latissimus dorsi flap
- 3) Thoraco Epigastric flap
- 4) lat. thigh flap
- 5) Gluteal flap
- 6) Reubens flap (deep circumflex iliac A)

Alloplastic

- 1) silicon jelly implants
- 2) silicon implants & saline refill.

combined

- 1) Tram flap + implant
- 2) LD flap + implant

— Best***

Alloplastic ∴ implants are placed beneath pectoralis major***

— complications — capsular tear/contracture

(dx) by MRI

* Prognostic factors

→ most imp factor

(Stage) >> Axillary LN status **

→ metastatic breast ca : most imp prognostic factor is

* ER/PR status.

- BLOOM-RICHARDSON GRADING

- * T - Tubule formation
- N - nuclear pleomorphism
- M - mitosis.

- NOTTINGHAM PROGNOSTIC INDEX:-

$$NPI = (0.2 \times \text{tumour size}) + \text{LN stage} + \text{tumour grade}$$

- used to select patients for adjuvant treatment

Classifications ***

- CHANG → medulloblastoma
- MASOKA → Thymoma
- NOGUCHI → Adeno ca. lung
- REISS & ELLSWORTH → } Retinoblastoma
(or)
- ESSON PROGNOSTIC INDEX

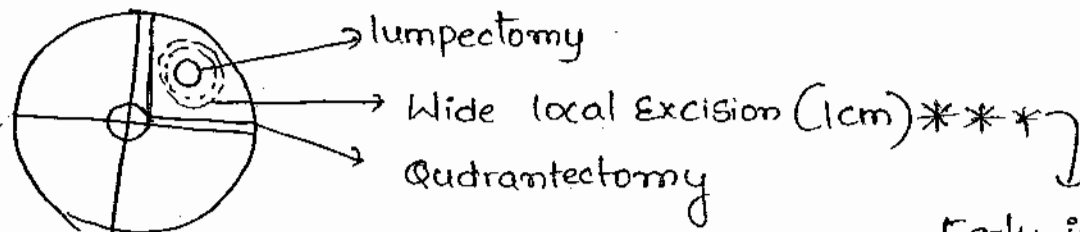
- SULLIVAN MODIFICATION - Adrenocortical ca.

OF McFEELEN E SYSTEM

- DUKES - colorectal ca.
- MEVIN - ca. GB
- JACKSON - ca. penis
- Robson - ca. kidney (Rcc)
- GLEASON - ca. prostate.

- 1) ROTTERS → Interopectoral - co. breast ✓
- 2) ROUVIER → Retropharyngeal - naso pharyngeal ca ✓
- 3) DELPHIAN → pretracheal/
prelaryngeal ✓
- 4) LN OF LUND → callot's Δ ✓
- 5) CLOUQUET → Femoral canal ✓
- 6) KRAUSE → Jugular fossa ✓
- 7) IRLSCH → (L) axillary N ✓
- 8) SISTER MARY JOSEPH → periumbilical metastatic deposits ✓
- 9) VIRCHOW'S - supraclavicular ✓

Breast conservation surgery



(C/I)

Absolute

Early invasive
disease. *

Relative

- 1) Pregnancy
- 2) 2 or > 2 tumours
in different quadrants
or diffuse appearing
microcalcifications
- 3) persistently (+ve)
margins
- 4) Therapeutic Radiation
exposure

- 1) H/o collagen vascular
disease like scleroderma
& Active lupus
Erythematosus
- 2) more than 1 tumour
in same quadrant
or indeterminate
calcification
- 3) large pendulous
Breast
- 4) large tumour in
small breast.

Inflammatory Breast cancer

mastitis carcinomatosa

($T_{4b} \equiv III_b \equiv LABC$)

- Characterised by inflammatory changes in breast skin involving $> 33\%$ of breast skin
- Redness/Erythema, Brawdy induration & Early onset of the 'peau d'orange'.
- Early permeation of lymphatics by tumour cells

✓ (C/F) most malignant type of breast cancer

- ✓ Presence of lump not mandatory (also in Paget's disease of nipple)
- ✓ $> 75\%$ pts present & axillary LN involvement ✓
- ✓ $> 25\%$ pts present & distant metastasis ✓
- ✓ diagnosed by biopsy *

(Rx) Neoadjuvant chemotherapy + MRM + RT

- multimodality (Rx) & 5-years survival - 30%.

Male breast cancer

- Responsible for (1%) Breast Cancer.
- 5th - 6th decade.
- only ductal carcinoma ✓
- MC type - invasive ductal carcinoma ✓
- ER/PR +ve $\rightarrow 80\%$ ✓
- Her-2-neu - +ve - 25% ✓

⊖ State of hyperestrogenemia

⊖ cirrhosis

⊖ chronic liver disease

⊖ undescended testis

⊖ Klinefelter Syndrome

⊖ Androgen insensitivity Syndrome

⊖ Testicular feminisation Syndrome

- In 20% case Breast cancer preceded by Gynecomastia.
but it is not a risk factor for ca. breast**✓

Ⓢ Mc-presentation is breast lump.

- Due to scanty breast tissue early involvement of nipple & chest wall.

- pt may present w/ Erosion of nipple

Ⓢ biopsy

* Stage / Stage (Rx) & prognosis is similar to female except that in males simple mastectomy done in place of Breast conservation Surgery.

CYSTOSARCOMA PHYLLODES

⊖ Phyllodes tumour ✓

⊖ Serocystic disease of the breasts ✓

⊖ Type of Sarcoma ✓

⊖ origin is mesenchymal

⊖ Benign, Borderline / malignant

- Seen in 5th to 6th decade

* ↑ risk of haemorrhage & necrosis in the tumour. ✓

→ skin is multicoloured - VARIGATE appearance *** ✓

(C/F) affected breast is massively enlarged & bossellated appearance having both solid & cystic areas & varigate appearance of skin.

3 are not involved

→ lymph nodes
 ✓ nipple
 ✓ chestwall

} so tumour mobile

* (No) nipple retraction, deviation, ulceration.

Mc - Site - metastasis (lungs) ***

(90c) - Biopsy

(Rx) *** Benign cases - WIDE LOCAL EXCISION
 malignant - simple mastectomy.
 appearing

*** MRM should not be done (not ass & LN involvement)

Sarcomas & lymphatic & hematogenous spread.

Malignant fibrous histiocytoma (sarcom)

Angiosarcoma.

Rhabdomyosarcoma

Clear cell sarcoma

Epithelial sarcoma

Synovial.

- Benign, Young, (16-25) yrs
- Mobile, Breast mouse *

(C/F) mobile lump

(90%) FNAC

(Rx) No treatment

Excision is done for cosmetic reasons.

Mammography - POP CORN CALCIFICATION *** ✓

MONDOR'S disease

- Thrombophlebitis of Superficial, Inframammary veins
- Veins: Kat thoracic
Thoraco epigastric] *** ✓
- STRING phlebitis (thrombosed vein appears as cord) ✓

(Rx) NSAIDS + Breast support? ✓

Non responding - Excision

ZUSKA'S disease

- Recurrent periductal mastitis
- Smokers
- presents + repeated Breast abscess

(Rx) I/D + antibiotics

* Risk of Breast ca. in BRCA1 mutation = 60-80%

*** risk in ovarian cancer = 20-40%

Males - Breast ca - ass + - BRCA2 ✓

(17)

(18) chromosome

* Early age of onset ✓

* B/L ✓

* mc type - invasive ductal ca ✓

- poorly differentiated

- Well differentiated

ER/PR (-)

ER/PR (+ve)

- poor prognosis

- Ovary

- Colon

- Prostate

- Ocp + GSM

↓
Pancreas, Gallbladder,
malignant melanoma

Luminal criteria

- LUM 'A' → ER(+), PR(+), Her-2-neu(-)

- LUM 'B' → Triple (+ve) (ER, PR, Her-2-neu(+))

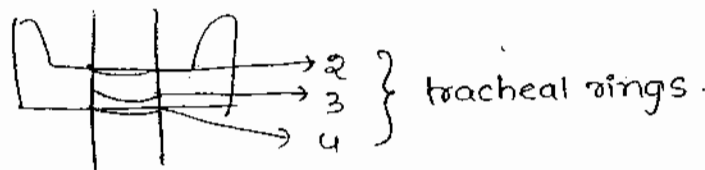
- Basal cell type - Triple (-ve) but (+ve) for myoepithelial markers CK-5, CK-16, CK-17.

- Her-2 neu type - ER(-), PR(-), Her-2 neu(+)

15
16
17

- Shape - Shield ** shaped

- wt = 20-25gms, Daily iodine requirement - 100-150 μ g/day
pregnancy (250 μ) ** ✓



- Size of thyroid $\propto$ iodine intake

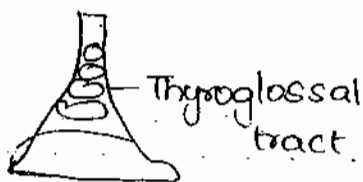
- Father of thyroid surgery $\rightarrow$ THEODOR KOCHER **

* { Wolff-Chaikoff - iodine induced hypothyroidism
Jod-Basedow - iodine induced hyperthyroidism JE

Pendred Syndrome :- congenital hypothyroidism + sensineural
hearing loss due to mut. of sulphate transport protein
gene on (7q) *** (7q)

Tyroglossal cyst 10.

- 10-15 yrs - mc



* MC - SUBHYOID

* others are - suprahyoid

- near thyroid cartilage
- foramen caecum
- floor of mouth

(C/F) midline swelling in neck moving $\bar{c}$ deglutition
moves up on protrusion of tongue

Complications :-

- 1) infection
- 2) abscess

(Rx) SISTRUNK operation *

Centric removal of cyst + central
portion/body of hyoid

4) ↑ risk of papillary ca. of thyroid.

Thyroglossal fistula

- Acquired

(Rx) SISTRUNK operation + excision of fistula tract ***

GOITER

- Endemic goitre when >5% pop. has goitre ✓

- Mc solitary thyroid nodule

*** Colloid > Follicular Adenoma

Retrosternal / substernal / mediastinal goitre

- when >50% goitre located below neck

(C/F) initially asymptomatic

↓

Stridor in night

↓

dyspnoea, dysphagia, hoarseness
of voice

↓

dilated veins over ant. chest wall

↓

* Pemberton Sign +ve

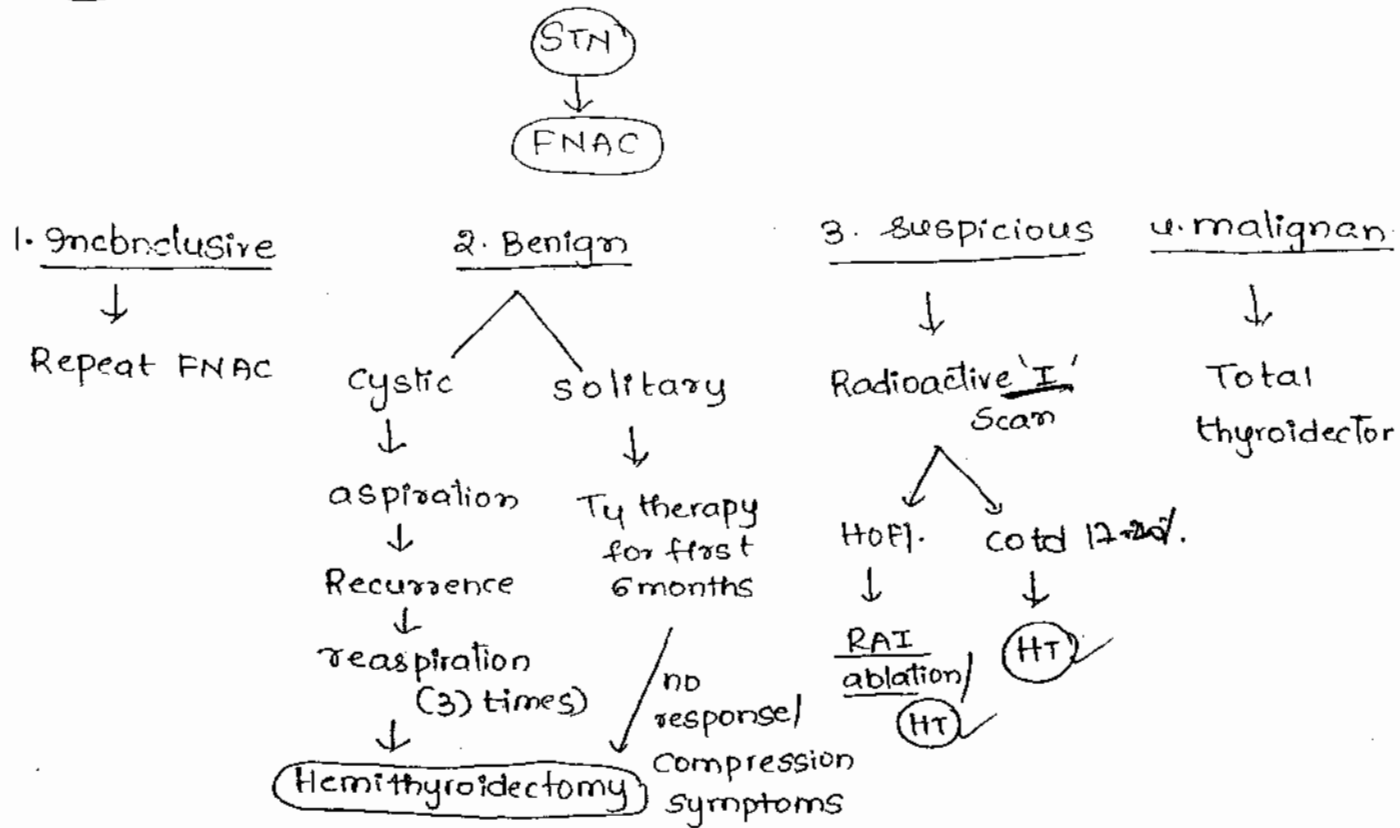
↳ Elevation of U/L above forehead, facial congestion

& puffiness.

(Rx) Excision done by cervical incision.

- 1st investigation - Solitary thyroid nodule - TFT
- most useful invest. TSH ***, which can Δ se subclinical hypo/hyper due to ultrasensitivity of TSH

90c $\rightarrow$ FNAC



* Risk of malignancy in cold nodule = 17-20% $\uparrow\uparrow$
Hot nodule = 1-3%

* I¹²³ - $\frac{1}{2}$ life = 13 hrs - RAI Scan

* I¹³¹ - $\frac{1}{2}$ life = 8 days - RAI ablation

RAI ablation :-

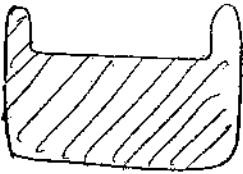
* I¹³¹ - β rays + γ rays
(90%) (10%)
 $\downarrow$ $\downarrow$
Responsible for therapeutic effect Tracer studies (used)

(depth of penetration = 0.5 mm) **

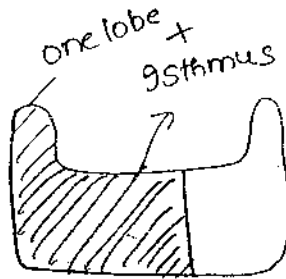
* Absolute (C/I) are

- 1) pregnancy
- 2) lactation.

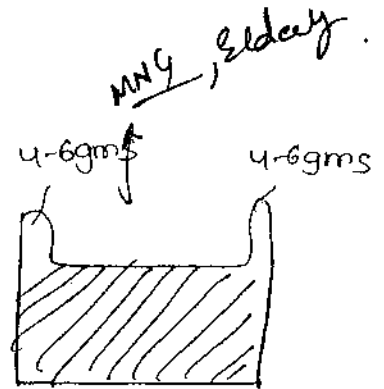
Types of thyroidectomy



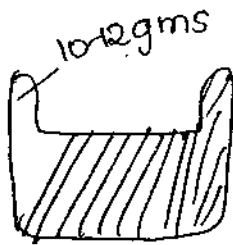
Total



hemithyroidectomy



sub total thyroidectomy



** HARTLEY DUNHILL
OPERATION

leaving small remnant
in tracheo oesophageal groove

Near total

- * In patients of multinodular goitre delayed recurrence after 20-30 yrs occurs after sub total thyroidectomy
- So total thyroidectomy preferred in these pts

- * only indication subtotal thyroidectomy - multinodular goitre in elderly patients ✓

GRAVES DISEASE

- ✓ Diffuse toxic goitre
- ✓ Autoimmune disorder
- Thyroid stimulating (Ab) against TSH receptors
- ASS. E HLA - (B-8/DR3)
- females

- 1) Thyrotoxicosis
- 2) Ophthalmopathy / Exophthalmos
- 3) Dermopathy / Pretibial myxoedema
- 4) Thyroid Acropathy
(sub periosteal new bone formation in metacarpals)
- 5) Gynecomastia.

(C/F) Thyroid stimulation symptoms

- * ↑ BMR → ↑ appetite but wt loss
- * heat intolerance
- * Excessive sweating

Sympathetic stimulation → Fine tremors (fingers & tongue) **
 ✓ Tachycardia
 ✓ Palpitations
 ✓ Lack of sleep & mental irritability ✓

- CNS symptoms more common in Young patients ✓
- CVS symptoms - predominant in elderly ✓ AF & CHF
- in females - Amenorrhoea
 ✓ ↑ risk of Abortion
 Infertility

in children - Early growth & maturation

MC - (GI) - diarrhoea *

* Thyroid is hypervascular :- (upper pole)

Signs :- Audible bruit *
 Venous hum *
 Palpable thrill * (systolic)

*** * presents ~~on~~ Eye signs - diagnostic.

* Presence of TSAb are also diagnostic.

* ↑ sed radioactive iodine uptake in pts of hyper thyroidism → highly suggestive Graves

(Rx) Propranolol for sympathetic stimulation

Antithyroid drugs → methimazole, carbimazole, propyl-thiouracil.

*** propyl thiouracil blocks peripheral conversion of T_4 - T_3 & ass $\bar{c}$ minimal placental transfer. So preferred during pregnancy.

(Amiodarone

(Propranolol

(Propylthiouracil

(Steroids

} Blocks peripheral conversion

- After Antithyroid drugs - pt become asymptomatic - 2wks

- Euthyroid - 6weeks.

- pts not definitive Rx ass $\bar{c}$ recurrence

definitive (Rx)

(1) RAI ablation → indications

(2) Surgery



Total thyroidectomy

- Elderly pts

- poor surgical

risk pts

- recurrence after surgery

(C/I)

Absolute

Pregnancy

Lactation

Relative

- Young pts

- Smoker

- Ophthalmopathy

Indication of surgery

along $\bar{c}$ large nodule & suspicious

Struma lymphomatosa (conversion of thyroid - lymphoid tissue)

- Autoimmune disorder
- more common in females
- Auto-antibody → anti TPO
- HLA B-8 / DR-3 / DR-5 *** ✓

risk factor for * lymphoma.

* Papillary ca. of thyroid.

- CD4 mediated CD8 cytotoxicity responsible for follicle destruction
- permanent hypothyroidism.

- (CF) - loss of hair - obesity
- hearing loss - ↓ sed appetite but wt gain
- confusion - constipation
- mental slowness - menorrhagia
- delayed DTR'S

- (90%) FNAC → lymphocytic infiltration } LE, HC, ESKANAZY cells.
- HURTHLE CELLS **
- ESKANAZY CELLS **

- (Rx) life long thyroxine supplementation.

ACUTE SUPPURATIVE THYROIDITIS ✓

- Infection of thyroid is rare due to rich vascularity,
tough fibrous capsule & high conc. of iodine
- predisposing:
 - ① immunocompromised like HIV, transplant & elderly & malignancy
 - ② penetrating trauma to thyroid

* It is a polymicrobial infec caused by Strep & anaerobes

(C/F) Pain in cervical region. $\bar{c}$ tenderness over thyroid $\bar{c}$ fever
 $\bar{c}$ chills and rigor.

(dx) on laboratory inv:- $\uparrow$ ESR & leucocytosis

(Rx) I/D + systemic antibiotics.

* Persistent pyoform sinus should be excised in children
presenting $\bar{c}$ recurrent acute suppurate thyroiditis

Subacute / DeQuervian / Viral / Granulomatous

- Predisposed by upper resp tract infection caused by virus
leading to granulomatous inflammation - Follicle destruction

- ASS $\bar{c}$ HHA-B35 ✓

(Stages) FNAC $\rightarrow$ Epithelioid cells & Giant cells.

1 $\rightarrow$ hyperthyroid due to follicle destruction & T_3, T_4 release

2 $\rightarrow$ Euthyroid

3 $\rightarrow$ hypothyroid

4 $\rightarrow$ Euthyroid (spont. resolution occurs in $>75\%$ pts)

(C/F) Mild - moderate pain over thyroid region

Signs & symptoms depends on stage of disease.

$\uparrow$ ESR, RAIU $\rightarrow$ $\downarrow$ as follicle destroyed ✓
 $\rightarrow$ also infection $\rightarrow$ 90% FNAC

(Rx) NSAIDS

non responding - steroids

- Invasive fibrous thyroiditis ✓
- Characterised by replacement of whole thyroid & parathyroid by fibrotic process
- fibrotic process invades trachea, oesophagus, RLN. ✓
- ASS: 1) Retroperitoneal fibrosis
2) periorbital fibrosis
3) Retroorbital fibrosis
4) primary sclerosing cholangitis

(C/P) Signs & symptoms of both hypo & hypopara. ✓
evidence of compression - dyspnoea, dysphagia & hoarseness of voice.

(90c) Wedge shaped excision biopsy ✓

(Rx) life long thyroxine +
life long ca. supplements +
life long vit. D

*** Hyperthyroidism is never seen in Reidel's thyroiditis

Painless/silent thyroiditis

- lymphocytic & Autoimmune thyroiditis
- Variant of Hashimoto's having similar manifestations (like De Quervain's)

Stages of painless thyroiditis resembles De Quervain

Hyper
↓
Eu → hypo
↓
Euthyroid.

- Mc malignancies

$P > F > M > A$ ***

Papillary ca. thyroid

→ encapsulated **

- mc type - ***

- 90% sufficient areas.

- low dose Radiation Exposure → risk factor

- Thyroglossal cyst & hashimoto's ↑ risk.

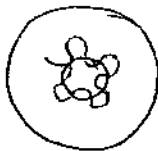
Pathology characterised by Papillary projections & dystrophic calcification → PSAMMOMA BODIES ***

(P) → papillary variant of RCC
Pap. ca. thyroid

(S) Serous cystadenoma ovary

(M) Meningioma

* → B/L
→ local recurrence
Common
- multicentric



- pseudo inclusion bodies
- nuclear groove
- optically clear nucleus.

* ORPHAN ANNE NUCLEI
EYE *

- Dx based on nuclear not on cytoplasmic.

Variants : presents as Single nodule + local LN.

1. Tall cell

2. Insular → ** poor prognosis.

3. Columnar

4. Diffuse sclerosing

5. Clear cell

6. Trabecular



region.

— Lateral Aberrant thyroid is considered as metastatic deposit to Lat. cervical lymph node from papillary ca. ✓

* Mc - Route of spread - lymphatics

Lymph

— Mc - site of metastasis - lungs →

— (90%) - FNAC ✓

(Rx) - Total thyroidectomy + Removal of enlarged central group of LN ± MRND. (if any LN is (+ve))

Follicular ca. thyroid. → most probable in long standing goitre
— mc-males

— Seen in iodine deficient areas

— Seen in 4th to 6th decade

(C/F) sudden rise in size of swelling ± minimal / no pain over the swelling. (or) ~~no~~ minimal (or) no signs of compress

— Mc route - hematogenous

mc site of metastasis - Bone having pulsatile secondaries

*** - osteolytic sec. in bones

— LN are not involved.

— FNAC not able to diff Adenoma from ca.

(90%) → Biopsy

(Rx) - Total thyroidectomy

* Papillary & follicular → Well differentiated

* Huothle cells are seen in follicular carcinoma

① high dose thyroxine is given to suppress TSH to prevent the prolif of remnant of thyroid.

② Whole body scan by Iodine 131 - gt diagnoses & ablates the thyroid remnant & metastatic deposits (SD microcarcin)***

- gt makes thyroglobulin a better marker for detecting post op recurrence

Follow up :- Thyroglobulin, USG neck, chest x-ray

PET scan :- in well differentiated

- ↑↑ thyroglobulin $\bar{c}$ normal chest xray & USG neck

* Any recurrence after thyroidectomy managed by RAI ablation

Medullary ca. Thyroid

→ arises from parafollicular 'C' cells (located superolaterally & derived from ultimobranchial body **

- Releases calcitonin.

- Despite a raised calcitonin pt having normocalcemia

Sporadic

MEN 2A/2B

- 60 yrs

- Young pts

- Single u/L

- multiple & B/L

RET oncogene

- * H/o of diarrhoea, hypercalcaemia
- * presence of Amyloid Stroma on FNAC
- * (+ve) Family H/o of pheochromocytoma & hyperparathyroidism.
- * characterised by hematogenous & lymphatic spread
- * Liver - Mc metastasis
- * TSH independent tumour.

↓ Ret proto oncogene.
(Rx) doesn't respond to radioactive I ablation

(Doc) → FNAC

(Rx) - Total thyroidectomy + Routine central lymph node dissection + ipsilateral MRND if tumour > 1cm
+
B/L MRND if LN is (+ve) ✓

Very poor prognosis ✓

RAIodine → not useful for

- 1) Anaplastic
- 2) Medullary carcinoma.

Anaplastic ca.

→ ass $\bar{c}$ p53 mutation

- rare ✓ from multinodular goitre
 - Seen in 7th to 8th decade
 - Sudden ↑ in size of swelling $\bar{c}$ severe pain $\bar{c}$ evidence of compression (dyspnoea, dysphagia, hoarseness) ✓
 - Mc - route - direct invasion
 - Mc - met - lungs ✓
- Anaplastic $\bar{c}$ infiltrating trachea & sternum ⇒ palliation.

(Doc) FNAC

(Rx) Total thyroidectomy - Resectable tumours

Tracheostomy - unresectable tumours.

- Survival ~~rate~~ < 6 months. + Radiotherapy.

Thyroid mets - From Breast ***

→ Diffuse large B-cell lymphoma (DLBL) ***

- ① primary CNS lymphoma
- ② orbital lymphoma
- ③ Thyroid lymphoma
- ④ Gastric (DLBL > MALTOMA)
- ⑤ Small intestinal lymphoma
- ⑥ Colonic
- ⑦ Rectal



Thyroid lymphoma

- Non-Hodgkin's - mc
- Subtype - DLBL - MC ✓

Hashimoto's ↑ses the thyroid lymphoma

(C/F) Sudden ↑se size of swelling which is painless

- ✓ E evidence of compression
- ✓ ass E fever

(90c) Biopsy (For any kind of lymphoma located any where in body) ***

(Rx) Regimen - CHOP any lymphoma histiocytes and

- Cyclophosphamide
- Hydroxydanzubicin / doxorubicin ✓
- Oncovine (vincristine) ✓
- Predneslone ✓

- aggressive / high grade (RT) ✓

- Surgery - Residual mass left after chemotherapy.

Steps :-

- * Skin crease incision ~~in~~ cervical collar placed 1cm below the cricoid cartilage
- * Skin & platysma is divided.
- * flap is raised superiorly upto thyroid, inferiorly upto suprasternal notch.
- * Incise the strap muscles in the midline & retract them laterally. capsule of thyroid is removed
- * (1st) structure ligated is middle thyroid vein - preventing avulsion which leads to embolism.
- * Superior thyroid vessels ligated close to thyroid to prevent injury of Ext. branch of Sup. laryngeal nerve (SLN → ex.)
- * Inf. thyroid A should be ligated close to thyroid to prevent vascular infarction of parathyroid. (colour is ** CANARY YELLOW)
- * Accidentally removed parathyroid should be autotransplanted into (Sternocleidomastoid) (in hyperparathyroidism due to Adenom/hyperplasia 3 1/2 gland removed, half gland autotransplanted into Brachioradialis of non-dominant hand)
- * Thyroid detached from underlying trachea from strap dissection & ~~remove~~ hemostasis is secured
- * wound sutured after drain insertion.

Complications:-

- 1) Haemorrhage:- slippage of ligature from sup. thyroid vessels / Bleeding from muscular A.
→ causes resp. depression (due to hematoma) *

- (2) Respiratory obstruction :- laryngeal Edema
Tension hematoma
RLN injury
- (3) Nerve injuries :- RLN,
Ext. branch of sup. laryngeal (N)
Cervical Sympathetic trunk
- (4) Parathyroid insufficiency :- 2-5th day *

- M.c cause is vascular infarction.
- (5) Thyroid insufficiency :- (6) Thyrotoxic crisis in hyperthyroid
pts who are not made Euthyroid (i

TRAUMA

- * CAB is followed for the pts of cardiac arrest
- * ABC is " " " of Trauma
- * Cervical spine injury should be suspected in all the cases of trauma. It should be Stabilised first

ATLS PROTOCOL ***

ABCDE
= 1st survey

Airway & cervical spine stabilisation

- Assess airway
- check patency
- maintain patency by
- Jaw thrust, chin lift
- ET tube intubation

Breathing (oxygenation & Ventilation)

- Rate & depth of respiration
- on dyspnoea & tachypnoea rule out hemo/pneumo
- Alleviate hemo/pneumo thorax by chest-tube insertion.

↓
CIRCULATION
www.FirstRanker.com
C haemorrhage control

www.FirstRanker.com

* Control Ext. haemorrhage

* Assess vitals

- ↑ PR, ↓ BP

- Suspect significant

Ext/Int. haemorrhage

- Start fluid Resuscitation

- Non-responding cases

↓

Blood transfusion **

↓
DISABILITY LIMITATION

Glassgow
Coma Scale

pupils
(size/reaction/quality)

↓
EXPOSURE WITH PREVENTION
OF HYPOTHERMIA

2^o Survey → Head to toe complete physical examination & history taking

① head & face - # and laceration

② neck - neck injuries

③ chest - Rule out rib fracture

④ Abdomen - look for abrasion, bruise

⑤ Back - LOG ROLL **, 5 people are required
one-head, 3-body, 1-Exam.

Per-Rectal * PR performed at this stage

⑥ Extremities - crepitus / deformity / Abnormal movement

⑦ Repeat neurological assessment

- GCS

- look for localising signs of neurological injury.

Revised trauma score

(CRS)

(G) CS

(B) P

(R) R

(TRISS)

(trauma & injury severity score)

* ISS + RAM

- (R) TS

- (A) ge

- (M) echanism

mangled Extremity Sev. Score

(MESS)

(E) nergy

(L) imb ischaemia

(S) hock

(A) ge

HEAD INJURY

(EDH)

- Collection of blood b/w Skull & Dura matter
- Caused by trivial trauma to temporal region (weakest point ptesion*)

Middle meningeal A located beneath it.

- Bleeding is Arterial
- lucid interval - (+ve)
- (90°) NCCT

Bi lenticular

(Rx) Drainage by burr hole / craniotomy

(SDH)

- collection of blood b/w Dia & Dura matter
- Significant trauma in elderly.
- leading to injury of cortical veins
- Bleeding is Veinous

(90°) NCCT

concavoconvex

(Rx) Drainage by craniotomy

* Raccoon Eyes /
Black Eyes

* subconjunctival
hematoma

* CSF Rhinorrhoea

* carotico cavernous
fistula ↓

pulsating
exophthalmos

* Hemotympanum

* ossicular disruption

* 7th, 8th nerve
injury

* CST otorrhoea

** BATTLE SIGN - mastoid
hematoma / retroauricular
hematoma

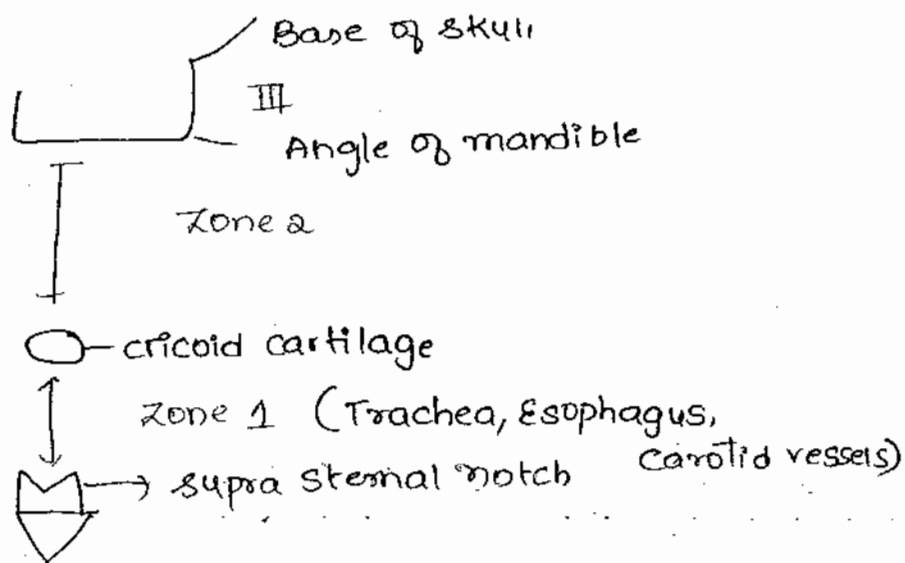
NECK INJURIES

** Two important landmarks

- platysma

- sternocleidomastoid

zones in neck injury ***



Zone-1 most dangerous *

- wound should be explored in all cases.

- mc injured organ in air blast - Tympanic membrane
- mc severely organ in air blast - lung.

under water blast :-

head is out :- mc injured } small intestine
mc severely }

head submerged - Tympanic membrane - MC
Severely - Small intestine

Tension pneumothorax

- caused by Blunt/penetrating trauma

Predisposing factors :-

- Penetrating trauma leading to formation of unidirectional valve
- Blunt trauma - Tracheobronchial injury
- central line incision - injury to apex of lung

(C/F) dyspnoea, tachypnoea

Absent breath sounds on Auscultation

hyperresonance of percussion.

(Rx) Wide bore needle in 2nd intercostal space in midclavicular line

(Rx) of choice → chest tube insertion - 5th ICS,

"Ant. Axillary line" in "SAFETY"



(Ant.) pect. major

(Post) Latissimus dorsi

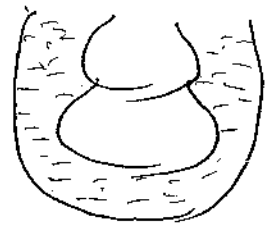
below - 6th rib

5th space

- 3 (or) > 3 ribs # at 2 or > 2 places ***
- also known as paradoxical Respiration which increases work of breathing (painful & Abdominal)
- leads to Respiratory failure.
- (Rx) of choice - flail chest - NSAIDS
- Resp failure - IPPV.

Pericardial tamponade

- mc - cause penetrating trauma
- *** BECK's triad →
 - muffled heart sound ✓
 - distended neck veins ✓
 - Hypotension ✓
- - on X-ray - Enlarged cardiac shadow
- 90% ECHO
- (Rx) initially needle pericardiocentesis
- (tx) → surgical pericardiectomy



Thoracotomy

indications :-

- ① Chest drain output - 1500ml in Blunt trauma ✓
- 1000 ml in penetrating trauma ✓
- ② Chest drain output - >200 ml/hr for consecutive 3hrs ✓

- ③ Tracheobronchial injuries ✓
- ④ Oesophageal perforation ✓
- ⑤ Injury to Descending thoracic aorta ✓
- ⑥ Cardiac herniation ✓

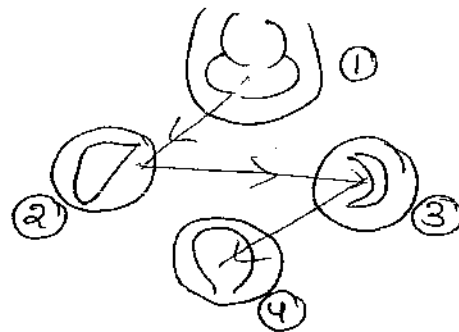
- Mc injured organ in Blunt trauma - spleen > liver
- " " penetrating - small intestine
- " Bowel in Blunt trauma - Jejunum.

FAST

→ Focal assessment & Sonography for trauma.

- 2-5 mins

- ① pericardium ② perihepatic
- ③ perisplenic ④ pelvic.

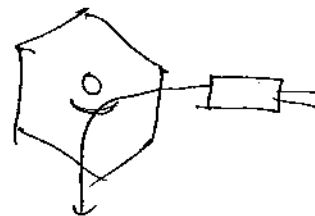


E-FAST - STRATOSPHERE sign
ended on pneumothorax ***

- FAST has replaced DPL. now first inv done in a stable pt of blunt trauma abdomen.

DPL

- Catheter inserted into pelvis after the infra umbilical incision



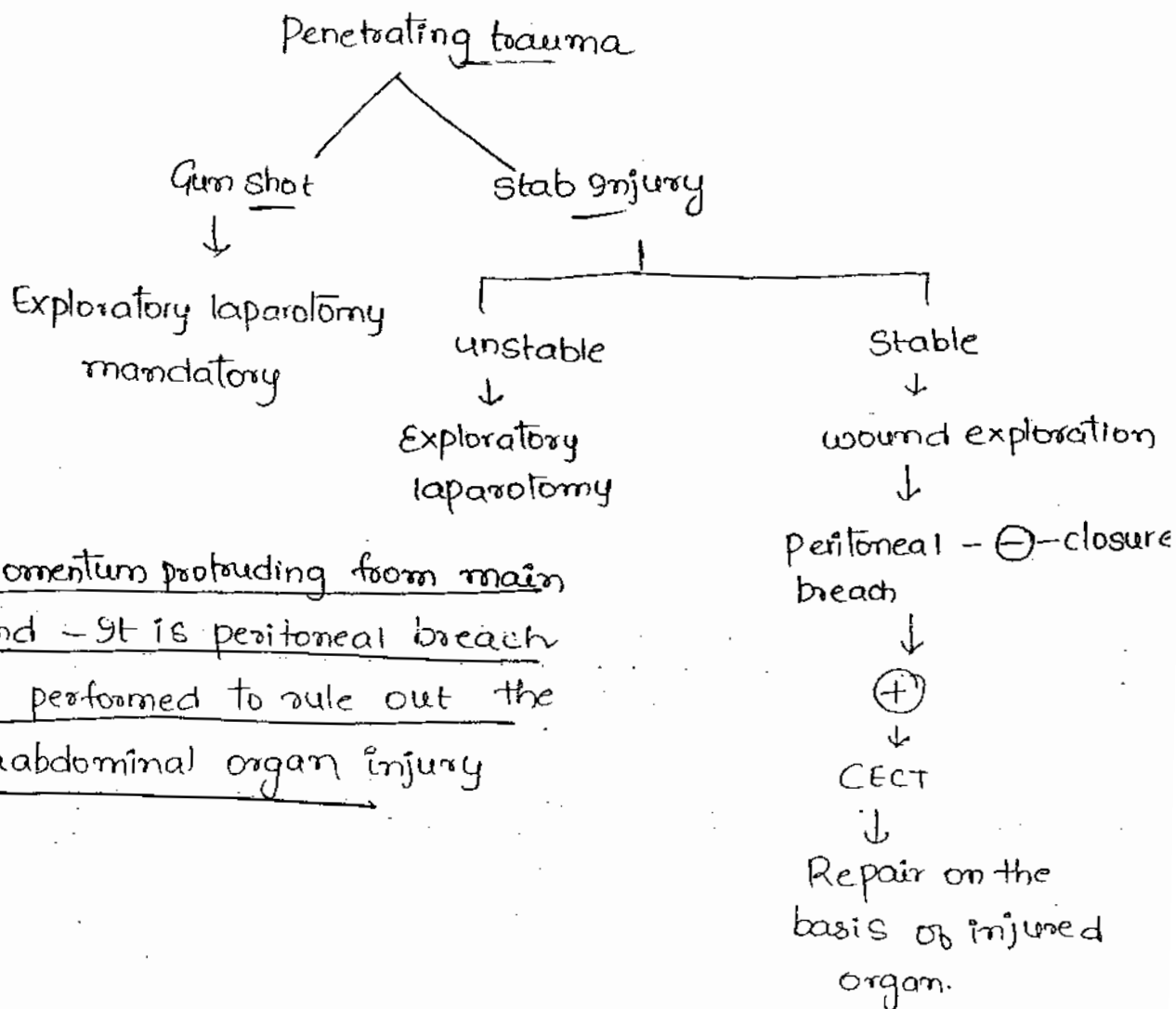
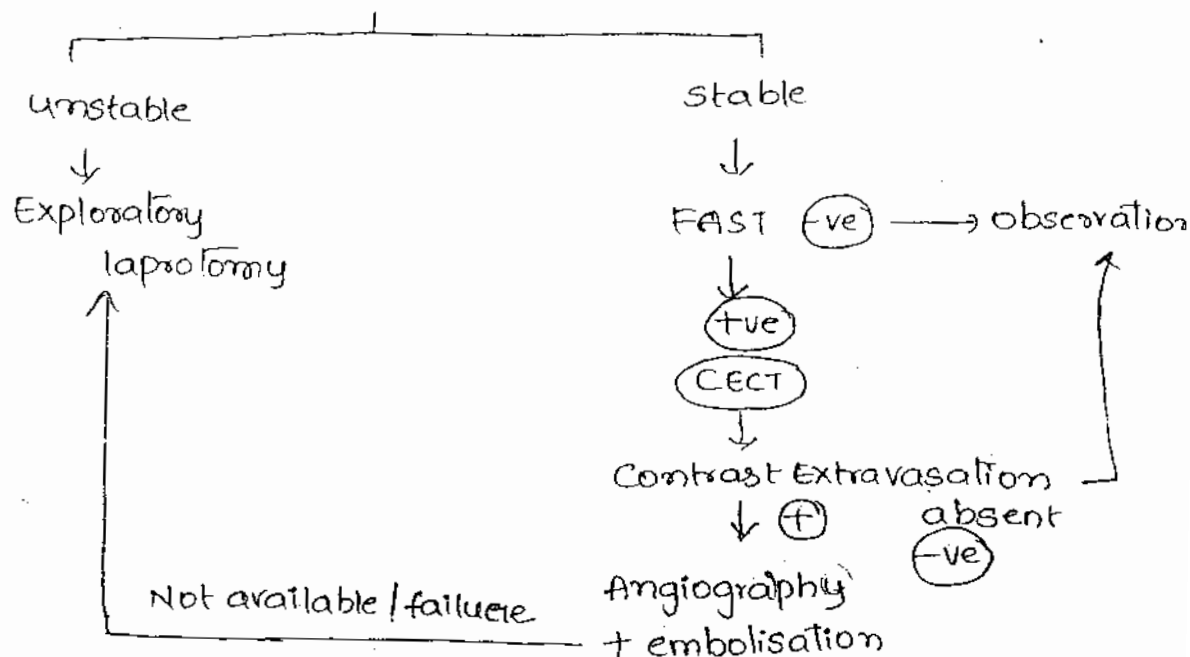
- DPL (+ve) ⊕ >10ml blood aspirated

② Effluent contains >1 lakh RBC's ✓

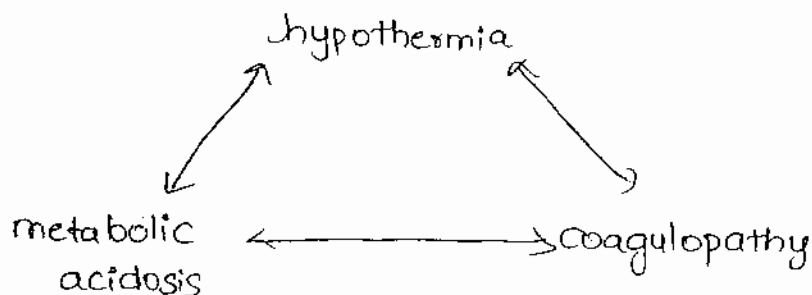
>500 WBC's ✓

presence of Bile, Bacteria, fecal / vegetable matter ✓

Pneumothorax
- stratosphere sign.



* When omentum protruding from main wound - It is peritoneal breach
CECT performed to rule out the intraabdominal organ injury



Damage Control Surgery :- ***

- Abbreviated lapotomy having 3 phases

(I)

- control haemorrhage & contamination

(II)

- resuscitation in ICU for 24 hrs
- correction of hypothermia, metabolic, acidosis, coagulopathy

(III)

- definitive operation
- Repair of injured vessel & Anastomosis (or) per forations / Stoma formation.

* Stoma is preferred over complex anastomosis.

Repair of musculoskeletal system

(Bone) (Extensor) (Flexor) (Artery) (Nerve) (Veins) (Skin)

→ In musculoskeletal injury priority given to bleeding tumour.

CNS TUMOURS

* Mc brain tumour - metastasis

* Mc primary Brain tumour - meningioma > glioma ✓

new!

most common Brain tumour in children → medulloblastoma

most common site of Astrocycloboma

www.FirstRanker.com

children - Infratentorial (cerebellum, ^{midline})

Adults - supratentorial (cerebral ^{opposite} side, cortex)

Astrocycloboma

Mc type in children (Astrocycloboma) - pilocytic

" " Adults (Astrocycloboma) - Glioblastoma

Overall (Astrocycloboma) ^{multiforme}

WHO classification

① Grade I - pilocytic → surgery only

Grade II - low grade

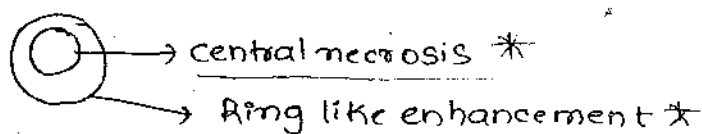
Grade III - Anaplastic

Grade IV - Glioblastoma multiforme

} Surgery + EBRT
(as it involves the
② brain tissue)

- mc Type = worst prognosis

- endothelial proliferation + necrosis



- Temozolomide *

Oligodendroglioma → Frontal lobe

- 10% Brain tumours

- mc site ⇒ frontal lobe

- mc - genetic mutation involvement of 19q > 1p ***

- pts having this mutation will respond to Temozolamide.

(C/F) mc - symptom - Seizures.

Pathology :- Fried-Egg cytoplasm
Chicken-wire vasculature
microscopic calcification

on (CT)

Calcification

① OGG - 90%

② Meningioma - 60%

③ Ependymoma - 40-50%

(Rx) surgical Excision & Temozolomide in pts having mutation @ 1p & 1p.

Ependymoma - arises from ependymal lining

- mc - site in children - 4th ventricle

Adults - lumbosacral region of spinal cord

(myxopapillary ependymoma)

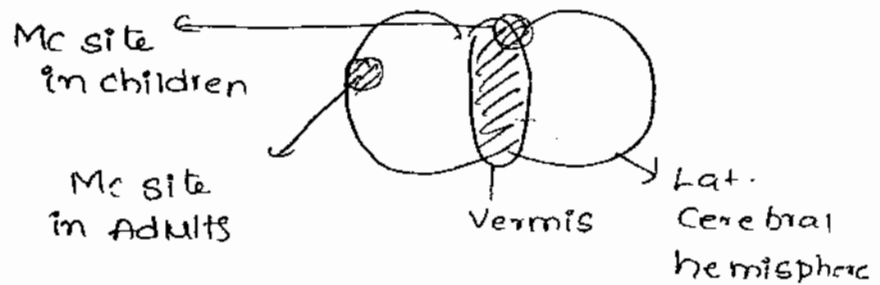
- CSF spread is present

(Rx) Resection & craniospinal irradiation.

Medulloblastoma - most Radiosensitive Brain Tumour

- most malignant Brain tumour of Children

- infratentorial (cerebellum) seen in 2-4 yrs of age



(C/F) ↑ Ict

Adults - Ataxia, w/ Dysmetria

* * CSF spread

- most Radiosensitive tumour (Brain)

(Rx) surgery & craniospinal irradiation

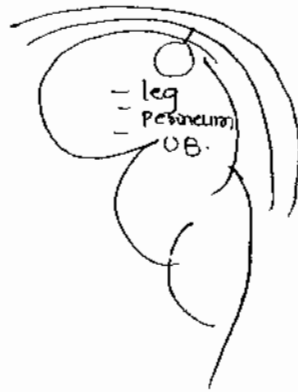
Meningioma → arachnoid layer.

- Mc primary brain tumour

- mc intracranial Extra axial dural based neoplasm

- arises from meningo mesothelial cells of Arachnoid

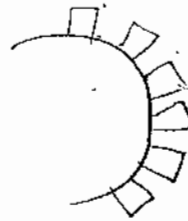
- Females



(C/F)

motor deficit in UL in 90% cases followed by sensory deficit in the perineum followed by sphincter dysfunction of bladder

- * Bony hyperostosis
- * Blisters
- * pneumatization & expansion of bone



- SUN-RAY SIGN and DURAL TAIL SIGN

- Signs of 1st ICT & calcification, vascular sclerosis, erosion

(Rx) surgical excision ✓

Metastasis

- mc Brain tumour

- mc primary - Ca lung > Ca breast

- mc primary for leptomeningeal - Ca breast * metastasis

- Mc-Site- Frontal lobe - junction of grey & white matter.

(Rx) upto 3 metastasis - liver lungs, brain

Resectable - metastasectomy

4 (or) more → WBRT * - whole Brain RT.

motor 6 by 4 cm
sensory 6 by 4 cm
2+3+2
4 cm
3
4

SUTURES

Absorbable

- Absorbed by body due to phagocytosis/enzymatic digestion

natural :- catgut & chromic catgut

Synthetic :- (PVD)

- ① Polycaprone
- ① Polydioxone
- ① Vicryl (Polyglactin)
- ① Dexon (polyglycolic acid)

non-Absorbable

- Persist for indefinite period

natural :-

Silk, Linen

Synthetic PEN

- ① Polyester
- ① Polyamide
- ① Polypropylene (Prolene)
- ① Ethilon
- ① Nylon

Two types of sutures

CPE

mono filament

- Single strand
- smooth & strong
- low risk of infection
- knots are less stable

Eg:- Catgut *
Prolene *
Ethilon *

poly filament

- multiple strands
- having crevices in b/w strands
- high risk of infection
- knots are stable

Eg:- SLIP
① Silk
① Linen
① Polyglycolic acid

** 60 days in absorption - catgut

60-90

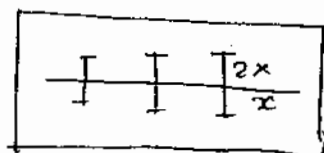
- VCD

- ① Vicryl
- ① Chromic catgut
- ① Dexon

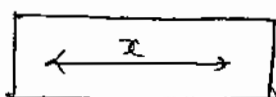
- ↓
- * Resistant to infection $\bar{c}$
E.coli & Klebsiella
 - min risk of infection
 - * max risk of infection
 - * Dexon (PGA)

→ CATGUT : derived from submucosa of sheep discovered
by John hunter ***

- preserved in isopropyl alcohol *



= gap b/w suture is double the
thickness of skin.



wound length = x
suture length = $4x$



I Ends → length = 1-2 mm (ends) **

- * AD, in a/w polycystic renal disease
- * MC extra renal manifestation - polycystic liver disease
- * Liver cysts always preceded by renal cysts

S_x Derooting of a small No. of large cysts
can be combined $\bar{c}$ liver resection to $\downarrow$ liver volume
MC complication of S_x - ascites.

MAIN complication - bacterial infection of cyst

PCLD - x a/w liver failure

PCLD + PCKD + berry aneurysm + MVP.

11600

5500
6/1
3600
2500
6100

2
1200
800
600
600
600
3600

5300
200
2500
3600
11600

16000
500

PLA	fever	RUG tenderness	ALP ↑
ALA	abd pain	hepatomegaly	↑ PT
hydrated dixare	asymptomatic/ abd pain	RUG mass	Eosinophilia

Hemangioma	Hepatic adenoma	FNH	Peliosis hepatis
MC in middle aged ♀ (as in OCP usage) * MC hepatic tumour * has risk of rupture >>> malignancy * CECT - slow contrast enhancement d/t small vessel uptake / peripheral nodular enhancement	* CECT - Fast phase - PV washout * BUT NO characteristic diff b/w this * malignancies	* CECT - core wheel appearance * SULPHUR COLLOID scan → BEST FOR FNH (as KUPFFER cells, characteristically present in FNH, take up sulphur colloid)	Multiple cystic blood filled spaces * C/T: pain & abd swelling * also OCLs anabolic steroids <u>Bartonella</u> we need iron doxycycline
* NO & in asymptomatic * excitation in symptomatic	* NO & needed * can do excision biopsy if dx uncertainty	* NO & needed * can do	

age	20-40 yrs	> 50 yrs
gender	M:F ≥ 10:1	M:F 1:5
Travel to endemic areas	✓	X
alcohol use	common	common
diabetes	uncommon	common
Number	solitary 80%	solitary 50%
Location	Rt lobe	Rt lobe
Jaundice	rare	25% of cases
MC symptom	abdominal pain	fever > abd pain > jaundice
LFT	MC change is ↑ PT	↑ ALP
Elevated bilirubin	X	↑
MC org	E. histolytica	E. coli (worldwide) Klebsiella (India) Staph (CGO)
MC route of spread	Portal vein	Biliary > PV > Hep artery > direct extension
IOC	s/o USG & CT confirmed by serology	s/o USG & CT, confirmed by aspiration & culture
XOC	metronidazole 750mg TDS X 10-15 days	percutaneous catheter drainage + A/b for 6 wk (2 iv + 4 oral)

→ Dual blood supply

25% by hepatic artery (O₂ Blood)

75% by portal vein (deoxygenated blood).

→ Glycogen capacity, 65g/kg of liver tissue.

- 9th GI malignancies from oesophagus till rectum

↳ hematogenous spread, Mc site of metastasis

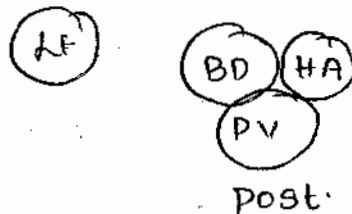
"Liver" **

→ For non GI malignancies ↳ h. spread mc site of metastasis "lungs" **

Eg:- RCC, Testicular tumours, CA penis,

Soft tissue sarcoma, CA anal canal

→ portal triad appears as "mickey mouse view"
on USG

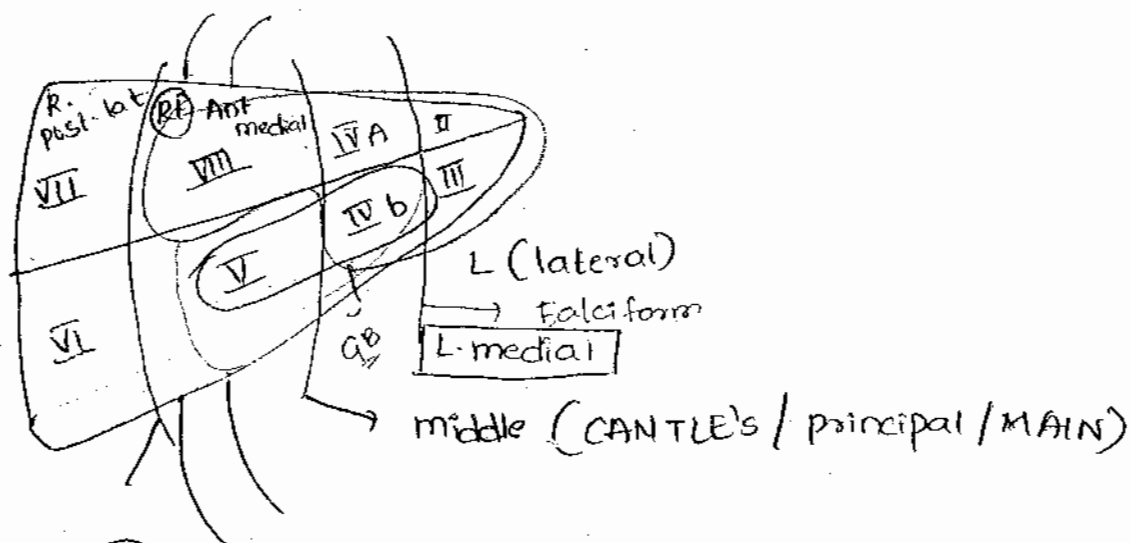


→ Fascial planes in relation to liver:-

- Condensation of intraabdominal fascia near ant. surface of liver

- cystic plate (GB), hilar plate (Hilum), umbilical plate (umbilical fissure).

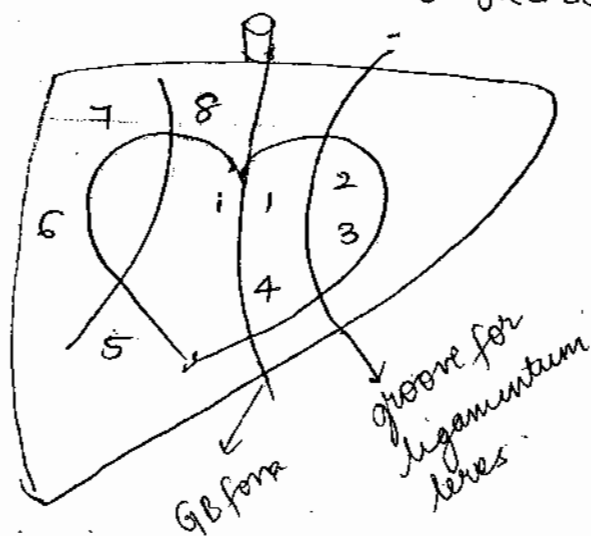
portal vein & hepatic vein



Ⓡ portal fissure / scissurae

Gall bladder ⓐ IVb & V **

→ line of division of surgical beds (GB bed to IVC)



	Contents
① L. lateral Sector (segment)	- II & III Lt post
② L. medial	- IVa & IVb
③ Rt. Antero medial	- V & VIII
④ Rt. post lateral	- VII & VI

- IV - Quadrate lobe (present b/w Grootos ligamentus teres & GB)

Extended hepatectomy is also known as Trisegmentectomy. Ⓡ ext hepatectomy involves

II, III, IV, V, VIII

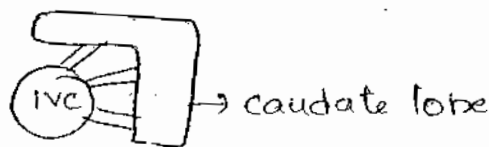
Ⓡ Ext hepatectomy - (V, VI, VII, VIII, IVa, IVb)

→ min amount left intact 20%

→ Kupffer cells in

- HP - Supplied by both left & (Rt) branch of portal vein
- PV - Biliary drain to both (L) & (R) hepatic duct
- IVC - But venous drainage goes directly into IVC through 6-10 branches

supplied by (L) hepatic artery only



- Budd chiari synd - caused by hepatic vein thrombosis, whole liver is atrophied but the caudate lobe hypertrophied as it drains directly into IVC

- In cholangio carcinoma (hilar) - Early involvement of caudate lobe - caudate lobectomy (because it is drained by both (L) & (R) bile ducts)

Pringle manoeuvre:-

- In placement of soft clamp near foramen of Winslow, it controls bleeding from portal veins & hepatic artery. It controls PV bleeding effectively (less pressure)
- When branch of portal vein is ligated, hepatic A rises its blood supply to the liver but not vice versa.

Hepatocellular CA is exclusively supplied by branches of hepatic artery but not portal vein

- For hepatobiliary pancreatic malignancies of Adults, FNAC or biopsy is not mandatory for dx

- Triple phase CT → Ioc for Hcc
- CECT is Ioc for diagnosis of CA of GB & Pancreas
- MRI Ioc - cholangiocarcinoma
- In triple phase CT $\bar{C}$ Arterial hypervascularisation
 $\bar{C}$ venous wash out is Δ criteria for Hcc

Pyogenic liver abscess

(Liver MC site for visceral abscess)

- MC liver abscess (no significant gender / ethnic / geographical difference in dxn frequency?)
- MC in Females, alcoholics, age 5th-6th decade
- (i) MC route is "Bile duct / biliary tract" (Cholangitis -
- * MC cause is CBD stones, in western countries
- CholangioCA leads to Cholangitis) Associated co morbid
CRF, cirrhosis, Hb malignancy
- (ii) 2nd MC route portal veins
- (iii) 3rd Hepatic Art (grp for pts suffering from
chronic granulomatous disease)
- (↑ risk of SABC by staph / strept leading
* to pyogenic liver abscess) *
- MC organism responsible for PLA in children
- * suffering of chr. granulomatous disease is
Staph. Aureus
- (iv) - Direct Extensions :- Pyothorax, Subdiaphragmatic
abscess, Acute suppurative cholecystitis, Perinephric
abscess

Can → Hematochezia
Spread → Primary tract

↓
Jaw
↓
Abd pain
↓
Fever, chills, rigors

RA
Tars

- mc → fever followed by Abd. pain
- Gen. present c̄ fever c̄ chills & rigor
- Ass c̄ fatigue & Anorexia
- Jaundice is seen in 25% of pt c̄ PLA but rare in Amoebic liver abscess.

Exogenous
Endophthalmitis
MC in diab

- mc LFT Abn is ↑ ALP ** (common & severe)
- Δsis highly suggested by USG/CT *
- Confirmed by Aspiration & culture
- (Rx) - percutaneous catheter drainage & Antibiotics. (iv for 2 wks + oral 4 wks)

Amoebic liver Abscess

- Amoebiasis :- caused by Entamoeba histolytica
- Route of infection - faecooral *
- Infective stage - Tetranucleate cyst **
- Common in developing countries 20-40 yrs of age group (mostly) (male > female = 20:1)
- mc site of Amoebic colitis is caecum & Ascending colon leading to "Flank shaped ulcers" **
- In 2/3rd cases colitis is silent, pts are not having diarrhoea) **
- In ALA, as a rule - colonic lesions are silent *

Flank shaped
Ulcer

reddish brown fluid in cavity having

"Anchovy sauce appearance" ** (odour more reliable character than colour)

next
up
Abd pain

C/F

- Mc Symptom - Abdominal pain
others, fever, fatigue, Anorexia

Jaundice - rare *

GnV

:- Abs highly suggested by USG/CT

Diagnostic Investigation - Amoebic Serology by
ELISA* in non endemic areas.

(Rx) of choice - High dose oral metronidazole 750mg
TID for 10-15 days

Pt become asymptomatic by 5 days.

- But radiological resolution requires 3-9 months

Follow up of uncomplicated liver abscess by USG
weekly for 1 month followed by monthly USG till 1 year

(Rx) of asymptomatic passers (luminal agents)

Paramomycin

Iodoquinol

Diloxanide furate

[diloxanide furate
↳ a systemic amebicide as
furate hydrolysed & diloxanide not so
active amebicide)

Mc site of rupture peritoneal cavity ***

Others are pleural, pericardial cavity.

→ Rupture into peritoneal cavity by exploratory-lap &
peritoneal lavage.

- Pleural cavity - chest tube insertion

- Pericardial cavity - pericardiocentesis

- rupture in bronchi
↓
self limited &
postural drainage &
Antibiotics

- (iv) no response after 3-5 days of metro
- (ii) Diagnostic uncertainty
- (iii) high risk abscess > 5cm
left lobe abscess (↑ risk of rupture)
- (v) Secondary bacterial infection
- (i) Pregnancy (high dose Rx not safe)
- (vi) Refractory after 48-72 hrs of Rx

Hydatid cyst:-

- Zoonoses seen in sheep grazing areas (common in Australia, New Zealand, East Africa, South America & Mediterranean countries)
- Echinococcus granulosus (Mc)
- Others are E. multilocularis, E. vogelli, E. oligarthrus
- Definitive host - Dog *
- Intermediate - Sheep *
- accidental dead end host - man (cut man to man transmission)
- ~~Route of infection to human~~

duodenal
capillaries

Release of larva (oncosphere/hexacanth) ***

liver
&
PV

systemic
&
lvc

System which penetrates the duodenal capillaries reach liver through portal vein & systemic circulation through lvc

→ Mc Organ Liver → lung → spleen → kidney →
Brain → bone

(C/F)

4th - 5th decade

♀ = ♂

hepatomegaly (MC sign)

- symptomatic → discomfort, dyspepsia, Abd. pain

→ (9nv) - USG

→ diagnosis is highly suggested by USG showing the

" ROSETTE appearance / cysts in cyst appearance

- (CT) - calcifications

- (dx) confirmed by Serology **

Sensitivity > 95%

• ELISA ✓

- Immunoblot ✓

- (ARC-5) ✓

- Casoni test :: 50-60% Sensitive, its obsolete due to
Poor Sensitivity & anaphylaxis

- (DOC) for preop prophylaxis - Albendazole

- ↓ Size of cyst, Scolicidal, other option mebendazole

(Sx) PAIR most preferred

- conservative → Cyst evacuation + omentoplasty
Pericystectomy (preferred Sx option)

Radical → hepatic resection

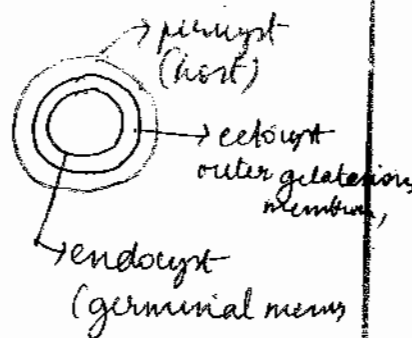
Obliteration of cyst cavity + sutures 1) gastroflexion

2) (capsitonnage)

horizontal mattress
sutures

↓
Capsulorrhaphy
manipulation

myoplasty



surgery

E. Reaspiration - most preferred

www.FirstRanker.com

www.FirstRanker.com

Agents are ✓ 20% hypertonic saline

✓ 0.5% cetrimide & 0.05% chlorhexidine

✓ Absolute Alcohol

✓ 10% povidine iodine

(C/E) PAIR ***

- inaccessible cyst
- peripherally located cyst
- multiloculated cyst
- cystobiliary communication (stricture may form)
- cysts in lungs & brain (no pericyst)
- calcified cyst
- Perforated cyst & Recurrent cyst

chemo $\leftarrow$ albendazole
 mebendazole
 ↓
 only option in
 widely disseminated
 poor s_x risk

GHAB's classification for Hydatid cyst on USG:-

(Gharbi's) *

I  only fluid

II  water lily sign / water snake sign

III  Honeycomb
multiloculated

IV  Complete heterogeneous
mass

V  calcified cyst egg shell calcification

(MC complication - rupture into biliary tree)

- Mc (R) lobe of liver
- X-ray changes
 - Raised (R) dome of diaphragm
 - Reactive pleural Effusion
 - Atelectasis / collapse of lung

Liver tumours

- mc malignancy - metastasis ✓
- mc 1^o malignancy Hcc
- mc 1^o malignancy in children - hepatoblastoma
- mc benign tumour - hemangioma

→ mc malignancy - metastasis
in brain, bone, lung, liver

→ Follow up after aspiration in amoebic liver abscess

- USG weekly for 1 month
- monthly USG - till 1 yr

→ pulmonary hydatidosis ***

- meniscus sign 
- water lily sign 
- Double arc sign 
- crescent sign 
- moon sign 

- liver malignancies studied by

- ✓ CT
- ✓ USG
- ✓ laparoscope
- ✓ Radionuclide study

Hemangioma — MC Benign tumour of liver

- Females ass $\bar{c}$ Ocp use (MC)
- Single Generally, Size $< 5\text{cm}$.
- If Size $> 5\text{cm} \Rightarrow$ giant hemangioma

C/F — mostly asymptomatic

- Symptomatic — Abd. discomfort or pain
- rarely KASSABACH MERITT SYNDROME ass $\bar{c}$ consumptive coagulopathy $\bar{c}$ platelet count ($\downarrow$) [due to Platelet trapping] along $\bar{c}$ Hemangioma & Av malformation

- Both FNAC & Biopsy — contraindicated **

- Ioc $\Rightarrow$ MRI
 $\downarrow$

" peripheral nodular enhancement (or) lightberg"

(R_v) — growth of hemangioma occurs by Ectasia
not neoplasia commonest incidentaloma

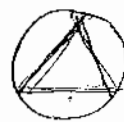
- (R_x) of choice ENUCLEATION **

ENUCLEATION (R_x) of choice

- hemangioma — liver
- $\rightarrow$ insulinoma — head of pancreas
- $\rightarrow$ leiomyoma $\rightarrow$ oesophagus
- $\rightarrow$ [chylolymphatic cyst]
- $\rightarrow$ Focal nodular hyperplasia (FNH) $\rightarrow$ Second MC Benign tumour (liver)

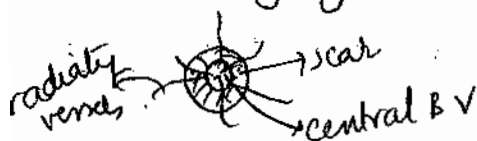
- females
- ocp use association but less strong
- second mc common Bening tumour in liver

— CECT → Central stellate scar *** — FNH



- serous cystadenoma pancreas
 - *** → Renal oncocytoma
 - Fibrolamellar variant of Hcc
- } Also

— Angiogram → CART WHEEL / SPOKE WHEEL ***



— Renal oncocytoma (also)



(C/F)

- Benign
- asymptomatic

(Rx)

- no (Rx) required
- Excision done — diagnostic uncertainty
- High accuracy w nuclear imaging ***

Hepatic Adenoma

- Benign proliferation of hepatocytes
- Mc — females ass. w ocp use
- Hepatic architecture — not maintained

hemorrhage
may be
seen

(Portal Vein, Bile duct,

hepatic artery, Kupfer cells,

hepatocytes, sinusoids) → (N) of present as in (N) liver

Cords / sheets of cells w prominent vessels

(Arterial feeding, no PV supply)

Peripheral Blood vessels

- ass & ↑ risk of hemorrhage & necrosis in tumours
- risk of hemoperitoneum ⇒ 30-50%.
- Two risks :-
 - ① Rupture (subcapsular → intraabdominal haemorrhage)
 - ② malignant transformation (10%)

(C/F) mostly sympt & Abd. pain

- pregnancy ↑ risk - tumour rupture (↑ estrogen lev)

(R_x) - Excision. (hepatic adenoma always merits surgery)

HCC

- Risk factors

CIRRHOSIS

- Alcohol
- hep. B & C virus
- chronic active autoimmune hepatitis

- Primary biliary cirrhosis

NAFLD

METABOLIC DISORDERS

- Hemochromatosis
- Wilson's disease
- Glycogen storage disorder
- α₁-antitrypsin deficiency
- * porphyria cutanea tarda
- * orotic aciduria
- Tyrosinemia
- ALAGILLE'S SYNDROME

ENVIRONMENTAL FACTORS

Moderate

- Anabolic steroids
- ✓ Cig. Smoking
- ✓ AFLATOXIN

THOROTRAST

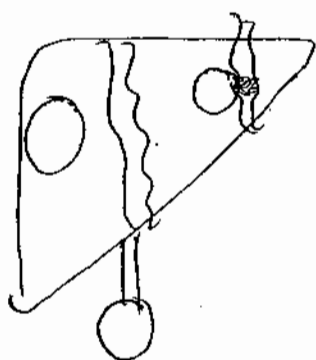
- * HCC
- cholangio carcinoma
- ~~hepatic~~
- hepatic fibrosis
- Angiosarcoma

✓ Congenital

cholestatic syndromes

most cases are due to HBV seen in asian population & sub-Saharan Africa

- Mc - males
- sixth decade
- World wide - HBV induced Hcc is ↓ sing due to vaccination but Hcc induced Hcc ↑ sing due to sexual transmission, Blood transf, HIV, (co) immunodeficiency



Grossly

- ① Hanging - Best prognosis
- ② pushing
- ③ infiltrative - most common worst prognosis ***

IPS BD

Valveless

- IVC
- portal vein
- SVC
- Dural venous Sinus
- Batson plexus of veins

- Hcc & RCC having property of vascular invasion

- RCC invades Renal vein → IVC → (RT) Abdom

- Hcc invades - portal vein from one branch it can involve other branch

- portal vein valveless

- ($> 2/3$) patients are having multicentric & Bilobar disease

→ Fibrolamellar variety not ass c cirrhosis
→ ass. c (N) AFP levels

Malignancy
w/ abdominal pain

mc → Abd. pain ✓ > wt. loss
Anorexia

- weight loss, Jaundice is seen in 10% cases due to parenchymal insufficiency
- Tumour is hyper vascular (Audible bruit in 25% & tumour rupture -
- AFP raised in 70% cases (3-5%)* * *

Paraneoplastic manifestations

- Mc hypercholesterolemia * *
- Seco hypoglycemia - Mc. second.
- Erythrocytosis
- Hypercalcemia (Ca breast > Ca lung squella)

USG

→ Initial investigation of choice for any suspected hepatobiliary disease ✓

- Ioc - screening of high risk (HCC) is USG. ✓

"Triple phase CT" - Ioc for diagnosis

→ Arterial hypervascularisation

→ Venous washout ✓

Tumour markers

→ AFP - 20ng/ml (N)

→ protein induced by vit. K absence - 2

(PIVKA-2)

Lectin fraction-3 of
AFP - highly specific to
HCC → poor prognosis

* * * 70% have AFP > 20ng/ml of HCC

→ neurotension

OKUDA STAGING

(BATA) → Bilirubin
Albumin
Tumour Size
Ascites

CLIP STAGING → (Cancer liver Italian programme)

→ (HCV) induced HCC
→ (PACT) - P - Portal vein thrombosis
A - Alpha feto protein
C - Child - turcotte pugh score
T - Tumour Extension

CUPI (Chinese university prognostic Index)

* (HBC) induced HCC (BA₃TS₃)

(B) - Bilirubin
(A) - AFP, Ascites, ALP
(T) - TNM stage
(S) - symptoms

WHO - not a
staging **

BCLC criteria

- Barcelona clinic for liver cancer
- stage by stage Rx of HCC on the basis
of Okuda stage & performance status of
the patient

- ① Resectable tumours & Adequate hepatic reserve
— RESECTION
- ② Resectable tumour & inadequate hepatic reserve
— TRANSPLANTATION.

MILAM'S CRITERIA (MAZZARO) ←

- size of tumours $\leq 5\text{cm}$
- multiple tumours size $\leq 3\text{cm}$ no. 2-3
- no extrahepatic (or) vascular spread
- patients to fulfill milan's criteria (5 yr survival is 77%)

Methods of palliation:

- ✓ percutaneous ethanol injection
- ✓ percutaneous acetic acid "
- ✓ Radio freq. Ablation
- ✓ microwave "
- ✓ cryotherapy - liquid N_2 temp (-60°C) **
- ✓ Transarterial chemoembolisation (TACE)

✓ LCD → In liver

— cisplatin

— doxorubicin used

- TACE - only method of palliation having
- * survival at Advantage

- sunitinib ✓ Rec (First line Advanced metastasis), ca. Breast
 - Lapatinib ✓ Second line for (HER-2neu⁺) ca. Breast
 - Gefitinib ✓ Adenocarcinoma lung (Females, non smokers)
 - Sorafenib ✓ Advanced & metastatic HCC
- Also → Advanced & refractory ca. Breast
- Imanitinib resistant GIST.

Hepatoblastoma

- ⊕ Mc malignancy of liver in children
- ⊕ LBW - risk factor
- ⊖ ass. ̄ FAP & BWS (Beckwith weidman Syndrome)
- ⊖ AFP > 90% cases of hepatoblastoma
- ⊖ not ass. ̄ cirrhosis, Any metabolic, or hep B & C virus

C/F - most patients are < 18 months of age
 most < 18 months
 all < 3 yrs
 All patients < 3 yrs
 - Asymptomatic. ~~But~~ Intraabdominal palpable mass.

↑ platelet count → on lab. Examination - very high platelet count **

→ Diagnosis - Biopsy



most tumours are resectable - resection

- mc site of metastasis - lungs
- In patients w pulmonary metastasis - (R_x) is chemotherapy followed by surgery **
- >50% of patients w pulmonary metastasis respond to chemotherapy - metastasis disappear

SECONDARIES → multiple liver secondaries in GB ca.

→ ca. lung → most common primary for metastasis to KEPS LAB (ca. lung)

CA. Breast (TLL)

1. Kidney
2. Oesophagus
3. Pancreas
4. Skin
5. Liver
6. Adrenal
7. Brain

1. Thyroid
2. Lung
3. Leptomeningeal metastasis

✓ mc primary responsible for isolated metastas to spleen - ovarian cancer *

- mc primary responsible for splenic metastasis * - malignant melanoma

Liver  males (ca. lung)
females (ca. breast)

→ calcific hepatic metastasis Adeno-ca. colon



TESTIS → ca. prostate (1)
PENIS → ca. Bladder (r)

LIVER METASTASIS

- upto 3 metastasis for liver, lungs & Brain are resectable — Metastasectomy *
- 4 or more metastasis are indications for liver palliation.
- After metastasectomy 5 yr survival (25-58%)

LIVER TRANSPLANTATION → Mc Ind - Biliary atresia in children

- Human transplantation Act - 1994
- HLA typing not mandatory for liver transplantation.
- liver transplantation (first) - STARZL

*
*
*

heart - Christian Barnard

Kidney, face, hand - Harvey

Pancreas - Kelly & Lillhei

islet cell transplantation - Sutherland → into portal vein.

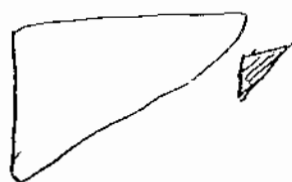
orthotopic transplantation

— placing the graft in the organ bed ✓

heterotopic : placing at different site bt not in organ bed.

- most are heterotopic **
- In Renal transplantation, diseased not removed
- Graft placed in (Rt) iliac fossa
- (Lt) kidney preferred due to long renal vein. **

Auxiliary LT :- placing small graft near organ bed



- Auxiliary partial orthotopic liver transplantation (APOLT)

⇒ After Excision of small portion, placing graft in vacated space.



APOLT - Indications

- ⊗ Acute fulminant reversible hepatic failure (preferred) ***
- ⊗ non-cirrhotic metabolic liver disease ✓
- ⊗ ABO incompatibility ✓
- ⊗ small for size graft ✓

Split LT

- Liver split into two (Rt) lobe to Adult & (Lt) lobe to a child

Reduced LT

- Size of graft is reduced (made appropriate) for the Recipient.

→ organ allocation based on MELD score

CBI → Creatinine
Bilirubin
INR.

* PELD score — organ allocation

→ Pediatric End stage liver disease

(N)utrition
(A)ge
(B)ilirubin
(I)NR
(A)lbumin.

Sequence of Anastomosis in liver transplantation.

SIPH-B ~~SHD-B~~

- suprahepatic venacava
- infra hepatic venacava
- portal vein
- hepatic artery
- Bile duct

In liver transplantation choledochocholedocostomy
is preferred over choledochojejunostomy (or)
hepatico jejunostomy.



** Indications in LT

- ① Diseased bile duct
- ② Disproportionation of size b/w donor & recipient
Bile ducts

→ (N) portal pressure is 5-10mmHg

- pressure more than 10mmHg portal HTN

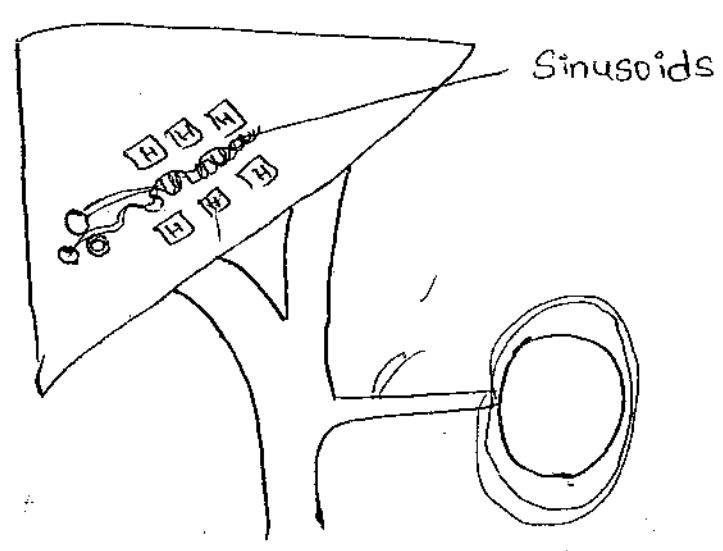
* 2 universal features ass c portal HTN are:-

- ① Oesophageal varices
- ② splenomegaly

Variceal formation occurs when pressure ≥ 10 mmHg

Variceal bleeding - 12mmHg, ~~10-12cm~~ saline ✓

*
*



Presinoidal Extra hepatic :-

- Splenic vein thrombosis
- Splenic AV fistula
- splenomegaly

Intra hepatic schistosomiasis

- nodular regenerative hyperplasia
- sarcoidosis
- GVHD

- Alcohol, HBV, HCV
- Primary biliary cirrhosis

Post sinusoidal

- Intrahepatic - Veno occlusive disease
- Extrahepatic
 - ✓ Budd-Chiari syndrome
 - ✓ IVC obstruction
 - ✓ (Rt) heart failure
 - ✓ constrictive pericarditis

In portal HTN formation of collaterals & Venous dilatation at porto systemic anastomotic sites leading to formation of

- ① Oesophageal varices
- ② caput medusae at umbilicus
- ③ Rectal varices
- ④ Bare area of liver
- ⑤ Post. Abd. wall

Venous hum at caput medusae CRUVEELHIE - BAUMGARTEN *

Mo. CDD → Cirrhosis, hepatic failure followed by variceal bleeding (2nd)

Management of Variceal bleeding

- Put two large bore IV canula
- IV fluids should be started
- Cut off Bp = 100 mmHg

- Indications of Blood transfusion Hb < 8g/dl
- Drug of choice to control Bleeding - OCTEOTIDE
 - Alternate - (Terlipressin + nitrates) **
 - Gastric lavage is performed in Room temp. saline to avoid hypothermia becoz hypothermia → Reversible platelet dysfunction ✓
 - Procedure of choice → Endoscopic Variceal ligation *

✓ Endoscopic variceal ligation > sclerotherapy
(↑ risk of perforation)

- ⊖ Routinely all the patients are given systemic antibiotics to ↓ the risk of infection, Rebleeding & duration of hospitalisation
- ⊖ After discharge variceal Eradication performed by Endoscopic variceal ligation * (EVL)
- ⊖ Doc for primary prophylaxis - propranolol
Rx of choice " " " " - EVL ✓
- ⊖ After EVL if Rebleeding occurs repeat endoscopy should be done *
- ⊖ If Endoscopy not able to control Bleeding surgical intervention to be done. *

- Triple lumen
- one complication - Aspiration $\rightarrow$ so airway should be protected before
- Air should be used for inflation of Balloon
- use of water, saline, contrast - Contraindicated
- minimum amount of Air - 300ml (Gastric Balloon)
- max. pressure by oesophageal balloon = 40 mmHg
- Oesophageal balloon deflated every 12 hrs to prevent oesophageal ischaemia
- prevents bleeding during transposition

* LINTON-NACHALAS TUBE - single lumen tube for isolated gastric varices

Tipss $\rightarrow$ ** most suitable for ongoing liver transplant

- $\rightarrow$ Transjugular intrahepatic porto systemic shunt
- non-selective
- inserted below (Rt) hepatic vein & (Rt) branch of portal vein
- name - VIATORR * 1cm diameter
- Diameter - 1cm
- Rosch needle used for cannulation of Portal vein.

Complication $\Rightarrow$ Encephalopathy due to high conc. of ammonia

- Others :- Stent Stenosis followed by Stent thrombosis
- Contraindications :-

Absolute

- ① RT heart failure
- ✓ pulmonary HTN
- ✓ hepato pulmonary Syndrome
- ✓ Polycystic liver disease

Relative

- ✓ portal vein thrombosis
- ✓ hypervascular liver tumour
- ✓ encephalopathy

Indications

- ① Prevention of variceal bleeding (Mc) **
- ① Refractory variceal bleeding
- ① Refractory Ascites
- ① Refractory hepatic hydrothorax
- ① Hepato Renal Syndrome
- ① portal HTN gastropathy
- ① Budd-chiari syndrome
- ① veno-occlusive disease

- 3 types

- ① non-selective
- ② selective
- ③ partial

non-selective

selective

partial

✓ Eck fistula

✓ DSRS

✓ Diameter

✓ Side to side

Distal

<10mm

porto caval shunt

splenorenal
shunt.

(SSPCS)

✓ INokuchi

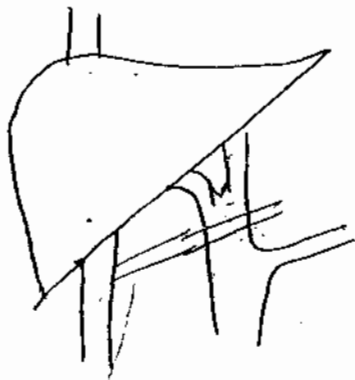
✓ interposition
graft

• porto caval (pc) (Bleeding varices)

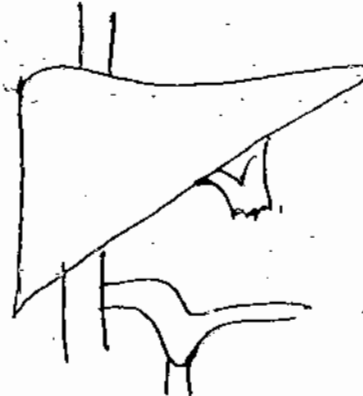
• meso caval (Mc) (midline approach
used.)

• meso renal MR)

✓ PSRS (proximal
spleno Renal
shunt)



Eck
fistula



* End to sideshunt
*

Side to side porto caval shunt :-

→ mc performed shunt worldwide

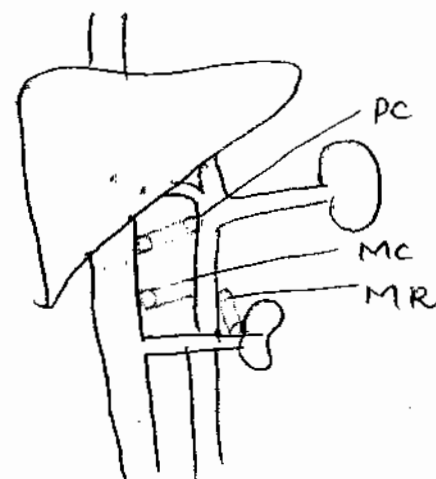
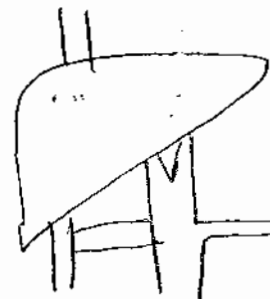
**

(Rx) of choice for Budd-Chiari

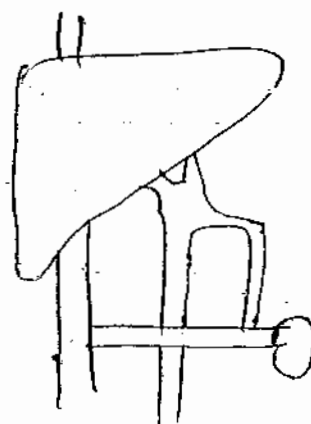
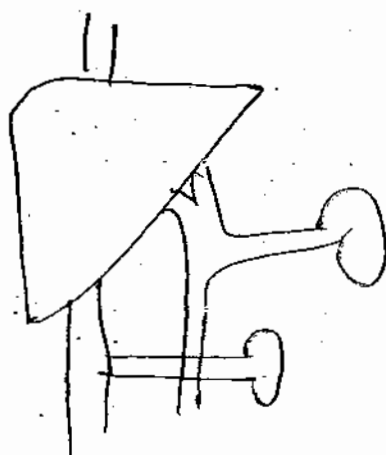
syndrome, venoocclusive disease,

Refractory ascites

Interposition graft

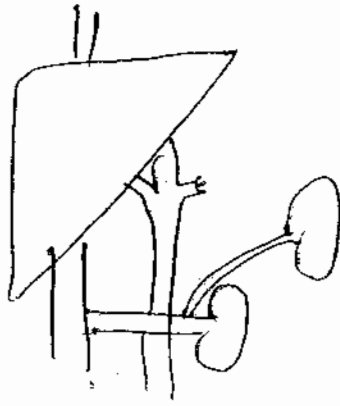


Proximal spleno renal shunt

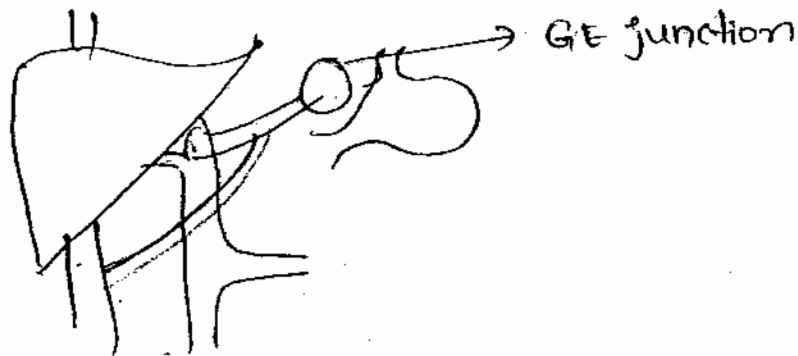


PSRS

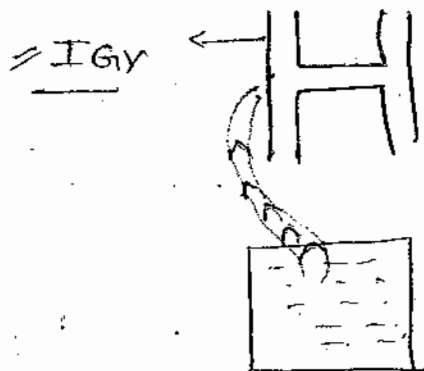
PSRS



Inokuchi shunt :- Inter position Graft B/w
 IVC Venacava & coronary vein (Gastric)



Portocaval shunt



3 types

- DENVER
- KEVEEN
- MINNESOTA

- one end placed in peritoneal cavity & other end placed in IGV ^{IV} (or) sometimes to SVC

- used for refractory Ascites.

*

Non cirrhotic portal HTN

→ out Hepatofailure, Acute, Portal Hypertension.

- 2 types

- ✓ Extrahepatic portal venous obstruction (EHPVO)
- ✓ non cirrhotic portal fibrosis (NCPF)

EHPVO

- 1st-2nd decade
- MC site of
* obstruction →
* confluence of
splenic vein
& superior
mesenteric vein
- ✓ 1st (or) 2nd order
branches affected
- ✓ splenomegaly
* less common
- * mild to mod.
- ✓ TCC → mesocaval shunt

NCPF

- ✓ 3-4th decade
- ✓ 3rd (or) 4th order
branches are
affected
- ✓ upper GI bleed (MC)
- ✓ extrahepatic presinusoidal
- ⊖ * more common
- ⊖ * mod. to severe
- ✓ vinyl chloride,
* * Arsenic, copper
(VAC)

but Ascites, Jaundice, encephalopathy (signs of hepatic failure)

Budd-chiari Syndrome

- hepatic venous outflow obstruction caused by
 - hepatic vein thrombosis
 - IVC obstruction
- Overall Mc cause of worldwide - hepatic vein thrombosis *
- In India, China, Japan, South Africa - Mc cause is membranous obstruction of IVC * ✓

World wide - Mc - cause ⇒ polycythemia vera *

**

(C/P)

- Tender congestive hepatomegaly, fatigue, Anorexia,
- Ascites, Jaundice
- lymphoedema more common in IVC obstruction.

Ioc

- Venography (or)

- Budd-chiari syndrome by hepatic vein thrombosis leads to Atrophy of liver & hypertrophy of caudate lobe & "central"

* Hot spot sign * - scintigraphy

- * Secondary collaterals on venography
- Berger's disease - cork screw collaterals - Angio graphy ✓
- In acute cases anticoagulants are started & (Rx) of choice $\Rightarrow$ Side to side porto caval shunt in hepatic vein thrombosis ** (SSPCS)
- For membranous obstruction of IVC $\rightarrow$ Transcatheter membranotomy
- Hepatic vein thrombosis + IVC obstruction } SSPCS + cavoatrial shunt (CAS)
- In Advanced cases pt presenting w/ hepatic failure - liver transplantation ✓ *

Veno occlusive disease

- endothelial sclerosis of sublobular hepatic veins & venules (hepatomegaly, portal venous obstruction) *
- ** Mc - VOD - Western countries - Bone marrow transplantation
- use of chemotherapy agents Cytarabine, oxogamycin, carmustine, Gemtuzumab
- use of Azathioprine, Bone marrow transplant
- consumption of "Bush tea" *

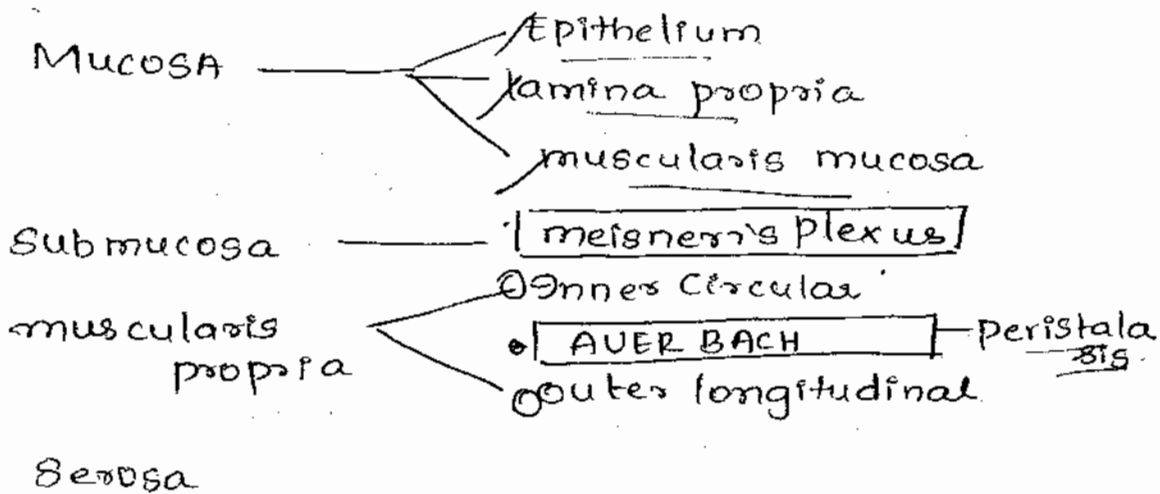
↓
CROTOLARIA] **
SCENCACIO] *

Alkaloid pyrrolizidine *

Rx of choice → SSpc ✓

* DEFIBROTIDE - specific ↓ ↓ ↓ the
* mortality.

GIT



— Meisner's plexus function → Intestinal
Secretions &
Villous motility ✓

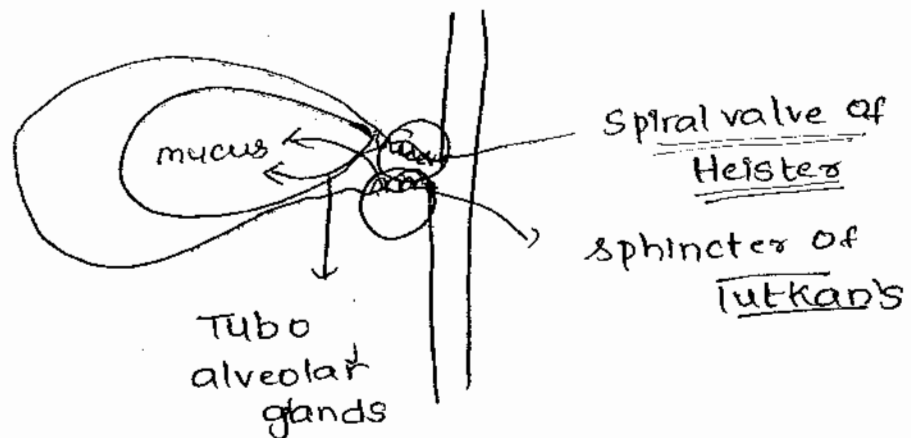
* Serosa missing - Oesophagus ✓

* Submucosa & Muscularis mucosa → Gall
bladder
absent ✓

* Strongest layer of GIT ⇒ Submucosa ✓

*** [

- Sea green in colour**
- Thin & elastic, pyriform shape ✓
- Content - (30-50ml)
- Function :- Storage, concentration, acidification of bile ✓
 - Concentrates by ~~200~~ 5-10 times*



- Maximum Absorptive surface / unit surface area
- ** ⇒ Gall bladder

GALL STONES

- mc Gallstone world wide - cholesterol *
- (mixed if given)
- Mc in India - pigmented

- Bile composed of water (90%), cholesterol,
Bile acid, lecithin

- Cholesterol made water soluble by bile acid &
lecithin due to formation of micelle

- 3 mandatory for cholesterol gall stones

✓ lithogenic bile

✓ nucleation

✓ hypomotility of GB

Lithogenic Bile

Bile: Chole: ↑

(↓ Bile
Cholesterol ratio) **

nucleation

Hypomotility

- supersaturation of fat - pronucleating
cholesterol obesity factors
T saturation

• Obesity

• high fat intake

• clofibrate
therapy

ruhalin

BAL

clofibrate

thiazide

10/12

✓ infection

✓ mucin

Glycoproteins

⊗ prolonged
fasting

⊗ prolonged
TPN

⊗ pregnancy

⊗ ocrotide **

⊗ Ocp's

⊗ massive
burns

- Bile acid deficiency

• CYP7A-1 mutation

• primary biliary
cirrhosis

• gall disease

• gall resection

• use of Bile
acid sequestrant

(CHOLESTRYAMINE

CHOLESTIPOL) MDR3 gene

lentiviral

mutation
www.FirstRanker.com

MDR-3 gene

mutation.

- Somatostatin is known as "universal switch off"
- Better analogue - Ocreotide
 - Control variceal bleeding
 - ↓ ses output of enterocutaneous & pancreatic fistula
 - secretory diarrhoea
 - ↓ ses the secretion of CCK → Gall ~~Bowel~~ Bladder hypomotility
 - ↓ ses secretion of insulinoma

Pigmented Stones - primary

Black - BB

- Bilirubin pigment
- ** Polymer of Ca. phosphate
& Ca. Bicarbonate $\text{PO}_4 \text{ HCO}_3$
- Hard & opaque seen
in - Sickle cell anaemia
 - β -thalasemia
 - Hemoglobinopathies
 - prosthetic heart valve

Brown.

- composed of
Ca. Bilirubinate +
Ca. palmitate +
Ca. stearate
- Infestation of worms
 - ✓ Ascariis
 - ✓ clonorchis sinensis
(Dead products)
- ↓
Infection
by E. coli &
✓ Klebsiella
- ↓

↓ β -Glucuronidase
(Brown Stones) un conj. conj bilirub

Acute cholecystitis - USG

Acalculous cholecystitis - USG

chronic cholecystitis - USG

Gold standard [90%] for dx of Acute chole-
* cystitis $\Rightarrow$ HIDA HIDA cholangiogram-MMR

Plain X-ray **

$\rightarrow$ Tri radiate fissure "Mercedes Benz sign"



$\rightarrow$ Bi radiate "seagull"



Complications

Gall Bladder

- Asymptomatic
- Acute cholecystitis
- Chronic cholecystitis
- mucocoele
- empyema
- ischaemia / perf
- carcinoma

CBD & Pancreas

- Jaundice
- Acute pancreatitis

Small Intestine

- Gall stone ileus

- Gall stone ileus → commonest site (distal ileum) **
- Generally in elderly patients (6th - 7th decade)
 - mostly asymptomatic
 - most common fistula cholecystoduodenal fistula **
 - 2nd mc → cholecystocolic fistula
 - characterised by RIGLER'S TRIAD **

- ⊖ Small bowel obstruction
- ⊖ pneumobilia
- ⊖ Ectopic Gallstones

Diagnosis :- Clinical Evaluation

- Xray & USG

- (Rx) :- Removal of obstruction only by enterotomy **
- cholecystectomy performed in 2nd stage surgery
 - ↓
 - Done in ⊖ Young patients
 - ⊖ stable cep
 - ⊖ cholecystocolic fistula

Acute Cholecystitis

Epigastric pain
+
Fever
+
leucocytosis
(↑ WBC)

} Triad

Acute cholecystitis

on pressing tip of 9th costal cartilage —
costal catch in inspiration

Hyperaesthesia of infra scapular area

⇒ "BOA's sign" **

(Rx)

< 72 hrs of

Acute cholecystitis

— conservative (Rx)
followed by
same sitting
cholecystectomy

> 72 hrs

— conservative + interval

laparoscopic cholecystectomy
(4-6 weeks)

** Emphysematous cholecystitis → Clostridium welchii (Anaerobe)
(2) E. coli (Aerobe)

— Mc organism emphysematous
pyelonephritis → E. coli

— Xanthogranulomatous pyelonephritis → Proteus
(STAG HORN CALCULI)

— Xanthogranulomatous cholecystitis — non-infective
* Cause

— Rupture of ROKITANSKY ASCHOFF SINUSES
↓
Bile leak → xanthogranulomatous
cholecystitis

Two factors responsible for ↑ risk complications

① Gall bladder stasis

② Anaemia

Mc - perforation - fundus

Predisposing factor - prolonged Ileo, IPN, requirement
major surgeries CABG, hospital
stay, THR, massive burns
leptospirosis**

- Malasia is more commonly ass than dengue

**

Both are uncommon

(C/F)

→ signs & symptoms

- ✓ Epigastric pain

✓ fever

✓ leucocytosis

(dx)

→ USG

Gold standard - HIDA

(Rx)

✓ lap. cholecystectomy (stable patients)

✓ unstable patients - percutaneous cholecysti
stomy.

**

Adenomyomatosis

mucosa + muscularis Hyperplasia & hyperplasia

- characterised by hyperprolif. of mucosa & hyperplas-
tic changes in muscularis

Comet tail

'V' shaped artefacts

(Rx) - Symptomatic & Gall stones } → cholecystectomy

GB polyp

cholesterol polyp

- * more common
- ✓ multiple, small & Pedunculated
- ✓ Benign

Adenomatous polyp

- ✓ Single
- ✓ sessile, large
- ✓ premalignant
- ✓ Risk of invasive cancer ↑
- * Age > 60.
- * Ass. $\bar{c}$ Gall stones
- * Size > 1cm
- * Documented ↑ size on Repeat scan

Porcelain GB (or) Calcified GB

- ✓ Calcium encrustation in the wall of GB leading to Bluish appearance & grating sensation on cutting GB
- ✓ Seen in 5th to 6th decade
- ✓ ass. $\bar{c}$ Gall stones > 90% cases
- ✓ Maj → Asymptomatic

- (dx) incidentally on X-ray

(Rx) Early lap. cholecystectomy ✓ early lap.

CARCINOMA GALL BLADDER → Mc → Adenocarcinoma

Risk factors ⇒ ① choledochal cyst

② Abnormal pancreaticobiliary duct Junction (APBDJ)

③ stone ≥ 3cm

④ obesity

⑤ chronic Typhoid carrier

⑥ Adenomatous polyp

⑦ porcelain GB.

* Smoking is not a risk factor ✓

* Sumoking risk of rest of GI & hepatobiliary pancreatic duct ca. ✓

Max. incidence of ca. GB ⇒ 1. India (UP & Bihar - Fem)
2. Pakistan ✓

→ Age 6th - 7th decade

- Gallstones (78-98%) Gallstones

- 0.3-3% pt of Gallstones → Ca. GB develop.

- All Gallstones doesn't rise the risk of ca. Gallbladder

30% - Body

10% - neck

① CA 19-9 ***
② CEA

Histological types

- ① Diffuse sclerosing (infiltrative) (MC, worst prognosis)
- ② nodular/mass forming
- ③ papillary ca. (Best prognosis)

* segment of liver related to GB = IV b, V

* MC involved organ in ca. GB = liver

(C/F)

- long H/o repeated episodes of Biliary colics & certain change in character of pain & persistent ✓

- dull aching pain

↳ Anorexia

↳ weight loss

(dx) - USG (initial investigation)

(90%) - CECT Abdomen ✓

Staging

7th AJCC TNM classification

T_{1a} - Involvement of lamina propria

T_{1b} - muscularis propria

T₂ - perimuscular connective tissue

Of Single Extrahepatic organ

T₄ - Involvement portal vein / hepatic A /
2 or more Extrahepatic organ

N₁ - LN along (PHC-2) portal vein,
hepatic A, cystic duct, CBD.

N₂ - LN along (VACS) venacava,
aorta, celiac A., SMA.

Madhu

M₀ - no metastasis

M₁ - metastasis

Stages

I_a $\Rightarrow$ T_{1a}

I_b $\rightarrow$ T_{1b}

II - T₂

III_a - T₃

III_b - T₁₋₃ (N₁)

IV_A - (T₄) N₀₋₁

IV_B - Tany (N₂)
Tany Nany (M₁)

I_A - lap cholecystectomy sufficient ✓

I_b to III_b - extended cholecystectomy ✓

IV_a - Extended cholecystectomy +
Extended (Rt) hepatectomy ✓

IV_b - palliation by chemotherapy ✓

$\rightarrow$ unresectable GB ca survival $\rightarrow$ 4-6 months ✓

* * * FEMCITANIB + CISPLATIN

Ext. Cholecystectomy - En bloc removal of

- Segment IVb + V of liver
- Gall Bladder
- lymph nodes along cystic duct, CBD, peripportal & Retro pancreatic lymph nodes

Post site Excision - not an isolated procedure

* * * usually performed $\pm$ Extended cholecystectomy

- ✓ no survival Advantage
- ✓ prognostic imp. only.

Medical management of Gall stones

→ only used for cholesterol Gall stones

- Agents are

$\left. \begin{array}{l} \text{Ursodeoxycholic acid} \\ \text{Cefuroxime} \end{array} \right\} \rightarrow \text{HMG-CoA reductase Inhibitors}$

↓

Rate determining Step.

Cholesterol dispersion occurs from stones by

Physico chemical means. It is associated with high

risk of recurrence * *

- ✓ cholesterol stones
- ✓ size 40mm
- ✓ non acute symptoms
- ✓ functioning GB.

* DM is not an indication for prophylactic cholecystectomy. bcz incidence is similar to (N) population.

* Indications of prophylactic cholecystectomy

- ① Heart transplant recipient
- ② lung " "

cyclosporine given in these recipient which rises the risk of Gall stone formation

- ③ prolonged TPN Requirement

- ④ Biliopancreatic diversion

- ⑤ stone size > 2.5cm

- ⑥ hemolytic conditions

- ⑦ Non-functioning GB

- ⑧ Trauma GB

- ⑨ Typhoid carrier

- ⑩ incidentally detected Gallstones during elective surgery

- ⑪ Gallstones in relatives of ca-GB patients

- ⑫ Adenomatous polyp & stone ✓

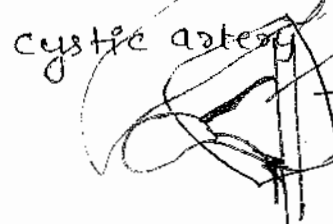
- ⑬ Porcelain GB

- common hepatic duct
 - cystic duct
 - cystic artery
- content lymph node of lung

Hepatocystic Δle ***

- common hepatic duct
- cystic duct
- Inf. surface of liver

cys
2 ducts
+ 1 (A)



content
Calot's Δ
Hepato
cystic
content

Rotter's → Interpectoral - Ca. Breast

Rouvier's → Retropharyngea - nasopharynx
Ca.

Delphian nodes → pre tracheal
(or)
pre laryngeal

Virchow node → (Lt) supraclavicular
nodes

Irish nodes → (Lt) Axilla - Ca. stomach

Sister Mary Joseph → cutaneous
metastatic
deposit
around umbilicus

Clouquet node → Femoral
canal

Krause nodes → Jugular fossa
lymph nodes

(L) supradia... → Trousseau's Sign.

Trousseau Sign → carpopedal spasm
→ hypocalcemia

Trousseau Syndrome → migratory thrombophlebitis.
Ca. pancreas.

→ LIVER → cisplatin + doxorubicin

→ CA GB → Gemcitabine + cisplatin
Cholangiocarcinoma

Pancreas → Gemcitabine.

Esophagus } → Epirubicin
stomach } cisplatin (ECF)
S-FU

Small intestine → S-FU

Colorectal cancer → FOLFOX-TU
S-FU, LEUCOVORIN,
Oxaliplatin

Ca. Anal canal → Nigro regimen
(chemo regimen)

SFU + ~~MME~~ Mitomycin

— $Mc = (F)$

➤ ~~hypothesis~~ hypothesis - Abnormal pancreatico biliary duct junction (APBDJ)

— Congenital

— responsible for reflux of pancreatic enzymes into bile duct — weakening & dilatation of bile duct

TODANI MODIFICATION OF ALANZO - LEZ CLASSIFICATION **

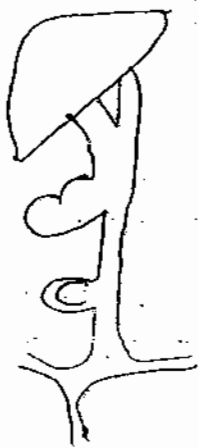
Dilatation of extrahepatic Bile duct



Ia - cystic dilatation ()

Ib - focal segmental ()

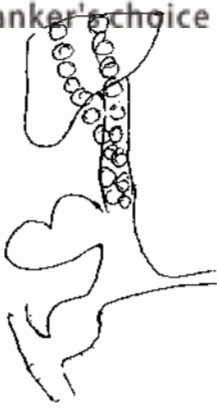
Ic = fusiform.



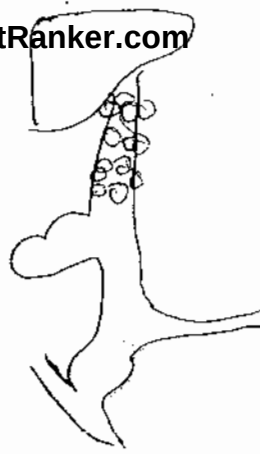
II - Diverticular formation.



III → choledochocoele



IVa → Both intra hepatic & Extrahepatic (multiple cysts)



IVb - only Extra hepatic



V → only intra hepatic

* CAROLIS disease
(Central dot sign)

Type I, II, IVb ⇒ Hepatico jejunostomy

IVa & V ⇒ Liver transplantation

III ⇒ Endoscopic sphincterotomy
+ cyst wall unroofing

common ⇒ Type 1 > Type 4 > Type 3 *

(C/F)

Triad

Abd. mass
Abd. pain
Intermittent Jaundice

→ Abd. mass
→ Abd. pain
→ Intermittent Jaundice

(MC)

- symptom in child < 2yrs of age ⇒ Jaundice

Mc in patients > 2yrs of age ⇒ Abd. pain

- Cystolithiasis
- Rep Episodes of Cholangitis
- pancreatitis
- ↑ risk of malignancy of
 - liver
 - GB
 - Bile duct - Max. risk of malignancy
 - pancreas (cholangiocarc.)
 - Duodenum.

Mc site of cholangiocarcinoma in choledochal cyst is within the cyst involving post-wall

Ioc

MRep ⇒ Magnetic Resonance Cholangiopancreatogram

Body
diagnostic
of
Extra & Intra
Hepatic

- T₂ phase of MRI * *
- Slow moving fluids or static fluids
& pancreatic juice are having high
Signal intensity - white
- Fast moving fluids & surrounding
tissues - low signal intensity - Black
- purely diagnostic which can evaluate
both intra & extra hepatic BD
- max. sensitivity of dx of CBD stones

Ioc → Eg: CBD stones, CBD strictures, choledochal cyst, MRI + MRep (cholangiocarcinoma)

- Both diagnostic & Therapeutic
- used to remove stone in distal portion of BD
- To put stents in distal portion of BD

Contraindications:-

litumetic → to remove distal
stone

1. Stone size > 1.5cm
2. multiple stones
3. Hepatic stones (intra)
4. stones proximal to stricture
5. Impact stones

&
place stents

- For CBD stone > 1.5cm, Removal by supraduodenal

choledochotomy (MC complication - Acute pancreatitis)

PTC :- Invasive both dx & therapeutic

- used for removal of intra hepatic stones
- stones located in proximal portion of BD
- stones located proximal to stricture

CBD stones

<2yrs

Retained CBD stone :- CBD stone detected in

2yrs of cholecystectomy

Recurrent CBD stone after 2yrs cholecystectomy

- ^{>2yrs} 6-12% of pts of gall stones

Two types

Primary

Secondary

Primary

me in developing

Secondary

me in developed.

- Formed inside the Bile duct
- Brown Stones
- more common in developing countries

- Formed in Gall Bladder — CBD
- cholesterol stones
- more common in western countries

(C/F)

- Asymptomatic
- symptomatic
 - Jaundice
 - cholangitis.

****** - ALP, - GGT, 5' nucleotidase raised in any kind of CBD obstruction - obstructive jaundice

90c → MRCP

dx & therapeutic → ERCP

Max. size of stone removed by ERCP = 1.5cm

stones > 1.5cm removed by supraduodenal choledochotomy

Cholangitis

Mc - CBD stone

- Two factors mandatory

1. obstruction

2. infection

- cholangio lymphatic & cholangio venous reflux → spread of infec from Biliary tract → systemic circulation

Pain
Jaundice
fever..

- pain
- Jaundice
- fever

Unhealed
cases

Raynaud's
pentad *
Charcot's
+
1) mental status
changes
2) Shock

In non responding patients 1st step

1. ERCP & stone removal or stenting
2. PTC & stone removal or stenting
3. open Biliary decompression (ERCP & PTC is failed or not available)

- T-tube cholangiogram performed on 7 to 10th day after insertion **
- If no filling defects -- Remove T-tube *
- If filling defects presents -- Retain upto 4-6 wks for maturation of tract
- stones removed by BURHENES technique Burhenes *

Bile duct injury

- * Incidence in open cholecystectomy $\Rightarrow$ 0.1-0.2%
- Lap cholecystectomy $\Rightarrow$ 0.3-0.85%
- Mc. injured segment of BD is proximal (or) common hepatic duct **
- Significant BD injury by experienced surgeons **

of significant Bile duct injury caused
by Visual misperception Caused by experienced
surgeons

< 3% Caused by Young beginners due to
lack of experience

** After repair of BDI, if drain output
is using only observation because it
stops spontaneously in 4-6 weeks

⇒ If drain output rising - distal obstruction
due to stone or stricture treated by
ERCP or stenting

ERCP
&
Stenting

Steps of (R_v) of postop. detected BDI

1. Control the infection by IV Antibiotics
2. Drain the Biloma by USG/CT guided aspiration
(or) drain insertion
3. Complete cholangiography → ERCP if obstruction
is suspected (or) MRCP
4. Definitive treatment :-
 - ERCP & stenting
 - Resection of stricture & hepaticojejunostomy

Type I → common hepatic duct (CHD) stump $\geq 2\text{cm}$
structure low

Type II → CHD stump $< 2\text{cm}$ stricture - mid

Type III → hilar stricture & intact confluence

Type IV → hilar stricture & destroyed confluence

Type V → stricture involving (RT) aberrant, (RT) sectoral duct & or & out CHD.

* STRASBERG CLASSIFICATION OF LAPROSCOPIC BDI.

Type A :- Bile leak from cystic duct stump (or) leak from subvesical duct of luschka
— most common **

Type B - Transection & occlusion of Aberrant (RT) sectoral duct

Type C - Transection & out occlusion of Aberrant (RT) sectoral duct

Type D :- Lat. injury to CBD wall.

Type E :- E1-E5 → Bismuth classification

ANP

- More common in males
- Autoimmune disorders ass $\bar{c}$ autoantibodies more common in females

- Eg: *
1. primary biliary cirrhosis $\rightarrow$ Antimito chondrial antibody
 2. Graves disease - TSH antibody against TSH receptors
 3. Hashimoto's - Anti TPO
 4. pernicious - Against parietal cells.

$\Rightarrow$ unknown Etiology characterised by involvement of both intra & Extrahepatic bile duct

Pathophysiology

Cholangiocytes - Target cell for injury



onion skin appearance **
pathognomic



multiple strictures - Beaded
(or) pseudo diverticula appearance

(c/f)

initial stage - Asymptomatic

Earliest lab finding - asymptomatic $\uparrow$ or

GGT *

- presents $\bar{c}$ repeated episodes of cholangitis like pain, Jaundice, fever, Anorexia, fatigue, pruritis

- may have raised level of ALP.

Selective absence of intrahepatic peripheral branches leads to pruned tree appearance ** - keep

Rx

for controlling symptoms - high dose ursodeoxycholic acid

Rx oc

→ Liver transplantation

→ risk factor for cholangiocarcinoma

primary biliary cirrhosis

- females
- Autoimmune.
- Anti mitochondrial antibody
- hyperlipidemia, melanosis

↓

Xanthomas, xanthelasma

- pruritis precedes Jaundice ***✓
- fatigue is severe

** pruritis & fatigue are very severe & are characteristic of this.

- pruritis & fatigue are indications for liver transplantation.

CHOLANGIOCARCINOMA

Risk factors

- choledochal cyst
- CBD stone
- primary sclerosing Cholangitis

Pain
Jaundice
And
fever
fatigue
Pruritis

- Cirrhosis
- Clonorchis Sinensis
- Opisthorchis Viverris
- HBV, HCV, HIV
- Asbestos
- Nitrosamine
- Dioxin
- DM, Obesity, loops, smoking, Thorotrast, INH

GC BHC AND
DOSTI

- mc site Hilum - KLATSKIN TUMOUR **
- Tumour markers - CA-19-9, CEA
- Chemo → gemcitabine + cisplatin

Histological

- Diffuse infiltrative / sclerosing (mc worst prognosis)
- nodular / mass forming
- papillary (Best prognosis)

- (C/F) → painless progressive Jaundice
- pruritis, fatigue, Anorexia, clay coloured stools

1) Ampullary carcinoma

2) PeriAmpullary carcinoma - in 2cm of ampulla

Includes Ampullary + Distal Cholangiocarcinoma +
ca-head pancreas + Duodenal carcinoma

* COURVOISIER'S LAW :- In case of obstructive Jaundice, GB seldom palpable due to stone as GB shivelled or fibrosed.

- If GB is palpable in pts of obstructive Jaundice it is due to periampullary ca.

Exceptions :-

- ① Double impaction stone (1- cystic duct, 2- hepatic duct)
2. oriental cholangiohepatitis (hepatolithiasis)
- multiple stones.
3. mucoecoele
4. stone impacted in ampulla of Vater

Goe → cholangioeca.

MRI + MRCP

Rx → Hilar cholangiocarcinoma :-

CBD resection + lymphadenectomy +
caudate lobectomy

Distal cholangiocarcinoma :-

pylorus sparing WHIPPLE'S procedure

unresectable cholangioeca.

Gemcitabine + cisplatin

Hemobilia

- Mc cause is gastrogenic during PTC*

- characterised by Quinck's Triad **

→ malignancy & rupture of hepatic - A aneurysm
also the cause

- Jaundice
- upper (or) lower GI Bleeding

QUINKE'S
TRIAD **

**
Me is main in > 90% of cases

dx & therapeutic - Angiography & embolisation

(Rx)

- conservative
- non responding - Angiography & embolisation
- if not available - surgical ligation of bleeding vessel

* Sphincter of Oddi - (4) sphincters

- Sphincter ampullae
- sphincter pancreatikus
- Superior choledochal sphincter
- inferior " "

High
Malignancy
H. amyloma accepta

- * * *
- Pancreas Divisum → Mc Cong. anomaly of pancreas characterised by divided drainage

Body, ^{tail} ~~neck~~ → minor duct (Accessory duct of Santorini)
head, uncinate → major duct

- major position, Body, tail → Accessory duct of Santorini by minor papillae leading to min outflow obstruction

(C/F) → Acute pancreatitis

(R) → dorsal duct sphincterotomy or sphincteroplasty
Best position for sphincterotomy is 11 o'clock * *
not at 4 o'clock (or) 5 o'clock.



Annular pancreas - around gut

distal atresia
below the
ampulla

4 - Ring of annulus of (N) pancreatic tissue around the and part of duodenum - located proximal to ampulla
characterised by duodenal obstruction & non-bilious Vomiting

- Duodenal Atresia distal to Ampulla → Bilious vomiting
- Ass. ∩ Duodenal Atresia & Down's syndrome

* Single bubble - hypertrophic pyloric stenosis

* Double bubble - duodenal atresia, Annular pancreas

* Triple bubble - Jejunal Atresia

- (K_x) - Duodenoduodenostomy followed by Pancreas
of choice → Duodenal atresia
- Duodenojejunostomy
- Duodenojejunostomy → SMA
syndrome

Acute pancreatitis - Gallstones > Alcohol

- Mc cause Gall stones
- Alcohol - second
 - ERCP **
 - Blunt trauma
 - hypertriglyceridemia
 - hypercalcemia
 - hyperparathyroidism
 - Drugs
 - Viral (mumps, Coxsackie, Echo virus)
 - Rare :- Ca. pancreas
 - cystic fibrosis

Ex → route not required
No correlation b/w severity & serum amylase
most significant lipam

Drugs with Established Association **

- 1) 6-Mercaptopuril
- 2) Azathioprine
- 3) Deoxyguanosine
- 4) Cytarabine
- 5) Amino salicylic acid
- 6) Tetracycline
- 7) Pentamidine
- 8) Oestrogen
- 9) Trimethoprim - sulphamethoxazole
- 10) Thiazide
- 11) Valproate
- 12) Pyresomide
- 13) Metronidazole

MAD CAT PET TV FM

- L-Asparaginase
- Acetaminophen

— Abnormal intrapancreatic activation of pancreatic enzymes



mechanism of death
MODS - < 48h
Sepsis > 48h

damage of duct & acini

- Mc of death in 48 hrs of hospitalisation
- **

[MODS] ✓

- Mc of death after 48hrs of hosp - sepsis ✓
- **
- First sign of MODS - ARDS - Resp failure ✓

Clinical presentation :- Epigastric pain radiating to back. partially relieved by sitting & leaning forward

- stooping position
- Release of pancreatic enzymes - paralytic ileus
- nausea & vomiting
- haemorrhagic pancreatitis - Ecchymosis around

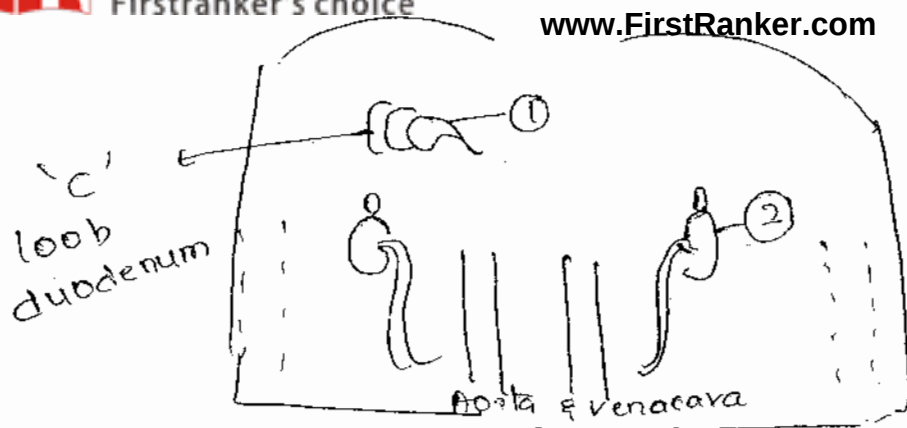
flank ⇒ Grey Turner's Sign *

umbilicus - Cullen sign *

inguinal - Fox sign *

X-ray changes

- ① Gas less Abdomen
2. Ground Glass appearance
3. Sentinel loop
4. Colon cut off sign *
5. Rehart halo sign *



→ For retroperitoneal pathology **9bc** — CECT

① Pancreatic pathologies

Acute pancreatitis

Pancreatic necrosis, abscess, pseudocyst

Chronic pancreatitis

Ca. pancreas

② Kidney :-

— RCC

— ADPKD

— TB (Renal)

③ Retro peritoneal

fibrosis &

— Sarcoma

(retroperitoneal)

— Routinely CECT is not recommended for **(dx)**

of Acute pancreatitis

— Reserved for cases of diagnostic ~~constraint~~

Uncertainty (b) complications

— Routine **(dx)** laboratory investigation

— Serum Amylase * *

— no correlation b severity & Amylase

— in 10% pancreatic necrosis — **Amylase** — **(N)**

(Rx) : NSAID → METAMIZOLE
OPIATE → BUPRENORPHINE

- Ryle's Tube for paralytic ileus
- Antibiotics not given but when infec. suspected given
- Not accepting food for > 7 days TPN given

Prognostic / severity scores

1. Ranson's score
2. Glasgow score
3. modified glass gow
4. APACHE II (Acute physiology and chronic health Evaluation)
5. CT severity index (CTSI)



BALTHAZAR CT grading + necrosis score

6. CRP > 130

* Ranson's score (Alcoholic) ALWAYS
**

At time of Admission

1. Age > 55 years
2. WBC count > 16000/uL
3. RBS > 200mg/dl
4. LDH > 350 IU
5. AST > 250 U

After 48 hrs of Admission

- * Fall in hematocrit > 10 points
- 2. BUN ↑ > 5
- 3. $Ca^{+2} < \frac{8 \text{ gm}}{\text{mg/dl}}$
- 4. Base deficit ≥ 4
- 5. $pO_2 < 60 \text{ mmHg}$
- 6. fluid sequestration > 6L

APACHE-II ***

BT ↑HR at CWWG SHOP-2

- 1) Blood pressure
- 2) Temp
- 3) HR
- 4) RR
- 5) creatinine
- 6) WBC count
- 7) Glass GOW coma scale
- 8) hematocrit
- 9) Sodium
- 10) Oxygenation
- 11) PH, potassium.

complications

- Acute fluid collection
 - pseudocyst
 - pancreatic Abscess
 - " Necrosis
- Acute collection of fluid in peripancreatic region
in 4 weeks of Acute pancreatitis
- most resolve spontaneously - no Rx required
- pseudocyst → after 4 weeks fluid collection
lined by granulation tissue
- MC cause of death - infection

collection of pur in peripancreatic region

(C/F) Abd. pain
fever & chills & rigors

(Rx) Deep seated abscess is generally drained percutaneously under USG or CT guidance

Pancreatic necrosis :- sterile

non viable fat (or) pancreatic tissue in Pancreatic region

→ sterile, Mc complication Infection

(Rx) Repeated surgical debridement & zipper application & lavage

- only group of antibiotics having good pancreatic penetration

IMEPENEM, MEROPENEM ***

PSEUDOCYST

- lined by granulation tissue not by epithelium

- Incidence in Acute pancreatitis - 10-20%
Chronic " - 20-40%

- of Acute pancreatitis → cyst, single, large extra pancreatic
chronic " → multiple, small intrapancreatic

- Mc site lesser sac ***

asymptomatic

- large pseudocyst - Abd. pain, non bilious vomiting - undigested food particles.

- m.c. complication $\Rightarrow$ infec. followed by haemorrhage

(Rx) of choice $\Rightarrow$ CECT

(Rx) $\rightarrow$ may resolve spontaneously - observation

Indications of Rx

$\rightarrow$ size $> 6\text{cm}$

$\rightarrow$ duration $> 6\text{weeks}$

$\rightarrow$ symptomatic pseudocyst (or) pseudocyst c complication.

(Rx) of choice $\Rightarrow$ cysto gastrostomy
cysto duodenostomy } - (X)

** cysto jejunostomy $\rightarrow$ Treatment of choice

disadvantage of cysto jejunostomy cysto gastrostomy.

- SUMP syndrome *

cysto jejunostomy $\Rightarrow$ $\uparrow$ Blood loss long duration of surgery

Disadv

2 Anastomosis

Adv $\rightarrow$ Rapid collapsing cyst. 2 out
formation of SUMP

- Mc cystic lesion - pseudocyst (75%)
- Mc cystic neoplasm of pancreas - mucinous cystadenoma

**

Mucinous cystadenoma :- (lined by columnar Epithelium)

- Mc site ⇒ Body & tail Amylase (N)
- MC - females premalignant
- pathology :- Macrocytic, content - mucinous & gels premalignant (so, CEA ↑ used)

- not ASS & pancreatitis - Amylase - (N) ✓

(C/F) - most symptomatic presents & Abd. pain ✓

(Rx) - Resection ✓

Serous cystadenoma - Benign

- Benign *** ✓

- Mc - site - head of pancreas

- mc - females

- microcystic - sponge like appearance

- CEA (N), (N) Amylase

- serous content

(C/F) - Asymptomatic

(dx) - central stellate scar ***

- central sunburst calcification *** ✓

(Rx) - Resection



Intraductal papillary mucinous neoplasm

- MC → head & uncinate process Premalignant & ↑ CEA
↑ Amylase
- 5th-6th decade
- M = F
- Benign / Borderline / malignant
- 3 types
 - 1) main duct variety
 - 2) Branched duct variety
 - 3) Mixed variety (main duct + branched)

(C/F) → Repeated episodes of pancreatitis

- Premalignant condition
- CEA, Amylase ↑↑
- Diagnosed - endoscopy - 2 characteristic

appearance → MUCIN PROTRUDING FROM
FISH MOUTH OPENING **

(Rx) Resection (partial pancreatectomy)

CHRONIC PANCREATITIS

Exocrine
↓
Endocrine

- Irreversible fibrosis of pancreatic parenchyma
leading to exocrine & endocrine insufficiency
- Exocrine insufficiency precedes endocrine
- ** * > 90% of Acini & Islet cells are damaged
- Patients develop insufficiency

MC Cause - Alcohol
- Mc Symptom - Epigastric pain

Characterised by

- 1) Diabetes mellitus
- 2) Pancreatic Calcification
- 3) Steatorrhoea

DPS

- calcification
- duct penetrating sign
- Dilatation of Bile & pancreatic duct
diff 4m Ca

90C - CECT

* Gold standard = ERCP

CHAIN OF LAKES
STRING OF PEARLS
BEADED APPEARANCE

- most accurate ~~90C~~ investigation for dx of Early changes → endoscopic USG

↓
dx made by ROSEMONT'S criteria

Rx :- Analgesics

NSAIDS → Metamizole

opioid - Buprenorphine

- enteric coated pancreatic enzyme supplement for malabsorption & insulin for Diabetes mellitus

- If pain is not relieved coeliac ganglia blocked

- If pain not relieved yet then surgical intervention

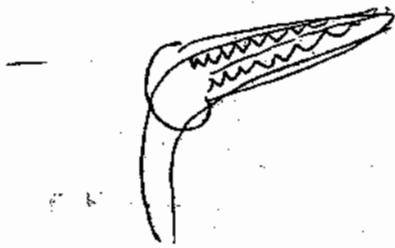
② Resection procedure

Drainage procedure

- longitudinal pancreaticojejunostomy

* * PUESTON PROCEDURE

- Ductal HTN is responsible for pain
- Pueston procedure uses the ductal pressure → ↓ se the pain



Resection procedure

- Pancreatic head is the pacemaker of inflammation

- For pain relief it should be resected

* 1. BEGIER'S procedure

* 2. FREY'S procedure

BEGIER'S - duodenum preserving pancreatic head resection

FREY'S - local resection of pancreatic head & longitudinal pancreaticojejunostomy.

BEGIER'S procedure of choice ⇒ ASS. E maximum pain relief.

CARCINOMA PANCREAS

- Mc Genetic mutation -

* KRAS → p-16 (Her-2-neu also involved)

- Cholangio also

* CA GB → p53 > KRAS ✓
 * Ca. stomach → p53 > COX-2 ✓

Risk factors

- smoking
- Hereditary factors } → Established
- Associations } → diabetes mellitus
obesity
chronic pancreatitis

(DOC)

HEREDITARY FACTORS

H₃ AFP

- HNPCC
- hereditary pancreatitis
- hereditary breast & ovarian cancer (BRCA-2)
- Ataxia Telangiectasia — (AR)
- Familial Atypical multiple mole melanoma syndrome
- Peutz-Jegher syndrome
- mc site — HEAD of pancreas **
- 5th — 6th decade
- Adenocarcinoma — males & smokers
- Intense desmoplastic reaction

(C/F)

MC — Jandice ****

- anorexia, fatigue, pruritis, weight loss,
 Passage of clay coloured stools

(90c)

→ CECT

P.ca-Tandice

✓ widening of 'c' loop

✓ Double Duct Sign

✓ Reverse '3' sign of FROSTBERG ** due to inflammatory changes in medial wall of duodenum

✓ ROSE THORNING **

✓ mucosal irregularity *

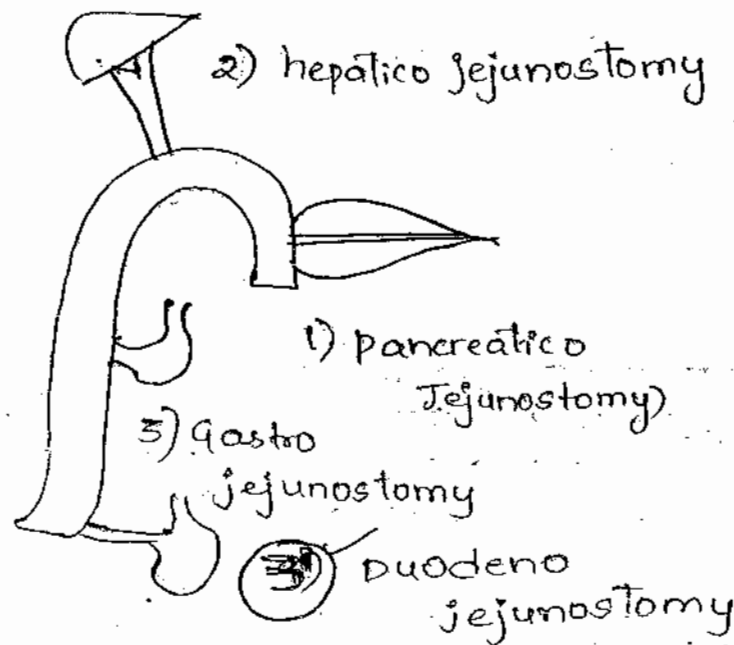
✓ scalloped egg appearance *



R_x of choice :-

** LONGMIRE - TRAVERSO PROCEDURE

└─> pylorus preserving whipples
└─> " " pancreaticoduodenectomy



—most imp margin => SM Vessel margin

(or)

uncinate margin

(or)

retroperitoneal margin

Survival

- I - II - 16-20 months ✓
- *-* III - 6-10 months ✓
- IV - 3-6 months ✓

Chemotherapy - unresectable - Gemcitabin.

NEURO ENDOCRINE TUMOURS

Somatostatin
receptor

- Neuro Endocrine tumours secrete active substance
- symptomatic at early stage due to production of substance not becoz. of mass like Adeno ca.
- so, prognosis of NET is better than Adenoca.

(dx) - made in laboratory by measuring active substance

- most NET except insulinoma express somatostatin receptors

- [90c] → Except insulinoma → [SRS] *

[90c] → insulinoma - localisation * (somatostatin
* Receptors
scintigraphy)

↓
Intraoperative

* Endoscopic usg & manual palpation *

→ non-functional

→ Insulino

— Mc - functional NET of pancreas - Insulinoma

— Mc - functional & malignant - Gastrinoma
NET of pancreas.

Insulinoma

— Benign

→ Equally distributed in head, body, & tail

— Characterised by

WHIPPLE'S Triad * *

✓ hypoglycemia - 45-50mg/dl & relief of
symptoms after taking oral glucose

✓ neuroglycopenic symptoms - headache, ~~for~~ Dizziness

✓ Sympathetic stimulation - palpitation, sweating,
tachycardia

✓ Weight gain

* Gold standard — Fasting for 72hrs

* for (dx) — Ratio of Insulin to glucose > 0.4
is diagnostic.

90c for localisation

Intraoperative endoscopic ultrasound &
manual palpation

Oral arterial calcium injection & portal venous
Blood sample. better sensitivity than EUS.

www.FirstRanker.com

www.FirstRanker.com

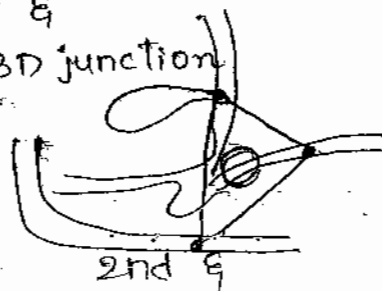
- (Rx) → Insulinoma (Body & tail) - Distal pancreatectomy
Insulinoma (Head of pancreas) - Enucleation ✓

Gastrinoma

- Zollinger - Ellison syndrome (also known as)
- Mc - site 1) Duodenum (1st part > 2nd > 3rd)
2) Pancreas (Not seen in 4th part)
- Duodenal Gastrinoma - metastasize - lymph nodes.
- Pancreas " " - liver
- Pancreatic Gastrinoma - poor prognosis
- 90% Gastrinoma located in Δ of Passaro *
(Gastrinoma Δ) *

Boundaries :

Cystic duct &
CBD junction



Body & neck
of pancreas

- Excess release of Gastrin → acid peptic disease - (peptic ulcers)
- (Clf) - Abd. pain & symptoms of reflux & regurgitation & diarrhoea which is characteristically relieved by Nasogastric Aspiration

large, multiple, jejunal & Refractory ulcers
& ulcers not Responding to R_x are

highly suggestive

[90c] Basal acid output $> 15 \text{ meq/hr}$ *

Best provocative test $\Rightarrow$ Secretin stimulation test -

- After secretin stimulation - release of
 $> 20 \text{ pg/ml}$

[90c] - localisation - SRS.

R_x - pylorus preserving whipples

Glucagonoma

4-D syndrome

$\Rightarrow$ Diabetes mellitus

$\Rightarrow$ Dermatitis

$\Rightarrow$ DVT

$\Rightarrow$ Depression

DDDD

Mc site - Body & tail.

Mc symptom - NEM - necrolytic Erythema **
migrans *

ass. $\bar{c}$ DVT.

(dx) $\rightarrow$ measuring glucagon -

[90c] - localisation - SRS ✓

R_x - distal pancreatectomy ✓

- Verner morrison syndrome **
 - pancreatic cholera
 - WDHA syndrome (water diarrhoea hypokalemia Achlorhydria)
 - It is characterised water diarrhoea, $\downarrow \text{Na}^+$, $\downarrow \text{K}^+$, $\downarrow \text{Cl}^-$, metabolic acidosis
 - ** hypercalcemia & hyperglycemia $\uparrow \text{Ca}^{2+}$ $\uparrow$ glycer
- medical emergency

- (Rx) $\Rightarrow$ IV fluids $\bar{c}$ correction of dyselectrolytemia
- $\Rightarrow$ Mc site of tumour - tail
- $\hookleftarrow$ Distal pancreatectomy

** ESOPHAGUS ** narrowest tube of GI

- narrowest tube of GI
- Extends C₆ to T₁₁
- 25cm $\bar{c}$ 3 narrowings from upper oesophagus

- 15cm - Beginning (cricopharynx)
- BALD** 25cm - arch of aorta, left Bronchus
- 40cm - diaphragmatic opening

- serosa absent, meissner's plexus absent
- submucosa - strongest layer

- narrowest region of GI - cricopharynx
 $\downarrow$
1.5cm **

foreign bodies which crosses cricopharynx can be left as such & 2 possible exceptions

- ① Sharp foreign body
- ② Button Batteries

Congenital Diaphragmatic Hernia

- Bochdalek hernia **
- (Lt) post. lat hernia
- in SK population
- Mc on left side located along left post. lateral aspect of diaphragm.
- characterised by herniation of stomach, spleen, transverse colon into (Lt) hemithorax leading to collapse of ipsilateral lung
- ASS & pulmonary hypoplasia & pulmonary HTN
- Dextrocardia

Most imp prognostic & Mc cause of death is pulmonary hypoplasia **

- GIT abnormalities ass & polyhydramnios
- Genitourinary abnormalities - oligohydramnios

(C/F) ~~SM~~ Triad of **

- 1) Respiratory distress
- 2) Dextrocardia
- 3) Scaphoid abdomen

RDS

- BMV is contra indicated

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- It can be diagnosed by X-ray

1) Air fluid levels ̄ gastric bubble in (Lt) hemithorax

(Rx)

- Bring organ back, close defect

- larger defects - mesh used for closure

- Early dx & Rx are not prognostic

MORGIAGNIAN HERNIA

| Larrey's Hernia

→ Larrey's hernia ~~Right~~ ant.

→ (Rt) ^{ant.} sided diaphragmatic hernia

- Through space of Larrey, sup. Epigastric vessel passes (hernia b/w costal & sternal part of diaphragm)

- MC - Organ herniated - Transverse colon

(Rx) - Bring organ back and close the defect

HIATUS HERNIA

- Adults

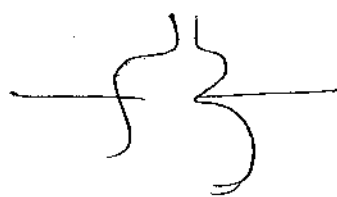
(I) - sliding

II - Rolling

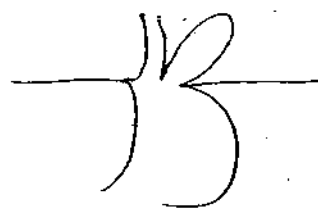
III - mixed (Both)

IV - complicated (organ other than stomach herniated)

↓
Spleen & Transverse colon)



(I)



(II)



(III)

Mc - paraesophageal hernia → mixed (Type III)
↳ most complicated

(C/E)

→ Type I ⇒ Reflux, symptoms of GERD

Type II ⇒ Abd. pain

Type III ⇒ Both Reflux & Abd. pain

Type IV ⇒ Abd. pain (relief on lying down)

(Ioc)

- Barium swallow ** (Barium meal in tendelenberg)

**
*

For anatomical disorder - Barium study

Eg: 1) Barium swallow ⇒ hiatus hernia,
Zenker's diverticulum

2) Barium meal ⇒ gastric diverticulum

3) Barium meal ⇒ Small intestinal
follow through diverticulum

4) Barium Enema ⇒ colonic diverticulum

5) Enterodysis / is preferred over
small bowel
enema

Barium meal - Small intestine
follow through diverticula
&
Crohn's disease

* Endoscopy or Biopsy → Barret oesophagus,
Ca. oesophagus

* 24 HR pH monitoring → GERD

* manometry → motility disorders

Mc → complication - oesophagitis

ulcer located at lesser curvature $\Rightarrow$ RIDING *

$\rightarrow$ ULCER (or) CAMERON'S ULCER **

Mc-site of stress (or) CUSHING ULCER *

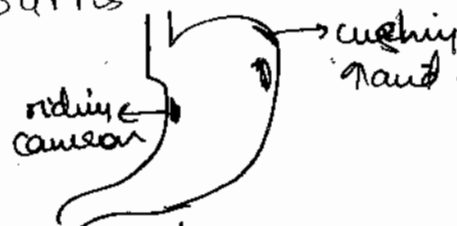
- neuro injury $\Rightarrow$ Fundus ** incidence

- ASS $\bar{C}$ rise Acid production

↓ as
moves
distance

* Cushing ulcer - stomach - Burns

Acid production - (N)



GERD $\rightarrow$ Earliest indicator - Resp symptoms

PMT BD CAM $\Rightarrow$ $\downarrow$ LES pressure $\rightarrow$ GERD

- prostaglandin E₁ & E₂, Progesterone
- morphine, meperidine
- Theophylline
- Barbiturates
- Diazepam, Dopamine
- calcium channel Blockers
- Atropine
- N - nitrates

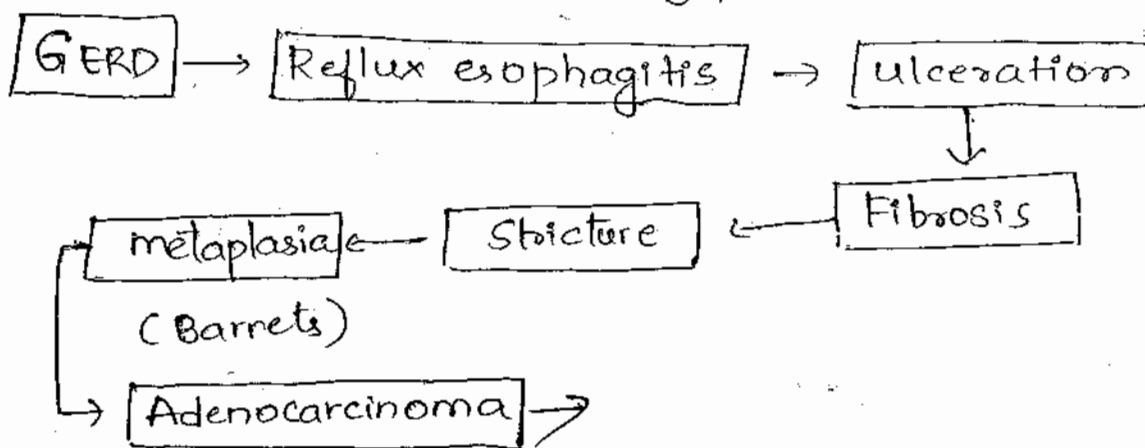
CAPS FAT $\downarrow$ LES pressure PSM BAG ↑

- $\Rightarrow$ chocolate, caffeine
- $\Rightarrow$ Alcohol
- $\rightarrow$ pepper mint
- $\rightarrow$ smoking
- $\rightarrow$ Fatty food

- PP
- Substan P
- motilin
- Bombesin
- Angiotensin II
- Gastrin

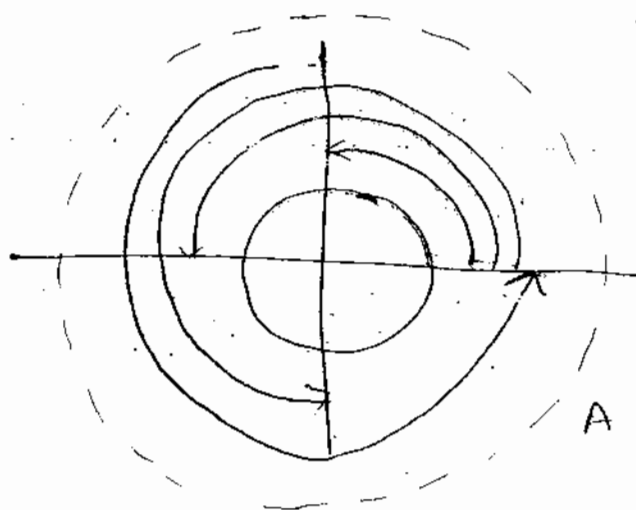
Incompetent LES :- Total length $< 2\text{cm}$ intra-abdominal length $< 1\text{cm}$ & LES pressure $< 6\text{mmHg}$

- Incompetent LES $\rightarrow$ GERD
- Characterised by $\Rightarrow$ Retrosternal heart burn
 - reflux
 - regurgitation
 - dyspepsia



90c 24 hr pH monitoring

(Rx) $\rightarrow$ lap. NISEEN'S FUNDOPLICATION **
 $\rightarrow$ complication
 $\rightarrow$ pneumothorax



180° A - DOR

270° A → BELSER MARK - IV

270° P → TOUPET

360° → NISSENS

Rosetti → include only ant stomach wall in wrap

ACHALASIA CARDIA - premalignant

↓ LES

→ Absence of LES relaxation ⇒ ↑ LES pressure

Pathophysiology - selective loss of inhibitory neurons in organ plexus of esophagus leads to absence of LES relaxation (defect in myenteric plexus)

Secondary pathology :- Absence of peristalsis in esophagus
- ineffective contractions in esophagus

(C/F) - characterised by dysphagia, regurgitation, weight loss.

liquid > solids - Dysphagia - more to liquids compared to solids.

Complications :- chronic phases → oesophagus loses tone become dilated & tortuous

- MEGACOESESOPHAGUS (oo)

* SIGMOID OSESOPHAGUS

[IOC] *

Manometry → 1) ↑ LES pressure

Amyl nitrate inhalation test

2) absence of LES relaxation

3) Absence of peristalsis

4) ineffective contractions

(Rx) - nitrates & Ca^{2+} channel blockers

- BOTOX injection (Recurrence)

- Esophageal dilatation by Balloon & Bougie *

(Rx) of choice → Laproscopic
**

HEELER'S CARDIOMYOTOMY *

- myotomy extended upto 1cm of cardia

* Vascular supply → 9mf. Thyroid vessels

Bronchial vessels

9mf. phrenic vessels

left Gastric vessels

Diffuse Esophageal spasm → all esophagus muscle.

- Tertiary non-peristaltic contraction of Esophagus

- characterised by chest pain & dysphagia

Doc - manometry

Amplitude > 120mm Hg

duration ⇒ > 2.5 Sec

(Rx) - Ca^{2+} channel blockers & nitrates

non-Responding - Esophagomyotomy



- BEADED APPEARANCE
- ROSARY - BEAD
- PSEUDO DIVERTICULAR

Barium swallow
(DES)

on Barium swallow - Achalasia cardia

- * Bird Beak
 - * Pencil tip
 - * Rat tail
- appearance

ca. esophagus - Barium swallow.

* Rat - tail filling defect $\Rightarrow$ ca. esophagus.

Nut-cracker esophagus

- most painful esophageal motility disorder characterised by 1) chest pain
2) dysphagia

90c - manometry

Amplitude - $> 180 \text{ mmHg}$

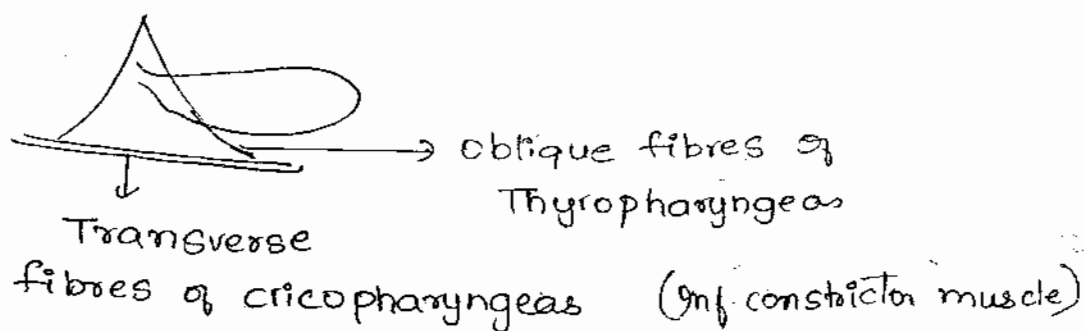
duration - $> 6 \text{ sec}$

(Rx)

Ca^{2+} channel blockers, nitrates

non- Responding - Esophagomyotomy.

- mc males, elders 60yrs
- Mc esophages diverticula
- contains only mucosa + submucosa



Pathology

- Dual (n) supply of upper esophageal sphincter

Thyropharyngeus → pharyngeal plexus

Cricoid — RLN

- Incoordination during swallowing
↓
herniation

- mc common complication

→ lung abscess *** ✓

— ↑ risk of Sq. cell Ca.

- 90% — Ba. swallow (lat x-rays) → second swallowing

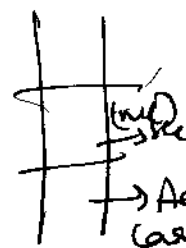
Rx DOHLMAN PROCEDURE

- esophagomyotomy + diverticulopex
- diverticulectomy / oesophagodiverticulostomy

- Mc → Squamous cell ca. - world wide
Western countries - Adeno ca.

Mc. site of Adeno ca. - lower 1/3rd *

- Mc. sq. cell ca. → middle 1/3rd *
Mc. site → ca. esophagus *



Risk factors :-

→

SCC

- ✓ Zenker's diverticulum
- ✓ Achalasia cardia
- ✓ corrosive intake
- ✓ intake of nitrosamines
- ✓ hot liquid ingestion
- ✓ smoking
- ✓ alcohol
- ✓ plummer winson syndrome
- ✓ congenital palmarsis et plantaris
- ✓ HPV (16, 18, 31, 33)
- ✓ Deficiency of Molybdenum, zinc Vitamin A
- ✓ CMOZA
- ✓ Bulimia nervosa
- ✓ Tylosis, lye stricture

Adenocarcinoma

- GERD
- Barrett's esophagus
- obesity
- Scleroderma

use features of W. mi ca. esophagus

Ectopic - Hypo- & acidic
sharply demarcated
rounded contours
7um

Palliation in Ca. Esoph.
photodynamic laser
SEME. EMB.

Mc site of metastasis - liver

ES (4) Chemotherapy → Epirubicin, Cisplatin, 5-Fluorouracil
Slowly & Esophagus →

Mc symptom - dysphagia followed by wt loss

- progressive dysphagia

initially. Solids > Semisolids > liquids

→ malignant ^{tracheo}esophageal fistula ⇒ choking, coughing, cyanosis

(dx) → initial investigation in suspected case

⇒ Barium swallow **

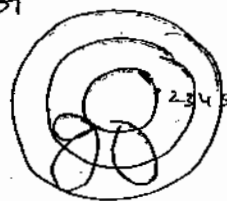
** APPLE CORE appearance Rat tail filling defect

- non specific for ca. esophagus also seen in ca. colon ✓

- 90c → (dx) → Endoscopic biopsy

** Staging → endoscopic USG

- Metastasis → CECT ✓



Management

In GI malignancies Gen. 5cm margin is sufficient - Exceptions

① Esophagus - 10cm margin

② distal rectum - 2cm margin

③ squamous, Basal, malignant melanoma

Sarcoma - 2cm margin
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Types of operations for ca. Esophagus :-

Anastamotic leak

middle 1/3.

1. IVOR-LEWIS TRANS-THORACIC ESOPHAGECTOMY (middle 1/3rd) → Abdominal neck

2. ORRINGER - TRANS HIATAL - most preferred **

3. MCLEON EN-BLOC OESOPHAGECTOMY

Advanced → chemo radiation followed by en-bloc resection

- After esophagectomy conduit is made from

1st → stomach ** - most preferred (Rt gastric & Rt gastroepiploic)

2) Left colon

3) Jejunum

→ EOS for T-staging (LN assessment)
→ stage decided by depth of tumourEsophageal perforation

* Mc cause ⇒ Iatrogenic during endoscopy

* Mc site ⇒ Cricopharynx - post-wall (cervical) (upper esophagus)

spontaneous

BOERHAAVE'S SYNDROME

esophageal perforation **

- Vomiting against closed glottis in lower 1/3rd
along post lat direction (longitudinal tear)- characterised by MACKLE'S TRIAD

① Thoracic pain

② vomiting

③ cervical subcutaneous emphysema

Water soluble contrast
esophagogram

Rx

Within 24 hrs

After 24 hrs

- oesophagostomy
chest tube insertion
feeding jejunostomy

mortality 20%

750%

STOMACH

→ Peptic ulcer

Duodenal

Gastric ulcer

Hpylosi - 90%

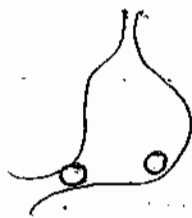
40%

→ Mc Site of peptic ulcer ⇒ 1st part of duodenum **

Modified Johnson's classification (Gastric ulcer)



I



II



III



IV



V

Type I $\rightarrow$ MC $\rightarrow$ incisura angulosis

Type II $\rightarrow$ 1 in body, 2nd - 1st part of duodenum

Type III - prepyloric

Type IV - high on less curvature

Type V - NSAIDS induced ulcer (anywhere)

$\rightarrow$ II & III $\rightarrow$ $\uparrow$ Acid production

$\rightarrow$ I & IV $\rightarrow$ (N) (or) low Acid production

$\rightarrow$ Type I $\rightarrow$ 'A' Blood group

Remaining $\rightarrow$ 'O' Blood group

(Rx)

Type I $\rightarrow$ Distal gastrectomy

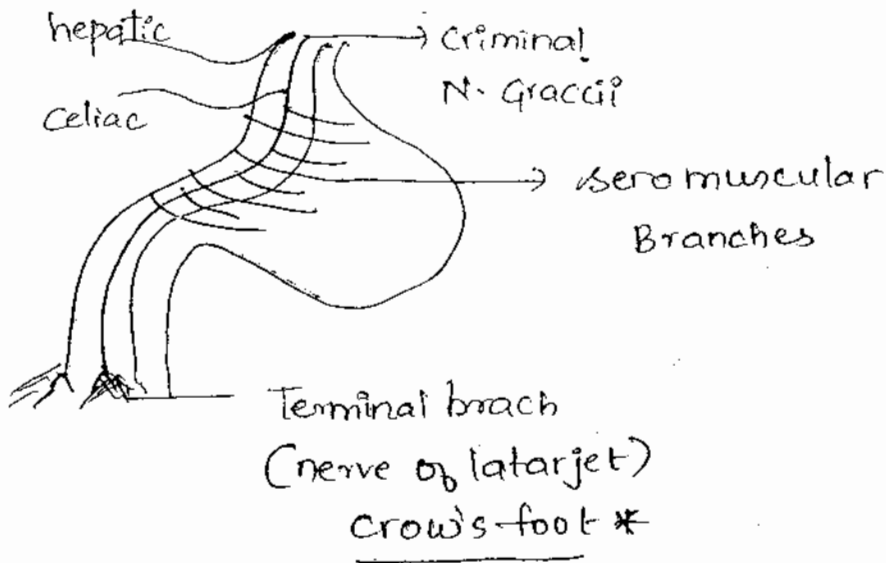
II & III $\rightarrow$ Truncal vagotomy +
Antrectomy

IV $\rightarrow$ SENDES - POUCHET - KELLICK
(4) MADLENER - SHOE MAKER

V $\rightarrow$ stop NSAIDS

Complications of peptic ulcer:

- Intractability
- Bleeding
- perforation
- Gastric outlet obstruction



- ① HSV :- division of serosomuscular Branches (Max. Recurrence min. morbidity) *
- ② selective vagotomy - Division distal to celiac & vagus *
- ③ Truncal vagotomy - Division of main trunk
* (min. recurrence = max. morbidity)

Intractability

INTRACTABLE Duodenal ulcer

- Highly selective vagotomy

RECURRENT - Truncal vagotomy

Bleeding

→ most common Bleeding vessel → Gastro*⁺ duodenal artery

** Ant. located ulcer - perforate

** post. located " - Bleeding

- (Rx) of choice - Bleeding
- ligation of Bleeding vessel + Pyloroplasty + Truncal vagotomy

Perforation

modified Graham's Repair - omental patch repair

Goo

- Mc cause world wide - ca. stomach

" " India - ca. stomach

- Mc site → first part of duodenum

- caused by Inflammatory edema

(Rx) - Gastric lavage + Bowel rest for 4-8 hrs

- In non-Responding - Truncal vagotomy + Antrectomy

- If Antrectomy difficult due to Scarring -

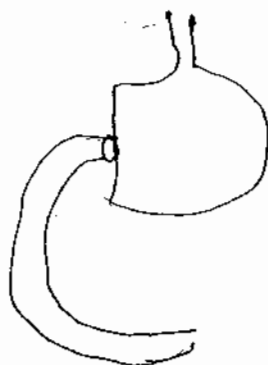
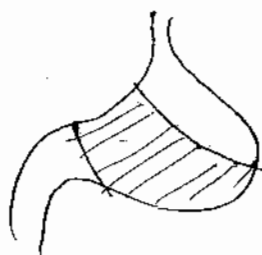
(Co) fibrosis - Truncal vagotomy +

Gastrojejunostomy

Types of gastrectomy

- Total gastrectomy - Whole stomach removed
- hemigastrectomy - half of stomach
- Distal → distal 1/3rd
- subtotal → distal 2/3rd of stomach
- Extended Gastrectomy → stomach & small portion of distal esophagus.

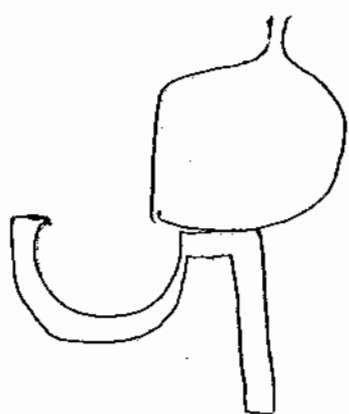
BILROTH - 1



GASTRODUODENOSTOMY

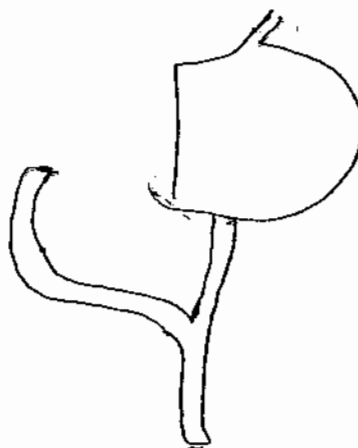
Bilroth - 2

Gastrojejunostomy



Roux - en - y

Gastrojejunostomy



Type - 1 - more physiological

Type - 2 - Max risk of complications

* "DUMPING SYNDROME" - more common in

Bilroth II - gastrectomy

Early Dumping : Seen in 30-45 min of

meals due to collection of fluid in proximal

(Rx) - iv fluids

Late dumping - After 2-3 hrs due to excessive release of insulin causing reactive hypoglycemia

(Rx) - oral glucose

Management

- Dietary :- Small frequent meals, low carbohydrates high fat & proteins - Avoid high calorie drinks. Avoid liquids $\bar{c}$ meals

- Ocreotide used to decrease the secretions > 99% pts respond to ocreotide

- In < 1% patients who are symptomatic even after ocreotide. convert Type II to Type I

complications of Gastrectomy

- Iron deficiency (Rx) by oral supplementation

- > 50% stomach removed - megaloblastic anaemia

- Megaloblastic - (Rx) life long parenteral supplementation.

Risk factors

nutritional

- high complex carb. intake
(starch, cellulose)
- low fat intake
- smoked food

medical

- H. pylori, EBV
- Chronic Atrophic gastritis
- Menetiere's disease
- Pernicious anaemia

social - low socio-economic status

environmental :-

- ~~smoking~~
- lack of Refrigeration
- poor food preservation
- use of well water

Occupational

- Rubber
- coal

Genetic

- males, Blood group (N)
- HNPCC
- Li Fraumeni syndrome

→ Aspirin blocks COX-II is protective

→ mutation SPC stomach PS3 > COX-II ✓

- SLZAC → protective

→ selenium ✓

- Iron ✓

- Zinc ✓

- Vitamin-A, Aspirin ✓

- Vitamin-C, calcium ✓

- Alcohol → not a risk factor

→ Smoking → not - ca. ~~GB~~ GB

endemic

↓sing

→ Incidence of proximal gastric malign are rising

* Me $\rightarrow$ (Atrium) (site)

* the site of Ca. in pernicious anaemia - fundus

Age- group. 5th -6th decade

④ C/f - Mc symptom - Abd. pain followed by weight loss.

- MC symptom of linitis plastica is
Early satiety

Ca.

* * Manifestations

- Krukenberg tumour - ovary - Transcoelomic (oo)
Transperitoneal spread.

- Irish nodes - Involvement of Lt axial lymph nodes

- sister mary joseph nodes
- cut metastatic deposits around umbilicus

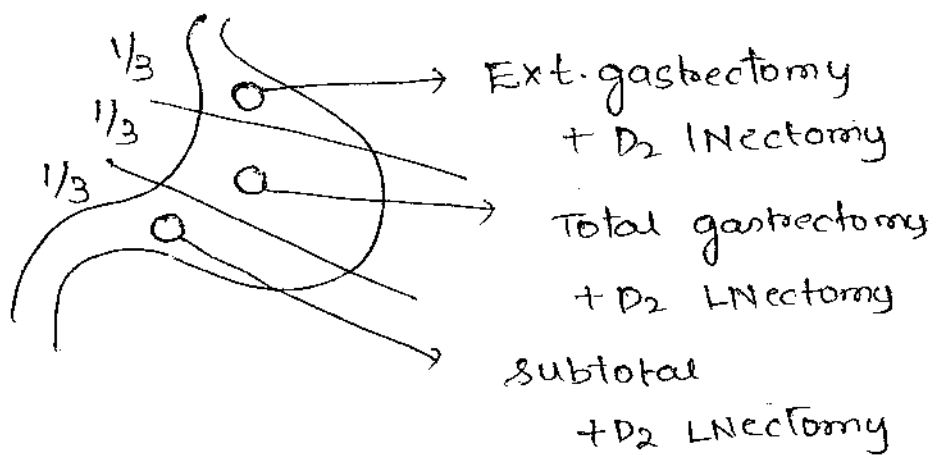
- * BLUMER'S SHELF - pelvic drop metastasis
- * Trousseau syndrome - migratory superficial Thrombophlebitis

Joc - Endoscopic Biopsy **

- Mc site of metastasis → liver

Chemotherapy regimen → Epirubicin, cisplatin
5-FU (ECF)

(R_x) -



- If diffuse variety involves distal $\frac{1}{3}$ rd
⇒ Total gastrectomy + D₂ LNectomy

* Indications of distal pancreatectomy

- Direct infiltration of Body (or) tail of Pancreas

* splenectomy

- Direct infiltration of spleen (or) ca. stomach arising from proximal part along Greater

→ Mc site - stomach > small intestine > colon > rectum > esophagus

- Gastrointestinal stromal tumour

- mesenchymal origin

- Tyrosine Kinase receptor - C-KIT
(CD117) ***

- Others - Bcl-2, CD-34.

- new tumour markers

- DOG-1 (detective on GIST-1)
- protein kinase - c theta

- SPINDLE CELL (70%) > Epitheloid (30%)

(CF) - Mc Presentation is Bleeding becoz tumour is hypervascular ***
→ leads to partial obstruction compression leading to Ab. pain
→ Extra mural. (Extra luminal)
- It behaves like sarcomas having hematogenous spread only.
- lymphatic spread not seen
- Mc site of metastasis - Liver*

[Qbc] → Extra luminal conditions of Abd. generally (dx) by ceCT

for GIST,
mesenchymal cyst
intra abdominal
collection
diverticulitis

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CECT

(Rx) for resectable tumours wedge shaped Excision

2cm margin

- lymphadenectomy not done
- not ass 2 lymph node metastasis

For unresectable - metastatic

[DOC] - imatinib mesylate *

- Monitoring of Response of imatinib is done by

[PET] scan

→ For imatinib resistant - DOC - sunitinib.

- Gold standard investigation - Recurrent GIST

- PETCT *

CARNEY'S TRIAD ***

- ✓ multifocal GIST
- ✓ pulmonary chondroma
- ✓ Extra Adrenal paraganglioma

→ [CHPS] → IHPs

- congenital hypertrophic pyloric stenosis - (X)

- Now ⇒ Infantile hypertrophic pyloric stenosis

pylorus

→ (N) at birth

— incidence 1 in 3000 pop

→ manifest after (3 to 6th) week of life

→ first born males affected

(C/E) Multiple Episodes of projectile (os) non
Bilious Vomiting

→ O/E → palpable olive/mass in direction

*** of peristalsis (L) → (R)

— Experienced makes (dx) by H/o &
Clinical Examination

GOC → USG *

Diagnostic criteria

→ pyloric muscle thickness > 4mm

→ pyloric channel ⇒ > 17mm 1

Barium meal :-

— STRING SIGN

— SHOULDER SIGN

— DOUBLE TRACK SIGN

**

→ Hypokalemia, hypochloremia, metabolic
Alkalosis & paradoxical aciduria **

→ medical emergency

— Fluid of choice — Normal saline

After Resuscitation & correction of dys electrolytemia

Surgery — RAMSTED'S FREDET PYLOROMYOTOMY

→ mucosal perforation occurs during surgery

→ oral feeding held for 48 hrs

→ Mallory Weiss tear → Left gastric A **

→ FOREST CLASSIFICATION (estimation of upper GI bleed)

* On endoscopic appearance

IA — active pulsatile bleeding

IB — oozing

IIA — non-bleeding visible vessel

IIB — Adherent clot → intermediate risk *

IIc — Black dot

III — clean Base

→ low risk *

} High risk *

High risk of Bleeding — IA, IB, IIA

→ Mc - site - Just below (GE) junction

→ (Cardia) mc - site

- more common in Alcoholics - mechanism & males

- Repeated vomiting & Retching

- partial tear involving mucosa & submucosa

- most common vessel - left gastric A*

(C/F) pt presents w upper GI bleed

- amount of Bleed - very small -

- Severe Bleeding - 10-20% cases

(dx) : endoscopy

(Rx) - majority - conservative like IV fluids & correction of coagulopathy

- non responding - upper GI endoscopy

→ Electrocoagulation

↓ failure

Angiography w

LGA + Embolisation

↓

Open surgical

ligation

- large arteriole 1-2mm diameter located 6-10 cm 4m
- lesser curvature (GE junction) — Abnormal
- located just below mucosa (arteriole) — pulsation leads to necrosis
- vessel Exposed to acidic environment → massive damage.

(C/F) ASS & massive GI bleed & hypotension

(I/O) — upper GI Endoscopy

(Rx) — Endoscopic Electrocoagulation

↓

Angiography + embolisation

↓

Surgical ligation.

WATER MELON STOMACH

GAVE (Gastric Antral vascular Ectasia)

- Characterised by vascular ectasia in Antrum of stomach
- Mc — females, 50-60yos
- (C/F) → most patients — Anaemia — becoz of Occult Bleeding
- Abd. pain
- > 25% → Chronic liver disease
- (dx) Endoscopy → parallel stripes in antrum
- resembles RIND of Water melon

(Rx) endoscopic electrocoagulation of dilated Blood vessels

Retropertitoneal fibrosis

→ Idiopathic - ORMOND'S DISEASE ** Q

← Secondary :-

1) Chronic Inflammation :- CATH

- chronic pancreatitis
- Actinomycosis
- Tuberculosis
- Histoplasmosis

2) Drugs :-

- Mc drug responsible - methysergide **
- pulm. fibrosis - Bleomycin → not RPF

✓ Amphetamines

✓ Hydralazine

- β -Blocker

- phenacetine

3) malignancies

✓ non-Hodgkin lymphoma

✓ carcinoid

✓ prostate

(HCC)

4) Radiation exposure

5) Connective tissue disorders

B/L → Extrinsic compression of ureter →

B/L HYDROURETERONEPHROSIS

medial deviation of ureter

(C/E)

Earliest → vague & non specific (dull arching pain)

Mc Earliest & sp. symptom

→ symptom of obstructive uropathy (pain, dysuria)

(dx)

⇒ CECT* - 90C

on IVP → medial deviation of ureter - pipe stem ureter*

also in TB

(Rx)

⇒ TAPS

- Tamoxifen

- Azathioprene

- Penicillamine

- Steroids.

Peritonitis

- Spontaneous Bacterial peritonitis
- secondary " "
- peritonitis in CAPD (Chronic Ambulatory peritoneal dialysis)

Spontaneous Bacterial peritonitis

- Adults - Ascites due to CLD
- Children → Nephrotic syndrome (pneumococci)

Gut → LN → Ascitic fluid

→ monomicrobial → E. coli - Adults **

Group - children **

A - streptococcus

(C/P) → Abd. pain

- Tenderness
- fever ±
- tachycardia

(dx) more than 250 - neutrophils & growth
of single organism - culture

(Rx) IV cefotaxime + Albumin

Secondary Bact. peritonitis

- Visceral perforation
- polymicrobial infection (E. coli & Bacteroides)
- (Rx) → Exploratory laparotomy + peritoneal lavage & repair of perforation

CAPD

- MC caused by staph. Epidermidis which colonises catheter (or) prosthesis processor
- (Rx) Instillation of 1st gen cephalosporin thru catheter
For Recurrent - Change catheter

→ more common in Female *

- 10-20 yrs.

Types ① chylolymphatic (Mc) **

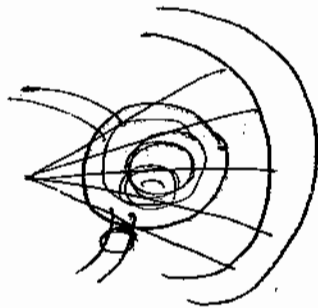
② Enterogenous (2nd mc)

3. Simple / mesothelial

4. Dermoid

5. Arising from urogenital Remnant

Chylolymphatic



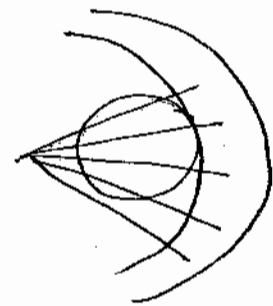
- Absence of Efferent lymphatics in mesentery of ileum & chylous collection & independent vascular supply

(Ry) - ENUCLEATION

TILIAUX TRIAD **

- 1) Soft fluctuant swelling around periumbilical region
- 2) moving perpendicular to attachment of mesentery
- 3) Zone of hyperresonance around the swelling

enterogenous



- shared vascular supply & Bowell

→ related to Bowel

(Ry) Resection & Anastomosis

PSEUDOMYXOMA PERITONI

→ mc-malignancy ⇒ mucinous cystadenocarcinoma
of appendix > ovary *

(*) → Mc → ~~males~~ Adenoca. of colon
(Eq frequency)
5th to 6th decade

(ClF) - gen. distention & Abd. distension,
- risk of hernia common colicky pain
after meals

[90C] - CECT

(Rx) - omentectomy + (Rt) hemicolectomy +
peritonectomy - Males

B/L salpingophorectomy - Females should
be added

HYPERTHERMIC INTRAPERITONEAL CHEMOTHERAPY

*

INTESTINAL OBSTRUCTION

- Mc - cause large bowel - malignancy
- for small bowel - Adhesions

Small bowel obstruction

causes : Adhesion
malignancy
hernia
Crohn's disease

* Max. risk of Adhesive obstruction ⇒ pelvic surgeries ** ✓
followed by lower abd. surgeries followed by
upper abd. surgeries

- (C/F) - Mc - Abd. pain - colicky due to hyperperistalsis
ass c multiple episodes of bilious vomiting
- vomiting & dyselectrolytemia is more common in prox obstruction *
 - Distension - distal obstruction *
 - swallowed air ⇒ Air fluid levels
↓
max. component (N_2) ** *
 - proximal segment distended c fluids
 - Third space loss - obstruction :
(Migration from Vascular → Extravascular (fluid))
⇒ so hypovolemia

- Two large bore IV canula
- IV fluids - RL is preferred
- Ryle's tube insertion - proximal decompression
- Foley's catheter U.O monitoring
- Best clinical indicator of tissue perfusion
* * * urine output $\Rightarrow$ 1ml/min
- After Adequate resuscitation pt should be investigated

GOC → X-ray Abdomen *
Supine view preferred over Erect

- [Jejunum $\Rightarrow$ valvulae conniventes * 
- Ileum $\Rightarrow$ characteristically characterless 
- large bowel $\rightarrow$ peripheral
 - presence of Haustrations 
 - wider in calibre

Proximal / First part of duodenum has cap

- Gas in Rectum - Incomplete obstruction

→ No gas - complete obstruction

- conservative management for selected patients of post-operative adhesive obstructions

- **Management**

Adhesion - Adhesiolysis

malignancy $\rightarrow$ Resection

Crohn's

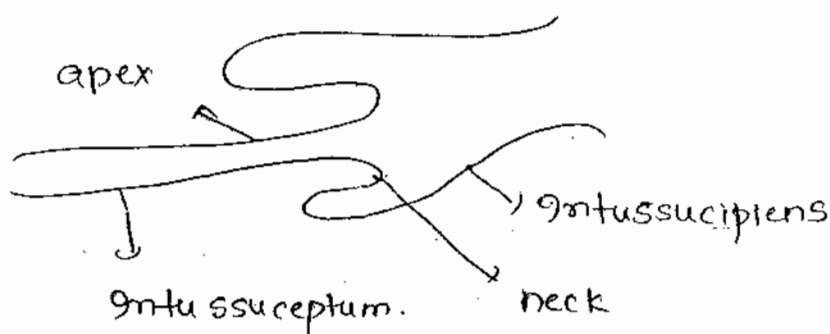
Ascaris infestation

→ Activity seen in 2 hrs after surgery - SI
4 hrs " " - Stomach
3-5 days - Colon

Colon → post operative ileus **

INTUSSUSCEPTION

- Telescoping of one segment into another



- most commonly gangrenous - Apex **
- middle layer is mc gangrenous
- common in children → 4-10 months
- Hypothesis: due to URTI & Rota virus diarrhoea
Peyer's patches hypertrophy which acts as lead point → intussusception

Mc type of intussusception

in children → ileocolic **

Adult → colocolic **

- Mc tumour of small bowel in children
**
- lymphoma
- Mc tumour responsible for intussusception →
lymphoma

Others * meckels diverticulum

* Hsp

(C/F)

- During attack pt cries a lot & pulling of leg towards Abdomen

- Vomiting is seen in all cases *

- In b/w attacks pt is normal

- After Repeated attacks - child passes small amount stool + blood - RED CURRANT JELLY **

- Palpation of sawage shape mass

(S)

- Empty of (Rt) iliac fossa

* 'Sign of Dance'

90c

Air enema preferred over Barium enema

*

↓

Diagnostic

&

Therapeutic

- For recurrence - Air enema should be done

Third recurrence - Indication for surgery

** X-ray

✓ meniscus sign

✓ Target sign

* Barium Enema

claw sign

coiled spring sign

* USG

✓ Pseudo kidney sign

✓ Target sign

(S)

- mc cause - malignancy
- mc site of malignancy in large bowel
 - ⇒ Rectum > Sigmoid **
- large bowel obstruction - type of closed loop obstruction

surgery - AS early as possible

→ Becoz of ↑sed risk of perforation

X-ray Abdomen

- peripherally placed loops & haustration & wider calibre
- distension more prominent, no vomiting

Management

(Rt) colon malignancy

→ (Rt) colectomy + ileotransverse Anast.

(Lt) "

- (Lt) " + colorectal Anast.

Sigmoid "

- 1) Sigmoidectomy + colorectal Anast

2) Total colectomy + ileorectal Anast.

In elderly pts - HARTMANN procedure *

↓
Sigmoidectomy + End colostomy

+

Closure of Rectal stump *

distal portion of Rectum $\Rightarrow$ Sigmoid colectomy

followed by Chemoradiation



Tumour resection
& colostomy closure

Colonic pseudo-obstruction

- Idiopathic — OGILVIE'S syndrome $\rightarrow$ denervation
** of colon distal to splenic flexure
- Secondary:- causes :-
 - 1) Diabetes
 - 2) uraemia
 - 3) Retroperitoneal hematoma
 - 4) hypothyroidism
 - 5) Dyselectrolytemia
 - 6) parkinson's
 - 7) collagen vascular
 - 8) hypoparathyroidism
 - 9) use of opiates & Antipsychotics

Pathophysiology :- sympathetic overactivity
(Absence of peristalsis)

- colon massively distended w/ Air

(CF) - Abd. discomfort & Abd. distension
(90c) $\rightarrow$ water soluble contrast enema

(Rx) [Doc] - NEOSTIGMINE **

- pt is relieved w/ in 3-5 min
after passing flatus (massive)
- Rule out Acute obstruction &
** cardiovascular contraindications

in cases of contraindications - flatus tube is inserted

VOLVULUS

mc site is sigmoid volvulus *

more commonly - Anti-clockwise ** can be clockwise also

long narrow mesentery & constipation leads to ↑ risk of sigmoid volvulus

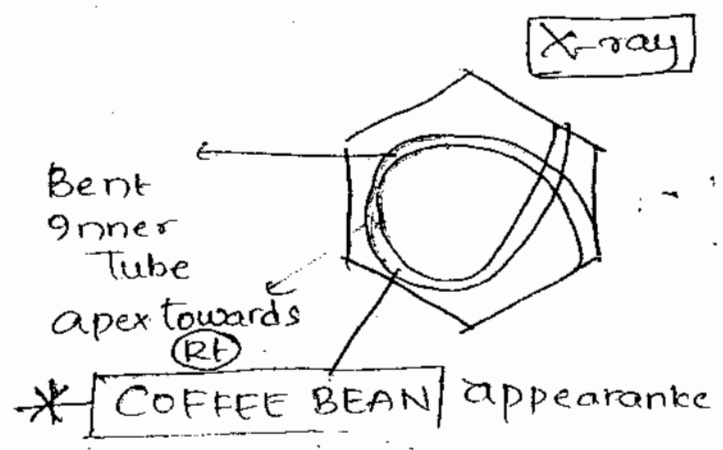
Predisposing

- old age, mentally impaired patients, hirschsprung, constipation
- hospitalised patients, loaded pelvic colon chagas

CF - signs & symptoms of large-Bowel obstruction

Barium enema *

- BIRD BEAK
- BIRD OF PREY sign
- Ace of SPADES appearance



* CT - Whorl Sign

Rx - colonoscopic detorsion & elective sigmoid * colectomy

- misnomer
- ilio caecocolic Volvulus - correct
- mc - clockwise

Predisposing :-

- multipara
- H/o prev surgery
- malrotation (or) distal obstruction in colon

(C/F) presents w/ sign & symptoms of small bowel obstruction.

X-ray → apex towards **(Lt)** side.

KIDNEY-BEAN ***

(Rx) ileo colectomy & ileotransverse anastomosis

SMALL INTESTINE

Diverticula

- most small bowel & large bowel diverticula are acquired, multiple, small, located along mesenteric border

Meckel's diverticulum → most frequent cong anomaly of GI tract

- single, true, located along antimesenteric border

- M/c Ectopic mucosa

* Gastric pancreas > colon

- * 2% prevalence
- * 2% inc length

- * 2 feet proximal to ileocaecal valve
- * symptomatic in <2 yrs of age

(C/F) Mc - symptom - Bleeding PR **

In Adults - Abdominal pain due to the intestinal obstruction caused by volvulus & intussusception.

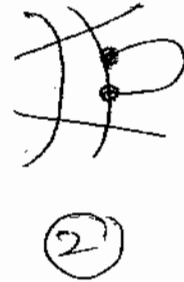
[90c] - tech-pertechnate scan * - symptomatic *

Asymptomatic - no-gastric mucosa - IOC ✓

Preferred ← { 1) Enteroclysis
2) Barium meal follow through

(Rx) ① Meckel's diverticula - Diverticulectomy, healthy base

② unhealthy base - Resection Anastomosis



- Incidentally detected Meckel's should be removed upto 80 yrs of age

** Complications ↑ if Meckel's having

- narrow mouth
- unhealthy base
- presence of ectopic gastric mucosa

- can be a lead point of Intussusception

→ Mc organism — Mycobacterium tuberculosis

M. Bovis — Eradicated by public health measures

→ Primary — lungs

→ Bowel → swallowing of infected sputum

→

↓
Ileum

↓

Initial disease activity

in submucosa

↓

Ulcers (Transverse) ***

↓

Fibrosis

↓

Stricture

long — Typhoid

— Mc affected segment of Bowel — Ileocaecal region

— Pathological types

Ulcerative variety : Virulence of organism

is high, Immunity low. formation of transverse ulcers in ileum

(C/F) — diarrhoea

hyperplastic → Virulence — low
Immunity — good

Inflammatory response — mesenteric lymphadenopathy &
Caseous necrosis

(C/F) → non specific symptoms of TB like Evening ↑ temp, low grade fever, Anorexia, weight loss, night sweats

→ In initial stage due to ulcers ileum - hypersensitivity
Diarrhoea ✓

→ After well formed strictures SAIO ✓

→ MC symptom - Abdominal pain. ✓

I/O - GI-TB

~~***~~ CECT Abdomen ***

→ ↑ ESR > 90% of cases

on paracentesis → lymphocytes > 500
(Exudate) protein > 2.5 gm/dl

SAAG ⇒ 1.1 < (less than)
(serum Ascitic Albumin gradient)

→ Adenosine
~~***~~ deaminase levels ⇒ ↑
(ADA)

Barium meal follow through. (Radiological)

→ contraction of mesocolic ligament

↓

pulled up caecum & obtuse angle (90° - 110°)
deformity

(GOOSE NECK) ***
deformity ✓

* STERLEIN sign

- narrowed appearance of ileum
- Shicture - ileum → STRING SIGN OF KANTOR * *
- also seen in crohn's disease *

* * "Inverted umbrella sign" FLEISHNER'S sign

- rigid caecum
- thickened IC valve
- narrowed ileum



(Ry)

- ATT

- Indication of surgery

- Acute obstruction
- perforation
- Bleeding
- fistula formation

CARCINOD TUMOURS

1. Bronchus

2. Ileum

3. Rectum

4. Appendix

5. colon

6. stomach

B > I > R > A > C > S

* *

Most common



localised carcinoid (L > OA > R)

larynx > ovary, Appendix > Rectum

Best prognosis

non localised carcinoid (P > C > SI)

pancreas > colon, SI

Worst prognosis

→ neuroendocrine tumour arising from Enterochromaffin cells of crypts of Lieberkuhn *

→ It produces 5-hydroxy tryptamine (or) Serotonin

→ Expresses somatostatin receptors

90c = Somatostatin Receptor Scintigraphy

C/F — Abd: pain
— Obstruction

carcinoid syndrome ⇒ Mid gut Carcinoid (MC)

— MC manifestation — **flushing** **

— wheezing

— Bronchospasm

— Diarrhoea.

TR *** ✓

PS ✓

MC lesion is Tricuspid regurgitation > PS

Rt heart ✓

Tr

90c → 24 hr urinary 5-hydroxy indole Acetic acid
5-HIAA

Rx — Resection & Anastomosis

for (Rx) of carcinoid tumours.

* Mc malignant tumour of small bowel is

① CARCINOID Tumour ✓

↓

② Adeno carcinoma ✓

* Mc malignant tumour of appendix

① mucinous Adeno carcinoma

↓

② Adeno carcinoma ✓

↓

③ carcinoid tumour ✓

LARGE INTESTINE

Hirschsprung disease m:f = 4:1

→ In 1 in 5000 population due to absence of ganglionic cells in both Auerbach (myenteric) & Meisner (submucosal plexus)

→ mc site → Rectum > Sigmoid

- Sometimes found in adult & some times involve small intestine

- affected segment - contracted → constipation large bowel obstruction

New born → Failure of passage of meconium in 48 hrs
abd. distension ✓

1st to 10 weeks → constipation, failure to thrive ✓

Children → repeated episodes of constipation ✓

FAECAL SOILING NOT A FEATURE OF HIRSCHSPRUNG.

- Rectal biopsy
- Absence of ganglion cells
 - hypertrophied nerve trunks

(Rx) → Initially - colostomy → definitive operation

SWENSON
DUHAMEL
SOAVE

Colorectal polyps

**
*

Neoplastic

- Adenomatous polyps
- 1) Tubular (MC) **
- 2) Villous (most malignant)
- 3) Tubulovillous

non-neoplastic

- hyperplastic
 - Hamartomatous
 - ✓ P-J polyp
 - ✓ Juvenile polyp
 - ✓ Inflammatory polyp
- (IBD → UC > CD)

P-J polyp :-

- mc site of polyp - Jejunum
- hypermelanotic macules over lip & buccal mucosa

LKB-1/STK-11 **
Chromosome -19.

Juvenile polyp

- Hamartomatous polyp in < 5 yrs of age
- Mc site - Rectum
- Bleeding PR **
- Risk of malignancy bit high compared to juvenile polyp < juvenile polyposis **

Adenomatous polyp

- ↑ risk of malignancy —
1. Villous
 2. Sessile polyps
 3. size > 2cm

→ **USA** → ↑ risk of malignancy

- ~~Ulcer~~ heterosigmoidoscopy
- ~~S.~~ Streptococcus Bovis Bacteremia
- ~~Acromegaly~~

*** **FAP**

- Familial Adenomatous polyposis
- AD.
- Adenomatous polyp
- > 100
- 100% Risk
- **APC** gene (Adenomatous polyposis coli)
- **5921**
- Age → 15 yrs of age
- By 40yrs all patients develop malignancy

Rx ^(TPC) Total proctocolectomy + ileal pouch
anal anastomosis (IPAA)

CF Bleeding p/R

Rx of choice for ulcerative colitis is
* same.

MC post-operative complication in FAP after

TPC + IPAA

www.FirstRanker.com

→ small bowel
obstruction

**

after surgery

Small bowel
obstruction

- After total proctocolectomy $\Rightarrow$ MC cause $\rightarrow$ perianal carcinoma
+ IPAA of death in FAP

**

- [90c] - screening $\Rightarrow$ APC gene testing, becoz polyp formation starts at 15yrs of Age ✓

Variants of FAP

* Gardner's syndrome

* Bony abnormalities $\rightarrow$ [osteoma] mandible **

* [CHRPE] $\rightarrow$ congenital hypertrophy retinal pigment epithelium

* [Desmoid tumours]

* [Supernumerary teeth]

* [Sebaceous cyst]

TURCOT'S syndrome

* ass $\bar{c}$ Brain tumour

- [FAP] medulloblastoma

- [HNPCC] Glioblastoma multiforme

[HNPCC]

$\rightarrow$ Hereditary nonpolyposis colon cancer

- mismatch repair gene abnormality

- [AD]

→ (hMLH-1, hMLH-2)

→ 2, 3, 7 chromosomes ✓

— FAP responsible of (1%) of colorectal — 100% risk ✓
 HNPCC — (5%) colorectal — 80% risk ✓
 Cancer upto

LYNCH syndrome

→ lynch-1 ⇒ colorectal cancer

lynch-2 → colorectal + Extraintestinal
 manifestations (malignancy)

*** Endometrium > Gastric > Ovarian EGID

*** Modified Amsterdam Criteria: — (HNPCC) ✓

*** " Bethesda Criteria — Detection
 of microsatellite
 instability (HNPCC)

* Muir TORRE syndrome

↳ variant of HNPCC

✓ multiple sebaceous cyst Adenoma

✓ multiple sebaceous Adenoma

✓ Keratokanthoma

COLORECTAL CANCER

✓ high fat Intake

✓ Alcohol

✓ FAP

✓ HNPCC

✓ smoking

✓ ureterosigmoidostomy

✓ S. Bovis Bacteremia

✓ Acromegaly

✓ Adenomatous
 Polyps

CARCINOMA COLON

→ mc site ⇒ Sigmoid **

→ Metastasis ⇒ LIVER

Chemotherapy — FOLFOX — IV

→ 5 Fluorouracil

→ Leucovorin

— Oxaliplatin

Right colon

— mc type is ulcero proliferative (fungating)

— mc ⇒ Bleeding

↓

— Anaemia

mc symptom — fatigue *

— mass in (RT) iliac fossa

— Both obstruction & Bleeding Seen — Transverse colon

Doc — Colonoscopy + Biopsy

Rx → Resection & Anastomosis — Dem margin

CARCINOMA RECTUM

— Mc symptom — Bleeding pr.

— characteristic symptoms

① Morning diarrhoea

left colon

— Annular stenosing

— obstruction

— Mc symptom

↓

Abd. pain **

- "SPURIOUS DIARRHOEA"
- Alteration of Bowel habits
- metastasis - liver
- chemo - FOL FOX IV

* [90c]

Proctoscope = 10cm

*

Rigid sigmoidoscope = 25cm ✓

flexible " = 60cm ✓

colonoscope = 160cm ✓

[90c]

→ Rigid sigmoidoscopy + Biopsy

[Inv for staging]

- TRUSS

- Trans Rectal ultrasound

- TRUS - not for lymph node

⇒ Eco MRI → investigation of choice for lymph node & overall staging

(Rx)

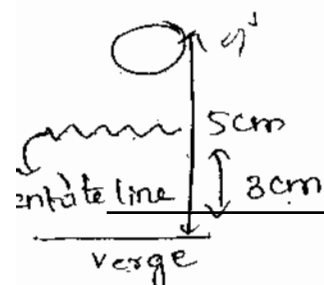
Ca Rectum located > 5cm above Anal verge

treatment is [LAR] * low Ant resection

Ca Rectum located < 5cm Anal verge

(Rx)

is [APR] → Abdominal perineal resection



Mc. SCC > BCC > malignant melanoma

Risk factors

- HPV (16, 18, 31, 33)
 - Smoking
 - HIV
 - Immune compromised state
 - Homosexuals
- mc - low socioeconomic status
Age - 5th - 6th decade

(C/F)

Mc - symptom - Bleeding "PR"

Apart from Bleeding "PR" → Foul smelling
discharge also anorexia & weight loss

most common - LN - inguinal lymph nodes

mc - metastasis (lungs) * * *

[Dx]

* *

proctoscopy + Biopsy

(Rx)

→ NIGRO regimen * * - chemoradiation

Chemotherapy → (5-FU + mitomycin)

↓
Rx of choice
sq. cell carcinoma

→ (N) Anatomical cushion composed of submucosal fat, Arterioles & venules

- located 3, 7, 11 o'clock position.

- helps in defecation.

- pts of constipation - Abnormal descent into lower portion of Rectum (or) Anal canal

→ Injury → Bleeding PR

Two types

Internal

→ located above dentate line

- Pain insensitive region leading to painless Bleeding 'PR'

External

- located below dentate line

- pain sensitive region leading to painful Bleeding "PR"

" 5 days painful
Self curing lesion "

(Rx) Excision

Classification of internal haemorrhoids

1^o → Bleeding only

2^o → Bleeding PR + prolapse during defecation & spont. resolution after defecation

3^o → Bleeding + prolapse & manual reposition.

- Mc cause of lower GI bleed - haemorrhoids
- * - Mc cause of significant lower GI bleed
- * - colonic diverticula

(Rx)

1^o

⇒ Dietary modification + high roughage diet + stool softness

2^oSelected
3^o pt

Banding (or) sclerotherapy

(used in

- Varices

- haemorrhoids

- varicose veins)

→ sclerosing agents - Mc

→ Na tetradecyl sulphate

- Ethynolamine oleate

- Polidocanol

- 5% phenol in Almond oil.

Selected 3^o4^o

- Haemorrhoidectomy

Milligan Morgan

open haemorrhoidectomy

Longo's

stapler

haemorrhoidectomy

Preferred ✓

- Mc complication of haemorrhoidectomy is pain & urinary retention (followed)

ANORECTAL ABSCESS

- * Mc site ⇒ 1) perianal - (Mc)
- * ⇒ 2) ischio-rectal - 2nd
- 3) sub mucous
- 4) pelvi-rectal

C/F → severe pain in perineal region & redness

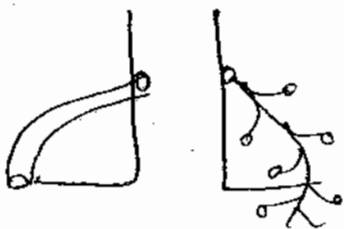
Rx → cruciate shaped incision & drainage & antibiotics

FISTULA IN ANO

- cryptoglandular theory
- undrained pus find own track

- ① low lying (Below Ano rectal ring)
- ② high lying (Above Ano rectal ring)

Ano rectal ring → Levator ani
 ✓ Internal anal sphincter
 ✓ Ext. anal sphincter



Simple fistula

Complex fistula

Simple fistula - single straight track - FISTULOGRAM *

Complex - multiple branch fistula - MRI *

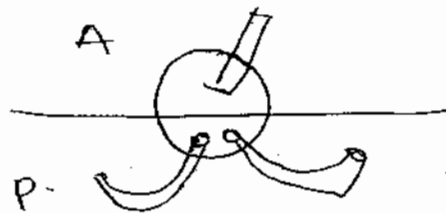
→ initial inv in simple fistula ⇒ FISTUOGRAM

Inv of choice ⇒ MRI

- ① Inter-sphincteric
2. Trans-sphincteric
3. Supra-sphincteric
4. Extra-sphincteric

ITS - E

* GOODSALL'S RULE - on basis of Ext. opening localisation of int. opening



→ Anterior - straight back
Post → curved back

Exceptions : Ext. opening > 3cm from anal verge

(or)

2 (or) more Ext. opening

↓

[Posterior rule applies]

Rx.

✓ FISTULOTOMY

✓ FISTULECTOMY

✓ SETOM (Cutting/Draining)

✓ VAAFT (Video assisted Anal fistula treatment)

to low lying fistula

→ non cutting / draining seton - infected fistula
in HIV, crohn's disease ✓

- when infec controlled by draining setone

monoclonal
antibody against

TNF- α

- Infiximab

non responding against

α_4 -integrin - Natalizumab ✓

→ Fissure → sentinel pile *** -